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Update on Uptake: PrEP usage and equity in the Florida and the United States

Understanding & Visualizing the HIV Epidemic

New Metrics for Measuring Equity in HIV Prevention

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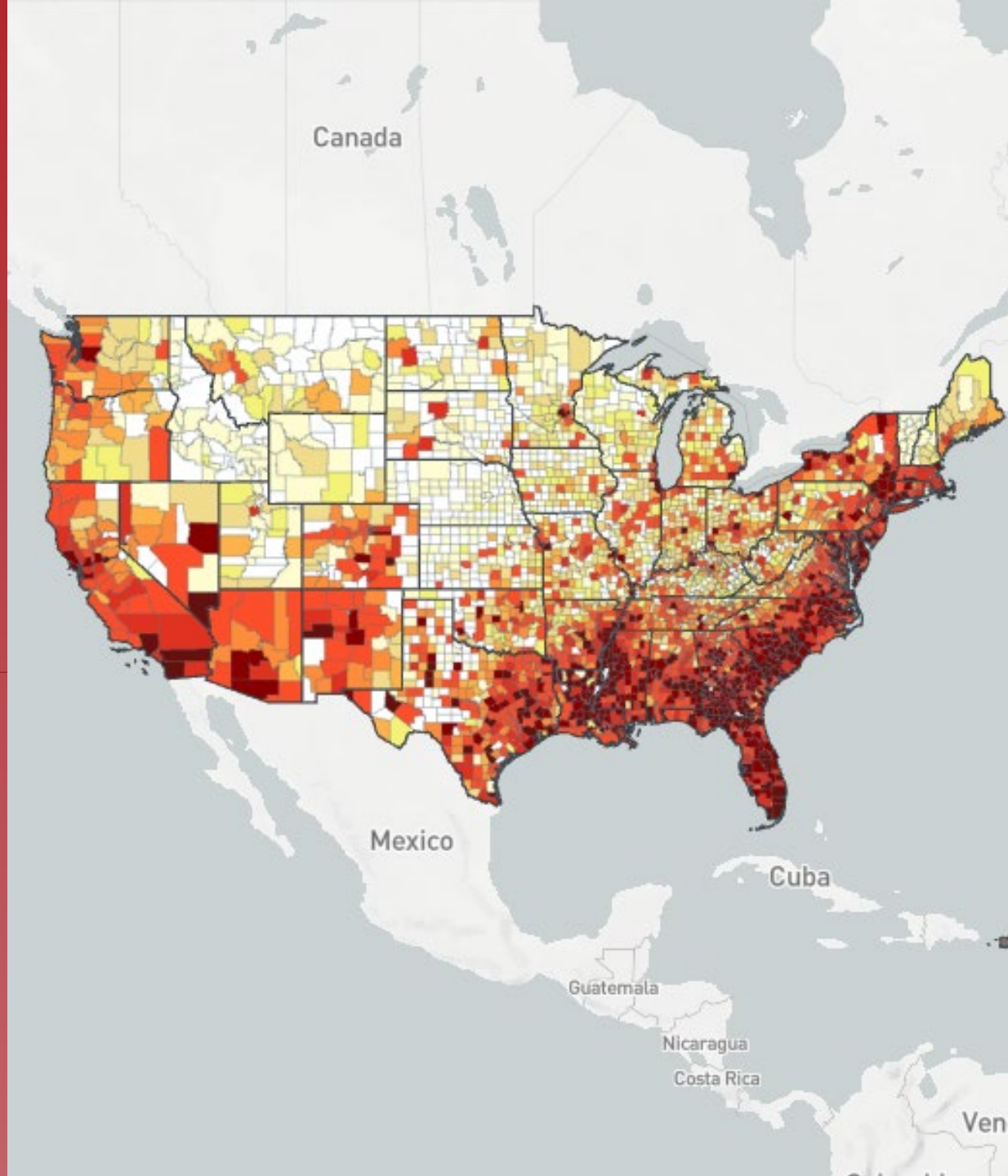

Introduction to AIDSVu

- **Partnership since 2010** between Gilead and Emory University
- Online platform that **visualizes data and disseminate insights on the U.S. HIV epidemic**
- Mission to make data widely available, easily accessible, and locally relevant to **increase awareness and inform public health decision making**
- **Broad user base**, including public health officials, policymakers, advocates, researchers, people impacted by HIV, and general public

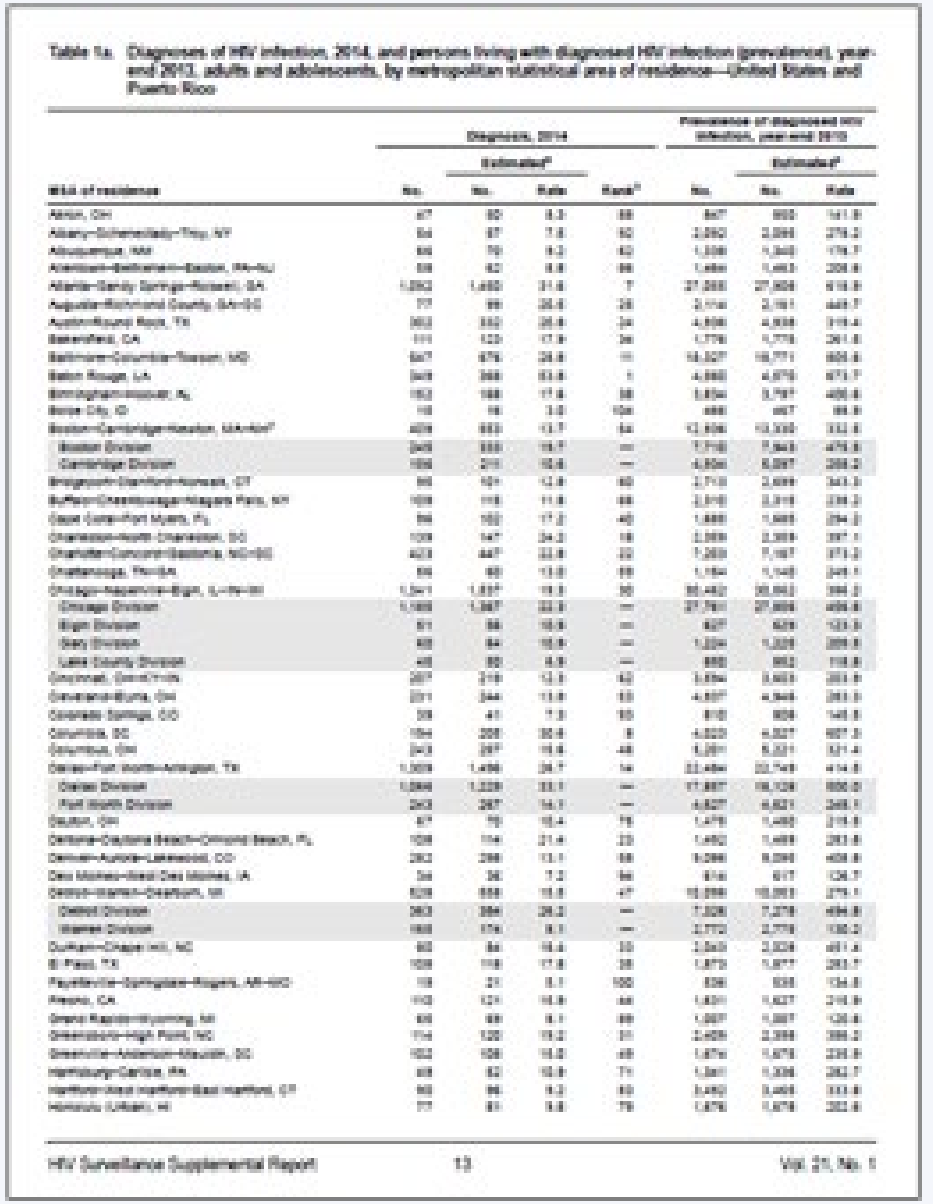

Table 1a. Diagnoses of HIV infection, 2014, and persons living with diagnosed HIV infection (prevalence), year-end 2013, adults and adolescents, by metropolitan statistical area of residence—United States and Puerto Rico

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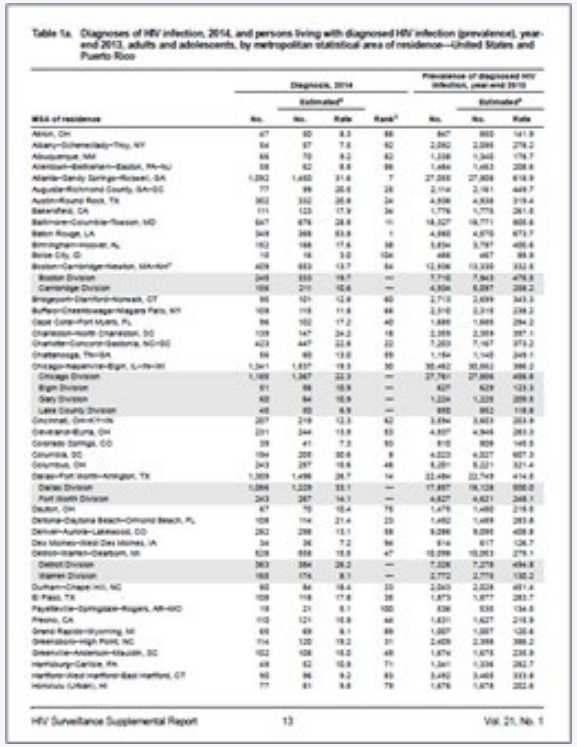

