Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

HHS Public Access

Author manuscript

J Epidemiol Community Health. Author manuscript; available in PMC 2016 September 30.

Published in final edited form as:

J Epidemiol Community Health. 2008 September ; 62(9): 798–803. doi:10.1136/jech.2005.045567.

Racial, gender and geographic disparities of antiretroviral treatment among US Medicaid enrolees in 1998

WD King[1,2,3], **P Minor**[4], **C Ramirez Kitchen**[5], **LE Oré**[3], **S Shoptaw**[3], **GD Victorianne**[3], and **G Rust**[4]

[1]University of California at Los Angeles Center for AIDS Research and Education, Center, Los Angeles, California, USA

[2]University of California at Los Angeles Department of Infectious Diseases, Los Angeles, California, USA

[3]Center for Health Promotion and Disease Prevention, Department of Family Medicine, David Geffen School of Medicine at University of California at Los Angeles, Los Angeles, California, USA

[4]National Center for Primary Care, Morehouse School of Medicine, Atlanta, Georgia, USA

[5]UCLA Department of Biostatistics, Los Angeles, California, USA

Abstract

Background—In 1998, highly active antiretroviral therapy (HAART) was widespread, but the diffusion of these lifesaving treatments was not uniform. As half of all AIDS patients in the USA have Medicaid coverage, this study of a multistate Medicaid claims dataset was undertaken to assess disparities in the rates of HAART.

Methods—Data came from 1998 Medicaid claims files from five states with varying HIV prevalence. ICD-9 codes were used to identify people with a diagnosis of HIV/AIDS or AIDS-defining illness. Multivariate analyses assessed associations between age, gender, race and state of residence for antiretroviral regimens consistent with HAART, as defined by 1998 Centers for Disease Control and Prevention (CDC) guidelines.

Results—Among 7202 Medicaid enrolees with a diagnosis of HIV/AIDS or AIDS, 62% received HAART and 25% received no antiretroviral therapy. Multivariate analyses showed that age, race, gender and state were all significant predictors of receiving HAART: white, non-Hispanic patients were most likely to receive HAART (68.3%), with lower rates in Hispanic and black, non-Hispanic segments of the population (59.3% and 57.5%, respectively, $p<0.001$). Women were less likely to receive HAART than men (51.8% vs 69.3%, $p<0.001$).

Correspondence to: Dr W D King, Center for Health Promotion and Disease Prevention, Department of Family Medicine, David Geffen School of Medicine, University of California at Los Angeles, 10800 Wilshire Blvd, Suite 540, Los Angeles, CA 90025, USA; wking37@yahoo.com.

Competing interests: None declared.

Ethics approval: IRB approval from the Morehouse School of Medicine and IRB exemption from the University of California.

Author Manuscript Author Manuscript Author Manuscript Author Manuscript

Conclusion—Despite similar insurance coverage and drug benefits, life-saving treatments for HIV/AIDS diffused at widely varying rates in different segments of the Medicaid population. Research is needed to determine the extent to which racial, gender, interstate and region disparities currently correspond to barriers to such care.

There are significant racial disparities in the treatment of HIV/AIDS, including disparities in the use of highly active antiretroviral therapy (HAART).[1–3] These disparities in treatment are associated with higher mortality rates and a widening black–white mortality gap.[4] Black patients have approximately ten times and Hispanic patients four times the mortality rate from HIV/AIDS compared with white patients.[56] While there are no apparent racial or ethnic differences in the clinical or biological effectiveness of HAART,[7] racial disparities in antiretroviral treatment persist after adjusting for both patient and provider factors.[8]

Approximately 50% of HIV+ people receiving care are Medicaid recipients, making Medicaid the largest source of funding for HIV clinical care in the US.[9] Although Medicaid and AIDS drug assistance programmes might be expected to equalise access to expensive antiretroviral drug regimens, black and Hispanic patients in these programmes have a lower frequency of antiretroviral treatment compared with white patients.[10] Similar disparities have been found in studies of single-state Medicaid claims data with or without state HIV surveillance data,[11] and in multistate studies of specific subsets of the Medicaid population, such as those with serious mental illness.[12]

We analysed Medicaid claims data from a broader sample consisting of five geographically and racially diverse states with varying rates of HIV prevalence in order to assess racial–ethnic and other disparities of patients on antiretroviral treatment (vs no treatment) or newer antiretrovirals or HAART regimens consistent with the 1998 adult and adolescent HIV treatment guidelines from the Centers for Disease Control and Prevention (CDC).[13]

METHODS

The 1998 State Medicaid Research Files (SMRF) were the most recent Medicaid claims data available at the start of this analysis. Five states were selected by applying the following criteria in order:

1. SMRF data available for 1998
2. Geographic distribution of states spread across the continental USA (one state each from the west, northeast and midwest and two states from the south)
3. States midrange among all US states in the size of their Medicaid populations (0.5 million and 1.5 million enrolled individuals)
4. Encounter-level utilisation data available in SMRF data for a majority of Medicaid enrolees (health maintenance organisation (HMO) or other capitated managed care enrolment ≤40%)
5. Racial–ethnic distribution to make the five-state aggregate sample similar to that of the US Medicaid population.

