NEXO

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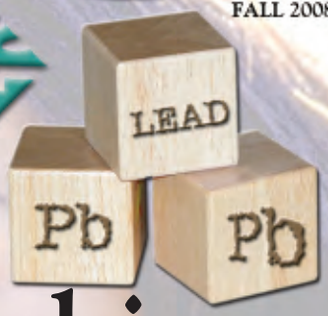
A Focus on Michigan's Latinos



Blood Lead Levels Among Children in Michigan

By Stan A. Kaplowitz, Harry Perlstadt, and Lori Post

This article provides the results from two studies on blood lead levels (BLL) among children in Michigan with a specific focus on Latino children. The first study sought to predict BLL from race, Medicaid status, and socio-demographic and housing characteristics. The second study examined the effects of several parent characteristics on BLL of newborns. The data used are from the Michigan Department of Community Health's database of Blood Lead Level Tests and the Database of Live Births.

The most common high dose sources of lead exposure for children are lead-based paint and lead contaminated dust and soil, commonly found in old, poorly maintained housing (CDC, 2005). Children may also be exposed to lead through contaminated candy, costume jewelry, and toys with lead paint. Blood lead levels as low as 10 μg/dL (micrograms of lead per deciliter) have long been known to be associated with adverse effects on cognitive development, growth, and behavior among children aged 1-5 years (Chen et al., 2005; National Research Council, 1993), and evidence is emerging that lead-associated intellectual deficits occur at blood lead levels less than 10 μg/dL (Lanphear et al., 2005).

The good news is that the number of children with Elevated Blood Lead Level (EBLL) has decreased noticeably in recent years. According to our examination of the Michigan Department of Community Health (MDCH) database of Blood Lead Level (BLL) tests, from 1998-2001, the number of different children with BLL greater than 10 μg/dL confirmed by a venous blood draw was approximately 15,000. During the next 4-year period (2002-2005), the comparable figure was less (approximately 10,000), although more children were being tested.

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2006-2008 In the Midwest

The Impact of Race and Ethnicity, Household Structure, and Socio-economic Status on Health

By Dr. Jean Kayitsinga and Dr. Rubén Martinez, JSRI

Overall, the health status of the U.S. population continues to improve – life expectancy increased between 1990 and 2004 by 3.4 years for males and 1.6 years for females; mortality from heart disease, stroke, and cancer has continued to decline in recent years; and infant mortality declined through 2001 and has not changed significantly since then. However, these improvements in health have not been equally distributed by income, race, ethnicity, education, and geography.

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Accessibility of Official Statistics

From the Director
Rubén O. Martinez

For over a century our federal and state governments have been using official statistics both to understand changes that have occurred and for planning what should be done. WWI forced our federal government to address shortcomings in the coordination of the statistical agencies and bureaus to meet the demand for statistics by the War Boards. Isolated work by the agencies had resulted in duplication and the inability to compare and combine their results due to inconsistencies in the categories and units used. The efficiency of economic mobilization to support the war was threatened by the haphazard work of the agencies, not to mention the waste of tax dollars. Today, in an era of data-driven planning and accountability, the need for official statistics is greater than ever. Not only must agencies and their bureaus systematically collect data and make their statistical results accessible to the public, but they must do so in a digital context in which the demand for official statistics continually increases.

As Michigan faces one of the worst economic crises in its history, state leaders must ask themselves if the public departments and their statistical bureaus are meeting the needs of the efforts to address the economic challenges. One fact is already clear: Even before the economic crisis, the State of Michigan was not meeting the demand for official statistics by race/ethnicity across the entire range of life areas. This is just one category, albeit one of the most important ones, for tracking issues of disparities, inequities, and discrimination. Take for example Michigan Public Act 653 of 2006, which amended Public Health Act 368, which provides for a comprehensive health information system. PA 653 provides for, among other things, the monitoring of racial and ethnic health disparities and minority health. As a result, the Department of Community Health makes available statistical reports using the basic race categories provided by the Office of Management and Budget through its Statistical Policy Directive No. 15, while adding the category of "Arab Ancestry" to the others. Although more may be expected in the availability of statistical information, this department is far ahead of the others.

In corrections, for example, it is immensely difficult to find a current statistical profile of correctional inmates by race/ethnicity in Michigan, at least on the Internet. Instead, the *2005 Statistical Report* found on the Michigan Department of Corrections web page provides statistics using the categories of White and Non-White. For the student interested in Latinos, this report provides little useful information. Moreover, it is not clear in which category Latinos are included. In contrast, the State of Texas provides a *Statistical Report (FY 2007)* which provides statistics using the categories Black, White, Hispanic and Other. This is an improvement, although students interested in Native Americans and Asians would have difficulty accessing those figures.

As e-government continues to take hold, the lack of public accessibility to useful public data by relevant categories diminishes the transparency of government and, thus, democracy itself. As was the case nearly a century ago, more is lost by failing to consider the statistical needs of government in a period of great social and economic change than by providing the resources to systematically meet those statistical needs. In today's digital environment, it also means meeting the statistical needs of the public. Surely the planning demands of today cannot be addressed without useful public statistics that inform strategic thinking, policy development, and planning processes related to the broad range of life areas. The public good can best be served through a responsive and transparent government that provides useful official data and public statistics in ways that members of the public are able to access easily and use productively.

Former JSRI Director Passes Away

Dr. Israel Cuellar, Director of JSRI from 2001-2004, passed away at his home in San Antonio, Texas on Sept. 7, 2008. Dr. Cuellar was an internationally and nationally known scholar whose work on acculturation continues to shape research on minority groups nationwide. His final novel, *The Barrida Cure,* is in press. His presence and leadership in higher education — and especially psychology — will be missed.

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Blood Lead Levels

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However, the number of confirmed cases of elevated BLL is still not trivial, and probably an underestimate. In addition to confirmed cases, many cases of apparently elevated BLL, identified by a finger prick for a droplet of blood, are not followed up with a more diagnostic venous draw. Our analysis of this database finds that this number was over 6,600 in 1998-2001 and over 3,000 for 2002-2005.

Prior research shows that the mean BLL in children tends to peak between 18-36 months of age, and slowly declines over the next few years (CDC, 2005; Dietrich et al., 2001). Together, these findings suggest that the age of child and the year of testing are important factors to consider.

Phase 2 of the third National Health and Nutrition Examination Survey (NHANES III) revealed that an estimated 535,000 children aged 1-5 years and enrolled in Medicaid across the U.S., had elevated BLLs with a prevalence three times greater than BLLs among young children *not* enrolled in Medicaid (9% compared with 3%) (CDC, 1997a; GAO, 1998).

Elevated Blood Lead Level (EBLL) also disproportionately affects certain minorities, most notably Latinos and African Americans, (see e.g., Lanphear et al., 1996). For example, while the average incidence rate of elevated blood lead levels in low income children in El Paso County, Texas was 7.7% in 1995, low income children residing in zip codes in *colonias* and decayed urban areas had rates as high as 10% (Amaya et al., 1997).

Aguirre and Hernandez (2003) conducted a more detailed study on lead poisoning in Latino children. They found that in San Bernardino County (California), where persons of Latino origin account for 46% of the total population, 65% of 2,500 children with elevated blood lead levels were Latino. In addition to deteriorating paint in old houses, they identified three common sources of lead in Latino households: use of clay pottery for cooking and serving food, home remedies, and Mexican candies. Imported clay pottery was the second most common source of lead exposure for children in San Bernardino County. The lead is found in the glaze finishing on both the inside and outside of the pottery. When a "bean pot" is heated to boil the beans, the lead is released into the beans themselves. They also identified lead-based home remedies to cure illnesses such as *azarcón* (lead tetroxide) and *greta* (lead monoxide) for *empacho,* or gastrointestinal problems. Imported from Mexico, some samples have concentrations of 70%-90% lead oxides. Finally, a small proportion of candies produced in Mexico and imported in the early 2000s were found to have high levels of lead both in the wrappers and the candy itself.

