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PLACE MATTERS FOR HEALTH IN BERNALILLO COUNTY:

Ensuring Opportunities for Good Health for All

A Report on Health Inequities in Bernalillo County, New Mexico

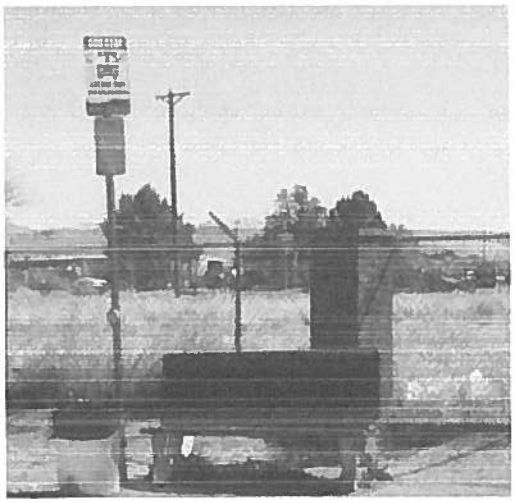

Exhibit B

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PLACE MATTERS FOR HEALTH IN BERNALILLO COUNTY:

Ensuring Opportunities for Good Health for All

A Report on Health Inequities in Bernalillo County, New Mexico

Prepared by the
Joint Center for Political and Economic Studies

In Conjunction With
the Center on Human Needs, Virginia Commonwealth University
and The Virginia Network for Geospatial Health Research

JOINT CENTER FOR POLITICAL AND ECONOMIC STUDIES
SEPTEMBER 2012

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FOREWORD

Place matters for health in important ways, according to a growing body of research. Differences in neighborhood conditions powerfully predict who is healthy, who is sick, and who lives longer. And because of patterns of residential segregation, these differences are the fundamental causes of health inequities among different racial, ethnic, and socioeconomic groups.

The Joint Center for Political and Economic Studies is pleased to add to the existing knowledge base with this report, "*Place Matters* for Health in Bernalillo County: Ensuring Opportunities for Good Health for All, A Report on Health Inequities in Bernalillo County, New Mexico." The report, supported by a grant from the National Institute on Minority Health and Health Disparities (NIMHD) of the National Institutes of Health, provides a comprehensive analysis of the range of social, economic, and environmental conditions in Bernalillo County and documents their relationship to the health status of the county's residents.

The study finds that social, economic, and environmental conditions in low-income and non-white neighborhoods make it more difficult for people in these neighborhoods to live healthy lives.

The overall pattern in this report – and those of others that the Joint Center has conducted with other PLACE MATTERS communities – suggests that we need to tackle the structures and systems that create and perpetuate inequality to fully close racial and ethnic health gaps. Accordingly, because the Joint Center seeks not only to document these inequities, we are committed to helping remedy them.

Through our PLACE MATTERS initiative, which is generously supported by the W.K. Kellogg Foundation, we are working with leaders in 24 communities around the country to identify and address social, economic, and environmental conditions that shape health. We look forward to continuing to work with leaders in Bernalillo County and other communities to ensure that every child, regardless of their race, ethnicity, or place of residence, can enjoy the opportunity to live a healthy, safe, and productive life.

Ralph B. Everett
President and CEO
Joint Center for Political and Economic Studies

EXECUTIVE SUMMARY

Place matters for health in important ways. Differences in neighborhood conditions powerfully predict who is healthy, who is sick, and who lives longer. And because of patterns of residential segregation, these differences in neighborhood conditions are the fundamental causes of health inequities found among different racial, ethnic, and socioeconomic groups.

This study examined the relationships between place, ethnicity, and health in Bernalillo County, N.M., and found that:

- Life expectancy in the county varies by more than 22 years across census tracts.
- The percentage of low-birth-weight infants varies by a factor of 12 across census tracts.
- Community-level health risks, which are measured by factors such as educational attainment, violent crime rates, foreclosure rates, unemployment rates, and the percentage of overcrowded households, vary widely across census tracts.
- A clear relationship exists between community risk index scores and health outcomes; when a neighborhood's community risk index is low, life expectancy is high.
- Nonwhite and low-income census tracts, such as those in the downtown area, face a higher concentration of environmental health hazards such as air pollution and toxic industrial wastes than do whiter and higher-income census tracts;
- Life expectancy is an average of 5.2 years shorter in census tracts with the greatest concentration of environmental hazards.

Although researchers cannot say with certainty that these neighborhood conditions *cause* poor health, the overall pattern suggests that the clustering of social, economic, and environmental health risks in low-income and nonwhite neighborhoods makes it more difficult for people in these communities to live healthy lives.

These patterns need not and should not continue as they are. Policy makers should consider steps to reduce the concentration of health risks in vulnerable communities and support health-enhancing resources. For example, the use of Health Impact Assessments as well as the environmental assessments required under the Consolidated Environmental Review Act can help to ensure that low-income and Hispanic communities are not disproportionately hurt by environmental degradation and policies or practices that cluster health risks.

There is a strong moral imperative to enact policies designed to improve health for all. But there is also a powerful economic incentive. A study released by the Joint Center for Political and Economic Studies in 2009 found that the direct medical costs associated with health inequities among African Americans, Hispanics, and Asian Americans approached $230 billion between 2003 and 2006. When the indirect costs of health inequities, such as lowered productivity and lost tax revenue resulting from illness and premature death, are added to the equation, the total cost of health inequities between 2003 and 2006 exceeded $1.24 trillion.[1] For both moral and economic reasons, now is the time for action to address neighborhood conditions that shape health outcomes.

INTRODUCTION

Place matters for health, and it may be even more important than access to health care or health-related behaviors. This is the startling conclusion of a large and growing body of public health research, including this report. This research demonstrates that neighborhood conditions have powerful direct and indirect influences on health, often operating in ways over which individuals have little control. The research further indicates that unhealthy neighborhood conditions tend to cluster adjacent to one another, and most often in minority and low-income neighborhoods. According to many leading scholars, place is a root cause of health inequities between racial, ethnic, and socioeconomic groups.

In Bernalillo County, N.M., people living in neighborhoods characterized by poor housing, inadequate schools, polluted environments, insufficient transportation, and lack of safety typically have significantly poorer health than people living in neighborhoods that don't suffer from these conditions. They also have higher rates of poverty and lower life expectancy.

Data on a national scale indicate that neighborhoods shape the health of individuals in many ways;

- Neighborhood conditions such as the level of crime and violence not only increase the risk of injury and death, but they also increase the stress levels of those who are not directly victimized, which in turn can lead to premature aging and other stress-related illnesses.
- Neighborhoods can also directly influence health through environmental degradation and exposure to air, water, and soil hazards—hazards such as lead paint in homes, which can lead to permanent cognitive and behavioral impairment in young children, or molds, rodents, and insects, which are associated with asthma and other health problems. Children are also at greater risk for asthma if they live in communities with high levels of air pollution.
- Neighborhood characteristics shape health indirectly. For example, research has shown that when fresh produce and healthy foods are readily available, people are more likely to report eating a healthy diet. On the other hand, when low-cost but nutritionally poor fast food is one of the few options close at hand, neighborhoods experience higher rates of obesity and related illnesses.
- The likelihood that neighborhood residents will be able to exercise or enjoy an active lifestyle is powerfully shaped by community characteristics. In neighborhoods that aren't safe or where residents are fearful and distrustful, people find it harder to bike, jog, or play outdoor sports.

Other factors that we don't typically think of as affecting people's health, such as the quality of schools, also play a role. The best predictor of a person's health is his or her educational level. In other words, the better educated people are, the more likely they are to be healthy. But too many children in the United States live in poor neighborhoods and are stuck in schools that have high dropout rates, outdated textbooks, crumbling facilities, inadequately trained teachers, and a woeful lack of resources. As a result, these children are more likely to receive an inadequate education, are less prepared for many of life's challenges, and are at greater risk of poor health.

The quality of transportation also affects a community's health. Good public transportation can minimize environmental health threats while at the same time encouraging economic growth by linking people with jobs, goods, and services.

Taken together, these neighborhood factors—housing, schools, transportation, environmental quality, public safety—often are referred to as social determinants of health.

Despite these problems, the communities most disadvantaged from a health standpoint are also the same communities where the greatest gains can be made to improve the community's health. In doing so, we can also improve the health of surrounding communities. This report finds that by working together to reduce the concentration of health risks and increasing health-enhancing resources, we can give all residents of Bernalillo County a better chance to live healthy lives.

Part I of this report provides background information about Bernalillo County, including population data, health outcomes, socioeconomic conditions, community characteristics, and a community risk index. Part II examines the geographic relationship between the community risk index and life expectancy. Part III examines the environmental hazards in the county and the geographic relationship between environmental hazards, health outcomes, and life expectancy. Part IV presents conclusions about the role of community risk factors and environmental hazards in understanding disparities in health outcomes in Bernalillo County. For a full explanation of data sources and analytic methods, please access the Virginia Commonwealth University Center on Human Needs website, at http://www.humanneeds.vcu.edu/.

Table 1. Demographic Characteristics of Bernalillo County, State of New Mexico, and United States

	Bernalillo	New Mexico	United States
Population (2009)[(a)]	642, 527	2,009,671	307,006,556
Population Density (2000)[(b)]	477.4	15.0	79.6
Race/Ethnicity (2009)[(a)]			
Hispanic	46.7%	45.6%	15.8%
White	42.0%	41.0%	64.9%
Black	2.7%	1.9%	12.1%
Other	4.3%	2.9%	6.6%
American Indian and Alaska Native Alone	4.2%	8.6%	0.6%
Foreign Born	10.4%	9.8%	12.5%

(a) Source: U.S. Census Bureau, 2009 American Community Survey
(b) Source: 2009 Geolytics Projection

I. Bernalillo County: Where People Live

Bernalillo County Population

Bernalillo County, located in central New Mexico, had a population of 642,527 in 2009,[2] almost one third of the state's population. It is the most densely populated county in New Mexico, with 477 people per square mile. The city of Albuquerque, with a population of 529,219, accounts for more than 80% of the county's population. The city has an average density of 1,237 people per square mile, with a high of over 12,000.

As detailed in Table 1, Hispanics are the largest ethnic group in the county and make up a significantly larger percentage of the population than the national average (46.7% compared to 15.8% nationally). The majority of the Hispanic population in Bernalillo County is U.S.-born. According to the U.S. Census Bureau, the foreign-born population in the county is similar to that of the nation (10.4% compared to 12.5% nationally).