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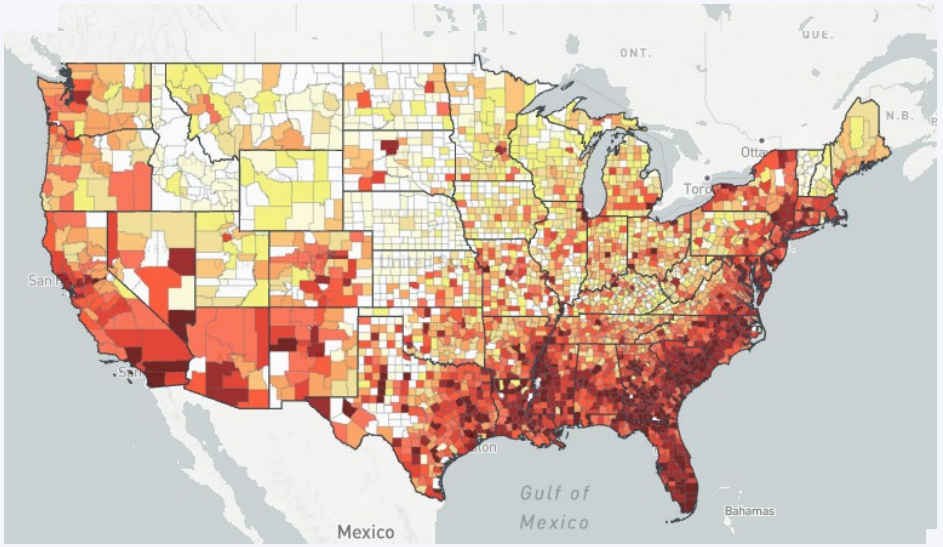

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In 2020, the **South**

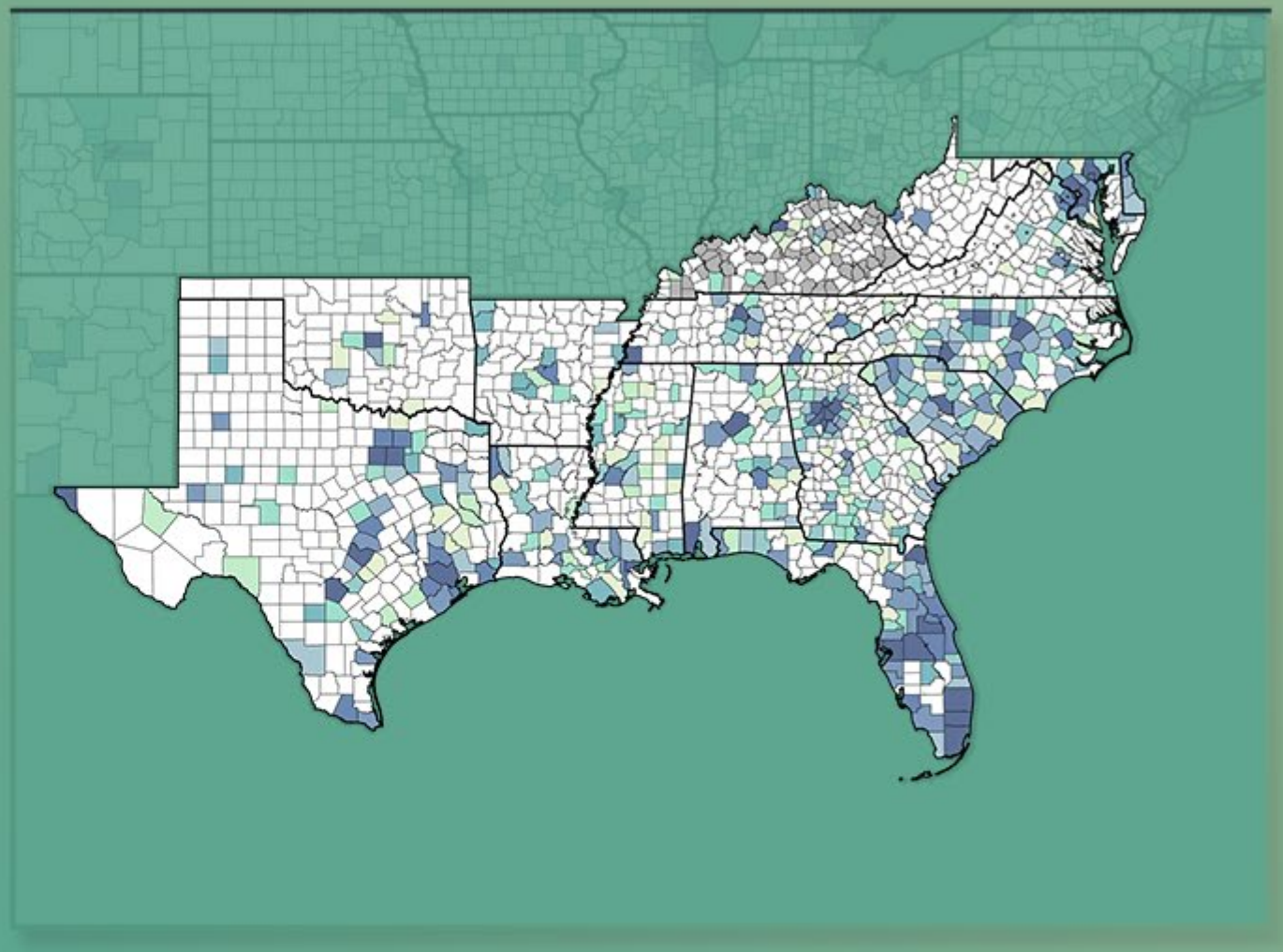
comprised 38%

of the U.S. population

but represented

over half (52%)

of **new HIV diagnoses**.



Number of Persons Newly Diagnosed with HIV, 2019

5 - 5	6 - 6	7 - 8	9 - 10	11 - 13	14 - 18	19 - 27	28 - 46	47 - 101	102+

AIDSVu.ORG

SOURCE: CDC ATLAS

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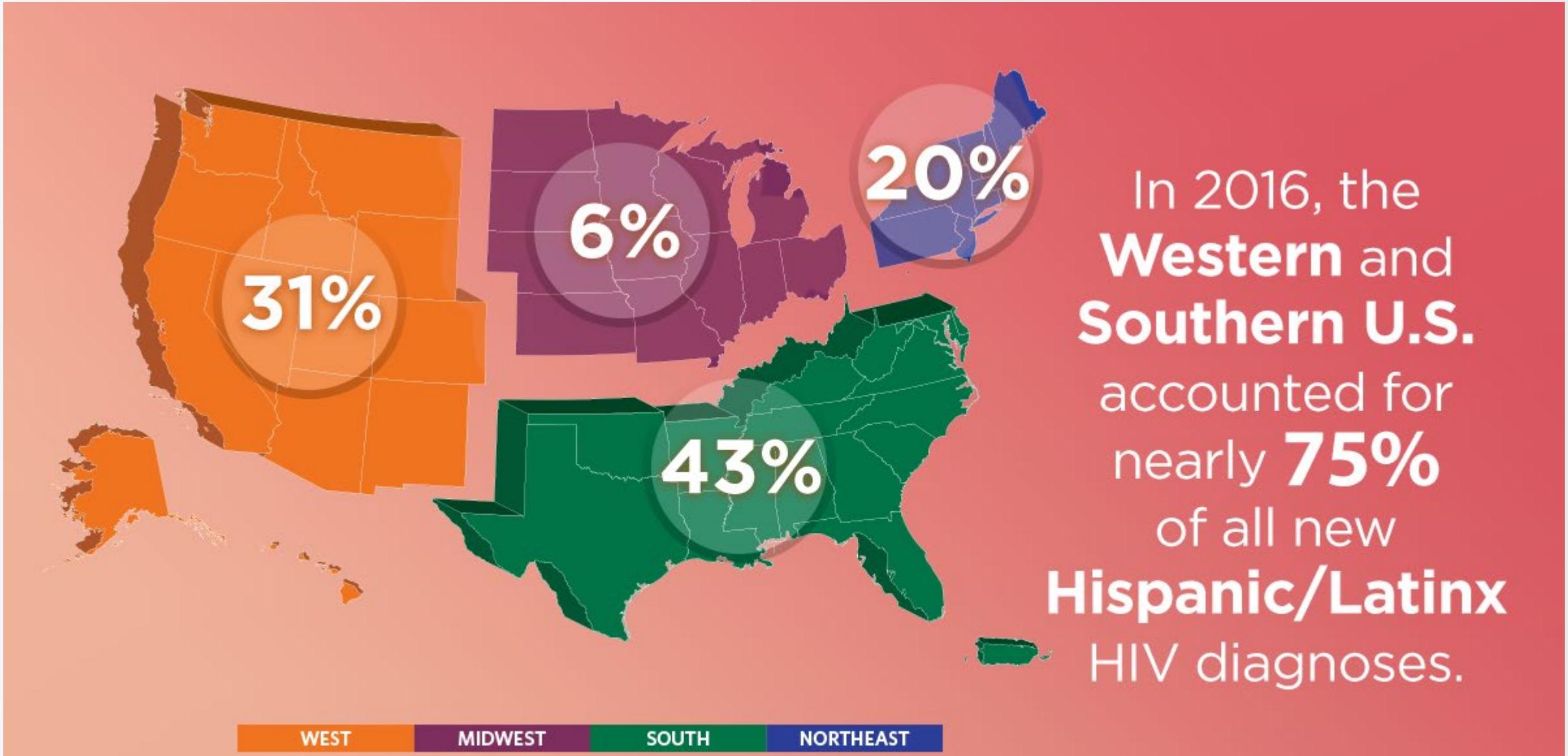