Morales et al (2005) analyzed data for 3,325 Mexican-American youth aged 1-17 years from the Third National Health and Nutrition Examination Survey (NHANES III, 1988–1994). The survey included demographic, socio-economic, and housing questions and was administered by a bilingual staff in Spanish or English. Following the survey, blood samples were taken in NHANES III mobile examination centers.

Their analyses reveal that BLL declines with acculturation, that is, the length of time the family has been in the U.S. and the use of English as the primary home language. But when controlling for other variables — family's income relative to the poverty level, educational attainment of head of household, and age of housing — Latino children's blood lead levels declined to levels similar to their Anglo-American counterparts. They also found that Medicaid enrollment did not predict BLL in Mexican-American children, although it is a predictor for all children in the U.S. (see Morales et al., 2005).

Another well-known risk factor is age of housing. Lead was a major ingredient in most interior and exterior house oil-based paints prior to 1950, with some paints containing as much as 50% lead by dry weight (EPA, 1996). The paint industry gradually reduced the sale of lead paint, and in 1955, it adopted a voluntary standard (American Standards Association Z66.1) limiting the use of lead in interior paints to no more than 1% by weight. Paint companies placed warnings on paints with more than 1% lead indicating that they should not be used on interior residential and other surfaces accessible to children (National Paint and Coatings Association, 2007). But, in 1971, the New York City Health Department found heavily leaded interior paints on paint store shelves (Bird, 1971). In 1978, the Consumer Product Safety Commission banned the sale of residential paint containing more than 0.06% lead (see Laraque and Trasande, 2005).

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Blood Lead Levels

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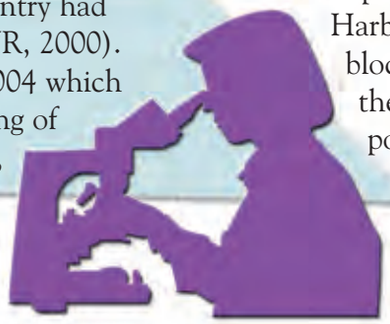
Compared to other medical tests, BLL tests are not especially expensive. Children insured by Medicaid receive BLL tests as a covered service. In Michigan, the MDCH Lead Laboratory charges $16.91 for the analysis (MDCH, 2007). The cost through a commercial laboratory ranges from $10-$75, plus the charge for an office visit (Yolo County, Calif., 2007).

However, while one BLL test is not terribly expensive, universal testing would be sufficiently costly that leading public health agencies have developed strategies so that BLL testing can be efficiently targeted at those with the greatest risk. Since being Medicaid-enrolled is a substantial risk factor, federal regulations require that children aged 1-5 years insured by Medicaid receive BLL tests at 12 and 24 months, and that such tests be benefits that are covered by Medicaid. Despite this, in 2000 only 19% of young children enrolled in Medicaid across the country had been screened with a blood lead test (MMWR, 2000).

In response, Michigan enacted PA 55 of 2004 which requires Medicaid providers to increase testing of Medicaid enrolled children to 80%. By 2007, the percentage of children tested, at least once, by age two had improved to approximately 61% for those in Medicaid managed care and 51% of those in Medicaid fee for service. But over 40% of Michigan children insured by Medicaid were still not tested (MI-CLPPP, 2007).



The Center for Disease Control (CDC) developed a set of guidelines to increase the screening (i.e. BLL testing) and follow-up care of children who most need these services, and to ensure that screening is appropriate for local conditions (CDC, 1997b). These guidelines allow public health authorities to develop their own screening policy using local BLL data and/or housing data collected by the U.S. Census Bureau.

The challenge facing local health departments, then, is deciding which children are most likely to need screening, and how they can be identified. Since elevated BLL is especially prevalent among people living in or near old and poorly maintained housing, the commonly used methods of assessing risk have used information regarding 1) Medicaid status; 2) self-report questions about the family's housing and habits, and 3) assessments of the age of housing and socio-economic characteristics of the neighborhood.

Many public health departments have assessed housing and neighborhood characteristics at the zip code level. Michigan, in the 1990s, classified zip codes as high or low risk based on the incidence of lead poisoning among young children, the proportion of pre-1950 housing, and the proportion in poverty. In Michigan, half of all zip codes were classified as "high BLL risk" by the MDCH.

It is more predictive, however, to assess health risk from smaller geographic areas, like census tracts and block groups (see Krieger et al., 2003a, 2003b). Block groups generally contain 300-3,000 people and a tract contains 1,000-8,000 people. While Michigan has less than 1,000 zip codes, it contains almost 2,000 census tracts and over 8,400 block groups. Moreover, the census provides data on housing characteristics, income, and race/ethnicity for block groups.

The major characteristics known to affect BLL (income, age of housing and race/ethnicity) can vary greatly among block groups within a zip code. For example, Michigan zip code 49022 (city of Benton Harbor and two townships) contains 36 census block groups. Based on the 2000 census data, the percentage of people below 185% of poverty ranged from 11-82%, the percent living in housing built before 1950 ranged from 8%-69%, and the percent African American ranged from 0-97% across the census blocks.

Study 1. Race, Medicaid, and Neighborhood Characteristics

Study 1 predicts BLL from race, Medicaid status and various socio-demographic and housing characteristics. Previous studies have geo-coded housing and socio-demographic characteristics by block groups within a county to identify areas of high risk for childhood lead poisoning (Reissman et al., 2001; Roberts et al., 2003; Sargent et al., 1995; Lanphear et al., 1998). Krieger et al., (2003a, 2003b) compared all children ages 1-5 years in Rhode Island, who were screened for lead levels by block groups, census tracts, and zip codes, on a set of variables focusing on social inequalities related to health disparities — class, education, and poverty-wealth. This study takes the statewide approach of Krieger et al., but also develops a prediction equation to identify children at high risk by incorporating variables more directly

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related to elevated BLL — that is, age of housing, income, education, race/ethnicity, and Medicaid status.

Methods

Data. The MDCH maintains a database of all reported BLL tests in Michigan. It contains the residence address of the child at the time of the BLL test, Medicaid status, and racial identification of most of the children. Each address was geo-coded with the latitude, longitude, and 2000 census block group. The co-authors worked with the MDCH Childhood Lead Poisoning Program under a grant from the Centers for Disease Control. The data were provided to the co-authors with all names and identifiers removed, in accordance with human research protection rules. After receiving the data, we attributed to each case, census data about the racial-ethnic breakdown, housing characteristics, and the income and educational characteristics of the residents of the block group.

To see how well an equation developed from one time period can predict BLL several years later, we grouped the data into two files: one for BLL tests performed in 1998-2001 and the other for tests from 2002-2005. For the analysis reported here, we kept only the highest BLL result for each child in each four year period.

Our analysis is restricted to children who had not reached their sixth birthday when tested. For 1998-2001, we used data from 223,571 unique children, of whom 73% were Medicaid enrolled. The 2002-2005 data contained 340,188 unique children, of whom 69.8% were Medicaid enrolled.

We lacked the racial classification of 22.9% of cases in 1998-2001 and 36.1% in 2002-2005. To substantially reduce the loss of cases due to missing data, we assumed that the child was not Black if the child's block group was less than 10% African American, and assumed the child to be Black if the block group was more than 90% African American. This imputation resulted in only 6.6 % missing cases in 1998-2001 and 9.7% in 2002-2005.

While the MDCH database contains the variable Ethnicity, we found that 7.5% of cases are coded Latino, 0.9% non-Latino, and the rest have missing data on this variable. Due to so much missing data, this variable was not included in our prediction equation.

Data Analysis Strategy. Lanphear et al., (1998) predicted elevated BLL from block group socio-demographics and housing by dichotomizing BLL at 10 mg/dL for Elevated BLL. However, since BLL is not only continuous but appears to have ill effects that resemble a dose-response relationship (see, e.g., Canfield et al., 2003), we treat it as a continuous variable.

