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**A Quantitative Analysis of Racial/Ethnic Disparities in
Health Care Usage: The Roles of Perceptions of Care and
Expected Longevity**

A Dissertation Presented

by

Jeffrey Alfred Jones

to

The Graduate School
in Partial Fulfillment of the
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in

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Stony Brook University

The Graduate School

Jeffrey Alfred Jones

We, the dissertation committee for the above candidate for the
Doctor of Philosophy degree, hereby recommend
acceptance of this dissertation

John A. Rizzo, Ph.D - Dissertation Advisor

Professor

Joint Position with the Department of Economics and the Department of Preventive
Medicine
Stony Brook University

Debra Sabatini Dywer, Ph.D - Chairperson of Defense

Clinical Associate Professor

Department Chair

Department of Health Care Policy and Management
Stony Brook University

Mark R. Montgomery, Ph.D - Committee Member

Professor

Department of Economics
Stony Brook University

Josephine Connolly-Schoonen, Ph.D - Outside Committee Member

Clinical Assistant Professor

Department of Family Medicine
Stony Brook University

This dissertation is accepted by the Graduate School

Lawrence Martin
Dean of the Graduate School

Abstract of the Dissertation
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Countless studies have documented the existence of disparities by race and ethnicity in the health care system in the United States. However, not many have sought to explicitly quantify the relative importance of each of the proposed determining factors. This dissertation thus sought to identify the major causes of disparities in health care usage by employing an adaptation of the Blinder/Oaxaca decomposition method originally used in the literature on wage differentials.

Specifically, this study sought to investigate the roles that racial differences in patients' perceptions of care and expected longevity (as they relate to expected gains) might play in the observed disparities in usage. Perceptions of care measures (trust and fear/dislike) were used to investigate the importance of the doctor-patient relationship in determining usage disparities through its effect on expected gains. Expected longevity was used as the length of time that someone expects to live would affect how willing they are to invest in anything with payoffs derived in the future. Thus, if expected net payoffs/gains of utilizing health care are positive, the individual would use care.

Results show that while expected longevity was found to positively affect whether or not someone utilizes care, it was not a contributing factor to the racial divide in usage. However, when exploring the role of perceptions of care, while the differences in utilization rates between whites and minorities were due mainly to unobserved factors peculiar to each racial/ethnic group, perceptions of care disparities also played a major role in addition to socioeconomic and access factors. These results, while encouraging the need for further analysis into what drives usage disparities by race, point out that the doctor-patient relationship (apart from SES and access issues) should also be considered as a possible contributor to racial/ethnic disparities in usage.

Table of Contents

List of Tables	vi
Acknowledgments	vii
1 Introduction	1
1.1 Motivation	1
1.2 A Survey of the Relevant Literatures	3
1.2.1 Racial/Ethnic Disparities in Health Care Usage	3
1.2.2 Racial/Ethnic Disparities in Patients' Perceptions of Care	7
1.3 Contribution Overview	11
2 Racial/Ethnic Disparities in Health Care Usage: The Role of Perceptions of Care	12
2.1 Introduction & Motivation	12
2.2 Data & Methods	13
2.2.1 Data	13
2.2.2 Methods	14
2.3 Results	17
2.3.1 Summary Statistics	17
2.3.2 Testing for the Effect of Patients' Perceptions of Care	19
2.3.3 Quantifying the Importance of Patients' Perceptions of Care	19
2.4 Discussion	31
3 Racial/Ethnic Disparities in Health Care Usage: The Role of Expected Longevity	33
3.1 Introduction & Motivation	33
3.2 Data & Methods	35
3.2.1 Data	35
3.2.2 Methods	36
3.3 Results	37
3.4 Discussion	46
4 Conclusion	48

List of Tables

2.1	Summary Statistics: Perceptions of Care Analysis	20
2.2	Summary Statistics by Race: Perceptions of Care Analysis	21
2.3	Logit Regression Analysis of <i>Doctor Visits</i>	23
2.4	Logit Regression Analysis of <i>Doctor Visits</i> for Whites	24
2.5	Logit Regression Analysis of <i>Doctor Visits</i> for Blacks	25
2.6	Logit Regression Analysis of <i>Doctor Visits</i> for Hispanics	26
2.7	Logit Regression Analysis of <i>Doctor Visits</i> for <i>Others</i>	27
2.8	Decomposition of the White/Black Disparities in <i>Doctor Visits</i>	28
2.9	Decomposition of the White/Hispanic Disparities in <i>Doctor Visits</i>	29
2.10	Decomposition of the White/ <i>Other</i> Disparities in <i>Doctor Visits</i>	30
3.1	Summary Statistics of Expected Longevity Analysis: Key Dependent, SES & Access Variables	38
3.2	Summary Statistics of Expected Longevity Analysis: Health Indicators	39
3.3	Summary Statistics by Race of Expected Longevity Analysis: Key Dependent, SES & Access Variables	39
3.4	Summary Statistics by Race of Expected Longevity Analysis: Health Indicators	40
3.5	Logit Regression Analysis of <i>Breast Self Exam</i> : Key SES & Access Variables	41
3.6	Logit Regression Analysis of <i>Mammogram</i> : Key SES & Access Variables	42
3.7	Logit Regression Analysis of <i>Pap Smear</i> : Key SES & Access Variables	43
3.8	Logit Regression Analysis of <i>All Three Procedures</i> : Key SES & Access Variables	44
3.9	Logit Regression Analysis of <i>Expected Longevity</i>	45

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Chapter 1

Introduction

1.1 Motivation

According to the 2002 report of the Institute of Medicine (IOM) entitled *Unequal Treatment: Confronting Racial and Ethnic Disparities in Health Care*, a health care disparity exists when membership in a social group (e.g. race/ethnicity) is linked to health care treatment or outcomes in a way that is unwarranted by the fundamental need of the patient [43]. Racial disparities in health care usage have been documented across disciplines. Although some of these differences can be attributed to lower socio-economic status (SES) and health insurance coverage rates among minority ethnic groups, they persist in favor of non-Hispanic whites (NHWs) even after controlling for these factors [23]. Albeit numerous studies have discussed possible driving forces behind the differing patterns of health care usage among these groups, not many have attempted to explicitly quantify these differences. This dissertation seeks to do this with the aim of identifying the major causes of disparities in health care utilization by race/ethnicity.

The literature on racial disparities has also investigated variations in patients' perceptions of care across racial/ethnic groups. Using measures of perception such as satisfaction with and trust in physician/health care providers, a majority of studies find that minorities in comparison to whites trust less and are less satisfied with the health care they receive [33]. It can be argued that a patient's perception of the health care they receive is directly related to their expected benefits of care which, following basic economic theory would influence the patient's decision to utilize care. To date, few economic studies have investigated this possible link between perceptions of care and health care usage. This is cogent in light of the societal push to reduce usage disparities; as information on the *relative* importance of the determining factors would aid in identifying more effective rectification policies. The main chapter (chapter 2) of this dissertation thus seeks to quantify the relative importance of perceptions of care as a predictor of differences in health care usage by race/ethnicity.

There also exists a literature on the importance of expected longevity (as a measure of health stock) in determining the demand for health services (health care usage). The liter-

ature is largely theoretical however, and provides varied arguments for a direct relationship between expected longevity and the demand for health care. For example, Ehrlich & Chuma (1990) and Becker & Mulligan (1997) both argue that higher life expectancy would imply that potential payoffs from health investments (like preventive care) are higher. Thus, someone with a relatively higher expected longevity would be more likely to use preventive health care than someone with a relatively lower expected longevity [22, 7]. Chapter 3 of this dissertation will therefore investigate whether or not there exists differences in expected longevity across races that might be driving differences in usage across races.

The remainder of this chapter however, will provide a context for my research by surveying the relevant literatures. These literatures include studies done on racial/ethnic disparities in health care usage and patients' perceptions of care. The chapter then concludes with an overview of the contribution of my research to the current literature.

1.2 A Survey of the Relevant Literatures

1.2.1 Racial/Ethnic Disparities in Health Care Usage

Modeling The Determinants of Health Care Usage

Most of the empirical work done on usage disparities employs the social-psychology conceptual framework of the Andersen Behavioural Model (ABM) of Health Care Utilization [3]. The model posits that an individual's use of health services is a function of three characteristics: predisposing, enabling and need factors. Predisposing factors are characteristics of an individual that exist before sickness and include the following three dimensions: demographic characteristics such as age, gender, marital status; social structure characteristics such as education, race/ethnicity and occupation; and health beliefs such as personal attitudes regarding medical care, medical professions, and illness. Enabling factors are community and individual means that aid in the person's use of health services and include regular source of care, income, and health insurance. Need factors represent either a subjective acknowledgment of need (e.g., patient's symptoms) or an objective professional recognition of need for services (e.g., disease severity).

To date, few health economists have sought to place health care utilization disparities in the context of an economic model. Ana Balsa and Thomas McGuire however, are among the few who have attempted to fill this dearth in the health economics literature. In their 2001 paper they purport that statistical discrimination may play a role in the treatment disparities observed across races [5]. Statistical discrimination refers to how an agent (an employer, a doctor), without intending to discriminate, might apply an otherwise reasonable decision making rule (pay according to productivity, treat according to need), that in practice leads to unequal treatment of members of two ethnic groups. The authors suggest that as physicians might have a harder time understanding a symptom report from minority patients, they are relatively more likely to mismatch treatment to need. Though the focus of the paper was on explaining treatment disparities, the authors suggest that minority patients would consequently anticipate relatively less benefits from treatments and thus rationally demand less care.

In their 2003 follow up paper Balsa et al. additionally suggest that physicians' stereotypes about patients may play a role in the observed disparities in treatment [6]. Stereotyping is a term used by social psychologists to refer to "the process by which people use social categories (e.g. race, gender) in acquiring, processing, and recalling information about others" (Dovidio, 1999, p. 804)[20]. The authors assume that physicians hold the negative stereotype about black/minority patients that says: "Blacks can't be relied upon to comply with treatment recommendations". Given that doctors observe severity accurately and they value the net benefit of treatment the same for both groups, the benefit of treatment depends on the doctor's effort level and the patient's compliance with recommendations. If doctors think that minorities are relatively less likely to comply with treatment, they may exert relatively less effort (leading to treatment disparities). Thus perceiving the consequent lower benefits

of care, minorities may be relatively less compliant (less likely to use care) than their white counterparts.

The previous paragraphs provide background on the conceptual frameworks that form the rationale for the empirical models used to explain usage disparities by race in this research. The proceeding paragraphs will highlight and comment on some of the recent empirical studies done on racial/ethnic disparities in usage.

Empirical Studies on Racial/Ethnic Disparities in Health Care Usage

Some of the literature has used medicare claims data to study usage disparities. The benefits of this data are two-fold; in the analysis, access to care factors would be homogeneous across races, and information on the health care system needs of a vulnerable part of the population (older individuals) would be provided. Gornick et al. (1996) link 1990 census data on median income according to zip code with 1993 medicare data for 26.3 million beneficiaries age 65+ to study the effects of race and income on mortality and use of services. Using age-and-sex-adjusted rates of various diagnoses and procedures according to race and income to compute black:whites ratios, the authors find that race and income have substantial effects on use of services among medicare beneficiaries with outcomes favoring whites over blacks [30]. Although the authors are able to adjust for the availability of services, this type of analysis lacks the ability to control for differences in beliefs or perceptions/attitudes about care (willingness to use services) across races that may drive differences in usage.

Subsequently, Escarce & McGuire (2004) use 1997 Medicare data to replicate an earlier study that used 1986 data to examine racial differences in usage of specific medical procedures/tests among elderly persons. Studying 30 procedures/tests that were previously analyzed using the 1986 data, along with several new ones more widely used in the early 1990s, they find that racial differences remain in the age and gender-adjusted rates of use. Specifically, blacks have lower rates of use than whites although the white-black gap in use under Medicare appears to be narrowing [23]¹. While this study suggests that racial disparities in usage seem to persist over time, it suffers from the same drawbacks as the aforementioned paper.

