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# Trends in Provider-Advised HIV Antiretroviral Therapy Deferral in the United States, 2009-2014

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**Medical Monitoring Project**

## Abstract

Since 2012, U.S. clinical guidelines for antiretroviral therapy (ART) initiation have recommended universal ART prescription barring patient contraindications. Although ART prescription has significantly increased among U.S. HIV patients in recent years, the reasons for this increase, and why some patients are still not taking ART, are not well characterized. We lack information on the proportion of patients deferring ART based on the advice of their provider, whether these patients differ from patients deferring ART for other reasons, and whether provider-advised ART deferral has decreased as guidelines have moved towards universal ART prescription. Further, few have examined reasons for ART deferral among patients in diverse care settings, which can inform efforts to increase, and identify reasons for inequities in ART use.

To fill these gaps, we analyzed data from the Medical Monitoring Project (MMP), which conducts interviews and medical record abstraction on annual probability samples of U.S. HIV patients. We assessed the proportion of persons who reported provider-advised ART deferral during 2009-2014, and used bivariate linear regression to estimate linear trends in provider-advised ART deferral over time by patient characteristics and clinical setting.

During this period, the proportion of patients reporting provider-advised ART deferral decreased from 67% to 40%. Significant decreases were observed in all patient subgroups and clinical settings. Patients recently reporting non-provider-advised reasons for ART deferral were significantly less likely to be virally suppressed and more likely to have inconsistent care, be depressed, binge drink, and use illicit drugs.

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This work suggests that U.S. providers are recommending ART deferral for fewer patients, consistent with increasing adoption of 2012 universal prescribing guidelines. Addressing patients' financial, mental health, and substance use barriers may be needed to achieve universal ART prescription in the United States.

**Keywords**

Human Immunodeficiency Virus; HIV; Antiretroviral Therapy; ART; Antiretroviral Therapy Initiation

## Introduction

Antiretroviral therapy (ART) use and subsequent viral suppression decrease HIV-related morbidity and HIV transmission (Cohen et al., 2016; May et al., 2014). Since 2012, U.S. guidelines for ART initiation have recommended universal ART prescription barring patient contraindications (Panel on Antiretroviral Guidelines for Adults and Adolescents, 2016). Although there were significant increases in ART prescription from 2009–2013 among adults receiving HIV care (Bradley et al., 2016), the reasons for these increases have not been thoroughly examined. One likely explanation is declining provider-advised ART deferral as providers adopt clinical guidelines, and population-based estimates for 2013–2014 indicated that nearly three-quarters of HIV care providers reported initiating ART for all patients, barring contraindications (Weiser et al., 2017). However, we lack information on the proportion of patients deferring ART based on the advice of their provider, whether these patients differ from patients deferring ART for other reasons, or whether provider-advised ART deferral has decreased as guidelines have moved towards universal ART prescription. Further, few have examined reasons for ART deferral among patients in diverse care settings, which could help inform efforts to increase, and identify reasons for inequities in, ART use.

We assessed trends from 2009 to 2014 in self-reported reasons for ART deferral among HIV-positive adults in care, overall and by patient characteristics and clinical setting. To characterize recent ART deferral, we estimated prevalence of, and factors associated with, provider-advised versus other reasons for ART deferral for patients receiving HIV care during 2013–2014.

## Materials and Methods

The Medical Monitoring Project (MMP) is a national HIV surveillance system that produces annual, cross-sectional estimates of behavioral and clinical characteristics of HIV-positive adults (Bradley et al., 2014). MMP data collection is part of routine public health surveillance and was determined to be nonresearch. Informed consent was obtained from all interviewed participants. For the 2009–2014 data collection cycles, MMP used a 3-stage design to sample HIV-positive adults receiving outpatient medical care (i.e., states, outpatient HIV care facilities, and patients). Data were collected via face-to-face or telephone interviews and medical records were abstracted at the sampled facility. Response rates were 100% at the state/territory level, facility response ranged between 76–86%, and

patient response ranged between 49–56%. Data were weighted on the basis of known probabilities of selection and were adjusted for facility and patient non-response.

