Invited Review

CROI 2026: Innovations in HIV Care and Service Delivery to Improve Treatment Outcomes

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Abstract: *At the 2026 Conference on Retroviruses and Opportunistic Infections (CROI), investigators presented new findings and innovative interventions that may impact HIV service delivery and care cascade metrics. CROI 2026 focused on challenges faced by specific populations and novel interventions that address those challenges. These include the use of machine learning to predict virologic failure or missed clinic visits; individual-level interventions, such as in-person or virtual training and adherence support; clinic-based person-centered care and optimized clinic practices interventions; and a system-wide opt-out HIV screening and linkage program across federally qualified health centers that led to 100% linkage to care for those newly diagnosed with HIV. Point-of-care testing for HIV-1 RNA viral load and tenofovir adherence were well received by participants but not associated with improved outcomes. Researchers discussed the impact of disruptions in funding for HIV care and research, particularly among countries receiving support from the US Agency for International Development and the President's Emergency Plan for AIDS Relief. Although data continue to emerge on the profound impact of funding cuts, the collaboration of researchers, care delivery experts, and community members led to the restoration of some programs and continued support for National Institutes of Health-funded research.*

Keywords: care cascade, CROI 2026, funding, HIV, PEPFAR, USAID

The HIV Care Cascade and the Use of Machine Learning to Predict Cascade Elements

At the 2026 Conference on Retroviruses and Opportunistic Infections (CROI), investigators offered novel data on HIV care cascade metrics, with 2 presentations demonstrating challenges faced by younger people with HIV (PWH). Heck and colleagues (Abstract 182) used population-based HIV impact assessment (PHIA) surveys conducted after 2019 in Eswatini, Lesotho, Malawi, Mozambique, Tanzania, Uganda, and Zimbabwe, to explore subgroups of men with HIV facing challenges in diagnosis, treatment, and viral suppression. They concluded that most men who were unaware of their HIV status or who were virally unsuppressed belonged to 1 or more of the following subgroups: sero-different couples, those with recent mobility, adolescent boys and young men, older adults, sex workers, and gay or bisexual men. The overall care cascade for men with HIV was 85% status aware, 82% on treatment, and 76% virally suppressed, but those with recent mobility, those aged 18 to 29 years, and those in serodifferent couples faced the most challenges in care cascade metric attainment. Adolescent boys and young men who had recent mobility experienced higher rates of all 3 suboptimal cascade outcomes: 31% were undiagnosed, 4.8% were untreated, and 11.9% were unsuppressed.

A longitudinal study of men who have sex with men (MSM) and people who inject drugs (PWID) in India (Abstract 922) found disparities in outcomes for men aged 18 to 29 years between surveys conducted in 2012 to 2013 and 2022 to 2024. Prevalence increased from 6% to 16% (MSM aged 18-29 years) and 15% to 27% (PWID aged 18-29 years). Viral suppression was lowest for those aged 18 to 29 years (21% of PWID aged 18-29 years vs 68% of PWID aged >40 years; 65% of MSM aged 18-29 years vs 85% of MSM aged >40 years) from 2023 to 2024. These presentations underscore the need for support for young adults, particularly men, in achieving viral suppression.

Many investigators at CROI used machine learning and artificial intelligence-driven models to support HIV prevention and treatment. Christian and colleagues (Abstract 1077) used data from 158,134 PWH with longitudinal viral load records in Rwanda to develop a machine learning model to predict unsuppressed viral load. Virologic failure often followed signals of instability, including frequent clinic visits and referrals to enhanced counseling. They tested 4 learning models, and the best performing model, LightGBM, predicted unsuppressed viral load with

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an accuracy of 81.2%, a specificity of 91.4%, and a recall of 75.3%. Similarly, investigators used data from 8 clinical sites in Kenya to build a machine learning-based model to predict the probability of a patient missing their next scheduled clinic visit (Abstract 1076). They conducted a pilot study that included previsit outreach to those patients identified to be at risk for missing their next visit and found that men and older patients were more likely to be flagged as at risk. Outreach led to higher odds of returning to the clinic.

Individual counseling and training interventions led to improved virologic suppression for adolescents transitioning to adult HIV care clinics, men with HIV and stimulant use disorders, and women with HIV and prior sexual trauma

Innovative HIV Care Delivery Interventions

CROI 2026 featured numerous successful, innovative HIV care delivery interventions targeting HIV care cascade metrics. Three notable examples described individual-level training or counseling programs that improved virologic suppression. The first, a training program for adolescents transitioning to adult HIV care environments from Zanoni and colleagues (Abstract 156), compared an existing, in-person training intervention for adolescents with HIV with a modified version that offers virtual training via WhatsApp, with a control group receiving standard care. Unfortunately, the cluster randomized trial was halted after 9 months because of funding cessation. At that time, the in-person intervention was associated with a significant increase in virologic suppression (93%; $P = .035$) compared with the standard of care group (87%), but virologic suppression did not differ between the virtual intervention (84%) and standard care ($P = .9$). Retention in care was higher in the in-person and virtual intervention groups than in the standard of care group. Funding has now been restored for this project and investigators will continue with the second phase, expanding the 2 interventions to 8 additional clinics.