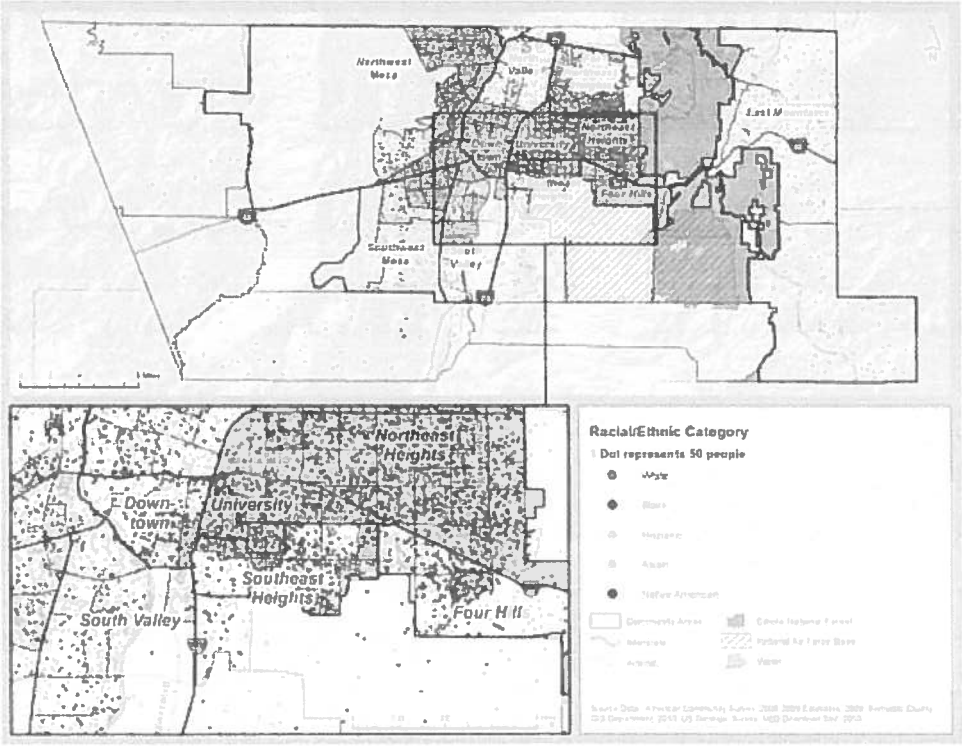
As in many areas of the United States, where residential patterns reflect historical racial and ethnic segregation and restrictions in the housing market,[3,4,5] there are notable differences in the ethnic and racial composition of neighborhoods across Bernalillo County. Map 1 shows the racial and ethnic composition of the census tracts in central Bernalillo County. Census tracts with the highest concentrations of Hispanic residents are in South Valley and Southwest Mesa; there, the majority of census tracts are 75% to over 90% Hispanic. Downtown also has a high percentage of Hispanic residents. A number of census tracts in the Far Northeast Heights/Foothills areas are over 75% white. One way to assess the racial/ethnic mix of an area is to use the Diversity Index, a measure of the likelihood that two people randomly chosen from an area will be of a different race or ethnicity. The higher the value, the less segregated the area. While the index for Bernalillo as a whole is 61.7%, the value ranges from 13.7% (low diversity) to 80.6% (high diversity). Based on the Diversity Index, the Northwest Mesa, North Valley, Southeast Heights, Northeast Heights, and University are the most diverse areas.

Map 2 highlights census tracts within Bernalillo County in which the percentage of foreign-born residents has been higher than the county average over several decades. As indicated by dark brown shading on Map 2, foreign-born residents have been more concentrated in Southeast Heights and Downtown since the 1970s.

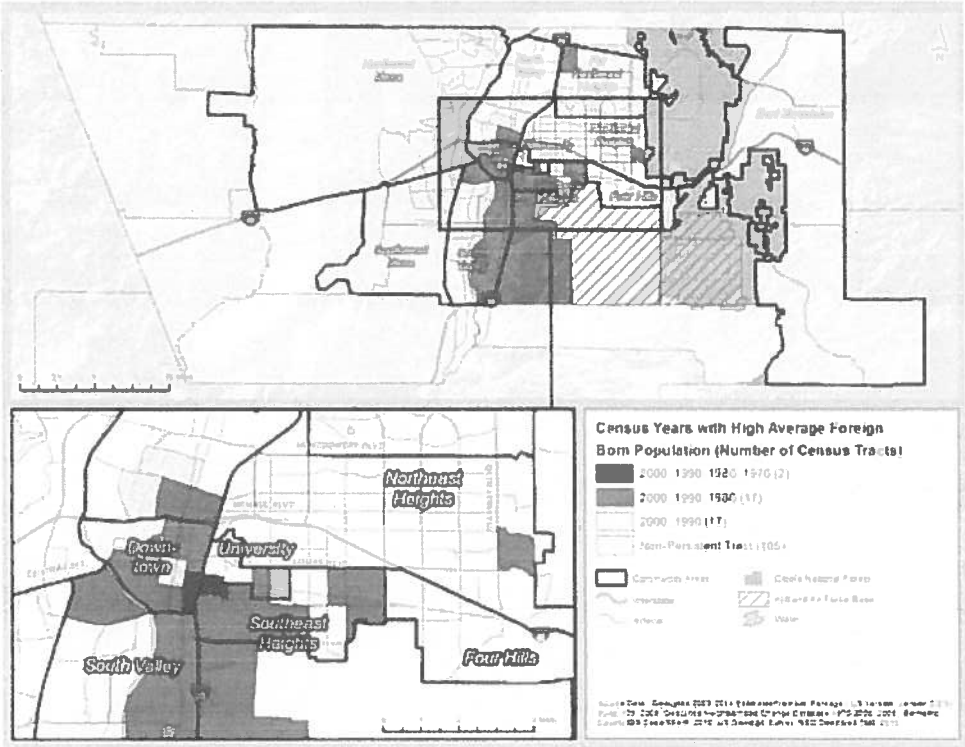
Socioeconomic Conditions

Like other communities, socioeconomic conditions in Bernalillo County have an important and often unrecognized influence on health status. Education, for example, is a pathway to higher income and net worth, which in turn have strong influences on health status and access to health care. National statistics indicate that adults (age 25 and older) who lack a high school education or equivalent are three times more likely to die before age 65 than those with a college education.[6] They are also more likely to engage in unhealthy behaviors such as cigarette smoking.[7]

Map 1: Racial/Ethnic Distribution by Census Tract, Bernalillo County, N.M. (2005-2009)



Map 2: Persistent Foreign Born by Census Tract, Bernalillo County, N.M. (1970-2009)



Note: The category of "persistent foreign born" includes census tracts that, for two or more decennial census periods, had a percentage of foreign-born population equal to or greater than the overall Bernalillo County average (5%) for the time period from 1970 to 2000.

Table 2. Socioeconomic Characteristics of Bernalillo County, State of New Mexico and United States

	Bernalillo	New Mexico	United States
Educational Attainment			
Less than High School (K-12)	13.5%	17.2%	14.7%
High School Only	24.3%	26.4%	28.5%
Some College	30.7%	31.1%	28.9%
Bachelor's Degree or Higher	31.5%	25.3%	27.9%
Poverty Rate			
Below 0.50 of Poverty Rate	7.3%	7.5%	6.3%
.50-.99 of Poverty Rate	8.6%	10.5%	8.1%
1.00-1.99 of Poverty Rate	19.5%	22.3%	18.4%
2.00 and Above of Poverty Rate	64.6%	59.7%	67.3%

Source: U.S. Census Bureau, 2009 American Community Survey

Educational attainment in Bernalillo County, where 86.5% of adults age 25 and over have completed high school, compares favorably with that of New Mexico (82.8%) and the U.S. (85.3%) (Table 2). However, educational attainment varies greatly by race and ethnicity (Figure 1). According to 2009 data from the American Community Survey, over 25% of the county's Hispanic adults have not completed high school, and almost 60% have no education beyond high school. Of the foreign-born residents, 32.3% do not have a high school degree and 54.5% do not have an education beyond high school. While educational outcomes are slightly better for Native American residents, nearly 40% have no education past high school.

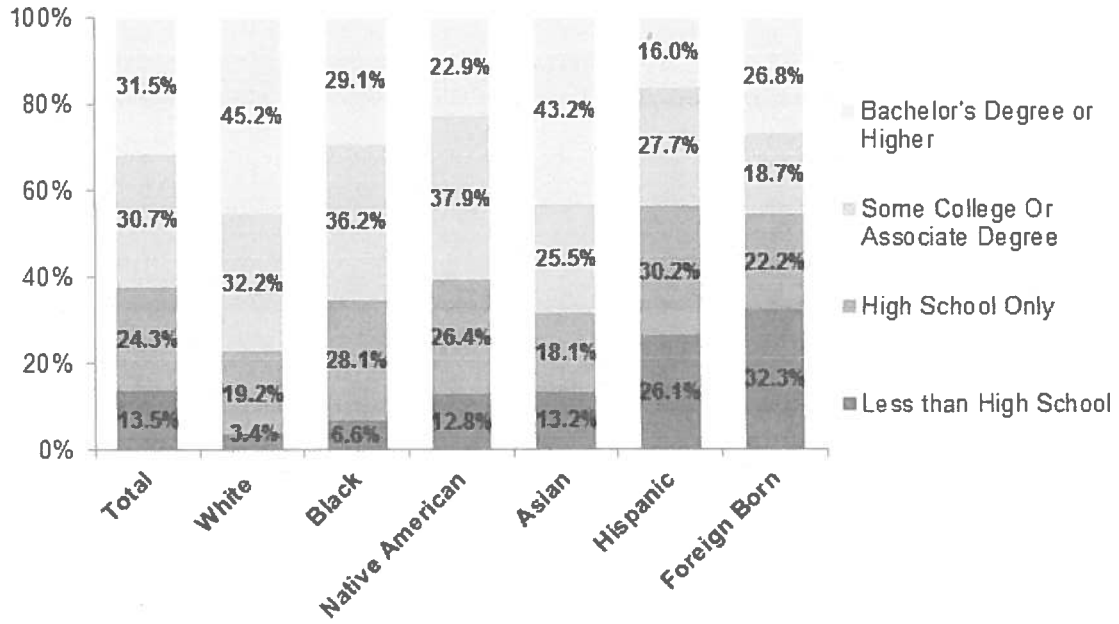
The percentage of adults in Bernalillo County who have graduated from high school varies even more by neighborhood. Census tracts in which 40% or more of the adult population have not completed high school are in Downtown, South Valley, Southeast Heights, North Valley, and Native American lands in the northwest and south (Map 3).

Poverty also has a strong influence on health: nationally, families living below the federal poverty level are 3.6 times more likely to report fair or poor health than those with incomes at least twice the poverty level.[8] Experiencing poverty during childhood influences a child's cognitive, emotional, behavioral, and physical development. For example, poor children have a higher rate of lead poisoning than non-poor children, have a higher prevalence of developmental delay, and are more likely to be reported as having long-term emotional or behavioral problems. Childhood poverty also decreases a child's likelihood of high school graduation.[9,10] Poverty rates are highest in Native American lands bordering the western and southern portions of Bernalillo County (Map 4). In 2009 in these areas, as well as in a few census tracts in the Southeast Heights and South Valley, over 55% of the population had incomes below 150% of the poverty level.

Persistent poverty, defined as having at least 20% of the population with incomes under 100% of the federal poverty level for at least two consecutive census periods, is shown in Map 5. Areas of persistent poverty since the 1970s are shown in dark brown. These include six census tracts in South Valley, Southeast Heights, Downtown, and North Valley. Areas of persistent poverty since the 1980s are shown in lighter brown. These include eight census tracts in Downtown, North Valley, South Valley, and Southeast Heights.