Also, in the research on racial disparities among older adults is a study by Dunlop et al. (2002)[21]. The authors use data from the 1993-1995 study on the Asset of Health Dynamics Among the Oldest Old (AHEAD), to investigate differences in the 2-year use of health services by gender and among non-Hispanic White versus minority (Hispanic and African American) ethnic/racial groups. Logistic regression analyses are carried out accounting for predisposing factors², health needs, and economic access³. Their results imply that significant ethnic disparities in use of medical services covered by Medicare cannot be accounted for by economic access among older adults with similar levels of health needs. They thus

¹The authors concede that their analysis cannot identify the reason for the narrowing but offer suggestions as to why.

²These include race, age, gender, and marital status.

³These include education, income, wealth, and health insurance.

purport that to explain the apparent ethnic disparities in usage, other cultural and attitudinal factors merit investigation.

A number of studies have looked at the usage disparities present in a particular market of health care. For example, Gilbert et al. (2002) use the Florida Dental Care Study to test whether non-Hispanic African Americans (AAs) and non-Hispanic whites (NHWs) differ in their responsiveness to new dental symptoms by seeking dental care, and in certain predictors of dental care utilization [29]. They find that racial differences in responsiveness to new dental symptoms by seeking dental care, and in other predictors of dental care utilization exist in favor of NHWs. However, using the ABM⁴, Doty et al. (2003) examine whether adult preventive dental care usage differs across race/ethnicity. Logistic regression results find that race effects dissipate once *enabling factors* (income level, insurance, census region etc.) are controlled for in addition to *predisposing factors* such as gender, age, education and health status [19]. Therefore, access and ability to pay issues may be driving disparities in preventive dental care usage.

Focusing his study on the market for child mental health, Zimmerman (2005) tests the role played by social factors (race, education, income etc.) in child mental health services use [46]. Using the National Longitudinal Survey of Youth (NLSY) Child Youth/Adult Supplement, indicators of mental health service use are regressed on social/economic determinants, family structure variables, and insurance variables controlling for need of care. The study finds that while African Americans and Latinos are less likely than white children to receive treatment, economic (maternal education, income) and insurance variables seem to hold little predictive power. The seemingly insignificant effect of the insurance variables may be due to low variation in health insurance coverage as this market historically has had lower insurance coverage. Albeit the results of these three studies support the presence of disparities, they cannot be generalized as they pertain to two specific markets (dental and mental health).

There also exists a literature on racial disparities in cancer screening procedures. Cooper et al. (2003) investigate whether there are racial differences in the use of and indications for colorectal procedures in Medicare beneficiaries. Using Outpatient and Physician-Supplier claims for all medicare beneficiaries age 65 years and older in 1999, indications for fecal occult blood testing (FOBT), sigmoidoscopy, colonoscopy, and barium enema are divided into diagnostic, surveillance, or screening categories. The authors then calculate annualized rates based on the number of eligible fee-for-services months. Results show that racial disparities exist not only in the use of colorectal procedures but also in the indications for such testing, with African Americans less likely than caucasians to undergo screening tests [17].

Bynum et al. (2005) determine how screening mammography varies by age and race when adjusted for propensity to die [11]. In a retrospective cohort study, the authors determine the rates of screening mammogram performed in 2000-2001 based on claims, adjusted for propensity to die in 2000, for a nationally representative 5% random sample of female fee-for-service Medicare beneficiaries 65 years and older. They find that white women are

⁴The Andersen Behavioral Model (ABM) of Health Care Usage is a staple in the usage disparity literature [3].

more likely to be screened than women of other races. However, in a policy brief on cancer screening in California using CHIS⁵ 2001 data, Babey et al. (2003) report that white women had higher rates of screening than all other races with the exception of their African-American counterparts [4]. Yet, for the most part the differences in cancer screening favor whites over minorities.

In 2005, Blanchard et al. evaluate rates of preventive care among African-Americans in specific demographic categories such as age, income, gender and Caribbean decent [8]. Using data from the Commonwealth Fund 2001 Health Care Quality Survey, their analysis focuses on a subset of Blacks in comparison to Whites and Hispanics. The outcome variables; rates of primary care visits, cholesterol and blood pressure screening, diabetes care and cancer screening of Blacks are comparable to Whites with Blacks having higher rates for some services. In general though, Blacks had higher rates of usage than did Hispanics.

In another study Fiscella et al. (2007) examine the hypothesis that fewer primary care visits by minority patients contribute to the observed disparities in preventive care usage [27]. They analyse claims from Medicare beneficiaries 65 and older who participated in the Medicare Current Beneficiary Survey from 1998 to 2002. Using outcomes such as: colorectal cancer screening, influenza vaccination, lipid screening, mammography and pap smear screening in separate multivariate analyses, they find that minority status was significantly associated with only colorectal screening, after controlling for the number of primary care visits. Thus, the differences across race/ethnicity in primary care visits would seem to play a role in the differences in most of the other preventive care usage outcomes investigated.

Researchers have also observed racial/ethnic differences in the use of the influenza vaccination as a preventive care service. Schneider et al. (2001) determine whether the magnitude of the racial disparity in influenza vaccination is smaller among managed care enrollees than among those with fee-for service insurance [42]. Using the 1996 Medicare Current Beneficiary Survey, the authors compare the percentages of African-American and White respondents (adjusted for sociodemographic characteristics, clinical comorbid conditions, and care-seeking attitudes) who were vaccinated. Although managed care is associated with higher rates of vaccination for both whites and African-Americans, disparities still exist among those in managed care plans. Thus, disparities persist across health insurance plans.

A related study done by Chen et al. (2005) investigates the scope of racial/ethnic disparities in the use of preventive services in the elderly, and the impact of health insurance type on use [15]. Employing the California Health Interview Survey (CHIS 2001), the authors use bivariate and multivariate logistic regression models to find that African-Americans and Latinos are significantly less likely to be vaccinated for influenza compared to whites. Asian Americans also are significantly less likely to obtain a mammogram compared to whites. Moreover, those with Medicare plus Medicaid coverage are significantly less likely to use all four preventive services compared to those with Medicare plus private supplemental insurance. Hence, despite near-universal coverage by Medicare, racial/ethnic disparities in the use of some preventive services among the elderly persist. The authors thus suggest that further

⁵CHIS is the California Health Interview Survey. It is the largest state-level health survey in the nation.

research should focus on identifying potential cultural and structural barriers to receipt of preventive services aimed at designing effective intervention among high-risk groups.

The previous paragraphs have provided a snapshot of the plethora of studies done on usage disparities by race/ethnicity. On the whole disparities persist in favor of whites across different usage measures and even across racial/ethnic groups with similar access to health care. Some of the studies mentioned have suggested that one reason for the persistence even after controlling for access might be racial differences in cultural norms, beliefs and or perceptions of health care. Thus exploring the possible causal link between disparities in perceptions of care and disparities in usage is the main goal of this dissertation. Yet before we embark on that investigation, it is prudent to first justify its validity by next providing a review of some of the equally voluminous literature on racial/ethnic differences in patients' perceptions of care.

1.2.2 Racial/Ethnic Disparities in Patients' Perceptions of Care

Apart from the literature on racial disparities in health care utilization exists related studies on racial variation in patients' perceptions of care. The main measures used to indicate perceptions of care are ratings of patients' trust in and satisfaction with their doctor/provider. A related literature has sought to ascertain the causes whether historical or current of medical mistrust itself. This section will survey first some of the literature describing disparities in perceptions of care across racial/ethnic groups in general and then discuss some findings of research done specifically into the origins of medical mistrust among African-Americans.

Empirical Studies on Racial/Ethnic Disparities in Patients' Perceptions of Care

A paper by Doescher et al. (2000) assesses whether a person's race or ethnicity is associated with low trust in the physician [18]. Data are obtained from the 1996-1997 Community Tracking Study (CTS) using adults who identified a physician as their regular provider and had at least 1 physician visit in the preceding 12 months. The outcome variables included patients' ratings of their satisfaction with the style of their physician and their trust in physicians. After adjustment for socioeconomic and other factors using multivariate analysis, the study finds that minority group members reported less positive perceptions of physicians than whites.

A study by LaVeist et al. (2000) investigates determinants of satisfaction with medical care among 1,784 (781 African American and 1,003 white) cardiac patients using the Cardiac Access Longitudinal (CAL) Study [36]. They conceptually model patient satisfaction (similar to the ABM) as a function of *predisposing factors* (gender, age, medical mistrust, and perception of racism) and *enabling factors* (medical insurance). Their results show that African Americans report less satisfaction with care and are more likely to mistrust, and to perceive racism. Multivariate analysis finds that the perception of racism and mistrust of the medical care system led to less satisfaction with care. Additionally when the researchers control for

perceived racism and medical mistrust, race is no longer a significant predictor of satisfaction. This would suggest that higher levels of perceived racism and medical mistrust among African-Americans compared to Caucasians are driving the observed racial differences in satisfaction between the two groups.

Hunt et al. (2005) studies whether racial and ethnic differences in the distribution of individuals across types of health plans explain differences in satisfaction and trust with their physicians [33]. The authors wondered whether *directly* controlling for the restrictiveness of health plans (indemnity, PPO etc.) would alleviate the race effect in perceptions of care. Data is derived from the 1998-1999 CTS consisting of a nationwide sample of adults (18 years and older). Regression analyses are used to detect independent effects of respondent race and ethnicity on satisfaction and trust with physician, while controlling for enrollment in different types of health plans. Augmenting the framework used in LaVeist et. al (2000) to also control for need (health status) and medical care factors⁶, results indicate that racial and ethnic minorities are more likely than whites to have lower levels of trust and satisfaction with their physician. This suggests that racial disparities in perceptions of care seem to exist even within health plans.

Weech-Maldonado et al. (2003) also provide support to the above finding by examining whether consumer reports and ratings of care in Medicaid managed care vary by race/ethnicity and language [44]. National Benchmarking Database data (adults enrolled in Medicaid managed care plans) are analyzed using linear regression models with dependent variables: global rating items⁷ and multi-item reports of care⁸. Using race/ethnicity, language spoken at home (English, Spanish, Other), and survey language (English or Spanish) as independent variables along with other covariates such as gender, age, education, and self-rated health, the authors observe that racial/ethnic and linguistic minorities tend to report worse care than whites. Furthermore, linguistic minorities reported worse care than did racial and ethnic minorities. This suggests that language barriers (as a proxy for communication problems/difficulties) between doctors and patients may also play a role (independent of the race effect), in the disparities in patients' perceptions.

Some of the literature on perceptions of care looks also at the effect of doctor-patient racial concordance on patients' satisfaction with health services. For example, Saha et al. (1999) use data from the 1994 Commonwealth Fund's Minority Health Survey (CFMHS) to examine this possible link between patient-physician racial concordance and patients' ratings of their physicians and satisfaction with health care [40]. Using bivariate and logistic regression analyses, they find that black respondents with black physicians are more likely than those with non-black physicians to rate their physicians as excellent during the previous year. These results may be in large due to selection into match quality; where patients who are able to choose their physicians would tend to be more satisfied with care regardless of their race.

⁶These factors include unmet need, usual source of care and utilization measures.

⁷These include ratings of personal doctors, specialists, health care and health plan.

⁸These include reports on getting needed care, timeliness of care, provider communication, staff helpfulness and the plan service.

Indeed, Saha et al. (2000) offers support to this by finding that, using the same data, black and Hispanic Americans sought care from physicians of their own race because of personal preference and language, and not solely because of geographic accessibility [41].

