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[Wendy Armstrong](#), *Emory University*
[Vincent Marconi](#), *Emory University*
[Minhly Nguyen](#), *Emory University*
[Sarita Shah](#), *Emory University*
[Caitlin Moran](#), *Emory University*
[Lauren Collins](#), *Emory University*
[Jonathan Colasanti](#), *Emory University*
[Cecile Lahiri](#), *Emory University*
N Sarita Shah, *Emory University*

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The COVID-19 pandemic as a catalyst for differentiated care models to end the HIV epidemic in the U.S. – applying lessons from high-burden settings

Lauren F. Collins^{1,2}, Jonathan A. Colasanti^{1,2,3}, Minh Ly Nguyen^{1,2}, Caitlin A. Moran^{1,2}, Cecile D. Lahiri^{1,2}, Vince C. Marconi^{1,2,3,4}, Wendy S. Armstrong^{1,2}, N. Sarita Shah^{1,3,4}

¹Division of Infectious Diseases, Emory University School of Medicine, Atlanta, GA, USA

²Grady Healthcare System, Infectious Diseases Program, Atlanta, GA, USA

³Rollins School of Public Health, Emory University, Atlanta, GA, USA

⁴Atlanta Veterans Affairs Medical Center, Decatur, GA, USA

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The COVID-19 pandemic has exposed longstanding vulnerabilities in our healthcare system, and has laid bare the individuals and communities most threatened by insufficient public health support. In the U.S., persons with HIV (PWH) represent a heterogeneous population with complex medical and sociobehavioral needs currently unmet by systemically-flawed care models^{1,2}. Thriving on health disparity, COVID-19 devastates the same communities where HIV prevalence is highest³, illuminating the catastrophic synergy of poverty, policies and structural racism⁴. This unprecedented time demands reexamination of HIV care delivery, paving the way for a revitalized healthcare infrastructure tailored to the needs of PWH and those at-risk of HIV to realize the goals of the *Ending the HIV Epidemic* (EHE) initiative⁵.

The EHE initiative aims to reduce new HIV infections in the U.S. by 90% by 2030 through focusing resources on hardest hit communities. A vital component of this strategy is to treat HIV infection rapidly and effectively so PWH achieve and maintain viral suppression. Prior to COVID-19, HIV care in the U.S. was frequently delivered by facility-based, provider-led visits occurring at 3–6-month intervals, with antiretroviral therapy (ART) dispensed in 30-day increments for the majority of patients. This “one-size-fits-all” model inadequately considers the varied needs of an estimated 1.1 million PWH residing in diverse local contexts across the U.S.⁶. The consequence is substantial drop-offs at each step in the HIV care continuum; in 2016, only 49% of PWH were retained in care and 53% had viral suppression, the current marker of successful HIV treatment⁶.

Corresponding author: Lauren F. Collins, MD, MSc, Department of Medicine, Division of Infectious Diseases, Emory University School of Medicine, 49 Jesse Hill Jr Drive, Atlanta, GA, 30303, Telephone: 404-251-8938, lauren.frances.collins@emory.edu.

In February 2020, COVID-19 arrived to the Southern U.S., the national epicenter of the HIV/AIDS epidemic and a region crippled by limited healthcare infrastructure and widespread health disparities^{1,7}. As the pandemic rapidly expanded, clinic operations pivoted to minimize in-person visits while ensuring patients had an uninterrupted ART supply. COVID-19 forced health systems to urgently implement mechanisms to reach patients and keep essential medications accessible through telehealth, medication delivery programs, mobile health units and home visits. For implementers of HIV care, the pandemic provides a long-overdue impetus to build innovative, more patient-centered healthcare delivery models.

Differentiated service delivery (DSD) is an HIV care model that combines aspects of facility- and community-based care and healthcare worker- or peer-led care processes⁸ (Figure). Fundamentally, DSD is an adaptive approach that aims to efficiently use limited resources by tailoring health services to local context, and patients' clinical status and preferences. This care model originated in Sub-Saharan Africa after global HIV care shifted to a "treat all" strategy in 2016. Existing healthcare infrastructure became severely overwhelmed by the marked expansion of PWH requiring care⁹. To expand access, healthcare providers, pharmacies, and communities collaborated on remodeling ART delivery, adherence support, and retention tracking by leveraging local resources including personnel and alternative care sites. Employing a more client-centered approach than standard ambulatory-based visits, DSD empowers the primary stakeholder (patient) to find a mode of care conducive to their lifestyle while simultaneously decongesting the traditional healthcare system^{8,9}.

DSD has been most widely adopted in high-burden settings, where heterogeneity in HIV micro-epidemics (ranging from stable patients requiring fewer system touches to ill patients requiring intensive medical services)^{10,11} drives the need for a personalized public health approach¹². In the U.S., populations of PWH, barriers to care, and care continuum outcomes differ regionally, with the Deep South falling behind^{1,13}. Implementation of locally-tailored DSD across the country could offer access to care and ART in diverse settings such as clinics, communities and homes, with varying frequency of clinical assessment based on need¹⁴. The Ebola crisis in 2014–2015 accelerated use of DSD models in African countries to safeguard continuous ART through 6-month refills and community distribution¹⁵. COVID-19 likewise catalyzed adoption of HIV care models in the U.S. that are more accessible, differentiated, and patient-centered, and progress should be sustained beyond the current crisis.