A second study of an individual-level virtual intervention tested the efficacy of the Supporting Treatment Adherence for Resilience and Thriving (START) mHealth App in 286 sexual minority men with HIV and stimulant use disorder in the US (Abstract 184). All participants had a recent history of nonadherence to antiretroviral therapy (ART) and 46% had a detectable viral load at baseline. They were randomly assigned to the START intervention, which integrates positive affect skills with self-monitoring of mood and ART adherence, or a website-based control condition with referrals to additional practitioners. At 6 months, the adjusted odds ratio (aOR) for virologic suppression, defined as below 300 copies/mL based on the cutoff threshold for the mail-in dried blood spot test used in the study, was 0.42 in the START intervention arm (95% CI, 0.19-0.93) compared with the website-based controls. The difference was driven by a 2-fold greater incidence of virologic rebound in the control group, and the number needed to treat was 5. There was no effect on the reported severity of the individual's stimulant use disorder. Investigators noted that recruitment was very challenging; only 1 in 5 individuals screened for the study enrolled. Despite this, cost for this mHealth intervention was feasible and the potential impact for the growing population of men with HIV using stimulants is encouraging.

Finally, Sikkema and colleagues (Abstract 185) designed a task-shared trauma-focused coping intervention, Improving AIDS Care after Trauma (ImpACT), for women with HIV and sexual trauma in South Africa. In a hybrid type I effectiveness trial, they compared 4 or more sessions of the ImpACT intervention to problem-solving therapy (PST) in 349 women with HIV. Retention was low (70%) over 12 months in each study arm, but 94% of participants in the ImpACT intervention arm achieved viral suppression to below 50 copies/mL compared with 84% in the PST arm ($P = .049$). Investigators measured psychologic metrics and determined that the interventions led to improvement in coping skills; however, social/spiritual coping was significantly higher in the ImpACT group than in the PST group. These 3 investigations shed light on how subgroups impacted by HIV can benefit from individual-level training or counseling interventions tailored to their specific circumstances.

CROI 2026 also included innovative interventions occurring at the clinic or health system level. A cluster randomized trial in Zambia investigated a person-centered care (PCC) intervention that included training and coaching of health care workers, evaluation of client experience with feedback to clinic staff, and performance-based facility incentives (Abstract 183). Overall, virologic resuppression was more common during the intervention condition than during the control condition (61% vs 53%, respectively; adjusted hazard ratio, 1.18; 95% CI, 1.05-1.33).

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The PCC intervention was associated with reduced treatment interruptions, shorter time to documented virologic resuppression, and improved patient-clinician communication.

A sequential multiple-assignment randomized clinical trial in South Africa tested the impact of optimized clinical practices, which included welcome back services, 6-month refills, outreach to long-term follow-up care, chronic medicine dispensing, and smart locker pickup at the clinic, on viral suppression (Abstract 186). The first phase of the study comparing optimized clinic practices with and without a conditional lottery incentive found no differences between the 2 groups. In the second phase, those with a detectable viral load, not engaged in care, or with more than 2 barriers to care were randomly assigned 2:1:1 to continue in their original assignment group, to smart locker ART pickup and monitoring, or to home ART delivery and monitoring. There was no significant difference between these groups, with high levels of viral suppression (88%) across all 3 arms. However, there was a difference for those aged younger than 30 years. The adjusted relative risk for virologic suppression for those younger than 30 years of age in the smart locker compared with the optimized clinic practices group was 1.24 (95% CI, 1.01-1.52; $P = .04$) and home delivery was noninferior to the optimized clinic practices group. These data suggest that optimized clinic practices are associated with high levels of viral suppression across all age groups, and that younger PWH may benefit from alternative strategies for ART delivery.

A study of more than 216,000 patients receiving care at 13 clinics from a network of federally qualified health centers (FQHCs) provided a powerful proof of concept for enhanced opt-out HIV screening and linkage to care in a primary care setting (Abstract 159). The program identified 218 newly diagnosed people with HIV and 1667 who were out of care. They successfully linked 100% of these clients to care, with 90% of linkage to care events occurring within 30 days of testing. Overall, the network of FQHCs supports more than 30 clinics and nearly 5 million patients in the US, making them well positioned to scale up the program across their network. In summary, CROI 2026 highlighted numerous novel individual- and system-level interventions that support virologic suppression, often tailored to specific communities or contexts.

Point-of-Care and Virtual Laboratory Testing to Improve HIV Care

Several CROI 2026 presentations focused on new uses of point-of-care (POC) testing to improve HIV care outcomes. Gorbach and colleagues (Abstract 977) described supporting the virtual submission of HIV viral load results to an app-based digital cohort, EPI-LoVE (Exploring, Predicting, and Intervening on Long-term Viral Suppression Electronically). Participants chose 1 of 4 modalities to send their data to the platform, including uploading a personal copy of their test (41%), using a self-collection blood kit (24%), testing at an external laboratory site (12%), or testing at an affiliated clinic (22%). Of those who submitted viral load data, 37% were not virologically suppressed and 56% were suboptimally engaged in HIV care, demonstrating high uptake even for those with challenges for virologic suppression.

