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Prevalence of anal cytology screening among persons with HIV and lack of access to high-resolution anoscopy at HIV care facilities

Sun Hee Rim, PhD, MPH[1,*], **Linda Beer, PhD**[2], **Mona Saraiya, MD, MPH**[1,#], **Yunfeng Tie, PhD**[2], **Xin Yuan, MD**[3], **John Weiser, MD, MPH**[2]

[1]Division of Cancer Prevention and Control, National Center for Chronic Disease Prevention and Health Promotion, Centers for Disease Control and Prevention, Atlanta, GA, USA

[2]Division of HIV Prevention, National Center for HIV, Viral Hepatitis, STD, and TB Prevention, Centers for Disease Control and Prevention, Atlanta, GA, USA

[3]DLH Corporation, Atlanta, GA, USA

Abstract

Background: People with HIV at highest risk of anal cancer include gay, bisexual, and other men who have sex with men and transgender women aged 35 years or older as well as other people with HIV aged 45 years or older. Identifying and treating precancerous lesions can reduce anal cancer incidence in these groups. We assessed the prevalence of anal cytology and access to high-resolution anoscopy among people with HIV overall and in those individuals at highest risk.

Methods: Data were obtained from the Centers for Disease Control and Prevention's Medical Monitoring Project, a population-based survey of people with HIV aged 18 years and older, and a supplemental Medical Monitoring Project facility survey. We report weighted percentages of people with HIV receiving anal cytology during the past 12 months, access to high-resolution anoscopy, and characteristics of HIV care facilities by availability of high-resolution anoscopy.

Results: Overall, 4.8% (95% confidence interval [CI] = 3.4% to 6.1%) of people with HIV had undergone anal cytology in the prior 12 months. Only 7.7% (95% CI = 5.1% to 10.6%) of gay, bisexual, and other men who have sex with men as well as transgender women 35 years of age or older and 1.9% (95% CI =0.9% to 2.9%) of all other people with HIV aged 45years and older had anal cytology. Prevalence was statistically significantly low among people with HIV with the following characteristics: non-Hispanic or Latino, Black or African American, high

[*]**Correspondence to:** Sun Hee Rim, PhD, Division of Cancer Prevention and Control, Centers for Disease Control and Prevention, 4770 Buford Highway, NE, MS S107-4, Atlanta, GA 30341, USA (srim@cdc.gov).

[#]Mona Saraiya was a full-time employee at the Centers for Disease Control and Prevention when she made contributions to this article.

Author contributions

Sun Hee Rim, PhD, MPH (Conceptualization; Methodology; Writing—original draft); Linda Beer, PhD (Conceptualization; Data curation; Methodology; Supervision; Writing—review & editing); Mona Saraiya, MD, MPH (Conceptualization; Methodology; Supervision; Writing—review & editing); Yunfeng Tie, PhD (Data curation; Formal analysis; Methodology; Writing—review & editing); Xin Yuan, MD (Formal analysis; Methodology; Writing—review & editing); John Weiser, MD, MPH (Conceptualization; Data curation; Methodology; Supervision; Writing—review & editing).

Conflicts of interest

None.

school education or less, heterosexual orientation, and living in southern Medical Monitoring Project states. Among people with HIV, 32.8% (95% CI = 28.0% to 37.7%) had no access to high-resolution anoscopy on-site or through referral at their care facility; 22.2% (95% CI = 19.5% to 24.9%) had on-site access; 45.0% (95% CI = 41.5% to 48.5%) had high-resolution anoscopy available through referral. Most facilities that received Ryan White HIV/AIDS Program funding, cared for more than 1000 people with HIV, or provided on-site colposcopy also provided high-resolution anoscopy on-site or through referral.

Conclusions: Rates of anal cytology and access to high-resolution anoscopy were low among people with HIV, including those individuals at highest risk of anal cancer. Our data may inform large-scale implementation of anal cancer prevention efforts.

In the general US population, anal cancer accounts for approximately 1 to 2 cases per 100 000 person-years and about 7700 new diagnoses annually (1). People with HIV, however, are 19 to 28 times more likely to be diagnosed with anal cancer than the general population (2–4). Among men, one-third of anal cancer cases occur among people with HIV, and for women, 3.0% of cases occur among people with HIV (5,6). Among people with HIV, anal cancer incidence is higher among men who have sex with men (MSM) (about 89 cases per 100 000 people) and individuals 45 years of age and older (≥ 30 per 100 000 people) (4).

About 90% of anal cancers are caused by the human papillomavirus (HPV) (7). Like cervical cancer, anal cancers are preceded by a high-grade squamous intraepithelial lesion (HSIL) (8). Screening for anal HSILs can be performed using anal Papanicolaou testing (hereafter, anal cytology) alone or with HPV co-testing, although there are currently no US Food and Drug Administration–approved anal cancer screening tests. For those who screen positive for cytologic HSIL—or have abnormal cytologic results, including HSIL, low-grade squamous intraepithelial lesions, or atypical squamous cells of undetermined significance (ASC-US) (9)—a referral for a high-resolution anoscopy procedure is recommended to biopsy and histologically confirm HSIL and treat anal lesions (10,11). Data from the Anal Cancer/HSIL Outcomes Research Study, a randomized clinical trial, have shown that treating anal HSIL among people with HIV aged 35 years and older leads to a 57% reduction in anal cancer (8). Among people with HIV, early detection of histologically verified precancerous lesions (through screening of people at high risk of anal cancer), and treatment of anal cancer precursors can reduce incidence (8). Although proposed evidence-based recommendations are still under review by the US Department of Health and Human Services (12), the International Anal Neoplasia Society in January 2024 released guidelines for screening or early detection of anal cancer among several high-risk groups with and without HIV (13). The International Anal Neoplasia Society guidelines recommend anal cytology in 12-month intervals, with an extended interval (12–24 months) suggested for limited-capacity settings (13).

The disproportionate burden of anal cancer among people with HIV combined with the limited supply of clinical specialists to perform high-resolution anoscopy procedures (14) supports the need to ascertain anal cancer screening prevalence and diagnostic capacity among HIV care facilities serving people with HIV. Using data from the only data source for nationally representative data on people with HIV and their care settings, we examined the

prevalence of anal cytology screening among people with HIV overall and among selected groups—including people with HIV at highest risk of anal cancer: gay, bisexual, and other MSM as well as transgender women aged 35 years or older (4,8,14) and all other people with HIV aged 45 years and older (4,14). We also described access to high-resolution anoscopy—on-site or by an established outside referral relationship at the person's usual place of HIV care—as well as characteristics of facilities where high-resolution anoscopy is available vs not available to help inform implementation of anal cancer screening and program capacity in the United States.

Methods

Data source

Data were analyzed from the 2019 cycle of the Medical Monitoring Project (MMP), a nationally representative clinical and behavioral surveillance system of adults with diagnosed HIV sponsored by the Centers for Disease Control and Prevention (CDC).

Briefly, the MMP uses a 2-stage sampling design: 1) one-time sampling of 16 US states and Puerto Rico (from all US states, the District of Columbia, and Puerto Rico) and 2) annual sampling of adults aged 18 years or older with diagnosed HIV from the National HIV Surveillance System, a US census of people with HIV. MMP methods details are described elsewhere (13,14).

For the 2019 data cycle, data collection occurred between June 2019 and May 2020 through in-person and telephone interviews and medical record abstractions. All sampled jurisdictions participated in the MMP; the response rate among people with HIV was 45%. Data were weighted on the basis of probability of selection; adjusted for nonresponse; and poststratified to known population totals from the National HIV Surveillance System by sex, age, and race and ethnicity.

We also analyzed data from the MMP facility survey, a supplemental survey of all HIV care facilities where 2019 cycle MMP participants received HIV care, to ascertain characteristics of facilities and high-resolution anoscopy access (no access, on-site access, or access through an established referral relationship). Data were collected during July to November 2021; the facility survey response rate was 45%. To describe facility characteristics, data were weighted to adjust for nonresponse. To link a person's HIV care facility data to the MMP person-level dataset, data were imputed for nonresponding facilities (15).

The MMP is a public health surveillance activity, but local institutional review board approval was obtained by jurisdictions when required. All participants provided informed consent.