Author Manuscript Author Manuscript Author Manuscript Author Manuscript

Two of these five states were considered high prevalence by the CDC (Georgia at 16.9/100 000 and New Jersey at 26.3/100 000), while three states had low HIV prevalence (Arkansas at 8.0/100 000, Indiana at 8.2/100 000 and Washington at 7.8/100 000).[14] Medicaid claims data from the five states were used to identify all Medicaid-insured patients aged 18–64, who had a diagnosis of either HIV/AIDS or HIV/AIDS-defining illness during the calendar year 1998. The year (1998) is appropriate for this analysis because it is approximately 2 years after the first protease inhibitor (Saqunavir) was approved by the Food and Drug and Administration (FDA) and 2 years after HAART guidelines were released.

SMRF files are compiled by the Centers for Medicare and Medicaid Services (CMS) from claims and eligibility data submitted by each state to CMS for the production of required state-level reports. Data fields and data dictionary are standardised from state to state. SMRF data represent final action and paid claims for a single calendar year, based on date of service. SMRF data are divided into one personal summary or enrolment file and four claims files – outpatient/other, inpatient, long-term care and drug files.[15] Data files are stored securely and confidentially. This analysis received institutional review board (IRB) approval from the Morehouse School of Medicine and IRB exemption from the University of California, Los Angeles (UCLA).

We merged 1998 personal summary files from all five states and identified enrolees' aged 18–64 who had been continuously enrolled in Medicaid for at least 12 months. People enrolled in HMOs were excluded during the study period for lack of encounter-level data. We then isolated people with at least one inpatient or outpatient Medicaid claim during the calendar year with a diagnosis code for either HIV or HIV/AIDS-defining illness (ICD-9 codes 042 to 044.99 and 079.53).[16][17] We excluded people from racial/ethnic groups with fewer than 20 individuals from our sample for bivariate and multivariate analysis.

Dependent variables

Dependent variables were (a) any antiretroviral drug treatment; (b) multidrug treatment (defined as receipt of at least two drugs in the same year); (c) treatment within specific drug classes (NRTI, NNRTI, PI); (d) the newest antiretrovirals (Combivir and Efavirenz); and (e) a three-drug HAART regimen. All variables were dichotomised to either yes or no for receipt of the treatment regimen at any time during the calendar year 1998.

Using FDA-approved marketing dates, we identified 14 antiretrovirals available in 1998 (table 1),[18] assigning each to one of three classes—nucleoside reverse transcriptase inhibitors (NRTI), non-nucleoside reverse transcriptase inhibitors (NNRTI) and protease inhibitors. Each medication was identified by its main ingredient in Medicaid pharmacy claims using National Drug Codes and then linked to each patient's personal demographics. We then categorised combinations of drugs received by individuals as HAART (yes/no) according to 1998 CDC treatment guidelines.[13]

Independent variables

Demographic variables such as age, gender and race/ethnicity were all self-reported in CMS SMRF files, which were already divided by state of residence.[15] Age was recoded as a categorical variable by age groups. Race and ethnicity were available only in one combined

Author Manuscript Author Manuscript Author Manuscript Author Manuscript

variable, with six values (white, non-Hispanic, black non-Hispanic, Hispanic, Asian/Pacific Islander, American Indian/Alaska native and other).[19] Because of low numbers in certain racial/ethnic categories, we limited our analyses only to the categories of white non-Hispanic, black non-Hispanic and Hispanic. We linked urban–rural continuum codes from the 1998 Health Resources Service Agency (HRSA) area resource file (ARF) to the county federal information processing standard code of each individual's residence, and then dichotomised to urban or rural from the initial codes.[20]

Analysis

Initial bivariate analyses of our independent variables and dependent variables were conducted using χ^2 tests. We then conducted a logistic regression with receipt or non-receipt of HAART as our dependent variable and demographic variables as the independent variables. SPSS version 11.0 was used for all analyses (SPSS Inc., Illinois, USA).

RESULTS

A total of 1 789 308 enrolees from the personal summary files fit the age, race and Medicaid enrolment criteria, and 7972 people (0.45%) had Medicaid claims with a diagnosis code for HIV or AIDS-related diseases at any point in the calendar year. We excluded all the people whose race–ethnicity was listed as unknown (703 people) and also those in racial–ethnic groups with such small numbers as to fall below our confidentiality screens (another 67 people).

Almost 90% of enrolees (85.4%) were between the ages of 20 and 50 years (table 2). Just over half (53.1%) were ethnically identified as black non-Hispanic, and 56.0% were male. Nearly 9 out of 10 lived in urban settings (88.1%).

Receipt of any antiretroviral therapy

Among the 7202 black, white and Hispanic individuals on whom all bivariate and multivariate analyses were conducted, approximately one in four HIV/AIDS patients (27.3%) received no antiretroviral therapy at all. The proportion of HIV clients receiving any antiretroviral medications varied from 87.5% in Indiana to 61.9% in Georgia. Approximately 71% of black non-Hispanic patients received treatment in 1998, compared with 80% of white non-Hispanic clients (80.7%, $p<0.001$). Male patients were significantly more likely to be treated compared with female patients (81.8% vs 65.3%, $p<0.001$). Rural–urban differences in rates of non-treatment were not statistically different (table 3).

