THE JOURNAL OF EQUITY IN HEALTH www.JEHonline.org October 2008 Vol. 1, No. 1, 22-40

Is Poverty the Main Factor Contributing to Health Care Disparities? An Investigation of Individual Level Factors Contributing to Health Care Disparities

Paulette M. Niewczyk, MPH, PhD

Department of Sociology, University at Buffalo

Jamson S. Lwebuga-Mukasa, MD, PhD

Center for Asthma and Environmental Exposure, Lung Biology Research Program, Division of Pulmonary and Critical Care, Department of Medicine, Kaleida Health Buffalo General Hospital Division, University at Buffalo School of Medicine and Biomedical Sciences

This research sought to examine whether poverty is the main factor contributing to health care disparities, using the fundamental cause of social inequalities theory. We hypothesized that individuals with higher socioeconomic status (SES), controlling for gender, age and race were more likely to report having a medical home, a proxy measure for health care disparities. Structured interviews of 1669 heads of households in the City of Buffalo, NY collected from a stratified random sample provide the data for this research. Among respondents, SES and race were significantly associated with having a medical home. The fundamental causes of social inequalities theory was partially supported by the data. Lower SES individuals were less likely to report having a medical home. However, individual SES variables and race only contributed 22 percent of the variance explained by reporting a medical home, indicating that other factors contributed to most inequalities in health care. Factors beyond individual socioeconomic and racial differences need to be considered in evaluation of inequities in health care.

Keywords: poverty, health care disparities, health disparities, socioeconomic status, race, minorities; Buffalo, New York

Prior research has shown that reduced access to health care, lack of health insurance coverage, poverty, socioeconomic status (SES), race, area of residence, and age have all been associated with health disparities (House and Williams, 2000; Williams and Collins, 1995; Hayward et al., 2000; Smedley et al., 2003; Jackson, 2005; Browning and Cagney, 2002; Arcury et al., 2005; Alliance for Health Care Reform, 2003; House et al., 2005; Asch et al., 2006; Williams, 2005; Agency for Health Care Research and Quality [AHRQ], 2004; Farmer and Ferraro, 2005; Kitagawa and Hauser, 1973; Link and Phelan, 1995; Phelan et al., 2004). The aim of the current research was to examine which individual level factors contribute to health care disparities, and specifically whether poverty is the main factor contributing to health care disparities, using the framework. We hypothesized that individuals with higher SES, controlling for gender, age and race are more likely to report having a medical home,

Contact Information: Paulette M. Niewczyk, MPH, PhD, 45 Sagebrush Lane, Lancaster NY 14086, (716) 681-8950; pmwydro@buffalo.edu

Acknowledgement: This study was supported in part by RO1-CCR220259-01 from the Centers for Disease Control and Prevention to JL-M.

a proxy measure for health care disparities. Structured interviews of 1669 heads of households in the City of Buffalo, NY collected from a stratified random sample provide the data for this research.

Background

At the individual level, a wide range of documented factors contribute to health disparities, although the specific roles of some factors are not clear cut. Some researchers attribute differences in health status as differences in persons' SES (House and Williams, 2000; Williams and Collins, 1995; Hayward et al., 2000; Smedley et al., 2003; Farmer and Ferraro, 2005). Persons with low SES are more likely to suffer greater disease morbidity, higher mortality rates, lower life expectancy, fewer health screenings, have less access to health care, lower rates of health insurance coverage, and less likelihood of having a medical home (Schultz et al., 2002; Krieger and Fee, 1994; Raphael, 2000; Farmer and Ferraro, 2005; Kitagawa and Hauser, 1973; Williams, 2005; Almeida et al., 2005). Being unemployed (Sorlie et al., 1995; Williams, 2005), having a job with low occupational prestige (Marmot et al., 1984; Marmot et al., 1991), having a lower education level (Ross and Wu, 1995; Adler et al., 1994; Sorlie et al.,1995; Almeida et al., 2005), living in poverty (Galbraith et al., 2005; Wilkinson, 1992), and early childhood socioeconomic position (Williams and Collins, 2001; Williams and Collins, 1995) are all factors contributing to health disparities.

Other researchers have found that race plays a key role in defining health and health care disparities. Black and Latino minority populations are, on average, less healthy, receive poorer quality of health care, are more likely to lack health insurance coverage, lack a health care provider, receive fewer medical screenings, have higher infant mortality rates and lower overall life expectance than whites (Centers for Disease Control and Prevention [CDC], 2005; House and Williams, 2000; Jackson, 2005; Schultz et al., 2002; Frayne et al., 2005; Wong et al., 2002; Byrd and Clayton, 1992; Williams and Collins, 1995; Farmer and Ferraro, 2005; Lillie-Blanton et al., 1996). A particular challenge is teasing apart the independent contributions of SES on the one hand and race on the other.

Additional individual level factors contributing to differences in health and health care include lack of health insurance (Kaiser Commission of Medicaid and the Uninsured, 2004) and the type of health insurance coverage. Type of coverage matters because individuals who have means-tested public health insurance, such as Medicaid, were more likely to experience poorer quality of health care, fewer health screenings, poorer disease management, less routine health care and were less likely to report having a medical home (Alliance for Health Care Reform, 2003; Shi, 1999; Andrulis, 1998; Berk and Schur, 1998; DeNavas-Watt et al., 2004; Center for Studying Health Systems Change, 1997) than individuals who are entitled to public insurance (through Medicare, Veterans Administration and Champus) or who have employer-sponsored health insurance. Lack of transportation and not owning a vehicle has been attributed to disparities in health care (Arcury et al., 2005; Gesler et al., 2001; Wilson, 1996). Additionally, other factors acknowledged include basic demographics such as age and gender influence disparities; males (Asch et al., 2006; Williams, 2005). Young adults are more likely to lack health insurance and a medical home (House et al., 2005; Asch et al., 2006).

While all of the above mentioned factors have been linked to health disparities, most researchers contend that poverty and/or SES is the main contributor. What is less well understood are the processes by which SES impacts health outcomes. Is individual SES alone at the root of existing health disparities? Are there other individual or community factors that are implicated as well? Answering these fundamental questions is challenging. SES is so closely intertwined with race and area of residence that many studies have been, so far, unable to disentangle the effects of individual level, community level and systemic factors. Clearly, all contribute, but

which factors have the greatest impact on health disparities, and under what conditions, remains to be determined. Currently, the Healthy People 2010 Initiative seems to be the catalyst to many policies focusing on individual level interventions, with the goal of reducing and eliminating health and health care disparities (Department of Health and Human Service [DHHS], 1999; Smedley et al., 2003). However, lacking a firm understanding of the multiple levels of factors that predict health and health care disparities, it is doubtful that efficient and effective policy interventions can be designed to reduce or eliminate the inequalities.

