
UNIVERSITY OF NORTH TEXAS
HEALTH SCIENCE CENTER AT FORT WORTH
1970

Wittenmyer, Brian F., A Study of Disparities in the Receipt of Anti-Retroviral Drugs, Health Status, and Insurance Coverage among a Sample of HIV-Positive Adults. Master of Public Health (Health Management and Policy), December 2006, 88 pp., 8 tables, references, 32 titles.

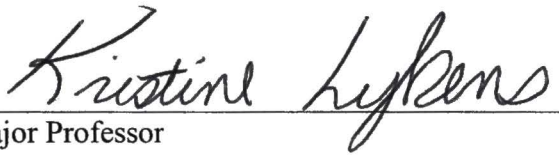
Anti-retroviral medications (ARVs) are effective at treating HIV/AIDS. Medicare, Medicaid, and ADAP are public programs that supply ARVs to needy patients in the U.S. Studies have documented disparities in AIDS incidence/prevalence, insurance, and ARV-use.

The study described demographic, clinical, and insurance characteristics of a sample of HIV+ persons. The study explored relationships between AIDS diagnosis, health status, and ARV- receipt and demographic, insurance, and clinical variables. Disparities in ARV-receipt, AIDS diagnosis, and health-status were found for gender, age, race, geographic region, and SES. Policy recommendations included: shortening the disability waiting-period for Medicare-eligibility, and relaxing Medicaid's income-eligibility requirements.

A STUDY OF DISPARITIES IN THE RECEIPT OF ANTI-RETROVIRAL DRUGS, HEALTH STATUS, AND INSURANCE COVERAGE AMONG A SAMPLE OF HIV-POSITIVE ADULTS

Brian F. Wittenmyer, B.A.

APPROVED:



Major Professor

Committee Member

Committee Member

Department Chair

Dean, School of Public Health

A STUDY OF DISPARITIES IN THE RECEIPT OF ANTI-RETROVIRAL DRUGS, HEALTH STATUS, AND INSURANCE COVERAGE AMONG A SAMPLE OF HIV-POSITIVE ADULTS

THESIS

Presented to the School of Public Health

University of North Texas
Health Science Center at Fort Worth

in Partial Fulfillment of the Requirements

for the Degree of

Master of Public Health

By

Brian F. Wittenmyer, B.A.

Fort Worth, Texas

December 2006

ACKNOWLEDGEMENTS

I dedicate this thesis to my wonderful wife, Ghazala. Without her unconditional love, support, and encouragement, I could not have finished this thesis and earned my Master of Public Health degree. I give my love and thanks to my family for their constant and unconditional love and support: my dear parents, Margaret and Eugene Wittenmyer; my Grandmother, Oleta Wittenmyer; and my siblings, Jeff and Leslie Wittenmyer. I also give my love to the entire Ansari and Kazi clans, of which I am very proud to be a member. Most importantly, I give my thanks to God. Without God's grace, I could not have completed my thesis and graduate school.

I extend my warm thanks and gratitude to my thesis committee. My major professor and committee chair, Kristine Lykens, Ph.D., showed me unwavering patience, faith, reassurance, and guidance throughout the entire process. Jeffrey Talbert, Ph.D., and Tim Strawderman, Ph.D., showed me much support and guidance in this quest.

I thank all my professors at the School of Public Health for imparting to me their knowledge and guidance. I give thanks to Chieh-Wen "Ed" Hsu, Ph.D., for his wisdom, knowledge, and support and for my first public health job as a graduate research assistant.

My friends deserve heartfelt recognition. I owe special words of gratitude to Avi Raphaeli, Ph.D., for his friendship and guidance. Dr. Raphaeli pointed me in the direction of the public health field and encouraged me to attend graduate school. I wish to thank my dear friends Linda and John Fosseen, Pete and Jeane Fahrenthold, Prauttus Samuel, and Malik and Jamila Mainor for all their love, friendship, and support.

TABLE OF CONTENTS

LIST OF TABLES

Table

CHAPTER I

INTRODUCTION

Rationale

HIV and AIDS have become a serious public health problem in the United States since the HIV virus was first identified in 1981. Before the mid-1990s, treatments were largely ineffective at slowing or preventing the progression of HIV infection to AIDS or restraining high mortality rates. According to the Centers for Disease Control and Prevention [CDC] (2001), during the first two decades of the HIV epidemic (1981-2000), 774,467 people were reported to have developed AIDS. By December 2000, some 448,060 persons had died of AIDS, and 322,865 were living with the disease. The number of new AIDS cases and AIDS deaths decreased significantly after the mid-1990s, after the introduction of effective, multi-drug treatment regimens (CDC, 2001).

Anti-retroviral (ARV) therapy has been shown to be effective at slowing the progression of HIV infection to AIDS (CDC, 2001; Frey, 2002). Intensive ARV-drug therapy, known as Highly Active Anti-Retroviral Therapy (HAART) consists of treatment with two or more classes of anti-retroviral drugs. Multiple-drug therapy has been demonstrated to be effective in the face of drug-resistant strains of HIV (Frey, 2002).

There are three main classes of anti-retroviral agents: reverse transcriptase [RT] inhibitors, protease inhibitors [PI] (Frey, 2002; National Institutes of Allergy &

Infectious Diseases [NIAID], 2006), and fusion inhibitors (NIAID, 2006). There are two types of RT inhibitors: nucleoside analogs (nucleoside/nucleotide reverse transcriptase inhibitors) [NRTI] and non-nucleoside reverse transcriptase inhibitors [NNRTI] (Frey, 2002). Fusion inhibitors are the newest class of anti-retroviral agents and were approved in 2006 (NIAID, 2006). Treatment guidelines change frequently, and a detailed discussion of appropriate treatment regimens is outside the scope of this thesis. A brief description of ARV treatment may be found in Chapter II of this report.

Anti-retroviral therapy is costly (Henry J. Kaiser Family Foundation [KFF], 2000a; KFF, 2000b; KFF, 2006). Three main government-financed programs provide healthcare, including anti-retroviral treatment, to HIV-positive persons: Medicare (KFF, 20006), Medicaid (KFF, 2000b), and the AIDS Drug Assistance Program (ADAP) (KFF, 2000a). Medicaid is the largest provider of the three programs, spending more on HIV-care than the combined total of spending by Medicare and the ADAP programs (KFF, 2000b). Medicaid and Medicare are entitlement programs, meaning that all eligible applicants receive coverage and assistance. ADAP is an assistance program, and not every eligible applicant may receive care (KFF, 2000a).

Much research has been devoted to examining the dynamics of disparities for medical treatment (availability, usage levels, and adherence), health outcomes, and health status, for a number of disease conditions, according to several socio-economic and cultural factors. Discerning the relationships between these factors and health is complicated by disagreements among researchers over which phenomena are truly measured (Turnock, 2001) and the proper means to measure these phenomena. Social

position is commonly measured by socio-economic status (SES) and poverty. Evidence suggests that a person's position in society has a broad influence on his or her health. Education is a factor that has been associated with SES (Turnock, 2001).

Several studies have confirmed the existence of disparities in the use of anti-retroviral medications in the United States, in the context of factors such as race/ethnicity, socio-economic status, insurance status, gender, and educational attainment. Sambamoorthi, Moynihan, McSpiritt, and Crystal (2001) found differential patterns in HAART use according to race/ethnicity, age at time of AIDS diagnosis, stage of illness, vital status (whether the person was alive or dead), and whether the person had Medicare coverage. Sambamorthi (2001) found that Non-Hispanic Blacks and Latinos were less likely to receive at least one ARV prescription during the study period, 1996-1998. Age was found to be a factor in ARV receipt, as persons aged 30 $\leq$49 were more likely to receive ARV drugs than persons in the other age groups. Persons with primary Medicare coverage were twice as likely as Medicaid-only recipients to receive HARRT (Sambamoorthi et al., 2001).

Anderson and Mitchell (2000) found that the receipt of ARV drugs varied according to race/ethnicity and gender. Non-Hispanic Blacks were less likely to receive multi-drug therapy than Non-Hispanic Whites, while Hispanics were more likely to receive HAART than Non-Hispanic Whites. This finding is important, because HIV-positive persons who receive HAART live longer than those persons who do not receive such therapy (Anderson & Mitchell, 2000). Geographic region within the United States has also been associated with receipt of ARV medications, as persons from Southern

states were less likely to have received ARV treatment as residents of a Northeastern state (Shapiro, Morton, McCaffrey, Senterfitt, Fleishman, Perlman, Athey, et al., 1999).

Several studies have concluded that SES is an important factor in access and receipt of treatment for HIV/AIDS. One study found that the fulfillment of basic survival needs present barriers to health care access for HIV-positive persons and act independently of barriers to care within the healthcare system (Cunningham, Andersen, Katz, Stein, Turner, Crystal, Zierler, et al., 1999). Competing subsistence needs included: healthcare; food, shelter, and housing; transportation; and employment. Persons who had one or more competing subsistence need were 50% more likely to not receive ARV medicines and were three times as likely to report low access to healthcare as those with no competing subsistence needs (Cunningham et al., 1999). Educational attainment is a factor that is often associated with SES (Pearce & Smith, 2003; Turnock, 2001). Persons who had possessed the highest levels of education were more likely to receive HAART than those with lesser amounts of education (Shapiro et al., 1999).

Three studies found differences in the use of healthcare by HIV-infected persons with different types of health insurance coverage. Smith and Kirking (2001) found that changes in insurance coverage were a factor in the receipt of ARV medications. Persons who were uninsured, lost coverage, and recently gained coverage used ARV drugs less than those persons remained insured (Smith & Kirking, 2001). Shapiro et al. (1999) examined data from the HIV Cost and Services Utilization Study (HCSUS) and found that persons with Medicare coverage were more likely to have received anti-retroviral therapy than those persons with Medicaid coverage. Another study examined access and

receipt of ARV medications by Medicaid and ADAP participants in California, New York, Florida, and Texas (Kahn, Zhang, Cross, Palacio, Birkhead, & Morin, 2002). Kahn et al. (2002) found that approximately twice as many Medicaid participants had AIDS as those enrolled in ADAP. Non-Hispanic Blacks were more likely to receive ARV medications through participation in Medicaid than in ADAP, while Non-Hispanic Whites were more likely to access these drugs through ADAP than Medicaid. Hispanics were more likely to access ARV medicines through ADAP, except in New York-state, where they were more likely to access these medicines through Medicaid (Kahn et al., 2002). Kahn et al. (2002) found that between race/ethnicity differences were slight and displayed an inconsistent pattern.

Statement of Purpose

The purposes of this study are four-fold. The first purpose is to describe the characteristics of the study sample in terms of several demographic, clinical, and health-insurance characteristics. The second purpose of the study is to research potential relationships between three dependent variables (diagnosis of AIDS, health-insurance status, and receipt of anti-retroviral medications) and several independent variables, relating to demographic characteristics of the study sample, insurance status, and overall-health status. The third purpose is to discuss the results, significance, and potential impact of the study for public health. Fourth, the study shall include appropriate policy recommendations and suggestions for further research.

Research Questions

Question 1

What are the characteristics of the study sample, in terms of demographics, overall-health status, access to ARV medications, and health-insurance status?

Question 2

Are there disparities in the receipt of anti-retroviral (ARV) medication and AIDS prevalence, in terms of demographic, insurance-status, and health-related (clinical) variables?

Question 3

What are the characteristics of the Medicaid program and the AIDS Drug Assistance Program (ADAP) in Texas, New York, and Florida? What are the characteristics of the federal Medicare program? What lessons could be learned from a comparison of these programs?

Question 4

What policy recommendations could be made (if any) concerning potentially effective roles for publicly-financed, state-level health assistance programs (Medicaid and ADAP) and the federally-funded, national-level health insurance program, Medicare?

Importance of Study

Disparities in HIV-prevalence and ARV-use are well documented in the literature. This report seeks to document these disparities for the sample of respondents in the HIV Cost and Services Utilization Survey (HCSUS) and make potentially useful recommendations for government policies to remediate these disparities.

Delimitations

The study employed an analysis of data that were drawn from the HIV Costs and Services Utilization Study (HCSUS). The HCSUS was a nationally representative study of persons who were receiving care for HIV disease/AIDS. The HCSUS was funded through a joint agreement between the Rand Corporation and the U.S. Agency for Healthcare Research and Quality (AHRQ). The HCSUS was conducted by a consortium of public and private institutions and centered at the Rand Corporation (AHRQ, 1998; Rand Corporation, 2005). The public release of the HCSUS data set contains only de-identified data. There are no data in this release that could provide indication of a participant's identity.

Limitations

The current study has a number of limitations. First, the HCSUS did not sample prisoners, military personnel, persons receiving inpatient care, and persons receiving care from emergency departments. The results of the current study may not be representative of the entire HIV-population for this reason. Second, the HCSUS did not sample persons from Alaska, Hawaii, Puerto Rico, and the remainder of the U.S. territories and possessions. The HCSUS data are not applicable to these regions. Third, for some variables in the HCSUS data set, the values for some variables may logically contradict the values for other variables. For instance, a respondent may have been listed as a female for the gender variable and as a gay male for other variables that contain data on sexual orientation and means of transmission (HCSUS, 2000). Fourth, the HCSUS was designed to be representative of the entire population of HIV-positive persons in the

United States. The HCSUS contains data on 2,864 persons. The HCSUS project team created statistical weights in order to make the results of analysis nationally representative. The current study did not employ these analytical weights, and the results of the study may not be representative of the entire population of HIV-positive persons in the U.S.

Definition of Terms

Acquired Immunodeficiency Syndrome: See *AIDS.*

Acute HIV infection: phase of HIV infection that is characterized by a high level of viral production and mononucleosis-like symptoms, e.g. fever, sore throat, rash, general malaise, lymphadenopathy, diarrhea, etc.

Acute retroviral syndrome: group of symptoms that resemble mononucleosis infection. These symptoms are the first indication of HIV infection in 50-70% of all HIV patients and in 45-90% of women.

ADAP: AIDS Drug Assistance Program. ADAP programs are operated by each U.S. state and are funded, in part, under Title II of the Ryan White Care Act. ADAP provides therapeutic medications and associated devices to eligible persons and primarily serves low-income populations.