Regression analysis assumes that the residuals are normal and have homogeneity of variance (see McClendon, 1994). Consistent with earlier findings, (Brody et al., 1994) our BLL data are normally distributed after being logarithmically transformed. The transformation that best meets this assumptions is *Ln*(BLL-.5) where *Ln* is the logarithm to base *e* (≈2.718) and BLL is the blood lead level in the MDCH database. Since the minimum BLL level recorded is "1," it is always possible to compute the logarithm of (BLL-.5), and it is also likely that many of the BLL results recorded as "1" would actually be closer to .5 if the measurement were more precise. This logarithmic function of BLL is our dependent variable in all regressions.

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TABLE 1. PREDICTING *LN*(BLL-.5) FROM RACE, AGE AND BLOCK GROUP CENSUS VARIABLES IN 1998-2001 AND 2002-05 FROM HIERARCHICAL LINEAR MODELING (standard errors)

Predictor	Coefficients for 1998-2001	Coefficients for 2002-05
Intercept	-0.401 (0.009)	-.0487 (0.009)
Individual Child Characteristics		
Black	0.270 (0.007)	0.206 (0.006)
Medicaid	0.220 (0.004)	0.172 (0.006)
Age 1	0.242 (0.007)	0.224 (0.007)
Age 2	0.426 (0.007)	0.390 (0.007)
Age 3	0.295 (0.007)	0.265 (0.007)
Age 4	0.180 (0.007)	0.138 (0.007)
Age 5	0.147 (0.008)	0.058 (0.008)
First Year of Four	0.289 (0.005)	0.220 (0.004)
Second Year of Four	0.171 (0.005)	0.075 (0.004)
Third Year of Four	0.055 (0.005)	0.017 (0.004)
Block group census variables		
Proportion not graduating HS	0.468 (0.044)	0.556 (0.040)
Proportion pre 1940 housing	0.808 (0.019)	0.694 (0.050)
Proportion 1940-1950 housing	0.277 (0.034)	0.119 (0.021)
Proportion below 185% Poverty	0.377 (0.030)	0.212 (0.028)
Proportion Black	0.414 (0.016)	0.400 (0.014)
Proportion Latino	0.641 (0.054)	0.556 (0.050)
Interactions		
Medicaid * Proportion pre 1940 housing	Trivial – not included	0.109 (0.018)
Medicaid * Proportion 1940 -1949 housing	Trivial – not included	0.171 (0.028)
Adjusted R-Sq after prediction equation using		
Above block group Variables	0.285	0.215
Above individual level variables	0.229	0.168
Above individual level variables + block group variables plus interactions	0.341	0.256

Notes: For 1998-2001, n=206,991; for 2002-05, n = 307,204. In 1998-2001, year 1 = 1998, while in 2002-05, year 1 = 2002. All P values are less than 0.001. The reference groups for dummy variables were Age zero (i.e., less than one) and the last year of each four year period.

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The Latino population is the fastest growing population in the United States. It is projected to increase from 35,622,000 in 2000 to 102,560,000 in 2050, reaching 24.4% of the U.S. population in 2050. Latinos are more concentrated in the West (42.3%) and South (35.0%) than in the Northeast (13.6%) and Midwest (9%) regions. Although the percentage of the population that is Latino has increased each year from 2000 to 2007 in all regions, greater changes in the percentage of the Latino population are observed in the Midwest (26.5%) and South (23.9%) than in the Northeast (15.0%) and West (12.6%). Significant racial and ethnic disparities still exist across a wide range of health measures and may be widening given such rapid growth of Latinos and other ethnic groups.

Race and ethnicity remain strong predictors of health status. Socio-economic status (SES) also continues to be a remarkably strong determinant of variations in the rates of illness and death. Numerous studies, such as those by Lynch and Kaplan (2000) and by Robert and House (2000), have shown that individuals at higher SES levels do better on most measures of health status than their lower SES counterparts.

The gaps in health status may also be due to differences in household structures. For instance, being married is generally healthier for an individual than being unmarried. Families and households have been changing in structure as indicated by the increase in female-headed households and non-family households. The latter half of the 21th Century in the United States was a period of widespread family change characterized by rising age averages at first marriage and first birth, an increase in non-marital child bearing, and cohabiting unions (Bumpass et al., 2000; Casper et al., 2002; Wu et al., 2001; Landale et al., 2007).

Disparities in health status may also be due to more rapid gains in health status for high SES than for low SES groups or worsening health status for those with lower socio-economic status. It may also reflect the deteriorating effects associated with changing family structures. In this article we present the results of our study on the relative and combined health effects of race and ethnicity, socio-economic status, and household structure, and determine how socio-economic status and differences in household structure explain the racial and ethnic gaps in health.

Background

Generally, African Americans and Native Americans have higher mortality and poorer health status than do other group in the U.S. Although the gap in life expectancy between Blacks and Whites has narrowed, it nevertheless persists. According to the National Center for Health Statistics (NCHS, 2007), the infant mortality rate in 2004 for Blacks was more than twice that of Whites, and that for American Indians was about 1.5 times that of Whites. Hispanics had a slightly lower rate than Whites. The term "Hispanic paradox" was coined to refer to the phenomenon that Hispanics tend to be of lower SES, but have better than expected health and mortality outcomes. Infant mortality rates for Asian Americans also tend to be lower than those for Whites, although relative mortality varies for specific causes of death for all groups. Also, variations exist within Latinos; Puerto Ricans have higher infant mortality rates than do other Latino groups and non-Hispanic Whites. Clearly, race and ethnicity and SES continue to be strongly associated with health status.

SES affects health by affecting a broad array of biomedical, environmental, behavioral, and psychosocial risk factors for health. The mechanisms through which SES affects health include individuals' exposure to both health-damaging conditions and health-protecting resources. Some exposures have direct effects on health while others influence psychosocial and behavioral factors related to disease and death, including cognition and emotion (e.g., depression, hopelessness, hostility, and lack of control) and behavior (e.g., use of cigarettes, alcohol, and other substances). Health-damaging exposures include early life conditions, inadequate nutrition, poor housing, exposure to lead and other toxins, inadequate health care, unsafe working conditions, uncontrollable stressors, social exclusion, and discrimination (Adler et al., 2008).

SES may also affect health by exposing individuals to different stressful conditions. Disadvantaged environments, which vary by SES, expose individuals to greater

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THE BALLAD OF ESEQUIEL HERNÁNDEZ

A Film Review By Luis Moreno, MA, JSRI Research Assistant

The national debate over immigration and national security has led to the dramatically increased military presence on the U.S. and Mexico border. In 2006, President Bush called on the Department of Homeland Security (DHS) to develop a new type of infrastructure by adding new personnel (military-type Border Patrol agents and force) and technology (joint activities with the U.S. Armed Forces) to secure the U.S. and Mexico Border.[1]

Not since the late 1990s has the Border Patrol conducted missions with the U.S. Armed Forces. Prior to that, the Department of Defense (DOD) had been working with the Border Patrol, under "Joint Task Force Six," to conduct military-type missions to stop drug smuggling on the *la frontera*.[2]

The military pressure on the U.S. and Mexico border reached a dramatic, but painful, crescendo in 1997 when the West Texas town of Redford, with a population just over 100, became the site of the first U.S. civilian to be intentionally killed by U.S. Armed Forces along the U.S. and Mexico border.

On May 20, 1997 — six days after he turned 18 — Esequiel Hernández, Jr., was shot while tending to his goats by U.S. Marine Corporal Clemente Banuelos. Hernández was unaware that any battle-ready Marines were on his family's property or in the area. The three-man Marine squad was fully camouflaged and carefully hidden when Hernández fired his antique .22 rifle twice to keep wild dogs away from his goats. The Marine unit was part of a newly ordered military surveillance unit patrolling along the U.S. and Mexico Border for drug smuggling activity.

In response to the young American's shots "in their general direction," the combat-equipped Marines methodically stalked Hernández for about 20 minutes without calling for assistance or guidance from the Border Patrol. Ultimately, as detailed in the documentary directed by Kieran Fitzgerald, Cpl. Banuelos somehow mistakenly believed Hernández was a guard for drug smugglers and had fired twice at them. Consequently, Banuelos shot and killed Hernández with a high-velocity round in the back.