Marmot and colleagues (1987) argued that controlling for individual level factors, access to health care and health care utilization accounts for little of the association between SES and health. Such findings have led some researchers and commentators to suggest that improved access and quality of medical care at the individual level alone may do little to reduce persistent socioeconomic inequalities in health (Bird et al., 2000).

Limited access to health care among some minority populations is an important contributor to health care disparities (AHRQ, 2004). Equitable access to medical care is regarded as crucial to limiting or preventing disparities in health among the poor and minority populations (Williams and Collins, 1995). The IOM defined access to health care as "the timely use of personal health services to achieve the best possible health outcomes" (Smedley et al., 2003). Potential for access can be measured in terms of proximity to a health care provider or health care facility, having transportation to get to wherever necessary health care is provided and having a primary health care provider or a *medical home*. A medical home is defined by the American Academy of Pediatrics as the site of health care that provides "primary care that is accessible, continuous, comprehensive, family-centered, coordinated, compassionate, and culturally effective" (American Academy of Pediatrics, n.d.). Under ideal circumstances, a medical home is the place where a health care provider works with the patient to coordinate both medical and non-medical needs. Having a medical home can assist patients by providing a pathway for accessing specialty care, educational services, out-of-home care, family support, and other public and private community resources that are important to the overall health of the patient. What characterizes a medical home most fundamentally is whether a person has a regular, dependable place where they routinely receive the health care they need, and which includes a sustained relationship with a health care provider.

An understanding of the mechanisms that contribute to health care disparities is the first step towards specifying conditions that can minimize health disparities for poor and minority populations. Lacking a primary care provider often means not receiving health screenings and preventative care and overuse of emergency facilities—all important determinants of health status stemming from usual source of care (Williams & Collins,1995). In contrast, receiving preventative primary care, a characteristic highly associated with having a medical home can play a major role in enhancing quality of life (Williams & Collins,1995). In fact, while access to appropriate medical care is important for all people, it has been found to have a greater effect on the health status of minorities and persons of low SES than for more affluent populations (Williams, 1990). Consequently, having a medical home may be even more important for poor or minority individuals' health status than for their more advantaged counterparts.

Primary health care is generally regarded as the foundation of the health care system and having a usual source of primary care, or a medical home, significantly increases the likelihood that an individual will receive preventative and routine care (Gill & Mainous, 1998; AHRQ, 2004). Having a usual primary care provider, as opposed to using a hospital-based clinic or Emergency Department (ED) for urgent care, also increases the continuity of care for patients (Gill et al., 2000; Lambrew et al., 1996; Hayward et al., 1991; Mainous and Gill, 1998; Weiss and Blustein, 1996) and provides more efficient and effective health care

(Starfield & Shi, 2004). Visiting a physicians' office versus depending on a hospital-based clinic or ED as the usual source of health care has been associated with overall reduced ED visits (Christakis et al., 1999; Gill et al., 2000), decreased hospitalizations (Gill et al., 2000), less morbidity (Sweeney and Gray, 1995), better health-related outcomes (Konrad et al., 2005), earlier disease detection (Konrad et al., 2005), better reported access to care (Lambrew et al.,1996), and increased reported quality of care (Christakis et al., 2002; Hjortdahl & Laerum, 1992). One study found that having a regular physician had a greater impact on receiving preventative services such as routine blood pressure and cholesterol level screenings, than did having a regular health care site, implying the importance of sustained interpersonal relationships between patients and doctors for optimal continuity of care (Xu, 2002). For these reasons, we regard receiving routine care at a private physician's office as the indicator for whether or not individuals have a medical home. We use the two terms, private physician office and medical home, interchangeably to refer to the concept that it is not merely the site of care, but also the sustained social relationships between doctors and patients that matters in terms of better understanding health care disparities.

We define private health care provider as a primary care physician caring for patients at a private doctor's office, versus non-private health care providers such as a community-based health clinic or out-patient hospital. The role of having health insurance coverage (and type of coverage) is considered, since lacking health insurance or the type of health insurance coverage an individual has often presents a potential barrier to routine access to health care. Type of health insurance coverage is defined as employment-based health insurance, private-pay (individually purchased policies), coverage under public insurance such as Medicare or Medicaid, and having no insurance at all. We examine the impact of race controlling for SES and area of residence. We examine the impact of black race as compared to whites, as well as minorities as compared to whites. We define minorities as non-white race.

Conceptual Framework

The fundamental causes of social inequalities in health are explored via the theoretical framework used in the study. According to this theory, social conditions, namely poverty and low social class, are the fundamental causes of health disparities (Link & Phelan, 1995; Link & Phelan, 2005). The theory maintains that social inequalities produce health inequalities, and that policies that reduce social and economic inequalities will reduce health inequalities (Link & Phelan, 2005). Furthermore, social position, which includes resources such as money, education, prestige, power, social support and social networks, is the main contributor to health disparities (Link & Phelan, 1995). Persons with higher SES enjoy a wide range of resources, material and non-material, that can be used to advantage their health status (Link & Phelan, 1995). These resources directly shape an individual's health behavior by influencing a person's knowledge of, access to, and capacity to engage in health-enhancing behaviors (Link & Phelan, 2005). In addition, greater resources enable an individual to have greater access to better neighborhoods and jobs and stronger social networks (Link & Phelan, 2005), as additional contributions to healthfulness.

Link & Phelan (1995) argue that the key element of the fundamental cause theory is access to resources that can be used to avoid or minimize ill health. From this perspective, the association between low income, health insurance coverage and having a routine source of health care are central. If an individual does not have access to health insurance or lacks a health care provider, the ability to maintain good health is com-promised.

Previous studies have found that unequal SES is a fundamental cause of health disparities (Link & Phelan, 1995; House et al., 1990; House et al., 1994; Schultz et al., 2002; Kaplan & Lynch, 1999). For example, in a

study of cancer screenings among women, women of higher SES were more likely to be screened for cervical and breast cancer than those with a lower SES; 80 percent of women with a college education were screened for cervical cancer, whereas just about fifty percent of women with a high school or less than high school education were screened (Link et al., 1998). Link and colleagues (1998) also found other similar patterns in terms of income; 75 percent of women with a family income of $50,000 or greater had mammograms for breast cancer screening, compared to less than 50 percent of women with a family income of $20,000 or less.