Participants and measures

The population of inference is adults living in the United States with diagnosed HIV who were aged 18 years or older. MMP interviews provided sociodemographic characteristics, sexual orientation, and sexual behaviors in the past 12 months. Medical records abstraction provided clinical characteristics such as HIV disease stage, geometric mean CD4 count,

sustained viral suppression in the past 12 months (all HIV RNA test results <200 copies/μL or undetectable), and receipt of anal cytology in the past 12 months. Results of ASC-US, low-grade squamous intraepithelial lesion, HSIL, atypical squamous cells, inability to rule out HSIL, and squamous cell carcinoma were categorized as abnormal cytology or ASC-US. In this analysis, people with HIV at highest risk included 1) gay, bisexual, or other MSM (defined as cisgender men who reported having sex with other cisgender men in the past 12 months or that their sexual orientation was gay or bisexual) or transgender women aged 35 years and older (4,8,14) and 2) all other people with HIV aged 45 years and older (4,14).

The MMP facility survey provided availability of clinical and supportive services, such as high-resolution anoscopy, gynecologic care, and colposcopy on-site or through referral, and other facility characteristics (eg, facility type, receipt of RWHAP funding, rural/urban status of facility location).

Data analysis

Using MMP participant data, we estimated weighted percentages and 95% confidence intervals (CIs) of all people with HIV aged 18 years or older (N = 4100) and people with HIV with anal cytology in the past 12 months, by selected characteristics. We provide data on people with HIV with anal cytology in the past 24 months, by selected characteristics, in Supplementary Table 1 (available online). Using linked MMP participant and facility survey data, we report weighted percentages of US people with HIV receiving HIV care (N = 3798), stratified by receipt of care at facilities that provide no high-resolution anoscopy access, on-site high-resolution anoscopy, or access through an established referral relationship. Finally, using weighted facility survey data, we describe characteristics of 447 HIV care facilities by high-resolution anoscopy availability. We calculated the prevalence difference and 95% confidence interval for each stratification and used 2-tailed t tests to assess statistically significant differences in prevalence ($P < .05$). An estimate was considered unstable if its coefficient of variation $(s/\bar{x}) \times 100$, measured as the estimate's SE divided by the estimate, was 0.30 or higher (16,17). Analyses were conducted using SAS, version 9.4, software (SAS Institute, Cary, NC) and SUDAAN, version 11.0.3, software (RTI International, Research Triangle Park, NC) and accounted for the MMP's complex sample design.

Results

Only 4.8% (95% CI = 3.4% to 6.1%) of people with HIV at highest risk of anal cancers had had anal cytology in the prior 12 months: 7.7% (95% CI = 5.1% to 10.6%) of gay, bisexual, and other MSM or transgender women aged 35 years or older and 1.9% (95% CI = 0.9% to 2.9%) of all other people with HIV aged 45 years or older (Table 1). Compared with people with HIV not at highest risk, a higher percentage of gay, bisexual, or other MSM and transgender women aged 35 years or older had anal cytology (prevalence of difference = 3.8%, 95% CI = 1.1% to 6.5%), whereas a lower percentage of people with HIV aged 45 years or older had anal cytology (prevalence difference = 2.0%, 95% CI = −3.3% to −0.7%). A statistically significantly lower percentage of non-Hispanic Black or African American people with HIV received anal cytology compared with non-Hispanic White people with

HIV (prevalence difference = −2.8%, 95% CI = −5.3% to −0.3%); the sample size for the other race or ethnicity category was too small to produce stable estimates. Among cisgender men, 5.4% (95% CI = 3.8% to 6.9%) had anal cytology; estimates for cisgender women and transgender women were unstable. Prevalence of anal cytology was low among people with HIV who had lower educational attainment (high school education or less), identified as heterosexual or straight, had not reported any anal receptive sex in the past 12 months, and had fewer (≤ 5) sexual partners. Also, lower percentages of people with HIV residing in southern MMP states received anal cytology compared with those in western MMP states (prevalence difference = −6.0%, 95% CI = −10.5% to −1.6%). People with advanced HIV, those individuals without sustained viral suppression, and geometric mean CD4 cell count of 200/μL or less in the past 12 months less often received anal cytology.

Two-thirds (67.2%) of US people with HIV who were in HIV care received care at a facility that provided high-resolution anoscopy on-site or by referral (22.2% on-site and 45.0% by referral) (Table 2; Supplementary Table 2, available online). About one-third (32.8%) of US people with HIV who were in HIV care received care at a facility not known to provide high-resolution anoscopy access on-site or by referral (Table 2). There were no statistically significant differences in high-resolution anoscopy access by race or ethnicity, gender, age, or education among people with HIV receiving care. Gay, bisexual, or other MSM and transgender women aged 35 years or older and all other people with HIV aged 45 years or older had similar high-resolution anoscopy access to people with HIV not at the highest risk of anal cancer. People with HIV more likely to receive care at a facility with on-site access to high-resolution anoscopy included those individuals with advanced HIV (vs nonadvanced HIV, prevalence difference = 5.7%, 95% CI = 1.4% to 10.1%) and those with geometric mean CD4 cell counts of 200/μL or less in the past 12 months (vs >200/μL, prevalence difference = 8.5%, 95% CI = 2.7% to 14.3%) (Table 2). People with HIV more likely to receive care at a facility with access to high-resolution anoscopy by referral included those individuals with advanced HIV (vs nonadvanced HIV, prevalence difference = 5.2%, 95% CI = 0.9% to 9.5%) and those individuals with an ASC-US or higher anal cytology result in the past 12 months (vs negative, prevalence difference = −16.8%, 95% CI = −31.7% to −1.9%). People with HIV more likely to be seen at facilities that provided high-resolution anoscopy access on-site or by referral included people with HIV with incomes at or below the federal poverty level (vs above the federal poverty level, prevalence difference = 5.3%, 95% CI = 0.8% to 9.8%), people with HIV with public-only insurance (vs any private insurance, prevalence difference = 4.2%, 95% CI = 0.1% to 8.4%), people with advanced HIV (vs nonadvanced HIV, prevalence difference = 10.9%, 95% CI = 6.5% to 15.3%), those individuals who have ever had stage III HIV (vs those who did not, prevalence difference = 4.0%, 95% CI = 0.7% to 7.3%), and those individuals with geometric mean CD4 cell counts of 200/μL or more in the past 12 months (vs >200/μL, prevalence difference =14.5%, 95% CI = 9.1% to 19.9%) (Supplementary Table 2, available online). Of people with HIV with anal cytology in the past 12 months and ASC-US or greater disease, 36.5% (95% CI = 24.5% to 48.4%) received HIV care at a facility not known to provide high-resolution anoscopy access; there were no significant differences by cytology results (ie, ≥ ASC-US vs negative) (Table 2).

Among facilities providing HIV care to MMP participants, 36.6% (95% CI = 31.8% to 41.4%) did not provide high-resolution anoscopy access either on-site or by referral (Table 3). A higher percentage of RWHAP-funded vs nonfunded facilities provided high-resolution anoscopy access (prevalence difference = 13.1%, 95% CI = 3.9% to 22.3%) (Table 3; Supplementary Table 3, available online). Facilities that had HIV caseloads consisting of more than 1000 people with HIV (vs caseloads of < 50 people with HIV, prevalence difference = 33.3%, 95% CI = 13.3% to 53.3%) were also more likely to provide high-resolution anoscopy access. HIV care facilities that provided on-site gynecologic care or colposcopy also more commonly provided on-site high-resolution anoscopy than those that did not.

Discussion

Anal cytology use is low among people with HIV, overall and for groups at highest risk of anal cancer, and access to high-resolution anoscopy for follow-up of abnormal cytology results is limited. About 1 in 21 people with HIV at highest risk of anal cancer had had anal cytology in the past year. Approximately one-third of people with HIV in groups at highest risk had no access to follow-up high-resolution anoscopy at the facility where they received HIV care, and less than one-quarter had on-site access to high-resolution anoscopy. Similarly, one-third of people with HIV with abnormal cytology results received HIV care at a facility not known to provide high-resolution anoscopy access. To our knowledge, this article is the first to report nationally representative estimates of receipt of anal cytology among US people with HIV, by risk status, and the first to characterize access to high-resolution anoscopy (no access, on-site access, or access by referral) by sociodemographic subpopulations. Considering the ongoing and periodic review of evidence by guideline panels (12,13,18), our findings have important implications to inform large-scale implementation of anal cancer screening for people with HIV at high risk.