AIDS: Acquired Immunodeficiency Syndrome is a highly infectious disease caused by the human immunodeficiency virus (HIV). AIDS is the most advanced and severe stage of HIV-infection. HIV infection may have a long latency period, without recognizable symptoms, after initial exposure to the virus. AIDS is characterized by a drop in levels of immune cells, such as T cells (CD4 cells), and opportunistic infections and cancers. AIDS is defined in a person if one of the following is present: CD4-cell count < 200/μL and acute (primary) or asymptomatic HIV infection and without an AIDS-defining condition; CD4-cell count < 200/μL and symptomatic without an AIDS-defining condition; CD4-cell count of any number of cells and an AIDS-defining condition.

Agency for Healthcare Research and Quality: AHRQ. A federal agency, based in Rockville, MD, that is part of the U.S. Department of Health and Human Services (DHHS). The AHRQ is the primary health services research branch of the DHHS, performing research into healthcare quality, safety, outcomes, effectiveness, delivery, costs, and sources of payment.

AHRQ: See *Agency for Healthcare Research and Quality.*

AIDS Drug Assistance Program: See *ADAP.*

Anti-retroviral medication: antiviral agent that interferes with a retrovirus's ability to replicate or enter the host cell.

ART: anti-retroviral therapy. Anti-retroviral therapy involves the use of anti-retroviral medications to treat a viral infection.

ARV: anti-retroviral.

CD4: protein found in human blood that is located on 65% of immune cells. HIV infects immune cells with the CD4 protein on their surfaces.

CD4 lymphocyte: See *T cell.*

Centers for Disease Control and Prevention: CDC. A federal agency, based in Atlanta, GA, that is part of the U.S. Department of Health and Human Services (DHHS). The CDC is the primary agency that gathers and disseminates epidemiologic and health-related data in the United States.

CDC definition of AIDS: CD4-cell count of less than 200 cells per μL.

Centers for Disease Control and Prevention: See *CDC.*

Demographic characteristics: qualities that describe and relate to human populations and population segments (e.g., gender, age, race/ethnicity, marital status, occupation, educational attainment, sexual orientation, geographic location of residence, etc.).

Dx: medical shorthand for "medical diagnosis."

Fusion inhibitor: class of anti-retroviral agents that interferes with the HIV virus's ability to enter the host cell.

HAART: highly active anti-retroviral therapy. HAART is a treatment strategy that employs two or more different classes of anti-retroviral drugs. This treatment often is used to treat patients with a drug-resistant strain of the HIV virus.

HCSUS: See *HIV Cost and Services Utilization Study.*

HIV: Human Immunodeficiency Virus, the infectious retrovirus that causes AIDS in humans. There are two types of HIV: HIV-1 and HIV-2. HIV-1 was discovered in 1981 and is found primarily in North and South America, Europe, Asia, and most of Africa. HIV-2 was discovered in 1986 and is found principally in West Africa. HIV-2 is less virulent than HIV-1 and may have a longer latency period.

HIV Cost and Services Utilization Study: nationally representative study of HIV-positive persons in the 48 contiguous United States and Washington, DC. The HCSUS was conducted by a consortium of federal government agencies, research institutions, and private organizations, centered at the Rand Corporation. More information may be

obtained from the Agency for Healthcare Research and Quality (AHRQ) and the Rand Corporation.

Immunodeficiency: a medical condition characterized by a damaged, weakened, or improperly functioning immune system. Immunodeficiency may be innate (congenital), acquired, or induced and results in an inability to develop a normal immune response.

Latency period: period of time between infection or exposure to a disease-causing organism or agent and the onset of disease.

Lymphocyte: white blood cell-type that aids in antibody formation. Levels of lymphocytes are used as markers of a patient's health.

Medicaid: mixed federal-state assistance program that finances medical care and long-term care for poor and indigent populations.

Medicare: federal health-insurance program that finances healthcare for elderly and disabled populations.

MSM: men having sex with men.

Non-nucleoside reverse transcriptase (RT) inhibitor: one of a class of anti-retroviral medications that interfere with the function of reverse transcriptase.

Nucleoside analogue: one of a class of anti-retroviral agents that interfere with HIV's ability to synthesize DNA. Nucleoside analogues are also referred to as "nucleoside/nucleotide (RT) inhibitor."

Opportunistic infection: infection caused by an organism that takes advantage of a weakened immune system. Opportunistic infections do not normally cause infection in persons with healthy immune systems.

PLWHA: person living with HIV and AIDS.

Protease inhibitor: one of a class of anti-retroviral agents that blocks the action of the enzyme protease, preventing the replication of the HIV virus.

Protease: any of a group of enzymes that act as catalysts in the breakdown of peptides or amino acids, the building blocks of RNA and DNA.

Retrovirus: virus that contains the enzyme reverse transcriptase, which allows the virus to replicate within the host cell.

Reverse transcriptase: reverse transcriptase is an enzyme necessary for a retrovirus to convert viral RNA to viral DNA, thereby replicating its genetic code.

Seroconversion: development of antibodies in the blood as a result of immunization or infection.

Symptomatic HIV infection: stage of HIV infection in which symptoms have begun to present, but AIDS has not developed.

T cells: lymphocytes, originating in the thymus gland, that regulate the immune system's destruction of infectious agents. CD4 lymphocytes are a subgroup of T lymphocytes. T cells are often referred to, simply, as "T lymphocytes."

Viral load: level of detectable viruses in a person's blood, expressed as x/mm^3.

Virus: any of a number of simple submicroscopic parasites of plants, animals, and bacteria that cause disease. A virus is essentially a core of RNA or DNA that is surrounded by a protein coat. Viruses cannot replicate on the own and must replicate inside a host cell. Viruses generally are not considered to be living organisms.

CHAPTER II

LITERATURE REVIEW

Since HIV was first identified in 1981, HIV-virus infection and AIDS, the most severe form of the infection, have become a major public health problem in the United States. Until the first anti-retroviral therapies became available in the mid-1990s, treatment of AIDS was largely ineffective at limiting the high rates of fatality and progression of HIV infection to AIDS (CDC, 2001). Nucleoside analogs were the first class of anti-retroviral medications to be developed (Frey, 2002). Nucleoside analogs, such as AZT, provided some early treatment success (CDC 2001). The introduction of protease inhibitors initiated the use of multi-drug treatment of AIDS (Sambamoorthi et al., 2001). Highly active anti-retroviral therapy (HAART) reduced the staggering death toll from AIDS (CDC, 2001) and delayed what had been, heretofore, a looming and imminent death. There currently is no cure for HIV infection and AIDS (NIAID 2006), though recent medical treatments have been successful at relieving symptoms, prolonging life, and combating opportunistic infections (Frey, 2002).

For the period June 1981 to December 2000, the number of HIV and AIDS cases and fatalities sharply increased during the decade of the 1980s, peaked in the early 1990s, and then exhibited a decline. The greatest impact of the epidemic was among men who have sex with men (MSMs) and racial/ethnic minorities. Increases in cases were observed for women and heterosexuals. AIDS prevalence was observed to increase,

though fatalities decreased. The trends in the HIV epidemic at that time indicated that prevention activities would be necessary in order to control the epidemic among MSMs, women, and intravenous drug users (IDUs) (CDC, 2001).

For the period June 1981 through December 2000, 774,467 persons were reported to have AIDS and 448,060 had died. In December 2000, there were a total of 322,865 persons with AIDS. Of these cases, 79% were male, 61% were Non-Hispanic Black or Hispanic, and 41% were MSMs. Furthermore, the cumulative incidence (774,467) of the epidemic up to that time may be divided into three equal parts. One-third of cases were reported from 1981 through 1992, one-third from 1993 to 1995, and the last third from 1996-2000. HAART was introduced in the mid-1990s (CDC, 2001), corresponding roughly to the border between the second and third divisions of reported cases for the period. This provides an indication of a leveling-off of AIDS mortality, as there was the same number of mortalities in five years (1996-2000) as there was in three years (1993-1995).

The incidence of AIDS showed a rapid increase throughout the 1980s, reached a high-point in the early 1990s, and declined through the remainder of the decade. According to the CDC (2001), the peak in incidence was associated with the change in the AIDS surveillance case definition, which was made in 1993. After the introduction of HAART in 1996, sharp declines in incidence and mortality were reported. Between 1998 and June 2000, AIDS incidence and deaths plateaued, and prevalence increased (CDC, 2001).

The CDC (2001) states that from 1981-2000, 85% of AIDS diagnoses were among persons aged 20-49 years of age. AIDS also affects some segments of the American population more than others. In the early 1980s, most AIDS incidence was among the white population. Through the 1980s, the incidence in Non-Hispanic Blacks rose consistently. By 1996, Blacks accounted for more new cases of AIDS than any other racial/ethnic group. The most common modes of exposure, from 1981 to 2000, were MSM (46%), intravenous (IV) drug use (25%), and heterosexual contact (11%). Beginning in 1996, the declines in incidence for MSMs and IV drug use were greater than for heterosexuals (CDC, 2001).

Women are at a disproportionately high risk of developing AIDS. Women, who are exposed to HIV through heterosexual contact, are the fastest-growing risk group in the United States. The percentage of total AIDS cases that are found in women has increased throughout the epidemic. In 1985, 7% of AIDS cases were women, while 23% were women in 1999. Furthermore, women with AIDS may not live as long as men, though the reasons for this are unclear (Frey, 2002).

HIV is a retrovirus, meaning that it uses the enzyme *reverse transcriptase* in the replication of its genetic code (Frey, 2002). There currently is no cure for HIV infection (NIAID, 2006), though effective anti-retroviral treatments have been available since the mid-1980s (CDC, 2001; NIAID, 2006). Anti-retroviral treatments are disease-fighting agents that interfere with an aspect of a retrovirus's infection and replication process. Presently, there are three main classes of anti-retroviral agents: reverse transcriptase (RT) inhibitors, protease inhibitors (PI), and fusion inhibitors. Each class of anti-retroviral

agent operates on a different mechanism of HIV functioning. Reverse transcriptase inhibitors and protease inhibitors prevent HIV from replicating (Frey, 2002; NIAID, 2006). Fusion inhibitors prevent the HIV virus from adhering to a cell. Such an action prevents the virus from entering and infecting the cell (NIAID, 2006).

The U.S. Department of Health and Human Services (DHHS) recommends that anti-retroviral therapy should be initiated in all HIV-positive persons with "acute HIV syndrome," within at least six months of HIV seroconversion, and anyone with a clinical diagnosis of AIDS or symptomatic HIV infection (Evering, Kaswan, & Minamoto, 2003). Anti-retroviral therapy has been shown to effectively retard the progression of HIV to AIDS. Studies have shown that HAART, employing two nucleoside analogues and one protease inhibitor or non-nucleoside reverse transcriptase inhibitor, greatly decreases viral load, increases CD4-cell counts, and slows the progression of HIV infection to AIDS (Deeks, Smith, Holodny, & Kahn, 1997; Palella, Delaney, Moorman, Loveless, Fuhrer, Satten, Aschmanet, D.J., et al., 1998). Clinical guidelines for the treatment of adult HIV infection recommend the initiation of anti-retroviral therapy in patients whose CD4-cell counts are below 350/μL or whose viral loads are greater than 30,000 HIV-RNA-copies/μL (Panel on Clinical Practices for Treatment of HIV Infection, 2001; Carpenter, 2000). Research has shown that HAART and proper medical care have made AIDS a manageable, though incurable, disease (CDC, 1998; Panel on Clinical Practices, 1998).

Several factors have contributed to the current high incidence rates of HIV and AIDS. Current rates for HIV and AIDS are partly due to a new generation of MSMs

(CDC, 2001), who matured after the largely successful prevention efforts of the 1980s. Additionally, minority MSMs, especially Non-Hispanic Blacks, have become the most-affected population with HIV. Several socioeconomic-status (SES) and cultural factors have been associated with high-risk behaviors and act as barriers to the access of services for MSMs. These factors have included homophobia within the general population, high rates of poverty and unemployment, and lack of access to healthcare (CDC, 2001).

Several studies have confirmed the well-documented link between poor health and socioeconomic factors. Two studies documented the causal relationships between income inequality (LeClere & Soobader, 2000), education, area of residence, and occupation to poor health outcomes (Lynch & Kaplan, 2000). Furthermore, Cunningham et al. (1999) identified subsistence-economic barriers and competing subsistence needs that interfered with the receipt of adequate healthcare and attainment of the basic necessities for living. These barriers included not obtaining healthcare because of subsistence needs; postponing the seeking of care from a doctor because of lack of transportation, were too sick to visit the doctor, or could not obtain time-off from employment; and forgoing subsistence needs because of the necessity of obtaining healthcare (Cunningham et al., 1999).

Disparities in the availability, access, and clinical use of anti-retroviral medications have been documented (Karon, Rosenberg, McQuillan, Khare, Gwinn, & Petersen, 1996). Insurance status has been found to be a factor in access to healthcare services (Fleishman, Hsia, & Hellinger, 1994). Low-income, uninsured HIV-positive persons are less likely to receive HAART than those persons with private insurance or

higher incomes (Shapiro et al., 1999; Andersen, Bozzette, Shapiro, St. Clair, Morton, Crystal, Goldman, et al., 2000; Smith & Kirking, 2001). Smith and Kirking (2001) found that changes in health insurance coverage affected access and adherence rates for anti-retroviral drugs. No insurance coverage was associated with greatly reduced rates of the use of anti-retroviral medications. Both gaining and losing insurance coverage were associated to decreased use of anti-retroviral drugs, though there was a stronger association between the gaining insurance coverage and decreased use (Smith & Kirking, 2001). Cunningham, Hays, Williams, Beck, Dixon, and Shapiro (1995) found that the uninsured had lower access to healthcare than did those persons with Medicaid coverage. This result was especially true in terms of cost of purchasing healthcare services (Cunningham et al., 1995).