Subsequently, LaVeist et al. (2002) examines the same 1994 CFMHS sample of African American, white, Hispanic, and Asian American respondents to test the hypothesis that doctor-patient race concordance is predictive of patient satisfaction [37]. This analysis instead examines racial/ethnic differences in patient satisfaction among patients in multiple combinations of doctor-patient race/ethnicity pairs. Multivariate models find that for respondents in each race/ethnic group, patients who have a *choice* in the *selection* of their physician are more likely to be race concordant. Furthermore, whites are more likely to be race concordant and among each race/ethnic group, respondents who are race concordant report greater satisfaction⁹. These results would thus seem to confirm our suspicions about selection into match quality.

The Origins of Negative Perceptions of Care Among Minorities: Medical Mistrust

The previous subsection describes some of the voluminous empirical literature on racial disparities in patients' perceptions of care. Overwhelmingly, the majority of the studies mentioned find that minorities tend to have a more negative perception of the health care they receive, than their white counterparts. Thus, tangential to the studies done on disparities in perceptions by race are studies done on identifying the possible reasons for less favorable perceptions among minorities. Although most of these studies have focused specifically on the evolution of mistrust of the health care system by African-Americans (AAs), it can be argued that other racial/ethnic minority groups, might have similar reasons for their relatively negative outlook on health care as compared to whites.

Before discussing the possible determinants of medical mistrust among African-Americans, it is prudent to describe how mistrust is measured. LaVeist et al. (2000), measures medical mistrust through a Medical Mistrust Index (MMI) by asking patients to react to five statements regarding mistrust of the health care system on a 4-point scale (*strongly disagree, disagree, agree, or strongly agree*) [36]. The five statements are:

- Patients have sometimes been deceived or misled at hospitals.
- Hospitals often want to know more about your personal affairs or business than they really need to know.
- Hospitals have sometimes done harmful experiments on patients without their knowledge.
- Rich patients receive better care at hospitals than poor patients do.
- Male patients receive better care at hospitals than female patients do.

⁹Not all such studies yield these qualitative results. See Chen et al. (2001)[16]

When the responses to these statements for a group of black and white cardiac patients were analysed, the authors find that AAs were significantly more likely to mistrust than whites.

Researchers have generally linked African-Americans' mistrust of health care organizations to incidents of medical malice that date back to slavery, and yet include more modern day health care environments [12, 13, 26, 28]. Perhaps the most frequently attributed source of medical mistrust for African-Americans is the Tuskegee Study of Untreated Syphilis in the Negro Male (TSUS)¹⁰, which occurred between 1932 and 1972. However, Gamble (1997) points out that to argue that the TSUS is the most important reason why many AAs distrust the institutions of medicine and public health, would be to neglect that mistrust preceded public revelations about the Tuskegee study [28]. The author suggests that the use of slaves as test subjects in horrendous medical experiments, beliefs propagated even after the civil war that African-Americans continued to be experimented on, and fears of biological genocide (e.g. from AIDS) currently present in African-American communities could all play a role apart from TSUS.

Consequently, Brandon et al. (2005) examine race differences in knowledge of the TSUS and the relationship between knowledge of the study and medical system mistrust [10]. Conducting a telephone survey of AA and white adults 18-93 years of age in Baltimore, MD, the authors ascertained responses to questions about mistrust of medical care, including a series of questions regarding the TSUS. Regression analyses show no differences by race in knowledge of or about the Tuskegee study and that knowledge of the study was not a predictor of trust of medical care. However, the authors did find significant race differences in medical care mistrust when using the MMI described earlier. Their findings would seem to cast doubt on the proposition that the widely documented race difference in mistrust of medical care results from the Tuskegee study. However, a subsequent editorial by White (2005) points out errors in the authors' analyses and urges caution with regard to any change in research direction or policy debate based on the results reported in the article [45].

A recent study by Hammond (2010) proposes and tests a conceptual model of medical mistrust in a sample of African American men [32]. The psychosocial correlates of the model include background factors¹¹, identity/socialization factors¹², recent health care experiences¹³, recent socioenvironmental experiences¹⁴, and health care system outcome expectations¹⁵. Hierarchical regression analyses designed to assess both direct and mediated relationships suggest that perceived racism in health care is the most powerful predictor of medical mistrust even after controlling for other factors. Age, masculine role identity, recent patient-physician interaction quality, and discrimination experiences are also found to directly affect mistrust. Notably, perceived racism in health care is also found to have effected

¹⁰This study involved 399 Black men from Macon County, Alabama who were deliberately denied effective treatment for syphilis in order to document the natural history of the disease [34].

¹¹These include age, personality, level of education and health status.

¹²i.e., masculine role identity and health care system socialization.

¹³e.g. the quality of recent patient-physician interactions.

¹⁴e.g. racial discrimination experiences.

¹⁵i.e., perceived racism in health care.

the relationship between discrimination experiences and medical mistrust. The authors' findings suggest that African American men's mistrust of health care organizations is related to personal characteristics, previous negative social/healthcare experiences, and expectations of disparate treatment on the basis of race.

This section provided a brief overview of a small portion of the literature on racial/disparities in patients' perceptions of care. By and large empirical studies show that racial/ethnic minorities have a more negative perception of their doctors than do whites. This qualitative similarity between disparities in usage and disparities in perceptions of care begs the question of whether or not differences in perceptions of care (through their affect on expected benefits of care) could be partly responsible for the apparent differences in usage across racial/ethnic groups. Addressing this question forms the heart of this dissertation. while furthermore describing the role of perceptions of care in health care usage disparities. The next section thus provides an overview of the goals of this research.

1.3 Contribution Overview

Hence, while the existing literature supports that there are racial/ethnic disparities in health care usage, substantial effort to describe in more detail the relative importance of each of the proposed causes is yet to be made. As is such, the goal of this dissertation is to provide a genesis for ascertaining the main driving forces of the differences in health care utilization between whites and minority ethnic groups. The results of such analyses could prove useful in helping health care policy makers better direct resources to abating disparities in usage with a view of improving health care for everyone.

First, chapter 2 investigates the role that racial disparities in patients' perceptions of care plays in the racial/ethnic divide in health care usage. So far disparities in usage and disparities in patients' perceptions of care have been treated as though they are mutually exclusive. However, as a patients' perception of the health care they receive (trust, satisfaction) contributes to their expected gains from health care, patients' perceptions might govern usage behavior. I seek to identify the extent of this governance in relation to the other factors such as access and ability to pay, with the hope of further illuminating the part that the doctor-patient relationship plays in racial/ethnic disparities in health care utilization. Furthermore, in the third chapter I propose that racial differences in patients' expected longevity (as it relates to expected future payoffs) might play a role in the observed disparities in usage across race. Chapter 4 then provides a conclusion to the dissertation.

Chapter 2

Racial/Ethnic Disparities in Health Care Usage: The Role of Perceptions of Care

2.1 Introduction & Motivation

In making any decision an economic agent considers the expected benefits/gains from a particular choice. A patient's perception of the health care they receive is related to their expected benefits of care, as someone with a relatively poor perception is likely to have a relatively low expected gains from usage. Thus a patient's perception of health care could influence the patient's decision to utilize care. To date few health economists have explored the possible link between disparate patterns in perceptions of care by race and the observed racial differences in usage. Highlighting the importance of patients' perceptions of care would bring to light the role that the doctor-patient relationship plays in usage disparities. Furthermore, reducing disparities in usage would have implications for aiding the reduction of current disparities in health with an aim to improve health care for everyone.

This chapter thus explores the link between racial differences in patients' perceptions of care and such differences in health care use. Specifically, to ascertain the relative importance of racial differences in perceptions of care as a predictor of racial disparities in health care utilization, I explicitly quantify racial/ethnic differences in health care utilization by using an adaptation of the Blinder-Oaxaca decomposition methods first used in the Labor Economics literature on gender and race wage differentials [9, 38]. Their methods separate the determinants of the difference in an outcome variable between two groups into a part explained by observable characteristics, and one due to differences in the estimated coefficients. I use this descriptive measure to better identify the relative importance of perceptions of care and various other predictors of disparities in health care usage. This chapter proceeds as follows. The next section discusses the data used and methods employed in the study. The third section presents the results of the study, while the last section offers a discussion of the results.

2.2 Data & Methods

2.2.1 Data

The data used in this analysis comes from the household component of the Community Tracking Study (CTS) 2003 [1]. This nationally representative survey tracks changes in health care access, utilization, coverage, costs, and other experiences with the health care system. The Center for Studying Health System Change has conducted such studies since 1996. The sub sample used consists of 38793 individuals 18 years and older chosen at random from 60 sites across the USA. Of these about 90% reported having a usual source of care (i.e. a place that they would go to when sick or needing advice about their health). It is this 90% portion of the sample that is used in the analysis.

The outcome variable of health care utilization is a 0/1 binary variable constructed from a question that asked how many times an individual went to the doctor in the past 12 months. The constructed variable *Doctor Visit* has a value of one if a person went to the doctor at least once and zero otherwise¹. The key explanatory variables include *race*: broken down into three 0/1 indicator variables for black, Hispanic and other² (white being the reference group), *trust* and *fear/dislike*: the measures of patients' perceptions of care. The variable *Trust* was determined as the average of the 5-point Likert scale responses to the following four questions regarding the doctor that the person usually goes to see:

- I think my doctor may not refer me to a specialist when needed.
- I trust my doctor to put my medical needs above all other considerations when treating my medical problems.
- I think my doctor is strongly influenced by health insurance company rules when making decisions about my medical care.
- I sometimes think that my doctor performs unnecessary tests or procedures.

Fear/Dislike is a 0/1 variable constructed from the Likert scale responses to the question: "You will do just about anything to avoid going to the doctor. Is that? (1) definitely true, (2) mostly true, (3) mostly false, (4) definitely false." Individuals that indicated 2 and below were seen as fearful of or averse to going to the doctor (i.e. *fear/dislike* had the value of one for them). Following the (ABM) framework³, the other explanatory variables include *predisposing factors* such as age (indicators for 18-34, 35-64, 65-79 years old), gender (0/1 if female), *need factors* such as *subjective* health (poor, fair, good, very good, excellent health

¹In analyses not presented here, number of doctor visits in the past year was also used as a health care utilization outcome variable. Results were mostly qualitatively similar to that of the binary variable model and are available upon request.

²This includes Native Americans, Asians etc.

³See Andersen (1995)[3].

being the reference group) and *enabling factors* such as family income, poverty level⁴, health insurance⁵ and education⁶.

Priors are that minorities are less likely to go to the doctor than whites even after controlling for these various factors. In regards to trust, those more trusting of their doctor would be more inclined to visit them. On the other hand, someone who has a strong fear/dislike for their doctor is less likely to go. This thinking follows from a model proposed by Balsa et al. (2001,2003)[5, 6], where an individual is more likely to go to the doctor if their expected net gains is non-negative. In regards to the other *predisposing factors*, younger individuals are less likely to go to the doctor being in relatively better health, while being female is expected to positively affect the person's probability of having a visit.

Individuals in poorer health are more likely to see a doctor, given their higher health need. Family income as an *enabling factor* is expected to positively affect usage rates as higher income individuals would be better able to afford the expense of usage, *ceteris paribus*. Poorer individuals (more poverty stricken), on the other hand would be less able (likely) to use. With respect to health insurance, we would expect that those covered under any insurance would be more likely to use than the uninsured because of the relatively lower cost incurred and higher access afforded. Particularly, we would expect that the privately insured (in reference to the uninsured) might be more likely to use than the publicly insured because of the relatively better quality of coverage.

2.2.2 Methods

This study seeks to identify the role of patients' perceptions of care in racial/ethnic disparities in health care use. To achieve this goal, two empirical questions are addressed: (1) Does a race effect still persist after controlling for patients' perceptions of care in addition to the other predisposing, enabling and need factors? (2) What proportion of the racial disparities in usage is as a result of racial variation in patients' perceptions of care? The first question is answered using simple logit regression analysis, while the second involves more complicated measures as discussed below.