People with HIV welcomed point-of-care and remote monitoring for virologic suppression and adherence

Project Bright, a study of virologic suppression among gay men with HIV experiencing intimate partner violence, piloted a strategy of using self-collected blood in microcontainer tubes (Abstract 165). Specimen return rates were 75.4% to 76.9% over 12 months and sample viability was more than 91%. Investigators concluded that participants were willing to participate in this type of remote monitoring and achieved high levels of virologic suppression, with only 7% having quantifiable virus at any time. Finally, Drain and colleagues used monthly urine tenofovir testing and every-6-month POC viral load testing to support adherence among South Africans initiating first-line ART. Among the 72% of participants retained in care at 72 weeks, there was no significant difference in viral suppression rates between those assigned to POC testing (93%) and controls (90.3%). These 3 presentations demonstrate that POC testing is feasible and sometimes the preferred modality for testing, even if not associated with improved viral suppression.

International Impact of Disruptions to Funding for HIV Service Delivery and Care

The impact of federal funding disruptions on HIV service delivery and research was a theme running throughout CROI this year. The cluster randomized trial by Zanoni and colleagues (Abstract 156) mentioned above was just one of many projects placed on hold or discontinued because

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of changes in the President's Emergency Plan for AIDS Relief (PEPFAR), US Agency for International Development (USAID), or other funding structures. In an interactive symposium, Garnett (Abstract 21) explained that substantial reductions in funding for PEPFAR were predicted, but the abrupt nature of the change was not. Current projections show PEPFAR funding will decrease by 40%, from $4.85 billion in fiscal year 2025 to $2.9 billion in 2026. The programmatic goal is to continue service delivery but reduce expenditures on technical assistance, prevention, and health systems. Garnett emphasized the extreme challenge of maintaining HIV prevention programs and support structures for HIV care in most countries receiving support from PEPFAR.

Funding changes often led to interruptions in services aside from direct care that remain integral to successfully functioning clinics

These assertions were underscored by a rapid cross-sectional survey of a global cohort of HIV clinics by Brazier and colleagues (Abstract 1051) in June and July of 2025, shortly after the changes in funding. Of 76 clinics responding, 47% reported disruptions in services, particularly for HIV counseling and testing and for preexposure prophylaxis (PrEP). Care services were impacted, with 22% reporting disruptions of ART availability, 24% reporting absence of viral load testing, and 24% noting inability to conduct early infant diagnostic testing. There were stark geographic variations, with no Latin America-based clinics reporting disruptions in care and widespread disruptions in Eastern and Southern Africa.

Similarly, a facility audit across a population-based sample of clinics in KwaZulu-Natal, South Africa (Abstract 1054) determined that 42% of clinics reported disruptions in services. Although these were more common in PEPFAR-supported clinics, disruptions were seen in some nonsupported clinics. Layoffs of nonclinical staff were common, particularly lay health workers, file clerks, and data entry technicians. The authors noted that many interruptions were in what they call "silent" services, ie, those not in direct patient care but integral to a successfully functioning clinic, such as clinical mentoring, technical support, and patient tracing.

Batiste emphasized the community impact of these service disruptions in her talk (Abstract 22) using qualitative data from community members to underscore the erosion of trust and confusion that followed the funding cuts. She proposed the use of community-led monitoring, now a part of the Joint United Nations Program on HIV/AIDS standards,[1] to support community resilience and local control of HIV prevention and treatment programs.

Kambugu described the numerous changes in National Institutes of Health (NIH) policy over the past year and their impact on HIV research in Africa (Abstract 23). He noted that most NIH awards in Africa are held by the US-based institutions, and funds flow to African institutions through subawards. The indirect cost cap of 15% in February 2025 led to hiring slowdowns or freezes, reversals of program expansion plans, and reductions in funds available for compliance, monitoring, and data systems. When foreign subawards were prohibited in May 2025, clinical trials were curtailed, enrollment was paused across numerous research studies, and the administrative burden of contracts, subaward renewals, and reporting increased. Although the NIH enacted a replacement structure for international collaboration in May 2025, the complex award architecture and increased reporting and compliance burden continue to impact collaborative research between the US and African countries. As Staley reminded us in his plenary (Abstract 11), there is reason to hope, as bipartisan support for continued NIH funding grows and many funding streams have been restored. Staley called for continued collaboration between clinicians, researchers, and advocates to call out the importance of HIV care delivery and research, and the human impact of current funding trajectories.

All abstracts cited in the text appear in the CROI 2026 Abstract eBook, available online at www.CROIconference.org

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Financial affiliations in the past 24 months: Dr Taylor reported serving as an advisor or consultant to Gilead Sciences, Inc. (Updated April 15, 2026)

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(Updated April 10, 2026) *Reviewers/Planners 2 and 3 reported no relevant financial relationships with ineligible companies.* (Updated April 29, 2026)

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Additional Reference Cited in Text

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