To further test the theory that socioeconomic factors fundamentally impact health, Phelan and colleagues (2004) hypothesized that SES would be strongly associated with mortality for preventable causes of death, and that resources would be less related to mortality for less preventable causes of death. Their argument was that, if the utilization of resources among persons with high SES levels is critical in prolonging life, in situations when resources associated with higher social class are useless, high SES should yield little to no advantages, and the SES-mortality association would dissipate. Using data from the 1999 National Longitudinal Mortality Study, which is a large scale, prospective study that includes nearly 400,000 cases of selected Current Population Surveys that are linked to the National Death Index to determine occurrences and causes of death in a follow-up period of nine years, the researchers developed ratings using two physician-epidemiologists to classify the preventability of death, being low or high preventability. High-preventability causes included conditions such as chronic obstructive pulmonary disease, lung cancer and cerebrovascular disease, whereas low-preventability causes included conditions such as arrhythmias, pancreatic and stomach cancer (Phelan et al., 2004). Gradients according to SES indicators of education and income were examined separately for high and low preventability causes. They found that the SES-mortality association was much stronger for highly preventable causes of death than for less preventable causes of death, supporting the fundamental cause theory.

Study Questions

Three study questions were tested: 1. What proportion of residents lack a medical home or health insurance coverage in Buffalo, New York? 2. What individual level factors are associated with having (or lacking) a medical home? 3.) Does the fundamental cause of social inequalities theory, specifically, SES, explain differences in health care, particularly, reporting a medical home?

Design and Methods

The study area was the City of Buffalo, New York, which is the largest city in Western New York, with a total population of 292,688 (US Census Bureau, 2000). Forty seven percent of the city residents are males. The median age is 33.6 years (US Census Bureau, 2000). Buffalo has a high percentage of minorities, with 37.2 percent black and 7.5 percent Latino, compared to the national rates of 12.3 percent black, 12.5 percent Latino, and 12.5 percent other race/ethnicity (US Census Bureau, 2000). Twenty-seven percent of all city residents live below the poverty level, compared to twelve percent nationally (US Census Bureau, 2000). The median household income in Buffalo is $24,536, and of all households, 31.4 percent do not own a car (US Census Bureau, 2000).

Health insurance coverage and type of health insurance coverage (employer-sponsored, Medicare or Medicaid, uninsured), having a medical home and type of health care facility typically visited (e.g., Emergency Department), hospital based clinic, or private physician's office) was studied, controlling for a variety of individual characteristics. Physical access to health care was measured by car ownership at the household level.

This study used data from a larger study (Lwebuga-Mukasa et al. 2005; Lwebuga-Mukasa et al., 2004) which assessed disease prevalence and environmental exposures among residents in Buffalo

neighborhoods. Data from a cross-sectional, strategic random sample of 1669 Buffalo heads of households were used. The data was collected by trained interviewers who went to every 10th house on pre-selected streets using the Polk Directory. The interviewers sought consent from the head of the household and performed structured, face-to-face interviews which took about 30-45 minutes to complete.

The survey instrument consisted of three parts. Part one addressed the demographic characteristics of the head of household, the home environment and the health of household members. Part two asked about household members with respiratory problems, medication use among household members, and disease associated symptoms. Part three addressed additional medical problems (such as heart disease, diabetes, cancer) among household members and the respondents' attitudes about social problems in their community. The analyses reported in this research focuses on questions from part one of the larger survey, which included demographic and socioeconomic information, health insurance coverage information, location where the head of household received primary care (medical home), home and car ownership. Additional variables included in the analyses included highest level of education achieved by the respondent, monthly household income, employment status, age, sex and race.

Ethics

The survey instrument and protocol were approved by the University at Buffalo Health Sciences Institutional Review Committee. All participants signed a statement of informed consent.

Data Management and Analysis

Descriptive statistics using the Statistical Package for Social Sciences (SPSS) Version 14.0, (Chicago, IL), was used to perform univariate and multivariate statistics. Data were stratified by race, age and sex. Chi square tests, ANOVAs, and odds ratios were used to test for statistical significance as appropriate. Odds ratios were computed using Epi Info version 3.2 (CDC). Categorical variables were dummy coded and entered into a logistic regression model using SPSS to estimate the effects of the independent variables such as race, employment, education, income, car ownership, home ownership, and insurance type, to determine which of the individual level factors were most associated with the dependent variable, having a medical home.

Results

Demographic Characteristics

Demographics are displayed in Table 1. A total of 1699 (85%) of the 2000 targeted households completed the survey, of which 30 were excluded due to pertinent missing data, leaving 1669 in the analysis.

Note that there was one fifteen year old participant in the study sample. This individual was an emancipated, head of household, thus eligible for inclusion. Ages were collapsed for the analyses; a quarter of the sample was aged 15 to 34, about half were aged 35-64, and the remainders were age 65 and older (22.6%). The other race/ethnicity category was constructed to allow for comparisons between races; this group was comprised of Asians, Native Americans, and individuals who selected two or more racial categories.

Households Reporting No Health Care

One hundred and forty-five heads of household, 10 percent of study respondents, reported they had no regular source of health care. Blacks were the most likely to lack a usual source of health care altogether, with 11.4 percent of households reporting that they received no regular health care, followed by 10.8 percent of other race, 8.3 percent of whites and 7.5 percent of Latinos, although the differences between racial groups were not statistically significant.

Table 1. Sample Demographics

% Males	35
% Females	65
Age Mean	48.2
Age S.D.	18.4
Age Range	15-98
% Black	48.6
% White	31
% Latino	14.7
% Other	5.8
Years at Residence Mean	11.1
Years at Residence S.D.	13.3
Years at Residence Range	<1-85
Years Residing in Buffalo Mean	33.7
Years Residing in Buffalo S.D.	20.4
Years Residing in Buffalo Range	<1-89
Completed High School	78.7
Employed	42.9
Employer-based Health Coverage	32.9

The mean age of individuals lacking a routine place for medical care was 46.6 years. Sixty one percent did not own a car, 62 percent were unemployed, 20 percent had not finished high school, 93.5 percent reported having some kind of health insurance coverage with 41 percent reporting insurance coverage through Medicare or Medicaid.

Individual Level Factors Contributing to Having a Usual Source of Health Care

Overall, women, individuals aged 35 and older, whites, individuals with more than a high school education, who were employed, with an income above $1,000 a month, who own a car, who own a home, and who have private health insurance were more likely to report having a usual source of health care, shown in Table 2.