Several studies have indicated that race and ethnicity are factors that influence access to anti-retroviral therapy. One study (Kahn et al., 2002) examined the use of HAART in the Medicaid and ADAP programs in four states (California, Florida, New York, and Texas). Kahn at al. (2002) found that 78-88% of Medicaid enrollees had AIDS or were symptomatic of HIV, while 31%-48% of ADAP enrollees had AIDS or symptomatic HIV infection. Non-Hispanic Blacks were found to participate in Medicaid at rates above their representation in the HIV epidemic, but found to participate in ADAP at rates lower than their representation in the epidemic. Non-Hispanic Whites were found to participate in Medicaid at rates lower than their representation in the epidemic, while participating in ADAP at rates higher than their representation in the epidemic. Except in New York, Hispanics tended to participate in ADAP at rates higher than their

representation in the HIV epidemic. Kahn et al. (2002) found that between-group race/ethnicity differences in HAART-use were small and inconsistent, in relation to state. They concluded that Non-Hispanic Blacks were enrolled in Medicaid at a higher rate than they were enrolled in ADAP. This finding may represent differences in the programs' eligibility requirements and a tendency to receive treatment later in the progression of HIV to AIDS. Differences within individual state programs were small, with respect to race and ethnicity (Kahn et al., 2002).

The majority of HIV-positive persons depend upon public health insurance, and this is their main means of receiving care. The manner in which eligibility for public health insurance is structured in the United States produces a situation in which the level of coverage for which a HIV-positive person is eligible and may receive is tied to the progression of the disease (Goldman, Leibowitz, Joyce, Fleishman, Bozzette, Duan, & Shapiro, 2003). The three main public programs that provide medical care for HIV-positive persons are Medicare (KFF, 2006), Medicaid (KFF, 2000b), and the AIDS Drug Assistance Program (KFF, 2000a).

Medicare is the health insurance program funded and operated directly by the federal government. Medicare pays for the healthcare services for close to seven million permanently disabled Americans. Medicare represents an important means of attaining coverage for people living with HIV and AIDS who receive benefits through SSDI (Social Security Disability Insurance). Medicare spending on HIV care represents 26% of total spending on such care. Medicare covers anti-retroviral drugs through its Part D prescription drug benefit. In order to qualify for Medicare, people with HIV must survive

a 29-month waiting period. Three percent of Medicare recipients with HIV are over 65 years of age or older (KFF, 2006).

HIV-positive persons, who are under the age of 65, can qualify for Medicare if they meet a number of criteria. An under-age-65 person must be disabled with a condition that renders him or her unable to work for at least one year or that will ultimately result in their death. The person must have earned enough work-credits to qualify for SSDI payments and must wait 29 months before becoming eligible. Persons who suffer from End-Stage Renal Disease (ESRD) are automatically covered by Medicare, even if they are under age 65, and are exempt from the waiting period. 80% of HIV-positive individuals with Medicare coverage are under age 50, and close to 66% also had Medicaid coverage (KFF, 2006).

Medicare Part D provides prescription-drug coverage for HIV-positive persons. The rules of Medicare Part D require a covered person to pay 100% of the amount of his or her drug costs that exceed the plan's coverage gap amount, until the person reaches the level of catastrophic coverage. Medicare Part D also has very high requirements for cost-sharing. Many covered persons purchase their medications through ADAP assistance, Medicaid, or private health insurance coverage (KFF, 2006).

Approximately 100,000 persons with AIDS are covered by Medicare. Close to 65,000 of these persons also receive Medicaid assistance. Medicare beneficiaries with HIV differ from the larger HIV-positive population in several ways. Medicare's HIV-positive beneficiaries tend to be a little older, have a more advanced stage of HIV-infection, and be poorer. HIV-positive Medicare beneficiaries tend to be Non-Hispanic

Black, male, and younger than the larger population of Medicare beneficiaries (KFF, 2006).

Medicaid is a second major source of funding of anti-retroviral medications for HIV-positive persons. Medicaid accounts for 43% of total spending on HIV care and spends an amount on HIV-care that is larger than the combined spending by Medicare and the ADAP programs. Medicaid is a federal-state program that receives some funding, guidance, and requirements from the federal government, but that is administered at the state-level. Since Medicaid is managed at the state-level, there is a wide level of variation among state Medicaid programs (KFF, 2000b). Some states are more generous than other states in the benefits, cost-sharing, and coverage that they offer. This situation differs from the Medicare program, whereby residents of all states are eligible for the same level of coverage and services, all other factors being equal.

As with the Medicare program, individuals must meet certain qualifying criteria in order to receive Medicaid benefits. Federal requirements mandate the certain classes of people must be covered by Medicaid programs, including those persons who are disabled. Most HIV-positive persons who are covered by Medicaid are eligible because they also meet the income and disability requirements of the federal SSDI program. Other HIV-positive Medicaid beneficiaries may qualify through state-specific programs to aid the medically needy. Potential Medicaid beneficiaries may also qualify, if able-bodied, if they meet income or other program requirements (KFF, 2000b).

Fifty-five percent of adults with AIDS receive Medicaid services. Medicaid covers twenty-nine percent of the total HIV-positive population. An estimated 13-17%

of HIV-positive persons are dual enrollees and covered by both Medicare and Medicaid. HIV-positive women are more likely than adult males to have Medicaid coverage. All states offer prescription drug coverage to Medicaid recipients. Several states have placed limits on the number of prescriptions that a beneficiary may obtain in a single month. Additionally, many states now enroll beneficiaries in managed care plans (KFF, 2000b). Importantly, HIV-positive Medicaid beneficiaries tend not to be as healthy as their privately-insured peers (KFF, 2000b).

The third major publicly-financed means of provisioning medical care to HIV-positive persons are the AIDS Drug Assistance Programs. The ADAP programs provide medications to low-income, HIV-positive persons who are without healthcare insurance or without adequate insurance coverage. Each of the fifty U.S. states, Puerto Rico, Guam, and the U.S. Virgin Islands has an ADAP program. The ADAP programs began to provide drug assistance to HIV-positive persons in 1987, with the approval of AZT, the first anti-retroviral medication. The ADAP programs were incorporated into the Title II of the Ryan White Comprehensive Resources Emergency (CARE) Act of 1990 (KFF, 2000b).

ADAP programs are not entitlement programs, and each state or territory operates its program independently. Each program has its own requirements for eligibility and sets its own policies for which drugs it shall decide to cover. Because of the expensive nature of anti-retroviral medications, an increasing number of persons with AIDS turn to ADAP programs for financial assistance in purchasing their medications. Individuals must have little or no access to anti-retroviral medications and must meet income

requirements that can vary widely. ADAP programs differ, from state to state, in the number of drugs that they cover in their formularies. Since ADAP programs are not entitlement programs, their budgets are normally limited. Many state and territory ADAP programs have not been able to aid all eligible residents within their state or territory and have had to enact caps on enrollment (KFF, 2006).

CHAPTER III

DATA AND METHODOLOGY

Methodology

The aim of the study was to explore demographic characteristics, health and insurance disparities, and potential associations and relationships between clinical, health insurance, and demographic variables. The study sought to study disparities in AIDS prevalence, health-insurance status, and the receipt of anti-retroviral (ARV) medications. The demographic variables contained information on gender, age, race/ethnicity, education level, employment status, marital status, presence of children living in the home, income, degree of urbanization of a respondent's residential zip code, and healthcare provider's geographic region. The health insurance variables contained data on recent health insurance status (including the type of health insurance) and coverage under publicly funded AIDS Drug Assistance Program. The clinical variables contained data on clinical AIDS-status (e.g., did the person have AIDS?), overall composite-health status, and receipt of anti-retroviral medications. See Tables 1 and 2 for specific information on the values that each study variable may take.

Construction of the Overall Composite-Health Status variable

The *Overall Composite-Health Status (t-score)* variable is measured on a 100-point scale. This variable consists of the mean of a composite physical-health variable and a composite mental-health variable, each of which were scored on a 100-point scale. Ten individual factors, or "scale items," were used to create the individual composite mental and physical-health variables (HCSUS, 2000):

- number of days in bed because of poor health
- energy level
- positive effect
- freedom from anxiety
- freedom from depression
- general health
- freedom from pain
- physical functioning
- role functioning
- social functioning

For each factor, a weighted mean, standard deviation, and standard scoring coefficient were calculated. Each scale item was transformed into a z-score and multiplied by its standard scoring coefficient. Each composite score was calculated by summing the results of this process and transforming the sum into z-scores. *Overall*

Composite-Health Status (t-score) was created by calculating the mean of the two individual composite-health scores (HCSUS, 2000).

Population and Sample

The present study analyzed data from the HIV Cost and Services Utilization Study (HCSUS, 2000). The HCSUS was funded through a joint agreement between the Rand Corporation and the U.S. Agency for Healthcare Research and Quality (AHRQ, 1998). The HCSUS was conducted by a consortium of public and private institutions and centered at the Rand Corporation (AHRQ, 1998; Rand Corporation, 2005). "The HCSUS employed a multistage design in which the geographical areas, medical providers and patients were sampled" (HCSUS, 2000). The entire baseline study period lasted from January 1996 to April 1997 (Shapiro, 1999).

The following description, quoted from the HCSUS baseline documentation, defines the HCSUS study sample:

> The HCSUS cohort is a nationally representative probability sample of HIV-infected adults receiving care in the contiguous United States. For practical reasons, the reference population was limited to persons at least 18 years old with known HIV infection who made at least one visit for regular or on-going care to a non-military, non-prison medical provider other than an emergency department during a specified "population definition period" (HCSUS, 2000).

Protection of Human Subjects

The current study did not require the direct involvement or inclusion of any study subjects. The data analysis employed only secondary, de-identified data from the baseline survey of the unrestricted, public-use version of the HIV Cost and Services Utilization Study (HCSUS). There are no personally-identifying data or information that could provide any indication of a participant's identity.

The HCSUS data set does not contain data on children below 18 years of age, and children did not participate in the study (Rand Corporation, 2005). Each respondent was at least 18 years of age when interviewed. It must be noted that the first age category for the age variable has 17 years of age as its lower bound. Since the baseline data gathering period lasted from January 1996 through April 1997, the HCSUS staff calculated the age of each respondent on January 5, 1996, and used this age as the baseline age (HCSUS, 2000).

Data-Collection Procedures

The researcher's data-collection procedure consisted of the following activities. The HCSUS dataset was obtained from the Agency for Healthcare Research and Quality in December of 2004. The data were not analyzed or inspected in any manner until after the University of North Texas Health Science Center' Institutional Review Board approved the researcher's *Request for Exempt Status and Waiver of Informed Consent* in the spring of 2006. The data used for this study were gathered solely from the HCSUS baseline dataset on cd-rom. The variables of interest were subset into a secondary dataset for the analysis. All data collection and analysis were performed on the seventh floor of

the UNT HSC School of Public Health and at the researcher's residence. No persons besides the researcher viewed or analyzed any of the data from the HCSUS datasets, in accordance with the data-use agreement that was signed and submitted to the AHRQ in December of 2004.

Instrumentation

The data analysis was conducted with the following software packages, running under the Microsoft® Windows® XP operating system: SPSS® 14.0, SAS® 9.0, and STATA™ 9.1. The statistical tables were prepared using Microsoft® Word 2002, running under Microsoft® Windows® XP.

Data Analysis

The researcher employed a number of statistical procedures and tests on the variables. The continuous independent variable was *Overall Composite-Health Status (t-score).* Linear-regression analysis was performed and basic, descriptive statistics were calculated, including mean, median, mode, and standard deviation. Frequency counts, frequency percentages, cross-tabulations, and χ^2 were calculated and logistic regression was performed on the categorical dependent and independent variables. No new statistical procedures were invented or developed for this study. The two categorical dependent variables were: *Received Anti-Retroviral (ARV) Drugs in the Last 6 Months* and *Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx.* The thirteen categorical independent variables were:

- Covered by ADAP in the Last 6 Months
- Age

- Children ≤17 Living in Household
- Current Employment Status
- Education Level
- Gender
- Geographic Region
- 1995 Income Category
- Insurance Category in the Last 6 Months
- Relationship of Co-Inhabitant to Respondent
- Race/Ethnicity
- Sexual Orientation
- Percentage of Respondent's Zip Code in Urban Area (≥50,000)

CHAPTER IV

RESULTS

Introduction

The present study examined un-weighted, de-identified, secondary data from the public-use version of the HIV Cost and Services Utilization Study (HCSUS). The baseline data set contained 2,864 cases. All respondents were HIV-positive, though not all had been diagnosed with AIDS at baseline. Sixteen of the HCSUS core variables were analyzed. These variables contained data on the sample's demographic characteristics, overall composite-health status, receipt of anti-retroviral (ARV) medication treatment, and health-insurance status. In the Appendix, Table 1 and Table 2 present information on the values of the analysis variables. Tables 3 through 8 present detailed results of the statistical analyses: frequencies, percentages, cross-tabulations, linear regression, and logistic regression.

This chapter presents the findings for the following research questions. Four questions were posed in the context of access to anti-retroviral (ARV) medications and health insurance for HIV-positive adults, living within the continental United States and the District of Columbia.

Question 1

What are the characteristics of the study sample, in terms of demographics, overall-health status, access to ARV medications, and health insurance status?

Question 2

Are there disparities in access to anti-retroviral (ARV) medications and AIDS prevalence in terms of demographic, insurance-status, and health-related (clinical) variables?

Question 3

What are the characteristics of the Medicaid program and the AIDS Drug Assistance Program (ADAP) in Texas, New York, and Florida? What are the characteristics of the federal Medicare program? What lessons could be learned from a comparison of these programs?[1]

Question 4

What policy recommendations could be made (if any) concerning potentially effective roles for publicly-financed, state-level health assistance programs (Medicaid and ADAP) and the federally-funded, national-level health insurance program, Medicare? (See Chapter V: Discussion, Conclusions, and Recommendations.)

[1] This research question was not investigated, because the public-use version of the HCSUS dataset does not contain a state-level variable for a respondent's place of residence or the location of his or her healthcare provider. As originally envisioned, the state-level characteristics of the Medicare and ADAP programs were to be investigated for Texas, New York, and Florida. Additional data were to be gathered on the nature of each state's legislative and health-policy environments. These data were to be used to create policy variables. Last, statistical analyses were to be conducted to test for any potential relationships between the policy variables and whether a respondent had been diagnosed with AIDS, had received ARV medications, and his or her overall composite-health status.