Using annual cross-sectional MMP data representing U.S. HIV patients during 2009–2014 (n=28,124), we estimated the overall percentage deferring ART by year. Among 1,908 persons who reported deferring ART at the time of interview, we examined patients' self-reported primary reason for deferring ART in 2009 and 2014. Reasons for deferral included provider-advised ART deferral, feeling healthy, side effects, money or insurance problems, or other reasons (e.g. depression, being worried about adherence, denial, drinking or using drugs). We assessed the proportion of persons who reported provider-advised ART deferral (versus all other reasons for deferral) during 2009–2014, and used bivariate linear regression to estimate linear trends over time by history of ART use (ART naïve vs. ART experienced), geometric mean CD4 t-lymphocyte cell (CD4) count over the past 12 months (<500 vs. ≥500), care at facility receiving Ryan White HIV/AIDS program (RWHAP) funding, facility ownership type (public vs. private), and facility HIV patient load (≤400 vs. >400 patients). In the linear models, $\beta_{TREND}$ represents the average annual percentage point change over the years examined. In the graphs, 2012 is highlighted to show the year in which U.S. guidelines began recommending universal ART prescription barring patient contraindications.

To characterize ART deferral in the most recent time period for which we had data, 2013–2014, we assessed differences between patients deferring ART based on the advice of their provider compared with patients giving other reasons for ART deferral using Rao-Scott chi-square tests. We assessed differences overall and by age, gender, non-Hispanic black or African American race/ethnicity (hereafter referred to as black), gay or bisexual identity, educational attainment, household at or below the poverty level, type of health coverage or insurance (any private insurance, public insurance only, uninsured/only RWHAP program funding), homelessness and incarceration in the past 12 months, length of time since HIV diagnosis, regular care utilization (≥1 viral load in each 6 month period), symptoms of major or other depression in the past 2 weeks based on the Patient Health Questionnaire 8, binge drinking (≥5 alcoholic beverages for men and ≥4 for women in a single sitting), any illicit drug use, and viral suppression (most recent viral load undetectable or ≤ 200 copies/mL). Statistical significance for all tests was defined as $p<0.05$. All analyses accounted for the complex sample design and weights.

## Results

From 2009 through 2014, the proportion of U.S. HIV patients deferring ART decreased from 12% (95% confidence interval [CI:11–13]) to 4% (CI:3–4) ($P_{TREND}<0.0001$, $\beta_{TREND}=-0{\cdot}02$). In 2009, reported reasons for deferring ART were provider advised (67%, CI:61–72), feels healthy (9%, CI:6–13), side effects (7%, CI:5–10) and other reasons including depression, being worried about adherence, denial, drinking or using drugs (13%, CI:10–16). The proportion reporting money or insurance as a reason for ART deferral in 2009 was 3% (CI:1–5) but this estimate was unstable due to small sample size. By 2014, reported reasons for deferring ART were provider advised (40%, CI:34–47), feels healthy (14%, CI:8–19), side effects (7%, CI:4–10) and other reasons (25%, CI:20–30). The

proportion reporting money or insurance as a reason for deferring ART in 2014 was 14% (CI:8–19).

From 2009 through 2014, there was a significant overall decrease in participants reporting provider-advised ART deferral, from 67% to 40% (Figure 1). Although ART deferral was less common among ART-experienced patients compared to ART-naïve patients, both groups had significant decreases in provider-advised ART deferral, as did those with geometric mean CD4 counts <500 and ≥500. Provider-advised ART deferral significantly decreased among patients attending both RWHAP-funded and non-funded facilities, although the former had larger annual estimated decreases ($\beta_{TREND}$= −0·06 for RWHAP-funded versus −0·02 for non-funded facilities, Figure 2). Significant decreases were also seen among patients attending public and private facilities and those attending clinics with HIV patient loads of ≤400 and >400 patients.