Since one of the main research objectives is to determine which individual level variables were the most important contributors in health care disparities, and to determine if SES is the 'fundamental cause' in health care disparities, the data were stratified by race, age and gender by SES variables to test if SES variables were significant contributors in health care disparities—after controlling for race, age and gender.

Table 3 shows where individuals reported obtaining their usual type of health care stratified by race. Whites were the most likely to have a medical home, with nearly half reporting they usually received their health care from a private physician's office, as compared to Latinos OR= 4.73 (CI= 3.10-7.22) and blacks OR= 1.68 (1.31-2.16). Latinos reported receiving almost all of their care in hospital clinic settings (79.3%) compared to blacks (55.6%) and whites (47.3%), and individuals of other races (59.8%) x^2=63.42, DF=3, p=.00.

Since race showed a significant effect on having a medical home (visiting a private physician's office for health care), the data was stratified to test the impact of SES variables controlling for race, thus testing the fundamental causes of health disparities theory. When stratified by race (Table 4), both white and minority individuals with higher SES were more likely to report having a medical home. However, whites were significantly more likely to report a medical home than minorities, even in the lower SES categories, except for individuals aged 65 and older, where differences between whites and minorities and reporting a medical home disappeared.

Overall, respondents in the 15-34 age group were the least likely to report having a medical home, and persons aged 65 and over were the most likely to report having a medical home (x^2=9.36, df=2, p<.01). This trend persisted when age and demographic and socioeconomic indicators were controlled for. Table 5 displays the data stratified by age. Differences in SES indicators remained significant when data were stratified by age, whereas persons with lower SES were less likely to report having a medical home (except for income, where persons in the lower income category were less likely to

Table 2: Percentages with a Usual Source of Health Care by Demographic and SES Variables

Medical Home	N	%	x^2 (df)
Gender			
Male	497	29.5	
Female	938	38	10.01(1), *p*=.00
Age Category			
18-34 years	351	27.9	9.36 (1), *p*=.01
35-64 years	722	36.6	
65 or older	317	37.5	
Race			
Black	693	34.6	
White	433	47.1	64.45 (3), *p*= .00
Latino	227	15.9	
Other	92	32.6	
Education Level			
< High School	299	24.1	
> High School	1136	37.8	19.5 (1), *p*=.00
Employment Status			
Unemployed	820	28.7	
Employed	620	43.4	33.67 (1), *p*=.00
Income			
< $1000 p/mo.	487	18.3	
> $1000 p/mo.	410	44.6	73.20 (1), *p*=.00
Vehicle Ownership			
No Car	514	18.2	
Own a Car	911	44.5	100.2 (1), *p*=.00
Home Ownership			
Rent	849	22.5	
Own Home	585	52.6	138.8 (1), *p*=.00
Insurance Type			
Public/Gov't.	1157	33.4	
Private	282	43.3	9.73 (1), *p*=.00

Table 3. Usual Source of Care Reported by Race

	% (Total N)	% (Total N)	% (Total N)
Race	**Private MD**	**Hosp/Clinic**	**None**
Black	34.6% (693)	55.6% (693)	11.4% (693)
White	47.1%** (433)	47.3% (433)	8.3% (432)
Latino	15.9% (227)	79.3%* (227)	7.5% (227)
Other	32.6% (92)	59.8% (92)	10.9% (92)
Total	35.3% (1445)	57.1% (1445)	9.8% (1444)

* if less than .05 **if less than .01

Table 4. Percentages with a Medical Home by Demographic and SES Variables Stratified by Race

Medical Home	**N**	**% White**	**% Minority**	**x^2 (df)**
Gender				
Male	495	36.7	25.8	6.32 (1), *p*=.01
Female	931	54	32	38.52 (1), *p*=.00
Age Category				
18-34 years	351	40.4	23.7	9.30 (1), *p*=.00
35-64 years	717	53.2	30.2	33.28 (1), *p*=.00
65 or older	313	41.1	36	.88 (1), *p*=.35
Education Level				
< High School	297	34.2	21	5.28 (1), *p*=.02
> High School	1129	49.9	32.3	31.9 (1), *p*=.00
Employment Status				
Unemployed	813	41	23.7	24.7 (1), *p*=.00
Employed	619	54.7	38.5	14.2 (1), *p*=.00
Income				
< $1000 p/mo.	484	25.2	16	5.32 (1), *p*=.02
> $1000 p/mo.	409	57.3	36	18.21(1), *p*=.00
Vehicle Ownership				
Do Not Own Car	514	27.4	15.9	7.35 (1), *p*=.01
Own Car	907	53.8	39.5	17.0 (1), *p*=.00
Home Ownership				
Rent Home	844	31.7	20.1	11.3 (1), *p*=.01
Own Home	581	59	48.4	6.4 (1), *p*=.00
Insurance Type				
Public	758	37.8	20.3	22.1 (1), *p*=.00
Private	672	53.7	44.6	5.3 (1), *p*=.02

Table 5: Percentages with a Medical Home by Demographic and SES Variables Stratified by Age

	15-34	35-64	65+	
Medical Home	**N=349**	**N=717**	**N=307**	**x^2 (df)**
Gender				
Male	25	28.7	34	2.1 (2), *p*=.35
Female	29	40.7	39.6	9.2 (2), *p*=.01
Education Level				
< High School	10	19	35	14.3 (2), *p*=.00
> High School	31	40	39	7.4 (2), *p*=.03
Employment Status				
Unemployed	20	25.6	35.5	12.5 (2), *p*=.02
Employed	32	49	53.3	17.4 (2), *p*=.00
Income				
< $1000 p/mo.	21	15.5	21	2.4 (2), *p*=.31
> $1000 p/mo.	38	47	48	2.8 (2), *p*=.25
Vehicle Ownership				
Do Not Own Car	17	15	24	4.8 (2), *p*=.09
Own Car	32	49	50	21.8 (2), *p*=.00
Home Ownership				
Rent Home	24	20.6	23.7	3.9 (2), *p*=.14
Own Home	43	55	50.3	3.9 (2), *p*=.54
Insurance Type				
Public/Gov't	27	34.4	34.5	5.7 (2), *p*=.059
Private	34	48	46	3.2 (2), *p*=.20

have a medical home but did not differ by age).