Characteristics of the Study Sample

Clinical and Health-Status Variables

Table 3 contains frequencies and descriptive statistics for the study variables. The three dependent variables were the health-status and clinical variables: *Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx, Received Anti-Retroviral (ARV) Drugs in the Last 6 Months*, and *Overall Composite-Health Status (t-score)*. A majority (58.9%) of HIV-positive respondents had been diagnosed with AIDS, and an overwhelming number had received ARV drugs (81.8%). The composite-health variable had a mean score of 49.4803, median of 50.6092, standard deviation of 10.02648 and a range of 19.14 (minimum) to 66.46 (maximum). *Overall Composite-Health Status* was measured as a t-score, which was constructed from the mean of a composite physical-health t-score and a composite mental-health t-score. The overall composite-health t-score was weighted to a mean of 50.0 and weighted to a standard deviation of 10.0 (HCSUS, 2000). The remaining 13 variables were analyzed as independent variables. It should be noted that *Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx* and *Received Anti-Retroviral (ARV) Drugs in the Last 6 Months* were used as additional dependent variables to analyze *Overall Composite-Health Status (t-score)*.

Demographic and Insurance-Status Variables

The largest racial/ethnic group in the study population was Non-Hispanic White (48.8%), followed by Non-Hispanic Black (33.5%), Hispanic (14.9%), and Other (2.8%). The majority of respondents were male (70.4%). The majority of respondents were aged 35 ≤49 (53.7%), and slightly more than one-third were between the ages of 17 and 34

(37%). Fewer than 10% were aged 50 or above (9.3%). Similar numbers of respondents were homosexual (43.3%) and heterosexual (42.7%). Thirty-percent of respondents lived alone, 21.6% lived with a male partner, 10.6% lived with their spouse, 3% lived with a female partner, 1.2% were homeless, and 33.7% lived in another or unspecified type of living arrangement. The vast majority of respondents did not have children living at home (82.5%) and lived in a zip code that was very highly urbanized (84.2%).

Values for *Education Level* exhibited a roughly even distribution, as 25.2% lacked a high school diploma, 28.1% had completed high school, 28.3% had some college education, and 18.3% had at least a BA or BS degree. The income distribution was skewed toward the lower income-brackets: 61.8% earned $17,000 or less, and only 9.5% earned above $55,000. Close to one-half of respondents were disabled and did not work (48%), and 35.4% had at least some degree of employment. The majority of respondents resided in the Southern (32%) or Western (31.7%) regions of the U.S. One-quarter of respondents lived in a Northeastern state (24.7%), and 11.6% lived in the Midwest. (Please see Table 2 in the Appendix for a listing of the states included in each geographic region.) The vast majority of respondents did not receive ADAP assistance (90.6%). Close to one-third of respondents received Medicaid assistance (30.7%), 18.9% were without health insurance coverage, 28.7% had private insurance coverage, 3.5% had Medicare insurance, and 11.9% received both Medicaid and Medicare health benefits.

Analysis: ARV Drugs, AIDS Diagnoses, and Health Status

The data were examined to search for potential disparities in the receipt of ARV medications and AIDS diagnoses. The analyses consisted of cross-tabulations, chi-square

test, and logistic regression. Tables 4 and 5 display the results for the cross-tabulations and chi-square tests for the dependent variables *Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx* and *Received Anti-Retroviral Drugs in the Last 6 Months*, respectively. Tables 6 and 7 contain the results of logistic regression analysis for *Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx* and *Received Anti-Retroviral (ARV) Drugs in the Last 6 Months.*

Table 4 displays the cross-tabulations and results of the chi-square analysis of the dependent variable *Has AIDS, per CDC Definition (CD4 < 200) or AIDS* Dx. The chi-square analysis was used to examine the individual association between the independent variable and dependent variable. There were statistically-significant associations between AIDS status and all independent variables, except for *Geographic Region* and *Percent of Respondent's Zip Code in Urban Area. Relationship of Co-Inhabitant to Respondent* was significant at the $p \leq 0.05$-level ($p = 0.021$). The remaining independent variables were significant at the $p \leq 0.01$-level: *Race/Ethnicity* ($p = 0.000$), *Gender* ($p = 0.000$), *Age* ($p = 0.000$), *Children ≤17 Living in Household* ($p = 0.000$), *Educational Level* ($p = 0.005$), *1995 Income* ($p = 0.001$), *Current Employment Status* ($p = 0.000$), *Sexual Orientation* ($p \leq 0.000$), *Received Anti-Retroviral Drugs in the Last 6 Months* ($p = 0.000$), *Insurance Category in the Last 6 Months* ($p = 0.000$), and *Covered by ADAP in the Last 6 Months* ($p = 0.000$).

Table 5 displays the tabular results of the chi-square tests and cross-tabulations for the dependent variable *Received Anti-Retroviral (ARV) Drugs in the Last 6 Months.* There were statistically-significant associations between receipt of ARV drugs and all

independent variables, except for *Children ≤17 Living in Household, Geographic Region*, *Sexual Orientation*, and *Percentage of Respondent's Zip Code in Urban Area.* The results were significant at the $p \leq 0.05$-level for the following variables: *Relationship of Co-Inhabitant to Respondent* ($p = 0.027$) and *Current Employment Status* ($p = 0.033$). The results were significant at the $p \leq 0.01$-level for *Race/Ethnicity* ($p = 0.000$), *Gender* ($p = 0.000$), *Age* ($p = 0.000$), *Education Level* ($p = 0.001$), *1995 Income* ($p = 0.000$), *Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx* ($p = 0.000$), *Insurance Category in the Last 6 Months* ($p = 0.000$), and *Covered by ADAP in the Last 6 Months* ($p = 0.002$).

Table 6 displays the logistic regression results for the dependent variable *Received Anti-Retroviral (ARV) Drugs in the Last 6 Months*. The regression model has a -2 Log Likelihood value of 2425.179. The model correctly predicted 81.9% of the values of the dependent variable. For this analysis, only *Gender*, *1995 Income*, *Current Employment Status*, *Geographic Region*, and *Covered by ADAP in the Last 6 Months* had statistically significant relationships with the dependent variable. Females were 1.446-times as likely to have received ARV drugs ($p = 0.012$), all other variables held constant. Respondents in the following income categories were less likely to have received ARV drugs in the last six months: "$5,001 ≤10,000" ($OR = 0.250, p = 0.001$), "$10,001 ≤ 17,000" ($OR = 0.247, p = 0.001$), "$17,001 ≤25,000" ($OR = 0.308, p = 0.004$), "$25,001 ≤40,000" ($OR = 0.328, p = 0.006$), and "$40,001 ≤55,000" ($OR = 0.442, p = 0.038$). Respondents who were unemployed or laid-off were 0.600-times as likely to have received ARV therapy ($p = 0.014$). People who lived in the Western U.S. were 1.636-times as likely to have received ARV drugs ($p = 0.001$), all other variables held constant.

Respondents who were covered by ADAP in the last six months were 0.464-times as likely to have received ARV medications in the last 6 months ($p = 0.000$), all other variables held constant.

Table 7 displays the results of logistic regression for the dependent variable *Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx.* The regression model had a -2 Log Likelihood value of 3,257.648. The model correctly predicted 67.4% of the values of the dependent variable. Respondents aged 50 years or older were 1.430-times as likely to have an AIDS diagnosis than a member of another age group, all other variables held constant ($p = 0.022$). Westerners were 1.294-times as likely to have AIDS as were residents of other geographic regions, all other variables held constant ($p = 0.037$). Females were 1.719-times as likely to have AIDS as males, all other variables held constant ($p = 0.000$). Those following groups of respondents were less likely to have AIDS, all other variables held constant: "unemployed/laid-off" ($OR = 0.537, p = 0.000$) and "disabled/not-working" ($OR = 0.579, p = 0.008$). Those persons who were "not-working (other)/retired/not-looking" were 2.291-times as likely to have AIDS ($p = 0.000$). Those respondents who had ADAP coverage in the last six months were 0.539-times as likely to have AIDS, all other variables held constant ($p = 0.000$).

Table 8 displays the results of the linear regression analysis of the *Overall Composite-Health Status (t-score).* The linear regression model has an adjusted R^2 of 0.2210. All other variables held constant, the results indicated that non-Hispanic Blacks were healthier than non-Hispanic Whites ($\beta = 2.08725$; $p = 0.000$) and females were less

healthy than males (β = -1.010151; p = 0.043). For the *Age* variable, those respondents in the "35 ≤49" age-group were less healthy than those in the "17 ≤34" age-group (β= -1.144234; p = 0.002), and those persons in the "≥50" age-group were healthier than those respondents in the "17 ≤34" age-group (β = 1.276851; p = 0.053), all other variables held constant. Those persons who earned more than $75,000 were far healthier than those who earned less than $40,000 ($\beta$ = 3.751595; p = 0.003), all other factors held constant. Additionally, those respondents who received anti-retroviral drugs in the last six months were healthier than those persons who did not receive these medications (β = 1.068615; p = 0.020), all other variables held constant.

The linear regression model (Table 8) also produced statistically significant results for the following variables. When all other factors were held constant, those respondents who had earned a high school diploma (β = 0.9491396; p = 0.051), some college credit (β = 1.798541; p = 0.001), a BA or BS degree (β = 1.567396; p = 0.021), and a graduate or professional degree (β = 2.230459; p = 0.013) were healthier than those who had not completed high school. Persons who had been diagnosed with AIDS were less healthy than those persons who had not been diagnosed with AIDS (β = -1.942845; p = 0.000), all other variables held constant. Respondents, who were classified as working at least part-time or as having a job but not working (reference category), were healthier than those who were "unemployed/laid-off" (β = -2.952588; p = 0.000), "disabled/not-working" (β = -7.838077; p = 0.000), and "not-working (other)/retired/not-looking" (β = -2.981455; p = 0.000), all other factors held constant. When all other variables were held constant, those persons who had private health insurance were healthier than the

uninsured ($\beta = 1.1941$; $p = 0.052$), and respondents who lived with a male partner were less healthy than those who lived with their spouse ($\beta = -1.685728$; $p = 0.018$). The remainder of the variables had no statistically significant results.

CHAPTER V

DISCUSSION, CONCLUSIONS, AND RECOMMENDATIONS

Summary of Results

The results of logistic regression analysis of the dependent variable *Received Anti-retroviral (ARV) Drugs in the Last 6 Months* (Table 6) revealed that a number of demographic groups were more likely or less likely to receive ARV medications than other groups. Females were more likely than males to receive anti-retroviral drugs. In other words, there was a positive relationship between female gender and receipt of ARV medications. Respondents who earned $55,000 or less per year were less likely to have received ARV drugs than those persons who had no reported income. Those with no income may be classified as "destitute." Residents of Western and Southern states were more likely to have received ARV drugs than residents of Northeastern states. Persons who were covered by ADAP were less likely to receive ARV drugs than persons who were not covered by ADAP. The present study found a negative relationship between being unemployed/laid-off and receipt of ARV medications. Receipt of ARV drugs in the last six months was not associated statistically with race/ethnicity, age, relationship of respondent's co-inhabitant to the respondent, presence of children living in the home, education level, sexual orientation, degree of urbanization of a respondent's zip code, and type of insurance coverage in the last six months.

Table 7 provides the results of logistic regression for the dependent variable *Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx*. The HCSUS study designated a person as having AIDS if he or she had a CD4-cell count of less than 200/μL or had been diagnosed by a physician as having AIDS. Female gender was positively associated with having AIDS than male gender. Those persons who were aged 50 years or older were more likely to have AIDS than younger persons. The categories "unemployed/laid-off" and "disabled" were negatively associated with having AIDS. People who responded that they were not working for an unspecified reason, retired, or not actively searching for employment were much more likely to have AIDS than employed persons and were far more likely to have AIDS than persons who reported being "disabled (not working)" or "unemployed/laid-off."

Residents of the Western United States were more likely to have AIDS than other regions of the nation. There was a negative relationship between ADAP coverage and having AIDS. The results showed that there was no statistically significant association between AIDS-status and race/ethnicity, the relationship between a respondent's co-inhabitant(s) to the respondent, presence of children living in the household, educational attainment, income, sexual orientation, level of urbanization of a respondent's zip code, and type of insurance in the last six months.

The results of the linear regression analysis of the dependent variable *Overall Composite-Health Status* indicated that Non-Hispanic Blacks were healthier than Non-Hispanic Whites, Hispanics, and other ethnicities (e.g., Asians, American Indians, Native Alaskans, and Pacific Islanders). Females were less healthy than males. Respondents

who were aged 50 years or older were healthier than younger respondents, and persons aged 35 to 49 were the least healthy of all three groups. The results indicated that those persons who earned more than $75,000 per year were healthier than those who had no reported income (e.g., $0). Incomes between $1 and $75,000 were not statistically associated with *Overall Composite-Health Status*. Persons who were covered by ADAP were healthier than those persons who had no such coverage.

Education level was positively related to overall health status. Those who had earned a high school diploma, but who had not attended college, were approximately as healthy as those persons who had not graduated from high school. People who had attended at least some college were healthier than those persons who had not attended college. People with a graduate or professional degree were the healthiest group of respondents. Those persons with AIDS were sicker than those persons who did not have AIDS. Not having employment was negatively associated with beneficial overall health status. Private health insurance coverage was positively associated with good overall health, while no other insurance category was associated with overall health status. Having a male partner living in the household was negatively associated with overall health status. *Overall Composite-Health Status* was not associated with geographic region in the U.S., sexual orientation, ADAP coverage in the last six months, level of urbanization of a respondent's zip code, and the presence of children living in the home.

Discussion

The results of the present study found that females were more likely than males to receive ARV medications and to have AIDS. Low-income mothers and pregnant women

very often receive care through Medicaid (KFF, 2006) and the State Children's Health Program (SCHIP). Each SCHIP program is operated at the state-level. SCHIP, like ADAP, is not an entitlement program, so not all needy mothers and their children receive assistance. The increased likelihood that women received ARV medications may be an indication of Medicaid eligibility due to having minor children and being low-income.