In 2016, the **Western** and **Southern U.S.** accounted for nearly **75%** of all new **Hispanic/Latinx** HIV diagnoses.

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SOURCE: U.S. CENTERS FOR DISEASE CONTROL AND PREVENTION

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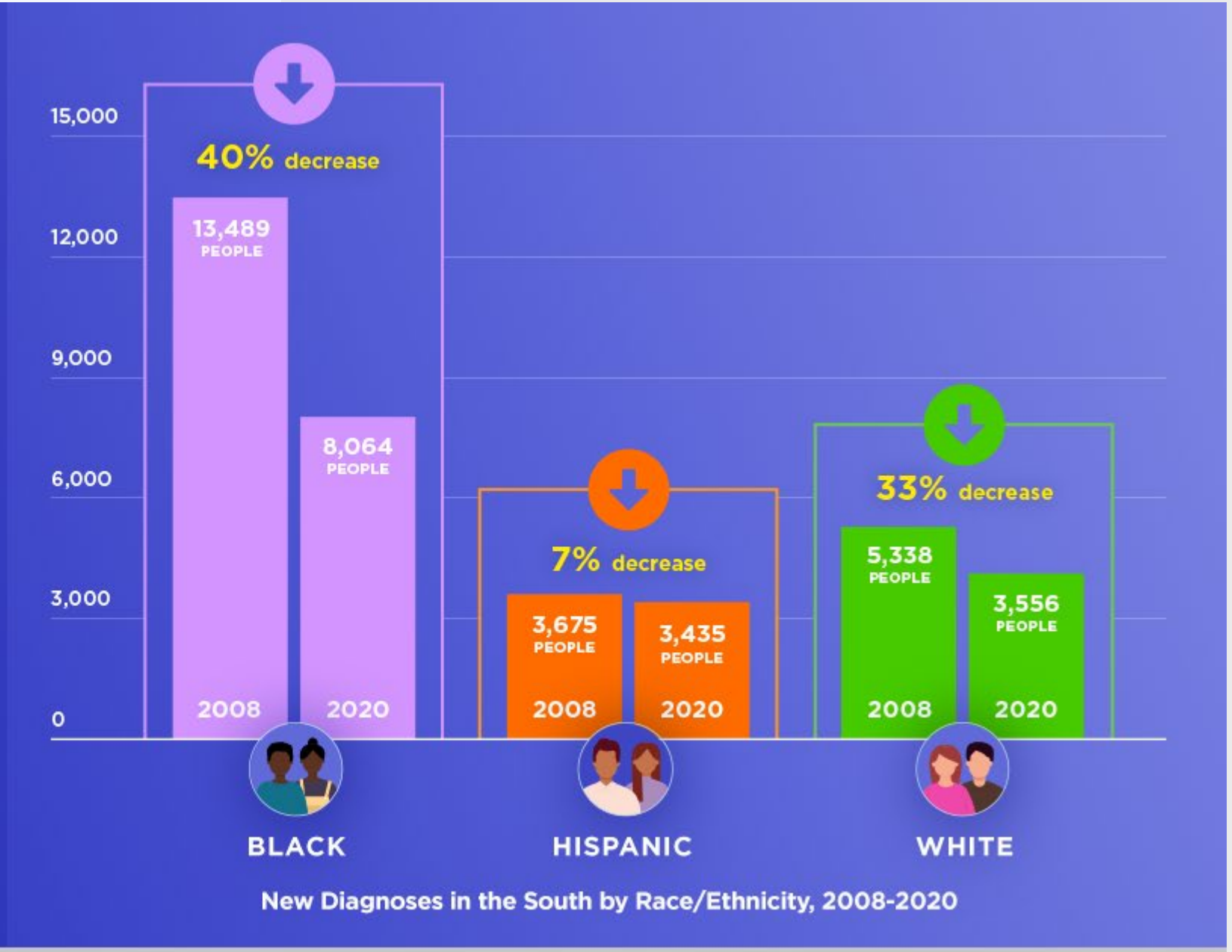
In the **South**,

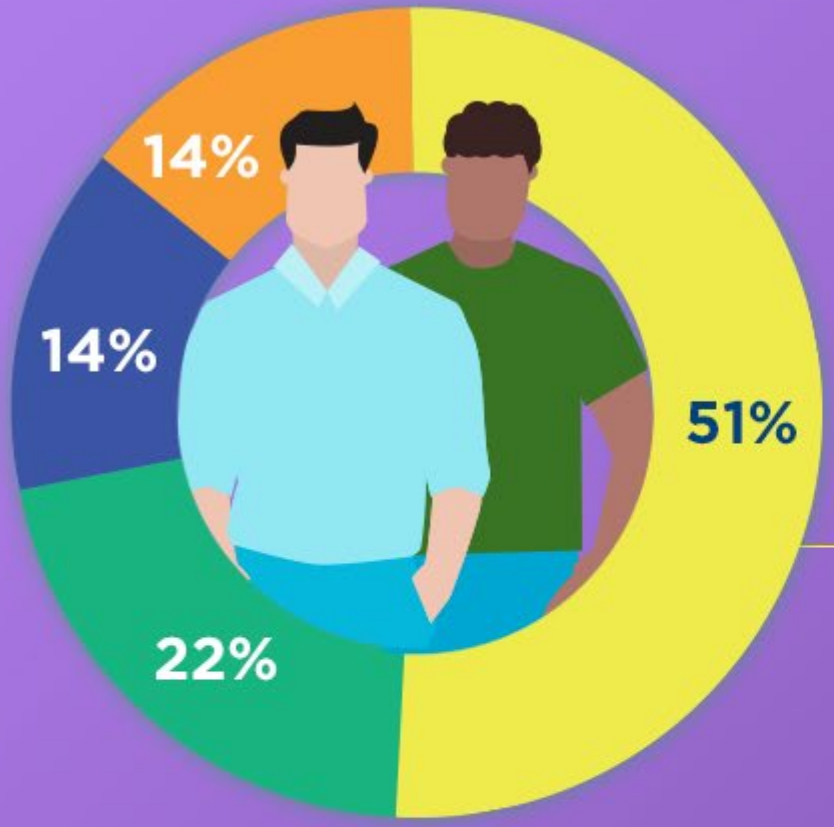
Black people had the largest decrease

in **new HIV diagnoses** of any race/ethnicity from **2008 to 2020**.

However, they still make up a **disproportionate amount of new HIV diagnoses**.