Women were more likely than men to report having a medical home. Gender differences are tested controlling for SES variables, as shown in Table 6. Overall, women were more likely to report having a medical home than men, although the differences are most profound between men and women with higher SES levels. Women with greater than a high school education, whose incomes were greater than $1,000 per month, who rented their homes, and who owned a car were more likely to report having a medical home than men with similar SES indicators. Men and women with private insurance were equally likely to have a medical home. There was no statistically significant difference between men and women having a medical home by owning a home, making less than $1,000 per month, being unemployed, or having less than a high school education. In all of those instances, men and women had relatively low levels of having a medical home, and no significant gender differences in having one.

A logistic regression model was used to test the main effects of each of the SES indicators along with race, age and gender on the dependent variable, having a medical home. Variables were dummy coded 0 and 1, where 1 indicated having a medical home, the dependent variable. The independent variables were coded in the same way with 0 as the reference category; for example, for the variable 'blacks', 0 were all non-blacks and 1 were blacks.

Results are displayed in Table 7. It was found that having income greater than $1,000 per month, car and home ownership, being a woman, and being white race were the individual influences most predictive of reporting a medical home for health care. Education level, employment status, insurance type, and age were not statistically significant in the regression model. The final model, consisting of the independent variables race (white or non-white), gender, income, car ownership and home ownership accounted for 22% of variance explaining reporting a medical home.

Discussion

The main finding is that individuals with higher SES were more likely to have a medical home, while individuals with lower SES were more likely to visit a clinic or hospital, or lack health care altogether (11.4%). We tested whether SES was the fundamental cause of health care disparities among individuals in the study population. This application of the theory is novel in that the theory has been used in prior research to examine health disparities (differences in morbidity and mortality), but has not been applied to disparities in health care. The fundamental cause of social inequalities in health theory was partially supported by the data. Persons with higher SES were more likely to report having a medical home. However, the final model only accounted for 22 percent of the variance and there were significant differences among residents of difference races, particularly minorities (non-whites) in terms of whether or not they reported receiving care from a private physician's office. Even using several variables to control for SES, whites were more likely to report having a medical home than minorities.

That individuals with higher SES were more likely to report having a medical home is not surprising, given expectations derived from health disparities research. Certainly, the role of SES in health care disparities is complex. Variables associated with SES play a large role in many factors associated with having a medical home, including the following: the type of health insurance a person has, whether an individual rents or owns their home and the location of their residence; ease of access to a provider or care facility; access to transportation; resources to pay for care; and knowledge to adhere to treatment regimens. Findings from this research are consistent with differences in health care based on SES documented by other researchers (Steelfisher, 2004; Andrulis, 1998; Berk and Schur, 1998; Cunningham, 2006; St. Peter et al., 1992). Our research findings lend partial support to the fundamental cause of social inequalities in

Table 6: Percentages with a Medical Home by Demographic and SES Variables Stratified by Gender

Medical Home	Males N=493	Females N=923	x^2 (df)
Education Level			
< High School	27	23	.56 (1), *p*=.46
> High School	30.3	41.7	14.2 (1), *p*=.00
Employment Status			
Unemployed	21.6	32.2	9.9 (1), *p*=.00
Employed	39.3	45.5	2.2 (1), *p*=.14
Income			
< $1000 p/mo.	11.3	21.3	7.2 (1), *p*=.01
> $1000 p/mo.	39.3	48	3.0 (1), *p*=.09
Vehicle Ownership			
Do Not Own Car	14	19.8	2.4 (1), *p*=.14
Own Car	37	49	12.0 (1), *p*=.00
Home Ownership			
Rent Home	44.7	57.4	8.4 (1), *p*=.00
Own Home	18.6	24	3.2 (1), *p*=.07
Insurance Type			
Public/Gov't	26.6	37	12.8 (1), *p*=.00
Private	46.7	42	.50 (1), *p*=.48

Table 7: Logistic Regression Full Model -- Factors Associated with Having a Medical Home

			95% CI for Exp(*B*)		
	***B* (*SE*)**	***p***	**Lower**	**Exp(*B*)**	**Upper**
Constant	-2.23				
	(0.66)				
Income	**0.71**	**0.00**	1.41	2	2.9
	(0.19)				
College Education	0.34	0.17	0.86	1.4	2.3
	(0.20)				
Employed	0.39	0.055	0.99	1.5	2.18
	(0.20)				
Own Car	**0.5**	**0.02**	1.1	1.7	2.5
	(0.21)				
Own Home	**-0.78**	**0.00**	0.32	0.46	0.66
	(0.19)				
Private Insurance	.02	.93	0.67	1.02	1.55
	(0.22)				
Gender	**0.66**	**0.00**	1.4	1.94	2.8
	(0.18)				
Age	0.01	0.21	0.996	1.01	1.02
	(0.01)				
Black	**-0.56**	**0.00**	0.4	0.57	0.84
	(0.20)				
Latino	**-0.86**	**0.00**	0.25	0.42	0.72
	(0.27)				
Other Race	-0.39	0.25	0.34	0.67	1.33
	(0.35)				

N=1669 % Predicted Correct- 74.5

R^2 = 0.233 (Hosmer & Lemeshow), 0.17 (Cox & Snell), 0.233 (Nagelkerke). Model $\chi^2(11) = 151.01$, $p < .001$.

health theory; however, it is also clear that SES alone does not fully explain the differences in having a medical home.

Since such a wide variety of possible factors contributing to health care disparities have been published, it is likely that different factors may be the root causes of disparities within different population subgroups, communities and geographic areas. Beyond the vast differences in Americans' social class, race, culture, language, religion and so forth, health care systemic differences abound. For example, insurances vary widely from plan to plan and even within the same insurer, such as Blue Cross and Blue Shield, where coverage can differ based on geographic region. Although Medicare is a nationwide program, public assistance programs like Medicaid vary widely across the country due to state-level administration of such programs. The issue of the confounding potential of such wide variation makes investigations like this one, at the local level, highly relevant to the investigation of health care disparities.

If SES alone accounted for the disparities in health care, we would have expected no difference between minorities and whites within similar socioeconomic strata. However this was not the case. Interestingly, we found that whites were significantly more likely to a have medical home, compared to minority individuals when stratified and analyzed by SES indicator data. The differences between minorities and whites found here warrant further investigation to attempt to tease out the effects of SES and race.