Receipt of antiretrovirals by class and therapy

Overall, Medicaid enrolees in these five states in 1998 were more likely to be on a PI-based HAART regimen than an NNRTI. Sixty-nine per cent (69.6%) had pharmacy claims for at least two different antiretroviral drugs in the same year. More enrolees >30 years of age received newer drugs (Combivir or Efavirenz) and also had higher rates of multidrug therapy. Black non-Hispanic enrolees were more likely to have received Combivir (31.6%) compared with white non-Hispanic and Hispanic people (table 3), but were still significantly

Author Manuscript Author Manuscript Author Manuscript Author Manuscript

less likely than whites to have received multidrug combination therapy (65.6% vs 76.9%; p<0.001).

Receipt of HAART

Overall, 61.5% of Medicaid-insured HIV patients in our five-state study received HAART. Georgia had the lowest frequency of people receiving HAART (46.7%, p<0.001). Across age groups, patients aged 30–59 clustered with the highest HAART treatment rates (63.0% to 65.9%, p<0.001). White non-Hispanic patients were more likely to receive HAART (68.3%) than Hispanic (59.3%) or black non-Hispanic clients (57.5%, p<0.001). Female patients were less likely to receive HAART than men (51.8% vs 69.3%, p<0.001). Rural–urban differences in rates of HAART were not significant on bivariate analysis (table 3).

Multivariate analysis

After multivariate analysis, enrolees <30 years had significantly lower odds ratios (OR) of HAART receipt (ages 20–29 years: OR 0.64; 95% CI 0.51 to 0.79) (ages <20 years: OR 0.35; 95% CI 0.24 to 0.50) compared with clients aged 50–59 years (table 4). White patients had significantly higher odds of receiving HAART compared with black (OR 0.80; 95% CI 0.71 to 0.90) and Hispanic (OR 0.70; 95% CI 0.55 to 0.89) patients. Males had significantly higher odds of receiving HAART compared with females (OR 1.87; 95% CI 1.68 to 2.06). Patients in New Jersey had significantly higher odds of receiving HAART compared with patients in the reference state, Georgia (OR 2.34; 95% CI 2.06 to 2.65). A subgroup analysis demonstrated a statistically significant interaction between race and state, and also between race and rural/urban, which was predictive of HAART (p<0.01) (results not displayed).

DISCUSSION

Compared with previous studies, our data represent HIV-infected patients in more states geographically spread across the US. Among these Medicaid clients, all of whom had public insurance coverage for medical care and prescription drugs throughout 1998, we found significant racial, gender and geographic disparities in any antiretroviral therapy and specifically HAART, which by 1996 had been established as the standard of care. This is consistent with previous studies finding significant racial disparities in the use of antiretroviral drugs.[1–321] We also found significant disparities in any multidrug regimen, as well as fixed dose combinations (Combivir) that could ostensibly improve adherence. Even after controlling for age, gender, geographic region, state and urban–rural residence, Hispanics and black non-Hispanics were undertreated relative to whites, and women were undertreated compared with men.

There are many potential explanations for these disparities, none of which can be excluded by this analysis. This could be a classic example of disadvantaged populations experiencing a slower technology diffusion curve.[22] The state-level variations in treatment rates would suggest that Georgia was subject to slower adoption of new treatment options at the provider or patient level, as the medications of interest were available on each state's drug formulary. Slower diffusion may also contribute to racial–ethnic disparities, reflecting differences in the mix of providers or institutions caring for members of racial/ethnic minority groups,[23] and

Author Manuscript Author Manuscript Author Manuscript Author Manuscript

perhaps also for women with HIV. Another conceptual framework is the disparities model. African–American and other minority patients in a variety of clinical settings are less likely to receive effective treatment,[24] although poverty, insurance status and usual source of care can drive dramatic within-group differences as well.[25] We have previously demonstrated racial and ethnic disparities among Medicaid enrolees in receipt of treatments as varied as antidepressants in the elderly[26] and epidural pain management while giving birth.[27]

Differences may not always represent discrimination or inequity.[28] However, there should be no racial or regional variation in potential benefit from antiretroviral therapy. Widespread adoption of HAART led to dramatic declines in HIV-related deaths, although a black–white mortality gap persisted.[132930] By 1996, the total number of deaths of black people with HIV actually exceeded deaths among whites.[30] One analysis suggests that HIV/AIDS directly accounts for 11.2% of the black–white disparity in years of potential life lost, while it accounts for none of the disparities that occur by educational status.[31]

Disparities may be associated with provider, patient and system-level factors. Different providers may care for patients of different racial–ethnic groups, or providers may prescribe differently for different patients. To the extent that providers have unfounded, informal biases about the abilities of patients of different backgrounds to adhere to complicated HAART regimens, patients may be labelled as “poorly motivated”, “disorganised”, “undeserving of this expensive therapy” or “potentially non-compliant”. If widespread, such a bias (or “cognitive shortcut”)[24] could lead to systematic under- or non-treatment of African–Americans relative to whites, even among physicians who have no conscious intention of discriminating.[30–32]

