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Building the case for localized approaches to HIV: structural conditions and health system capacity to address the HIV/AIDS epidemic in six US cities

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Abstract

Since the discovery of the secondary preventive benefits of antiretroviral therapy, national and international governing bodies have called for countries to reach 90% diagnosis, ART engagement and viral suppression among people living with HIV/AIDS. The US HIV epidemic is dispersed primarily across large urban centers, each with different underlying epidemiological and structural features. We selected six US cities, including Atlanta, Baltimore, Los Angeles, Miami, New York, and Seattle, with the objective of demonstrating the breadth of epidemiological and structural differences affecting the HIV/AIDS response across the US. We synthesized current and publicly-available surveillance, legal statutes, entitlement and discretionary funding, and service location data for each city. The vast differences we observed in each domain reinforce disparities in access to HIV treatment and prevention and necessitate targeted, localized strategies to optimize the limited resources available for each city's HIV/AIDS response.

Keywords

HIV; health system; policy; epidemiology

Introduction

Scientific advances in HIV treatment have demonstrated that early access to and sufficient uptake of combination antiretroviral therapy (ART) can dramatically reduce HIV-related morbidity, mortality and transmission (1, 2). National and international governing bodies have subsequently mobilized efforts to optimize engagement and retention of people living with HIV (PLHIV) along the cascade of care, most notably in UNAIDS' targets of 90% diagnosed, 90% on ART and 90% virally suppressed (3). This approach is reflected in the US Federal Government's National HIV/AIDS Strategy (NHAS), which adopts federal targets similar to UNAIDS's 90–90-90 global targets alongside goals of reducing new HIV infections, improving health outcomes for PLHIV, and minimizing HIV-related disparities across demographic groups (4).

To assist local stakeholders in achieving the NHAS's goals, the federal government increased domestic funding for HIV/AIDS from $21.8 billion in 2011 to $26.4 billion in 2016 (5). The majority of funds (70–75%) were allocated to HIV care, increasing from $15.3 billion to $19.7 billion to match increases in the costs of antiretroviral treatment (5, 6). Research and prevention funds remained stable at $2.7 and $0.9 billion respectively, while cash and housing assistance spending grew marginally from $2.7 to $3.0 billion (5). At the same time, provisions in the Affordable Care Act (ACA) extended access to health insurance through Medicaid expansion and private markets, eliminated cost sharing for HIV testing, and required parity for mental health and substance use coverage, helping improve access to care and patients' outcomes in participating states (7). To optimize the use of allocated

funds, the NHAS recommends stakeholders prioritize the development, evaluation and implementation of effective strategies to extend access for HIV testing, care and treatment, while also strategically concentrating limited federal resources to communities with high risks of HIV infection (8).

However, recent assessments of HIV care engagement show national results continue to fall below UNAIDS targets. According to the Centers for Disease Control and Prevention (CDC), an estimated 87% of PLHIV in the US are aware of their status, yet only 39% of those diagnosed were retained in care in the past year, and of those diagnosed only 30% are virally suppressed (9).

Wide disparities in health system infrastructure, funding and legislation across cities and states obscure these differences at the national level. Efficient and effective strategies to treat and prevent HIV infections including HIV testing (10), early uptake and sustained adherence to ART (11), pre-exposure prophylaxis (PrEP) (12, 13), and harm reduction strategies (e.g. opioid agonist treatment (OAT)(14) and syringe services programs (SSP) (15)) are available but with varying degrees of accessibility across the country.

With an estimated 82% of the population of PLHIV in the US residing in major urban centers (16, 17), we selected six cities, including Atlanta, Baltimore, Los Angeles, Miami, New York, and Seattle, to demonstrate the breadth of epidemiological and structural differences affecting the response to HIV/AIDS across the country. Together, these cities represent nearly one quarter of the US population of PLHIV (18, 19), but only 12% of the general population (20).

Methods

We conducted a targeted review of the grey and scientific literature to synthesize publicly-available data for our cities in four domains: a) HIV epidemiology (cascade of care, demographics among diagnosed PLHIV, and size of HIV vulnerable populations); b) state- and city-level HIV/AIDS related legal statutes; c) federal public funding support; and d) health system infrastructure for the treatment and prevention of HIV/AIDS and injection drug use.

HIV Epidemiology

For the purposes of this paper, we focused on three aspects of HIV epidemiology across the six cities: the cascade of care; racial and risk behavior demographics among diagnosed PLHIV; and the size of HIV vulnerable populations in each of the cities. With the exception of New York City, we summarized 2015 publicly reported surveillance data on the HIV epidemics within each metropolitan statistical area (MSA) or relevant county when available. This included Atlanta- Sandy Springs-Roswell, GA; Baltimore-Columbia-Towson, MD; Los Angeles-Long Beach- Anaheim, CA; Miami-Fort Lauderdale-West Palm Beach, FL; and Seattle-Tacoma-Bellevue, WA. For New York City, we reported data as the sum of the five boroughs: The Bronx, Brooklyn, Manhattan, Queens, and Staten Island. Primary sources of data included the CDC's annually released HIV Surveillance Report (18) and HIV Prevention and Surveillance data (21), and local surveillance reports (22–29).