Although prior studies of anal cancer screening among people with HIV are sparse and often limited to single-state or small institutional cohorts, our findings are consistent with reports of overall low prevalence of anal cancer screening and adherence to general cancer screening/follow-up (3,19–21). Until 2022, there was no randomized controlled trial to support the rationale for anal cancer screening or its potential efficacy (8). Screening people with HIV at high risk was controversial, and decisions to screen were made by individual health-care professionals or medical organizations on the basis of limited data. The New York State Department of Health AIDS Institute (11,22) and the US Department of Veterans Affairs (23) were among the first and few to recommend that people with HIV undergo annual anal cytology and digital rectal examination. Given the absence of formal guidelines to prompt physicians for screening at the point of care and the lack of national guidelines advising US people with HIV on how and when to get anal cancer screening at the time of MMP data collection, our findings on low screening uptake are not surprising.

The prevalence of cytology was low among all people with HIV but particularly among non-Hispanic Black or African American people with HIV and individuals of lower educational attainment. Although we did not assess the multifactorial barriers affecting receipt of anal cytology among people with HIV in our analysis, several contextual factors in the

literature may explain or contribute to our findings. First, studies have documented a lack of awareness about anal cytology, high-resolution anoscopy, and risk of anal cancer among people with HIV and gay, bisexual, or other MSM (9,24). For example, 70% of HIV-positive women from a single health-care system had never “heard of an anal Pap test” (25). Despite low overall awareness, college-educated gay, bisexual, or other MSM were significantly more likely to have knowledge of anal cancer (24). Among people with HIV as well as gay and bisexual men, acceptability of anal cytology is high. In one study, most individuals were willing to undergo anal cytology, particularly if screening was free or if cost barriers were removed (26). Men who reported greater concern about getting anal cancer were more likely to be willing to pay for testing (26). Gay, bisexual, or other MSM were more willing to undergo anal cytology than were heterosexual men (27). Black men were less willing to undergo anal cytology than were White men (27). Similarly, gay, bisexual, or other MSM participants in the Ontario HIV Treatment Network Cohort had higher odds of having discussed anal cancer screening with a health-care professional and to have been screened (21). Black and Asian men were less likely than their White counterparts to have discussed anal cancer screening or to have undergone anal cytology or anoscopy (21).

Second, stigma and discrimination are barriers to care receipt, particularly among non-Hispanic Black individuals; transgender people; and people with HIV who identify as gay, bisexual, or other sexual orientations (28); stigma was a considerable barrier to anal cancer screening for gay men (29). A qualitative study on shared decision making with 30 men who identified as Black and male, gay, or bisexual revealed that experiences of racism, discrimination, biphobia or homophobia, and clinician bias hindered discussions about anal cancer screening with their physician, highlighting the importance of a nonjudgmental health-care setting and clinician relationship to facilitate open communication and effective decision making about anal cancer screening (30). Lack of knowledge about anal cancer, coupled with perceived discrimination, lack of trust, and lack of effective communication between patient and clinician to discuss cancer risk and screening (28,31,32), may contribute to our observed prevalence disparities among demographic subgroups.

Although the prevalence of anal cytology was low overall, gay, bisexual, and other MSM as well as transgender women aged 35 years or older had the highest prevalence of anal cytology in the past 12 and 24 months, which could reflect awareness among HIV care providers of gay, bisexual, or other MSM as people at higher risk of anal cancer who could benefit from anal cytology compared with other subgroups (33,34). Still, anal cytology utilization is remarkably low among people with HIV at highest risk of anal cancer. Among people with HIV in HIV care, the highest priority of clinical management is controlling viral load (20). Given that Black or African American gay and bisexual men are less often virally suppressed than men of other races and ethnicities (35), clinicians may prioritize HIV-related clinical care over cancer screening. Although it is difficult to know if this pattern is reflected in our data, we found a lower prevalence of anal cytology among those individuals with stage III HIV, advanced HIV, and low CD4 cell counts.

The incidence of anal cancers is rising among people with and without HIV, and disparities continue to exist in anal cancer incidence, mortality (36), and screening (8). There is a critical need for greater patient and clinician education and awareness about risk factors for

anal cancer and about prevention—potentially through a combination of HPV vaccination and screening, especially for people with HIV in southern MMP states, who may be less likely to undergo anal cancer screening and reside in a region disproportionately burdened by HIV (36).

Health-care professional recommendation is well documented as a determinant of receiving cancer screening and follow-up (21). The majority of people with HIV who reported having discussions about anal cancer screening and had undergone anal cytology and follow-up indicated that their health-care professional initiated the discussion (21). Thus, greater emphasis on clinician education and decision support tools can help improve workflow, encourage risk awareness, collect clinically relevant medical and sexual history, document sexual orientation and identity, and promote shared decision making with patients. Health systems could consider offering more training on reducing stigma and racism in health care and promote environments that foster trust and open dialogue between patients and health-care professionals (32) to reduce barriers to timely and effective cancer screening and management.

Capacity and availability of high-resolution anoscopy are other important factors. Although there are no established standards, it is widely agreed that cytology-based anal cancer screening should be performed among people with HIV at high risk only if follow-up high-resolution anoscopy is available (13,20). Our data suggest that at least 1 in 3 HIV care facilities do not provide any high-resolution anoscopy access. Additionally, one-third of people with HIV undergoing anal cytology of ASC-US or greater and who may warrant a follow-up high-resolution anoscopy received HIV care at a facility lacking high-resolution anoscopy access. A recent study found that at least an estimated 124386 people with HIV with abnormal results would have no access to follow-up high-resolution anoscopy through their HIV care facility (37). High-resolution anoscopy with directed biopsy is currently the gold standard for diagnosis and management of precursors of anal cancer (10), and timely follow-up is an important aspect of an overall screening strategy. Studies have suggested, however, a paucity of medical expertise (ie, training and certification) and infrastructure for performing high-resolution anoscopy currently (14,38). In one clinic study of HIV-positive patients, the time to high-resolution anoscopy follow-up averaged 380 days partially because of the lack of on-site, high-resolution anoscopy–trained clinicians (38). Referral to another HIV clinic site could have further affected follow-up time to high-resolution anoscopy after abnormal cytology (38). High-resolution anoscopy procedures are technically challenging for several reasons; for example, it can be difficult to visualize the anal canal, with more mucosal folds and papillae and prevalent multifocal disease (39). Currently, high-resolution anoscopy procedures are not standardized, and there is clinical variation in technique, proficiency, quality, and accepted standards (10). Large scale-up of high-resolution anoscopy training, quality standards, and metrics could be beneficial if increased uptake of anal cancer screening is anticipated in light of new data (8).

RWHAP-funded HIV care facilities more often provided high-resolution anoscopy access as expected, given the major role of the RWHAP in providing training and resources. HIV care facilities that provided on-site gynecologic care or colposcopy also more commonly provided on-site high-resolution anoscopy. Similarly, facilities with the highest

HIV caseloads were more likely to provide high-resolution anoscopy access. This finding is noteworthy because of the connections between high-volume facilities and improved outcomes observed from other cancer populations (40,41) and the implications it may have for better adherence to standard of care and improved outcomes once anal cancer screening and management guidelines do become available. Of note, although colocation of services at the HIV care facility is generally preferrable, developing the capacity to provide on-site high-resolution anoscopy may not be practical for all facilities, including some community health centers and private practices. Given limited resources, referral for high-resolution anoscopy may be a preferable approach for some practices, as is sometimes the case for other diagnostic tests for cancer, such as colposcopy and colonoscopy.

Study limitations include the potential for recall and social desirability bias because MMP interview data are self-reported. MMP response rates were suboptimal, but results were adjusted for nonresponse and poststratified to known population totals from the National HIV Surveillance System using an established, standard methodology (16). Sample size among important subgroups was too small to produce stable estimates. Second, regional data are representative of MMP jurisdictions only and not all states in each region. Third, given the time difference in data collection between patient-level MMP data (June 2019-May 2020) and the facility survey (July-November 2021), estimates of patients attending facilities and utilizing services may be affected if available services changed during that time frame. The analysis is subject to limitations of a cross-sectional research design. Fourth, MMP collects clinical data at only 1 facility; some participants could have undergone anal cytology (or high-resolution anoscopy) at a facility that was not captured in our data (MMP does not capture patient-level data on actual receipt of high-resolution anoscopy). Less than 10% of participants reported receiving HIV care at more than 1 facility, however, during the 2-year observation period. Finally, we do not describe the number of high-resolution anoscopy providers or the length of time it takes to access high-resolution anoscopy at facilities where it is available on-site or by referral.