There are also patient-level factors that may account for the observed disparities in care. African–American and Hispanic/Latino populations may be less aware of potentially life-saving treatments than whites.[2433] Undertreated groups may also have a higher level of distrust of the medical care system and health professionals as a result of daily experiences of racism or gender discrimination, or specific past examples of distrust or HIV-specific forms of distrust.[34–38] For example, some African–American individuals believe HIV to be a man-made virus whose origin was in a government laboratory and whose cure has been withheld from the poor.[39]

Distrust can translate into lower acceptance of antiretroviral therapy. The provider is engaged in earning trust, even as the patient is giving or withholding trust. King *et al* demonstrated significant delays in the median time to receipt of protease inhibitor therapy for black patients who received care from white providers (461 days) versus black patients receiving care from African–American providers (342 days) and white patients receiving care from white providers (353 days).[40] The patient–physician dyad also has implications for gender disparities, which may be related to providers’ hesitancy towards prescribing antiretroviral drugs to women of childbearing age or the reluctance of women in this age category to take antiretrovirals or their shared negotiation around benefit versus risk.[41]

There may also be systemic or institutional factors driving these disparities. Giving the same insurance card and drug coverage benefits to individuals of different race or gender does not

Author Manuscript Author Manuscript Author Manuscript Author Manuscript

eliminate variations in their access to a primary care home or to HIV specialty care.[42,43] Unavailability of private sector Medicaid providers in low-income, inner-city neighbourhoods and lack of bilingual professionals for immigrant patients are two examples of structural inequities that can affect the care of patients with the same Medicaid scope of benefits.[44]

Systematic or institutional factors are also likely to contribute to the enormous state-to-state variation we found in treatment versus non-treatment. An obvious example is the relative unavailability of African–American and Hispanic/Latino physicians in proportions relative to the diverse populations of each state.[45] State-to-state variation is also inherent in the federal–state partnership that defines the Medicaid programme. Morin *et al* found differences in black versus Hispanic participation in state Medicaid compared with AIDS drug assistance programmes related to specific enrolment barriers.[46] Payment rates, covered services, drug formularies and other prescription limits may also vary from state to state.[47,48] We contacted state Medicaid offices and CMS to ensure that in 1998 none of the states in our sample had waiting periods or formulary barriers for antiretroviral medications (personal communications from NJ Division of Medical and Health Services; Mr Mark Trail, Medicaid Director, Georgia Medicaid Office; Bridget Johnson, Pharmacist, Arkansas Medicaid Department; Siri Childs, Pharmacist and Policy Chief for Washington Medicaid; and Indiana Family and Social Services Administration).

We were able to elicit from the dataset a Medicaid pharmaceutical claim for each of the antiretrovirals (except Abacavir) from every state. Other potential explanations for the state-to-state variability could include differences in the availability of HIV specialists who accept Medicaid in each state, the general quality of HIV care, the coordination of care available for HIV patients, per capita healthcare spending and the comprehensiveness and cohesiveness of the healthcare systems in the metropolitan areas of each state.

There are several limitations to our analysis. First, our Medicaid claims data did not allow us to control for variations in clinical severity such as CD4 count and viral load, both of which could be indicators for starting therapy.[13] Second, we were unable to determine the percentage of HIV+ people within a state that were enrolled in Medicaid. A third potential weakness was our exclusion of HIV+ managed care enrolees from our sample. However, Guwani and Weech-Maldonado found that black individuals received HAART less often than whites regardless of whether they were in managed care or a fee for service programme.[49] Fourth, ORs for HAART favoured patients living in rural areas over those in urban areas. Although few studies on rural HIV care have been published, a migratory effect from urban to rural areas has been demonstrated.[50,51] Reasons provided are to access HIV specialists not available in rural areas or because of concern of HIV-associated stigma.[50] Despite this migratory effect, describing disparities in HAART access between urban and rural areas has been equivocal.[51] More research is needed in this area to determine the impact of living in rural areas on HIV morbidity and mortality.

Finally, we assessed the use of drugs within a specific calendar year, but did not assess concurrent use from month to month, and so we cannot ensure that every patient receiving drugs from multiple drug classes was taking those same medications concurrently.

Author Manuscript Author Manuscript Author Manuscript Author Manuscript

Despite these limitations, the good news is that almost two-thirds of Medicaid enrolees in our large merged sample received HAART in 1998. The bad news is that there were still significant racial, gender and geographical disparities in both the receipt of any antiretroviral treatment and the receipt of HAART.

As the Medicaid programme is our nation's largest funder of for HIV care, further research is needed to determine the causes of these persistent racial, gender and geographical disparities in life-saving treatment among equally-insured, low-income enrolees.

Acknowledgments

The Medicaid claims data were obtained through a contract with Morehouse School of Medicine and the Centers for Medicaid and Medicare. We are grateful to Mr David Revere for his insightful comment on previous drafts of this manuscript.