State- and City-level HIV/AIDS related legal statutes

We focused on policies targeting PLHIV and those at elevated risk of infection, including sex workers and PWID. Our search considered laws pertaining to a) criminalization of HIV nondisclosure and transmission and b) legality of HIV prevention services, such as needle exchange and possession. For HIV and AIDS specific laws, we reviewed the CDC's State HIV Laws tool (30), The Center for HIV Law & Policy's comprehensive analysis of related criminal laws (31), and peer-reviewed publications describing the history of criminal charges for exposure and transmission of HIV (32–34). For the possession and exchange of needles, we similarly reviewed literature (35, 36) and referred to The Policy Surveillance Program's LawAtlas Project (37).

Federal public funding support

We organized public federal funding support into the following categories: HIV-related care and support services (including physician and hospital visits, drug coverage, and mental health services), cash and housing assistance (including Social Security Disability Insurance (SSDI) and Supplemental Security Income (SSI) assistance to disabled individuals with HIV), and prevention (including testing, counseling, health and risk education, public health information and communication, and surveillance and monitoring) (5, 38). We compiled publicly-reported federal HIV/AIDS expenditures for fiscal year 2015/16 for entitlement funds (i.e. Medicaid, Medicare) and discretionary funds (i.e. the Ryan White Program (excluding Part B), and the AIDS Drug Assistance Program (ADAP) reported by the Kaiser Family Foundation using a special data request to the National Alliance of State and Territorial AIDS Directors (NASTAD) (39). Data on housing expenditures were provided by the discretionary Housing and Opportunities for People with AIDS (HOPWA) program, and prevention funds came from the CDC's HIV/AIDS program (40, 41) and the Substance Abuse and Mental Health Service Administration (SAMHSA) (42). Where city or individual-level estimates were not reported (i.e. Medicaid, Medicare), we used population-adjusted national and state-level data to estimate funding per person.

Health System Infrastructure

We used publicly-available information on counts of existing service locations as of December 2016 and quantified the distribution of services per capita (20) and square mile (43). The number of practices and facilities offering HIV testing and primary care, opioid agonist treatment, syringe services programs, and PrEP access were determined using the CDC's National Prevention Information Network (44), American Academy of HIV Medicine (45), Intervention America (46), and North American Syringe Exchange Network(47) websites, and city-level departments of health or non-governmental organization press releases for PrEP (48– 52). PrEP clinic counts were compiled from directories that listed public clinics primarily catering to uninsured or underinsured populations and as such may not include all providers.

Results

HIV Epidemiology

According to CDC estimates, approximately 87% of PLHIV were aware of their status nationally in 2015 (9). At the state level, the percentage of PLHIV aware of their status was 90–93% in New York, 87–89% for California, Florida, and Washington, and 77–84% in Georgia and Maryland (53). Based on available data, New York City (94%), and Seattle (96%) were above the national average of PLHIV aware of their status (Figure 1). Across the cities, the proportion of estimated PLHIV who were virally suppressed was low to moderate (38–78%); and only one of the cities reported the proportion of PLHIV on ART (New York). Further, there was wide variation in the demographic and risk behavior characteristics of the six cities. For example, 9–78% of diagnosed PLHIV were black/African American, 3–43% Hispanic/Latino, and 15–70% white. Similarly, 28– 77% were MSM, 4–42% PWID, and 10–38% heterosexual.

While detailed data on the risk behaviors of diagnosed PLHIV was available for each city, publicly reported data concerning the composition and risk behavior of HIV negative and/or undiagnosed populations—which can be used to target prevention programs and otherwise calculate sub-group specific prevalence estimates—was lacking. Estimates of PWID per MSA were last provided for 2007 by Tempalski et al (54). At the time, Miami had the lowest estimated proportion of PWID at 0.05% (95% CI: 0.02–0.08%) or 7,607 of its residents and Baltimore had the highest proportion of PWID at 0.3% (95% CI: 0.13–0.48%) or 59,113 residents; suggesting a six-fold difference in the per-capita magnitude of injection drug use epidemics across the six cities. Similarly, Grey et al (55) provided recent estimates for the population sizes of MSM at the state level and for the 51 most populated US counties. According to their estimates using data from the American Community Survey, Maryland had the lowest proportion of MSM at 4.0% or 84,465 residents; while California had the highest at 5.7% or 792,750 residents. Of the counties reported, Miami-Dade had the lowest proportion of MSM at 6.2% or 59,733 residents, and New York County (Manhattan) had the highest at 13.8% or 87,556 residents. None of the counties in Maryland were listed as part of the 51 counties with the largest estimated MSM populations; suggesting that the difference in magnitude per city was greater than two-fold.