A full decade later, Fitzgerald's documentary, entitled *The Ballad of Esequiel Hernández,* explores both sides of this tragic event. In telling this account, Fitzgerald utilizes interviews from three of the four Marines, Hernandez's family, and investigators. In developing this comprehensive account of the intentional death of Esequiel Hernández, Jr., and the increased militarization of the U.S. and Mexico border, the documentary allows viewers to question their nation's immigration and national security policies. As the director states, "militarizing the border was something that lawmakers and politicians wanted. They wanted to have a show of force and tell people that by using the military, they were waging a real war on drugs [immigration and national security]."[3]

In the end though, the documentary adds the human element and personal costs to the debate over the issues of immigration and national security.

For more information on this documentary, visit: *www.pbs.org/pov/pov2008/ballad*

1 See President Bush's Comprehensive Immigration Reform Policy at www.whitehouse.gov/infocus/immigration (Accessed 1 Oct 2008).
2 See Timothy J. Dunn, The Militarization of the U.S.-Mexico Border, 1978-1992: Low-Intensity Conflict Doctrine Comes Home (Austin: CMAS Books, University of Texas at Austin, 1996).
3 See "Filmmaker Interview," www.pbs.org/pov/pov2008/ballad/ behind_interview.html (Accessed 1 Oct 2008).

Settling Out, Settling Down, and Settling In

JSRI Director Dr. Rubén Martinez delivers the first of three Fall "Our Journeys, Our Stories" presentations that highlight Latinos' accomplishments, achievements, and impacts in Michigan. The special events are partially sponsored by the Michigan State University Museum and include Leadership Contributions and Latino Contributions to the Visual Arts in Michigan.

Contributions of Latinos to the State of Michigan

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uncertainty, conflict, and threats for which there are often inadequate resources to respond effectively. These experiences cumulate to create chronic stress among individuals subjected to prolonged exposure to such conditions. Poor people are especially disadvantaged with respect to healthy lifestyles by engaging in greater cigarette consumption, unhealthier eating and drinking practices, and lower levels of participation in exercise across adulthood (Wickrama et al., 1999; Snead et al., 2002; Cockerham, 2005). In contrast, upper- and middle-classes tend to adopt healthier lifestyles by engaging in leisure-time sports and exercise, healthier diets, moderate drinking, little smoking, more physical checkups by their physicians, and greater opportunities for rest, relaxation, and coping with stress (Robert et al., 2000; Snead et al., 2002; Cockerham, 2005).

According to Williams and Collins (1995), increasing economic inequality is apparently the major driving force behind widening health disparities. However, to understand the widening gaps in health status one has to look at the combined and separate effects of SES and race and ethnicity on health. Although SES often accounts for a large part of racial and ethnic differences in health, independent effects of race and ethnicity on health outcomes persist, depending on which health outcomes are studied (Adler et al., 2008). Hispanics and African Americans in general have lower incomes and wealth than non-Hispanic Whites and Asians at a given income level (Braveman, et al. 2005).

Differences in household structure may also contribute to racial and ethnic gaps in health. According to the marital resource model, marriage provides social, psychological, and economic resources that in turn promote physical health and longevity (Ross et al., 1990; Waite et al., 2000). Culturally, however, marriage has become less valued as a source of economic stability (Teachman et al., 2000) and individuals are less inclined to get or stay married (Liu et al., 2008). It may also be the case that the increase of women in the labor force since the 1970s is associated with partners, especially wives, having less time and energy to provide social support to one another than in the past (Bianchi et al., 2000). In contrast, the stress model suggests that the strain of marital dissolution undermines the health of the divorced, the separated, and the widowed, which in turn leads to marital differences in health (Williams et al., 2004).

Marriage appears to enhance the health of men more than women and marital dissolution seems to have more adverse effects on the health of men than women (Williams et al., 2004). Marital patterns and experiences also differ by race and ethnicity. African Americans in general have lower rates of marriage compared to others (Oppenheimer, 1997) and report higher levels of strain, which tends to reduce the benefits of marriage for health (Umberson et al., 2005). In contrast, Latinos, particularly Mexican Americans, in general have higher rates of marriage than other groups. Mexican Americans are the most likely and non-Hispanic Blacks the least likely to have ever married. Other groups, such as non-Hispanic Whites and other Latinos (Puerto Ricans, Cubans, and Central and South Americans), fall somewhere between the spectrum of Mexican Americans and Blacks (Landale et al., 2007).

Data and Methods

The March Supplement of the Current Population Surveys (CPS) is used to explore the association between race and ethnicity, family structure, socio-economic status, and residence and health status. The CPS is a hierarchical data file with records of approximately 60,000 households. Only civilian working-age adult (between 18 and 64 years) householders in the labor force are used. Geographically, data were selected for the following states in order to focus on the health status of populations in the Midwest: Ohio, Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, and Kansas.

Data from the 2006-2008 CPS files were combined to facilitate a detailed breakdown by race and ethnicity across the variables of interest.

The dependent variable used in the analyses is a measure of self-reported physical health. Studies show this can be useful in predicting mortality, morbidity, disability, and health care utilization. Self-related physical health was assessed with a single item question: "Would you say (name's/your) health in general is excellent, very good, good, fair, or poor?" The

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dependent variable was further recoded to create a dummy variable, classifying respondents based on whether they reported fair/poor health, coded "1," or good, very good, or excellent, coded "0."

This study uses three central independent variables. The first is race and ethnicity. The race/ethnicity measure was constructed by first identifying respondents as Latinos or non-Latinos, and then categorizing the non-Latinos by race as being White, Black, or other race (e.g., Native Americans, Asians or Pacific Islanders, or others). The second variable of interest was household structure. Household structure was measured in terms of gender and number of heads in the household. Specifically, each household was characterized as dual-headed household, single male-headed household, or single female-headed household. The third variable of interest was socio-economic indicators, including educational attainment and household income. Education was measured by nine categories: 4th grade or less; 5th-8th grade; 9th-12th grade, no diploma; high school graduate; some college, but no degree; associate degree; bachelor's degree; master's degree; and doctorate or professional degree. Household income is measured using 11 categories: less than $10,000; $10,000-$14,999; $15,000-$19,999; $20,000-$24,999; $25,000-$29,999; $30,000-$39,999; $40,000-$49,999; $50,000-$69,999, $70,000-$89,999; $90,000-$99,999; and $100,000 and over. To provide the perspective on change, separate analyses were conducted for 2000-2002, 2003-2005, and 2006-2008.

Control variables included measures of age, foreign-born status, number of children in the household, home ownership, nonmetropolitan residence, service occupations, part-time employment, unemployed or not working, and health insurance coverage.

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TABLE 1. LOGISTIC REGRESSION MODELS OF FAIR OR "POOR" PHYSICAL HEALTH ON RACE, ETHNICITY, FAMILY STRUCTURE, AND SOCIO-ECONOMIC STATUS, 2006-2008