A major success of the past decade is that people with HIV are living longer (42). With increased life expectancy comes new challenges, such as susceptibility to comorbidities such as HPV-associated anal cancer and other cancers. Given the high benefit to risk ratio of cancer-prevention strategies for which there is a known screening test, people with HIV with stable disease could benefit from routine cancer screening (20). Ongoing surveillance of the burden of predominant cancers in excess among people with HIV may enable us to monitor and adjust public health services, education, and infrastructure in ways that complement and inform clinical programs and advance health equity (43). Cancer screening and prevention are part of a continuum, and providing the full range of anal cancer prevention services extends beyond providing high-resolution anoscopy access. Our analysis highlights the low prevalence of anal cancer cytology among people with HIV and screening disparities among subpopulations and geographic regions, drawing attention to the larger issues of access, equity, and capacity of anal cancer screening.

Supplementary Material

Refer to Web version on PubMed Central for supplementary material.

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Data availability

MMP data are not available for public sharing due to security and confidentiality guidelines for the release of HIV surveillance data. CDC may provide on-site access, however, to all relevant MMP data for researchers with approved analysis proposals who complete CDC security and confidentiality training. Proposals are reviewed and prioritized based on their importance for public health, their scientific merit, and on the needs and current workload of CDC staff. Inquiries should be made to Jason Craw (emf4@cdc.gov). All other project materials, including protocols and data-collection instruments, are available to the public on the MMP website (https://www.cdc.gov/hiv/statistics/systems/mmp/index.html).

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Table 1.

Characteristics of people with HIV overall and by receipt of anal cytology in the past 12 months—Medical Monitoring Project, United States, 2019 (N = 4100)

Characteristic	Total No.	Weighted column, % (95% CI)	People with HIV with an anal cytology performed in the past 12 mo		Prevalence difference	*P*
			No.	Weighted row, % (95% CI)		
Total	4100	—	207	4.8 (3.4 to 6.1)	—	—
People with HIV at the highest risk of anal cancer						
All gay, bisexual, and other MSM as well as transgender women aged ≥35 y and other people with HIV aged ≥45 y	3136	75.2 (73.1 to 77.2)	168	5.0 (3.4 to 6.7)	NA	—
Gay, bisexual, and other MSM as well as transgender women aged ≥35 y	1656	40.7 (36.3 to 45.2)	132	7.7 (5.1 to 10.6)	3.8 (1.1 to 6.5)	.006
Other people with HIV aged ≥45 y	1480	34.4 (30.9 to 38.0)	36	1.9 (0.9 to 2.9)	−2.0 (−3.3 to −0.7)	.002
People with HIV not at highest risk (none of the above)	964	24.8 (22.8 to 26.9)	39	3.9 (2.7 to 5.1)	Referent	—
Sociodemographic characteristics						
Race and ethnicity						
Black/African American, non-Hispanic	1708	41.5 (32.5 to 50.5)	43	2.7 (1.7 to 3.7)	−2.8 (−5.3 to −0.3)	.027
Hispanic or Latino[a]	933	22.4 (14.5 to 30.4)	76	7.6 (5.7 to 9.5)	2.1 (−0.8 to 4.9)	.149
Other race or ethnicity[b]	264	6.9 (5.3 to 8.4)	12	4.7 (1.0 to 8.3)[c]	NA	—
White, non-Hispanic	1195	29.2 (24.3 to 34.1)	76	5.5 (2.9 to 8.1)	Referent	—
Gender[d]						
Cisgender male	2965	74.9 (72.1 to 77.8)	170	5.4 (3.8 to 6.9)	NA	—
Cisgender female	1042	23.2 (20.3 to 26.1)	32	2.7 (0.8 to 4.7)[c]	NA	—
Transgender female	77	1.9 (1.3 to 2.4)	5	6.6 (0.3 to 12.9)[c]	NA	—
Age, y						
18–34	666	17.2 (15.4 to 18.9)	35	5.2 (3.6 to 6.7)	Referent	—
35–45	743	19.8 (18.1 to 21.5)	37	5.2 (3.0 to 7.4)	0.1 (−2.6 to 2.8)	.957
>45	2691	63.0 (60.8 to 65.2)	135	4.5 (2.9 to 6.1)	−0.7 (−2.7 to 1.4)	.524
Education						
Less than high school	688	16.3 (15.0 to 17.6)	19	2.4 (1.2 to 3.5)	−3.6 (−5.2 to −2.1)	<.001
High school or equivalent	1103	26.7 (25.0 to 28.5)	43	3.5 (1.8 to 5.3)	−2.5 (−3.9 to −1.1)	<.001
More than high school	2296	57.0 (54.7 to 59.2)	144	6.0 (4.5 to 7.6)	Referent	—
Employment						
Employed (for wages or self-employed)	1870	47.1 (45.1 to 49.1)	97	5.1 (3.4 to 6.8)	Referent	—
Unemployed or unable to work	1710	41.1 (38.9 to 43.3)	70	3.7 (2.4 to 5.1)	−1.4 (−3.0 to 0.2)	.084
Other employment status[e]	498	11.8 (9.9 to 13.7)	39	7.2 (4.3 to 10.0)	2.1 (−0.4 to 4.5)	.098

Characteristic	Total No.	Weighted column, % (95% CI)	People with HIV with an anal cytology performed in the past 12 mo		Prevalence difference	*P*
			No.	Weighted row, % (95% CI)		
Household income, past 12 mo						
Above federal poverty level	2145	58.4 (55.1 to 61.6)	115	4.9 (3.4 to 6.4)	0.6 (−0.8 to 2.0)	.429
At or below federal poverty level	1593	41.6 (38.4 to 44.9)	72	4.3 (2.7 to 5.9)	Referent	—
Health insurance or coverage, past 12 mo						
Any private insurance	1388	33.5 (30.7 to 36.2)	80	5.4 (3.5 to 7.3)	Referent	—
Public only	2259	54.8 (50.8 to 58.8)	104	4.4 (2.9 to 5.9)	−1.0 (−2.6 to 0.6)	.237
Ryan White HIV/AIDS Program coverage only	349	9.5 (7.0 to 12.1)	16	5.1 (2.6 to 7.7)	−0.3 (−3.1 to 2.6)	.858
Uninsured	47	2.2 (1.4 to 2.9)	3	2.4 (0.0 to 5.5)[c]	NA	—
Clinical characteristics						
HIV disease stage III[f]						
Yes	2440	57.3 (55.4 to 59.1)	120	4.5 (2.9 to 6.2)	−0.6 (−2.0 to 0.9)	.463
No	1659	42.7 (40.9 to 44.6)	87	5.1 (3.7 to 6.4)	Referent	—
Advanced HIV, past 12 mo[g]						
Yes	567	14.1 (13.1 to 15.0)	20	3.4 (1.4 to 5.4)[c]	NA	—
No	3259	85.9 (85.0 to 86.9)	187	5.5 (3.9 to 7.1)	Referent	—
Geometric mean CD4 cell count, past 12 mo						
≤200	270	8.4 (7.4 to 9.3)	7	2.6 (0.4 to 4.8)[c]	NA	—
>200	3002	91.6 (90.7 to 92.6)	193	6.5 (4.9 to 8.1)	Referent	—
Sustained viral suppression (all HIV RNA results <200 copies/mL or undetectable), past 12 mo						
Yes	2984	66.9 (61.8 to 72.0)	172	6.4 (4.6 to 8.3)	Referent	—
No	1116	33.1 (28.0 to 38.2)	35	2.1 (1.3 to 3.0)	−4.3 (−6.0 to −2.6)	<.001
Sexual orientation						
Lesbian or gay	1675	41.9 (37.7 to 46.0)	134	7.1 (4.9 to 9.2)	Referent	—
Heterosexual or straight	1912	45.9 (41.6 to 50.2)	41	1.8 (0.8 to 2.9)	−5.2 (−7.4 to −3.1)	<.001
Bisexual	359	9.2 (7.7 to 10.7)	23	7.8 (4.4 to 11.3)	0.8 (−2.5 to 4.0)	.645
Other sexual orientation	120	3.0 (2.1 to 3.9)	7	8.0 (0.8 to 15.2)[c]	NA	—
Gay, bisexual, or other MSM during the past 12 mo						
Yes	2054	51.4 (47.4 to 55.4)	159	7.4 (5.4 to 9.4)	Referent	—
No	2046	48.6 (44.6 to 52.6)	48	2.0 (0.9 to 3.0)	−5.5 (−7.5 to −3.4)	<.001
Any anal receptive sex, past 12 mo						
Yes	1048	27.0 (23.9 to 30.1)	90	8.2 (5.7 to 10.6)	Referent	
No	2919	73.0 (69.9 to 76.1)	112	3.6 (2.4 to 4.7)	−4.6 (−6.6 to −2.6)	<.001
Sexual history, past 12 mo						
0–5 partners	3773	92.6 (91.3 to 94.0)	176	4.2 (3.0 to 5.5)	Referent	—