Current state- and city-level HIV/AIDS related legal statutes

The six cities examined are located in states with varying degrees of legal provisions that explicitly criminalize “reckless endangerment” or knowingly exposing others to HIV (33, 34) through sex, sharing of contaminated injection equipment, and donating HIV-infected blood or tissue for transplantation; or implicitly criminalize related behavior through laws established as part of the war on drugs (35). New York had the fewest HIV transmission and syringe possession/distribution laws, while Atlanta, Miami, and Seattle had the most (Figure 2). According to The Center for HIV Law and Policy (56) there were 226 prosecutions and arrests for HIV exposure in the US between 2008 and 2014. Of these, nine occurred within the cities examined here: four in Miami, three in Atlanta, and two in Baltimore (56).

We found, in some cases, that federal, state and municipal laws contradicted one another. Although congress effectively lifted the ban on federal funding for syringe services programs in early 2016, at the time of publication, Georgia and Florida continue to prohibit access to these funds. Georgia's Bill 1058 bars organizations from public funding (36); and syringe services programs remain functionally illegal, as does failing to disclose HIV status to sexual and needle sharing partners (32), and the deliberate exposure to bodily fluids (57, 58). Despite potential legal ramifications, the Atlanta Harm Reduction Coalition continues to operate a mobile syringe services program twice a week (59) with no harassment from law enforcers. Similarly, Florida's Governor Rick Scott signed the Miami-Dade Infectious Disease Elimination Act (IDEA) in March 2016, permitting the University of Miami to run a 5-year syringe services program pilot program in Miami-Dade. However, the university must raise all funding from private grants and donations, despite the lifting of federal funding sanctions, and this program can only provide syringe exchange services (60–62).

While syringe services programs remain controversial in some states, others are pressing for additional HIV prevention-friendly policies. For example, Washington was the first state to establish a law requiring all insurers to cover PrEP with no out of pocket costs to their patients through the PrEP Drug Assistance Program (12, 63).

Public funding support

Following the Affordable Care Act Supreme Court ruling on Medicaid Expansion in June 2012, Florida and Georgia chose not to expand Medicaid eligibility to childless, non-disabled adults earning less than 138% of the federal poverty level, despite federal financial support to do so (64, 65). This decision affected the number of non-Medicare eligible PLHIV that could access entitlement funds. As a result, there were wide disparities in Medicaid funding per PLHIV across the cities (from $1,488 in Miami to $17,122 in New York), while the range per Medicare enrollee was more uniform (from $1,914 in Miami to $5,207 in New York) (Figure 3). Ryan White and ADAP collectively accounted for an additional range of $1,601 in Baltimore to $2,350 in New York per PLHIV. These variations in funding by geography are not unique to PLHIV, and can be explained in part by differences in patient demographics, health seeking behaviors, and prices and practice costs for care (66–68).

Housing and Opportunities for People with AIDS funding enables low income (≤80% area median income level) PLHIV and their families to afford housing and related supportive services (69). When distributed as an average estimate per PLHIV in each city, this appears as minimal assistance ranging from $204 in Seattle to $480 in Atlanta. However, since federal funding is allocated to states and cities with populations of PLHIV in greatest need of assistance, the more accurate interpretation of the average amount is that there is a greater need of support for residents in Atlanta compared with Seattle.

Outside of funds provided by charitable organizations, the majority of preventive funding for harm reduction, testing and prevention services is secured through national- and state-level grant competitions, as well as local department of health budgets. The availability of federal prevention funds per city resident vary from approximately $1.51 in Seattle to $5.68 in New York.

Health system infrastructure

The availability and distribution of HIV care and prevention services also vary across the six cities (Table 1). Atlanta had the fewest public HIV testing clinics at 0.35 per 100,000 residents and New York had the highest at 1.50 per 100,000 residents. Further, the number of primary care practices that accept HIV patients was over 3 times greater in Baltimore (2.47 per 100,000 residents) compared to Los Angeles (0.77 per 100,000 residents), and 4 times greater per square mile. In general, cities covering larger geographical areas have more dispersed services, necessitating greater travel distances for clients to access them.

Discrepancies in the distribution of treatment for substance use disorders, syringe services programs, and public clinics providing PrEP are much greater. Both Atlanta and Miami had a single syringe services program location each (0.02 per 100,000 residents, respectively), while New York had 23 (0.27 per 100,000 residents), or approximately 16 times more locations per 100,000 residents. In Seattle there were 1.21 public clinics providing PrEP per 100,000 residents while in Miami there were 0.07 per 100,000 residents - approximately 18 times more locations per 100,000 residents.