At the same time, women were found to have a greater risk of having AIDS than men. Heterosexual contact carries a great amount of risk as a means of transmission. Many women are at great risk of HIV infection (CDC, 2001; Vu, Steketee, Valleroy, Weinstock, Karon, & Janssen, 2002). Certain groups of heterosexual women are at a very high risk of contracting HIV: commercial sex workers (CSW), crack abusers, and IV drug users. (Vu et al., 2002) The percentage of total AIDS cases that are women has increased throughout the epidemic. Women made up just 7% of the total number of AIDS cases in 1985, 23% in 1999 (Frey, 2002), and 29% in 2004 (CDC, 2005). Additionally, women with AIDS do not live as long as men, though it remains unclear why this is the case (Frey, 2002). This last point may be borne out in Table 8, where linear regression analysis indicated that women with AIDS were less healthy than men.

Income was found to be a factor in ARV-receipt and overall health status. Destitute persons were more likely to receive ARV drugs than were other AIDS patients with income under $55,000 per year (Table 6). Destitute persons are eligible for Medicaid and they may also qualify for ADAP, Medicare, and SSDI (KFF, 2000a; KFF, 2000b; KFF, 2006). Income was not found to be statistically associated with having AIDS. Income was found not to be associated with overall health status, except for those

persons who made more than $75,000 per year. LeClere and Soobader (2000) found a link between income inequality and health outcomes. The present study results contradict this study's findings. There is a possibility that these two studies used health measures that were different from the measures used in this study – *Overall Composite-Health Status.*

Residents of Western and Southern states were found to have greater access to ARV medications than those in Northeastern and Midwestern states. Residents of Western states were found to be more likely to have AIDS than the remaining regions of the U.S. Geographic region was not associated with overall health status. Residents of states on the West Coast (California, Oregon, and Washington) may have received more generous benefits from their state Medicaid and ADAP programs. The higher likelihood of having AIDS in the West may be a product of the West Coast's large male homosexual population – especially in Los Angeles and San Francisco.

Respondents on ADAP were found to be less likely to receive ARV drugs than those without ADAP coverage (Table 6). ADAP is not an entitlement program. Individual state ADAP programs are not required to enroll all eligible applicants (KFF, 2000a). The requirements of Medicare and Medicaid allow all eligible persons to participate (KFF, 2000b; KFF, 2006) the lower likelihood of receiving ARV medications under ADAP may reflect this barrier to enrollment in ADAP. Additionally, ADAP eligibility requirements hold that a person must have no access or have insufficient access to ARV medications (KFF, 2000a). If a person were to have access through Medicare and/or Medicaid, then it is possible that he or she may not receive assistance from ADAP.

ADAP coverage was not associated with having AIDS (Table 7). If a person were receiving adequate ARV treatment, then he or she would be less likely to progress to AIDS, since ARV drugs slow the progression of HIV infection to AIDS (NIAID, 2006; Frey, 2002). ADAP coverage was also associated with better overall health, which may be a function of negative AIDS-status.

Persons aged 50 years or older were more likely to have AIDS than younger persons (Table 7). This result may be a function of HIV's long latency period. With ARV medications, it can take several years for a person to develop AIDS. Young people may have been infected, yet may not have lived long enough to develop AIDS. HIV infection has become a chronic illness, rather than being an acute disease. These is also some evidence that HIV is becoming less virulent, indicating that the disease is becoming more likely to create prolonged illness rather than quick death.

Persons aged 50 years or older tended to be healthier than younger persons – especially those in the 35 to 49 age category. The "≥50" age group may be healthier, because all persons aged 65 or older are automatically eligible for Medicare (KFF, 2006) and these persons (aged ≥50) may have lived long enough to qualify for SSDI benefits. Persons aged 35 ≤49 could be less healthy, perhaps because they had lived long enough to develop AIDS, but not to qualify for Medicare or Medicaid.

Educational attainment was not associated with receiving ARV medications (Table 6). Education was associated with having AIDS (Table 7) and level of overall composite health (Table 8). Educational attainment has been associated with health (Lynch & Kaplan, 2000). Education level can affect socioeconomic status (SES), and

SES has been found to influence health outcomes (LeClere & Soobader, 2000; Lynch & Kaplan, 2000).

Those respondents who were unemployed or laid-off were less likely to receive ARV medications and less likely to have AIDS. Disability was positively associated with having AIDS. This most likely is a result of AIDS causing the disability. Those persons who were retired, not looking for work, or not working for an unspecified reason were more likely to have AIDS than employed persons. Again, retired persons are generally aged 65 or older and may have lived long enough to have developed AIDS, given the long latency period of HIV. Not having employment was associated with poor overall health. This perhaps may be a function of negative insurance status and lower levels of physical activity.

Race/ethnicity was not found in the present study to be statistically associated with ARV receipt (Table 6). This finding contradicts the findings of Kahn et al. (2002). There may be the possibility that there are factors at play in the relationship between race/ethnicity and ARV receipt that were not tested in the present study. Non-Hispanic Blacks were found to be healthier than other ethnic groups (Table 8). Private health insurance coverage was positively associated with overall health status (Table 8). Those persons with private coverage tend to be employed. In the present study, employed persons were found to be healthier than all other employment categories (Table 8). This finding may indicate that employed people are less likely to be disabled and in better overall health.

Conclusions

Gender was statistically associated with all three clinical variables. Women were more likely to receive ARV medications than males, but they were also more likely to have AIDS and to be sicker. Race/ethnicity was not associated with use of ARV drugs, yet Non-Hispanic Blacks were healthier than Non-Hispanic Whites, Hispanics, and Other ethnicities. Age was not statistically associated with the receipt of ARV drugs. Age was associated with having AIDS and overall health. Persons who were ≥50 were more likely to have AIDS, yet they also were more likely to be healthier than younger respondents. Geographic region was associated with ARV-receipt and having AIDS, though not associated with overall-health status.

Socioeconomic status was found to be associated with ARV-receipt, having AIDS, and overall health for most of the four SES-related variables. Income was related to ARV-receipt and overall-health status, though it was not associated with having AIDS. Employment status and insurance status were associated with having AIDS, receiving ARV drugs in the last six months, and overall health. Education was associated with having AIDS and overall health, though educational attainment was not associated with receiving ARV medications.

Policy Recommendations

The findings of this study may contribute to changes in policy toward the provision of anti-retroviral medications to low-income and disabled persons with AIDS. The researcher recommends that the current two-year waiting period for a disabled person to qualify for Medicare be reduced to approximately 16 months. Currently, a

person must wait approximately 29 months after first qualifying for Social Security Disability Income (SSDI) before he or she qualifies for Medicare (KFF, 2006). The researcher believes that such a relaxation of current eligibility rules would increase the number of persons who receive anti-retroviral drugs. Even though such an expansion of eligible persons would increase federal costs for the Medicare program, the researcher believes that these increased expenditures may be offset by decreases in the amount of healthcare services used to treat AIDS-related opportunistic infections.

Second, the researcher recommends that the maximum income level for Medicaid eligibility be raised to allow persons who are not destitute or do not currently qualify for Medicaid benefits to receive benefits under the program. An alternative may be to add HIV-positive populations, who are not yet poverty-stricken, to qualify for Medicaid benefits under a "categorically needy" designation. As was mentioned above, the researcher believes that the increased costs that would be borne by state and federal governments would be offset by decreased levels of healthcare services that would have been used to treat opportunistic infections and other symptoms and complications of AIDS.

Recommendations for Further Research

Given the results of this study, the researcher recommends that more research be performed into disparities and differentials in the use of anti-retroviral medications, AIDS diagnoses, and differences in health status. This study revealed that persons with low-income, unemployment, and ADAP coverage were had lower odds of receiving anti-retroviral medications. The results of the research indicated that persons aged fifty years

and older were more likely to have AIDS than younger people. Women were found to be more likely to have AIDS than men. Persons with low socio-economic status were also found have higher odds of being diagnosed with AIDS. Third, research into overall health status is warranted. Research into why Non-Hispanic Blacks were in better health than Non-Hispanic Whites, women were less healthy than men, and unemployed persons were less healthy than employed persons could prove fruitful and provide important insights into the health of HIV-positive persons.

Implications for Public Health

The information obtained from this study provides valuable insights concerning the demographic, health-insurance, clinical, and health-status characteristics of a sample of HIV-positive persons in the forty-eight contiguous United States and the District of Columbia. This report may help policy-makes, academics, and other stakeholders form appropriate policies for the provision of anti-retroviral therapy to persons with AIDS.

APPENDIX

TABLES

Table 1
Variable Dictionary

ADAP6MO, "Covered by ADAP in the Last 6 Months"	
Numerical Value	Value Label
0	No
1	Yes
99	Data Missing
AGE, "Age"	
Numerical Value	Value Label
1	17 ≤34
2	35 ≤49
3	≥50
ANYCHILD, "Children ≤17 Living in Household"	
Numerical Value	Value Label
0	No
1	Yes
ARV6MO, "Received Anti-Retroviral (ARV) Drugs in the Last 6 Months"	
Numerical Value	Value Label
0	No
1	Yes
CDCAIDS, "Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx"	
Numerical Value	Value Label
0	No
1	Yes
CURREMPL, "Current Employment Status"	
Numerical Value	Value Label
1	Full/Part-Time/Sick-Leave/Other (w/Job)
2	Unemployed/Laid-Off
3	Disabled (Not-Working)
4	Not-Working (Other)/Retired/Not-Looking
EDUCAT, "Education Level"	
Numerical Value	Value Label
1	Less than High School Diploma
2	High School Diploma
3	Some College
4	BA/BS Degree
5	Graduate/Professional Degree

Source: *HIV Cost and Services Utilization Study (HCSUS).* [Public-use data file.] Rockville, MD: Agency for Healthcare Research and Quality.

Table 1
Variable Dictionary

(Continued from page 52)

GENDER, "Gender"

Numerical Value	Value Label
1	Male
2	Female

GEOGREG, "Geographic Region"

Numerical Value	Value Label
1	Northeast
2	Midwest
3	South
4	West

INCOME95, "1995 Income Category"

Numerical Value	Value Label
1	$0
2	$1 ≤5,000
3	$5,001 ≤10,000
4	$10,001 ≤17,000
5	$17,001 ≤25,000
6	$25,001 ≤40,000
7	$40,001 ≤55,000
8	$55,001 ≤75,000
9	≥$75,001

INS6MO, "Insurance Category in the Last 6 Months"

Numerical Value	Value Label
1	No Insurance
2	MCD
3	MCR
4	PRV
6	MCD+PRV
7	MCR+PRV
8	MCD+MCR
9	MCR+MCD+PRV

LIVEWITH, "Relationship of Co-Inhabitant to Respondent"

Numerical Value	Value Label
1	Spouse
2	Male Partner
3	Female Partner
4	Other/Unspecified
5	Living Alone
6	Homeless

Source: *HIV Cost and Services Utilization Study (HCSUS).* [Public-use data file.] Rockville, MD: Agency for Healthcare Research and Quality.

Table 1
Variable Dictionary

(Continued from page 53)

OVERCOMP, "Overall Composite-Health Status (t-score)"

[Continuous Variable]

RACETHNC, "Race/Ethnicity"

Numerical Value	Value Label
1	Non-Hispanic White
2	Non-Hispanic Black
3	Hispanic
4	Other

SEXORIEN, "Sexual Orientation"

Numerical Value	Value Label
1	Gay/Lesbian
2	Heterosexual
3	Bisexual
4	Celibate /Asexual
5	Other

URBRURAL, "Percentage of Respondent's Zip Code in Urban Area (≥50,000)"

Numerical Value	Value Label
1	0 ≤9.9%
2	10 ≤89.9%
3	90 ≤99.9%
4	100%
99	Data Missing

Source: *HIV Cost and Services Utilization Study (HCSUS).* [Public-use data file.] Rockville, MD: Agency for Healthcare Research and Quality.

Table 2

State-Wise Values for the Geographic Region Variable (GEOGREG)

	Sub-Region	States
Northeast	New England	Maine, New Hampshire, Vermont, Massachusetts, Rhode Island, Connecticut
	Middle Atlantic	New York, New Jersey, Pennsylvania
Midwest	Sub-Region	States
	Midwest	Indiana, Illinois, Michigan, Wisconsin, Minnesota, Iowa, Missouri, North Dakota, South Dakota, Nebraska, Kansas
South	Sub-Region	States
	South Atlantic	Delaware, Maryland, District of Columbia, Virginia, West Virginia, North Carolina, South Carolina, Georgia, Florida
	West South-Central	Arkansas, Louisiana, Oklahoma, Texas
	East South-Central	Kentucky, Tennessee, Alabama, Mississippi
West	Sub-Region	States
	Pacific West	California, Oregon, Washington
	Mountain West	Arizona, Colorado, Idaho, Montana, New Mexico, Nevada, Wyoming, Utah

Note. HCSUS data file includes data on only the 48 contiguous states and the District of Columbia.
Source: *HIV Cost and Services Utilization Study (HCSUS).* [Public-use data file.] Rockville, MD: Agency for Healthcare Research and Quality.

Table 3

Descriptive Statistics: Baseline variables

Dependent Variables

Received Anti-Retroviral (ARV) Drugs in the Last 6 Months (ARV6MO)

Category	Frequency	Percent
No	522	18.2
Yes	2,342	81.8

Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx (CDCAIDS)

Category	Frequency	Percent
No	1,178	41.1
Yes	1,686	58.9

Overall Composite-Health Status (t-score) (OVERCOMP)

Minimum	Maximum	*SD*	Mean	Median	Mode
19.14	66.46	10.02648	49.4803	50.6092	66.46

Independent Variables

Race/Ethnicity (RACETHNC)

Category	Frequency	Percent
Non-Hispanic White	1,399	48.8
Non-Hispanic Black	959	33.5
Hispanic	426	14.9
Other	80	2.8

Gender (GENDER)

Category	Frequency	Percent
Male	2,017	70.4
Female	847	29.6

Age (AGE)

Category	Frequency	Percent
17 ≤34	1,061	37.0
35 ≤49	1,537	53.7
≥50	266	9.3

Covered by ADAP in the Last 6 Months (ADAP6MO)

Category	Frequency	Percent[a]
No	2,596	90.6
Yes	258	9.0
Missing	10	0.3

Note. n = 2,864.

[a]Due to rounding, percentages may not total 100%.

Source: *HIV Cost and Services Utilization Study (HCSUS).* [Public-use data file.] Rockville, MD: Agency for Healthcare Research and Quality.