There were 145 heads of household, roughly ten percent of the respondents in the sample who reported that they did not go anywhere for health care, This may seem like a small proportion of the population, however, if these individuals need health care due to illness or injury, because they lack a medical home they will likely either receive no care at all or will use the ED. Thus, these small numbers of individuals can end up costing the 'system' a great deal financially, since the ED is much more costly than private care. Of interest in this study was the fact that most individuals who lacked a regular source of health care, nonetheless, had health insurance. This observation alone suggests that the simplistic view that lack of health insurance is the main contributor of health disparities is not fully supported. For this study population, health insurance, while important, does not guarantee access to a medical home. Additional studies to understand why individuals with health insurance coverage lack medical homes are in order.

We found that the differences between whites and minorities and reporting a medical home at younger ages disappeared among persons over 65 years of age. This may be explained by type of health insurance coverage. Perhaps Medicare is the 'great equalizer' in terms of health care access. Minority and/or poor individuals, who lacked health insurance or depended on Medicaid at younger ages, qualify for Medicare once they reach 65. Medicare is health insurance for the elderly, a public health insurance system available to all elderly individuals regardless of economic status. In this potential explanation, Medicare actually helps to 'close' the gap between minorities and whites. However, another plausible explanation may be that whites, once age 65, experience a downward shift in their health care fortunes, whereby their health insurance coverage, once retired from previous employment, may be of a lesser quality than previously experienced. If that is the case, 'closing' the gap in medical homes between minorities and whites, may not be due to equalizing effects of Medicare that improve the circumstances of minorities, but due to losses experienced disproportionately by whites, whose use of medical homes declines to rates similar to minorities. The data in this study appears to support the latter explanation. This is shown when stratifying the data by age category and race, where minorities increase in likelihood of having a medical home as age increases (from 23% percent in young adulthood, to 30% in middle age to 36% as senior); however, whites actually decrease in likelihood from middle age to senior, going from 53% to 41%, respectively. This finding warrants further investigation.

Race and SES at the individual level only accounted for 22 percent of the variance in reporting a medical home, which means that a great amount of the variance was unexplained by both race and SES. Although several of the individual variables (such as age, gender, education level) were statistically significant contributors to health care disparities, they did not fully explain differences in reporting a medical home. Future research needs to investigate the contribution of factors such as language and culture, patient preferences and health-seeking behaviors that were not included in the current study to analyze having a medical home. Language (non-English speaking) and cultural differences have been associated with health care disparities (Alliance for Health Care Reform, 2003; Smedley et al., 2003; Doty, 2003; Ashton et al., 2003; Cockerham, 2005; Bach et al., 2004). Individuals who have had poor experiences with the health care system, poor interactions with a health care provider, and lack of trust in the health care system contributed to the documented disparities in health and health care (Smedley et al., 2003; Schnittker & McLeod, 2005; Ashton et al., 2003; Seils & Schulman, 2004; Alliance for Health Care Reform, 2003). In addition, individual patient preferences, beliefs and attitudes may contribute to health disparities (Smedley et al., 2003; Schnittker & McLeod, 2005; Davis & Ford, 2004). A recent study had documented that most adults who lacked a medical home did so out of preference; they simply placed little value on having a usual source of care (Viera et al., 2006). All of the above mentioned factors may be important in explaining differences in reporting a medical home.

The current analysis focused on individual level factors. It is possible that differences between race and SES may be explained by community level differences such as access to a health care provider, for instance; certain neighborhoods may have more availability to medical facilities than others. Furthermore, the impact of residential segregation by social class and race may contribute to differences in health care disparities. Further research controlling for community level differences is warranted.

Study Strengths and Limitations

Although detailed studies are available at national levels, detailed descriptions of local disparities in health care are limited and a large, local sample may permit more finely grained analyses than a similarly sized national one, particularly since localized studies hold certain background variables constant. The present research on individual level factors influencing health care disparities provides such a benefit.

Despite this strength, the research had some limitations. It was a cross-sectional study in which the head of the household answered questions about him or herself, thus it is subject to recall bias. Some of the variables, such as reported income had a low response, and the study does not provide direct information about the quality of interaction between health care providers and patients, or patient preferences. Additional research investigating patient preferences, and causes from the perspective of the patient are warranted to determine the cause of health care disparities.

Conclusion

Among residents in the City of Buffalo, SES and race are significantly associated with having a medical home. The fundamental causes of social inequalities theory was partially supported by the data, with lower SES individuals being less likely to report having a medical home; however individual SES variables and race only contributed 22 percent of the variance explained by reporting a medical home. Factors beyond individual socioeconomic differences need to be considered, and the differences between race and having a medical home cannot be discounted.

References

Adler, N.E., Boyce, T and Chesney, M.A.. 1994.Socioeconomic status and health: the challenge of the gradient." *American Psychologist, 49,* 15-24.

Agency for Health Care Research and Quality. 2004. "National health care disparities report summary." Retrieved January 3, 2006 (http:// www.ahrq.gov/qual/nhdr03/nhdrsum03.htm).

Alliance for Health Care Reform. 2003. "Closing the gap: Racial and ethnic disparities in health care." Retrieved January 10, 2006 (www.allhealth.org).

Almeida, David M., Neupert, S.D., Banks, S.R., and Serido, J. 2005. "Do daily stress processes account for socioeconomic health disparities?" *Journals of Gerontology: Series B, 60B,* 34-39.

American Academy of Pediatrics. "Medical home". Retrieved January 6, 2007 (http:/www.aap.org/).

Andrulis, Dennis P. 1998. "Access to care is the centerpiece in the elimination of socioeconomic disparities in health". *Annuals of Internal Medicine 129*(5), 412-416.

Arcury, Thomas A., Preisser, J.S., Gesler, W.M., and Powers, J.M.. 2005. "Access to transportation and health care utilization in a rural region." The *Journal of Rural Health, 21,* 31-40.

Asch, Steven M., Kerr, E.A., Keesey, J., Adams, J.L., Setodji, C.M., Malak, S. and McGlynn, E.A. 2006. "Who is at greatest risk for receiving poor-quality health care?" *The New England Journal of Medicine 354*, 1147-1156.

Ashton, Carol M., Haidet, P., Paterniti, D.A., Collins, T.C., Gordon, H.S., O'Malley, K., Petersen, L.A., Sharf, B.F., Suarez-Almazor, M.E., Wray, N.P., and Street, R.L. 2003. "Racial and ethnic disparities in the use of health services: bias, preferences or poor communication?" *Journal of General Internal Medicine* 18, 146-152.

Bach, Peter B., Pham, H.H., Schrag, D., Tate, R.C., and Hargraves, L.J.. 2004. "Primary care physicians who treat blacks and whites." *The New England Journal of Medicine 351(6),* 575-584.