Discussion

Rather than a homogeneous national epidemic, the United States' HIV epidemic is a diverse set of microepidemics, primarily dispersed across large urban centers with different underlying epidemiological and structural features. We have outlined the differences in demographic composition of individuals diagnosed with HIV/AIDS, including MSM-dominated epidemics in Seattle and Los Angeles, black and African American populations disproportionately represented in Baltimore and Atlanta, and Hispanic or Latino populations over-represented in Miami and New York. Further, we estimated 2–6 fold differences in per-person financial support for medical care and housing expenses, and a nearly 9-fold difference in federal funds for HIV prevention across the selected cities. This, combined with variations in legal statutes related to the provision of HIV and drug-related interventions resulted in 3–18-fold differences in the numbers of HIV testing facilities, PrEP clinics, opioid agonist treatment clinics and syringe services programs (per capita or square mile). Influenced further by broader social, economic and political factors, the reported differences in infrastructure, legislation and funding reinforce structural inequities that exacerbate disparities in access to HIV treatment and prevention services.

Informing resource allocation based on local HIV microepidemics, would lead cities to implement policies targeting the areas with the highest potential impact in their specific jurisdiction, rather than uniform national policies that may be more or less effective in certain cities. For example, in cities such as Atlanta, with low testing rates and fewer resources for testing, investments in testing, treatment initiation and cascade retention, particularly among high-risk, black MSM, could be a better investment than equivalent policies in cities with different racial/ethnic distributions among PLHIV, or with higher testing and cascade retention rates, such as Seattle. In Baltimore, with the highest proportion of PWID among the six cities, increased spending on harm reduction infrastructure such as syringe exchange programs and improved access to opioid agonist treatment could have larger benefits than similar policies in Seattle, which had the lowest rates of PWID

prevalence among the six cities. In cities with well- established infrastructure for HIV surveillance, testing and treatment, targeting HIV-prevention policies to high-risk, hard to reach populations, could potentially be a better investment than marginal improvements in population-level HIV care. Identifying optimal bundles of HIV interventions for localized microepidemics has been done in Africa (70), and our future work with these six cities will use health economic modeling to explore the optimal mix of HIV interventions for each city.

Considering the broader scope of HIV-specific legal statutes and funding, we also highlight two specific recommendations to improve intervention outcomes. First, decriminalizing HIV disclosure, and syringe possession and distribution across the US should be viewed as a priority for all levels of government. States with laws that criminalize non-disclosure of HIV status do not appear to have lower transmission of HIV at the population level compared with states that do not (34, 71). Instead, heavy-handed legal statutes in Atlanta, Miami and Seattle in particular can deter PLHIV from learning their status to avoid possible criminal liability for non-disclosure (72). Since PLHIV not aware of their status are estimated to contribute to approximately 91.5% of new transmissions (71), such laws can have the unintended consequence of contributing to local HIV epidemics. It is therefore imperative to eliminate any legal indications which may discourage PLHIV from learning their status (32).

Further, existing legal restrictions on harm reduction services limit the capacity of the healthcare system to engage PWID in the treatment and prevention of HIV/AIDS (73). Even when cities overlook potential legal ramifications for syringe services programs and report no harassment from law enforcement, such as Atlanta (74), contradictions between state and federal laws in the form of funding stipulations create barriers to program expansion. These stipulations can limit the benefits of syringe services programs because the provision of ancillary services such as infectious disease testing and related treatment may be prohibited, as in Miami (62, 75). As cities embrace or expand such programs, states need to lift imposing funding bans. Failure to do so limits the reach of these programs despite their demonstrated need, and perpetuates public health risks to non-users through indirect effects of improper disposal of used equipment (76) and untreated addiction (e.g. high risk sexual behavior with non- users)(77).

Second, eligibility for entitlement funds should be harmonized to eliminate inequities in access to HIV care and preventive services for PLHIV. Current differences in the eligibility requirements for entitlement funds across states compound the potential impact on HIV-related outcomes. States that have not expanded Medicaid, such as Georgia and Florida, have exacerbated these differences in access to services, as non-adoption has disqualified them from Ryan White Part A base grant waivers, which freed-up funding for additional housing and social services elsewhere (78).

With changes to the ACA still a possibility, and the role for Ryan White funds in achieving access and retention in care unclear, discretionary funds at the state-level may alleviate some discrepancies in funding. However, these too are sensitive to budget cuts (79, 80). In the past, when local HIV budgets have contracted (e.g. California’s budget shortfall in 2009) (79), detailed surveillance data was instrumental in targeting resources to high risk communities and stemming additional infections in the short term (79, 81). Although state

funds may be able to compensate for short term losses in federal support, the sustainability of programs may be challenged.