New Diagnoses in the South by Race/Ethnicity, 2008-2020



MALE

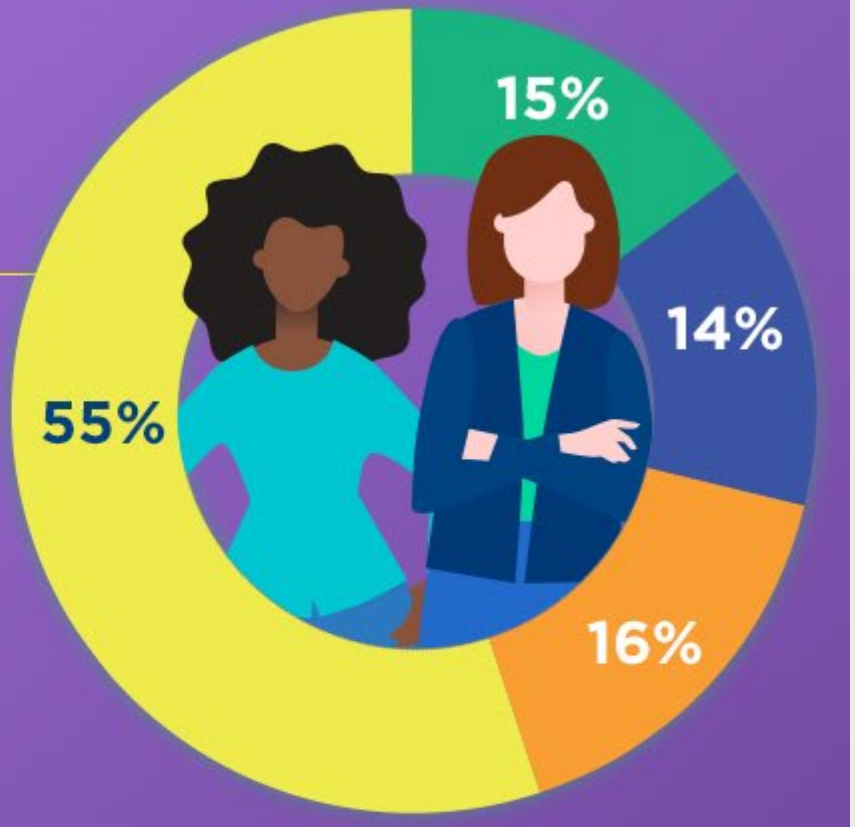
In 2020,

over half of women (55%)

and

men (51%)

newly diagnosed with HIV were living in the South.



FEMALE

Number of New Diagnoses, by Sex, by Region, 2020

MIDWEST NORTHEAST SOUTH WEST

**Due to rounding, some percentages may not add up to 100%.*

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SOURCE: CDC ATLAS

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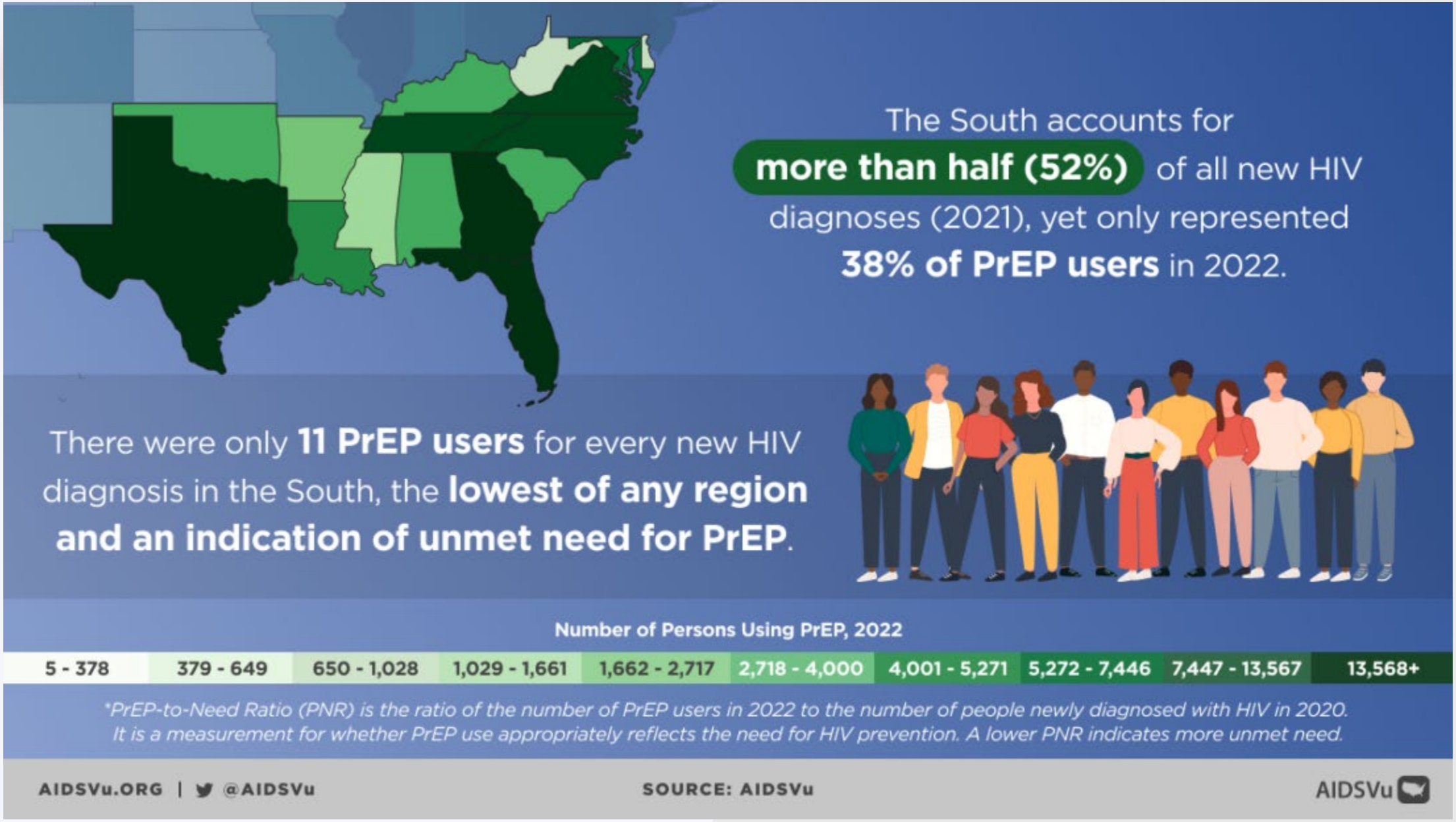
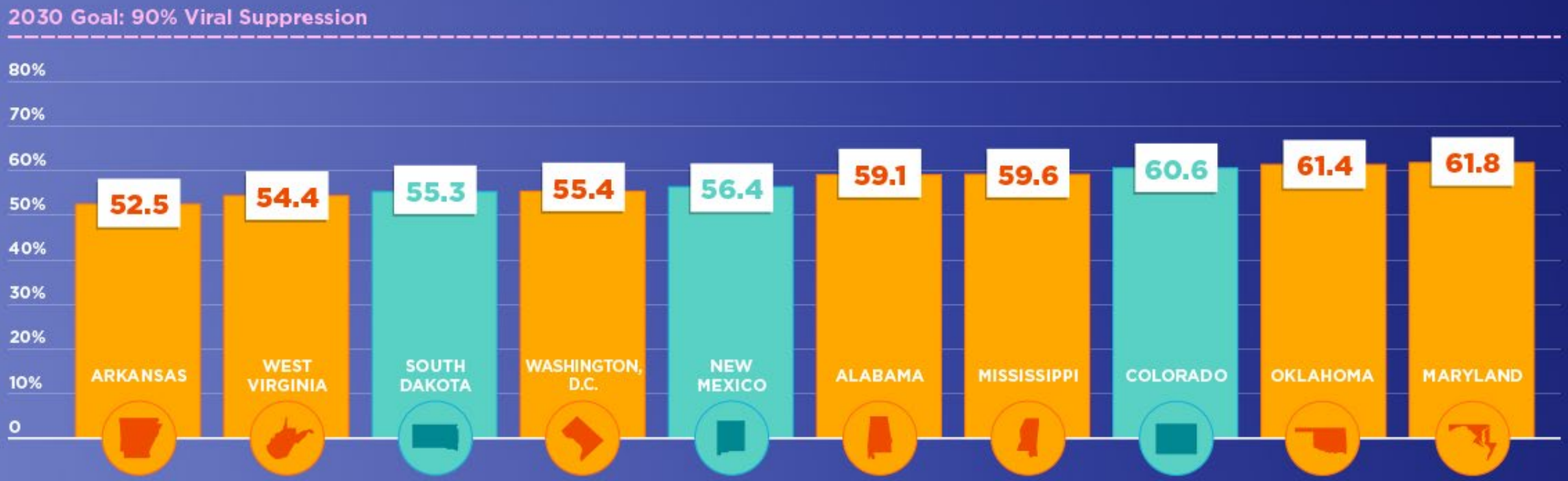

The South accounts for
more than half (52%) of all new HIV diagnoses (2021), yet only represented 38% of PrEP users in 2022.
There were only 11 PrEP users for every new HIV diagnosis in the South, the lowest of any region and an indication of unmet need for PrEP.
Number of Persons Using PrEP, 2022
5 - 378
379 - 649
650 - 1,028
1,029 - 1,661
1,662 - 2,717
2,718 - 4,000
4,001 - 5,271
5,272 - 7,446
7,447 - 13,567
13,568+
*PrEP-to-Need Ratio (PNR) is the ratio of the number of PrEP users in 2022 to the number of people newly diagnosed with HIV in 2020. It is a measurement for whether PrEP use appropriately reflects the need for HIV prevention. A lower PNR indicates more unmet need.
AIDSVu.ORG | @AIDSVu
SOURCE: AIDSVu
AIDSVu

In 2021, of the **10 states** with the **lowest ratesof viral suppression**, **7** were in the **South**.

The Ending the HIV Epidemic goal for viral suppression is for **90%** of **all people living with HIV** to be **virally suppressed** by 2030.