	Model 1	Model 2	Model 3	Model 4	Model 5
Variables	*β (S.E.)*	*β (S.E.)*	*β (S.E.)*	*β (S.E.)*	*β (S.E.)*
Intercept	-4.217 (0.099)***	-4.631 (0.117)***	-2.457 (0.148)***	-2.945 (0.157)***	-3.269 (0.166) ***
RACE/ETHNICITY					
Non-Hispanic Black	0.695 (0.065)***	0.476 (0.066)***	0.209 (0.070)**	0.201 (0.073)**	0.183 (0.074) *
Latino/Hispanic	0.365 (0.099)***	0.285 (0.099)***	-0.041 (0.109)	-0.018 (0.109)	-0.008 (0.108)
Asian	0.030 (0.181)	0.010 (0.182)	0.314 (0.190)	0.333 (0.190)	0.313 (0.190)
Other race	0.872 (0.109)***	0.748 (0.110)***	0.510 (0.112)***	0.481 (0.114)***	0.329 (0.118) ***
Age	0.032 (0.002)***	0.036 (0.002)***	0.046 (0.002)***	0.046 (0.002)***	0.047 (0.002) ***
Foreign-born Status	-0.039 (0.103)	0.050 (0.103)	-0.191 (0.114)	-0.147 (0.114)	-0.095 (0.113)
HOUSEHOLD STRUCTURE					
Single Male-headed Household		0.422 (0.064)***	-0.137 (0.070)	-0.081 (0.071)	-0.021 (0.071)
Single Female-headed Household		0.730 (0.053)***	0.089 (0.063)	0.136 (0.063)*	0.157 (0.065) *
Number of Children		0.017 (0.022)	0.018 (0.023)	0.010 (0.023)	-0.020 (0.023)
SOCIO-ECONOMIC STATUS					
Education Attainment			-0.171 (0.017)***	-0.163 (0.017)***	-0.158 (0.017) ***
Household Income			-0.150 (0.010)***	-0.116 (0.011)***	-0.094 (0.011) ***
Home Ownership			-0.481 (0.059)***	-0.454 (0.060)***	-0.414 (0.061) ***
Residence (Nonmetropolitan)				0.078 (0.051)	0.063 (0.052)
JOB QUALITY					
Service Occupation				0.121 (0.060)*	0.096 (0.060)
Part-time Employment				0.441 (0.060)***	0.327 (0.062) ***
Unemployed/Not Working				0.805 (0.079)***	0.667 (0.082) ***
HEALTH INSURANCE COVERAGE					
No Insurance					0.142 (0.055) **
Government insurance					0.842 (0.082) ***

Samora Endowment Scholarship Fund

JSRI Scholarship Winners

Following calls for applications for the endowed scholarship originally established by Dr. Julian Samora himself, JSRI — the Midwest's premier Latino research institute — announced the Spring and Fall winners for the competitive "Samora Endowment Scholarships." Three Michigan State University graduate and one undergraduate students were among the four recently named scholarship recipients.

The "Julian Samora Endowed Scholarship" fund was initially created with a "start-up" donation from Dr. Samora in 1995 and, through additional contributions and interest accrual over the years, now funds two awards for deserving MSU students. The scholarship supports talented students whose research interests focus on Latinos in the Midwest. The annual scholarships are also intended to financially assist students who have demonstrated the capacity to achieve both educational and professional goals, exhibited a special motivation to succeed, and are interested in engaging in research at the university level.

The 2007-2008 Spring scholarship winners include:

Louie Herrera Moreno III ***(top left)*** is a Ph.D. student in the new Chicano/Latino Studies Ph.D. Program at MSU. He earned a B.A. in Chicana/o Studies at San Diego State University and a master's in Chicana/o Studies from California State University. Moreno has presented his research at community, professional, and education settings and was formerly an Assistant Archivist at CSU-Northridge. This past summer, he was selected to serve in the 2008 Latino Museum Studies Program (LMSP) at the Smithsonian Institution in Washington, D.C. His areas of research include grass-root and community activism and historical preservation.

Jose Cruz Rosas-Garcia ***(bottom right)*** is an MSU junior majoring in Human Resources & Society with specializations in Latin American Studies and Chicano/Latino Studies. Originally from Mexico and the son of migrant farmworkers, Rosas is a first generation college student who enrolled at MSU through the College Assistant Migrant Program. His ambitions include formal training and continued education that will enable him to serve Latino communities.

Two other graduate students were named winners of the 2008-2009 Fall and Spring Endowment Scholarships.

Marisa Crystal Cuevas is a native of Los Angeles and is currently in her first year of law school at the Michigan State University College of Law. She studied sociology at the University of California-Berkeley where she was the Chair of the Associated Students of University of California Judicial Council. After she finishes law school, Cuevas envisions returning to Los Angeles and becoming an Assistant District Attorney.

David Cordova ***(top right)*** earned his bachelor's degree in Psychology from San Diego State University, a master's degree from Alliant International University, and is a doctoral candidate in MSU's Department of Family and Child Ecology. A student member of the National Hispanic Science Network on Drug Abuse, his research and clinical interests are in developing, implementing, and evaluating culturally appropriate prevention interventions for high-risk Latina/o families. He works as a Research Intern on studies funded by the Mental Health Services Administration (SAMHSA), which is part of the National Institute of Mental Health and Substance Abuse. Cordova provides clinical services and evaluates data as part of a 5-year SAMHSA study examining the effectiveness of an evidence-based prevention intervention for substance abuse, HIV, and hepatitis in high-risk Latina/o youth. He was awarded the 2008 Student of the Year Award by the Michigan Association for Marriage and Family Therapists, Outstanding Student Paper Award at the National Council of Family Relations, and a fellowship from the National Institute of Drug Abuse Summer Research Training Institute. He is a fellow of the SAMHSA Minority Fellowship Program.

OLARSHIP AWARD RECIPIENTS

Michigan State University students — graduate and undergraduate alike — are an intricate and instrumental part of the work at JSRI. Not only do they serve as student support and student administrative staff, but they also hold positions as emerging researchers and specialists on a variety of projects. ***The Institute's newest student employees include:***

Tianshu Pan is a Ph.D. student in the Measurement and Quantitative Methods program at College of Education. He received his M.S. in statistics at MSU in 2006 and will graduate in the fall semester of 2008. His areas of specialization include the Item Response Theory, reliability study, Hierarchical Linear Models, and their applications to Psychometrics.

René Andrade is an undergraduate student at Michigan State University majoring in Construction Management. His future goal is to start his own construction company and provide employment opportunities to the Latino Community. René was born in South Haven, Mich., his parents are from México, and he grew up speaking both Spanish and English fluently. René is the oldest of six children. When not studying, he visits his parents on the weekends and plays soccer for a team in the Kalamazoo soccer league.

Catie Hilbelink is a second year student in the new Master of Public Policy program at MSU. She received a B.A. in Political Science and International Development Studies from Calvin College in Grand Rapids, Mich. Prior to her work at the JSRI, Catie's studies focused on developing countries and non-profit agencies. Now at the JSRI, she is exploring not only the place of Latinos in Michigan politics, but also their impact throughout Michigan — the only state she has lived in.

Anna Malavisi is a second year Graduate student majoring in Philosophy, with a particular interest in ethics and development. She came to MSU after working for several years as a development practitioner in national and international non-government organizations in Bolivia. Anna's main philosophical interests are ethics, social and political thought, and engaging philosophy in development and other social issues like immigration and minority groups.

Elena Rosas is originally from Celaya Guanajuato, Mexico. She is currently an undergraduate student at MSU majoring in Geography with two specializations — Latin American & Caribbean Studies and International Agriculture. Her future goal is to publish her own Hispanic Human Geography Collection based on culture, demographics, population growth, etc. When her education is complete, Rosas hopes to obtain a position at the Michigan Agriculture Department Research.

Photos by Jose Rosas-Garcia and Danny Layne

Midwest Health Status

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The analysis in this study uses logistic regression models to predict the odds of fair/poor health and assess the relative effect of race and ethnicity, household structure, and socio-economic status, controlling for the effects of age, foreign-born status, number of children in the household, nonmetropolitan residence, job quality, and health insurance coverage. All models are estimated with generalized linear models (logit link) with robust standard errors. Descriptive statistics of variables used in the analysis are weighted to produce reliable estimates of the population under study (not shown, but available on the full online version on JSRI's web page), but logistic regression models use non-weighted data (see Table 1).

Results

Model 1 in Table 1 presents coefficient estimates from a logistic regression model of fair/poor health on race and ethnicity, controlling for age, and foreign-born status, providing a baseline comparison of subsequent models that add other explanatory variables. The outcome variable is ordered such that higher values reflect membership in worse health groups (i.e., those who reported fair or poor health as opposed to good, very good, or excellent health). African Americans, Latinos, and other races are significantly more likely than non-Hispanic Whites to report fair/poor health. Using model 1 in Table 1, the results show that the odds of fair/poor for African Americans are 2.00 times those of Whites [95% confidence interval (CI) for relative odds: 1.76, 2,27]. The odds for Latinos are 1.44 times those of Whites (95% CI: 1.17, 1.76). The odds of fair/poor for those in other race and ethnic groups are 2.39 times those of Whites (95% CI: 1.92, 2.94). The odds of fair/poor for Asians are not significantly different from those of Whites. The results in model 1 (Table 1) also show that the odds of fair/poor health are 1.03 times higher for each additional year increase in age (95% CI: 1.03, 1.04).