Discretionary funds from public and private grant competitions may help stem the loss of other financial resources, and direct funds to communities in greatest need. However, research into grant competitions has found that reviewer bias can strongly influence the outcomes of applications and penalize applicants who lack the grant writing expertise or human resources needed for success (82, 83). Further, these funding sources do not ensure the long-term sustainability of programs that standardized federal and state funding policies would enable.

Even if legal and funding constraints were resolved, differences in the distribution of HIV across demographic and risk behaviors, as well as available infrastructure to respond to these epidemics necessitate targeted strategies to make the best use of available resources. While effective strategies to treat and prevent HIV are available, investment decisions for these types of programs are challenged by their cost of delivery, infrastructure and human resource limitations. The value of a given intervention may vary greatly at different scales of implementation (84), and across cities with different levels of engagement in HIV care. The high disease burden of HIV/AIDS and increasing constraints on public health resources necessitate careful consideration of resource allocation and implementation decisions in HIV/AIDS (85, 86). Standardized, routinely collected data characterizing local epidemics and estimating the size and behaviours of populations at elevated risk of infection can inform choices between alternative intervention strategies.

Our study had several limitations. First, we limited our focus to epidemiological and structural factors directly related to provision of HIV/AIDS care and prevention, and acknowledge HIV risk environments encompass a broader set of social and economic forces not explicitly examined in this paper which affect HIV transmission, including employment and job security, education, housing, income security, stigma, social norms, and social power dynamics (87).

Second, data quality and availability within each of the domains was limited. Although we used centrally reported CDC surveillance data to describe the HIV epidemics, if this data was not available (e.g. Seattle-Tacoma-Bellevue is not included among the 20 MSAs publicly reported by the CDC (18)) we relied on county level-data (e.g. Seattle-King County). We have noted where data could not be acquired, and assessed the uncertainty in estimates where possible.

Due to limited and variable public availability of state and county funding for HIV, we restricted analysis to federal public entitlement and discretionary funds in our calculations. This likely underestimates the true amount of funding available per PLHIV or resident within each MSA, particularly in states that may provide additional funds such as New York (88), California (40) and Washington (89). Further, the contribution of private funders, including philanthropic organizations and the pharmaceutical industry, to HIV treatment and prevention in the US was unknown, however such entities typically fund global initiatives

(90–92) or provide drug cost reimbursements under private prescription assistance programs (93), thus minimizing the potential effect of this limitation.

Conclusion

The wide disparities in the prevalence of HIV by race and risk group, and differences in the structural conditions of each city demonstrate the need for localized responses to maximize health benefits. Reform of current state and municipal HIV statutes and consistency in public funding can help local health departments best support their communities in addressing urban HIV microepidemics. Reducing healthcare coverage and funding for public health intervention at this time (94), when solutions are at hand, may lead to inefficient use of existing resources (95), prolong the HIV epidemic, and magnify the public health and economic burden for future generations.

Appendix: Estimating enrollees per funding agency

State-level estimates for Ryan White, ADAP, CDC, SAMHSA and HOPWA funds were reported by the Kaiser Family Foundation, and sourced from a special data request to the National Alliance of State and Territorial AIDS Directors (NASTAD) (1).

To estimate the state-level number of Medicaid enrollees in NY, CA, MD, and FL, we adjusted the published 2011 number of enrollees with HIV, as reported by the Centers for Medicare and Medicaid Services, by applying city-specific estimates from Berry and colleagues for the adjusted relative risk of Medicaid coverage for HIV provider visits post-ACA (first half of 2014) versus coverage before (2011–2013) (2). For GA (non-adopter of ACA) and WA (adopter of ACA), we used the adjusted relative risk of Medicaid Coverage provided by Berry and colleagues.

For city-level Medicare enrollees, we calculated the average spending per HIV positive beneficiary by dividing the national level expenditure data (reported via the Kaiser Family Foundation) by the estimated number of beneficiaries living with HIV. Since there was no publicly available data on the number of beneficiaries, we multiplied the number of beneficiaries by the local HIV prevalence rate to obtain to approximate the number of state-level beneficiaries and assumed the distribution of Medicare enrolled PLHIV matched the distribution of all diagnosed within the state.