Characteristic	Total No.	Weighted column, % (95% CI)	People with HIV with an anal cytology performed in the past 12 mo		Prevalence difference	*P*
			No.	Weighted row, % (95% CI)		
>5 partners	308	7.4 (6.0 to 8.7)	30	11.6 (6.4 to 16.7)	7.3 (2.4 to 12.2)	.003
Region[h]						
Western MMP states	915	21.6 (9.5 to 33.7)	87	9.0 (4.6 to 13.4)	Referent	—
Midwestern MMP states	579	13.2 (0.0 to 27.2)[c]	9	1.4 (0.0 to 3.2)[c]	NA	—
Northeastern MMP states	877	18.9 (17.3 to 20.6)	43	5.2 (3.6 to 6.8)	−3.9 (−8.6 to 0.8)	.104
Southern MMP states	1552	42.7 (26.7 to 58.7)	44	3.0 (1.9 to 4.2)	−6.0 (−10.5 to −1.6)	.008
Puerto Rico	177	3.6 (0.0 to 10.8)[c]	24	9.7 (9.7 to 9.7)	0.6 (−3.8 to 5.0)	.784

[a] Hispanic or Latino people could be of any race. CI = confidence interval; MMP = Medical Monitoring Project; MSM = men who have sex with men; NA = not applicable.

[b] Other race or ethnicity includes Asian, Native Hawaiian or Other Pacific Islander, American Indian or Alaska Native, or people of multiple races.

[c] Coefficient of variation $(s/\bar{x}) \times 100 \geq 0.3$; the estimate may be unstable and should be interpreted with caution. Due to the unreliability of the estimates, corresponding prevalence differences could not be evaluated.

[d] Transgender men could not be included due to small sample size.

[e] Other employment status includes homemaker, student, and retired people.

[f] HIV infection, stage III (AIDS): documentation of an AIDS-defining condition or either a CD4 cell count <200 cells/μL or a CD4 percentage of total lymphocytes <14%. Documentation of an AIDS-defining condition supersedes a CD4 cell count or percentage that would not, by itself, be the basis for a stage III (AIDS) classification.

[g] Defined as a CD4 cell count <200/μL or <14% or an AIDS-defining condition.

[h] Regional estimates describe participants in MMP states located within that region; the regional estimate does not represent all people with HIV living in those regions. MMP states were grouped by regions (as defined by https://www2.census.gov/geo/pdfs/maps-data/maps/reference/us_regdiv.pdf) as Northeast (New Jersey, New York, Pennsylvania), South (Delaware, Florida, Georgia, North Carolina, Virginia, Texas, Mississippi), West (California, Oregon, Washington), Midwest (Indiana, Illinois, Michigan), and Puerto Rico.

Table 2.

Patient characteristics by access to high-resolution anoscopy on-site or through an established outside referral relationship at the usual place of HIV care—Medical Monitoring Project, United States, 2019

Characteristic	Received HIV care at a facility that is not known to provide high-resolution anoscopy on-site or through an established outside referral relationship				Received care at a facility that provides high-resolution anoscopy on-site				Received care at a facility that provides high-resolution anoscopy through an established outside referral relationship			
	No.	Weighted row, % (95% CI)	Prevalence difference (95% CI)	*P* for prevalence difference	No.	Weighted row, % (95% CI)	Prevalence difference (95% CI)	*P* for prevalence difference	No.	Weighted row, % (95% CI)	Prevalence difference (95% CI)	*P* for prevalence difference
Total	1171	32.8 (28.0 to 37.7)	—	—	878	22.2 (19.5 to 24.9)	—	—	1749	45.0 (41.5 to 48.5)	—	—
People with HIV at highest risk of anal cancer												
Gay, bisexual, and other MSM as well as transgender women aged ≥35y	453	31.7 (26.6 to 36.7)	−2.7 (−7.9 to 2.6)	.316	369	23.4 (19.3 to 27.6)	1.6 (−4.0 to 7.3)	.568	705	44.9 (40.5 to 49.3)	1.0 (−3.3 to 5.4)	.643
Other people with HIV aged ≥45y	419	33.2 (26.5 to 39.9)	−1.1 (−6.5 to 4.3)	.680	309	20.9 (17.3 to 24.5)	−0.9 (−5.3 to 3.6)	.702	645	45.9 (40.8 to 50.9)	2.0 (−2.7 to 6.7)	.409
People with HIV not at highest risk (none of the above)	299	34.3 (29.4 to 39.2)	Referent	—	200	21.8 (17.3 to 26.3)	Referent	—	399	43.9 (40.0 to 47.7)	Referent	—
Sociodemographic characteristics												
Race or ethnicity												
Black or African American, non-Hispanic	490	33.4 (28.7 to 38.0)	1.1 (−2.5 to 4.8)	.544	390	22.5 (18.1 to 26.8)	0.0 (−6.6 to 6.6)	.992	696	44.2 (39.2 to 49.2)	−1.2 (−9.0 to 6.7)	.769
Hispanic or Latino[a]	253	30.6 (21.7 to 39.6)	−1.6 (−9.8 to 6.6)	.699	200	22.9 (18.7 to 27.1)	0.5 (−4.3 to 5.2)	.844	418	46.5 (39.1 to 53.9)	1.1 (−6.4 to 8.7)	.769
Other race or ethnicity[b]	86	39.9 (30.0 to 49.7)	7.7 (−1.6 to 16.9)	.105	42	16.9 (8.3 to 25.5)	−5.5 (−13.7 to 2.7)	.187	116	43.2 (36.5 to 49.9)	−2.2 (−9.0 to 4.6)	.535
White, non-Hispanic	342	32.2 (28.1 to 36.3)	Referent	—	246	22.4 (18.8 to 26.0)	Referent	—	519	45.4 (39.7 to 51.0)	Referent	—
Gender[c]												
Male	864	33.0 (28.3 to 37.7)	Referent	—	627	22.3 (19.6 to 24.9)	Referent	—	1253	44.7 (40.8 to 48.7)	Referent	—
Female	281	32.3 (25.1 to 39.5)	−0.7 (−5.4 to 3.9)	.765	230	21.7 (16.9 to 26.6)	−0.5 (−5.2 to 4.1)	.830	461	46.0 (41.5 to 50.5)	1.2 (−3.4 to 5.9)	.607
Transgender female	21	33.8 (18.8 to 48.8)	0.8 (−15.9 to 17.4)	.929	17	24.1 (10.1 to 38.1)	1.8 (−10.7 to 14.3)	.773	29	42.1 (24.2 to 60.1)[d]	NA	—
Age, y												