While DSD has thus far been most commonly implemented for PWH with stable viral suppression, similar strategies may be useful for populations with retention and adherence challenges, especially if difficulty attending in-person provider or pharmacy appointments leads to ART disruptions. Rather than dispensing 1-month ART refills by pharmacy pick-up, DSD models encourage 3-month or 6-month ART supplies obtained via "fast-track" intra-facility retrieval or community distribution points¹⁶. Models are individualized based on community context and patient status (i.e., newly initiating ART, unstable or stable on treatment)^{17,18}. Task-shifting has been widely used in South Africa since 2012 when the STRETCH trial demonstrated nurse-initiated and monitored ART improved mortality for

PWH with CD4 counts >200 cells/ μ L and overall quality of care¹⁹. Another South African study found that when compared to usual care, participation in client-led “adherence clubs” improved retention in care (81.6% vs. 89.5%) and had comparable viral suppression (79.6% vs. 80.0%)²⁰. While “fast-track” models were cost-saving in Malawi (10% reduction in annual unit cost of providing care to stable patients)¹⁸, it will be important to evaluate cost-effectiveness in U.S. settings and among patients of varying clinical stability.

Reduced frequency of in-person visits and ramping-up telehealth has potential to further decongest clinics, reduce patient inconvenience and improve outcomes. In 2015, the Veterans Affairs healthcare system offered telehealth in HIV specialty clinics given the large proportion (21%) of PWH who must travel 1 hour for care. A cluster-randomized trial of 1,670 veterans found telehealth uptake increased as the time saved from travel increased; viral suppression was higher among telehealth users than controls (91.5% vs. 80.0%)²¹. Telehealth is generally acceptable and multibeneficial²², however, the availability of and proficiency with technology varies among patients, presenting challenges to effective patient-provider communication. Ideally programs should offer flexibility in format (video, telephonic, face-to-face, co-provider) to accommodate patient-provider preferences and also guide implementation science to determine which approaches are most effective.

COVID-19 has starkly exposed gaps in our healthcare infrastructure beyond service delivery, namely social determinants of health that are exacerbated by the current crisis. Without addressing the intersectionality of structural racism, food insecurity, housing instability, stigma, mental health and substance use disorders – synergized by the COVID-19 and HIV epidemics – we will not be successful at EHE in the U.S¹. DSD offers a strategic platform to confront social determinants of health that obstruct HIV treatment outcomes (i.e., retention and viral suppression) and deliver on the other EHE pillars: diagnosis, prevention, outbreak response⁵. Critical to this mission is building a robust public health workforce trained in testing, counseling and triaging community referrals²³. Community health worker and patient navigator interventions among PWH in the U.S. and high-burden settings have been shown to promote psychosocial outcomes and housing security, respectively, and ultimately improve success across the care continuum^{24,25}. Investing in community-based public health personnel equipped with multifaceted skills and resources allows for bundling of health promotion activities²⁶. For example, performing culturally-competent COVID-19 contact tracing could double as an opportunity to conduct HIV testing and provide pre-exposure prophylaxis (PrEP) for HIV prevention²⁷. Such integrated service delivery has the potential to destigmatize and scale-up testing (for COVID-19, HIV, other STIs and non-communicable diseases, such as hypertension and diabetes), build trust among communities, and restore public health infrastructure for long-lasting impacts on individual and community health^{23,26,28}.

The current era prompts reevaluation of the standard metrics used to evaluate the quality of HIV care and to inform programming. Current measures are imperfect; they require several visits per year, involve longitudinal measurement, are not immediately actionable, and do not consider the patient’s psychosocial health and overall wellbeing. Among the six core HIV/AIDS Bureau clinical care performance measures, three require a visit in the last six months (HIV medical visit frequency, gap in HIV medical visits, annual retention in care)²⁹.

Using current definitions, if a patient stably suppressed was seen annually, this would result in misclassification as “not retained.” Moving forward, patients with stable viral suppression should be allowed annual HIV-1 RNA measurements – instead of biannual – without forfeiting ART coverage or retention status. Acceptable clinical encounters should include telehealth, in addition to face-to-face visits. Lastly, the pandemic has accentuated the psychological toll of health, economic, and social stressors on overall wellbeing³⁰. Validated tools exist to measure quality of life (QOL) among PWH³¹ and should be the final step in the care continuum, beyond viral suppression. For example, the WHOQOL-HIV BREF is a cross-culturally validated scale assessing six QOL domains, can be self-administered in 10 minutes, and has been used in Ethiopia and Nigeria among PWH to guide targeted interventions^{32,33}. This scale could be integrated into U.S. DSD models once adapted to local context.