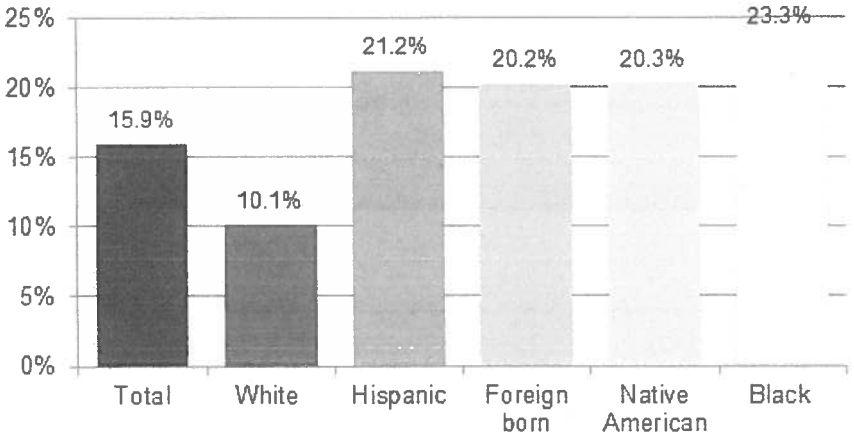
Poverty rates in Bernalillo County are somewhat higher than national rates. In 2009, about 16% of households in Bernalillo County had incomes below 100% of the federal poverty level ($22,000 or less for a family of four), compared to 14% nationwide. Like educational attainment, poverty rates vary with race and ethnicity. According to American Community Survey data for 2009, white residents are least likely to live in poverty (10.1%) compared to black, Native American, Hispanic, and foreign-born residents (23.3%, 20.3%, 21.2%, and 20.2% respectively; see Figure 2).

Figure 1: Educational Attainment in Bernalillo County, N.M.



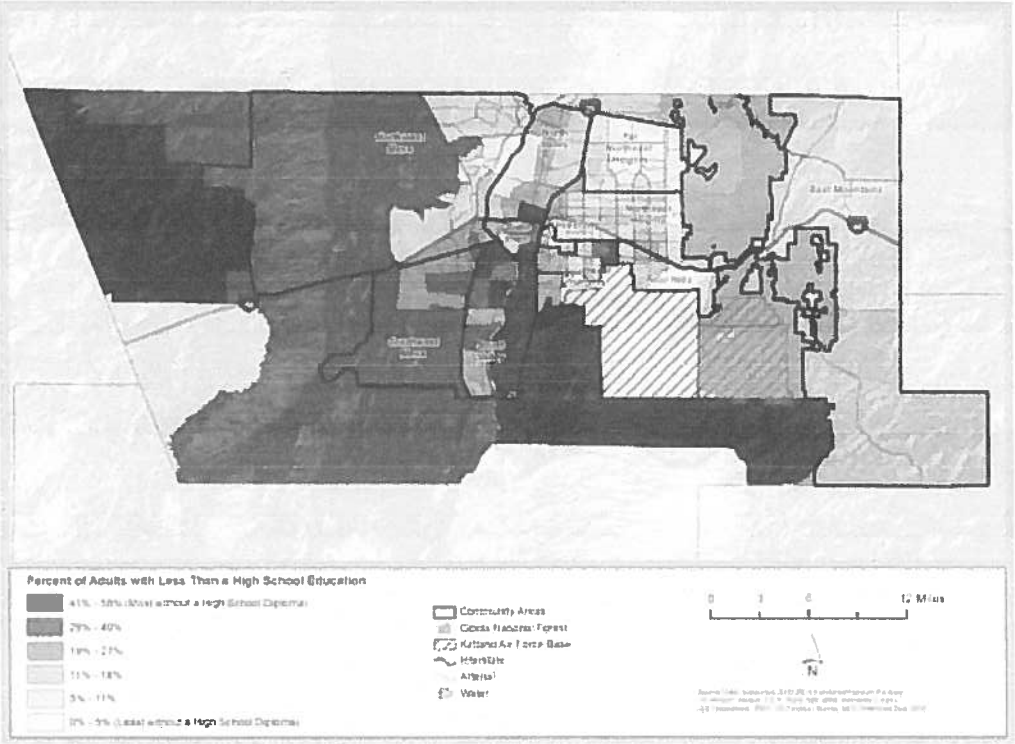
Source: U.S. Census Bureau 2009 American Community Survey
Notes: : White includes Non-Hispanic population only; all other racial categories include Hispanic and Non-Hispanic population.

Figure 2: Individuals in Poverty in Bernalillo County, N.M., by Race, Ethnicity, and Nativity



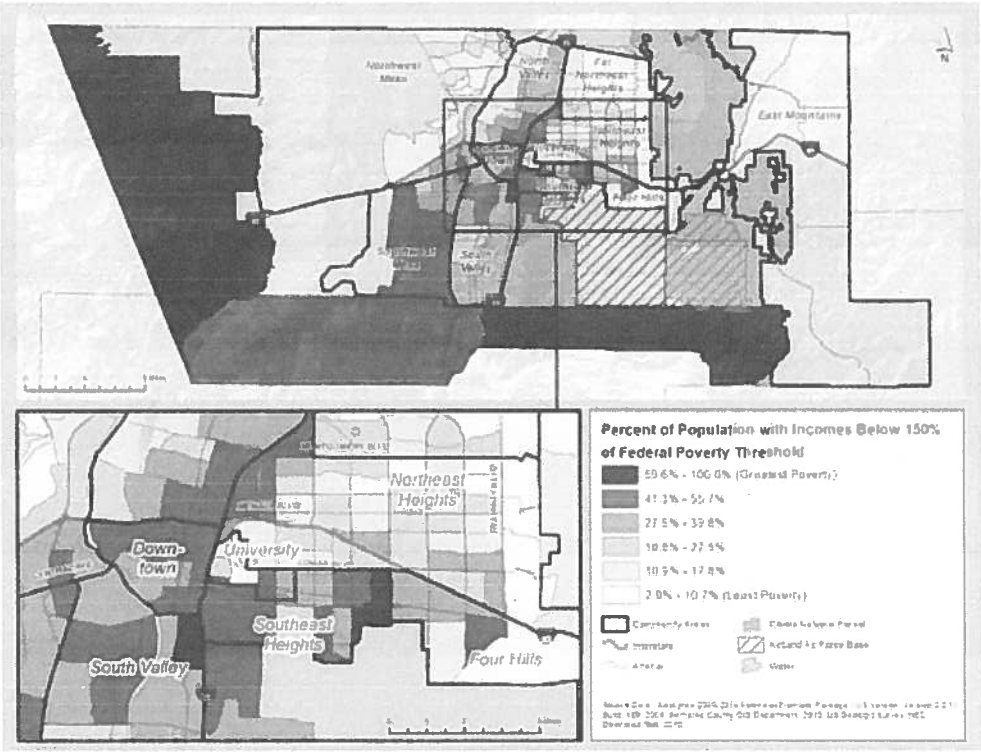
Source: U.S. Census Bureau, 2009 American Community Survey

Map 3: Adults With Less Than High School Education by Census Tract, Bernalillo County, N.M. (2009)

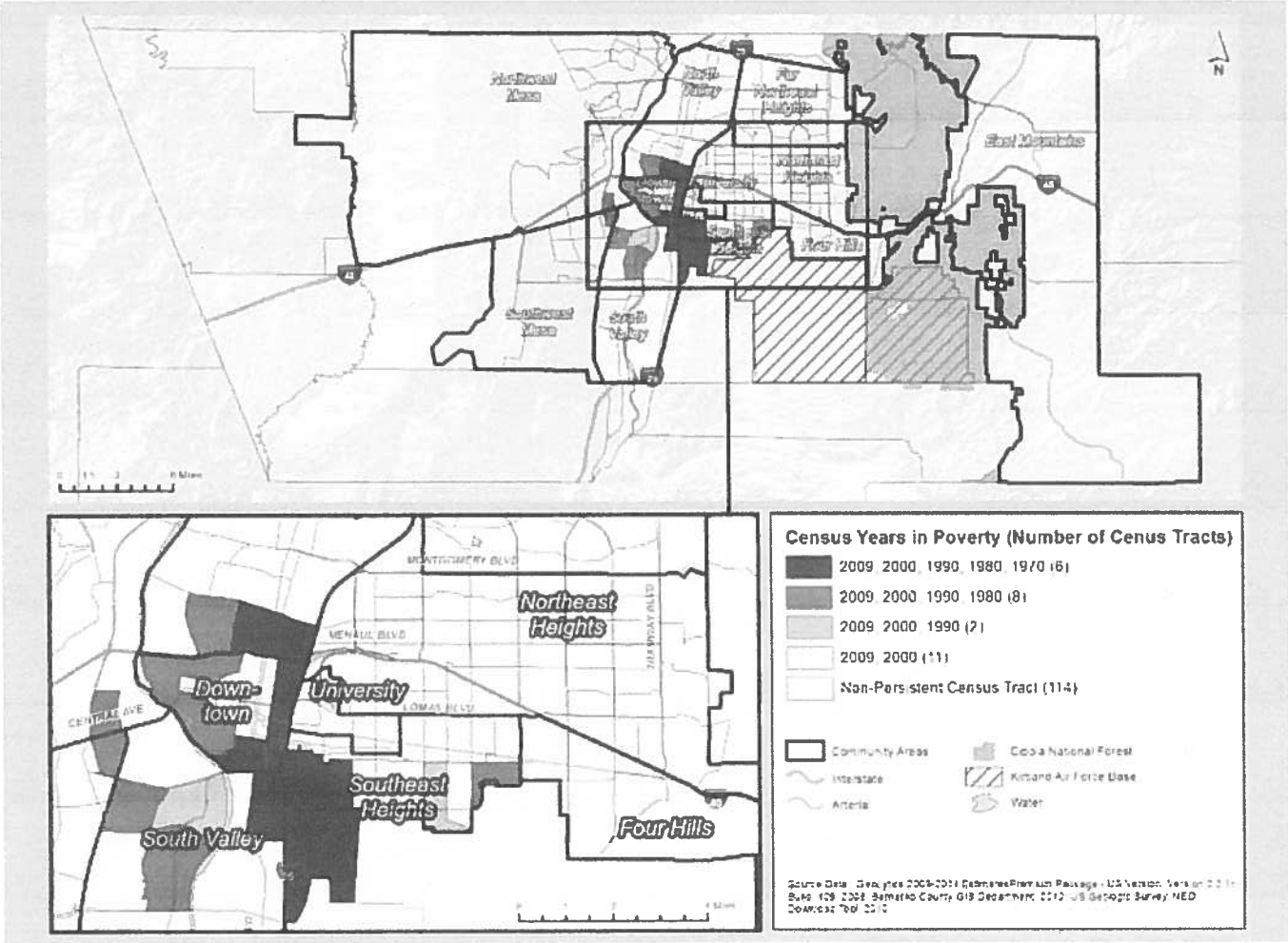


Note: Adults age 25 or older without a high school diploma or equivalent.