Viral Suppression*, 2021

**Individuals living with diagnosed HIV who had a low (<200 copies/mL) or undetectable viral load (the amount of HIV in the blood).*

For the purposes of this analysis, D.C. is treated as a state

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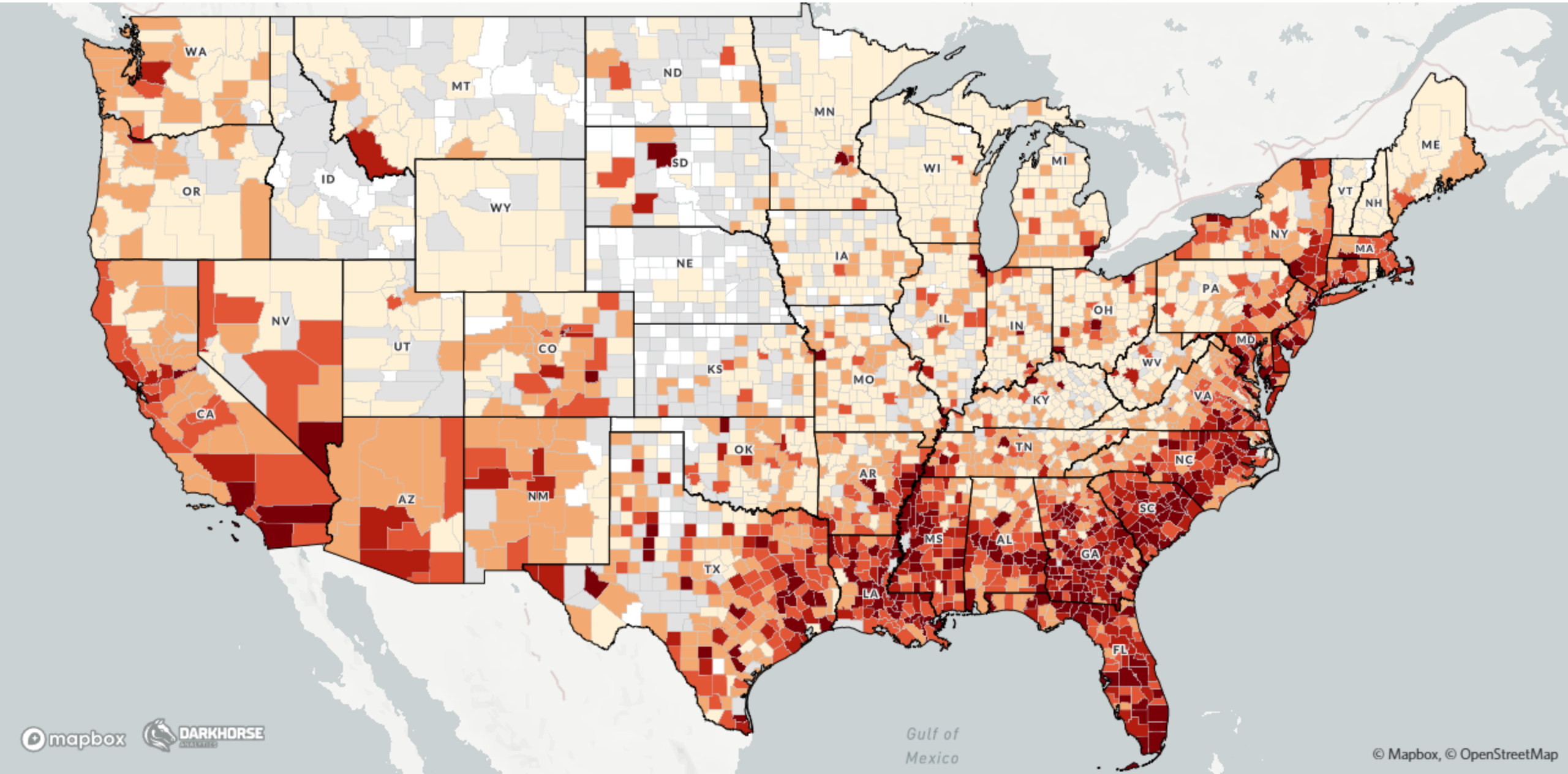
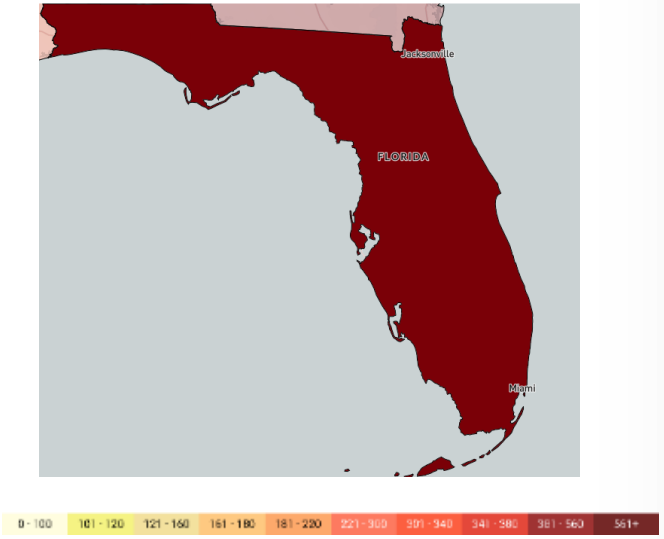
Rates of Persons Living with HIV per 100k, 2022



mapbox DARKHORSE ANALYTICS

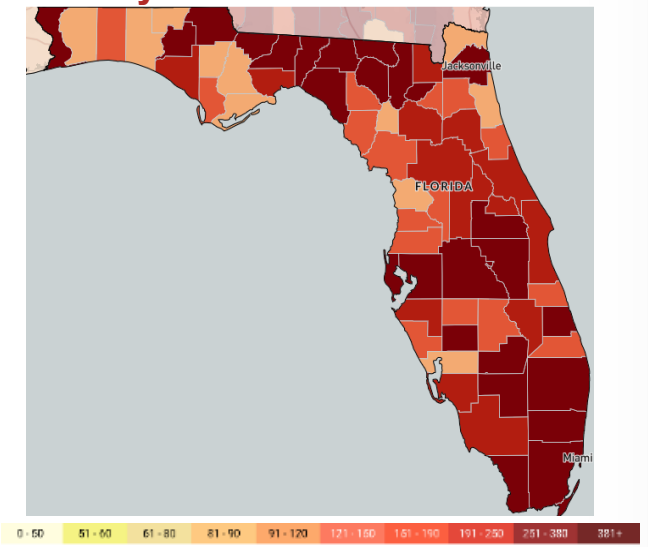
HIV Prevalence in Florida

State



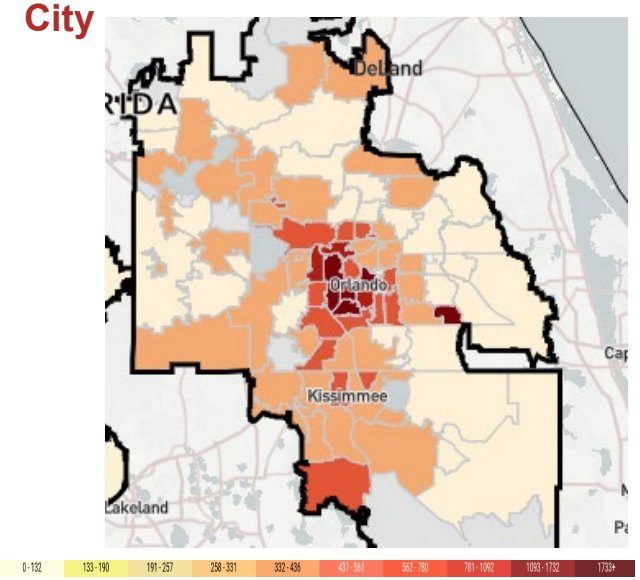
Georgia - Rates of Persons Living with HIV, 2021

County



Florida- Rates of Persons Living with HIV, 2022

City



Atlanta - Rates of Persons Living with HIV, 2021

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Evaluating service locations relative to need with AIDSVu