Testing for the Effect of Patients' Perceptions of Care

In order to first establish that disparities in health care usage exist in the data, a simple logit regression of health care usage on it's proposed determinants is carried out; including the race dummies (black, Hispanic, other with white being the reference group), while excluding the controls for perceptions of care (*Model 1*). A separate regression is then run now including the

⁴This consists of four indicators ranging from those whose income is less than 100% of the Federal Poverty Line (*FPL*) to those whose income is 300-399% of the *FPL*.

⁵This includes indicators of those with medicaid, medicare, medicare and other public care, other public care and private insurance.

⁶Education indicators were for those with less than high school, some college and college & more.

measures of perceptions of care (trust and fear)—*Model 2*. The equations for these regressions are shown below:

$$hcu_i = \alpha R_i + X_i\theta + \mu_i \quad (2.1)$$

$$hcu_i = \alpha R_i + \beta T_i + \gamma F_i + X_i\theta + \mu_i \quad (2.2)$$

where R_i is the race indicator, T_i is the trust measure, F_i is the indicator of fear/dislike, X_i is a matrix of the other explanatory variables mentioned before and μ_i is the disturbance term.

In cross sectional data analysis such as this, there is always the concern of endogeneity bias when relating the key explanatory variables (measures of perceptions of care) to usage (doctor visits). Specifically, in the case of the trust variable there is potential for reverse causality as the questions are directed to those who either have a regular doctor or have gone to their doctor in the past year. Thus the coefficient on trust may be biased upwards as having gone to the doctor influences someone's trust score in light of the questions answered to obtain the score as mentioned earlier.

Ideally, to mitigate this problem we would use a lagged trust/perceptions of care variable. However, as this is not available in this cross-sectional dataset, to address this issue I focus my analysis on those that have a regular doctor (usual source of care) that they go to. The idea is that for these individuals (as opposed to first time users/those without a usual source of care), the trust/perception of care measure is more a stock (built up over previous experiences) as opposed to a flow (being determined by contemporaneous experiences) variable. Thus, although there is some affect of current visit experiences on current perceptions, past visit experiences may hold more weight for these individuals. The results of this analysis are presented in the next section⁷.

Quantifying the Importance of Patients' Perceptions of Care

Addressing the second empirical question entails identifying the relative importance of the factors contributing to racial/ethnic differences in health care utilization. This is achieved by using an adaptation of the Blinder-Oaxaca decomposition methods first introduced by Blinder and Oaxaca into the Labor Economics literature on gender and race wage differentials [9, 38]. These methods allowed the authors to separate the determinants of the difference in an outcome variable between two groups into a part explained by observable characteristics, and one due to differences in the estimated coefficients (unobservables). In the literature, the differences due to unobserved characteristics are regarded as resulting from *discrimination* (race or gender). In this analysis, racial/ethnic disparities in health care utilization are hypothesized to result from observable factors such as varying socioeconomic status (e.g. education, income, access to care etc.), as well as unobservable group specific characteristics

⁷To establish that racial disparities in perceptions of care exist in the data, regressions of trust and fear were run with race being the key explanatory variable. In results not shown here minorities trusted less and feared/disliked more than whites with the exception of blacks who feared/disliked less than whites. For bivariate analysis that supports this see Table 2.2 in the Results section below.

(e.g. cultural norms/beliefs about health care usage) that may have resulted from *statistical discrimination* or *stereotyping*⁸ as discussed in chapter 1.

Analogous to Blinder (1973)[9], the sample is split into four groups—those with relatively higher health care usage (whites), and those with relatively lower usage (blacks, Hispanics and other). Separate logit regressions of usage on it's proposed predictors are carried out for each group of the form:

$$hcu_i^w = \alpha^w T_i^w + \beta^w F_i^w + X_i^w \theta^w + \mu_i^w \quad (2.3)$$

$$hcu_i^m = \alpha^m T_i^m + \beta^m F_i^m + X_i^m \theta^m + \mu_i^m \quad (2.4)$$

where hcu_i is the outcome variable for health care utilization of individual i in a given group (w —white or m —minority; black, Hispanic or other). Given the estimates of these two equations, I then carry out the non-linear decomposition proposed by Fairlie (1999)[24] of the form:

$$\bar{Y}^w - \bar{Y}^m = \left[\sum_{i=1}^{N^w} \frac{G(Z_i^w \hat{\beta}^w)}{N^w} - \sum_{i=1}^{N^m} \frac{G(Z_i^m \hat{\beta}^w)}{N^m} \right] + \left[\sum_{i=1}^{N^m} \frac{G(Z_i^m \hat{\beta}^w)}{N^m} - \sum_{i=1}^{N^m} \frac{G(Z_i^m \hat{\beta}^m)}{N^m} \right] \quad (2.5)$$

where \bar{Y} is the average probability of health care usage for a particular ethnic group (white or minority), $G(Z_i \hat{\beta})$ is the non-linear function that determines the outcome variable; Z_i being a matrix of all explanatory variables. The first set of brackets represents the overall proportion of the differences in usage rates across whites (w) and the particular minority group (m) caused by the differing levels of the observed explanatory variables (given the same marginal effect). The second set of brackets measure the overall proportion of the racial disparity in usage that can be attributed to unobserved characteristics across the groups (given the same levels of Z_i). As studies have shown that the second part is oft times difficult to interpret [35, 14], the explained differences will be the main focus here.

In order to address the relative importance of disparities in perceptions and other factors in determining racial differences in usage, a further calculation is made to isolate the individual contribution of the racial differences in the levels of each of the explanatory variables, to the observed usage disparity. Analogous to Fairlie (1999)[24], assume that Z includes n variables Z_1 to Z_n . Then the independent contribution of Z_1 to the racial gap may be expressed as:

$$\frac{1}{N^m} \sum_{i=1}^{N^m} G(Z_{1i}^w \hat{\beta}_1^w + \dots + Z_{ni}^m \hat{\beta}_n^w) - G(Z_{1i}^m \hat{\beta}_1^w + \dots + Z_{ni}^m \hat{\beta}_n^w) \quad (2.6)$$

This says that, the contribution of Z_1 to the gap is equal to the change in the average predicted probability from replacing the minority distribution with the white distribution of Z_1 while holding the distribution of the other variables constant. For example, the contribution of *trust levels* to the racial divide in usage is equal to the change in the average predicted probability

⁸See Balsa et al. (2001, 2003)[5, 6]

of usage from replacing the distribution of *trust levels* among the minority group with that of whites *ceteris paribus*. A similar calculation is done to find the contributions of the other $n - 1$ variables⁹. The results of all the analyses described above are presented in the next section.

2.3 Results

2.3.1 Summary Statistics

Table 2.1 gives the summary statistics for the overall subsample used. About 80% of the sample went to the doctor at least once in the past 12 months. Roughly 75% of respondents were white, 11% black, 9% Hispanic and about 5% in the *other*¹⁰ category. The average trust level of an individual was relatively high being more than 4 out of a possible 5 points with a standard deviation of 0.817. On the other hand approximately 42% of the population expressed having a fear/dislike of/for going to the doctor. In regards to subjective health, about 38 percent of respondents reported being in very good health, 27% in good health, 12% in fair health and 4 percent in poor health. More than half of respondents (56.7%) were between the ages of 35 and 64, while about 55 percent of them were female. Average family income was about \$43,610 while about 9 percent of individuals fell below the Federal Poverty Line. Concerning health insurance coverage, 11% of the population reported being uninsured while 57 percent had some sort of private insurance. Most respondents had at least some college (52%) while 12 percent had less than a high school education.

Table 2.2 gives the summary statistics by race for the overall subsample used. A larger proportion of whites (0.823) went to the doctor as compared to any of the minority groups with Hispanics having the lowest proportion of 0.657. Whites on average also have a higher level of trust than their minority counterparts. In terms of the fear/dislike measure, Hispanics seem to be the most fearful of going to the doctor having a proportion of almost half who fear/dislike doctor visits. Blacks however, seem to be the least fearful of all the ethnic groups with a mean of 0.403. Blacks and those of the *other* race grouping (e.g asians, Native Americans etc..) have the highest percentage of those in poor health (5.2%). Whites on the other hand have the highest percentage of those in very good health at about 40%, while Hispanics have the lowest at about 27%.

Caucasians have the highest average income at around \$47,330, while African-Americans have the lowest at \$30,570. African-Americans are the most stricken by poverty in this sample with 21% of them falling below the Federal Poverty Line (FPL). Caucasians however, are the least poverty stricken with only 6% or so falling below the *FPL*. Considering health

⁹Unlike in the linear case, the independent contributions of Z_1 depends on the values of the other $n - 1$ variables. This implies that the choice of a variable as Z_1 (or the order of switching the distributions) is potentially important in calculating its contribution to the racial gap. Following the suggestion of Fairlie (2006)[25] I run several different permutations of switching and take the average.

¹⁰This includes Native Americans, Asians etc.

insurance coverage, whites have the lowest rate of those uninsured (at 7.6%) and the highest rate of those privately insured (at about 60%). While Hispanics were the most likely to have less than a high school education, those in the *other* group (e.g. asians, Native Americans etc.) were the most likely to have had some college or beyond.

2.3.2 Testing for the Effect of Patients' Perceptions of Care

Table 2.3 presents the results of the analysis that sought to investigate whether or not a race effect still persists even after controlling for patients' perceptions of care. We see that overall, the effect persists with (Model 2) or without (Model 1) controlling for perceptions, with all minorities less likely than caucasians to have had at least one doctor visit. Hispanics particularly show the greatest disparity in usage of all the minority groups, using at a rate that is about 30% lower than that of whites. Trust is found to positively affect usage with a 1 unit increase in the trust index making someone 26.7% more likely to utilize health care. On the other hand, those who were fearful of going to the doctor were about 40% less likely to have gone.

The health need factors significantly predict usage in the expected directions with those in poor health being about 6 times more likely to use health care than those in excellent health, with the increased likelihood of usage decreasing as perceived health improves. Likewise, the age indicators predict usage in the expected direction with those between the ages of 18 and 34 being about 75% less likely to use care compared to those over 80 years of age. This disparity is however mitigated as age increases.

Looking at the access variables, an additional \$10,000 of income increases the probability of going to the doctor by about 2.9-3.6%. The poverty level indicators show significantly that relatively poverty stricken individuals are less likely to visit the doctor with those below the *FPL* about 34-42% less likely. The health insurance indicators show on the whole that having any kind of health insurance made an individual more likely to go to the doctor. Individuals who had some partial amount of college were 20-25% more likely to utilize health care, while those with college and above were about 23-27% more likely to.

2.3.3 Quantifying the Importance of Patients' Perceptions of Care

Tables 2.4-2.7 show the results of the health care usage analysis by race. Across race, those who trusted their doctor more had a higher probability of visiting them. Conversely, more fearful individuals of all races with the exception of Hispanics, were less likely to go to the doctor. The health need indicators predict usage in the expected direction across races with individuals in poorer health being more likely to utilize care. On the other hand, younger individuals regardless of race were less likely to use care. While access/enabling factors such as income and poverty severity affected usage rates among whites, these factors were not as significantly predictive of usage among racial/ethnic minority groups. Health insurance coverage however, for the most part played a positive role in predicting usage rates among the different races/ethnicities.