Map 4: Poverty by Census Tract, Bernalillo County, N.M. (2009)



Map 5: Persistent Poverty by Census Tract, Bernalillo County, N.M. (1970-2009)



Note: The category of "persistent poverty" includes census tracts with a poverty rate of at least 20% for at least two consecutive census periods, looking retrospectively from 2009. This concept is based on the U.S. Department of Agriculture's research on persistent poverty counties.

II. The Health and Life Expectancy of the People of Bernalillo County

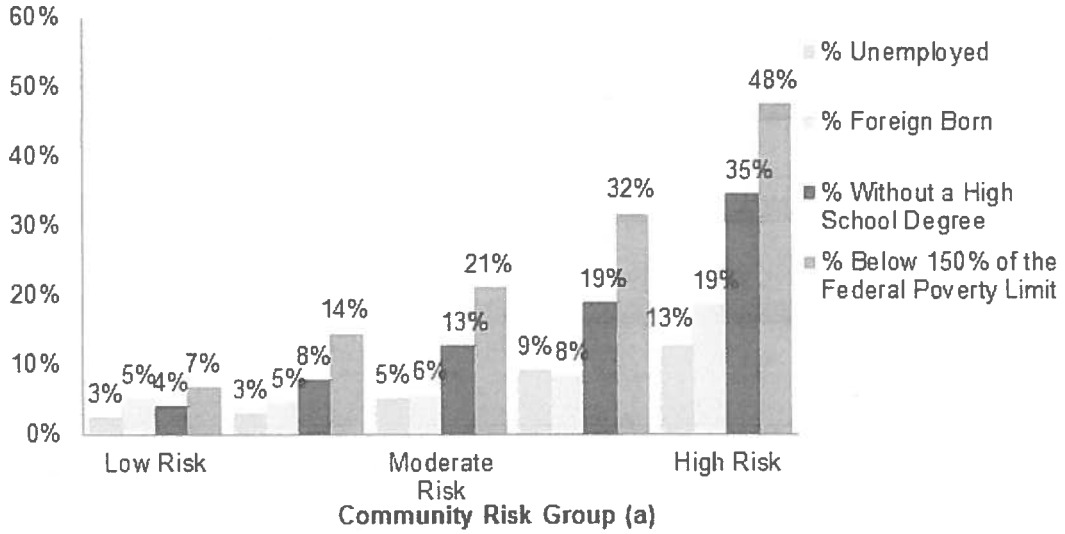
Housing Conditions

Neighborhood housing conditions have a significant impact on the community environment. Foreclosure rates in 2010 were lower in Albuquerque (one in 475 housing units) than in the nation (one in 381 units), but higher than the New Mexico rates (one in 753 units). Foreclosure rates during 2006-2008 were highest in the Downtown area, Northeast Heights, and Southwest Mesa.

The percent of vacant housing units for Bernalillo County is lower than both the state and national average, but varies greatly within the county. Census tracts with the highest rates of vacant housing, above 15%, include the Southeast Heights and the Downtown and University areas.

According to American Community Survey data for 2009, overcrowding in Albuquerque, generally defined by the survey as more than one person per room, is lower than the rate in New Mexico (2.4% and 3.6% respectively), and lower than the national rate (3.0%). Overcrowding varies by neighborhood in Bernalillo County, from census tracts with no significant overcrowding to census tracts with a rate of over 15%. Census tracts that have higher-than-average overcrowding rates include Northeast Heights, South Valley, and the Downtown and University areas.

Figure 3: Community Risk Index Groups, Bernalillo County, N.M.



(a) Community Risk Index quintiles; Source: Geolytic 2009 Projections, Albuquerque Public Schools; Research, Development and Accountability Department 2004-2006, RealtyTrac via the Federal Reserve, U.S. Census Bureau, Census 2000, Institute for Social Research 2004-2006

Community Risk Index

To sum up socioeconomic and neighborhood risks, we developed an index for comparing Bernalillo County neighborhoods. We statistically combined a set of measures into a single "community risk" index (CRI) for each census tract (see the Center on Human Needs website at http://www.humanneeds.vcu.edu/ for details). The CRI was calculated based on variables of interest to the Bernalillo County Place Matters Team and has a basis in social determinants of health literature. These variables include: average educational attainment, average standardized test scores, the violent crime rate, the foreclosure rate, the unemployment rate, vacant houses, households with no automobile, and overcrowded households. The higher the CRI score, the higher the risk associated with socioeconomic and community conditions. Use of this index enables us to examine the relationship between multiple community socioeconomic risks and health outcomes simultaneously.

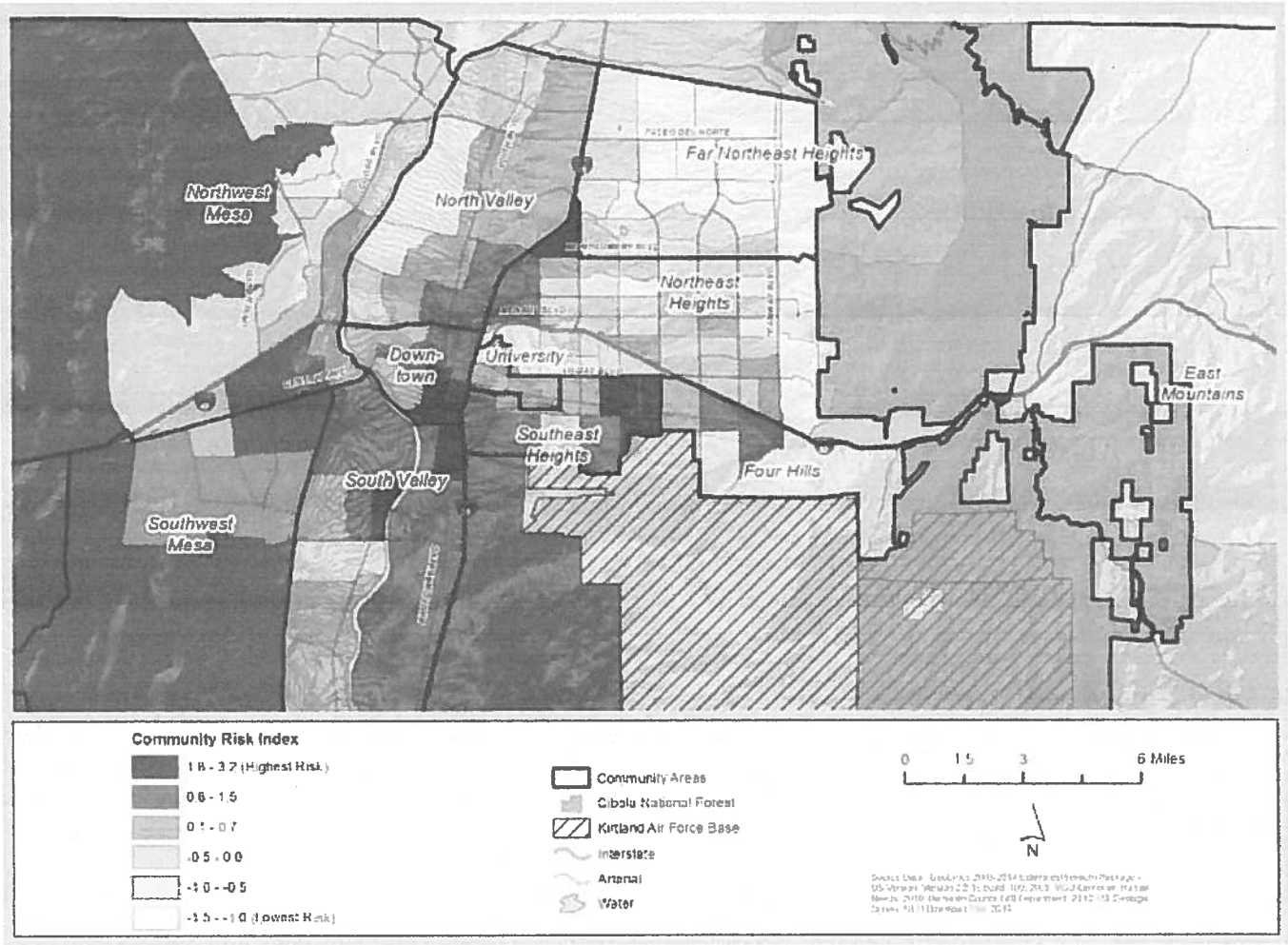
Figure 3 illustrates the relationship between the CRI and selected socioeconomic conditions. Census-tract-level scores on the CRI were divided into quintiles (five equal-size groups), which are displayed from lowest to highest. In the quintile with the lowest CRI values (lowest risk), the unemployment rate is 3%, 7% have an income below 150% of the federal poverty level, and 4% of adults lack a high school diploma. In the quintile with the highest CRI values (highest risk) 13% are unemployed, 48% have an income below 150% of the federal poverty level, and 35% of adults lack a high school diploma.

Map 6 examines geographic variation in the CRI, with high-risk areas shaded in dark brown, including Southeast Heights, Downtown, South Valley, and Northeast Heights. These are neighborhoods in which residents may be most vulnerable to poor health outcomes that are influenced by unfavorable socioeconomic conditions and community characteristics, such as high rates of poverty, crime, unemployment, low educational attainment, and poor housing conditions.

Health Status of Community Residents

Overall indicators of the health status of Bernalillo County are mixed. According to the County Health Rankings released in 2010 by the Robert Wood Johnson Foundation, Bernalillo County ranked the seventh highest in health status among the 33 counties in New Mexico; however, it should be noted that New Mexico ranked very low in morbidity, 10th lowest in the U.S.[11] Based on health outcome data from the New Mexico Department of Health for years 2001–2005, the average life expectancy in Bernalillo County (80.3 years) is slightly higher than for the state of New Mexico (77.3) or the United States (77.9). Similarly, the death rate in Bernalillo (783.6/100,000 population) is somewhat higher than the rate in the state of New Mexico (761.2) and lower than in the United States (803.6). On the other hand, rates of infant mortality and low birth weight in Bernalillo County are similar to those for New Mexico and the United States (Table 3).

Map 6: Community Risk Index by Census Tract, Bernalillo County, N.M. (2004-2009)



Note: The CRI is a composite index that is based on the following indicators: percentage of population with less than a high school education, average standardized test scores, the violent crime rate, the foreclosure rate, the unemployment rate, percentage of houses that were vacant, and percentage of households with no automobile or with overcrowding. Higher scores represent the highest levels of risk.

Given the significant differences by neighborhood in community risk factors that may affect health in Bernalillo County, it follows that health outcomes, including life expectancy, mortality, and rate of low-birth-weight births, vary sharply by neighborhood as well.

Life expectancy—how long a person born today can expect to live—varies by several decades across Bernalillo County neighborhoods. Based on vital statistics data from the New Mexico Department of Health for years 2001 to 2005, the average life expectancy for the county as a whole is 80.3 years. However, in some census tracts in the Downtown area and the Southeast Heights, a person born today can expect to live to only about 70 years or less. In other places in Bernalillo County, a person born today might expect to live into his/her nineties.