Funding: WDK was a postdoctoral fellow at UCLA CARE Center within the Department of Infectious Diseases and sponsored by Adult AIDS Clinical Trials Group Minority AIDS Training Program. He was partially supported by National Institute of Drug Abuse U01DA17394 and UCLA/DREW Project Export, NCMHD P20MD000148/P20MD000182.

References

1. Cunningham WE, Markson LE, Andersen RM, et al. Prevalence and predictors of highly active antiretroviral therapy use in patients with HIV infection in the United States. HCSUS Consortium. HIV Cost and Services Utilization. J Acquir Immune Defic Syndr. 2000; 25:115–23. [PubMed: 11103041]
2. Andersen R, Bozzette S, Shapiro M, et al. Access of vulnerable groups to antiretroviral therapy among persons in care for HIV disease in the United States. HCSUS Consortium. HIV Cost and Services Utilization Study. Health Serv Res. 2000; 35:389–416. [PubMed: 10857469]
3. Shapiro MF, Morton SC, McCaffrey DF, et al. Variations in the care of HIV-infected adults in the United States: results from the HIV Cost and Services Utilization Study. JAMA. 1999; 281:2305–15. [PubMed: 10386555]
4. Nash D, Katyal M, Shah S. Trends in predictors of death due to HIV-related causes among persons with AIDS in New York City: 1993–2001. J Urban Health. 2005; 82:584–600. [PubMed: 16237203]
5. Centers for Disease Control and Prevention. Health disparities experienced by black or African Americans – United States. MMWR. 2005; 54:1–3.
6. Wong MD, Tagawa T, Hsieh H, et al. Differences in cause-specific mortality between Latino and white adults. Med Care. 2005; 43:1058–62. [PubMed: 16166877]
7. Anastos K, Schneider MF, Gange SJ, et al. For the Women's Interagency HIV study Collaborative Group. The association of race, sociodemographic, and behavioral characteristics in response to highly active antiretroviral therapy in women. J Acquir Immune Defic Syndr. 2005; 39:537–44. [PubMed: 16044004]
8. Uphold CR, Mkanta WN. Review: Use of health care services among persons living with HIV infection: State of the science and future directions. AIDS Patient Care STDs. 2005; 19:473–85. [PubMed: 16124841]
9. Kates, J.; Kaiser Family Foundation. Financing HIV/AIDS Care: A Quilt with Many Holes. May. 2004 http://www.kff.org/hivaids/upload/Financing-HIV-AIDS-Care-A-Quilt-with-Many-Holes.pdf (accessed 7 Nov 2005)
10. Kahn JG, Zhang X, Cross LT, et al. Access to and use of HIV antiretroviral therapy: variation by race/ethnicity in two public insurance programs in the US. Public Health Rep. 2002; 117:252–62. [PubMed: 12432136]
11. Markson L, McKee L, Mauskiopf J. Patterns of Medicaid expenditures after AIDS diagnosis. Health Care Finance Rev. 1994; 15:43–59.