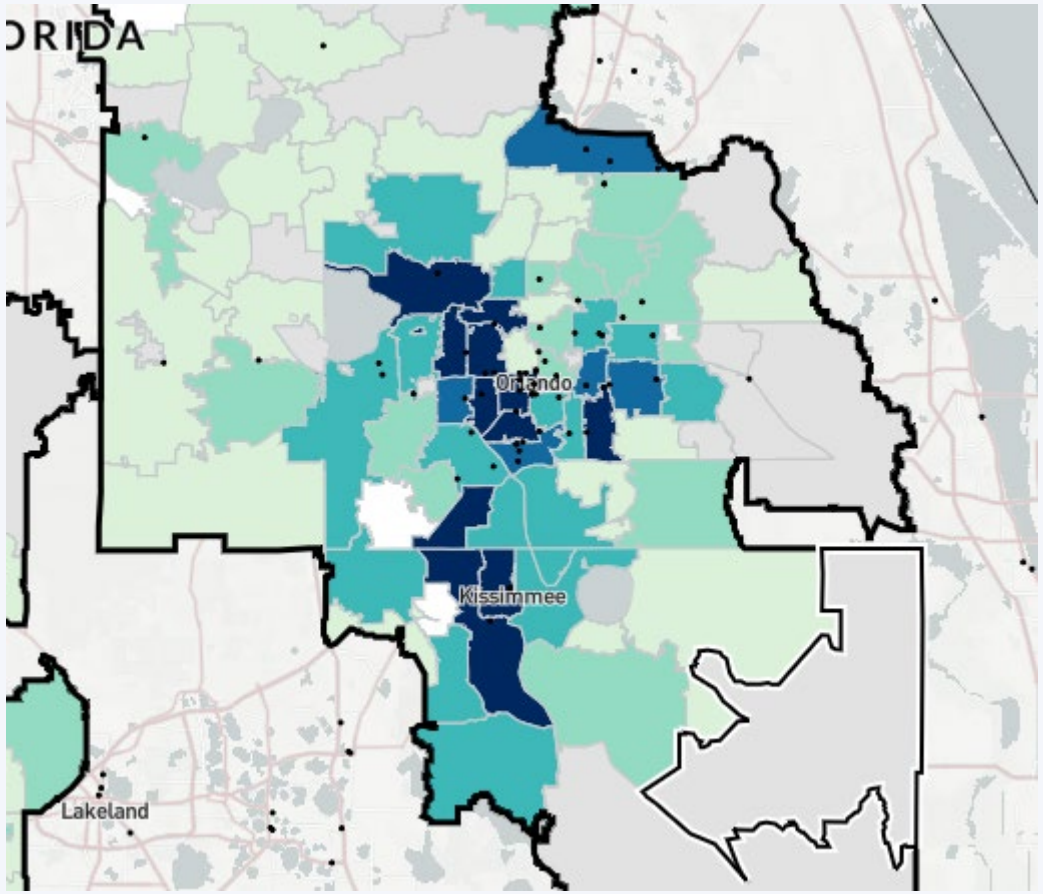
New HIV Diagnoses in Orlando

Number of Persons Newly Diagnosed with HIV, 2018-2022

Orlando, Zip Code 34773

⚠ Data are not shown to protect privacy because a small number of cases and/or a small population size.

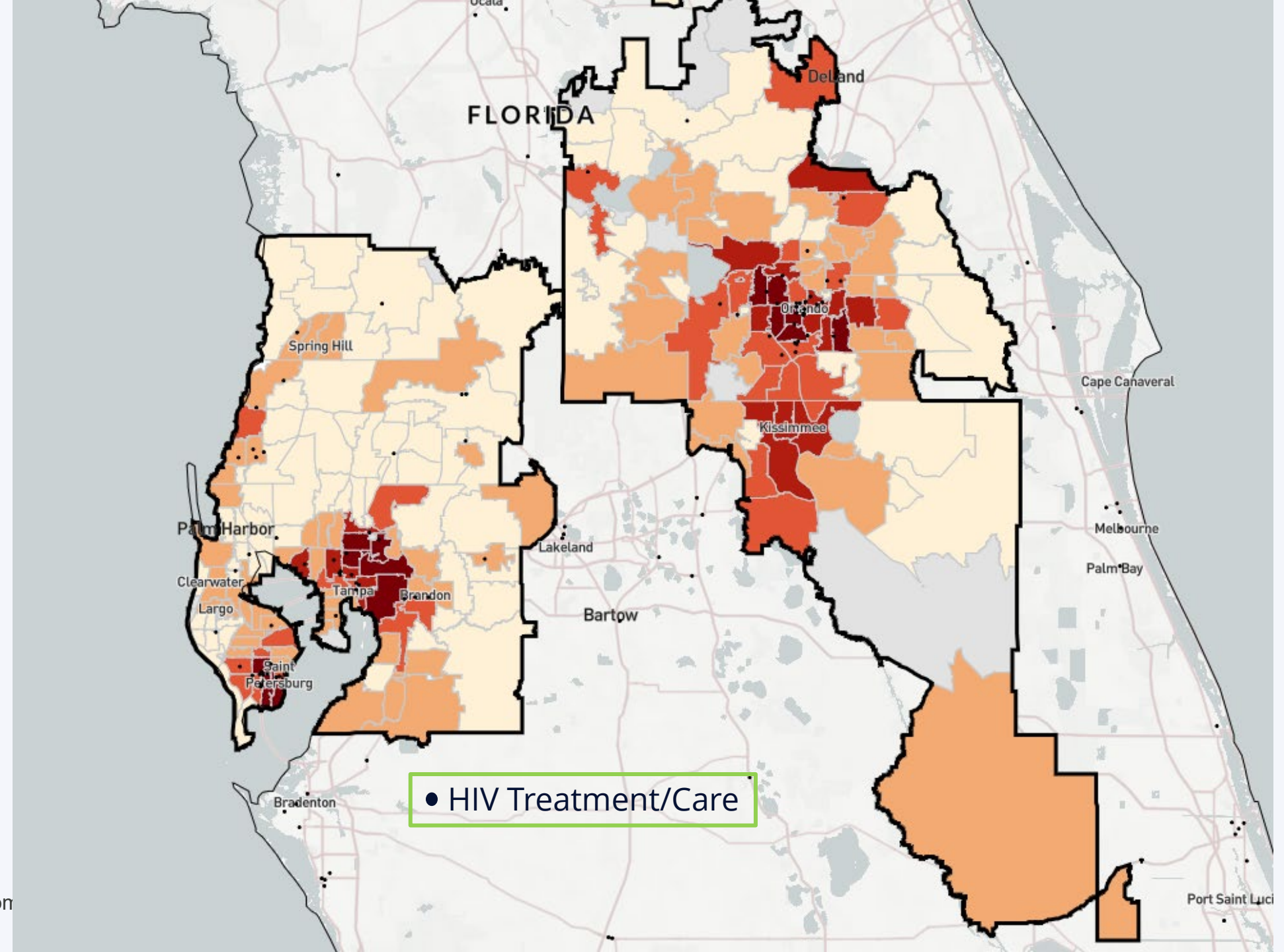
5 | 18 | 34 | 52 | 72



- Indicates PrEP service location

People Living with HIV in Orlando

Orlando
by the Numbers:



AIDSVu PrEP Data Resources and Research

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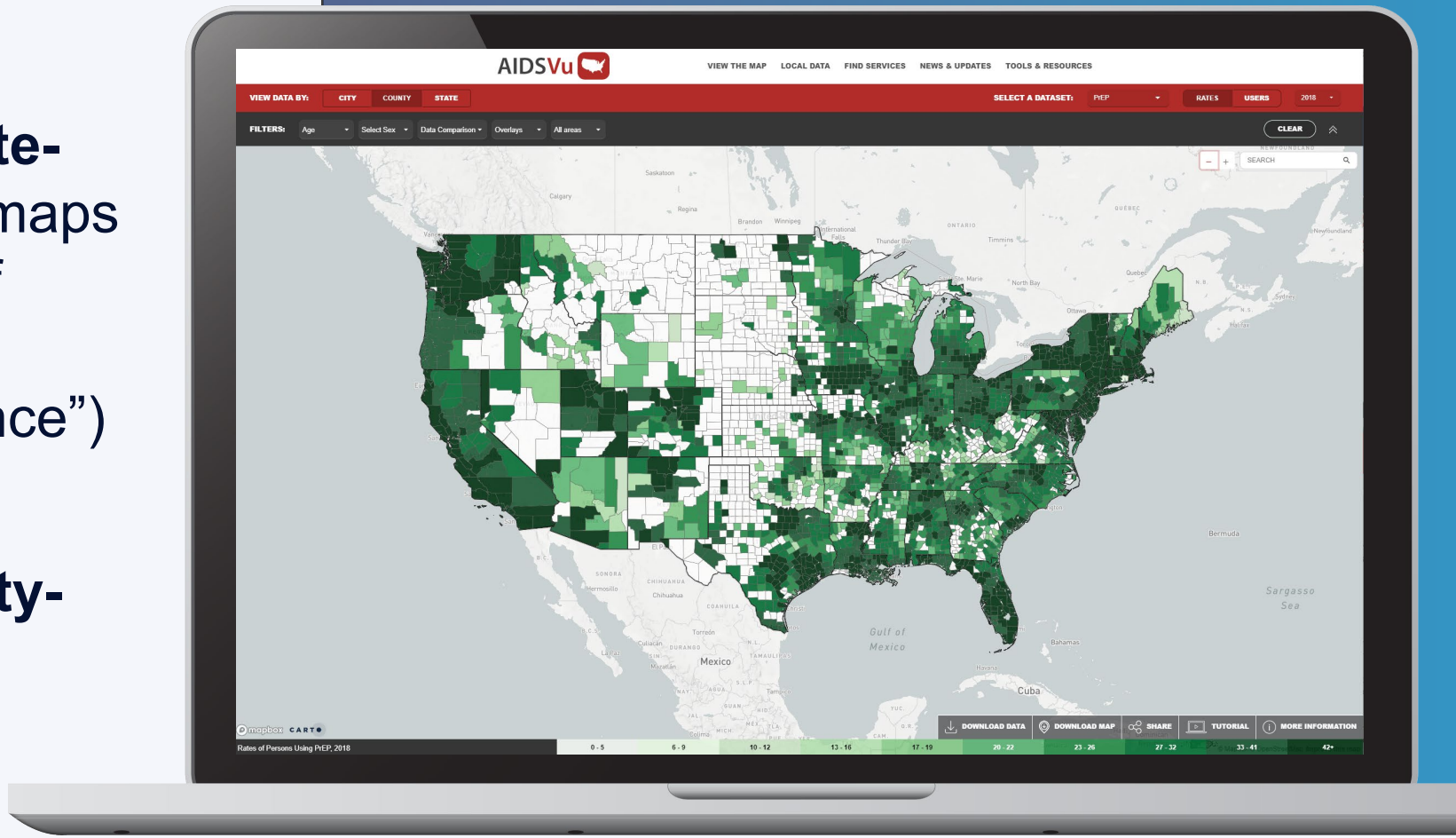
Background on PrEP