Table 3

Descriptive Statistics: Baseline variables

(Continued from page 56)

Independent Variables

Education Level (EDUCAT)

Category	Frequency	Percent[a]
Less than High School Diploma	723	25.2
High School Diploma	805	28.1
Some College	810	28.3
BA/BS Degree	370	12.9
Graduate/Professional Degree	156	5.4

1995 Income (INCOME95)

Category	Frequency	Percent[a]
$0	136	4.7
$1 ≤5,000	473	16.5
$5,001 ≤10,000	740	25.8
$10,001 ≤17,000	425	14.8
$17,001 ≤25,000	311	10.9
$25,001 ≤40,000	344	12.0
$40,001 ≤55,000	161	5.6
$55,001 ≤75,000	127	4.4
≥$75,001	147	5.1

Current Employment Status (CURREMPL)

Category	Frequency	Percent[a]
Full/Part-time/Sick-Leave/Other (w/Job)	1,015	35.4
Unemployed/Laid-Off	216	7.5
Disabled (Not Working)	1,375	48.0
Not-working (Other)/ Retired/Not-looking	258	9.0

Geographic Region (GEOGREG)

Category	Frequency	Percent
Northeast	707	24.7
Midwest	332	11.6
South	916	32.0
West	909	31.7

Note. n = 2,864.

[a]Due to rounding, percentages may not total 100%.

Source: *HIV Cost and Services Utilization Study (HCSUS).* [Public-use data file.] Rockville, MD: Agency for Healthcare Research and Quality.

Table 3

Descriptive Statistics: Baseline variables

(Continued from page 57)

Independent Variables

Sexual Orientation (SEXORIEN)

Category	Frequency	Percent
Gay/Lesbian	1,241	43.3
Heterosexual	1,222	42.7
Bisexual	150	5.2
Celibate/Asexual	205	7.2
Other	46	1.6

Insurance Category in the Last 6 Months (INS6MO)

Category	Frequency	Percent
No Insurance	542	18.9
MCD	879	30.7
MCR	101	3.5
PRV	821	28.7
MCD+PRV	78	2.7
MCR+PRV	57	2.0
MCD+MCR	341	11.9
MCR+MCD+PRV	45	1.6

Relationship of Co-Inhabitant to Respondent (LIVEWITH)

Category	Frequency	Percent[a]
Spouse	303	10.6
Male Partner	619	21.6
Female Partner	86	3.0
Other/Unspecified	965	33.7
Living Alone	858	30.0
Homeless	33	1.2

Children ≤17 Living in Household (ANYCHILD)

Category	Frequency	Percent
No	2,364	82.5
Yes	500	17.5

Percentage of Respondent's Zip Code in Urban Area (Urban ≥50,000) (URBRURAL)

Category	Frequency	Percent
0 ≤9.9%	203	7.1
10 ≤89.9%	135	4.7
90 ≤99.9%	218	7.6
100%	2,194	76.6
Data Missing	114	4.0

Note. n = 2,864.

[a]Due to rounding, percentages may not total 100%.

Source: *HIV Cost and Services Utilization Study (HCSUS).* [Public-use data file.] Rockville, MD: Agency for Healthcare Research and Quality.

Table 4

Cross-Tabulations and χ^2 Test: Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx

Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx					Chi-Square Test		
	Category	Yes	No	Total	χ^2	*df*	*p*
Race/ Ethnicity	Non-Hispanic White	522	877	1,399	--	--	--
	Non-Hispanic Black	448	511	959	--	--	--
	Hispanic	179	247	426	--	--	--
	Other	29	51	80	--	--	--
	Total	1,178	1,686	2,864	21.702	3	0.000**
Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx					Chi-Square Test		
	Category	Yes	No	Total	χ^2	*df*	*p*
Gender	Male	740	1,277	2,017	--	--	--
	Female	438	409	847	--	--	--
	Total	1,178	1,686	2,864	55.605	1	0.000**
Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx					Chi-Square Test		
	Category	Yes	No	Total	χ^2	*df*	*p*
Age	17 ≤34	497	564	1,061	--	--	--
	35 ≤49	573	964	1,537	--	--	--
	≥50	108	158	266	--	--	--
	Total	1,178	1,686	2,864	23.737	2	0.000**
Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx					Chi-Square Test		
	Category	Yes	No	Total	χ^2	*df*	*p*
Relationship of Co-Inhabitant to Respondent	Spouse	139	164	303	--	--	--
	Male Partner	267	352	619	--	--	--
	Female Partner	31	55	86	--	--	--
	Other/Unspecified	414	551	965	--	--	--
	Living Alone	315	543	858	--	--	--
	Homeless	12	21	33	--	--	--
	Total	1,178	1,686	2,864	13.234	5	0.021*
Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx					Chi-Square Test		
	Category	Yes	No	Total	χ^2	*df*	*p*
Children ≤17 Living in Household	No (No Children Living in Household)	928	1,436	2,364	--	--	--
	Yes (Children Living in Household)	250	250	500	--	--	--
	Total	1,178	1,686	2,864	19.677	1	0.000**

Note. n = 2,864. Dependent variable is "Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx."
*Significant at the $p \leq 0.05$-level. **Significant at the $p \leq 0.01$-level.
Source: *HIV Cost and Services Utilization Study (HCSUS).* [Public-use data file.] Rockville, MD: Agency for Healthcare Research and Quality.

Table 4

Cross-Tabulations and χ^2 Test: Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx

(Continued from page 59)

Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx					Chi-Square Test		
	Category	Yes	No	Total	χ^2	*df*	*p*
Education Level	Less than High School Diploma	327	396	723	--	--	--
	High School Diploma	349	456	805	--	--	--
	Some College	314	496	810	--	--	--
	BA/BS Degree	131	239	370	--	--	--
	Graduate/Professional Degree	57	99	156	--	--	--
	Total	1,178	1,686	2,864	14.896	4	0.005**

Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx					Chi-Square Test		
	Category	Yes	No	Total	χ^2	*df*	*p*
1995 Income	$0	62	74	136	--	--	--
	$1 ≤$5,000	231	242	473	--	--	--
	$5,001 ≤$10,000	260	480	740	--	--	--
	$10,001 ≤$17,000	182	243	425	--	--	--
	$17,001 ≤$25,000	123	188	311	--	--	--
	$25,001 ≤$40,000	136	208	344	--	--	--
	$40,001 ≤$55,000	68	93	161	--	--	--
	$55,001 ≤$75,000	49	78	127	--	--	--
	≥$75,001	67	80	147	--	--	--
	Total	1,178	1,686	2,864	26.512	8	0.001**

Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx					Chi-Square Test		
	Category	Yes	No	Total	χ^2	*df*	*p*
Current Employment Status	Full/Part-time/Sick-Leave/Other (w/Job)	556	459	1,015	--	--	--
	Unemployed/ Laid-Off	138	78	216	--	--	--
	Disabled/Not-working	358	1,017	1,375	--	--	--
	Not-Working (Other)/ Retired/Not-Looking	126	132	258	--	--	--
	Total	1,178	1,686	2,864	259.990	3	0.000**

Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx					Chi-Square Test		
	Category	Yes	No	Total	χ^2	*df*	*p*
Geographic Region	Northeast	287	420	707	--	--	--
	Midwest	124	208	332	--	--	--
	South	393	523	916	--	--	--
	West	374	535	909	--	--	--
	Total	1,178	1,686	2,864	3.234	3	0.357

Note. n = 2,864. Dependent variable is "Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx."
*Significant at the p ≤0.05-level. **Significant at the p ≤0.01-level.
Source: *HIV Cost and Services Utilization Study (HCSUS).* [Public-use data file.] Rockville, MD: Agency for Healthcare Research and Quality.

Table 4

Cross-Tabulations and χ^2 Test: Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx

(Continued from page 60)

Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx					Chi-Square Test		
	Category	Yes	No	Total	χ^2	*df*	*p*
Sexual Orientation	Gay/Lesbian	483	758	1,241	--	--	--
	Heterosexual	554	668	1,222	--	--	--
	Bisexual	54	96	150	--	--	--
	Celibate/Asexual	65	140	205	--	--	--
	Other	22	24	46	--	--	--
	Total	1,178	1,686	2,864	21.428	4	0.000**

Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx					Chi-Square Test		
	Category	Yes	No	Total	χ^2	*df*	*p*
Received ARV Drugs in Last 6 Months	No	344	178	522	--	--	--
	Yes	834	1,508	2,342	--	--	--
	Total	1,178	1,686	2,864	161.741	1	0.000**

Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx					Chi-Square Test		
	Category	Yes	No	Total	χ^2	*df*	*p*
Insurance Category in the Last 6 Months	No Insurance	312	230	542	--	--	--
	MCD	348	531	879	--	--	--
	MCR	30	71	101	--	--	--
	PRV	363	458	821	--	--	--
	MCD+PRV	17	61	78	--	--	--
	MCR+PRV	13	44	57	--	--	--
	MCD+MCR	80	261	341	--	--	--
	MCR+MCD+PRV	15	30	45	--	--	--
	Total	1,178	1,686	2,864	135.037	7	0.000**

Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx					Chi-Square Test		
	Category	Yes	No	Total	χ^2	*df*	*p*
Covered by ADAP in the Last 6 Months	No	1,093	1,503	2,596	--	--	--
	Yes	79	179	258	--	--	--
	Total	1,172	1,682	2,854[a]	12.786	1	0.000**

Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx					Chi-Square Test		
	Category	Yes	No	Total	χ^2	*df*	*p*
Percentage of Respondent's Zip Code in Urban Area	0 ≤9.9%	88	115	203	--	--	--
	10 ≤89.9%	45	90	135	--	--	--
	90 ≤99.9%	86	132	218	--	--	--
	100%	905	1,289	2,194	--	--	--
	Total	1,124	1,626	2,750[b]	4.002	3	0.261

Note. n = 2,864. Dependent variable is "Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx."
*Significant at the p ≤0.05-level. **Significant at the p ≤0.01-level.
[a]There were 10 missing values for this variable. [b]There were 114 missing values for this variable. Source: *HIV Cost and Services Utilization Study (HCSUS).* [Public-use data file.] Rockville, MD: Agency for Healthcare Research and Quality.

Table 5

Cross-Tabulations and χ^2 Test: Received Anti-Retroviral Drugs in the Last 6 Months

	Received Anti-Retroviral Drugs in the Last 6 Months				Chi-Square Test		
	Category	Yes	No	Total	χ^2	*df*	*p*
Race/ Ethnicity	Non-Hispanic White	221	1,178	1,399	--	--	--
	Non-Hispanic Black	216	743	959	--	--	--
	Hispanic	69	357	426	--	--	--
	Other	16	64	80	--	--	--
	Total	522	2,342	2,864	18.767	3	0.000**
	Received Anti-Retroviral Drugs in the Last 6 Months				Chi-Square Test		
	Category	Yes	No	Total	χ^2	*df*	*p*
Gender	Male	329	1,688	2,017	--	--	--
	Female	193	654	847	--	--	--
	Total	522	2,342	2,864	16.779	1	0.000**
	Received Anti-Retroviral Drugs in the Last 6 Months				Chi-Square Test		
	Category	Yes	No	Total	χ^2	*df*	*p*
Age	17 ≤34	235	826	1,061	--	--	--
	35 ≤49	245	1,292	1,537	--	--	--
	≥50	42	224	266	--	--	--
	Total	522	2,342	2,864	17.403	2	0.000**
	Received Anti-Retroviral Drugs in the Last 6 Months				Chi-Square Test		
	Category	Yes	No	Total	χ^2	*df*	*p*
Relationship of Co-Inhabitant to Respondent	Spouse	42	261	303	--	--	--
	Male Partner	100	519	619	--	--	--
	Female Partner	20	66	86	--	--	--
	Other/Unspecified	173	792	965	--	--	--
	Living Alone	178	680	858	--	--	--
	Homeless	9	24	33	--	--	--
	Total	522	2,342	2,864	12.639	5	0.027*
	Received Anti-Retroviral Drugs in the Last 6 Months				Chi-Square Test		
	Category	Yes	No	Total	χ^2	*df*	*p*
Children ≤17 Living in Household	No (No Children Living in Household)	430	1,934	2,364	--	--	--
	Yes (Children Living in Household)	92	408	500	--	--	--
	Total	522	2,342	2,864	.012	1	0.912

Note. n = 2,864. Dependent variable is "Received Anti-Retroviral Drugs in the Last 6 Months."

*Significant at the p ≤0.05-level. **Significant at the p ≤0.01-level.

Source: *HIV Cost and Services Utilization Study (HCSUS).* [Public-use data file.] Rockville, MD: Agency for Healthcare Research and Quality.

Table 5

Cross-Tabulations and χ^2 Test: Received Anti-Retroviral Drugs in the Last 6 Months

(Continued from page 62)

	Received Anti-Retroviral Drugs in the Last 6 Months				Chi-Square Test		
	Category	Yes	No	Total	χ^2	*df*	*p*
Education Level	Less than High School Diploma	149	574	723	--	--	--
	High School Diploma	161	644	805	--	--	--
	Some College	149	661	810	--	--	--
	BA/BS Degree	47	323	370			
	Graduate/Professional Degree	16	140	156	--	--	--
	Total	522	2,342	2,864	18.690	4	0.001**
	Received Anti-Retroviral Drugs in the Last 6 Months				Chi-Square Test		
	Category	Yes	No	Total	χ^2	*df*	*p*
1995 Income	$0	23	113	136	--	--	--
	$1 ≤$5,000	110	363	473	--	--	--
	$5,001 ≤$10,000	165	575	740	--	--	--
	$10,001 ≤$17,000	82	343	425	--	--	--
	$17,001 ≤$25,000	55	256	311	--	--	--
	$25,001 ≤$40,000	50	294	344	--	--	--
	$40,001 ≤$55,000	17	144	161	--	--	--
	$55,001 ≤$75,000	10	117	127	--	--	--
	≥$75,001	10	137	147	--	--	--
	Total	522	2,342	2,864	48.299	8	0.000**
	Received Anti-Retroviral Drugs in the Last 6 Months				Chi-Square Test		
	Category	Yes	No	Total	χ^2	*df*	*p*
Current Employment Status	Full/Part-time/Sick-Leave/Other (w/Job)	198	817	1,015	--	--	--
	Unemployed/ Laid-Off	50	166	216	--	--	--
	Disabled/Not-working	223	1,152	1,375	--	--	--
	Not-Working (Other)/ Retired/Not-Looking	51	207	258	--	--	--
	Total	522	2,342	2,864	8.760	3	0.033*
	Received Anti-Retroviral Drugs in the Last 6 Months				Chi-Square Test		
	Category	Yes	No	Total	χ^2	*df*	*p*
Geographic Region	Northeast	139	568	707	--	--	--
	Midwest	53	279	332	--	--	--
	South	163	753	916	--	--	--
	West	167	742	909	--	--	--
	Total	522	2,342	2,864	2.243	3	0.523

Note. n = 2,864. Dependent variable is "Received Anti-Retroviral Drugs in the Last 6 Months."