Model 2 report the results of a model of self-related physical health that includes household structural characteristics – headship of the household and number of children under 18 years of age. Consistent with expectations and previous research, single male-headed householders and single female-headed householders are more likely than dual-headed households to report fair/poor health. The odds of fair/poor health for single male-headed householders are 1.53 times higher those of householders in dual-headed households (95% CI: 1.35, 1.72). The odds of fair/poor health for single female-headed householders are 2.08 times higher than those in dual-headed households (95% CI: 1.87, 2.30). Adding family structure indicators reduces the logistic regression coefficients that describes the gap between Blacks and Whites by 32%, implying that one reason Whites have better health than Blacks has to do with their differences in family structure. Blacks are more likely to live in single female-headed households than Whites. The odds ratio describing that gap drops from 2.00 to 1.61 (95% CI: 1.41, 1.83). Adding family structure also reduces the gap between Whites and Latinos by 22%, suggesting that there is another factor that explains this gap given that Whites and Latinos have almost similar family structure. The odds ratio describing that gap drops from 1.44 to 1.33 (95% CI: 1.08, 1.62).

Model 3 reports the results of a model of self-related health that includes socio-economic indicators. Consistent with previous research, higher levels of education and higher incomes are associated with lower ratings of self-related health, i.e., better health. The odds of fair/poor health are 0.84 times lower for each additional unit of the education scale (95% CI: 0.82, 0.87). The odds of fair/poor health are 0.86 times lower for each additional unit of the income scale (95% CI: 0.84, 0.88). Model 3 also controls for home ownership. The results in model 3 show that the odds of fair/poor health are 0.62 times lower for home owners than those of renters (95% CI: 0.55, 0.69). Adding these socio-economic indicators in model 3 altered the effects of race and ethnicity on self-related health. The effects of African Americans and other races on self-related health are reduced while the effects of Latino become non-significant statistically. Adding socio-economic status indicators reduces the logistic regression coefficients that describe the gap between Blacks and Whites by 56%, implying that one of the reasons Whites have better health than Blacks is that Whites have higher education and income than Blacks. Once socio-economic status indicators are added in the model, the gap between Latinos and Whites disappear, suggesting that one of the main reasons that Whites

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Results

Predicting BLL from block group and individual (race and Medicaid status) characteristics

While the census provides a large number of potentially relevant variables, we created a prediction equation that includes only those variables that add a non-trivial increment to our ability to predict BLL.

Socio-economic status and BLL. For each block group, we computed the proportion of the population with income below various percentages of the poverty line: less than 50%, 100%, 150%, and 185% (children below the age of two are eligible for Medicaid if family income is below 185% of the poverty line). We find that the block group proportion with incomes below 185% of poverty has the highest bivariate correlation with BLL compared with all other income levels. Furthermore, adding the proportion of households at each of the three other income levels into the regression adds less than 0.01% to R-square. Hence, our only indicator of neighborhood income is the proportion with income below 185% of poverty. We also found that the block group proportion of people who have not graduated high school has a larger association with BLL than does the proportion at any other educational level (see Kaufmann et al., 2000).

Table 1 presents the unstandardized regression coefficients from a Hierarchical Linear Model in which we predict *Ln*(BLL-0.5) from all of the variables in the table. The second column contains coefficients for the period 1998-2001 and the third column, the coefficients for 2002-2005. Each coefficient represents the predicted change in the *logarithm* of (BLL-.5) if a predictor had the value "1" rather than "0." Thus a coefficient of 0.20 indicates that the BLL of a child with a value of "1" on that variable is predicted to be 22.14 % higher, controlling for other variables in the model, ($e^{0.20} = 1.2214$) than the BLL of a child with a value of zero on that same variable.

Age of housing

From 1940, the paint industry gradually reduced the sale of lead paint and, in 1955, adopted a voluntary standard (American Standards Association, 1955; Markowitz and Rosner, 2000) limiting interior paints to no more than 1% lead. In 1978, the Consumer Product Safety Commission banned the sale of residential paint containing more than 0.06% lead (Laraque and Trasande, 2005).

Although the CDC BLL risk assessment questionnaire (CDC, 1997b) assumes that risk from house paint did not decrease until after 1950, we analyzed the effect of the proportion of housing built in various decades, starting with all pre-1940 housing. Table 1 shows that the coefficients of housing built prior to 1940 (0.808 and 0.694) are much greater than the coefficients of housing built in the next decade, 1940-1949 (0.277 and 0.119, respectively). Surprisingly, the proportion of housing built between 1950 and 1980 had no perceptible effect on BLL, even though lead paint was not banned until 1978.

Some have suspected that rental housing is more poorly maintained and is therefore especially conducive to high BLL. However, the proportion of housing that is rental has, in both 4-year periods, a coefficient of only 0.05 and even adding its interactions with other variables adds less than 0.1% to R-square.

Race and ethnicity

The MDCH BLL database identifies six different racial groups. However, separating out groups other than African American adds less than 0.01% to R-square and so we combine all non-Blacks as the reference category. Table 1 shows that controlling for Medicaid status and neighborhood characteristics, a Black child has a *Ln*(BLL-.5) that is 0.270 greater than other children for 1998-2001, and 0.206 greater in 2002-05.

Since all predictors have a minimum of zero and a maximum of one (100%), we can compare the size of the unstandardized coefficients to determine which variables have the greatest effect. However, note that the value of a multiple regression coefficient can be substantially reduced by the presence of other predictors with which it is highly correlated (see McClendon, 1994).

Among the largest coefficients is that for percent Latino in the block group. Since the two coefficients (0.641 and 0.556) average approximately .6, this tells us that, *other things being equal*, those children living in a neighborhood that is 100% Latino have BLLs that are 80% higher than those living in a neighborhood that is

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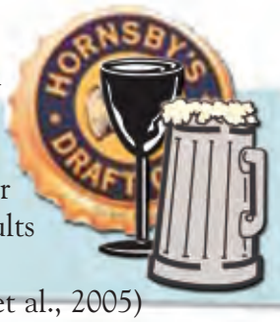
0% Latino. This result is in sharp contrast to the findings of (Morales et al., 2005) who found that Latinos had similar BLL to others once one controlled for other variables.

The coefficients for percent African American in the block group are smaller than the coefficients for percent Latino because the former variable is accompanied in the equation by the variable indicating whether the child is Black (the correlation between percent African American in the neighborhood and whether the child is Black exceeds 0.8). By contrast, the coefficients for percent Latino are larger because they are not reduced by a similar redundancy.

Child's age and year tested



We use child's age as a predictor, via a set of dummy variables that indicate the presence or absence of an attribute, with those less than one year old as the reference category. The results are consistent with prior findings (see Aguirre and Hernandez, 2003; Chen et al., 2005) showing two year olds to have substantially higher BLL than other groups. The dummies, for year tested, indicate that controlling for other variables, the predicted BLL decreased each year.

Comparing the 2002-2005 BLL results with those from 1998-2001

Table 1 permits us to see how patterns of BLL risk have changed and whether a prediction equation developed for one set of years can be useful for future prediction. The intercept is more negative for 2002-2005 (-0.487) than for 1998-2001 (-0.401), indicating that a child with the same characteristics would be predicted to have a lower BLL in 2005 than in 2001. This is because the central tendency of BLL decreased over time. However, applying the Table 1 coefficients derived from the 2002-05 data to the 1998-2001 data, the predicted values of *Ln(BLL-0.5)* from the coefficients for the latter years have an extremely high correlation (0.997) with the predicted values from former years' equation.

Study 2. BLL Predictors – Parental Characteristics

Study 2 examines the effect on BLL of several additional individual level variables from the Vital Records Database of Live Births. The variables of interest were: the education of the mother and father, whether the father has an ongoing relationship with the mother, whether the mother smoked or drank alcohol, and whether the mother is an immigrant and, if so, from where.