Map 7 illustrates this variation, with census tracts with the lowest life expectancies denoted in dark brown and census tracts with the highest life expectancies denoted by light yellow.

Low birth weight (defined as a weight of less than 5.5 pounds at birth) also varies sharply by neighborhood. Based on data from the New Mexico Department of Health for years 2001 to 2005, the average percent of low-birth-weight births for Bernalillo County is 8.5%. Geographic patterns for low birth weight are shown in Map 8. Darker brown areas on the map represent areas of high rates of low birth weight. Census tracts with the highest low-birth-weight rates are located in the Northeast Heights and University areas.

Map 7: Life Expectancy by Census Tract, Bernalillo County, N.M. (2001-2005)

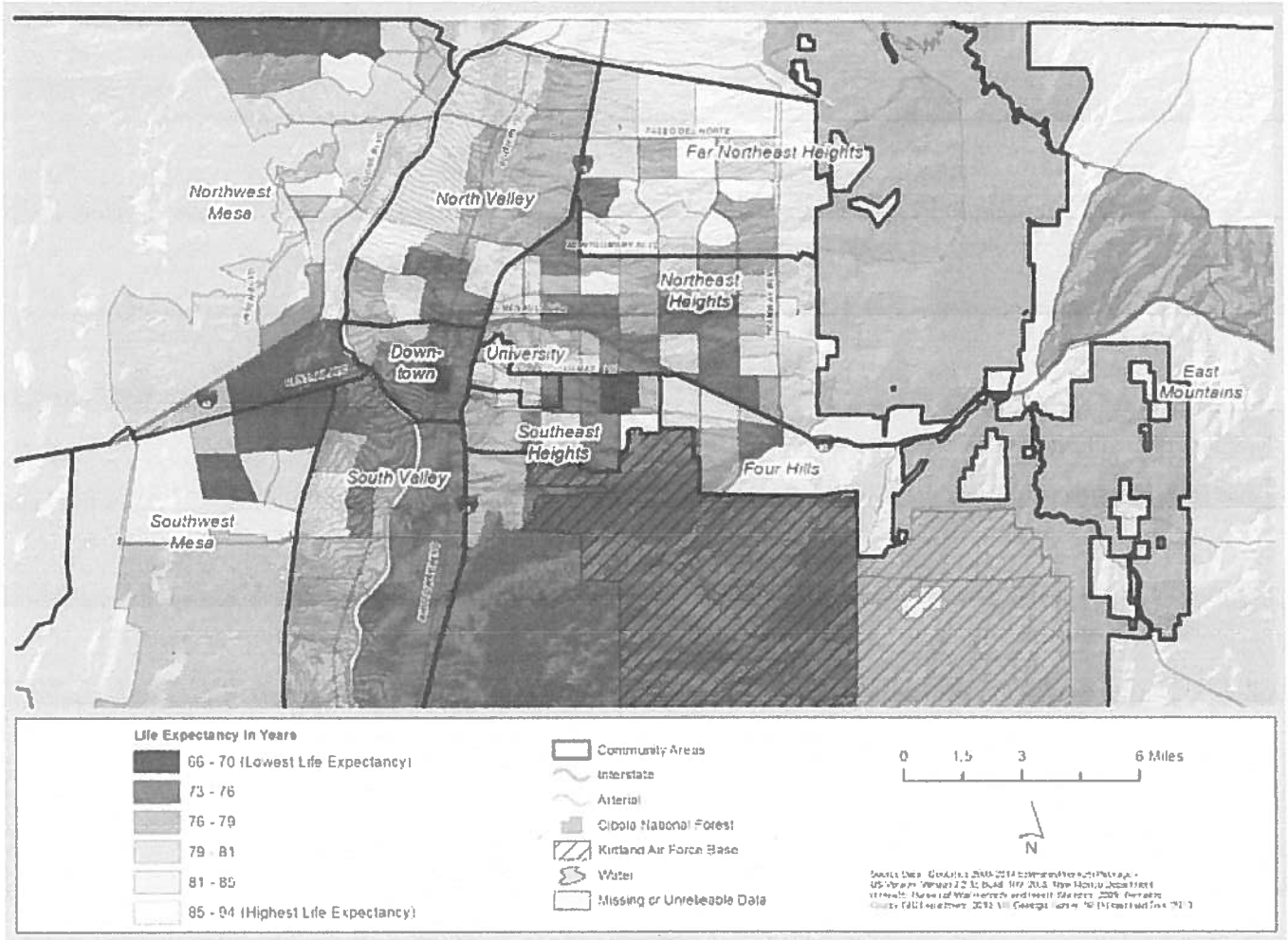
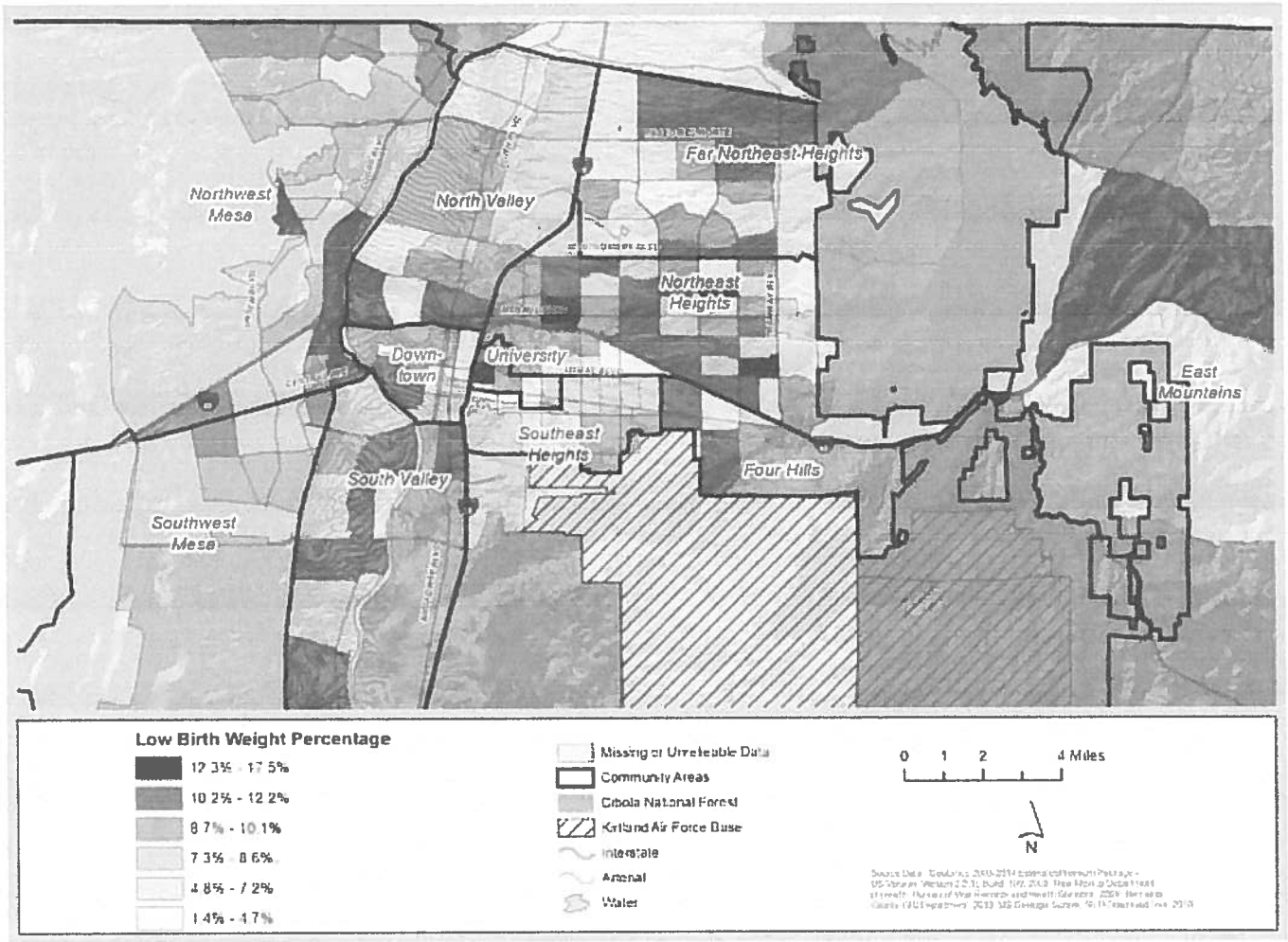


Table 3. Health Outcomes in Bernalillo County, State of New Mexico, and United States

	Bernalillo	New Mexico	United States
Deaths			
Life Expectancy in Years	80.3 (a)	77.3 (b)	77.9 (b)
Death Rate/100,000 Population	783.6 (a)	761.2 (b)	803.6 (b)
Births			
Low Birth Weight	8.4% (a)	8.5% (b)	8.2% (b)
Infant Mortality/1,000 Births	6.3 (a)	6.1 (c)	6.8 (c)

(a) New Mexico Department of Health, Bureau of Vital Records and Health Statistics, 2001-2005.
(b) Centers for Disease Control and Prevention, National Center for Health Statistics, 2005.
(c) National Vital Statistics Report, Vol 58, No. 17, April 30, 2010.
Available at http://www.cdc.gov/nchs/data/nvsr58/nvsr58_17.pdf.

Map 8: Low Birth Weight by Census Tract, Bernalillo County, N.M. (2001-2005)



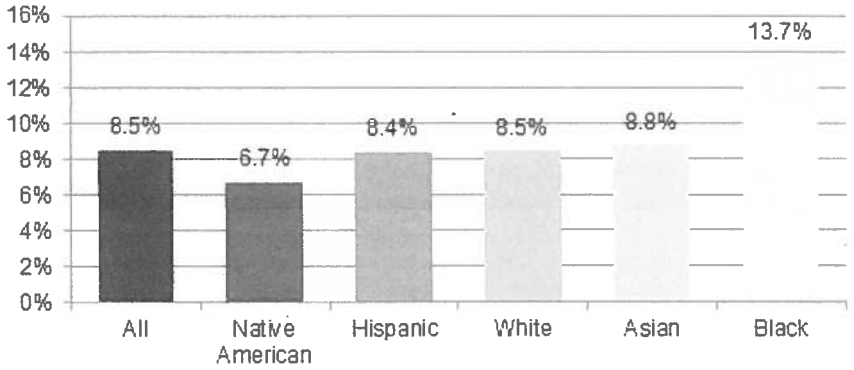
Note: Low birth weight is defined as a weight of less than 2500 grams, or about 5.5 pounds at birth. Rates in the Cibola National Forest may be unreliable due to small population size.

Figure 4 shows that the average low-birth-weight rate is nearly identical for Hispanics and whites, the two largest racial/ethnic groups in Bernalillo County. Thus, variability in low-birth-weight rates in Bernalillo County is likely to have less to do with racial/ethnic composition of neighborhoods and more to do with other community and individual risks. However, it should be noted that the percentage of low-birth-weight African American babies in the county is significantly higher than that for other population groups. This may be due to the relatively small African American population in the county, or it may be related to the stress of racism, an outcome that has been suggested by other research in other locations.