*Significant at the p ≤0.05-level. **Significant at the p ≤0.01-level.

Source: *HIV Cost and Services Utilization Study (HCSUS).* [Public-use data file.] Rockville, MD: Agency for Healthcare Research and Quality.

Table 5

Cross-Tabulations and χ^2 Test: Received Anti-Retroviral Drugs in the Last 6 Months

(Continued from page 63)

Received Anti-Retroviral Drugs in the Last 6 Months					Chi-Square Test		
	Category	Yes	No	Total	χ^2	*df*	*p*
Sexual Orientation	Gay/Lesbian	203	1,038	1,241	--	--	--
	Heterosexual	244	978	1,222	--	--	--
	Bisexual	26	124	150	--	--	--
	Celibate/Asexual	43	162	205	--	--	--
	Other	6	40	46	--	--	--
	Total	522	2,342	2,864	7.341	4	0.119

Received Anti-Retroviral Drugs in the Last 6 Months					Chi-Square Test		
	Category	Yes	No	Total	χ^2	*df*	*p*
Has AIDS, per CDC Def. (CD4 < 200) or AIDS Dx	No	344	834	1,178	--	--	--
	Yes	178	1,508	1,686	--	--	--
	Total	522	2,342	2,864	161.741	1	0.000**

Received Anti-Retroviral Drugs in the Last 6 Months					Chi-Square Test		
	Category	Yes	No	Total	χ^2	*df*	*p*
Insurance Category in the Last 6 Months	No Insurance	145	397	542	--	--	--
	MCD	188	691	879	--	--	--
	MCR	20	81	101	--	--	--
	PRV	100	721	821	--	--	--
	MCD+PRV	7	71	78	--	--	--
	MCR+PRV	6	51	57	--	--	--
	MCD+MCR	50	291	341	--	--	--
	MCR+MCD+PRV	6	39	45	--	--	--
	Total	522	2,342	2,864	63.013	7	0.000**

Received Anti-Retroviral Drugs in the Last 6 Months					Chi-Square Test		
	Category	Yes	No	Total	χ^2	*df*	*p*
Covered by ADAP in the Last 6 Months	No	492	2,104	2,596	--	--	--
	Yes	29	229	258	--	--	--
	Total	521	2,333	2,854[a]	9.353	1	0.002**

Received Anti-Retroviral Drugs in the Last 6 Months					Chi-Square Test		
	Category	Yes	No	Total	χ^2	*df*	*p*
Percentage of Respondent's Zip Code in Urban Area	0 ≤9.9%	29	174	203	--	--	--
	10 ≤89.9%	17	118	135	--	--	--
	90 ≤99.9%	38	180	218	--	--	--
	100%	415	1,779	2,194	--	--	--
	Total	499	2,251	2,750[b]	5.789	3	0.122

Note. n = 2,864. Dependent variable is "Received Anti-Retroviral Drugs in the Last 6 Months."

*Significant at the p ≤0.05-level. **Significant at the p ≤0.01-level.

[a]There were 10 missing values for this variable. [b]There were 114 missing values for this variable.

Source: *HIV Cost and Services Utilization Study (HCSUS).* [Public-use data file.] Rockville, MD: Agency for Healthcare Research and Quality.

Table 6

Logistic Regression: Received Anti-Retroviral (ARV) Drugs in the Last 6 Months

	Category	β	*OR*	*SE*	*p*
Race/ Ethnicity	Non-Hispanic White	Reference	--	--	--
	Non-Hispanic Black	0.218	1.243	0.307	0.479
	Hispanic	0.029	1.030	0.313	0.925
	Other	0.536	1.710	0.329	0.103
	Category	β	*OR*	*SE*	*p*
Gender	Male	Reference	--	--	--
	Female	0.368	1.446	0.147	0.012**
	Category	β	*OR*	*SE*	*p*
Age	17 ≤34	Reference	--	--	--
	35 ≤49	-0.320	0.726	0.205	0.120
	≥50	0.015	1.015	0.197	0.941
	Category	β	*OR*	*SE*	*p*
Relationship of Co-Inhabitant to Respondent	Spouse	Reference	--	--	--
	Male Partner	0.298	1.347	0.494	0.547
	Female Partner	0.196	1.217	0.478	0.681
	Other/Unspecified	-0.276	0.759	0.531	0.603
	Living Alone	0.412	1.510	0.465	0.376
	Homeless	0.063	1.065	0.466	0.893
	Category	β	*OR*	*SE*	*p*
Children ≤17 Living in Household	No (No Children Living in Household)	Reference	--	--	--
	Yes (Children Living in Household)	-0.219	0.804	0.166	0.187
	Category	β	*OR*	*SE*	*p*
Education Level	Less than High School Diploma	Reference	--	--	--
	High School Diploma	-0.173	0.841	0.314	0.581
	Some College	-0.228	0.796	0.304	0.454
	BA/BS Degree	-0.188	0.829	0.299	0.530
	Graduate/Professional Degree	0.059	1.060	0.321	0.855
-2 Log Likelihood Ratio: 2425.179 Percentage Correct: 81.9%					

Note. $n = 2,741$.

*Significant at the $p \leq 0.05$-level. **Significant at the $p \leq 0.01$-level.

Source: *HIV Cost and Services Utilization Study (HCSUS).* [Public-use data file.] Rockville, MD: Agency for Healthcare Research and Quality.

Table 6

Logistic Regression: Received Anti-Retroviral (ARV) Drugs in the Last 6 Months

(Continued from page 65)

	Category	β	*OR*	*SE*	*p*
1995 Income	$0	Reference	--	--	--
	$1 ≤5,000	-0.924	0.397	0.478	0.053
	$5,001 ≤10,000	-1.388	0.250	0.420	0.001**
	$10,001 ≤17,000	-1.397	0.247	0.411	0.001**
	$17,001 ≤25,000	-1.179	0.308	0.407	0.004**
	$25,001 ≤40,000	-1.116	0.328	0.405	0.006**
	$40,001 ≤55,000	-0.817	0.442	0.395	0.038*
	$55,001 ≤75,000	-0.564	0.569	0.439	0.199
	≥$75,001	-0.312	0.732	0.483	0.518
Current Employment Status	Category	β	*OR*	*SE*	*p*
	Full/Part-time/Sick-Leave/Other (w/Job)	Reference	--	--	--
	Unemployed/ Laid-Off	-0.511	0.600	0.208	0.014**
	Disabled/Not-working	-0.144	0.866	0.242	0.551
	Not-Working (Other)/ Retired/Not-Looking	0.117	1.124	0.190	0.539
Geographic Region	Category	β	*OR*	*SE*	*p*
	Northeast	Reference	--	--	--
	Midwest	0.199	1.220	0.155	0.200
	South	0.424	1.528	0.198	0.033
	West	0.492	1.636	0.149	0.001**
Sexual Orientation	Category	β	*OR*	*SE*	*p*
	Gay/Lesbian	Reference	--	--	--
	Heterosexual	-0.633	0.531	0.462	0.171
	Bisexual	-0.585	0.557	0.461	0.204
	Celibate/Asexual	-0.528	0.590	0.503	0.294
	Other	-0.757	0.469	0.488	0.121
Covered by ADAP in the Last 6 Months	Category	β	*OR*	*SE*	*p*
	No	Reference	--	--	--
	Yes	-0.768	0.464	0.215	0.000**
-2 Log Likelihood Ratio: 2425.179					
Percentage Correct: 81.9%					

Note. $n = 2,741$.

*Significant at the $p \leq 0.05$-level. **Significant at the $p \leq 0.01$-level.

Source: *HIV Cost and Services Utilization Study (HCSUS).* [Public-use data file.] Rockville, MD: Agency for Healthcare Research and Quality.

Table 6

Logistic Regression: Received Anti-Retroviral (ARV) Drugs in the Last 6 Months

(Continued from page 66)

	Category	β	*OR*	*SE*	*p*
Percentage of Respondent's Zip Code in Urban Area	0 ≤9.9%	Reference	--	--	--
	10 ≤89.9%	0.297	1.346	0.221	0.179
	90 ≤99.9%	0.504	1.656	0.277	0.069
	100%	-0.002	0.998	0.202	0.992
	Category	β	*OR*	*SE*	*p*
Insurance Category in the Last 6 Months	No Insurance	Reference	--	--	--
	MCD	-0.902	0.406	0.503	0.073
	MCR	-0.675	0.509	0.494	0.171
	PRV	-0.776	0.460	0.549	0.158
	MCD+PRV	-0.235	0.791	0.512	0.647
	MCR+PRV	0.068	1.070	0.632	0.915
	MCD+MCR	-0.424	0.654	0.662	0.522
	MCR+MCD+PRV	-0.379	0.685	0.510	0.457
-2 Log Likelihood Ratio: 2425.179					
Percentage Correct: 81.9%					

Note. $n = 2{,}741$.

*Significant at the $p \leq 0.05$-level. **Significant at the $p \leq 0.01$-level.

Source: *HIV Cost and Services Utilization Study (HCSUS).* [Public-use data file.] Rockville, MD: Agency for Healthcare Research and Quality.

Table 7

Logistic Regression: Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx

	Category	β	*OR*	*SE*	*p*
Race/ Ethnicity	Non-Hispanic White	Reference	--	--	--
	Non-Hispanic Black	0.072	1.075	0.268	0.787
	Hispanic	-0.241	0.786	0.274	0.379
	Other	0.068	1.071	0.283	0.809
Gender	Category	β	*OR*	*SE*	*p*
	Male	Reference	--	--	--
	Female	0.542	1.719	0.125	0.000**
Age	Category	β	*OR*	*SE*	*p*
	17 ≤34	Reference	--	--	--
	35 ≤49	0.227	1.255	0.166	0.170
	≥50	0.357	1.430	0.156	0.022*
Relationship of Co-Inhabitant to Respondent	Category	β	*OR*	*SE*	*p*
	Spouse	Reference	--	--	--
	Male Partner	-0.255	0.775	0.448	0.569
	Female Partner	-0.092	0.912	0.439	0.835
	Other/Unspecified	0.115	1.122	0.493	0.816
	Living Alone	0.047	1.048	0.429	0.914
	Homeless	0.112	1.119	0.432	0.795
Children ≤17 Living in Household	Category	β	*OR*	*SE*	*p*
	No (No Children Living in Household)	Reference	--	--	--
	Yes (Children Living in Household)	0.167	1.181	0.137	0.224
Education Level	Category	β	*OR*	*SE*	*p*
	Less than High School Diploma	Reference	--	--	--
	High School Diploma	-0.423	0.655	0.229	0.065
	Some College	-0.392	0.675	0.218	0.072
	BA/BS Degree	-0.134	0.875	0.211	0.526
	Graduate/Professional Degree	0.067	1.069	0.221	0.762
-2 Log Likelihood Ratio: 3257.648 Percentage Correct: 67.4%					

Note. $n = 2{,}741$.

*Significant at the $p \leq 0.05$-level. **Significant at the $p \leq 0.01$-level.

Source: *HIV Cost and Services Utilization Study (HCSUS).* [Public-use data file.] Rockville, MD: Agency for Healthcare Research and Quality.

Table 7

Logistic Regression: Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx

(Continued from page 68)

	Category	β	*OR*	*SE*	*p*
1995 Income	$0	Reference	--	--	--
	$1 ≤5,000	-0.038	0.963	0.319	0.906
	$5,001 ≤10,000	-0.421	0.656	0.265	0.113
	$10,001 ≤17,000	-0.011	0.989	0.254	0.964
	$17,001 ≤25,000	-0.089	0.915	0.248	0.719
	$25,001 ≤40,000	0.102	1.107	0.245	0.678
	$40,001 ≤55,000	0.341	1.407	0.228	0.135
	$55,001 ≤75,000	0.166	1.181	0.252	0.510
	≥$75,001	0.220	1.246	0.266	0.410
Current Employment Status	Category	β	*OR*	*SE*	*p*
	Full/Part-time/Sick-Leave/Other (w/Job)	Reference	--	--	--
	Unemployed/ Laid-Off	-0.621	0.537	0.167	0.000**
	Disabled/Not-working	-0.547	0.579	0.205	0.008*
	Not-Working (Other)/ Retired/Not-Looking	0.829	2.291	0.152	0.000**
Geographic Region	Category	β	*OR*	*SE*	*p*
	Northeast	Reference	--	--	--
	Midwest	0.009	1.009	0.130	0.943
	South	0.243	1.275	0.158	0.123
	West	0.258	1.294	0.124	0.037*
Sexual Orientation	Category	β	*OR*	*SE*	*p*
	Gay/Lesbian	Reference	--	--	--
	Heterosexual	0.109	1.115	0.338	0.748
	Bisexual	0.288	1.334	0.337	0.392
	Celibate/Asexual	0.309	1.362	0.376	0.411
	Other	0.526	1.692	0.368	0.154
Covered by ADAP in the Last 6 Months	Category	β	*OR*	*SE*	*p*
	No	Reference	--	--	--
	Yes	-0.619	0.539	0.163	0.000**
-2 Log Likelihood Ratio: 3257.648					
Percentage Correct: 67.4%					

Note. $n = 2{,}741$.

*Significant at the $p \leq 0.05$-level. **Significant at the $p \leq 0.01$-level.

Source: *HIV Cost and Services Utilization Study (HCSUS).* [Public-use data file.] Rockville, MD: Agency for Healthcare Research and Quality.