Table 2.8 describes the decomposition analysis of the white/black disparities in health care utilization. The difference between white and black health care usage rates is 0.029 in favor of whites. The portion of this difference explained by group differences in explained characteristics is 0.013 (45%). Superior trust levels among whites account for 0.007 of the overall difference in usage or 24.1%. Conversely, higher levels of fear/dislike of doctors

Table 2.1: Summary Statistics: Perceptions of Care Analysis

Variable	Sample Mean (Std. Dev.)	Observations
Doctor Visit	0.798	38793
White	0.749	38793
Black	0.109	38793
Hispanic	0.093	38793
Other	0.047	38793
Trust	4.163 (0.817)	31719
Fear/Dislike	0.417	38793
Poor Health	0.041	38793
Fair Health	0.121	38793
Good Health	0.265	38793
Very Good Health	0.375	38793
Age (18-34)	0.246	38793
Age (35-64)	0.567	38793
Age (65-79)	0.145	38793
Female	0.546	38793
Family Income (\$10,000)	4.361	38793
Usual Source of Care	0.885	38793
Poverty Level (below 100%)	0.093	38793
Poverty Level (100-199%)	0.156	38793
Poverty Level (200-299%)	0.163	38793
Poverty Level (300-399%)	0.147	38793
Medicare	0.041	38793
Medicare & Other Public Care	0.023	38793
Medicaid	0.033	38793
Other Public Care	0.015	38793
Private Insurance	0.571	38793
Uninsured	0.108	38793
Less Than High School	0.119	38793
High School	0.351	38793
Some College	0.529	38793
College & More	0.294	38793

Table 2.2: Summary Statistics by Race: Perceptions of Care Analysis

Variable	White (mean)	Black (mean)	Hispanic (mean)	Other (mean)
Doctor Visit	0.823	0.779	0.657	0.738
Trust	4.235 (0.776)	3.945 (0.885)	3.853 (0.933)	4.004 (0.882)
Fear/Dislike	0.407	0.403	0.499	0.446
Poor Health	0.037	0.052	0.050	0.052
Fair Health	0.100	0.189	0.203	0.134
Good Health	0.257	0.298	0.288	0.278
Very Good Health	0.398	0.317	0.272	0.351
Age (18-34)	0.214	0.304	0.388	0.331
Age (35-64)	0.576	0.556	0.511	0.555
Age (65-79)	0.161	0.109	0.083	0.094
Female	0.539	0.594	0.543	0.553
Family Income (\$10,000)	4.733 (3.496)	3.057 (2.832)	3.146 (2.843)	3.876 (3.433)
Usual Source of Care	0.908	0.861	0.747	0.835
Poverty Level (below 100%)	0.061	0.211	0.184	0.147
Poverty Level (100-199%)	0.128	0.223	0.296	0.165
Poverty Level (200-299%)	0.161	0.173	0.166	0.162
Poverty Level (300-399%)	0.156	0.127	0.113	0.111
Medicare	0.039	0.058	0.037	0.035
Medicare & Other Public Care	0.020	0.035	0.027	0.031
Medicaid	0.018	0.083	0.079	0.055
Other Public Care	0.011	0.020	0.030	0.042
Private Insurance	0.599	0.497	0.451	0.541
Uninsured	0.076	0.162	0.287	0.139
Less Than High School	0.087	0.176	0.306	0.130
High School	0.345	0.427	0.337	0.291
Some College	0.566	0.396	0.356	0.578
College & More	0.323	0.180	0.164	0.360
Observations	29092	4231	3624	1846

present among whites compared to blacks lessen the disparity by 0.001 or 3.4%.

Although poorer levels of perceived health among blacks serve to mitigate the disparity in usage, higher levels of income among whites contribute to 0.005 or 17.2% of the usage difference. Higher poverty rates among blacks also contribute significantly to the usage disparity, with a relatively higher percentage of blacks below the Federal Poverty Line (FPL) increasing the usage difference by 0.006 (or 20.7% of the overall disparity). While higher rates of medicare, medicaid and other public care among blacks lessen the disparity, higher rates of private insurance coverage among caucasians account for 0.008 or 27.6% of the group difference in usage. Higher education levels among whites contribute to a total of 0.006 or 20.6% of the overall disparity in usage between whites and blacks.

Turning to the white/hispanic decomposition analysis, Table 2.9 shows that the overall disparity in usage between whites and Hispanics is 0.067. About 53% (0.036) of this disparity can be explained by observable differences in the levels of the explanatory variables across the races/ethnicities. Lower levels of trust among Hispanics contributed 0.01 (or 14.9%) to the racial/ethnic divide in usage. On the other hand, a higher prevalence of fear/dislike of/for going to the doctor among Hispanics account for 0.005 or 7.5% of the white-Hispanic health care utilization difference.

As with the white/black decomposition analysis above, poorer levels of perceived health among Hispanics compared to whites contribute negatively to the usage disparity, while superior levels of income among whites explain 0.005 or 7.5% of the difference in usage rates. The fact that a higher portion of Hispanics than whites fell below the *FPL* explains 0.005 (7.5%) of the usage disparity. However, the fact that Hispanics are more likely to be covered by Medicaid or another type of public care health insurance lessened the usage divide, while higher levels of private insurance coverage among whites account for 0.008 (11.9%) of it. As in the case of the white/black analysis, superior education levels among whites account for 0.007 or 10.4% of the usage divide.

Table 2.10 presents the decomposition results for White/*Other* disparities in health care usage. The overall disparity in usage rates between whites and *others* is 0.041 with 0.013 (32%) of this explained by differences in observable characteristics. As in the previous analyses, higher trust levels among whites are responsible for 0.006 or 14.6% of the usage divide. Higher levels of fear of going to the doctor among those in the *Other* group account for 0.001 (or 2.4%) of the observed racial/ethnic disparity in usage.

The relatively poorer perceived health among those in the *Other* category, as with the previous analyses served to mitigate the usage disparity. However, lower levels of income among those in the *Other* category (compared to whites) are responsible for 0.003 or 7.3% of the observed disparity. A lower prevalence of poverty among whites accounts for 0.004 (or 9.7%) of the disparity in usage rates. However, as with the analyses of Blacks and Hispanics, higher participation in medicare, medicaid and other public health insurance among *Others* lessened the disparity. Yet, higher private insurance rates among whites explain 0.006 or 14.6% of the overall disparity in health care utilization.

Table 2.3: Logit Regression Analysis of *Doctor Visits*

Variable	Model 1	Model 2
Black	0.838(0.050)*	0.832(0.050)*
Other	0.725(0.059)*	0.759(0.062)*
Hispanic	0.628(0.043)*	0.681(0.047)*
Trust	–	1.267(0.027)*
Fear/Dislike	–	0.588(0.021)*
Poor Health	5.958 (0.792)*	6.054(0.810)*
Fair Health	3.644(0.269)*	3.919(0.294)*
Good Health	2.389(0.125)*	2.485(0.132)*
Very Good Health	1.633(0.073)*	1.649(0.075)*
Age (18-34)	0.221(0.022)*	0.258(0.035)*
Age (35-64)	0.255(0.025)*	0.303(0.040)*
Age (65-79)	1.090(0.156)	1.089(0.156)
Female	2.452(0.089)*	2.407(0.088)*
Family Income (\$10,000)	1.029(0.005)*	1.036(0.007)*
Poverty Level (below 100%)	0.578(0.046)*	0.665(0.054)*
Poverty Level (100-199%)	0.638(0.037)*	0.729(0.047)*
Poverty Level (200-299%)	0.762(0.043)*	0.829(0.048)*
Poverty Level (300-399%)	0.828(0.045)*	0.889(0.049)**
Medicare	1.163(0.135)	1.128(0.132)
Medicare & Other Public Care	2.485(0.424)*	2.373(0.406)*
Medicaid	2.644(0.289)*	2.672(0.295)*
Other Public Care	1.934(0.262)*	1.869(0.256)*
Private Insurance	1.840(0.085)*	1.835(0.086)*
Less Than High School	0.903(0.055)	0.936(0.058)
Some College	1.253(0.059)*	1.197(0.057)*
College & More	1.262(0.065)*	1.227(0.064)*
Observations	30060	30060

Odds ratios presented with standard errors in parentheses.

* Significant at the 1% level.

** Significant at the 5% level.

Table 2.4: Logit Regression Analysis of *Doctor Visits* for Whites

Variable	Odds Ratio	Std. Err.
Trust	1.208*	0.031
Fear/Dislike	0.587*	0.025
Poor Health	5.977*	0.982
Fair Health	4.674*	0.471
Good Health	2.636*	0.164
Very Good Health	1.639*	0.084
Age (18-34)	0.269*	0.040
Age (35-64)	0.296*	0.044
Age (65-79)	1.062	0.167
Female	2.452*	0.105
Family Income (\$10,000)	1.016**	0.007
Poverty Level (below 100%)	0.612*	0.064
Poverty Level (100-199%)	0.661*	0.049
Poverty Level (200-299%)	0.783*	0.051
Poverty Level (300-399%)	0.826*	0.050
Medicare	0.950	0.132
Medicare & Other Public Care	2.199*	0.496
Medicaid	2.722*	0.505
Other Public Care	1.749*	0.333
Private Insurance	1.595*	0.088
Less Than High School	0.970	0.078
Some College	1.177*	0.064
College & More	1.250*	0.073
Observations		24375

* Significant at the 1% level.

** Significant at the 5% level.

Table 2.5: Logit Regression Analysis of *Doctor Visits* for Blacks

Variable	Odds Ratio	Std. Err.
Trust	1.290*	0.075
Fear/Dislike	0.707*	0.075
Poor Health	7.515*	2.885
Fair Health	3.655*	0.693
Good Health	2.267*	0.364
Very Good Health	1.668*	0.256
Age (18-34)	0.388**	0.169
Age (35-64)	0.422**	0.181
Age (65-79)	1.128	0.522
Female	2.265*	0.242
Family Income (\$10,000)	1.105*	0.032
Poverty Level (below 100%)	0.777	0.168
Poverty Level (100-199%)	0.852	0.160
Poverty Level (200-299%)	0.828	0.150
Poverty Level (300-399%)	1.080	0.217
Medicare	2.010**	0.600
Medicare & Other Public Care	2.323**	0.877
Medicaid	2.545*	0.542
Other Public Care	1.120	0.350
Private Insurance	1.878*	0.251
Less Than High School	1.143	0.174
Some College	1.360**	0.195
College & More	1.212	0.231
Observations		3391

* Significant at the 1% level.

** Significant at the 5% level.

Table 2.6: Logit Regression Analysis of *Doctor Visits* for Hispanics

Variable	Odds Ratio	Std. Err.
Trust	1.188*	0.073
Fear/Dislike	0.665	0.078
Poor Health	3.748*	1.263
Fair Health	2.815*	0.532
Good Health	2.092*	0.345
Very Good Health	1.748*	0.280
Age (18-34)	0.217**	0.138
Age (35-64)	0.259**	0.164
Age (65-79)	0.679	0.452
Female	2.153*	0.246
Family Income (\$10,000)	1.029	0.030
Poverty Level (below 100%)	0.522*	0.127
Poverty Level (100-199%)	0.495*	0.099
Poverty Level (200-299%)	0.579*	0.118
Poverty Level (300-399%)	0.742	0.160
Medicare	2.014	0.821
Medicare & Other Public Care	1.593	0.648
Medicaid	2.012*	0.434
Other Public Care	2.201**	0.788
Private Insurance	1.976*	0.274
Less Than High School	0.946	0.142
Some College	0.874	0.138
College & More	1.169	0.226
Observations		2394

* Significant at the 1% level.

** Significant at the 5% level.

Table 2.7: Logit Regression Analysis of *Doctor Visits* for *Others*

Variable	Odds Ratio	Std. Err.
Trust	1.217**	0.112
Fear/Dislike	0.502*	0.085
Poor Health	11.86*	8.025
Fair Health	3.323*	1.083
Good Health	2.280*	0.565
Very Good Health	1.660**	0.374
Age (18-34)	0.404	0.344
Age (35-64)	0.540	0.457
Age (65-79)	3.063	2.831
Female	1.969*	0.332
Family Income (\$10,000)	1.012	0.029
Poverty Level (below 100%)	1.054	0.351
Poverty Level (100-199%)	1.474	0.437
Poverty Level (200-299%)	0.977	0.258
Poverty Level (300-399%)	1.208	0.358
Medicare	0.589	0.313
Medicaid	4.081*	1.846
Other Public Care	1.663	0.669
Private Insurance	1.856*	0.382
Less Than High School	0.405*	0.109
Some College	1.105	0.263
College & More	1.263	0.306
Observations		1285

* Significant at the 1% level.