- CDC estimates that approximately 1.2 million people are at high-risk for HIV exposure and could benefit from comprehensive HIV prevention strategies, including PrEP
- Number of PrEP users has increased by more than 1,700% since 2012
- PrEP use varies significantly across different sexes, age groups, races/ethnicities, states/geographic regions

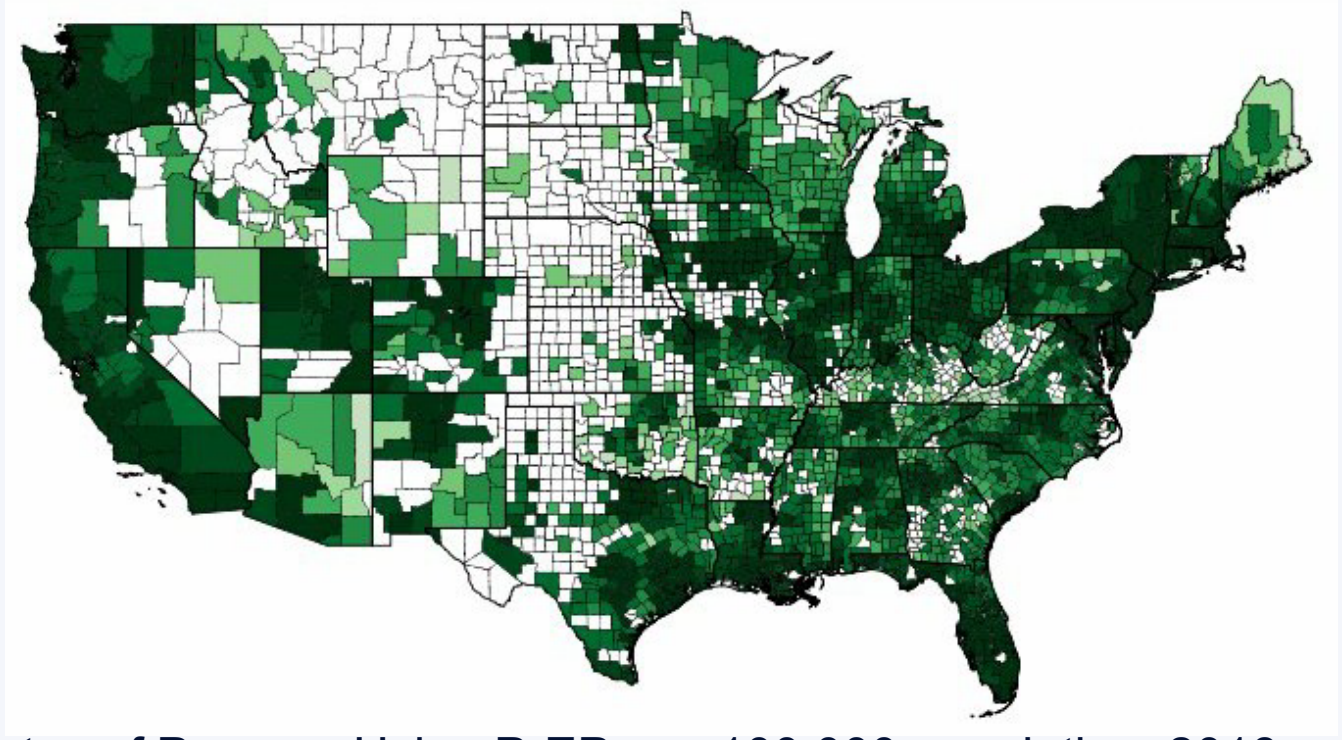
PrEP Data on AIDSVu

Note: All PrEP maps, data, and insights are pending finalization

- In March 2018, AIDSVu released the **first-ever state-level data** and interactive maps of **PrEP users** and rates of PrEP use per 100,000 population (”PrEP Prevalence”)
- **Early April 2020**, we are adding the **first ever county-level data on PrEP** (2012-2022).



PrEP Data on AIDSVu



Rates of Persons Using PrEP, per 100,000 population, 2018

County-level maps and datasets include:

- PrEP users and Rate of PrEP use
- Yearly data 2012 to 2022
- Overall, by sex, and by age
- Available alongside social determinants of health

Note: All PrEP maps, data, and insights are pending finalization

Data Source

- **First of its kind data release agreement:** Data obtained from Symphony Health with the support of Gilead Sciences, Inc., and compiled by researchers at the Rollins School of Public Health at Emory University
- **No single entity** collects data on all users of PrEP in the U.S.
- The exact number of PrEP users is unknown
- Data on AIDSVu derived from a single data source (Symphony Health) – open sample of commercially available data from more than **54,000 pharmacies, 1,500 hospitals, 800 outpatient facilities, and 80,000 physician practices**
- **Validated algorithm** excludes use for HIV treatment, post-exposure prophylaxis, and off-label treatment of chronic Hepatitis B before state-specific weights were applied
- **Data suppression rules were applied**

Data Methods

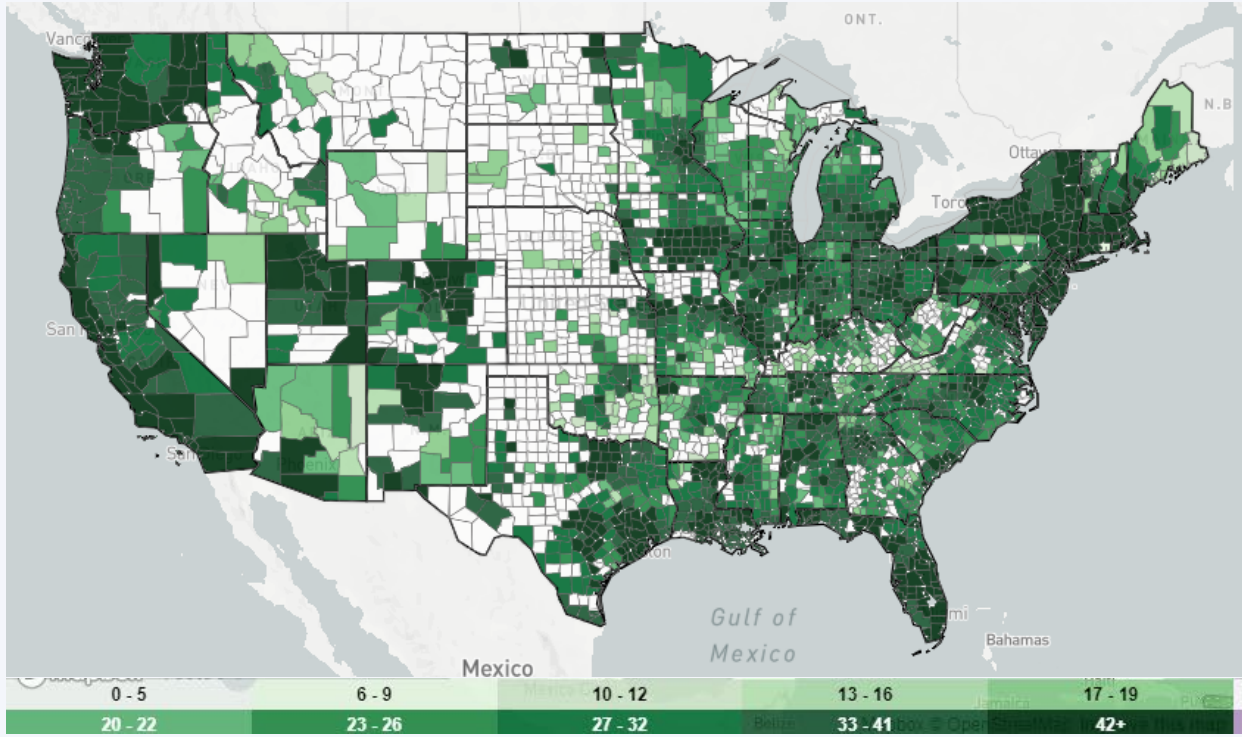
- **Represent a reliable and consistent metric for PrEP users at the county- and state-level** in the U.S. by year
- The actual number of PrEP users is likely higher
  - Dataset does not contain all TDF/FTC prescriptions in the U.S. – for example, dataset does not include data from closed healthcare systems and other entities that do not share their data with Symphony Health.
- Well suited to be used for **public health research and planning purposes**