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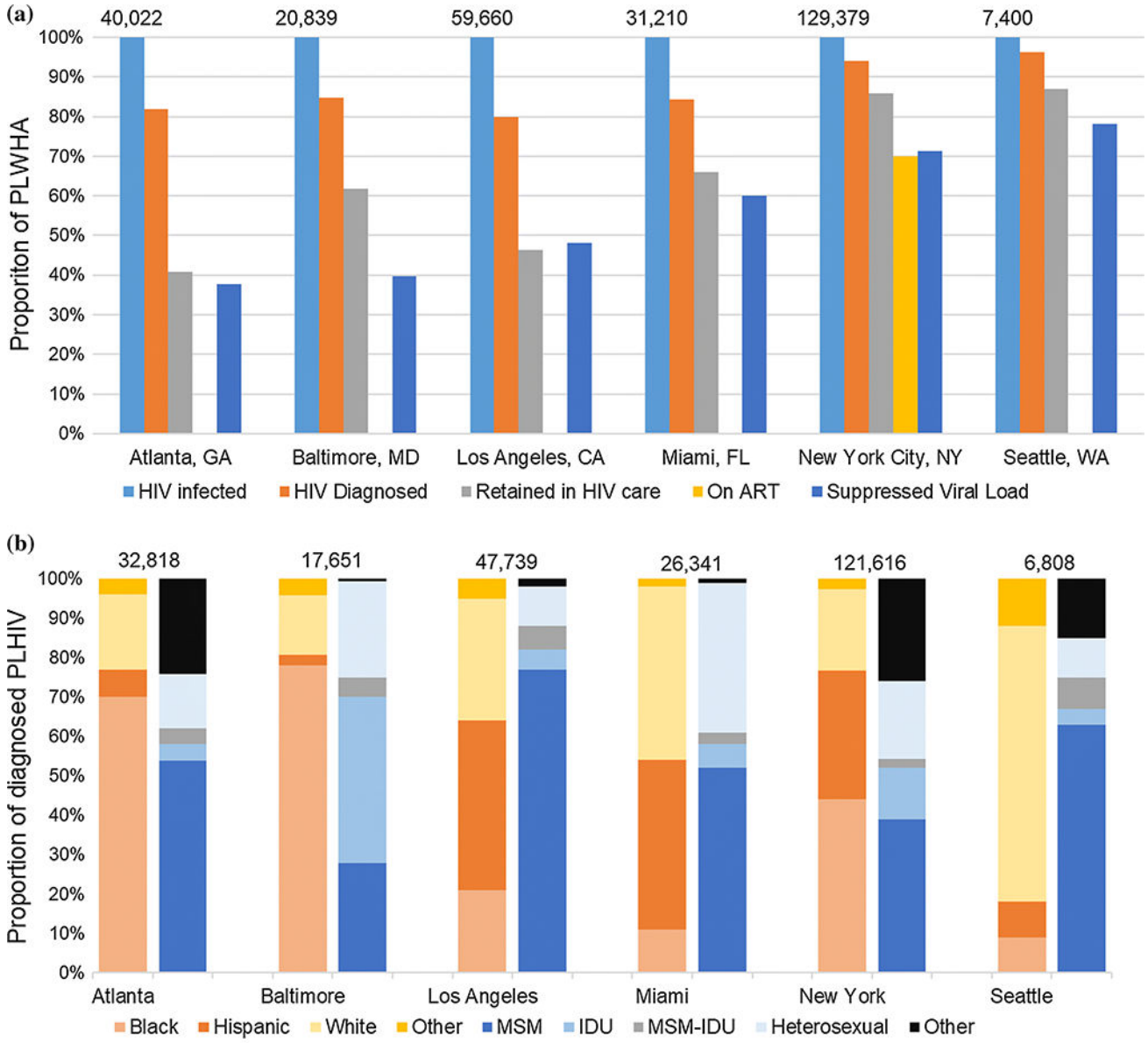


PLHIV people living with HIV, MSM men who have sex with men, PWID people who inject drugs, ART antiretroviral treatment, other includes hemophilia, blood transfusion, perinatal exposure, and risk factors not reported or identified

FIGURE 1.