** Significant at the 5% level.

Table 2.8: Decomposition of the White/Black Disparities in *Doctor Visits*.

White Usage rate ($N = 24375$)	0.883
Black Usage rate ($N = 3432$)	0.854
Overall Disparity	0.029
Explained Disparity	0.013
<i>Causal Factor</i>	<i>Contribution</i>
Trust	0.007 (24.1%)*
Fear/Dislike	-0.001 (-3.4%)*
Poor Health	-0.001 (-3.4%)*
Fair Health	-0.011 (-37.9%)*
Good Health	-0.005 (-17.2%)*
Very Good Health	0.003 (10.3%)*
Age (18-34)	0.011 (37.9%)*
Age (35-64)	-0.004 (-13.7%)
Age (65-79)	0.000 (0%)
Female	-0.006 (-20.7%)*
Family Income (\$10,000)	0.005 (17.2%)*
Poverty Level (below 100%)	0.006 (20.7%)*
Poverty Level (100-199%)	0.003 (10.3%)*
Poverty Level (200-299%)	0.000 (0%)**
Poverty Level (300-399%)	-0.001 (-3.4%)**
Medicare	0.000 (0%)
Medicare & Other Public Care	-0.001 (-3.4%)*
Medicaid	-0.006 (-20.7%)*
Other Public Care	-0.001 (-3.4%)*
Private Insurance	0.008 (27.6%)*
Less Than High School	0.001 (3.4%)
Some College	0.003 (10.3%)*
College & More	0.003 (10.3%)*

* Differential is significant at the 1% level. ** Differential significant at the 5% level.

Values in parentheses are the contributions expressed as a percentage of the overall disparity in usage.

Table 2.9: Decomposition of the White/Hispanic Disparities in *Doctor Visits*.

White Usage rate (<i>N</i> = 24375)	0.883
Hispanic Usage rate (<i>N</i> = 2491)	0.816
Overall Disparity	0.067
Explained Disparity	0.036
<i>Causal Factor</i>	<i>Contribution</i>
Trust	0.010 (14.9%)*
Fear/Dislike	0.005 (7.5%)*
Poor Health	-0.001 (-1.5%)*
Fair Health	-0.015 (-22.3%)*
Good Health	-0.005 (-7.5%)*
Very Good Health	0.006 (8.9%)*
Age (18-34)	0.027 (40.2%)*
Age (35-64)	-0.015 (-22.3%)*
Age (65-79)	0.000 (0%)
Female	-0.004 (-5.9%)*
Family Income (\$10,000)	0.005 (7.5%)*
Poverty Level (below 100%)	0.005 (7.5%)*
Poverty Level (100-199%)	0.007 (10.5%)*
Poverty Level (200-299%)	0.000 (0%)
Poverty Level (300-399%)	-0.001 (-1.5%)**
Medicare	0.000 (0%)
Medicare & Other Public Care	0.000 (0%)*
Medicaid	-0.006 (-8.9%)*
Other Public Care	-0.001 (-1.5%)*
Private Insurance	0.008 (11.9%)*
Less Than High School	0.001 (1.5%)
Some College	0.003 (4.5%)*
College & More	0.004 (5.9%)*

* Differential is significant at the 1% level. ** Differential significant at the 5% level.

Values in parentheses are the contributions expressed as a percentage of the overall disparity in usage.

Table 2.10: Decomposition of the White/Other Disparities in *Doctor Visits*.

White Usage rate (<i>N</i> = 24375)	0.883
Other Usage rate (<i>N</i> = 1421)	0.842
Overall Disparity	0.041
Explained Disparity	0.013
<i>Causal Factor</i>	<i>Contribution</i>
Trust	0.006 (14.6%)*
Fear/Dislike	0.001 (2.4%)*
Poor Health	-0.002 (-4.9%)*
Fair Health	-0.005 (-12.2%)*
Good Health	-0.004 (-9.7%)*
Very Good Health	0.002 (4.9%)*
Age (18-34)	0.016 (39.0%)*
Age (35-64)	-0.006 (-14.6%)
Age (65-79)	0.000 (0%)
Female	-0.001 (-2.4%)
Family Income (\$10,000)	0.003 (7.3%)*
Poverty Level (below 100%)	0.004 (9.7%)*
Poverty Level (100-199%)	0.001 (2.4%)*
Poverty Level (200-299%)	0.000 (0%)
Poverty Level (300-399%)	-0.001 (-2.4%)**
Medicare	0.000 (0%)
Medicare & Other Public Care	-0.001 (-2.4%)*
Medicaid	-0.004 (-9.7%)*
Other Public Care	-0.003 (-7.3%)*
Private Insurance	0.006 (14.6%)*
Less Than High School	0.000 (0%)
Some College	0.000 (0%)
College & More	-0.001 (-2.4%)**

* Differential is significant at the 1% level. ** Differential significant at the 5% level.

Values in parentheses are the contributions expressed as a percentage of the overall disparity in usage.

2.4 Discussion

Many studies have undertaken the task of identifying the causes of racial/ethnic disparities in health care utilization. Notwithstanding, few have sought to identify and describe the prime causes of differences in health care usage across races. There also has been research into the determinants of racial/ethnic disparities in perceptions of care measures such as trust and satisfaction. The purpose of this chapter was to explore the possible causal link between differences in perceptions of care across races (as it relates to expected gains) and observed differences in usage. This was done by first investigating the effect of perceptions of care on usage, and ultimately describing its contribution to the racial divide in health care usage.

Results overall show that whites are more likely to utilize health care than minorities even after controlling for perceptions of care, health need, SES and access. Albeit a race effect still persists even after controlling for patients' perceptions of care, the perceptions themselves are found to independently govern usage behavior. This highlights the importance of the doctor-patient relationship in determining health care usage, through its effect on expected gains. The results also indicate that the same positive relationship between perceptions of care and usage persists even across races.

The decomposition analyses reveal that across minorities roughly 30-50% of the difference in usage compared to whites was explained by differing levels of the explanatory variables. This means that 50-70% (depending on the racial comparison) can be attributed to variables not accounted for or unobservable group specific characteristics such as cultural norms/beliefs about health care usage that may have resulted from *statistical discrimination* or *stereotyping*. The decompositions also indicate that perceptions of care (trust and fear) play a major role in the disparities in usage observed. In fact while disparities in ability to pay variables (e.g. family income, poverty level) were the prime causes of white/black and white/hispanic differences in usage, perceptions of care were found to be as equally important as economic variables in determining white/*other* disparities in use.

Notably, differences in health insurance coverage across races was the least important contributor to white/black and white/hispanic disparities in usage and even served to mitigate white/*other* differences in utilization. Education level differences between whites and blacks seem to be similarly as important as perceptions of care determinants of white/black usage disparities. However, education level differences between whites and hispanics are not as important as perception differences in causing usage disparities between these groups; and white/*other* education level differences actually mitigate white/*other* usage disparities.

These findings suggest that while economic variables play a major role in causing racial/ethnic disparities in health care usage, perceptions of care (as they relate to expected gains) also significantly matter. Thus in addition to enacting policies to reduce disparities in economic status, policy makers should also enact policies aimed at reducing disparities in patients' perceptions of care, when aiming to reduce usage disparities. Such policies might include programs aimed at educating minorities on the benefits of health care usage in order to clear up any misconceptions they might have that have contributed to their distrust. On the supply

side, cultural competency programs aimed at educating physicians on the cultural nuances of their patients could help to reduce the occurrence of the adverse effects of *statistical discrimination*. The findings also suggest that while health insurance coverage does play a role in usage disparities, policies aimed at increasing access to as many as possible might not be as effective in narrowing the racial divide in usage unless they are used in tandem with policies aimed at improving minorities' perceptions of care.

One main limitation of this analysis is that the data is cross-sectional. As mentioned in the methods section, having a lagged trust/fear variable would be more ideal because of the potential reverse causality between current year trust/fear and current year usage. While using only those individuals who have a regular doctor should serve to mitigate this problem, it makes the results difficult to generalize to those who do not have a regular source of care. This is important as minorities tend to be more likely to not have a usual source of care compared to whites¹¹. The results of this study are thus likely to be biased downwards when compared to a representative sample (including those with and without a usual source of care) as those without a usual source of care are more likely to have poorer perceptions of care¹². Future work should hence seek to find/develop longitudinal data that includes measures of perceptions of care along with usage. Future work should also look at the role of perceptions in governing racial differences in other types of health care utilization (e.g. emergency room visits, hospital stays) to establish whether or not the results found persist. Notwithstanding, this research adds to current studies by illuminating the importance expected gains and other determining factors of disparities in health care usage.

¹¹See Table 2.2 where caucasians have the highest proportion of individuals with a usual source of care.

¹²In summary statistics not presented, individuals across races who did not have a usual source of care reported lower trust scores and higher fear/dislike compared to those with a usual source of care.

Chapter 3

Racial/Ethnic Disparities in Health Care Usage: The Role of Expected Longevity

3.1 Introduction & Motivation

A myriad of studies have time and again shown that members of racial and ethnic minority groups have lower medical use, including physician visits, diagnostic tests and procedures, screening and preventative care for disease, and referrals for specialty care, compared to whites [23, 27]. Though some of these disparities are as a result of lower socioeconomic status (SES) and health insurance coverage rates among African Americans and Hispanics, they persist even among those with coverage and when controlling for other socioeconomic characteristics [21].

Grossman's 1972 seminal work on the health human capital model posits that the initial stock of health capital is an important determinant of the demand for preventive health care services [31]. Expected longevity (how long someone expects to live) can be seen as a measure of the stock of health capital. Thus it can be argued that expected longevity (expected life-expectancy) plays a role in determining someone's use of preventive care services. Theoretical studies purport that the higher the life expectancy, the greater the potential payoffs from health investment [22, 7]. The greater expected payoffs should then lead to greater likelihood of health care usage (health investment). Although this argument might be sound, not much has been done in the way of validating it empirically. Alternatively, one can argue that someone with a relatively high life expectancy might conclude that there is no need for them to invest in preventive health services given their relatively high health stock. On the other hand, someone with a relatively low health stock (life expectancy) may deem investment necessary with a view to improving their current and future health stock. Which of these arguments outweighs the other is an empirical question.

Consequently, a study by Picone et al. (2004) empirically assesses the role of expected longevity (and other factors) on the demand for three measures used for early detection of breast and cervical cancer [39]. The authors find that individuals with a higher expected life

expectancy (longevity) are more likely to undergo cancer screening. These results would seem to validate the theoretical suggestions of Ehrlich & Chuma and Becker & Mulligan mentioned earlier. I wondered whether or not there exists disparities in expected longevity that could partly be causing observed differences in usage across races. This chapter will begin to explore this question as a starting point for ascertaining the relative importance of disparities in expected life expectancy as a predictor of differences in usage. The results of this analysis could do more to illuminate the relationship between expected longevity and health investment, along with providing further insight into the causes of disparities in health care usage by race.

The chapter continues next by describing the data set used along with the methods employed. The penultimate section provides the results of the analyses. A discussion of the results is then provided in Section 4.

3.2 Data & Methods

3.2.1 Data

The data used in this analysis comes from the 1994 and 1996 waves of the Health and Retirement Study (HRS). The *HRS* is a longitudinal household survey data set for the study of retirement and health among the elderly in the United States. With the goal of making the data more accessible to researchers, the RAND Center for the Study of Aging, with funding and support from the National Institute on Aging (NIA) and the Social Security Administration (SSA), created the RAND HRS data files. The RAND HRS is a user-friendly version of a subset of the HRS that contains cleaned and processed variables with consistent and intuitive naming conventions (RAND HRS, 2008) [2]. It is variables from the 1994 and 1996 waves of this version of the HRS that are used in this analysis.