Berk, Mark L. and Schur, C.L.. 1998. "Access to care: how much difference does Medicaid make?" *Health Affairs 17(3),*169-180.

Bird, C., P. Conrad and Fremont, A. 2000. *Handbook of Medical Sociology, 5th ed.* Upper Saddle River, NJ: Prentice Hall.

Browning, Christopher R., and Cagney, K.A. 2002. "Neighborhood structural disadvantage, collective efficacy, and self-rated physical health in an urban setting." *Journal of Health and Social Behavior* 43(4), 383-399.

Byrd, W. Michael and Clayton, L.A.. 1992. "An American health dilemma: a history of blacks in health system." *Journal of the National Medical Association, 84(2),*189-200.

Centers for Disease Control and Prevention. *Epi Info,* Version 3.2.

Centers for Disease Control and Prevention. 2005. "Health disparities experienced by black or African Americans-United States." *Morbidity and Mortality Weekly Review* 54(01), 1-3.

Center for Studying Health Systems Change. 1997. "Data Bulletin". 1.

Christakis, D. A., Wright, J.A., Koepsell, T.D., Emerson, S., and Connell, F.A. 1999. "Is greater continuity of care associated with less emergency department utilization?" *Pediatrics* 103(4 Pt 1), 738-742.

Christakis, D. A., Wright, J.A., Zimmerman, F.J., Bassett, A.L.,and Connell, F.A.. 2002. "Continuity of care is associated with high-quality care by parental report." *Pediatrics* 109(4), e54.

Cockerham, William C. 2005. "Health lifestyle theory and the convergence of agency and structure." *Journal of Health and Social Behavior, 46:*51-67.

Cunningham, P. J. 2006. "Medicaid/SCHIP cuts and hospital emergency department use". *Health Affairs 25*(1), 237-247.

Davis, S. D. and Ford, M. 2004. "A conceptual model of barriers to mental health services among African Americans." *African American Research Perspectives, 10,*44-54.

DeNavas-Watt, Carmen, Proctor, B.D., and Mills, R.J. 2004. "Income, Poverty and Health Insurance Coverage in the United States: 2003." *Current Population Reports, P60-226,* Washington, DC, U.S. Census Bureau.

Doty, M.M. 2003. "Hispanic patients double burden: Lack of health insurance and limited English." Retrieved August 18, 2006 (www.cmwf.org).

Farmer, M.M. and Ferraro, K.F. 2005. "Are racial disparities in health conditional on socioeconomic status?" *Social Science and Medicine* 60, 191-204.

Frayne, S. M., Halanych, J.H., Miller, D.R., Wang, F., Lin, H., Pogach, L., et al. 2005. "Disparities in diabetes care: impact of mental illness." *Archives of Internal Medicine* 165, 2631-2638.

Galbraith, Alison A., Wong, S.T., Kim, S.E., and Newacheck, P.W.. 2005. "Out-of-pocket financial burden for low-income families with children: socioeconomic disparities and effects of insurance." *Health Services Research, 40(6)*,1722-1737.

Gesler, W., Arcury, T.A., Presieer, J., Tervor, J., Sherman, J.E., and Spencer, J. 2001. "Access to care issues for health professionals in the mountain region of North Carolina." *International Quality of Community Health Education*, 20, 82-102.

Gill, J. M. and Mainous, A.G.. 1998. "The role of provider continuity in preventing hospitalizations." *Archives of Family Medicine* 7, 352-357.

Gill, J. M., Mainous, A.G., and Nsereko, M. 2000. "The effect of continuity of care on emergency department use." *Archives of Family Medicine* 9, 333-338.

Hayward, R., Bernard, A., Freeman, H., and Corey, C. 1991. "Regular source of ambulatory care and access to health services." *American Journal of Public Health* 81, 434.

Hayward, Mark, Crimmins, E., Miles, T., and Yang, Y. 2000. "Socioeconomic status nd the racial gap in chronic health conditions". *American Sociological Review 65*, 910-930.

Hjortdahl, P. and Laerum, E. 1992. "Continuity of care in general practice: effect on patient satisfaction." *British Medical Journal* 304(6837), 1287-1290.

House, James S., R. C. Kessler, R. Herzog, R. P. Mero, A. M. Kinney, and B. Breslow. 1990. "Age, socioeconomic status and health." *Milbank Quarterly, 68(3):* 383-411.

House, James S., Lantz, P.M., and Herd, P. 2005. "Continuity and change in the social stratification of aging and health over the life course: evidence from a nationally representative longitudinal study from 1986-2001/2002." *The Journal of Gerontology, Series B 60(5)*, 15-27.

House, James S., Lepkowski, J., Kinney, A.M., Mero, R.P., Kessler, R.C., and Herzog, A.R. 1994. "The social stratification of aging and health." *Journal of health and Social Behavior, 35*, 213-234.

House, James. S. and Williams, D.R. 2000. "Understanding and reducing socioeconomic and racial disparities in health." in *Promoting Health*, 81-124.

Jackson, Pamela Braboy. 2005. "Health inequalities among minority populations." *Journals of Gerontology: Series B, 60B (Special Issue 2)*, 63-67.

Kaiser Commission on Medicaid and the Uninsured. 2004. "Health insurance coverage in America: 2003 data update." Retrieved February 1, 2006 \(http://www.kaiseredu.org/).

Kaplan, G. A. and Lynch, J.W. 1999. "Socioeconomic considerations in the primordial prevention of cardiovascular disease." *Preventative Medicine, 26S*, 30-35.

Kitagawa, E.M., and Hauser, P.M. 1973. *Differential mortality in the United States: A study of socioeconomic epidemiology*. Cambridge, MA: Harvard University Press.

Konrad, T. R., Howard, D.L, Edwards, L.J., Ivanova, A., and Carey, T.S. 2005. "Physician-patient racial concordance, continuity of care, and patterns of care for hypertension." *American Journal of Public Health* 95(12), 2186-2190.

Krieger, Nancy and Fee, E. 1994. "Social class: the missing link in U.S. health data." *Journal of Health Services 24*, 25-44.

Lambrew, J. M., DeFriese, G.H., Carey, T. S., Ricketts, T.C., and Biddle, A.K. 1996. The effects of having a regular doctor on access to primary care." *Medical Care* 34(2), 138-151.

Lillie-Blanton, Marsha, Parsons, P.E., Gayle, H., and Dievler, A. 1996. "Racial differences in health: not just black and white, but shades of gray." *Annual Review of Public Health* 17, 411-448.