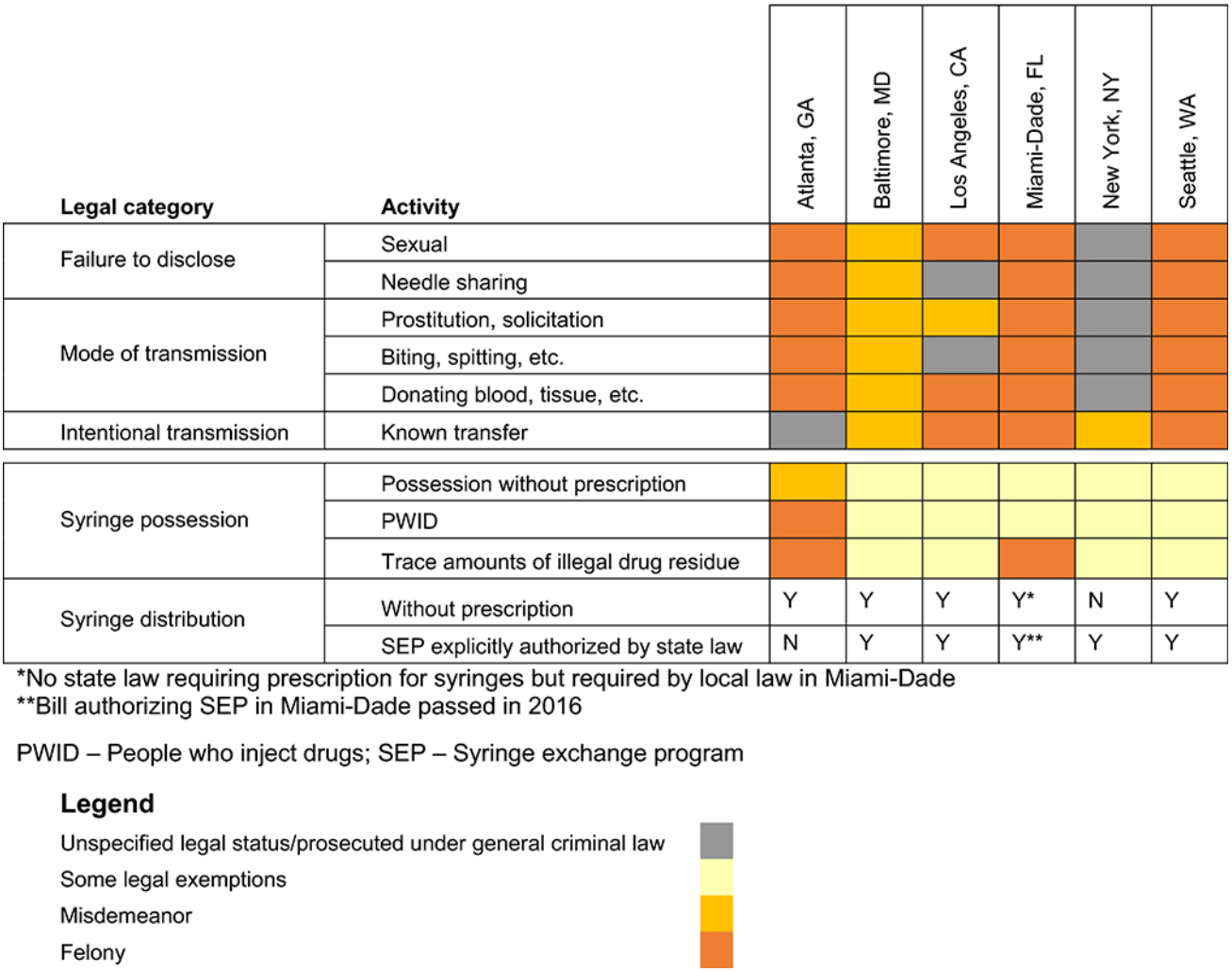
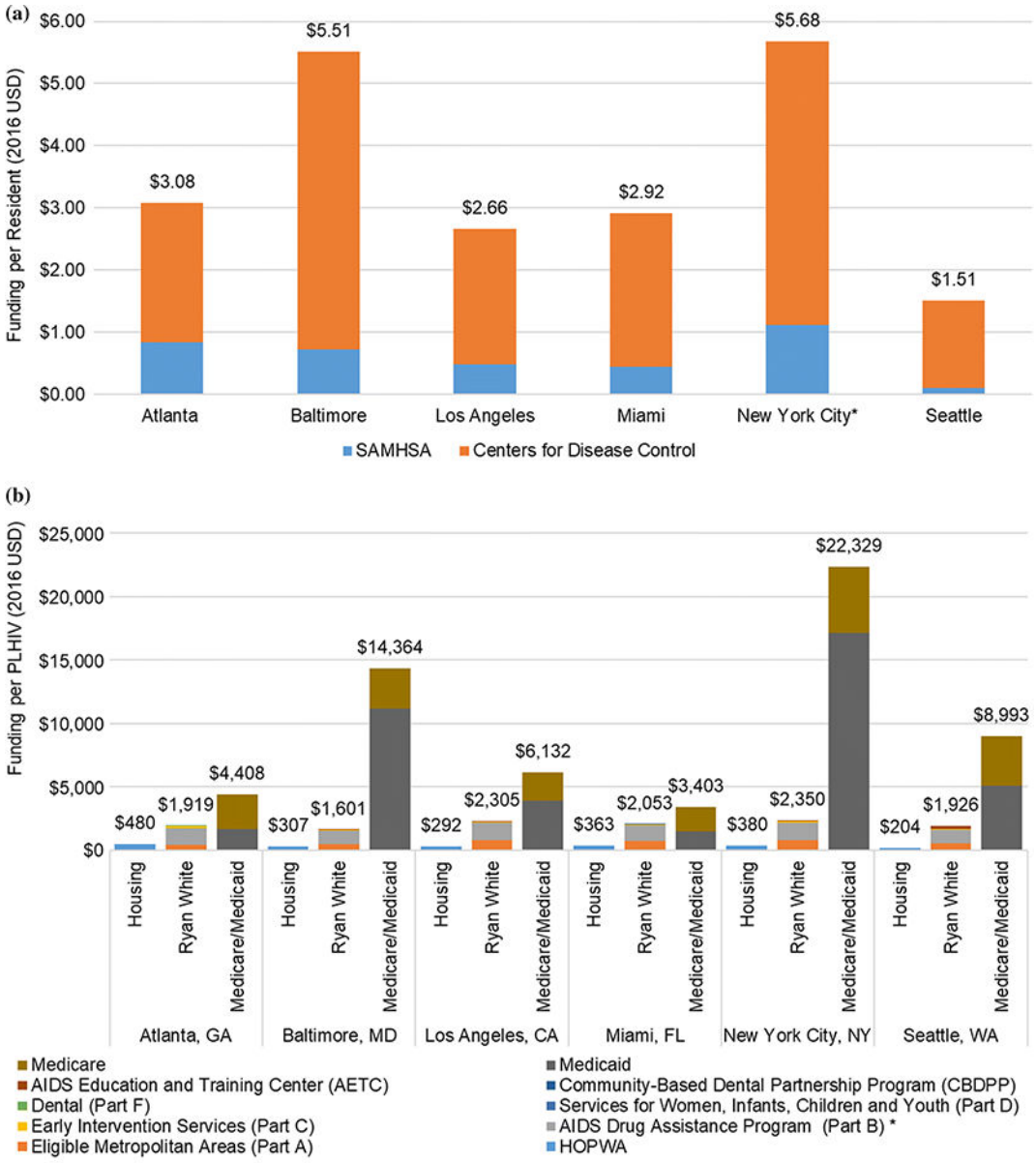