The subsample used consists of 4317 females born between 1931 and 1941. The outcome measures of health care utilization, following Picone et al. (2004), include cancer screening practices such as *Breast Self exam*¹, *Mammogram*², *Pap smear*³ and *All 3 Procedures*⁴ taken from the 1996 wave. The key explanatory variables include race/ethnicity indicators of black and Hispanic ethnic groups (in comparison to whites) and a lagged (1994) measure of expected longevity. The expected longevity measure comes from a question that asks the respondent the expected probability that they will live to be 75 years old. As the dataset is longitudinal, I was able to avoid the potential endogeneity problem of using current (1996) expected life expectancy measures against current utilization variables by using the responses to the longevity question posed two years earlier in 1994. Priors, following the majority of the empirical results found are that racial/ethnic minorities would have lower levels of usage compared to whites. Priors on the direction of the effect of expected longevity on usage are ambiguous as theoretical arguments can be made for either direction.

Other demographic controls include age, subjective and objective health indicators⁵, income⁶, education⁷, time preference (short or long, medium being the omitted group)⁸, health insurance coverage⁹, and whether or not the person was married. The poorer someone's

¹This includes a Y/N question coded as 0/1 that asks: "Do you check your breasts for lumps monthly?"

²This includes a Y/N question coded as 0/1 that asks: "Since the last interview, did you have a mammogram or x-ray of the breast?"

³This includes a Y/N question coded as 0/1 that asks: "Since the last interview, did you have a PAP smear?"

⁴This is a 0/1 variable created as the interaction between the *Breast Self Exam*, *mammogram* and *pap smear* variables.

⁵These include poor to very good health 0/1 indicators, and health condition 0/1 indicators such as whether the person had/has cancer, stroke, diabetes, high blood pressure and others as shown in Table 3.2.

⁶This is a measure the total annual household income of the respondent.

⁷These include 0/1 dummies of whether or not the person completed college or less than high school.

⁸This is a measure of impatience used by Picone et al. (2004) involving asking an individual which time period was most important to them in planning family spending and saving; *short*: less than a year, *medium*: between a year and 10 years and *long* term: 10 years or more.

⁹These include dummies for whether someone was covered by medicaid, medicare, a plan through current

health is, the more likely they are to utilize care. Higher levels of income would provide individuals with more ability to pay for health services and thus would increase usage. Higher levels of education would positively affect usage directly through more educated individuals perhaps being relatively more aware of the benefits of health care, and indirectly through its positive affect on income levels. In regards to time preference, theory suggests that more patient individuals (those with a low time preference or *longer time horizon*) are more likely to invest in preventive care as it's benefits are reaped in the longer term. Any type of health insurance coverage (compared to being uninsured) should positively affect usage. However, the quality of coverage of an employer based health plan (*Employer Health Plan*) is usually higher than that of a public plan (medicare and medicaid). We might thus expect the former health insurance coverage variable to have a greater marginal effect on usage (compared to the uninsured) than the latter.

3.2.2 Methods

This study seeks to identify the role of expected longevity in racial/ethnic disparities in health care use. To achieve this goal, I address the empirical question as to whether or not a race effect still persists after controlling for expected longevity in addition to other factors. In conjunction with this, I also run a logit regression of expected longevity against race and other proposed determinants to ascertain whether disparities in expected longevity by race exist in the data; with the hope of gaining more insight into its role (if any) in the apparent disparities in usage by race.

To first establish that disparities in health care usage exist in the data, a simple logit regression of health care usage on it's proposed determinants is carried out; including the race dummies (black, Hispanic, with white being the reference group), while excluding the control for expected longevity (*Model 1*). A separate regression (*Model 2*) is then run now including the measure of expected longevity (expected probability of living to the age of 75). The equations for these regressions are shown below:

$$hcu_{i,96} = \alpha R_i + X_{i,96}\theta + \mu_{i,96} \quad (3.1)$$

$$hcu_{i,96} = \alpha R_i + \beta EL_{i,94} + X_{i,96}\theta + \mu_{i,96} \quad (3.2)$$

where hcu is the measure of health care usage (Breast Self Exam, mammogram, pap smear or all three procedures), R_i is the race indicator, $EL_{i,94}$ is the expected longevity measure (from 1994), $X_{i,96}$ is a matrix of the other explanatory variables mentioned before and $\mu_{i,96}$ is the disturbance term. The results of this analysis are presented in the next section.

The second part of my analysis seeks to establish whether or not differences in expected longevity by race exist in the current sample. To achieve this end, a logit regression of ex-

or previous employment (*Employer Health Plan*) or another health insurance not public or through employment (*Other Health Ins.*)

pected longevity against its proposed determinants of the following form is run:

$$EL_{i,94} = \beta R_i + X_{i,94}\theta + \mu_{i,94} \quad (3.3)$$

where $X_{i,94}$ now includes covariates of expected longevity e.g. age, income and the various subjective/objective health indicators mentioned before now taken from the 1994 wave. Regression results are described in the proceeding section.

3.3 Results

Table 3.1 shows the summary statistics for the key dependent and explanatory variables used in this analysis. On average about 63% of the sample had a breast self exam in 1996. In the same year about 71% of the sample underwent a mammogram while 67% had a pap smear and about 40% engaged in all three of the aforementioned procedures. About 19% of the respondents were black, about 10% Hispanic and the rest were Caucasian. In 1994 on average respondents expected that there was about a 64% chance of them living to the age of 75. The average person had an annual income of about \$ 46, 000 while only 8% had at least a college degree. In terms of health insurance coverage, about 37% of the sample were covered through an employer health plan while 8%, 13% and 13% were covered by medicaid medicare, and a plan other than private or public respectively.

Table 3.2 presents the summary statistics for the subjective and objective measures of health that are posited to affect health care usage (cancer screening) both directly through the natural relation between health status and usage *ceteris paribus*, and indirectly through there affect on expected longevity. When considering the subjective measures of health, 7% judged themselves as being in poor health while 28.4% claim to be in very good health. The most prevalent health condition was arthritis (at 71% of respondents), followed by high blood pressure (at 59%) while only about 6% of respondents had had a stroke, and 9% had had cancer.

Table 3.3 compares the summary statistics of each race in the overall sample. On average, a higher percentage of blacks utilized cancer screening techniques than whites or Hispanics. Hispanics display the lowest levels of usage across the three ethnicities. In terms of expected longevity however, whites on average have a slightly higher expected probability of living than blacks (0.651 to 0.646), and a considerably higher probability than Hispanics (0.651 to 0.558). Whites had the highest mean income of \$53,810, with blacks having the lowest of \$25,770. Caucasians also had the highest percentage of those with a college degree (about 9%) and the lowest percentage of those who obtained less than a high school education (about 19% compared to 41% and 61% for blacks and Hispanics respectively). Turning to the access variables, blacks were the most likely to be under Medicaid, Medicare and an Employer sponsored health insurance plan, while a higher percentage of whites (14.5% as compared to blacks (7.7%) and Hispanics (8%)) were enroled in a plan not sponsored by employment or the government.

Table 3.1: Summary Statistics of Expected Longevity Analysis: Key Dependent, SES & Access Variables

Variable	Sample Mean	Std. Dev.
Breast Self Exam	0.630	–
Mammogram	0.708	–
Pap Smear	0.671	–
All Procedures	0.405	–
Black	0.190	–
Hispanic	0.096	–
Expected Longevity (prob.)	0.640	0.289
Age (years)	59.60	3.134
Income (\$10,000)	4.626	6.028
College	0.077	–
Less than High Sch	0.274	–
Married	0.611	–
Short time Horizon	0.197	–
Long time Horizon	0.075	–
Medicaid	0.075	–
Medicare	0.126	–
Employer Hlth Plan	0.366	–
Other Hlth Ins.	0.126	–
Observations	4300	

Summarizing the Health Indicators by race, in Table 3.4, looking at the subjective measures of health, a higher percentage of Hispanic women on average (14.1%) rated themselves as being in Poor Health, as compared to whites and blacks (6% and 10% respectively). On the other hand, 31.2% of caucasians saw themselves as being in very good health, in comparison to 18.7% and 14.8% of African-Americans and Hispanics respectively. However, when turning our attention to the objective measures of health, we see that the two prevalent conditions in the pooled sample (arthritis and high blood pressure) prevail more in the minority ethnic groups than in whites. In fact, overall the objective health of the minorities in the sample would seem to be worse than that of the caucasians.

Table 3.5 shows the key SES and Access variable results of equations 3.1 and 3.2 when the usage variable (*hcu*) is *Breast Self Exam*¹⁰. We see that with (*Model 2*) and without (*Model 1*) controlling for expected longevity, black women are roughly 79% (*Model 2*) and 80% (*Model 1*) more likely to cancer screen in this way than whites. Conversely, Hispanic women (as compared to whites) were 27% (*Model 2*) and 31% (*Model 1*) less likely to perform a self

¹⁰In results not shown here, the health indicators (subjective/objective) for all of the following analyses involving health care usage for the most part yielded insignificant odds ratios. They are thus omitted for ease of exposition.

Table 3.2: Summary Statistics of Expected Longevity Analysis: Health Indicators

Variable	Sample Mean	Std. Dev.
Poor Health	0.070	–
Fair Health	0.152	–
Good Health	0.260	–
V. Good Health	0.284	–
Had Cancer	0.088	–
Heart Problem	0.124	–
Lung Disease	0.075	–
Psych Problems	0.124	–
High Blood Pressure	0.592	–
Diabetes	0.193	–
Back Problems	0.326	–
Depression	0.170	–
Had Stroke	0.057	–
Arthritis	0.718	–
Observations	4317	

Table 3.3: Summary Statistics by Race of Expected Longevity Analysis: Key Dependent, SES & Access Variables

Variable	White Mean (Std. Dev)	Black Mean (Std. Dev.)	Hispanic Mean (Std. Dev)
Breast Self Exam	0.620	0.725	0.518
Mammogram	0.715	0.725	0.615
Pap Smear	0.675	0.684	0.615
All Procedures	0.397	0.480	0.321
Expected Longevity (prob.)	0.651(0.269)	0.646(0.330)	0.558(0.329)
Age (years)	59.74(3.109)	59.73(3.138)	59.36(3.127)
Income (\$10,000)	5.381(6.593)	2.577(2.613)	2.860(5.185)
College	0.088	0.052	0.034
Less than High Sch	0.192	0.413	0.615
Married	0.677	0.371	0.632
Short time Horizon	0.161	0.274	0.250
Long time Horizon	0.082	0.053	0.035
Medicaid	0.042	0.172	0.139
Medicare	0.118	0.189	0.153
Employer Hlth Plan	0.369	0.401	0.300
Other Hlth Ins.	0.145	0.077	0.080
Observations	3157	780	380

Table 3.4: Summary Statistics by Race of Expected Longevity Analysis: Health Indicators

Variable	White Mean	Black Mean	Hispanic Mean
Poor Health	0.060	0.100	0.141
Fair Health	0.134	0.217	0.334
Good Health	0.246	0.331	0.229
V. Good Health	0.312	0.187	0.148
Had Cancer	0.098	0.054	0.054
Heart Problem	0.119	0.159	0.102
Lung Disease	0.080	0.065	0.034
Psych Problems	0.115	0.125	0.153
High Blood Pressure	0.517	0.836	0.694
Diabetes	0.143	0.337	0.298
Back Problems	0.314	0.352	0.347
Depression	0.133	0.239	0.292
Had Stroke	0.044	0.088	0.124
Arthritis	0.691	0.781	0.757
Observations	3157	780	380

examination. Expected longevity is directly related to whether or not someone did an exam; increasing the likelihood by about 70% for every 1% increase in the expected probability of living to age 75. In terms of socioeconomic variables, having a college degree is seen to reduce the likelihood of having done a breast self exam by about 30%. While all other socioeconomic and access variables yielded insignificant results, being relatively impatient (short time horizon) made someone roughly 16% less likely to use this method of cancer screening.