Link, Bruce G., Northridge, M.E., Phelan, J.C., and Ganz, M.L. 1998. "Social epidemiology and the fundamental cause concept: on the structuring of effective cancer screens by socioeconomic status." *Milbank Quarterly* 76, 375-402.

Link, Bruce G., and Phelan, J.C. 1995. "Social conditions as fundamental causes of disease." *Journal of Health and Social Behavior* Extra Issue, 80-94.

Link, Bruce G. and Phelan, J.C. 2005. "Fundamental sources of health inequalities." in *Policy Challenges in Modern Health Care* Rutgers University Press, Piscataway: NJ.

Lwebuga-Mukasa, Jamson. S., Oyana, T.J., and Johnson, C. 2005. "Local ecological factors, ultrafine particulate concentrations, and asthma prevalence rates in Buffalo, New York, neighborhoods". *Journal of Asthma 42(5)*, 337-348.

Lwebuga-Mukasa, Jamson. S., Oyana, T.J., and Wydro, P.M. 2004. "Risk factors for asthma prevalence and chronic respiratory illnesses among residents of different neighbourhoods in Buffalo, New York". *Journal of Epidemiology and Community Health 58*(11), 951-957.

Mainous, A. G. and Gill, J.M. 1998. "The importance of continuity of care in the likelihood of future hospitalization: is site of care equivalent to a primary clinician?" *American Journal of Public Health, 88(10)*, 1539-1541.

Marmot, Michael, Kogevinas, M. and Elston, M.A. 1987. "Social/economic status and disease.: *Annual Review of Public Health* 8, 111-135.

Marmot, Michael, M., Shipley, M.J., and Rose, G. 1984. "Inequalities in death- specific explanations of a general pattern?" *The Lancet, 1,* 1003-1006.

Marmot, Michael, Smith, D., Stansfeld, S., Patel, C., North, F., Head, J., White, I., Brunner, E., and Feeney, A. 1991. "Health inequalities among British civil servants: The Whitehall II Study." *The Lancet,* 337(8754), 1387-1393.

Phelan, Jo C., Link, B.G., Diez-Roux, A., KawachiI, I., and Levin, B. 2004. "Fundamental causes of social inequalities in mortality: a test of the theory." *Journal of Health and Social Behavior* 45(3), 265-285.

Raphael, Dennis. 2000. "Health inequalities in the United States: prospects and solutions." *Journal of Public Health Policy* 21(4), 394-427.

Ross, Catherine E. and Wu, C. 1995. "The links between education and health." *American Sociological Review* 60, 719-745.

Schnittker, Jason and McLeod, J.D. 2005. "The social psychology of health disparities." *Annual Review of Sociology* 31, 75-103.

Schultz, Amy J., Williams, D.R., Isreal, B.A., and Lempert, L.B. 2002. "Racial and spatial relations as fundamental determinants of health in Detroit." *The Milbank Quarterly* 80(4), 677-707.

Seils, Damon M. and Schulman, K.A. 2004. "Perceptions of racial and ethnic differences in access to healthcare." *North Carolina Medical Journal 65(6),* 350-352.

Shi, L. 1999. "Experience of primary care by racial and ethnic groups in the United States." *Medical Care* 37(10), 1068-1077.

Smedley, B.D., Stith, A.Y., Nelson, A.R., and eds. 2003. *Unequal treatment: Confronting racial and ethnic disparities in health care.* Washington, DC: National Academy of Press.

Sorlie, P.D., Backlund, E., and Keller, J.B. 1995. "US Mortality by economic, demographic, and social characteristics: the national longitudinal mortality study". *American Journal of Public Health 85*(7), 949-956.

Starfield, B. and Shi, L. 2004. "The medical home, access to care and insurance: a review of evidence." *Pediatrics, 113*,1493-1498.

Statistical Package for Social Sciences for Windows. Version 13.0 Chic

St. Peter, R.F., Newacheck, P.W., and Halfon, N. 1992. "Access to care for poor children: separate and unequal?" *Journal of the American Medical Association* 267(20), 2760-2764.

Steelfisher, G.K. 2004. "Addressing unequal treatment: disparities in health care." *Issue Brief Commonwealth Fund* (709), 1-9.

Sultz, Harry A. and Young, K.M. 2001. *Health Care USA Understanding the Organization and Delivery, 3rd ed*. Gaithersburg, MA

Sweeney, K.G. and Gray, D.P. 1995. "Patients who do not receive continuity of care from their general practitioner-are they a vulnerable group?" *British Journal General Practice* 45(392), 133-135.

United States Census Bureau. 2000. "American Factfinder". Retrieved November 25, 2005 (www.Census.gov).

United States Department of Health and Human Services. 1999. "Healthy people 2010." Retrieved February 19, 2006 (www.aspe.hhs.gov).

Viera, Anthony J., Pathman, D.E., and Garrett, J.M. 2006. "Adults' lack of a usual source of care: a matter of preference?" *Annals of Family Medicine, 4(4),* 359-365.

Weiss, L. J. and Blustein, J. 1996. "Faithful patients: the effect of long-term physician-patient relationships on the costs and use of health care by older Americans". *American Journal of Public Health 86(12),* 1742-7

Wilkinson, Robert G. 1992. "Income distribution and life expectancy." *British Medical Journal* 304, 165-168.

Williams, David R. 1990. "Socioeconomic differentials in health: a review and redirection." *Social Psychological Quarterly* 53, 81-99.

Williams, David R. 2005. Patterns and causes of disparities in health, Chapter 8 In: *Challenges in Modern Health Care,* Robert Wood Johnson Foundation. Retrieved February 10, 2007 (www.rwjf.org).

Williams, David R. and Collins, C. 1995. "US socioeconomic and racial differences in health: patterns and explanations." *Annual Review of Sociology* 21, 349-386.

Williams, David R. and Collins, C. 2001. "Racial residential segregation: A fundamental cause of racial disparities in health." *Public Health Reports, 116(5),* 404-416.

Wilson, Willian Julius. 1996. "When work disappears." *Political Science Quarterly,111(4),* 567-595.

Wong, M.D., Shapiro, M.F., Boscardin, W.J., and Ettner, S.L. 2002. "Contribution of major diseases to

disparities in mortality." *New England Journal of Medicine* 347(20), 1585-1592.

Xu, Tom K. 2002. "Usual source of care in preventative service use: a regular doctor verses a regular site." *Health Services Research 37(6),* 1509-1529.