TABLE 2A. DESCRIPTIVE STATISTICS OF VARIABLES ADDED FROM LIVE BIRTHS DATABASE

Table 2a) for BLL tests 1998-2001

	DESCRIPTIVE STATISTICS				
	N	*Min.*	*Max.*	*Mean*	*Std. Dev.*
Latinbrth_mom	110395	.00	1.00	.0193	.13743
MidEastbrth_mom	110395	.00	1.00	.0161	.12592
mom_smokes	109209	.00	1.00	.2010	.40073
Mother drinks alcohol	109052	.00	1.00	.0159	.12499
Educ'n_father_unknown (0=No; 1= Yes)	110569	.00	1.00	.3126	.46356
Education_mom	109292	.00	17.00	12.46	2.353
Education_father imputed	109355	.00	17.00	12.4288	2.32100
Predicted Ln(BLL-.5) from Race, Medicaid & Block Group Variables	110569	-.37	2.44	.7743	.53362
Valid N (listwise)	*107789*				

TABLE 2B. DESCRIPTIVE STATISTICS OF VARIABLES ADDED FROM LIVE BIRTHS DATABASE

Table 2a) for BLL tests 2002-2005

	DESCRIPTIVE STATISTICS				
	N	*Min.*	*Max.*	*Mean*	*Std. Dev.*
Latinbrth_mom	209213	.00	1.00	.0359	.18606
MidEastbrth_mom	209213	.00	1.00	.0253	.15718
mom_smokes	212184	.00	1.00	.1922	.39405
Mother drinks alcohol	212056	.00	1.00	.0077	.08726
educfath_unk	214896	.00	1.00	.2559	.43636
Education_mom	210676	.00	17.00	12.52	2.384
Education_father imputed	210873	.00	17.00	12.4479	2.33649
Predicted Ln(BLL-.5) from Race, Medicaid & Block Group Variables	214896	-.46	2.15	.4351	.43916
Valid N (listwise)	*202986*				

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Both education level and alcohol consumption were assumed to be related to knowledge of good health practices. Smoking was also assumed to reflect less knowledge of good health practices. In addition, tobacco smoke contains lead (see e.g. Navas-Acien et al., 2004). Finally, when the mother lacks an ongoing relationship with the child's father, this both increases the probability that the family is in poverty and also increases the chance that the household lacks sufficient caregiving resources to maintain good health practices.

Methods

The data for this study came from linking the BLL database to the MDCH Vital Records Database of Live Births. Linking these databases provided the additional variables mentioned above. Education of each parent is measured in years of schooling. Drinking and alcohol consumption are dichotomized into "Yes" and "No" since treating them as continuous did not improve the prediction of BLL. Our measure of the father's ongoing relationship with the mother is an indirect proxy. If the father's education was unknown, we assumed that there was little ongoing relationship. The database also contained the state or country of each parent's birth and we grouped those born outside the U.S. into major regions.

Of the cases in the BLL database, 65.1% could be linked the Database of Live Births in 1998-2001 and 78.7% could be linked in 2002-2005. Of those cases that appeared in the combined database, less than 3% of them were missing data on any of the above individual level variables except for father's education (see Tables 2a and 2b).

Father's education, however was missing on over 25% of the cases. To have used listwise deletion in such situations would have not only deprived us of many cases, but would also have biased our coefficient estimates, since those cases on which this variable had a missing value tended to have substantially higher BLL than other cases. To solve this problem while still using this variable, we make use of the fact that where we have data on both father's and mother's education these variables have a rather high correlation (.658). Therefore where father's education is missing, we impute it to equal mother's education.[1]

TABLE 3. PREDICTING BLL FROM COMBINING DATABASE OF LIVE BIRTHS WITH BLL DATABASE (standard errors) USING AMOS & FATHER'S EDUCATION

PREDICTOR	COEFFICIENTS FOR 1998-2001	COEFFICIENTS FOR 2002-2005
Intercept	.395 (.018)	.399 (.013)
Predicted BLL from Study 1 (from Race, Medicaid and Block Group Variables)	.873 (.005)	.808 (.005)
Mother's Education (per Year)	-.017 (.002)	-.020 (.001)
Father's Education Imputed (per Year)	-.016 (.002)	-.013 (.001)
Father's Education Unkn (0=No; 1= Yes)	.075 (.006)	.077 (.005)
Mother smokes (0=No; 1= Yes)	.070 (.006)	.068 (.005)
Mother drinks alcohol (0=No; 1= Yes)	.056 (.020)	.019 (.021)
Mother Immigrant from Latin America	-.027 (.018)	-.007 (.010)
Mother Immigrant from Middle East	-.245 (.019)	-.194 (.012)
ADJUSTED R-SQ		
Using Prediction equation from BLL database	.291	.189
Adding predictors from Live Births database	.301	.200

For 1998-2001, n=107,789; for 2002-05, n = 202,986. All of the above coefficients are significantly different from zero at p < .001, except for Mother Immigrant from Latin America which is not significant at p = .05 in either set of years and Mother drinks alcohol which is significant at p =.004 in 1998-2001 and is not significant in 2002-05.

The purpose of this analysis is to learn the effect of each of our new predictor variables, when controlling for the variables from the original BLL database, which are listed in Table 1. We use the coefficients in that table and the characteristics of each case to compute a predicted score for each case.[2] We then enter that predicted score into the regression as one predictor, then add the other predictors.

Results

The percentage of children in the database whose mothers were born outside the U.S. was 12% in 1998-2001 and 7% in 2002-2005. We separated out for special attention those whose mothers were born in Latin America because they are considered likely to use leaded cosmetics and home remedies.

Several of our predictions are confirmed by Table 3. A mother who smokes and a father whose education is unknown are, other things equal, likely to have a child with higher BLL, though both of those effects are rather small. The effects of a mother's alcohol consumption are in the predicted direction, but are smaller. In the later set of years, this effect is so small as to be non-significant.

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Other things equal, the more education a mother and a father have, the lower the child's BLL. While the coefficients of education are rather small, note that each is per year of education. Thus if both the father and mother each gain five years of education, the *Ln*(BLL-.5) will decrease by .165 and BLL will decrease by over 15% when controlling for all other variables (including neighborhood characteristics, race, and Medicaid status).

Interestingly, when controlling for other variables, children of Latino immigrants have BLLs that are not significantly different from children of non-immigrant mothers.

Summary and Discussion on Findings

Unfortunately, data on whether or not a child is Latino is mostly missing from the BLL database, so we cannot directly compare the BLL of Latinos with that of some other groups. However, we can be confident that Latinos in Michigan have well above average BLL. First, they are more likely to have low income and to live in predominantly low income neighborhoods, both of which contribute to higher BLL. We also find that, holding constant income and neighborhood characteristics, living in a highly Latino neighborhood substantially increases the likelihood of Elevated BLL. In fact, a child living in a census block group that is 100% Latino is likely to have a BLL that is approximately 80% higher than a child at the same income level and living in a neighborhood with the same housing age and SES, but has no Latinos and no African Americans.

However, holding constant other variables that we have studied, children of mothers who immigrated here from Latin America have BLL that are no higher than others living in similar neighborhoods, of similar SES, and of similar family structure. This is somewhat surprising given that Aguirre and Hernandez (2003) found that use of clay pottery, home remedies, and Mexican candies, all of which are associated with immigrants, contribute to elevated BLL among Latinos. A possible solution to this puzzle, however, comes from the Morales, Gutierrez, and Escarce (2005) finding that BLL declines with the length of time a family has been in the U.S. and the use of English as the primary home language. Our database does not, however, provide this information about the mothers of those children tested.

Applications

While Medicaid eligibility and dichotomized zip code risk do not predict BLL nearly as well as our prediction equation, this information is fairly easy for providers to use. By contrast, using our prediction equation to predict a child's risk of Elevated BLL seems, at first glance, quite daunting.