Table 7

Logistic Regression: Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx

(Continued from page 69)

	Category	*β*	*OR*	*SE*	*p*
Percentage of Respondent's Zip Code in Urban Area	0 ≤9.9%	Reference	--	--	--
	10 ≤89.9%	-0.193	0.824	0.171	0.259
	90 ≤99.9%	0.282	1.326	0.212	0.183
	100%	0.078	1.082	0.166	0.637
	Category	*β*	*OR*	*SE*	*p*
Insurance Category in the Last 6 Months	No Insurance	Reference	--	--	--
	MCD	-0.283	0.754	0.365	0.438
	MCR	0.182	1.199	0.356	0.610
	PRV	0.137	1.147	0.419	0.744
	MCD+PRV	0.096	1.101	0.367	0.793
	MCR+PRV	0.765	2.148	0.461	0.097
	MCD+MCR	0.226	1.253	0.485	0.642
	MCR+MCD+PRV	0.511	1.666	0.373	0.171
-2 Log Likelihood Ratio: 3257.648 Percentage Correct: 67.4%					

Note. $n = 2{,}741$.

*Significant at the $p \leq 0.05$-level. **Significant at the $p \leq 0.01$-level.

Source: *HIV Cost and Services Utilization Study (HCSUS).* [Public-use data file.] Rockville, MD: Agency for Healthcare Research and Quality.

Table 8

Linear Regression: Overall Composite-Health Status (t-score)

	Category	β	SE	p
Race/ Ethnicity	Non-Hispanic White	Reference	--	--
	Non-Hispanic Black	2.08725	0.4613892	0.000**
	Hispanic	-0.125839	0.54222	0.816
	Other	-0.6268049	1.043007	0.548
	Category	β	SE	p
Gender	Male	Reference	--	--
	Female	-1.010151	0.499598	0.043*
	Category	β	SE	p
Age	17 ≤34	Reference	--	--
	35 ≤49	-1.144234	0.3773268	0.002**
	≥50	1.276851	0.6588986	0.053*
	Category	β	SE	p
Relationship of Co-Inhabitant to Respondent	Spouse	Reference	--	--
	Male Partner	-1.685728	0.7090803	0.018*
	Female Partner	-1.489257	1.127617	0.187
	Other/Unspecified	-0.5132941	0.6591585	0.436
	Living Alone	-0.7170894	0.6913273	0.300
	Homeless	-2.05883	1.80948	0.255
	Category	β	SE	p
Has AIDS, per CDC Definition (CD4 < 200) or AIDS Dx	No	Reference	--	--
	Yes	-1.942845	0.378393	0.000**
	Category	β	SE	p
Education Level	Less than High School Diploma	Reference	--	--
	High School Diploma	0.9491396	0.4856938	0.051*
	Some College	1.798541	0.5181248	0.001**
	BA/BS Degree	1.567396	0.6782909	0.021**
	Graduate/Professional Degree	2.230459	0.8975247	0.013**
Adjusted R^2: 0.2210				

Note. $n = 2,741$.

*Significant at the $p \leq 0.05$-level. **Significant at the $p \leq 0.01$-level.

Source: *HIV Cost and Services Utilization Study (HCSUS).* [Public-use data file.] Rockville, MD: Agency for Healthcare Research and Quality.

Table 8

Linear Regression: Overall Composite-Health Status (t-score)

(Continued from page 71)

	Category	β	SE	p
1995 Income	$0	Reference	--	--
	$1 ≤5,000	0.2132533	0.8994604	0.813
	$5,001 ≤10,000	0.222184	0.8825351	0.980
	$10,001 ≤17,000	-0.1882106	0.9337424	0.840
	$17,001 ≤25,000	0.9496548	0.9931354	0.339
	$25,001 ≤40,000	0.8014788	1.033637	0.438
	$40,001 ≤55,000	1.497187	1.191592	0.209
	$55,001 ≤75,000	2.099607	1.272593	0.099
	≥$75,001	3.751595	1.282524	0.003**
	Category	β	SE	p
Current Employment Status	Full/Part-time/Sick-Leave/Other (w/Job)	Reference	--	--
	Unemployed/ Laid-Off	-2.952588	0.7327186	0.000**
	Disabled/Not-working	-7.838077	0.4895328	0.000**
	Not-Working (Other)/ Retired/Not-Looking	-2.981455	0.6897256	0.000**
	Category	β	SE	p
Geographic Region	Northeast	Reference	--	--
	Midwest	-1.131141	0.6514395	0.083
	South	0.1684543	0.4897393	0.731
	West	-0.1597798	0.5139018	0.756
	Category	β	SE	p
Sexual Orientation	Gay/Lesbian	Reference	--	--
	Heterosexual	-0.1355211	0.5551413	0.807
	Bisexual	-0.8127229	0.8040489	0.312
	Celibate/Asexual	-0.1758667	0.755308	0.816
	Other	1.766053	1.367845	0.197
	Category	β	SE	p
Covered by ADAP in the Last 6 Months	No	Reference	--	--
	Yes	0.6939537	0.6038427	0.251
Adjusted R^2: 0.2210				

Note. n = 2,741.

*Significant at the $p \leq 0.05$-level. **Significant at the $p \leq 0.01$-level.

Source: *HIV Cost and Services Utilization Study (HCSUS)*. [Public-use data file.] Rockville, MD: Agency for Healthcare Research and Quality.

Table 8

Linear Regression: Overall Composite-Health (t-score)

(Continued from page 72)

	Category	β	SE	p
Percentage of Respondent's Zip Code in Urban Area	0 ≤9.9%	Reference	--	--
	10 ≤89.9%	0.5057133	0.9847633	0.608
	90 ≤99.9%	0.0497282	0.8725793	0.955
	100%	0.1749816	0.6727017	0.795
Insurance Category in the Last 6 Months	Category	β	SE	p
	No Insurance	Reference	--	--
	MCD	-0.0675325	0.5617961	0.904
	MCR	0.9348614	1.009551	0.355
	PRV	1.1941	0.6149666	0.052*
	MCD+PRV	1.01642	1.123783	0.366
	MCR+PRV	0.3583755	1.297315	0.782
	MCD+MCR	0.6078205	0.695976	0.383
	MCR+MCD+PRV	1.367099	1.427946	0.338
Received ARV Drugs in the last 6 Months	Category	β	SE	p
	No	Reference	--	--
	Yes	1.068615	0.4578957	0.020*
Children ≤17 Living in Household	Category	β	SE	p
	No (No Children Living in Household)	Reference	--	--
	Yes (Children Living in Household)	0.8153382	0.550767	0.139
Adjusted R^2: 0.2210				

Note. n = 2,741.

*Significant at the $p \leq 0.05$-level. **Significant at the $p \leq 0.01$-level.

Source: *HIV Cost and Services Utilization Study (HCSUS).* [Public-use data file.] Rockville, MD: Agency for Healthcare Research and Quality.

REFERENCES

Agency for Healthcare Research and Quality. (1998). *HCSUS Fact Sheet.* Retrieved October 31, 2006, from http://www.ahrq.gov/data/hcsus.htm

Anderson, K.H. & Mitchell, J.M. (2000). Differential access in the receipt of antiretroviral drugs for the treatment of AIDS and its implications for survival. *Archives of Internal Medicine, 160,* 3114-3120.

Andersen, R., Bozzette, S., Shapiro, M., St. Clair, P., Morton, S., Crystal, S., Goldman, D., et al. (2000). Access of vulnerable groups to anti-retroviral therapy among persons in care for HIV disease in the United States. HIV Cost and Services Utilization Consortium. *Health Services Research, 35,* 389-416.

Carpenter, C.C., Cooper, D.A., Fischl, M.A., Gatell, J.M., Gazzard, B.G., Hammer, S.M., et al. (2000). Antiretroviral therapy in adults: Updated recommendations of the International AIDS Society – USA Panel. *JAMA Journal of the American Medical Association, 283,* 381-390.

Centers for Disease Control and Prevention. (1998). Report of the NIH panel to define principles of therapy of HIV. *MMWR Morbidity & Mortality Weekly Report, 47,* 1-41.

Centers for Disease Control & Prevention (CDC). (2001). HIV and AIDS – United States, 1981-2000. *MMWR Morbidity & Mortality Weekly Reports, 50,* 430-434.

Centers for Disease Control & Prevention (CDC). (2005). Trends in HIV/AIDS diagnoses – 33 states, 2001-2004. *MMWR Morbidity & Mortality Weekly Report, 54,* 1149-1153.

Cunningham, W.E., Andersen, R.M., Katz, M.H., Stein, M.D., Turner, B.J., Crystal, S., Zierler, S., et al. (1999). Impact of competing subsistence needs and barriers on access to medical care for persons with human immunodeficiency virus receiving care in the United States. *Medical Care, 37,* 1270-1281.

Cunningham, W.E., Hays, R.D., Williams, K.W., Beck, K.C., Dixon, W.J., & Shapiro, M.F.. (1995). Access to medical care and health-related quality of life for low-income persons with symptomatic Human Immunodeficiency Virus. *Medical Care, 33,* 739-754.

Deeks, S.G., Smith, M., Holodny, M., & Kahn, J.O. (1997). HIV-1 protease inhibitors: A review for clinicians. *JAMA Journal of the American Medical Association, 277,* 145-153.

Evering, T., Kaswan, D., & Minamoto, G.Y. (2003). Management of the patient with HIV infection. In R.E. Rakel & E.T. Bope (Eds.), *Conn's current therapy,* (pp. 49-68). Philadelphia, PA: Elsevier Science.

Fleishman, J.A., Hsia, D.C., & Hellinger, F.J. (1994). Correlates of medical service utilization among people with HIV infection. *Health Services Research, 29,* 527-548.

Frey, R.J. (2002). AIDS. In J.L. Longe & D.S. Blanchefield (Eds.), *Gale encyclopedia of medicine* (2nd ed.), (pp. 73-81). Detroit, MI: Gale Group.

Goldman, D.P., Leibowitz, A.A., Joyce, G.F., Fleishman, J.A., Bozzette, S.A., Duan, N., & Shapiro, M.F. (2003). Insurance status of HIV-infected adults in the post-HAART era: Evidence from the United States. *Applied Health Economics and Health Policy, 2*, 85-91.

HCSUS: HIV Cost and Services Utilization Study. (2000). [Public-use data file.] Rockville, MD: Agency for Healthcare Research and Quality.

Henry J. Kaiser Family Foundation (KFF). (2006, March). *AIDS Drug Assistance Programs (ADAPS)* (Publication No. 1584-07). Menlo Park, CA: Henry J. Kaiser Family Foundation. Retrieved October 22, 2006, from www.kff.org/hivaids/1584-07-index.cfm

Henry J. Kaiser Family Foundation (KFF). (2000a, October.) *Medicaid's Role for Persons with HIV/AIDS (*Publication No. 1588). Menlo Park, CA: Henry J. Kaiser Family Foundation. Retrieved October 22, 2006, from http://www.kff.org/hivaids/1588-index.cfm

Henry J. Kaiser Family Foundation (KFF). (2000b, October.) *Medicare and HIV/AIDS* (Publication No. 7171-03). Menlo Park, CA: Henry J. Kaiser Family Foundation. Retrieved October 22, 2006, from http://www.kff.org/hivaids/upload/7171-03.pdf

Kahn, J.G., Zhang, X., Cross, L.T., Palacio, H., Birkhead, G.S., & Morin, S.F. (2002). Access to and use of HIV antiretroviral therapy: Variation by race/ethnicity in two public insurance programs in the U.S. *Public Health Reports, 117*, 252-262.

Karon, J.M., Rosenberg, P.S., McQuillan, G., Khare, M., Gwinn, M., & Petersen, L.R. (1996). Prevalence of HIV infection in the United States: 1984 to 1992. *JAMA Journal of the American Medical Association, 276*, 126-131.

LeClere, F.B., & Soobader, M.J. (2000). Effects of income inequality on the health of selected US demographic groups. *American Journal of Public Health, 90*, 1892-1897.

Lynch, J., & Kaplan, G. (2000). Socioeconomic Position. In L.F. Berkman & I. Kawachi (Eds.), *Social Epidemiology*, (pp. 13-35). New York: Oxford University Press.

National Institute of Allergy & Infectious Diseases. (2006, April). *Treatment of HIV Infection.* Retrieved October 22, 2006, from www.niaid.nih.gov/factsheets/treat-hiv.htm

Palella, F.J., Jr., Delaney, K.M., Moorman, A.C., Loveless, M.O., Fuhrer, J., Satten, G.A., et al. (1998). Declining morbidity and mortality among patients with advanced human immunodeficiency virus infection. *New England Journal of Medicine, 338*, 853-860.

Panel on Clinical Practices for Treatment of HIV Infection. (2001). *Guidelines for the use of antiretroviral agents in HIV-infected adults and adolescents, February 6, 2001.* Washington, D.C.: U.S. Department of Health and Human Services.

Pearce N. & Smith, G.D. (2003). Is social capital the key to inequalities in health? *American Journal of Public Health, 93*, 122-129.

Rand Corporation. (2005). *HIV Cost and Services Utilization Study.* Retrieved October 31, 2006, from http://www.rand.org/health/projects/hcsus

Sambamoorthi, U., Moynihan, P.J., McSpiritt, E., & Crystal, S. (2001). Use of protease inhibitors and non-nucleoside reverse transcriptase inhibitors among Medicaid beneficiaries with AIDS. *American Journal of Public Health, 91*, 1474-1481.

Shapiro, M.F., Morton, S.C., McCaffrey, D.F., Senterfitt, J.W., Fleishman, J.A., Perlman, J.R., et al. (1999). Variations in the care of HIV-infected adults in the United States: Results from the HIV Cost and Services Utilization Study. *JAMA Journal of the American Medical Association, 281*, 2305-2315.

Smith, S.R. & Kirking, D.M. (2001). Effects of insurance coverage on drug utilization in HIV disease. *Journal of Acquired Immune Deficiency Syndromes, 28*, 140-149.

Turnock, B.J. (2001). *Public Health: What it is and how it works.* Gaithersburg, MD: Aspen Publishers.

Vu, M.Q., Steketee, R.W., Valleroy, L., Weinstock, H., Karon, J., & Janssen, R. (2002). HIV incidence in the United States, 1978-1999. *JAIDS Journal of Acquired Immune Deficiency* Syndromes, *31*, 188-201.