In 2013–2014, provider-advised ART deferral was significantly more common among persons aged ≥50 years compared with those <50 years (51%, CI:42–59 vs. 39%, CI:33–45), blacks compared with non-blacks (51%, CI:42–59 vs. 32%, CI:23–41), those with regular versus not regular care utilization (51%, CI:42–61 vs. 33%, CI:26–40), those without vs. those with symptoms of depression (45%, CI:40–51 vs. 35%, CI:26–44), and those who did not use drugs compared with those who did (48%, CI:41–55 vs. 32%, CI:25–40). Viral suppression was significantly more common among those with provider-advised ART deferral versus those who deferred for other reasons (39%, CI:33–45 vs. 28%, CI:19–36).

## Discussion

From 2009 through 2014, the percentage of patients reporting provider-advised ART deferral decreased an average of 5 percentage points per year. We documented significant decreases in provider-advised deferral among all examined patient sub-groups and HIV care facility characteristics. Based on patient reports, providers were increasingly less likely to defer ART for ART-experienced patients and those with lower CD4 counts. This is consistent with increasing adoption by providers of U.S. clinical guidelines, which recommended ART initiation barring any contraindications for patients with CD4 counts of <350 before 2009, at <500 in 2009 and universal initiation in 2012. The smallest decrease in provider-advised ART deferral was among patients attending HIV care facilities not funded by the RWHAP. As more providers adopt universal ART prescription, newer regimens with a higher barrier to resistance are developed, and long-acting ART regimens receive approval, we may see further decreases in provider-advised ART deferral.

The United States has moved from an era where the majority of HIV patients deferring ART were doing so based on the advice of their provider to one where reasons for ART deferral are more complex. The percentage of persons deferring ART who reported money or insurance problems as reasons for ART deferral increased. Although there were improvements in coverage for HIV care over the time period examined (Kates & Dawson, 2017), poverty is extremely high among HIV patients (Centers for Disease Control and Prevention, 2016), and even those with coverage may face difficulties in affording medication copays. Further, lower educational attainment is common among HIV patients

(Centers for Disease Control and Prevention, 2016), which may result in difficulties in understanding or navigating the insurance or coverage systems that provide ART for some patients. Case management may help patients navigate financial and insurance barriers to ART use (Brennan-Ing et al., 2016).

Among persons deferring ART, the proportion citing other reasons for ART deferral such as depression, being worried about medication adherence, and drinking or drug use increased from 2009 to 2014. Compared to persons deferring ART based on the advice of their provider, we found that persons reporting other reasons for ART deferral were less likely to be virally suppressed and more likely to have inconsistent care, be depressed, and to binge drink and use illicit drugs. Although mental health and substance use problems are commonly cited by providers as a reason they would defer ART prescription (Weiser et al., 2017), we found that persons with potential mental health and substance use problems were more likely to cite other reasons for ART deferral. This tendency may result from these problems being barriers to engagement in care (Mugavero, 2008), thus limiting opportunities for providers to interact with patients and make recommendations about ART. In addition to efforts to improve engagement in HIV care, increasing access to mental health and substance abuse counseling and treatment and adherence support services for those who need them may help. Our results suggest that providing support to help patients overcome these psychosocial barriers to ART use will be critical to achieve universal ART for clinically-eligible persons receiving HIV care.

We also found that over half of black HIV patients reported provider-advised ART deferral compared with less than one-third of non-black patients. While more investigation is warranted, this may be due to racial/ethnic differences in patient-provider communication. Studies have found more provider verbal dominance and less patient provision of information in medical encounters with black compared to white HIV patients (Beach et al., 2011; Laws et al., 2014).