Author Manuscript Author Manuscript Author Manuscript Author Manuscript

12. Walkup J, Sambamoorthi U, Crystal S. Use of newer antiretrovirals among HIV-infected Medicaid beneficiaries with serious mental illness. J Clin Psychiatry. 2004; 65:1180–9. [PubMed: 15367044]
13. Centers for Disease Control and Prevention. Guidelines for the use of antiretroviral agents in HIV-infected adults and adolescents. MMWR. 1998; 47:42–82.
14. Centers for Disease Control and Prevention. HIV/AIDS Surveillance Report. 1998; 10:1–43. http://www.cdc.gov/hiv/topics/surveillance/resources/reports/pdf/hasr1002.pdf (accessed 19 Apr 2008).
15. Rust G, Minor P, Jordan N, et al. Do clinicians screen Medicaid patients for syphilis and HIV when they diagnose other sexually transmitted diseases? Sex Transm Dis. 2003; 30:723–7. [PubMed: 12972797]
16. Mrus JM, Shireman TL, Moomaw CJ, et al. Development of an HIV research database using Medicaid claims data. AIDS & Public Policy J. 2001; 16:48–54.
17. Walkup JT, Wei W, Sambamoorthi U, et al. Sensitivity of an AIDS case-finding algorithm: who are we missing? Med Care. 2004; 8:756–63. [PubMed: 15258477]
18. US Food and Drug Administration, Center for Drug Evaluation and Research. FDA drug approvals list, 1996–2002. Food and Drug Administration; Dec 12. 2002 http://www.fda.gov/cder/da/da.htm (accessed 7 Nov 2005)
19. Arday SL, Arday DR, Monroe S, et al. HCFA's racial and ethnic data: current accuracy and recent improvements. Health Care Finance Rev. 2000; 21:107–16.
20. Economic Research Service – US Dept. of Agriculture. Measuring rurality: rural–urban continuum codes. http://www.ers.usda.gov/briefing/rurality/RuralUrbCon/ (accessed 7 Nov 2005)
21. Palacio H, Kahn JG, Richards TA, et al. Effect of race and/or ethnicity in use of antiretrovirals and prophylaxis for opportunistic infection: a review of the literature. Public Health Rep. 2002; 117:233–51. [PubMed: 12432135]
22. Rogers, EM. The diffusion of innovations. 5th. New York: Free Press, a division of Simon & Schuster; 2003.
23. Bach PB, Pharm HH, Schrag D, et al. Primary care physicians who treat black and whites. N Engl J Med. 2004; 351:575–84. [PubMed: 15295050]
24. Smedley, BD.; Stith, AY.; Nelson, AR., et al. Unequal treatment: confronting racial and ethnic disparities in health care. Washington, DC: Institute of Medicine, National Academies Press; 2003.
25. Rust G, Fryer GE, Strothers H, et al. Modifiable determinants of health care utilization within the African-American population. J Natl Med Assoc. 2004; 96:1169–77. [PubMed: 15481745]
26. Strothers HS 3rd, Rust G, Minor P, et al. Disparities in antidepressant treatment in Medicaid elderly diagnosed with depression. J Am Geriatr Soc. 2005; 53:456–61. [PubMed: 15743289]
27. Rust G, Minor P, Nichols M, et al. Racial and ethnic disparities in the provision of epidural analgesia to Georgia Medicaid enrollees in labor. Am J Obstet Gynecol. 2004; 191:456–62. [PubMed: 15343221]
28. Centers for Disease Control and Prevention. Deaths among persons with AIDS through December 2000. HIV/AIDS Surveill Suppl Rep. 2000; 8:1–2.
29. King JT Jr, Justice AC, Roberts MS, et al. Collaboration in HIV Outcomes Research – US Program Team. Long-term HIV/AIDS survival estimation in the highly active antiretroviral therapy era. Med Decis Making. 2003; 23:9–20. [PubMed: 12583451]
30. National Center for HIV, STD and TB Prevention, Divisions of HIV/AIDS Prevention. Estimated number of deaths among adults and adolescents with AIDS by race–ethnicity, 1985–2003, US AIDS Surveillance – Trends L207 slide series through 2003, Slide 5 of 18. Centers for Disease Control and Prevention; http://www.cdc.gov/hiv/graphics/images/L207/L207-5.htm (accessed 7 Nov 2005)
31. Wong MD, Shapiro MF, Boscardin WJ, et al. Contribution of major diseases to disparities in mortality. N Engl J Med. 2002; 347:1585–92. [PubMed: 12432046]
32. Wong MD, Cunningham WE, Shapiro MF, et al. Disparities in HIV treatment and physician attitudes about delaying protease inhibitors for nonadherent patients. J Gen Intern Med. 2004; 19:366–74. [PubMed: 15061746]
33. Ebrahim SH, Anderson JE, Weidle P, et al. Race/ethnic disparities in HIV testing and knowledge about treatment for HIV/AIDS: United States, 2001. AIDS Patient Care STDS. 2004; 18:27–33. [PubMed: 15006192]

Author Manuscript Author Manuscript Author Manuscript Author Manuscript

34. Brandon DT, Isaac LA, LaVeist TA. The legacy of Tuskegee and trust in medical care: is Tuskegee responsible for race differences in mistrust of medical care? J Natl Med Assoc. 2005; 97:951–6. [PubMed: 16080664]
35. O'Malley AS, Sheppard VB, Schwartz M, et al. The role of trust in use of preventive services among low-income African-American women. Prev Med. 2004; 38:777–85. [PubMed: 15193898]
36. Boulware LE, Cooper LA, Ratner LE, et al. Race and trust in the health care system. Public Health Rep. 2003; 118:358–65. [PubMed: 12815085]
37. Bogart LM, Thorburn S. Are HIV/AIDS conspiracy beliefs a barrier to HIV prevention among African Americans? J Acquir Immune Defic Syndr. 2005; 38:213–18. [PubMed: 15671808]
38. Schuster MA, Collins R, Cunningham WE, et al. Perceived discrimination in clinical care in a nationally representative sample of HIV-infected adults receiving health care. J Gen Intern Med. 2005; 20:807–13. [PubMed: 16117747]
39. Klonoff EA, Landrine H. Do blacks believe that HIV/AIDS is a government conspiracy against them? Prev Med. 1999; 28:451–7. [PubMed: 10329334]
40. King WD, Wong MD, Shapiro MF, et al. Does racial concordance between HIV-positive patients and their physicians affect the time to receipt of protease inhibitors? J Gen Intern Med. 2004; 19:1146–53. [PubMed: 15566445]
41. Sambamoorthi U, McAlpine DD. Racial, ethnic, socioeconomic, and access disparities in the use of preventive services among women. Prev Med. 2003; 37:475–84. [PubMed: 14572431]
42. Cunningham WE, Andersen RM, Katz MH, et al. The impact of competing subsistence needs and barriers on access to medical care for persons with HIV receiving care in the United States. Med Care. 1999; 37:1270–81. [PubMed: 10599608]
43. Bonuck K. Housing needs of persons with HIV and AIDS in New York State. J Health Soc Policy. 2001; 13:61–74. [PubMed: 11190657]
44. Weech-Maldonado R, Morales LS, Elliott M, et al. Race/ethnicity, language, and patients' assessment of care in Medicaid managed care. Health Services Res. 2003; 38:789–808.
45. American Medical Association Minority Affairs Consortium. Total physicians by race–ethnicity, 2003. http://www.ama-assn.org/ama/pub/category/12930.html (accessed Nov 2005)
46. Morin SF, Sengupta S, Cozen M, et al. Responding to racial and ethnic disparities in use of HIV drugs: analysis of state policies. Public Health Rep. 2002; 117:263–72. [PubMed: 12432137]
47. Kaiser Commission on Medicaid and the Uninsured. State Medicaid outpatient prescription drug policies: Findings from a national survey, 2005 update. Kaiser Family Foundation; http://www.kff.org/medicaid/7381.cfm (accessed 7 Nov 2005)
48. Buchanan RJ. Medicaid managed care and coverage of prescription medications. Am J Public Health. 2002; 92:1238–43. [PubMed: 12144975]
49. Guwani JM, Weech-Maldonado R. Medicaid managed care and racial disparities in AIDS treatment. Health Care Finance Rev. 2004–2005; 26:119–32.
50. Berk M, Schur C, Dunbar J, et al. Short report: Migration among persons living with HIV. Soc Sci Med. 2003; 57:1091–7. [PubMed: 12878108]
51. Schur C, Berk M, Dunbar J, et al. Where to seek care: an examination of people in rural areas with HIV/AIDS. J Rural Health. 2002; 18:337–46. [PubMed: 12135154]