Characteristic	Received HIV care at a facility that is not known to provide high-resolution anoscopy on-site or through an established outside referral relationship				Received care at a facility that provides high-resolution anoscopy on-site				Received care at a facility that provides high-resolution anoscopy through an established outside referral relationship			
	No.	Weighted row, % (95% CI)	Prevalence difference (95% CI)	*P* for prevalence difference	No.	Weighted row, % (95% CI)	Prevalence difference (95% CI)	*P* for prevalence difference	No.	Weighted row, % (95% CI)	Prevalence difference (95% CI)	*P* for prevalence difference
18–34	217	36.3 (30.8 to 41.9)	Referent	—	134	20.8 (15.8 to 25.8)	Referent	—	264	42.9 (37.5 to 48.2)	Referent	—
35–45	207	31.7 (25.6 to 37.8)	−4.7 (−11.4 to 2.1)	.175	166	22.8 (17.5 to 28.1)	2.0 (−4.4 to 8.4)	.541	323	45.5 (41.1 to 50.0)	2.7 (−4.3 to 9.6)	.452
>45	747	32.3 (26.7 to 37.9)	−4.0 (−10.0 to 1.9)	.185	578	22.3 (19.8 to 24.9)	1.5 (−3.8 to 6.9)	.576	1162	45.4 (41.3 to 49.5)	2.5 (−1.7 to 6.7)	.243
Education												
Less than high school	184	30.8 (25.3 to 36.3)	−2.5 (−7.2 to 2.2)	.300	155	23.0 (18.8 to 27.3)	1.4 (−2.4 to 5.2)	.463	311	46.1 (40.8 to 51.5)	1.1 (−4.1 to 6.3)	.683
High school or equivalent	311	33.0 (27.4 to 38.5)	−0.3 (−3.6 to 2.9)	.833	242	22.8(18.4 to 27.2)	1.2 (−2.4 to 4.7)	.518	456	44.2 (40.5 to 48.0)	−0.8 (−4.8 to 3.1)	.688
More than high school	670	33.3 (28.1 to 38.5)	Referent	—	478	21.6 (19.3 to 24.0)	Referent	—	978	45.0 (40.8 to 49.3)	Referent	—
Employment												
Employed (for wages or self-employed)	559	34.4 (28.8 to 40.0)	Referent	—	384	21.3 (18.6 to 24.1)	Referent	—	782	44.3 (39.4 to 49.1)	Referent	—
Unemployed or unable to work	481	32.2 (27.6 to 36.7)	−2.2 (−5.9 to 1.4)	.233	387	23.1 (19.5 to 26.6)	1.7 (−1.2 to 4.7)	.249	729	44.8 (41.4 to 48.1)	0.5 (−3.6 to 4.6)	.815
Other employment status[e]	123	28.5 (22.4 to 34.7)	−5.9 (−10.0 to −1.7)	.006	102	22.4 (17.5 to 27.3)	1.1 (−3.6 to 5.7)	.648	230	49.1 (43.9 to 54.2)	4.8 (−0.4 to 10.0)	.070
Household income, past 12 mo												
Above federal poverty level	652	35.3 (30.1 to 40.5)	5.3 (0.8 to 9.8)	.020	413	20.0 (18.0 to 22.0)	−4.1 (−8.7 to 0.4)	.077	907	44.7 (40.2 to 49.2)	−1.2 (−5.7 to 3.3)	.596
At or below federal poverty level	419	30.0 (23.8 to 36.1)	Referent	—	375	24.1 (19.0 to 29.3)	Referent	—	706	45.9 (42.3 to 49.6)	Referent	—
Health insurance or coverage, past 12 mo												
Any private insurance	417	34.7 (29.0 to 40.5)	Referent	—	306	22.8 (19.5 to 26.1)	Referent	—	550	42.5 (37.6 to 47.3)	Referent	—
Public only	599	30.5 (24.9 to 36.1)	−4.2 (−8.4 to−0.1)	.046	71	20.8 (15.7 to 25.9)	−2.0 (−7.6 to 3.6)	.482	138	41.6 (36.0 to 47.1)	−0.9 (−6.3 to 4.5)	.746
Ryan White HIV/AIDS Program coverage only	121	37.6 (32.1 to 43.1)	2.9 (−4.1 to 9.9)	.419	482	22.1 (18.4 to 25.8)	−0.7 (−4.7 to 3.3)	.738	1023	47.4 (43.6 to 51.1)	4.9 (0.5 to 9.3)	.029

Characteristic	Received HIV care at a facility that is not known to provide high-resolution anoscopy on-site or through an established outside referral relationship				Received care at a facility that provides high-resolution anoscopy on-site				Received care at a facility that provides high-resolution anoscopy through an established outside referral relationship			
	No.	Weighted row, % (95% CI)	Prevalence difference (95% CI)	*P* for prevalence difference	No.	Weighted row, % (95% CI)	Prevalence difference (95% CI)	*P* for prevalence difference	No.	Weighted row, % (95% CI)	Prevalence difference (95% CI)	*P* for prevalence difference
Uninsured	16	40.0 (19.4 to 60.6)	5.3 (−17.0 to 27.6)	.642	9	20.9 (4.9 to 36.8)*	NA	—	16	39.1 (19.6 to 58.6)*	NA	—
Sexual orientation												
Lesbian or gay	490	33.2 (28.7 to 37.7)	Referent	—	368	22.8 (19.8 to 25.9)	Referent	—	696	44.0 (39.2 to 48.7)	Referent	—
Heterosexual or straight	534	32.0 (26.0 to 38.0)	−1.2 (−5.3 to 2.8)	.555	391	21.0 (17.4 to 24.6)	−1.8 (−5.9 to 2.3)	.381	846	47.0 (43.0 to 51.1)	3.0 (−2.4 to 8.4)	.269
Bisexual	99	33.8 (24.8 to 42.8)	0.6 (−7.4 to 8.6)	.881	82	23.4 (14.4 to 32.4)	0.6 (−7.6 to 8.7)	.891	151	42.8 (37.6 to 48.0)	−1.2 (−6.9 to 4.6)	.686
Other sexual orientation	36	37.4 (27.4 to 47.3)	4.2 (−6.4 to 14.7)	.439	31	27.3 (16.6 to 38.0)	4.5 (−7.0 to 15.9)	.444	43	35.3 (21.3 to 49.3)	−8.6 (−23.1 to 5.9)	.243
Sexual behaviors, past 12 mo												
0–5 partners	1069	32.7 (27.8 to 37.7)	0.8 (−5.3 to 7.0)	.789	812	22.3 (19.4 to 25.2)	−1.5 (−7.6 to 4.7)	.642	1618	45.0 (41.5 to 48.5)	0.6 (−7.6 to 8.8)	.884
>5 partners	94	33.6 (26.4 to 40.7)	Referent	—	63	20.9 (15.7 to 26.0)	Referent	—	125	45.6 (36.5 to 54.7)	Referent	—
Any anal receptive sex, past 12 mo												
Yes	313	32.3 (27.3 to 37.3)	Referent	—	217	21.9 (18.3 to 25.6)	Referent	—	445	45.8 (40.9 to 50.6)	Referent	—
No	815	32.8 (27.6 to 38.1)	0.6 (−3.5 to 4.6)	.786	635	22.3 (19.3 to 25.3)	0.4 (−3.6 to 4.3)	.861	1252	44.8 (41.0 to 48.7)	−0.9 (−6.0 to 4.2)	.725
Gay, bisexual, or other												
MSM during the past 12 mo												
Yes	600	33.2 (28.5 to 37.9)	Referent	—	450	22.9(19.4 to 26.4)	Referent	—	855	43.9 (39.5 to 48.3)	Referent	—
No	571	32.5 (26.8 to 38.2)	−0.7 (−4.3 to 2.9)	.703	428	21.4 (17.8 to 25.0)	−1.5 (−6.0 to 2.9)	.504	894	46.1 (42.1 to 50.2)	2.2 (−2.5 to 6.9)	.360
Clinical characteristics												
HIV disease stage III[f]												
Yes	659	31.2 (26.6 to 35.8)	−4.0 (−7.3 to−0.7)	.019	541	22.9 (20.2 to 25.6)	1.8 (−1.7 to 5.2)	.314	1073	45.9 (42.8 to 49.0)	2.2 (−1.2 to 5.7)	.208

Characteristic	Received HIV care at a facility that is not known to provide high-resolution anoscopy on-site or through an established outside referral relationship				Received care at a facility that provides high-resolution anoscopy on-site				Received care at a facility that provides high-resolution anoscopy through an established outside referral relationship			
	No.	Weighted row, % (95% CI)	Prevalence difference (95% CI)	*P* for prevalence difference	No.	Weighted row, % (95% CI)	Prevalence difference (95% CI)	*P* for prevalence difference	No.	Weighted row, % (95% CI)	Prevalence difference (95% CI)	*P* for prevalence difference
No	512	35.2 (29.4 to 40.9)	Referent	—	337	21.2 (17.4 to 24.9)	Referent	—	675	43.7 (38.9 to 48.5)	Referent	—
Advanced HIV, past 12 mo[g]												
Yes	128	23.5 (18.7 to 28.3)	−10.9 (−15.3 to−6.5)	<.001	155	27.1 (22.4 to 31.8)	5.7 (1.4 to 10.1)	.010	281	49.4 (44.3 to 54.6)	5.2 (0.9 to 9.5)	.019
No	1043	34.4 29.2 to 39.5	Referent	—	723	21.4 18.6 to 24.1	Referent	—	1468	44.3 40.7 to 47.8	Referent	—
Geometric mean CD4 cell count, past 12 mo												
≤200/μL	52	19.3 (13.9 to 24.8)	−14.5 (−19.9 to−9.1)	<.001	78	28.5 (21.7 to 35.3)	8.5 (2.7 to 14.3)	.004	138	52.2 (45.0 to 59.3)	6.1 (−0.9 to 13.0)	.086
>200/μL	954	33.9 (28.9 to 38.8)	Referent	—	631	20.0 (17.7 to 22.4)	Referent	—	1401	46.1 (41.8 to 50.4)	Referent	—
Sustained viral suppression (all HIV RNA results <200 copies/mL or undetectable), past 12 mo												
Yes	912	33.1 (27.7 to 38.5)	Referent	—	700	22.4 (19.4 to 25.4)	Referent	—	1356	44.5 (40.0 to 49.1)	Referent	—
No	259	32.2 (27.4 to 37.0)	−0.9 (−5.2 to 3.4)	.686	178	21.6 (16.2 to 26.9)	−0.8 (−6.7 to 5.1)	.785	393	46.2 (40.6 to 51.9)	1.7 (−5.9 to 9.3)	.661
Anal cytology (most recent in the past 12 mo) among those who had anal cytology												
Negative	14	20.9 (8.0 to 33.9)[d]	Referent	—	25	32.5 (18.5 to 46.5)	Referent	—	43	46.6 (31.6 to 61.6)	Referent	—
Atypical squamous cells of uncertain significance	15	30.1 (16.5 to 43.6)	9.1 (−8.5 to 26.7)	.309	20	35.0 (22.1 to 48.0)	2.5 (−17.5 to 22.5)	.803	26	34.9 (20.8 to 49.0)	−11.7 (−29.2 to 5.9)	.192
≥ Atypical squamous cells of uncertain significance[h]	31	36.5 (24.5 to 48.4)	15.5 (−2.1 to 33.1)	.084	35	33.8 (22.7 to 44.9)	1.3 (−20.3 to 22.9)	.906	38	29.7 (20.6 to 38.9)	−16.8 (−31.7 to−1.9)	.027