A key issue beyond the focus of this analysis is that most HIV-positive persons deferring ART are not receiving medical care, so efforts to increase linkage to and engagement in care will be essential to realize the full treatment and prevention benefits of ART use for persons living with HIV and their partners. A limitation of our analysis is that reasons for ART deferral were reported by the patient and may differ from the provider's perception (Christopoulos et al., 2015). However, efforts to increase ART use among clinically eligible persons must incorporate the patient's perspective about their behavior in order to be most effective. Another limitation is that the patient interview and our measure of viral suppression were not necessarily contemporaneous, so some misclassification may exist.

In conclusion, HIV patient reports suggest that U.S. providers are recommending ART deferral for fewer patients, perhaps reflecting increasing adoption of 2012 universal prescribing guidelines. However, more work may be needed to address patients' barriers to ART use apart from provider-advised deferral, particularly those related to financial barriers, mental health, and substance use.

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Disclaimer: The findings and conclusions in this report are those of the authors and do not necessarily represent the views of the Centers for Disease Control and Prevention. Portions of this work were presented at the 12th International Conference on HIV Treatment and Prevention Adherence in June 2017 in Miami, FL, USA.

## References

Beach MC, Saha S, Korthuis PT, Sharp V, Cohn J, Wilson IB, … Moore R (2011). Patient-provider communication differs for black compared to white HIV-infected patients. AIDS Behav, 15(4), 805–811. doi: 10.1007/s10461-009-9664-5 [PubMed: 20066486]

Bradley H, Frazier E, Huang P, Fagan J, Do A, Mattson C, … Skarbinski J (2014). Behavioral and Clinical Characteristics of Persons Receiving Medical Care for HIV Infection Medical Monitoring Project United States, 2010. Atlanta, GA: C. D. o. H. A. P. S. S. Report. Retrieved from HIV Surveillance Special Report 9: http://www.cdc.gov/hiv/library/reports/surveillance/#special.

Bradley H, Mattson CL, Beer L, Huang P, Shouse RL, & Medical Monitoring P (2016). Increased antiretroviral therapy prescription and HIV viral suppression among persons receiving clinical care for HIV infection. AIDS, 30(13), 2117–2124. doi: 10.1097/QAD.0000000000001164 [PubMed: 27465279]

Brennan-Ing M, Seidel L, Rodgers L, Ernst J, Wirth D, Tietz D, … Karpiak SE (2016). The Impact of Comprehensive Case Management on HIV Client Outcomes. PLoS One, 11(2), e0148865. doi: 10.1371/journal.pone.0148865 [PubMed: 26849561]

Centers for Disease Control and Prevention. (2016). Behavioral and Clinical Characteristics of Persons Receiving Medical Care for HIV Infection—Medical Monitoring Project, United States, 2014 Cycle (June 2014–May 2015). http://www.cdc.gov/hiv/library/reports/hiv-surveillance.html.

Christopoulos KA, Olender S, Lopez AM, Lekas HM, Jaiswal J, Mellman W, … Koester KA (2015). Retained in HIV Care But Not on Antiretroviral Treatment: A Qualitative Patient-Provider Dyadic Study. PLoS Med, 12(8), e1001863. doi: 10.1371/journal.pmed.1001863 [PubMed: 26263532]

Cohen MS, Chen YQ, McCauley M, Gamble T, Hosseinipour MC, Kumarasamy N, … Fleming TR (2016). Antiretroviral Therapy for the Prevention of HIV-1 Transmission. N Engl J Med. doi: 10.1056/NEJMoa1600693

Kates J, & Dawson L (2017). Insurance Coverage Changes for People with HIV Under the ACA. Retrieved from https://www.kff.org/health-reform/issue-brief/insurance-coverage-changes-for-people-with-hiv-under-the-aca/. Date accessed January 23, 2018

Laws MB, Lee Y, Rogers WH, Beach MC, Saha S, Korthuis PT, … Wilson IB (2014). Provider-patient communication about adherence to anti-retroviral regimens differs by patient race and ethnicity. AIDS Behav, 18(7), 1279–1287. doi: 10.1007/s10461-014-0697-z [PubMed: 24464408]