Author Manuscript Author Manuscript Author Manuscript Author Manuscript

What this study adds

- Prior racial disparities analyses using Medicaid claims data are limited as the data are either from single states or merged data from states with high HIV prevalence, whereas our analysis of five merged states varying in HIV prevalence and geographic distribution can be used to approximate national diversity.
- Our study demonstrates the importance of geographic residence and urbanisation on access to HIV care for Medicaid recipients.
- Our study demonstrates that racial and gender disparities in HIV care were far-reaching and included disparities not only in standard of care regimens but in receipt of the newest antiretrovirals.

Author Manuscript Author Manuscript Author Manuscript Author Manuscript

Policy implications

- Despite the availability of equal and full prescription benefit, racial, gender and geographic differences within the HIV Medicaid population exist.
- These disparities in the receipt of life-saving medications undoubtedly affect HIV morbidity and mortality and conceivably contribute to the racial disparities in HIV outcomes. Other implications include the need to address racial disparities in health care by further analysis of patient–provider relationships and their impact on the receipt of care; to redress racial and geographic disparities in health care before Medicaid reform to ensure equity in health care for the poor; and the use of Medicaid claims data for real-time surveillance to identify and correct inadequate treatment.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 1

Classes of antiretrovirals with their respective Food Drug and Administration (FDA) market-approved year

Antiretrovirals before 1998	Antiretrovirals since 1998
NRTI	NRTI
ddi (1991)	Abacavir (1998)
ddC (1992)	
d4T (1994)	
Lamivudine (1995)	
Zidovudine (1987)	
Combivir (1997)	
NNRTI	NNRTI
Delavirdine (1997)	Efavirnez (1998)
Nevirapine (1997)	
Protease inhibitor	Protease inhibitor
Saquinavir (1995)	Amprenavir (1999)
Ritonavir (1996)	Lopinavir/Ritonavir (2000)
Nelfinavir (1997)	
Indinavir (1996)	

NRTI, nucleoside reverse transcriptase inhibitors; NNRTI, non-nucleoside reverse transcriptase inhibitors.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 2

Demographics of merged sample of Medicaid recipients from five states (n = 7202)

Variable	Frequency (%)
Age (years)	
<20	166 (2.3)
20–29	767 (10.6)
30–39	2833 (39.3)
40–49	2555 (35.5)
50–59	752 (10.4)
60+	129 (1.8)
Race/ethnicity	
White, not Hispanic	2611 (32.8)
Black, not Hispanic	4236 (53.1)
Hispanic	356 (4.5)
Gender	
Female	3191 (44.3)
Male	4011 (55.7)
State	
Arkansas	221 (3.1)
Georgia	1905 (26.5)
Indiana	664 (9.2)
New Jersey	3413 (47.4)
Washington	999 (13.9)
Urban/rural	
Urbanised	6348 (88.1)
Non-urban	854 (11.9)

Author Manuscript Author Manuscript Author Manuscript Author Manuscript

Table 3

Bivariate results of receipt of type or class of antiretroviral therapy by recipient age, race/ethnicity, gender and geographic region (white and black non-Hispanic plus Hispanic Medicaid recipients, n = 7202)