Figure 2. HIV/AIDS-related legal statutes



HOPWA Housing Opportunities for Persons with AIDS, ADAP AIDS Drug Assistance Program, SAMHSA Substance Abuse and Mental Health Services Administration, CDC Centers for Disease Control and Prevention. Sources authors' analyses of publicly-availably data on core federal and state agencies in the fiscal year 2015/2016. Funding amounts for CDC, SAMHSA, HOPWA, Ryan White (except Part B funding) were compiled from FY 2016 program reports. Medicaid, Medicare, and ADAP funding is estimated based on the known distribution of people living with HIV/AIDS, state-level beneficiary enrollment, and average expenditure per enrollee. See the appendix for more details. Due to data limitations (i.e., aggregate spending data and population numbers), we were unable to derive standard errors/confidence intervals for estimates of per capita funding

Figure 3. Estimated funding for treatment, care and housing per person diagnosed with HIV, and prevention funding per city resident, by city and funding source in 2016

Table 1.

Public health infrastructure to support HIV/AIDS-related services

	Atlanta GA	Baltimore MD	Los Angeles CA	Miami FL
Urban area (sq. mi.)[a]	131.7	80.8	469.1	35.7
Metro population (2016 estimate)[b]	5,789,700	2,798,886	13,310,447	6,066,387
HIV and IDU related services				
HIV Testing (clinics)[c]	20	19	63	33
Primary care practices[d]	64	69	102	59
Substance use treatment programs				
MMT (centers)[e]	2	29	18	7
Buprenorphine (clinics)[f]	50	140	116	75
Syringe services programs (locations)[h]	1	16	11	1
PrEP (clinics)[i]	1	2	44	4
Rate per 100,000 MSA residents				
HIV Testing (clinics)	0.35	0.68	0.47	0.54
Primary care practices	1.12	2.47	0.77	0.97
Substance use treatment programs	0.90	6.04	1.01	1.35
Syringe services programs (locations)	0.02	0.57	0.08	0.02
PrEP (clinics)	0.02	0.07	0.33	0.07
Rate per city area (sq. mi.)				
HIV testing (clinics)	0.15	0.24	0.13	0.92
Primary care practices	0.49	0.85	0.22	0.61
Substance use treatment programs	0.40	2.09	0.29	2.30
Syringe services programs (locations)	0.01	0.20	0.02	0.03
PrEP (clinics)	0.01	0.03	0.09	0.11

[a] Urban land area

[b] Annual estimates of the resident population

[C] HIV testing includes all locations with addresses within each city, except New York City, which includes testing locations in 5 boroughs combined

[d] Numbers of providers listed as offering HIV specific care as part of their primary care practices according to the American Academy of HIV Medicine (AAHIVM)

[e] MMT Centers

[f] Buprenorphine clinics

[g] Number of admissions (not individual patients) were calculated from the most recent Treatment Episode Data Set (TEDS-A 2013). This numbers is not exhaustive, as only admissions to state-funded treatment facilities are captured in TEDS

[h] Syringe services program data.

[i] PrEP (clinics) - Clinic counts were compiled from directories which listed clinics primarily catering to uninsured or underinsured populations and is not an exhaustive list of PrEP providers.