May MT, Gompels M, Delpech V, Porter K, Orkin C, Kegg S, … Sabin C (2014). Impact on life expectancy of HIV-1 positive individuals of CD4+ cell count and viral load response to antiretroviral therapy. Aids, 28(8), 1193–1202. doi: 10.1097/qad.0000000000000243 [PubMed: 24556869]

Mugavero MJ (2008). Improving engagement in HIV care: what can we do? Top HIV Med, 16(5), 156–161 [PubMed: 19106431]

Panel on Antiretroviral Guidelines for Adults and Adolescents. (2016). Guidelines for the use of antiretroviral agents in HIV-1-infected adults and adolescents. Retrieved from http://www.aidsinfo.nih.gov/ContentFiles/AdultandAdolescentGL.pdf. Accessed July 20, 2016

Weiser J, Brooks JT, Skarbinski J, West BT, Duke CC, Gremel GW, & Beer L (2017). Barriers to Universal Prescribing of Antiretroviral Therapy by HIV Care Providers in the United States, 2013–2014. J Acquir Immune Defic Syndr. doi: 10.1097/QAI.0000000000001276

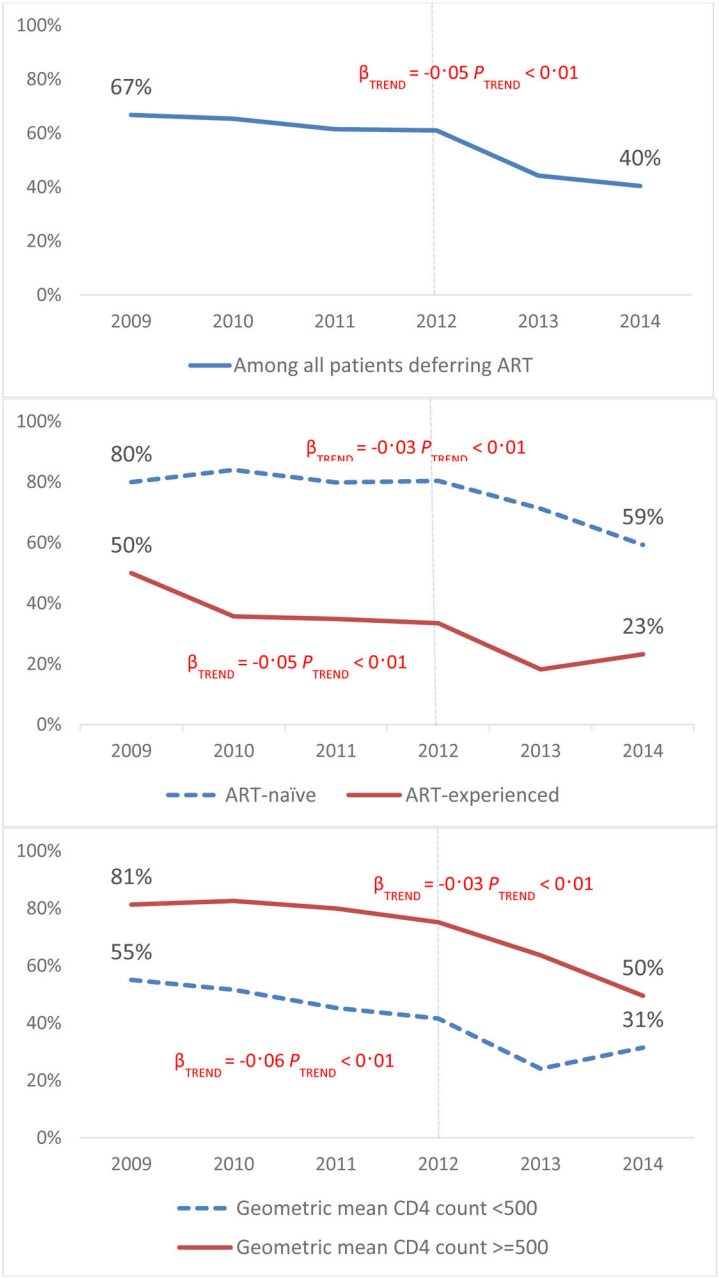


**Figure 1. Trends in provider-advised Antiretroviral therapy (ART) deferral, overall and by selected patient characteristics—Medical Monitoring Project, United States, 2009-2014**