Community Risk and Health Outcomes

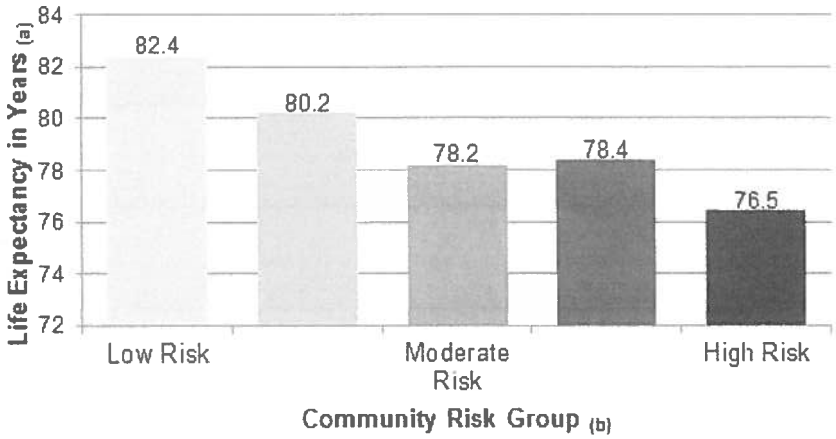
Although low-birth-weight rates often vary with socioeconomic characteristics, in Bernalillo County there does not appear to be any significant relationship between low-birth-weight rates and community or household-level characteristics measured at the census tract level. We may have insufficient data to uncover this relationship in Bernalillo County. However, census tracts in Bernalillo County with the highest level of community risk have lower average life expectancy (Figure 5). A variety of factors may affect life expectancy, including social, environmental and behavioral factors—some of which are themselves associated with the indicators measured by the community risk index. To some degree, the observed association between our index and life expectancy may represent the

Figure 4: Percent Low-Birth-Weight Births by Race/Ethnicity in Bernalillo County, N.M.



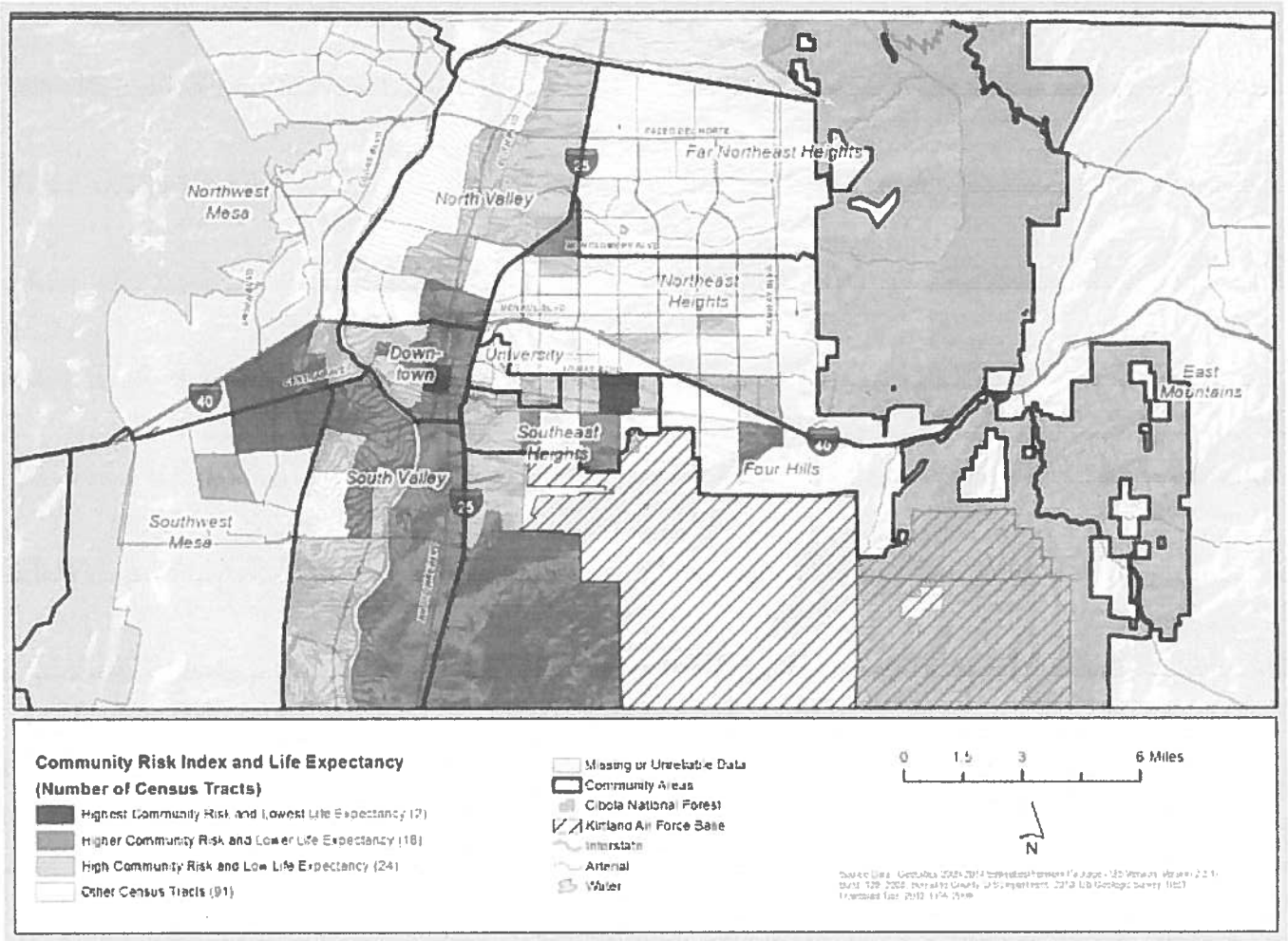
Source: Bernalillo County Department of Health, Seer Stat 2001-2005.
Note: Racial groups include Non-Hispanic population only. Hispanic can include any racial group.

Figure 5: Life Expectancy in Bernalillo County, N.M., by Community Risk Groups



(a) Life expectancy quintiles Source: Department of Health, Seer Stat, 2001-2005
(b) Community Risk Index quintiles; Source: Geolytic 2009 Projections, Albuquerque Public Schools; Research, Development and Accountability Department 2004-2006, RealtyTrac via the Federal Reserve, U.S. Census Bureau, Census 2000, Institute for Social Research 2004-2006

Map 9: Regions of Elevated Community Risk Index and Low Life Expectancy by Census Tract, Bernalillo County, N.M. (1970-2009)



Note: Values for CRI: highest = 1.79 - 3.21; higher = 0.71 - 1.47; high = 0.01 - 0.61.
Values for life expectancy (LE): lowest = 66 – 70; lower = 71 – 76; low = 77 – 79.

influence of these confounding variables and not a causal role of the measured indicators themselves.

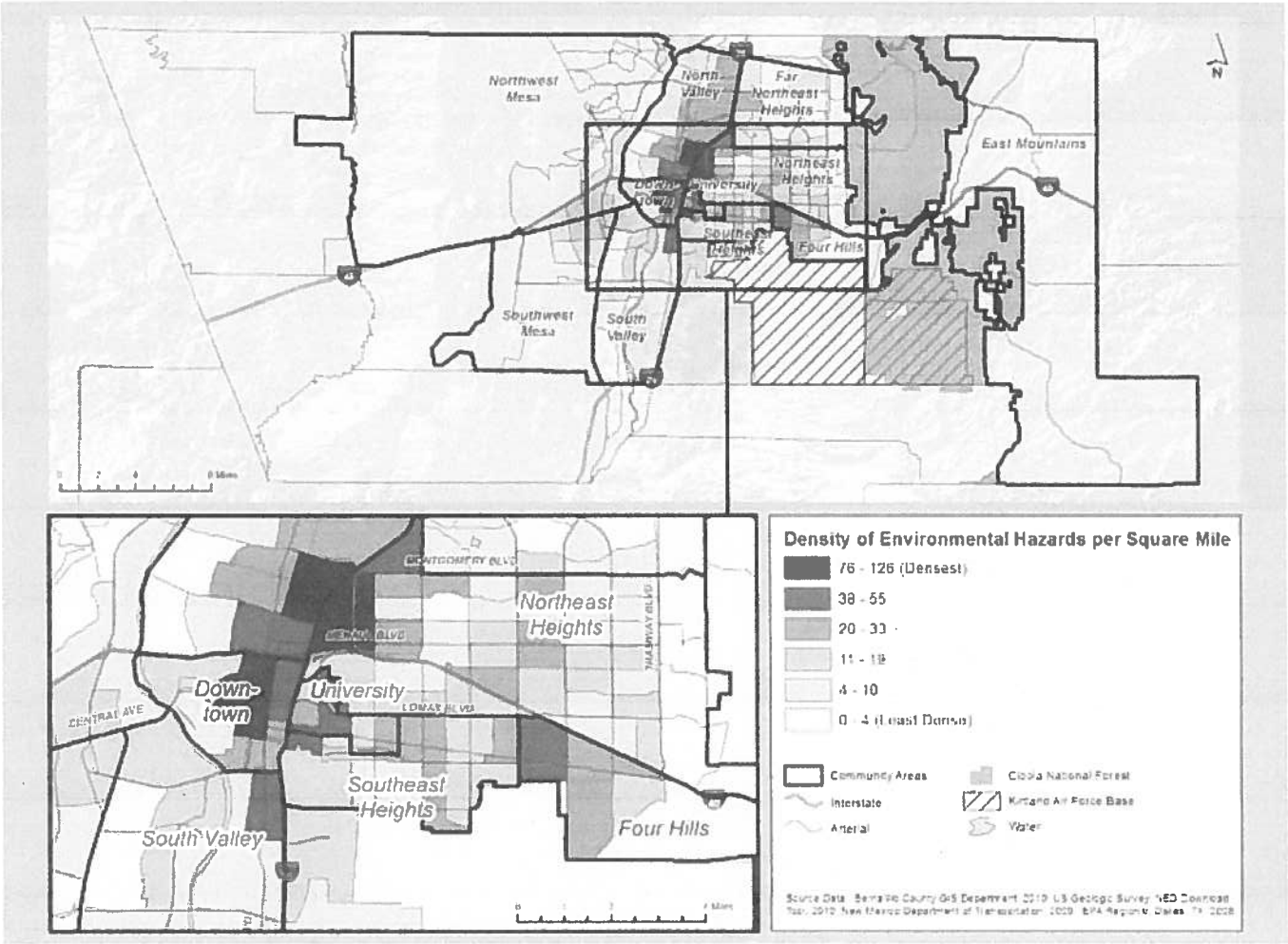
Map 9 shows the geographic relationship between socioeconomic and community risk factors (as measured by the CRI) and life expectancy in Bernalillo. Neighborhoods where the CRI is high and there are poor health outcomes are shown in darker colors. The map, which focuses on the urban areas of Bernalillo County, illustrates that census tracts in Southeast Heights, Downtown, Four Hills, South Valley, and portions of Northwest Mesa, Southwest Mesa, and Northeast Heights have a co-occurrence of high community risk index and low life expectancy.