Differentiated care models have been needed for decades, but the COVID-19 pandemic has served as a catalyst to harness tragedy for change^{16,34}. In refocusing our health systems to become patient-centered and community-invested, we have an unparalleled opportunity to use this crisis to restructure HIV care delivery permanently. Not only will these changes lead to progress toward EHE in the U.S., but may improve health disparities and clinical outcomes for PWH and all people in vulnerable populations. The HIV/COVID-19 syndemic makes it apparent that we must prioritize robust and sustained investment in addressing social determinants of health and in rebuilding our public health infrastructure to provide destigmatized and accessible care for all.

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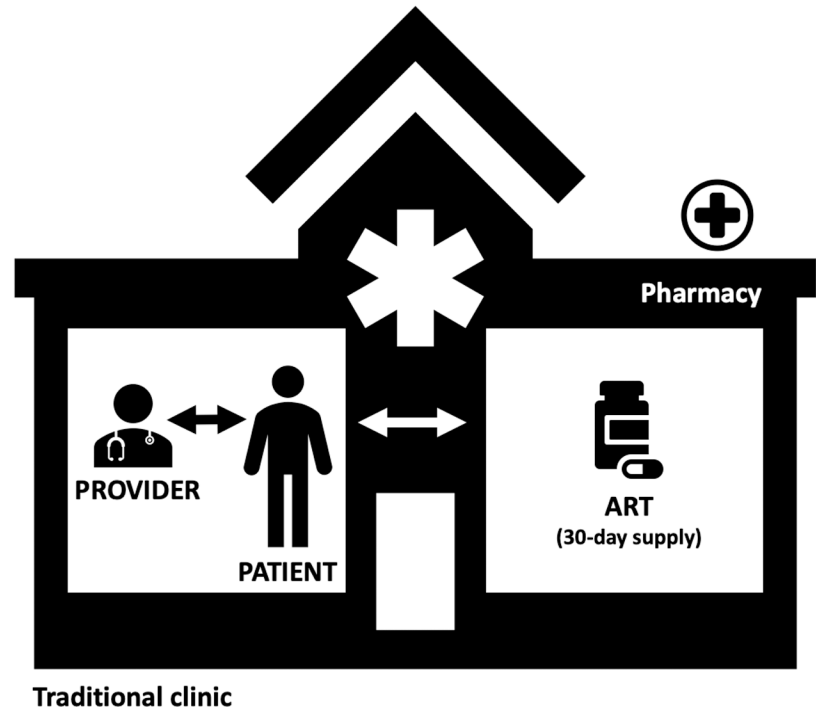
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A) Current service delivery for HIV care



B) Differentiated service delivery for HIV care

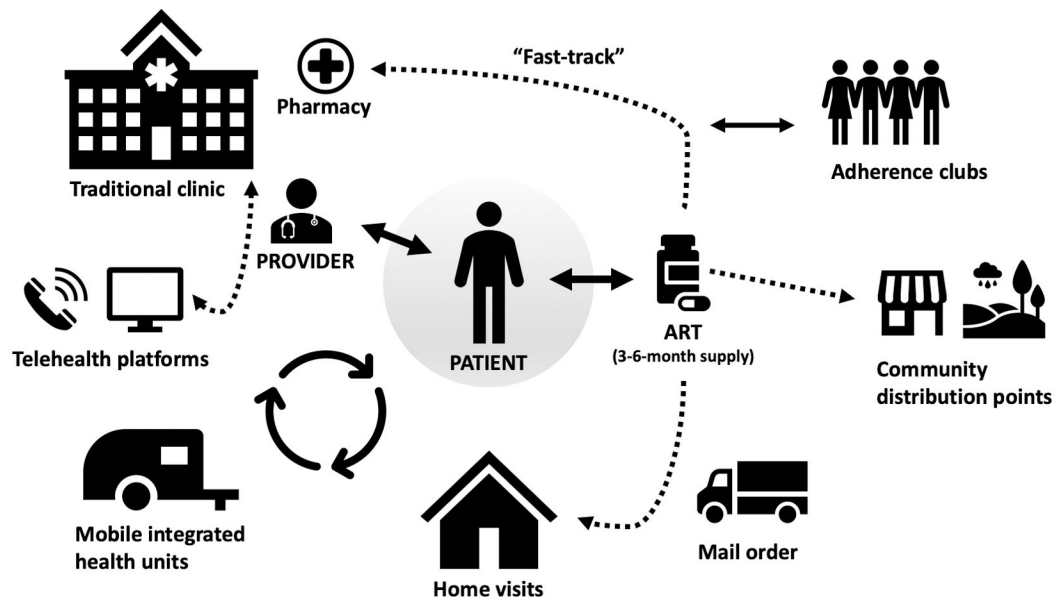


Figure. Current care delivery for persons with HIV in the U.S. comprises in-facility, provider-led visits every 3–6 months with antiretroviral therapy (ART) dispensed in 30-day supplies (A). Differentiated service delivery provides a more patient-centered approach adapted to local preference and context, allowing for innovative care platforms via telehealth, mobile units or

home visits, and ART delivery by mail order, community distribution points, or in-facility “fast-track” pick-up supported by adherence clubs (B).

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