[a] Hispanic or Latino people could be of any race. MMP = Medical Monitoring Project; PWH = people with HIV; PD = prevalence difference; GBMSM = Gay, Bisexual, and other Men who have Sex with Men; NA = not applicable; ASC-US = atypical squamous cells of undetermined significance.

[b] Other race or ethnicity includes Asian, Native Hawaiian or Other Pacific Islander, American Indian or Alaska Native, or people of multiple races.

[c] Transgender men could not be included due to small sample size.

[d] Coefficient of variation $(s/\bar{x}) \times 100 \geq 0.3$; the estimate may be unstable and should be interpreted with caution. Due to the unreliability of the estimates, corresponding prevalence differences could not be evaluated.

[e] Other employment status includes homemaker, student, and retired people.

[f] HIV infection, stage III (AIDS): documentation of an AIDS-defining condition or either a CD4 cell count of <200/μL or a CD4 percentage of total lymphocytes <14%. Documentation of an AIDS-defining condition supersedes a CD4 cell count or percentage that would not, by itself, be the basis for a stage III (AIDS) classification.

[g] Defined as CD4 cell count <200/μL or <14% or an AIDS-defining condition.

[h] ≥Atypical squamous cells of uncertain significance includes anal cytology results of atypical squamous cells of uncertain significance, low-grade squamous intraepithelial lesions, high-grade squamous intraepithelial lesions, atypical squamous cells (cannot rule out high-grade squamous intraepithelial lesions), and squamous cell carcinoma.

Table 3.

Access to high-resolution anoscopy (HRA) by selected characteristics of attended HIV care facilities—Medical Monitoring Project, 2019 (n = 447)

	Weighted percentage of HIV care facilities[a]											
	Does not provide high-resolution anoscopy				Provides high-resolution anoscopy on-site				Provides high-resolution anoscopy by referral			
Facility characteristic	No.	Weighted row, % (95% CI)	Prevalence difference (95% CI)	Pfor prevalence difference	No.	Weighted row, % (95% CI)	Prevalence difference (95% CI)	Pfor prevalence difference	No.	Weighted row % (95% CI)	Prevalence difference (95% CI)	Pfor prevalence difference
Total	156	36.6 (31.8 to 41.4)	—	—	60	12.1 (9.0 to 15.3)	—	—	231	51.3 (46.3 to 56.2)	—	—
Facility type[a]												
Hospital-based infectious disease clinic												
Yes	33	35.6 (25.4 to 45.9)	Referent	—	19	16.8 (9.3 to 24.4)	Referent	—	43	47.5 (36.9 to 58.2)	Referent	—
No	122	36.9 (31.4 to 42.3)	1.2 (−10.4 to 12.8)	.838	40	10.7 (7.4 to 14.1)	−6.1 (−14.4 to 2.2)	.150	187	52.4 (46.8 to 58.0)	4.9 (−7.1 to 16.9)	.424
Hospital-based primary care clinic												
Yes	11	26.1 (12.1 to 40.1)	Referent	—	13	30.4 (15.7 to 45.0)	Referent	—	19	43.5 (27.7 to 59.3)	Referent	—
No	144	37.7 (32.6 to 42.7)	11.5 (−3.3 to 26.4)	.128	46	10.2 (7.1 to 13.2)	−20.2 (−35.1 to −5.3)	.008	211	52.2 (47.0 to 57.3)	8.6 (−7.9 to 25.2)	.306
Private practice												
Yes	49	37.1 (28.7 to 45.4)	Referent	—	17	11.7 (6.2 to 17.2)	Referent	—	67	51.2 (42.5 to 59.8)	Referent	—
No	106	36.3 (30.5 to 42.1)	−0.8 (−10.9 to 9.4)	.878	42	12.2 (8.5 to 16.0)	0.5 (−6.1 to 7.2)	.881	163	51.5 (45.5 to 57.4)	0.3 (−10.2 to 10.8)	.957
State or local health department												
Yes	17	50.1 (33.0 to 67.2)	Referent	—	4	10.7 (0.0 to 21.5)[b]	NA	—	16	39.2 (22.8 to 55.6)	Referent	—
No	138	35.7 (30.8 to 40.7)	−14.4 (−32.2 to 3.5)	.114	55	12.1 (8.9 to 15.4)	NA	—	214	52.1 (47.0 to 57.3)	12.9 (−4.2 to 30.1)	.140
Sexually transmitted disease clinic												
Yes	6	22.9 (6.6 to 39.3)[b]	NA	—	9	24.1 (9.0 to 39.3)[b]	NA	—	19	52.9 (34.7 to 71.1)	Referent	—

Facility characteristic	Weighted percentage of HIV care facilities[a]											
	Does not provide high-resolution anoscopy				Provides high-resolution anoscopy on-site				Provides high-resolution anoscopy by referral			
	No.	Weighted row, % (95% CI)	Prevalence difference (95% CI)	Pfor prevalence difference	No.	Weighted row, % (95% CI)	Prevalence difference (95% CI)	Pfor prevalence difference	No.	Weighted row % (95% CI)	Prevalence difference (95% CI)	Pfor prevalence difference
No	149	37.5 (32.6 to 42.5)	NA	—	50	11.2 (8.0 to 14.4)	NA	—	211	51.2 (46.1 to 56.4)	−1.7 (−20.6 to 17.2)	.862
Other community-based organization												
Yes	14	29.1 (15.5 to 42.7)	Referent	—	5	6.4 (0.6 to 12.1)[b]	NA	—	33	64.5 (50.5 to 78.5)	Referent	—
No	141	37.3 (32.3 to 42.4)	8.2 (−6.3 to 22.8)	.265	54	12.6 (9.2 to 16.0)	NA	—	197	50.0 (44.8 to 55.3)	−14.5 (−29.4 to 0.4)	.057
Primary care health professional shortage area designation[c]												
Yes	69	34.8 (27.8 to 41.7)	−3.3 (−12.9 to 6.2)	.492	29	12.0 (7.5 to 16.5)	−0.3 (−6.5 to 6.0)	.932	113	53.3 (46.1 to 60.4)	3.6 (−6.2 to 13.4)	.471
No	87	38.1 (31.5 to 44.6)	Referent	—	31	12.3 (8.0 to 16.6)	Referent	—	118	49.6 (42.9 to 56.4)	Referent	—
Medically underserved area/population designatiom												
Yes	67	31.8 (25.1 to 38.5)	−8.7 (−18.1 to 0.7)	.071	30	11.8 (7.4 to 16.2)	−0.7 (−6.9 to 5.5)	.829	123	56.4 (49.4 to 63.5)	9.4 (−0.4 to 19.1)	.060
No	89	40.5 (33.8 to 47.2)	Referent	—	30	12.4 (8.1 to 16.8)	Referent	—	108	47.1 (40.3 to 53.8)	Referent	—
Receipt of Ryan White HIV/AIDS Program funding												
Yes	74	29.2 (23.2 to 35.1)	Referent	—	42	15.9 (11.1 to 20.7)	Referent	—	137	54.9 (48.4 to 61.5)	Referent	—
No	82	42.3 (35.3 to 49.2)	13.1 (3.9 to 22.3)	.005	18	9.3 (5.2 to 13.4)	−6.6 (−12.9 to −0.3)	.039	94	48.5 (41.4 to 55.5)	−6.5 (−16.1 to 3.1)	.186
Urbanicity of facility location[d]												
Counties in metropolitan areas ≥1 million population	102	33.9 (28.3 to 39.5)	Referent	—	52	15.0 (10.9 to 19.1)	NA	—	158	51.1 (45.2 to 57.0)	Referent	—
Counties in metropolitan areas of 250 000	27	38.4 (26.5 to 50.4)	4.5 (−8.6 to 17.7)	.500	6	7.4 (1.4 to 13.4)[b]	NA	—	41	54.2 (42.1 to 66.3)	3.1 (−10.4 to 16.5)	.655