	(n)	NRTI (%)	NNRTI (%)	PI (%)	Combivir (%)	Efavirenz (%)	Any antiretroviral drug therapy (%)	Multidrug therapy (at least two drugs in same year) (%)	HAART (%)
Total	7202	5297 (73.5)	1771 (24.6)	4452 (61.8)	2101 (29.2)	362 (5.0)	5239 (72.7)	5012 (69.6)	4430 (61.5)
Age (years)									
<20	166	79 (47.6)	13 (7.8)	53 (31.9)	29 (17.5)	4 (2.4)	80 (48.2)	74 (44.6)	56 (33.7)
20–29	767	460 (60.0)	129 (16.8)	356 (46.4)	208 (27.1)	22 (2.9)	465 (60.6)	412 (53.7)	356 (46.4)
30–39	2833	2109 (74.4)	760 (26.8)	1785 (63.0)	778 (27.5)	166 (5.9)	2150 (75.9)	2027 (71.5)	1784 (63.0)
40–49	2555	1994 (78.0)	667 (26.1)	1699 (66.5)	819 (32.1)	139 (5.4)	2013 (78.8)	1880 (73.6)	1683 (65.9)
50–59	752	563 (74.9)	181 (24.1)	486 (64.6)	229 (30.5)	28 (3.7)	568 (75.5)	533 (70.9)	481 (64.0)
60+	129	92 (71.3)	21 (16.3)	73 (56.6)	38 (29.5)	3 (2.3)	92 (71.3)	86 (66.7)	70 (54.3)
Race/ethnicity									
White NH	2610	2077 (79.6)	784 (30.0)	1773 (67.9)	657 (25.2)	195 (7.5)	2107 (80.7)	2006 (76.9)	1783 (68.3)
Black NH	4236	2978 (70.3)	901 (21.3)	2466 (58.2)	1340 (31.6)	153 (3.6)	3017 (71.2)	2777 (65.6)	2436 (57.5)
Hispanic	356	242 (68.0)	86 (24.2)	213 (59.8)	104 (29.2)	14 (3.9)	244 (68.5)	229 (64.3)	211 (59.3)
Gender									
Male	4011	3237 (80.7)	1142 (28.5)	2792 (69.6)	1211 (30.2)	244 (6.1)	3283 (81.8)	3110 (77.5)	2778 (69.3)
Female	3191	2060 (64.6)	629 (19.7)	1660 (52.0)	890 (27.9)	118 (3.7)	2085 (65.3)	1902 (59.6)	1652 (51.8)
Rural–urban									
Urban	6348	4659 (73.4)	1602 (25.2)	3955 (62.3)	1851 (29.2)	324 (5.1)	4724 (74.4)	4424 (69.7)	3919 (61.7)
Rural	854	638 (74.7)	169 (19.8)	497 (58.2)	250 (29.3)	38 (4.4)	644 (75.4)	588 (68.9)	511 (59.8)
State									
AR	221	168 (76.0)	49 (22.2)	133 (60.2)	72 (32.6)	9 (4.1)	168 (76.0)	151 (68.3)	135 (61.1)
GA	1905	1165 (61.2)	265 (13.9)	892 (64.2)	433 (22.7)	54 (2.8)	1179 (61.9)	1063 (55.8)	890 (46.7)
IN	664	566 (85.2)	206 (31.0)	489 (73.6)	204 (30.7)	44 (6.6)	581 (87.5)	550 (82.8)	477 (71.8)
NJ	3413	2618 (76.7)	924 (27.1)	2277 (66.7)	1214 (35.6)	166 (4.9)	2644 (77.5)	2479 (72.6)	2259 (66.2)
WA	999	780 (78.1)	37 (32.7)	661 (66.2)	178 (17.8)	89 (8.9)	796 (79.7)	769 (77.0)	669 (67.0)

NRTI, nucleoside reverse transcriptase inhibitors; NNRTI, non-nucleoside reverse transcriptase inhibitors; PI protease inhibitors; AR, Arkansas; GA, Georgia; IN, Indiana; NJ, New Jersey; WA, Washington.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript

Table 4

Multivariate analysis of demographic predictors of highly active antiretroviral therapy (n = 7202)

Variable	OR (CI)	Significance (p value)
Age (years)		
<20	0.35 (0.24 to 0.50)	<0.001
20–29	0.64 (0.51 to 0.79)	<0.001
30–39	1.03 (0.87 to 1.22)	0.75
40–49	1.10 (0.92 to 1.31)	0.28
50–59	1.00 (reference)	Reference
60+	0.71 (0.48 to 1.05)	0.08
Race/ethnicity		
Black	0.80 (0.71 to 0.90)	<0.001
Hispanic	0.70 (0.55 to 0.89)	0.003
White	1.00 (reference)	Reference
Gender		
Female	1.00 (reference)	Reference
Male	1.87 (1.68 to 2.08)	<0.001
State		
Arkansas	1.52 (1.13 to 2.04)	0.006
Georgia	1.00 (reference)	Reference
Indiana	2.06 (1.67 to 2.54)	<0.001
New Jersey	2.34 (2.06 to 2.65)	<0.001
Washington	1.67 (1.39 to 2.01)	<0.001
Urban/rural		
Urban	1.00 (reference)	Reference
Rural	1.38 (1.17 to 1.63)	<0.001