III. Environmental Hazards and Life Expectancy in Bernalillo County

Environmental Hazards

As noted above, factors that determine one's health are not restricted to the characteristics of individuals and families. Other factors, often referred to as social determinants of health, such as communities where people are exposed to environmental hazards, contribute to greater health risks. Environmental hazards may induce disease and injuries by exposing the population to contaminated air, water, and food or to hazards associated with workplace conditions, transportation, pests, noise, toxic spills, and climate change.

Map 10: Environmental Risk by Census Tract, Bernalillo County, N.M. (2002)



Note: The density of environmental hazards was generated from an aggregation of the following types of hazards per square mile:

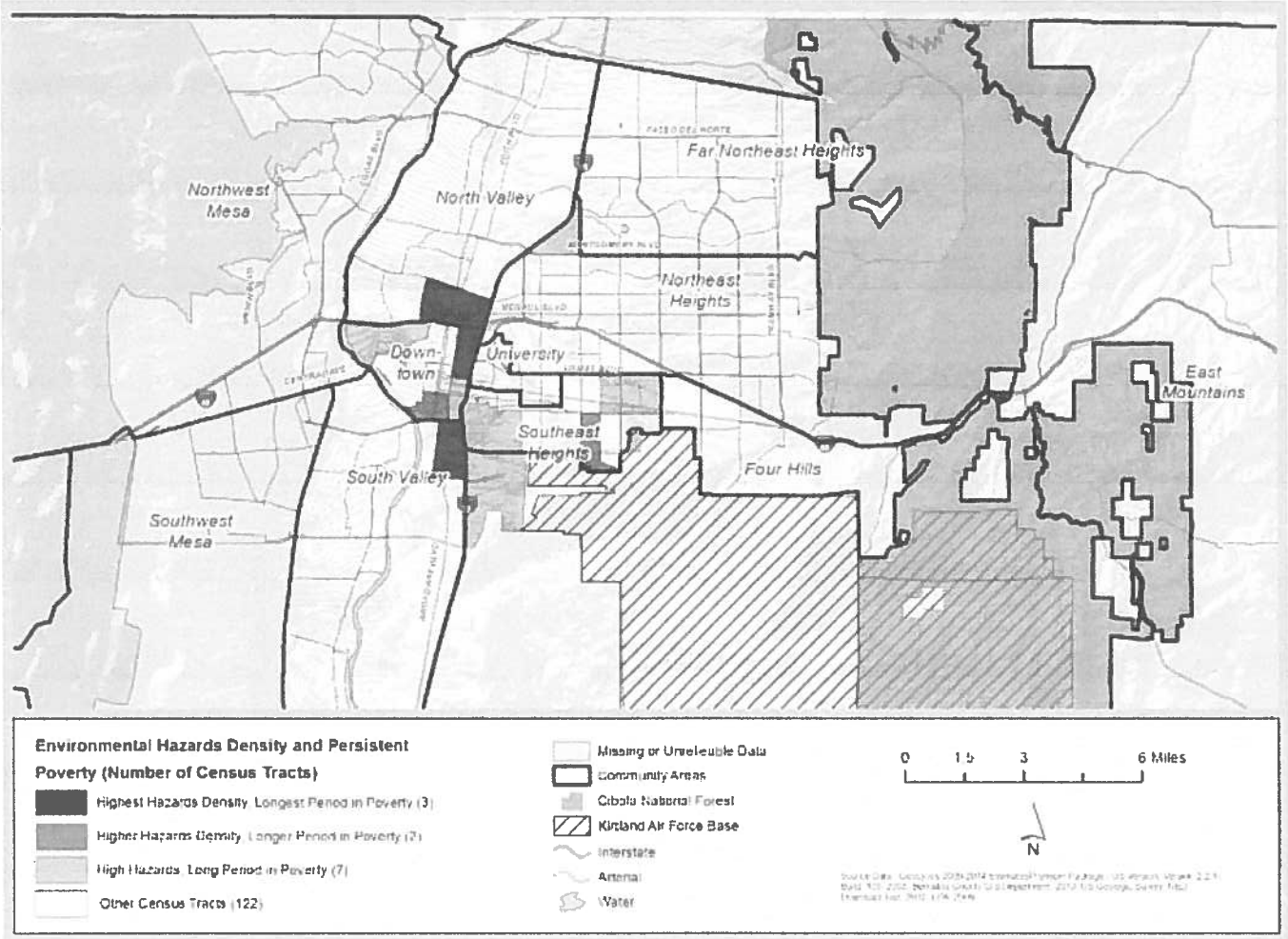
- Tier II reporting facilities
- Discharge permit points
- Dumping locations
- Hazmat locations
- Hospitals
- Railroad depots
- NMED discharge permit locations
- NPDES permit locations
- NMED petroleum storage tank bureau leak sites
- Stationary air [pollution] sources
- Superfund sites
- Industrial/manufacturing land use

While a broad array of environmental risks are considered to have health effects, the 2003 Albuquerque/Bernalillo County Comprehensive Plan identified primary sources of air pollutants as vehicular emissions, residential wood burning, dust from unpaved roads and construction sites, and, to a lesser degree, industrial operations. Primary sources of water pollutants include septic tanks, agricultural activities, gas stations, landfills, illegal dumping, and hazardous materials. In addition, there are three Superfund sites in Bernalillo County.[12] (According to the Environmental Protection Agency, "a Superfund site is an uncontrolled or abandoned place where hazardous waste is located, possibly affecting local ecosystems or people."[13,12])

Environmental Hazards in Bernalillo County

- Traffic corridors
- Railroads
- Industrial zones
- Brownfield sites
- Superfund sites
- Resource Conservation and Recovery Act (RCRA) sites
- Hazardous air pollutants

Map 11: Regions of Elevated Environmental Risk and Persistent Poverty by Census Tract, Bernalillo County, N.M. (1970-2009)



Note: Values for hazards density: highest = 38.95 - 54.65; higher = 26.00 - 33.01; high = 13.89 - 20.17.
Values for period in poverty: longest = 5 decades; longer = 3 – 4 decades; long = 2 decades.

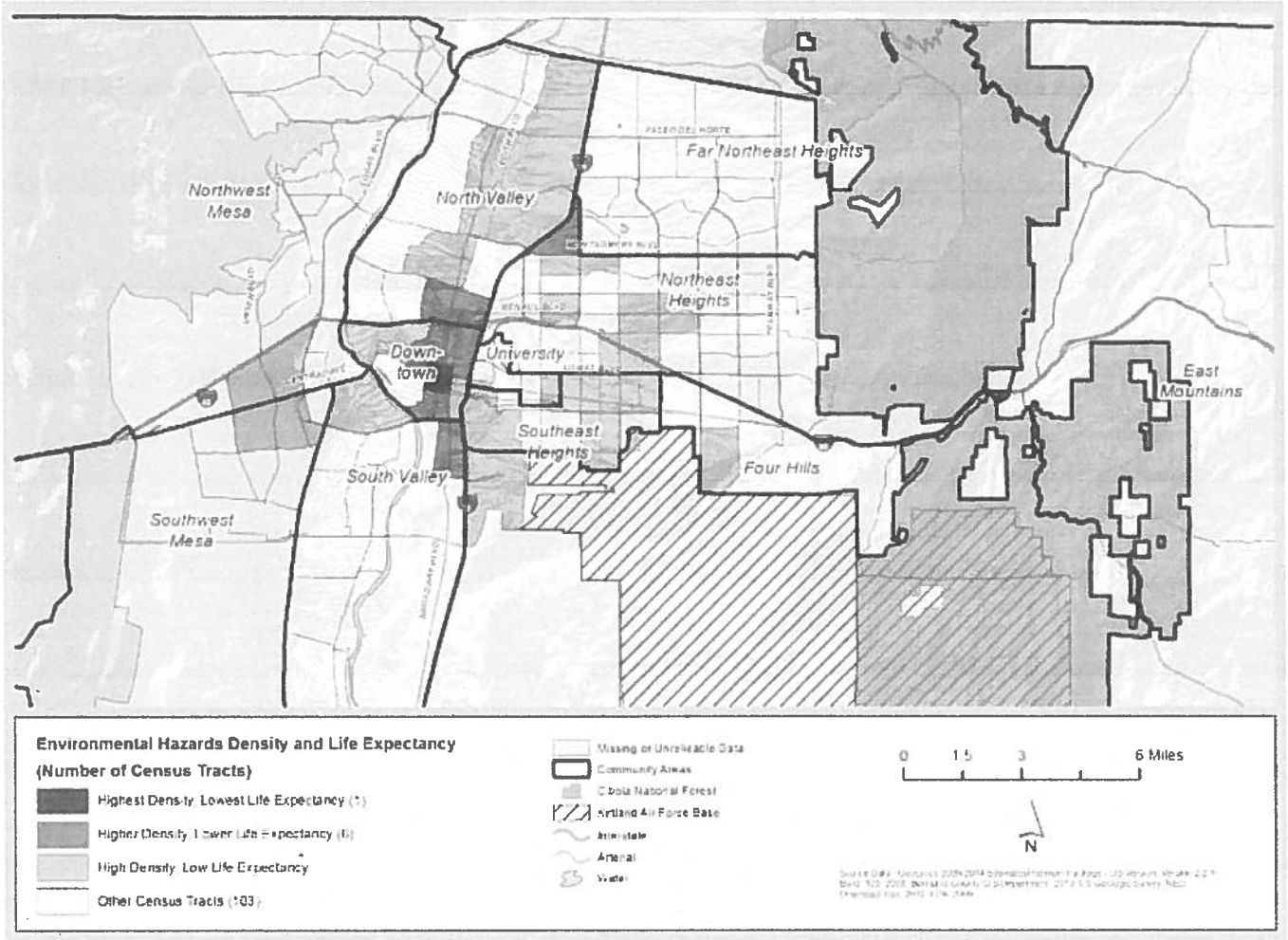
Exposure to environmental hazards is rarely uniform across geographic areas. Studies document proximity to hazardous sites and heightened exposure to pollution in neighborhoods with larger populations of people of color and the poor.[14,15,16,17] Studies in various locations also document that more environmental hazards occur in communities with large minority populations.[18] Some longitudinal studies suggest that toxic facilities are deliberately sited in minority communities,[19] possibly because such neighborhoods are socially isolated and hold limited political power to resist undesirable land use decisions by governments and corporations.[20]

As Map 10 shows, environmental hazards are most prevalent in downtown Albuquerque, near North Valley, and Northeast Heights close to Interstate 25. This measure does not reflect the number of pollutant sources but rather the number of pollutant sources divided by the square miles. While one census tract in Four Hills has elevated risk as measured by this index, the high risk score is primarily a result of land that is zoned for industrial or commercial use. Land use in this zoning classification does not necessarily result in exposure to environmental hazards.