Facility characteristic	Weighted percentage of HIV care facilities[a]											
	Does not provide high-resolution anoscopy				Provides high-resolution anoscopy on-site				Provides high-resolution anoscopy by referral			
	No.	Weighted row, % (95% CI)	Prevalence difference (95% CI)	Pfor prevalence difference	No.	Weighted row, % (95% CI)	Prevalence difference (95% CI)	Pfor prevalence difference	No.	Weighted row % (95% CI)	Prevalence difference (95% CI)	Pfor prevalence difference
to 1 million population												
Counties in metropolitan areas <250 000 population	13	48.3 (29.5 to 67.2)	14.4 (−5.2 to 34.1)	.151	2	3.1 (0.0 to 7.4[b]	NA	—	15	48.6 (29.8 to 67.4)	−2.5 (−22.2 to 17.1)	.801
Nonmetropolitan counties	14	51.2 (32.7 to 69.7)	17.3 (−2.0 to 36.6)	.079	0	NA	NA	—	17	48.8 (30.3 to 67.3)	−2.3 (−21.7 to 17.1)	.815
Insurance types accepted Private insurance												
Yes	135	33.9 (29.0 to 38.8)	Referent	—	56	12.5 (9.1 to 15.8)	NA	—	221	53.6 (48.5 to 58.8)	NA	—
No	20	66.2 (49.6 to 82.9)	32.3 (15.1 to 49.6)	<.001	3	7.5 (0.0 to 15.8)[b]	NA	—	9	26.3 (10.7 to 41.9)[b]	NA	—
AIDS Drug Assistance Program or Ryan White HIV/AIDS Program coverage												
Yes	89	29.8 (24.2 to 35.3)	Referent	—	43	13.2 (9.1 to 17.2)	Referent	—	169	57.0 (51.0 to 63.0)	Referent	—
No	66	46.4 (38.1 to 54.7)	16.6 (6.7 to 26.6)	.001	16	10.4 (5.5 to 15.4)	−2.8 (−9.1 to 3.6)	.397	61	43.2 (35.0 to 51.4)	−13.9 (−24.0 to −3.7)	.008
US Department of Veterans Affairs												
Yes	54	35.2 (27.4 to 43.1)	Referent	—	20	11.9 (6.7 to 17.2)	Referent	—	86	52.8 (44.7 to 61.0)	Referent	—
No	101	37.4 (31.3 to 43.4)	2.1 (−7.8 to 12.0)	.675	39	12.1 (8.2 to 16.0)	0.2 (−6.3 to 6.7)	.954	144	50.5 (44.3 to 56.7)	−2.3 (−12.5 to 7.9)	.659
TRICARE												
Yes	92	40.0 (33.5 to 46.6)	Referent	—	27	11.1 (6.9 to 15.3)	Referent	—	124	48.8 (42.2 to 55.5)	Referent	—
No	63	32.3 (25.3 to 39.2)	−7.8 (−17.3 to 1.7)	.109	32	13.2 (8.5 to 17.9)	2.1 (−4.2 to 8.4)	.510	106	54.5 (47.2 to 61.8)	5.7 (−4.2 to 15.5)	.259
Medicare												
Yes	136	34.4 (29.5 to 39.3)	Referent	—	56	12.6 (9.2 to 15.9)	NA	—	220	53.1 (47.9 to 58.2)	Referent	—

Facility characteristic	Weighted percentage of HIV care facilities[a]											
	Does not provide high-resolution anoscopy				Provides high-resolution anoscopy on-site				Provides high-resolution anoscopy by referral			
	No.	Weighted row, % (95% CI)	Prevalence difference (95% CI)	Pfor prevalence difference	No.	Weighted row, % (95% CI)	Prevalence difference (95% CI)	Pfor prevalence difference	No.	Weighted row % (95% CI)	Prevalence difference (95% CI)	Pfor prevalence difference
No	19	60.5 (43.2 to 77.7)	26.1 (8.1 to 44.0)	.005	3	6.4 (0.0 to 13.6)[b]	NA	—	10	33.1 (16.3 to 50.0)	−19.9 (−37.5 to −2.3)	.027
Medicaid												
Yes	127	34.5 (29.3 to 39.6)	Referent	—	50	11.7 (8.4 to 15.0)	NA	—	206	53.8 (48.5 to 59.2)	Referent	—
No	28	46.5 (33.9 to 59.1)	12.0 (−1.6 to 25.6)	.083	9	13.7 (5.2 to 22.2)[b]	NA	—	24	39.8 (27.5 to 52.2)	−14.0 (−27.5 to −0.6)	.042
HIV case load												
<50 patients	17	56.2 (38.5 to 73.8)	33.3 (13.3 to 53.3)	.001	0	—	—	—	14	43.8 (26.2 to 61.5)	9.4 (−11.2 to 30.1)	.370
50–249 patients	42	40.8 (31.0 to 50.6)	17.9 (4.3 to 31.5)	.010	5	3.8 (0.2 to 7.4)[b]	NA	—	61	55.4 (45.6 to 65.3)	21.0 (6.5 to 35.6)	.005
250–1000 patients	63	33.9 (26.6 to 41.1)	10.9 (−0.9 to 22.8)	.072	14	7.5 (3.5 to 11.6)	−35.2 (−47.1 to −23.2)	<.001	110	58.6 (51.1 to 66.1)	24.2 (11.1 to 37.3)	<.001
>1000 patients	20	22.9 (13.5 to 32.4)	Referent	—	37	42.7 (31.5 to 53.9)	Referent	—	30	34.4 (23.6 to 45.1)	Referent	—
Clinical services provided On-site gynecologic care												
Yes	59	29.4 (22.7 to 36.1)	Referent	—	46	20.1 (14.5 to 25.8)	Referent	—	106	50.5 (43.2 to 57.7)	Referent	—
No	97	42.0 (35.4 to 48.6)	12.7 (3.3 to 22.0)	.008	14	6.1 (2.9 to 9.3)	−14.0 (−20.6 to −7.5)	<.001	125	51.8 (45.2 to 58.5)	1.4 (−8.4 to 11.2)	.783
On-site colposcopy												
Yes	23	24.4 (15.2 to 33.6)	Referent	—	36	33.8 (23.9 to 43.7)	Referent	—	39	41.8 (31.3 to 52.2)	Referent	—
No	133	39.7 (34.2 to 45.1)	15.3 (4.6 to 26.0)	.005	24	6.7 (3.9 to 9.4)	−27.1 (−37.4 to −16.9)	<.001	192	53.6 (48.1 to 59.2)	11.9 (0.1 to 23.7)	.049

[a] Facilities are not mutually exclusive categories. Data for the following facilities are not reported because the denominator was less than 30: federally qualified health center or federally qualified health center look-alike, Department of Veterans Affairs, research facility, correctional facility, Indian Health Service, Tribal Health, or urban Indian health center. CI = confidence interval; NA = not applicable.

[b] Coefficient of variation $(s/\bar{x}) \times 100 \geq 0.3$; the estimate may be unstable and should be interpreted with caution. Due to the unreliability of the estimates, corresponding prevalence differences could notbe evaluated.

[c] The US Health Resources & Services Administration definitions at https://bhw.hrsa.gov/workforce-shortage-areas/shortage-designation were used to define Primary Care Health Professional Shortage Area designation and Medically Underserved Area/Population designations.

[d] The rural-urban continuum codes designations at https://www.ers.usda.gov/data-products/rural-urban-continuum-codes/ were used.