In the similar analysis of mammogram usage (Table 3.6), black women, in either model are again more likely to use care comparatively speaking; with this race effect slightly lower in *Model 2* (53% compared to 56% more likely). Hispanic usage in this case however is not significantly different from that of caucasians. Also, expected longevity is not found to be a significant predictor of mammogram cancer screening. However, in contrast to the analysis of breast self examination, socioeconomic and access factors do play a role in cancer screening in this way. For example, an additional \$10,000 in household income is seen to make women 7-8% more likely to undergo a mammogram. Having a college degree is also found to increase the likelihood of usage by 38-42%. Being relatively impatient is again found to reduce the probability of usage, while having an employer based health plan (as compared to no insurance) increases the rate of mammogram usage by 38-46%.

Looking at the *Pap Smear* analysis in Table 3.7, blacks are again more likely to utilize this preventive care measure than caucasians though this effect is dampened by the addition of expected longevity in *Model 2*. Hispanic usage is not significantly different from whites. Expected longevity is again found to be a positive predictor of usage, increasing the proba-

Table 3.5: Logit Regression Analysis of *Breast Self Exam*: Key SES & Access Variables

Variable	Model 1	Model 2
Black	1.799(0.178)*	1.791(0.188)*
Hispanic	0.689(0.085)*	0.730(0.097)**
Expected Longevity (prob.)	–	1.688(0.218)*
Age (years)	0.992(0.011)	0.992(0.011)
Income (\$10,000)	0.996(0.006)	0.997(0.006)
College	0.713(0.089)*	0.695(0.089)*
Less than High Sch	1.072(0.093)	1.115(0.102)
Married	1.207(0.094)**	1.166(0.094)
Short time Horizon	0.842(0.073)**	0.835(0.075)**
Long time Horizon	0.922(0.117)	0.912(0.119)
Medicaid	1.161(0.172)	1.207(0.193)
Medicare	1.163(0.127)	1.127(0.132)
Employer Hlth Plan	0.887(0.069)	0.882(0.071)
Other Hlth Ins.	1.129(0.119)	1.141(0.125)
Observations	4024	3726

Odds ratios are shown with standard deviations in parentheses.

* Significant at the 1% level.

** Significant at the 5% level.

bility by 32.5%. Age also plays a role in this analysis, decreasing the probability of usage by approximately 4% in either model. Income however increases usage by about 6% while having less than a high school education reduces it by 27% and 29% (*Models 2 and 1* respectively). Similar to mammogram screening above, having an employer based health plan increased pap smear screening rates by 24% and 26% in *Models 1 and 2* respectively.

In the Table 3.8 analysis of whether or not someone engaged in all three of these preventive care activities in the 1996 calendar year, blacks are again significantly more likely (82% in *Model 1* and 79% in *Model 2*) to use than whites, while Hispanics are not. Expecting to live relatively longer again has a positive affect on usage, increasing rates by 28%. For the most part, the socioeconomic and access variables are insignificant, but those who are relatively impatient are again found to be less likely to have utilized all three procedures (about 20% less likely).

Table 3.9 shows analysis of the proposed determinants of expected longevity. While blacks do not have significantly different means of expected longevity (as compared to whites), being Hispanic reduces the mean expected probability of living to age 75 by 67%. While being in poor or fair health (compared to excellent health) negatively affects the individual's expected longevity, being in good to very good health does not significantly affect expected life expectancy. On the other hand, the objective measures of health weren't found to significantly affect expected longevity.

Table 3.6: Logit Regression Analysis of *Mammogram*: Key SES & Access Variables

Variable	Model 1	Model 2
Black	1.560(0.159)*	1.529(0.167)*
Hispanic	1.035(0.134)	0.974(0.135)
Expected Longevity (prob.)	–	1.112(0.151)
Age (years)	1.003(0.012)	0.999(0.012)
Income (\$10,000)	1.078(0.013)*	1.070(0.013)*
College	1.384(0.224)**	1.420(0.236)**
Less than High Sch	0.696(0.061)*	0.717(0.067)*
Married	1.389(0.118)*	1.484(0.132)*
Short time Horizon	0.756(0.067)*	0.717(0.066)*
Long time Horizon	1.121(0.164)	1.102(0.166)
Medicaid	1.287(0.188)	1.348(0.212)
Medicare	0.943(0.105)	0.963(0.115)
Employer Hlth Plan	1.384(0.120)*	1.456(0.132)*
Other Hlth Ins.	0.988(0.109)	1.048(0.121)
Observations	4028	3731

Odds ratios are shown with standard deviations in parentheses.

* Significant at the 1% level.

** Significant at the 5% level.

Table 3.7: Logit Regression Analysis of *Pap Smear*: Key SES & Access Variables

Variable	Model 1	Model 2
Black	1.477(0.144)*	1.425(0.148)*
Hispanic	1.150(0.147)	1.107(0.151)
Expected Longevity (prob.)	–	1.325(0.173)**
Age (years)	0.962(0.011)*	0.960(0.011)*
Income (\$10,000)	1.061(0.011)*	1.058(0.012)*
College	1.299(0.194)	1.283(0.195)
Less than High Sch	0.714(0.061)*	0.726(0.065)*
Married	1.249(0.102)*	1.286(0.109)*
Short time Horizon	0.894(0.078)	0.875(0.079)
Long time Horizon	1.364(0.195)**	1.286(0.187)
Medicaid	1.089(0.154)	1.031(0.157)
Medicare	0.926(0.099)	0.936(0.107)
Employer Hlth Plan	1.244(0.102)*	1.263(0.108)*
Other Hlth Ins.	1.199(0.131)	1.220(0.138)
Observations	4025	3728

Odds ratios are shown with standard deviations in parentheses.

* Significant at the 1% level.

** Significant at the 5% level.

Table 3.8: Logit Regression Analysis of *All Three Procedures*: Key SES & Access Variables

Variable	Model 1	Model 2
Black	1.815(0.166)*	1.786(0.173)*
Hispanic	0.922(0.118)	0.901(0.124)
Expected Longevity (prob.)	–	1.280(0.162)**
Age (years)	0.981(0.011)	0.982(0.011)
Income (\$10,000)	1.013(0.006)**	1.011(0.006)
College	0.875(0.112)	0.883(0.114)
Less than High Sch	0.863(0.073)	0.914(0.082)
Married	1.316(0.102)*	1.324(0.107)*
Short time Horizon	0.792(0.069)*	0.799(0.072)**
Long time Horizon	1.207(0.149)	1.183(0.150)
Medicaid	1.026(0.149)	1.049(0.164)
Medicare	1.015(0.108)	0.985(0.113)
Employer Hlth Plan	1.066(0.081)	1.084(0.085)
Other Hlth Ins.	1.138(0.116)	1.169(0.123)
Observations	4019	3723

Odds ratios are shown with standard deviations in parentheses.

* Significant at the 1% level.

** Significant at the 5% level.

Table 3.9: Logit Regression Analysis of *Expected Longevity*

Variable	Odds Ratio	Std. Dev.
Black	1.089	0.519
Hispanic	0.331*	0.129
Age (years)	0.982	0.049
Poor Health	0.135*	0.094
Fair Health	0.178*	0.094
Good Health	0.442	0.205
V. Good Health	1.168	0.580
Had Cancer	0.847	0.195
Heart Problem	0.924	0.174
Lung Disease	1.152	0.271
Psych Problems	0.768	0.140
High Blood Pressure	0.918	0.064
Diabetes	0.929	0.085
Back Problems	0.964	0.151
Depression	0.586	0.207
Had Stroke	0.949	0.128
Arthritis	0.993	0.085
Income (\$10,000)	1.031	0.042
Observations	3887	-

* Significant at the 1% level.

** Significant at the 5% level.

3.4 Discussion

Several studies across disciplines have sought to identify the contributing factors to apparent racial disparities in health care usage. Yet, few have sought to describe the relative contributions of each of the proposed determinants. That said there also exists theoretical and empirical studies that suggest that initial health stock (as can be proxied by expected longevity) is a determinant of health investment (health care usage). The purpose of this chapter was to suggest and test whether or not racial disparities in expected longevity might be a contributing factor to racial differences in health care utilization.

The results overall show that for all the cancer screening usage measures used, black women are more likely to use than caucasians. However, Hispanic usage rates for the most part are not significantly different from those of whites. The key explanatory variable, expected longevity did for the most part directly affect usage consistent with the theory that higher health stock increases the likelihood of investing in preventive health services. Notably, the addition of expected longevity (when moving from *Model 1* to *Model 2*) did slightly dampen the strongly positive effect of being black on cancer screening. This might have suggested that expected life expectancy played a role in the differences in usage found. However, in the analysis that looked at the determinants of expected longevity, while we would expect a positive effect of being black on expected longevity, the effect though positive (odds ratio was greater than 1), was not significant. On the other hand, this analysis yielded a strongly negative and significant effect of being Hispanic on expected longevity. These findings altogether thus suggest that though expected longevity itself might be a predictor of usage, differences in it across races do not significantly contribute to the racial disparities in cancer screening observed in the dataset.

Socioeconomic and access variables also played a role in affecting usage in some of the results where for the most part, those with a relatively advanced education went for screening. Higher income levels, consistent with theory were also seen to positively affect usage rates. In terms of other access variables, only those with an employer based health plan seemed to be enabled to go for cancer screening. This may speak to the better quality of the plan compared to being under medicare or medicaid (or being uninsured) as suggested earlier.

One obvious limitation of this analysis is the fact that the dataset includes a specific demographic (women between the ages of 55 and 65). This hence makes it difficult to generalize the results found, to all age groups and/or genders. For example, it might be the case that younger age groups have more varied expected life expectancies even across races than the current sample. Also, women and men historically have had differing views and usage patterns of health care, making generalizing across genders infeasible. Future work should hence focus on obtaining a dataset with more age variation and use usage variables that are gender neutral. Also, as using an expected probability to proxy for expected longevity (life expectancy) could prove problematic for a measure that is usually in years, data on the actual expected years of life should be sought out¹¹. Nevertheless, this analysis hopes to encourage

¹¹Picone et al. (2004) try to get around this problem by calculating expected longevity as the probability of

researchers to explore the role that expected future payoffs might play in the racial divide in health care usage, with the view of identifying its relative importance with respect to the other contributing factors.

living to age 75 multiplied by the number of years to 75. To avoid having to multiply the difference in years by probability values of 0 and 1 however, they assumed the expected probability followed a Weibull distribution [39].

Chapter 4

Conclusion

Countless studies have documented the existence of disparities by race and ethnicity in the health care system in the United States. While the evidence in support of such disparities is strong, less is known about the relative importance of factors that have been studied to describe, explain, and/or predict utilization differences between race/ethnic groups. This dissertation thus sought to identify the major causes of disparities in health care usage by employing an adaptation of the Blinder/Oaxaca decomposition method originally used in the literature on wage differentials.

Specifically, this study sought to investigate the roles that racial differences in patients' perceptions of care and expected longevity (as they relate to expected gains) might play in the observed disparities in usage. Perceptions of care measures (trust and fear/dislike) were used to investigate the importance of the doctor-patient relationship in determining usage disparities through its effect on expected gains. Expected longevity was used as the length of time that someone expects to live would affect how willing they are to invest in anything with payoffs derived in the future. Thus, if expected net payoffs/gains of utilizing health care are positive, the individual would use care.

Results show that while expected longevity was found to positively affect whether or not someone utilizes care, it was not a contributing factor to the racial divide in usage. However, when exploring the role of perceptions of care, while the differences in utilization rates between whites and minorities were due mainly to unobserved factors peculiar to each racial/ethnic group, perceptions of care disparities also played a major role in addition to socioeconomic and access factors. These results, while encouraging the need for further analysis into what drives usage disparities by race, point out that the doctor-patient relationship (apart from SES and access issues) should also be considered as a possible contributor to racial/ethnic disparities in usage.

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