Community Characteristics and Environmental Exposure

In Bernalillo County, particular community characteristics are common in areas having a greater number of toxic facilities. Areas with high levels of potential pollution are significantly more likely to contain low-income, Hispanic, and recent immigrant populations (Figure 6). In the quintile with the highest levels of environmental risk, 32% of households have

Map 12: Regions of Elevated Environmental Risk and Low Life Expectancy by Census Tract, Bernalillo County, N.M. (1970-2009)



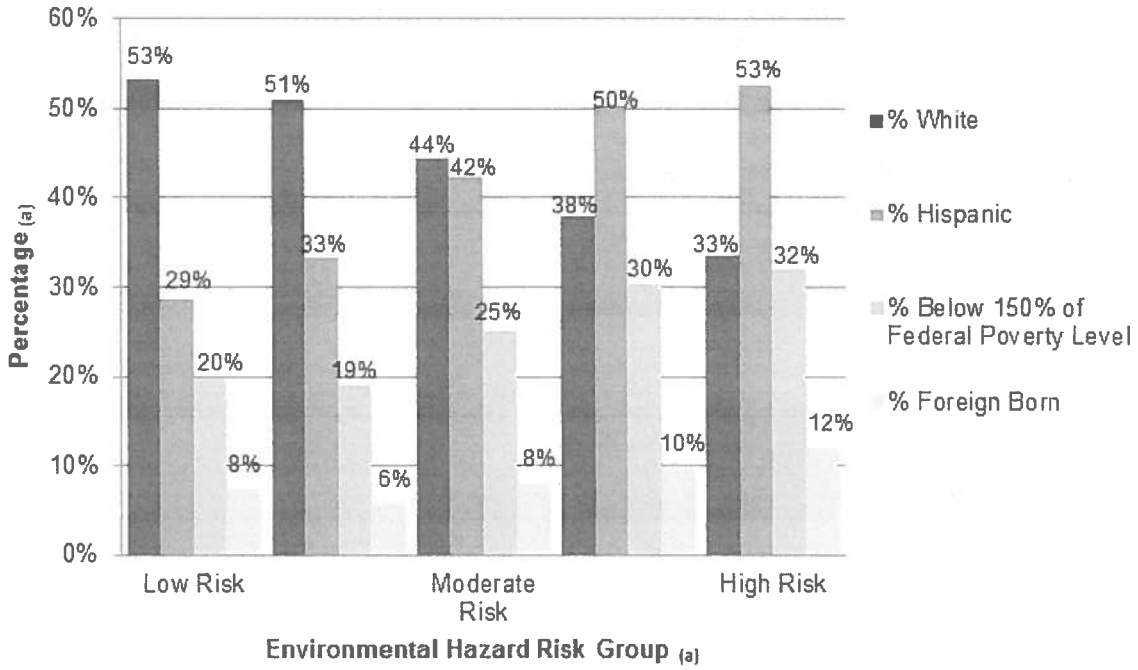
Note: Values for hazards density: highest = 54.65 - 126.15; higher = 27.43 - 54.64; high = 13.52 - 27.42.
Values for life expectancy: lowest = 66 - 70; lower = 71 - 76; low = 77 - 79.

incomes below 150% of the federal poverty level—or $33,525 for a family of four as of 2011—and 53% of these households are Hispanic. In addition, areas with the highest exposure to environmental hazards like landfills have on average 50% more foreign-born residents than the areas with the lowest exposure. Communities with the lowest levels of exposure to potentially toxic facilities tend to report higher incomes (20% below 150% of the federal poverty level) and to have a majority white population (53%).

Map 11 illustrates census tracts with a co-occurrence of persistent poverty and exposure to environmental hazards. Census tracts in the Downtown, South Valley, Southeast Heights, and North Valley have experienced high rates of poverty over several decades and have a high density of environmental hazards. There are, however, census tracts in the South Valley that have experienced persistent poverty but relatively few environmental hazards. The environmental hazards density (hazards per square mile) is meant to represent a general measure of pollution and hazards to the environment. The measure is based on the available hazardous and pollutant data from Bernalillo County at point level. Because the data set includes several types of hazards and pollutants, and excludes others, over differing time periods, the ground perception of hazard density may differ from the measure derived here.

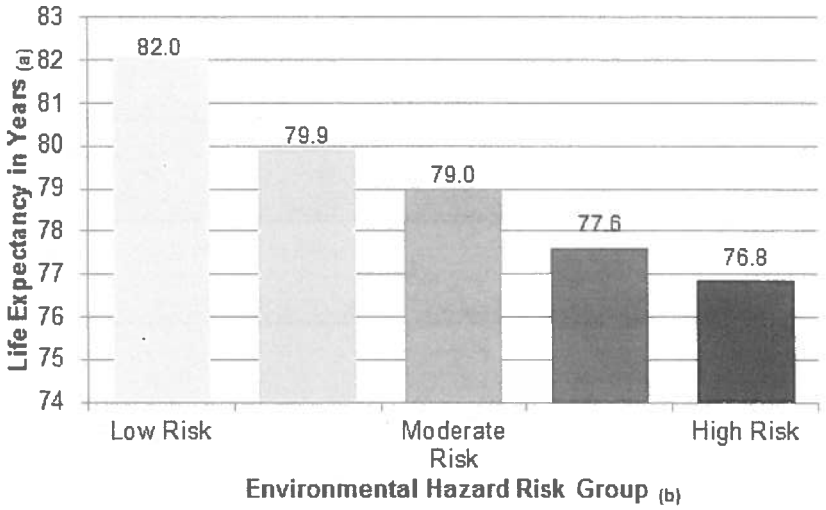
In sum, our findings indicate that exposure to environmental hazards—traffic corridors, railroads, industrial zones, brownfield sites, Superfund sites, Resource Conservation and Recovery Act sites, and hazardous air

Figure 6: Environmental Exposure by Race/Ethnicity and Poverty in Bernalillo County, N.M.



(a) Geolytic 2009 Projections
(b) Evnivronmental hazard risk quintiles; Calculated by Virginina Network for Geospatial Health Research.

Figure 7: Life Expectancy in Bernalillo County, N.M., by Environmental Risk Groups



(a) Life expectancy quintiles Source: Department of Health, Seer Stat, 2001-2005
(b) Evnivronmental hazard risk quintiles; Source: Bernalillo GIS Department

pollutants—is more likely to occur in communities where a higher percentage of the population is poor and/or Hispanic, and less likely in communities that have lower concentrations of poverty and a larger white population. Furthermore, in the Downtown area, South Valley, North Valley, and Northeast Heights, which had high environmental hazard exposure, life expectancy was low (see Map 12).

Figure 7 illustrates the relationship between the density of environmental hazards and life expectancy for census tracts in Bernalillo County. Census tracts were divided into quintiles according to the number of environmental hazards they contain. Life expectancy in the tracts in the highest quintile (with the most environmental hazards) was an average of 5.2 years shorter than for census tracts with the fewest environmental hazards (lowest quintile).

IV. Conclusion and Recommendations

Where people live within Bernalillo County powerfully predicts whether they are healthy, whether they are sick, and how long they live. Communities facing the greatest array of health risks have a larger percentage of low-income, immigrant, and Hispanic families than communities facing the least health risks. Specifically, the data show:

- Life expectancy in the county varies by more than 22 years across census tracts.
- The percentage of low-birth-weight infants varies by a factor of 12 across census tracts.
- Community-level health risks, which are measured by factors such as educational attainment, violent crime rates, foreclosure rates, unemployment rates, and the percentage of overcrowded households, vary widely across census tracts.
- A clear relationship exists between community risk index scores and health outcomes; when a neighborhood's community risk index is low, life expectancy is high.
- Nonwhite and low-income census tracts, such as those in the downtown area, face a higher concentration of environmental health hazards such as air pollution and toxic industrial wastes than do whiter and higher-income census tracts;
- Life expectancy is an average of 5.2 years shorter in census tracts with the greatest concentration of environmental hazards.

Although researchers cannot say with certainty that these neighborhood conditions *cause* poor health, the overall pattern suggests that the clustering of social, economic, and environmental health risks in low-income and nonwhite neighborhoods makes it more difficult for people in these communities to live healthy lives.

These patterns need not—and should not—continue as they are. Policy makers should consider steps to reduce the concentration of health risks in vulnerable communities and support health-enhancing resources. For example, the use of Health Impact Assessments as well as the environmental assessments required under the Consolidated Environmental Review Act can help to ensure that low-income and Hispanic communities are not disproportionately hurt by environmental degradation and policies or practices that cluster health risks.

Consolidated Environmental Review Act (CERA) Assessments

Currently, New Mexico regulations set limits for individual pollutants in air, water, and soil. However, regulations do not account for exposure to multiple pollutants from a single facility or multiple facilities and do not require an assessment of a project's overall impact on the environment or the public's health. This approach therefore underestimates a project's total impact on the community's health and the environment. To address this, CERA requires a 1-2 page environmental assessment for all projects that require permits under the federal Clean Air Act, Clean Water Act, or Hazardous Waste Act in order to identify, early on, impacts to the environment or the community's health. Environmental assessments include descriptions of: (1) the affected environment, (2) possible alternatives to the proposed actions, and (3) mitigating measures to reduce the project's impact to the environment and the community's health.

CERA requires the use of evidence-based science for the permit decision-making process that considers pollution sources, population exposures, environmental effects, and public health effects. It is expected to result in a consistent and predictable permitting process because projects will be vetted by the lead agency during the early project planning stages, potentially saving resources that would otherwise be needed later for environmental cleanup and health care costs.

Health Impact Assessments (HIAs)

HIAs allow researchers and policy makers to systematically judge the potential, sometimes unintended, effects of a proposed policy, plan, program, or project on the health of a population and the distribution of those effects within the population.

HIAs attempt to ensure that all government programs and initiatives in and outside of the health care delivery sector—such as transportation, housing, land use policies, and environmental protection—are assessed to determine their potential impact on the health status of affected communities.[21] HIAs are used extensively as a policy and planning tool in

Europe and other countries, and they are used increasingly in the United States. Bernalillo County is currently conducting HIAs for proposed land use changes in the Mountain View, San Jose, and Southeast Heights neighborhoods. King County in Washington State is developing a process to utilize an impact assessment tool that focuses on health equity and social justice in the adoption and implementation of county policies and decisions.

Other policies can also be effective in helping to reduce the concentration of health risks in vulnerable communities; CERA and HIAs are but two examples. The point is that community-based health promotion and disease prevention strategies are the most cost-effective ways to improve health, because they address the underlying causes of illness.

There is a strong moral imperative to enact policies designed to improve health for all. But there is a powerful economic reason as well. A study released by the Joint Center for Political and Economic Studies in 2009 found that the direct medical costs associated with health inequities among African Americans, Hispanics, and Asian Americans approached $230 billion between 2003 and 2006. When the indirect costs of health inequities—such as lowered productivity and lost tax revenue resulting from illness and premature death—are added to the equation, the total cost of health inequities between 2003 and 2006 exceeded $1.24 trillion. For both moral and economic reasons, now is the time for action to address neighborhood conditions that shape health outcomes.

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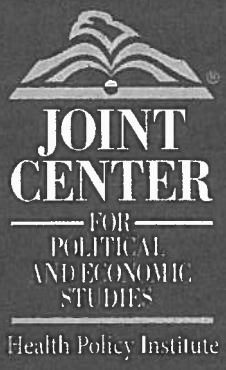

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