However, identifying communities and individuals with high risk of elevated BLL is possible using Internet websites. Our project has created a website at <http://midata.msu.edu/bll> that is very useful for determining if a child's BLL should be tested.[3] In addition to home address, the program requests the Medicaid status, race, and age of the child. From the address, the census block is determined and the census block characteristics are retrieved and entered into the prediction equation. The program then indicates if a BLL test is recommended, depending on whether the child's predicted value of *Ln*(BLL-.5) exceeds the cut-off chosen by MDCH, which has authorized its use as one way of determining whether a BLL test is needed.

The information entered into the website and the results are not saved, so that privacy is guaranteed. Ideally a parent who learns that their child should be tested will go to their pediatrician or local health department for that test. Early detection is important to preventing long term disabilities and complications due to elevated blood lead levels.

Endnotes

1 *The imputed value of father's education has a slightly higher correlation with mother's education than does the correlation based on observed data and this slightly biases our results.*

2 *This is preferable to separately entering all of the variables in Table 1 into the regression because the coefficients in Table 1 constitute the equation that best represents the entire population of BLL tests. If the coefficients we obtained from separately entering all of the variables in Table 1 were different from those in Table 1, it would simply indicate that the cases in study 2 are not a completely representative sample of those used in Study 1.*

3 *Note, however, that the results produced by the website will be updated when all analysis on this project is completed.*

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and Latinos differ in health has to do with their differences in socio-economic status. Adding socio-economic variables also rendered the effects of household structure insignificant, meaning that the gaps in health between single-headed households and dual-headed households are fully explained by socio-economic differences.

Model 4 introduces controls for living in nonmetropolitan areas and job quality, including service occupation, part-time employment, and unemployment. The results in model 4 indicate that the odds of reporting fair/poor health are significantly higher for individuals working in service occupations, part-time, and those who are unemployed. The odds of fair/poor are 1.13 times higher for those working in service occupations than for those in other occupations (95% CI: 1.01, 1.27). The odds of fair/poor are 1.56 times higher for individuals working part-time than for those of full-time workers (95% CI: 1.38, 1.75). The odds of fair/poor health are 2.34 times higher for individuals who are unemployed than for those of full-time workers (95% CI: 1.92, 2.60). The odds of fair/poor health for individuals in nonmetropolitan areas were not significantly different from those of individuals in metropolitan areas. Adding these controls in model 4 reduces the gap between Blacks and Whites by an additional 4% while the coefficient for Latinos remains non significant. However, adding these controls rendered the coefficient for single female-headed households significant and positive, suggesting that one of the reasons single female-headed householders have poor health is the type of jobs in which they are involved. They are more likely than those in dual-headed households to work part-time and in service occupations, jobs that tend not to offer health insurance coverage. Adjusting for job quality, however, changes the direction of the gap in health between householders in dual-headed households and those in single female-headed households, meaning that when the comparison is restricted to those who are employed full-time in non-service occupations (the reference categories), the odds of fair/poor health for single female-headed householders are significantly higher than those in dual-headed households.

Model 5, the final model in Table 1, controls for health insurance coverage. The results in model 5 indicate that individuals with no health insurance coverage and those with public health insurance coverage are significantly more likely to report fair/poor health than those that are covered by private coverage. The odds of fair/poor are 1.15 times higher for individuals with no health insurance coverage than for those with private health insurance coverage (95% CI: 1.04, 1.28). The odds of fair/poor are 2.32 times higher for individuals with public health insurance coverage than for those with private health insurance coverage (95% CI: 1.99, 2.71). Controlling for health insurance coverage reduces the gap between Blacks and Whites by an additional 9%. The coefficient for single female-headed householder is significant and the gaps in health between single female-headed households and dual-headed households increase by an additional 15%, meaning that when the comparison is restricted to those with private/other insurance (reference group), the odds of fair/poor health for single female-headed householders remain significantly higher than those in dual-headed households.

Conclusion

This research highlights the differentiated and relative effects of race and ethnicity, family structure, and socio-economic status on self-reported physical health status among adults. This study reveals that 74% of the gap in health between Whites and Blacks is explained by household structure, education, income, homeownership, job quality, and health insurance coverage. If the focus is on odds ratios rather than raw coefficients, 40% of the gap is explained. Of all factors, socio-economic status indicators are the most important source of the gap reduction. The gap in health between Whites and Latinos is fully explained by household structure and socio-economic status indicators.

The study's results also show that female-headed householders are more likely than dual-headed households to have poor health. About 78% of the gap between female-headed householders and dual-headed households is explained by race and ethnicity, socio-economic status, job quality, and health insurance coverage. If one views that gap in terms of odds ratios rather than raw coefficients, 44% of the gap is explained.

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Midwest Health Status

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These findings are consistent with previous studies that indicate that the gaps in health between Whites and Blacks persist even after accounting for household structure, socio-economic status, job quality, and health insurance coverage. Although the original gap in health between Whites and Latinos is smaller than that between Whites and Blacks, the analysis nonetheless explained the entire gap in health between Whites and Latinos. The poor health among Latinos compared with Whites was explained by a combination of family structure and socio-economic status.

This study shows that social contexts, including race and ethnicity, gender and household structure, and socio-economic status are important factors in health status. Policies that aim at improving household socio-economic conditions, strengthening dual-headed household structures, and providing support to single-headed households, especially single female-headed households, may have the greatest effect in closing the gaps in health. Our findings here call attention to labor market conditions that support all groups and household types. The gaps in health between different racial/ethnic groups and between different household structures are significantly reduced among higher income groups, suggesting that improving the economic well-being of disadvantaged groups may reduce for most of the disparities in health over the long run.

The limitations of the current study point to the areas where more research is needed. What are the actual mechanisms linking socio-economic indicators to varying levels of health decline? Common pathways between socio-economic status and health include health behaviors or lifestyles (e.g., smoking, drinking, eating, and physical activity). Health behaviors or lifestyles variables are not included in the CPS data.

It is also clear that the gaps in health are not fully explained by household structure, socio-economic status, job quality, and health insurance coverage, suggesting that other factors may account for this gap. Understanding health care in addition to social context factors may be critical in understanding health disparities. Finally, the limitations in this study point in the direction of using data that would help account for effects of local labor market conditions and community structure and social processes on health. Local labor market and social conditions affect both employment opportunities and incomes, and where people live, and may be key factors in the reduction of health gaps. Minorities, especially Latinos and Blacks, tend to live in communities that are structurally disadvantaged (Jargowsky, 1997; Massey et al., 1993; Wilson, 1987; 1996).

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by Danny Layne, JSRI

Latinos — whether they realize it or not — can significantly alter the scope of the nation's political landscape during this year's presidential election. All that's needed is for them to continue along the same path of voter participation that's been exhibited for the last two decades.

And when they do — according to Andy Hernandez, the co-author of the *Almanac of Latino Politics 2002-2004* — national-level politicians will undoubtedly acknowledge the interests and needs of Latinos in today's society.

Hernandez brought his common-sense, data-backed political insight to MSU this fall when he detailed the projected number and historic voting patterns of Latinos. He accentuated his message with research data about 10 "Latino Mega States" and Latinos' likely percentage shares in the 2008 presidential election's "battleground states."

Hernandez, the Executive Director of the Wesley Center for Family and Neighborhood Development in Austin, Texas and former President of the Southwest Voter Registration Education Project, discussed a variety of scenarios whereby either major presidential candidate could win or lose — depending on Latinos' election participation. He also compared Latino voting trends and identified political parties' base (or core) group appeal and their opportunities to sway or influence non-committed Latino voters.

Throughout the years, Hernandez has served as an advisor on multiple presidential campaigns and as a Leadership Development and Strategic Planning Consultant to multiple national organizations, including the U.S. Hispanic Leadership Institute in Chicago, the National Community of Latino Leaders, Inc. in Washington, D.C., the National Latino's Children Institute in San Antonio, and the Wellstone Institute in St. Paul, Minn. He has been a contributing author for Emerging Voices, Urgent Choices: Essays on Latino/a Religions Leadership and the Oxford Encyclopedia of Latinos and Latinas.

The visit and presentations were co-sponsored by MSU's Department of Political Science, the Symposium on Science, Reason, and Modern Democracy, and JSRI.

Andy Hernandez at MSU.
Photo by Danny Layne

Blood Lead Levels

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