Note: Dashed line denotes the year 2012, when U.S. guidelines began recommending universal ART prescription barring patient contraindications

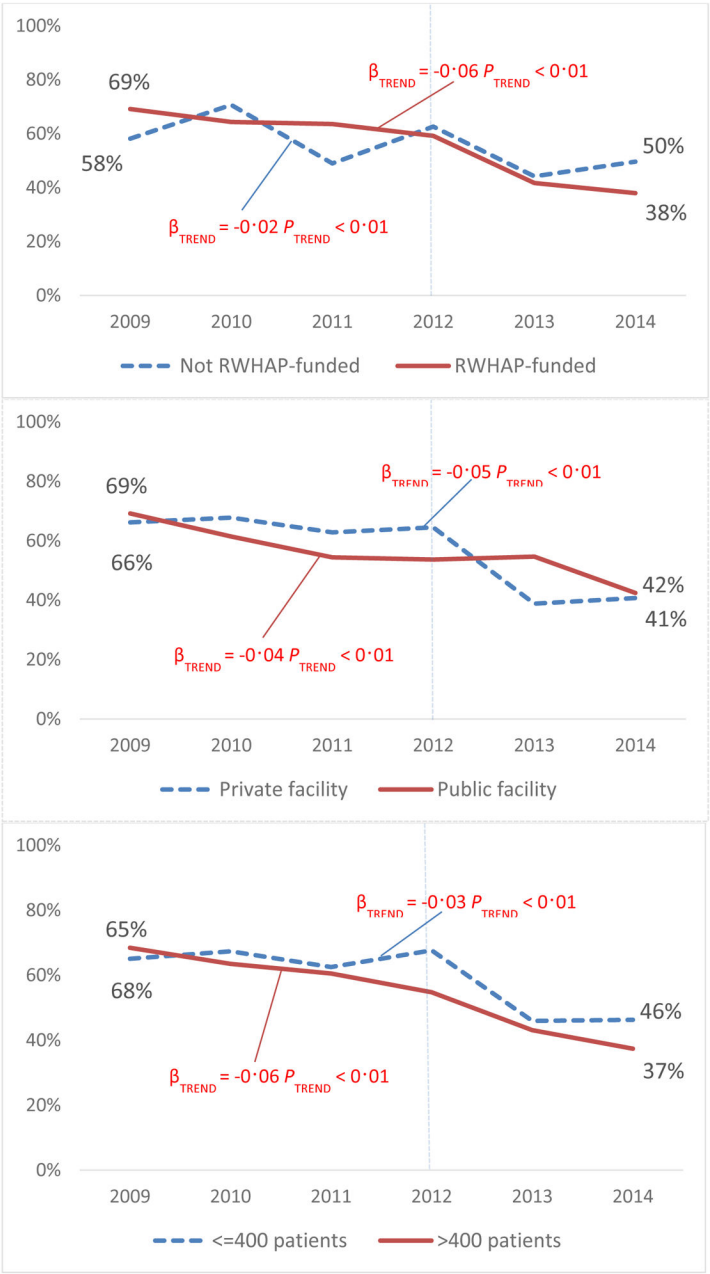


**Figure 2. Trends in provider-advised antiretroviral therapy (ART) deferral by selected HIV care facility characteristics—Medical Monitoring Project, United States, 2009-2014**

Note: Dashed line denotes the year 2012, when U.S. guidelines began recommending universal ART prescription barring patient contraindications