Annals of Epidemiology

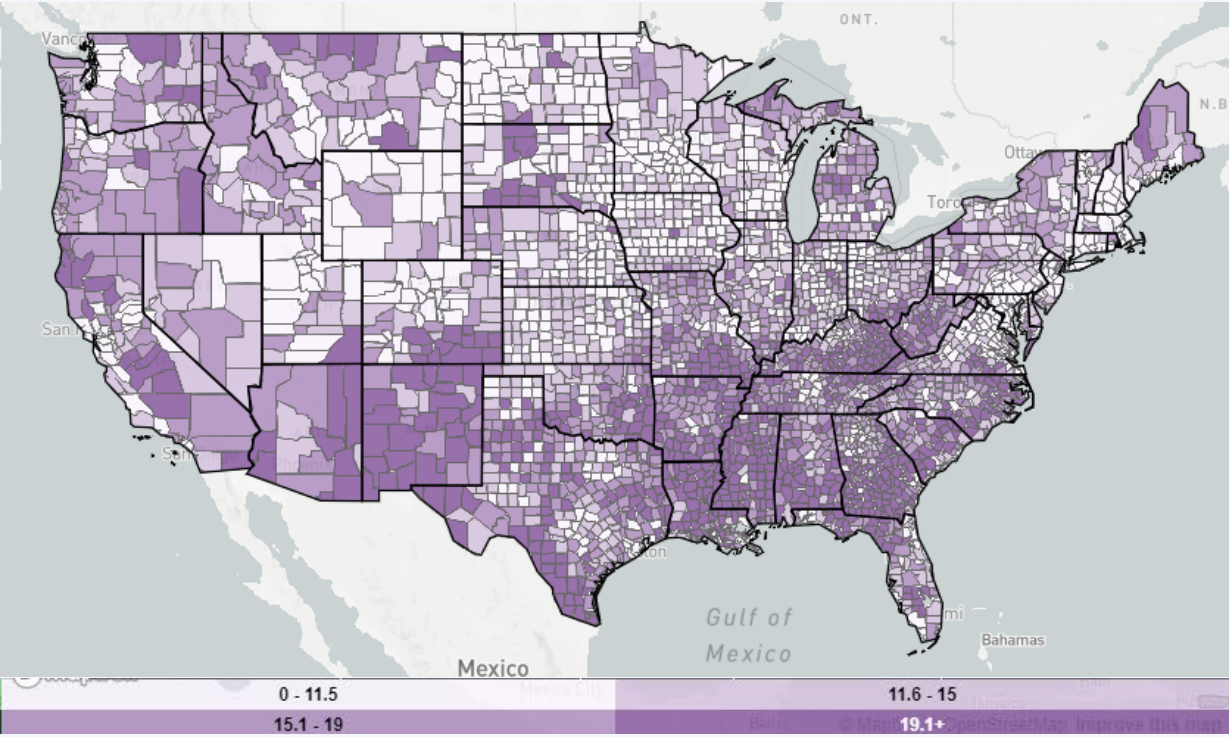
- Sullivan et al.'s article in *Annals of Epidemiology*, **Methods for County-Level Estimation of Pre-exposure Prophylaxis Coverage and Application to the U.S. Ending the HIV Epidemic Jurisdictions**

- Siegler et al.'s article in *Annals of Epidemiology*, **Policy and County-Level Associations with HIV Pre-exposure Prophylaxis Use, United States, 2018**

PrEP Users & SDOH Data Comparisons



Rates of Persons Using PrEP, 2018

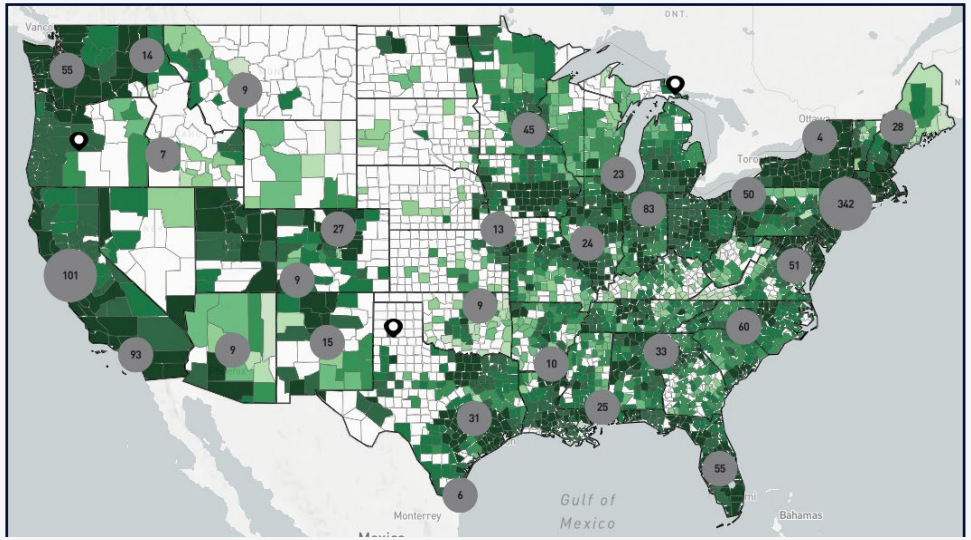


Percent of Population Living in Poverty, 2016

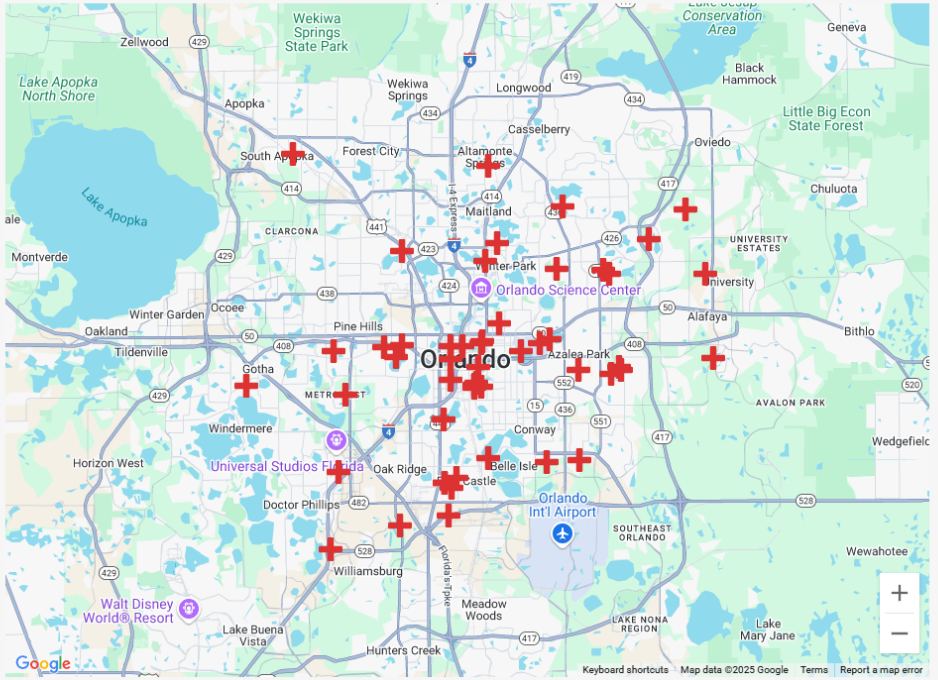
Note: All PrEP maps, data, and insights are pending finalization

PrEP Locator

- National directory of HIV PrEP Providers in the U.S.
- Developed by Emory University with funding from M•A•C AIDS Fund
- Overlay PrEP providers with AIDSVu maps, or search for provider near you
- Insight:



PrEP services across the U.S.



Harmony Healthcare
189 S Orange Ave, Ste 1830
Orlando, FL 32801 US
(407) 777-2022
0.2 miles

Centaur Medical Center
100 W Gore St, Ste 605
Orlando, FL 32806 US
(407) 271-4731
0.8 miles

Orlando Health
1012 Lucerne Terr, Orlando, FL 32806 US
(407) 423-1039
0.9 miles

Radiance Womens Center
1118 S Orange Ave, Ste 202
Orlando, FL 32806 US
(407) 743-2100
0.93 miles

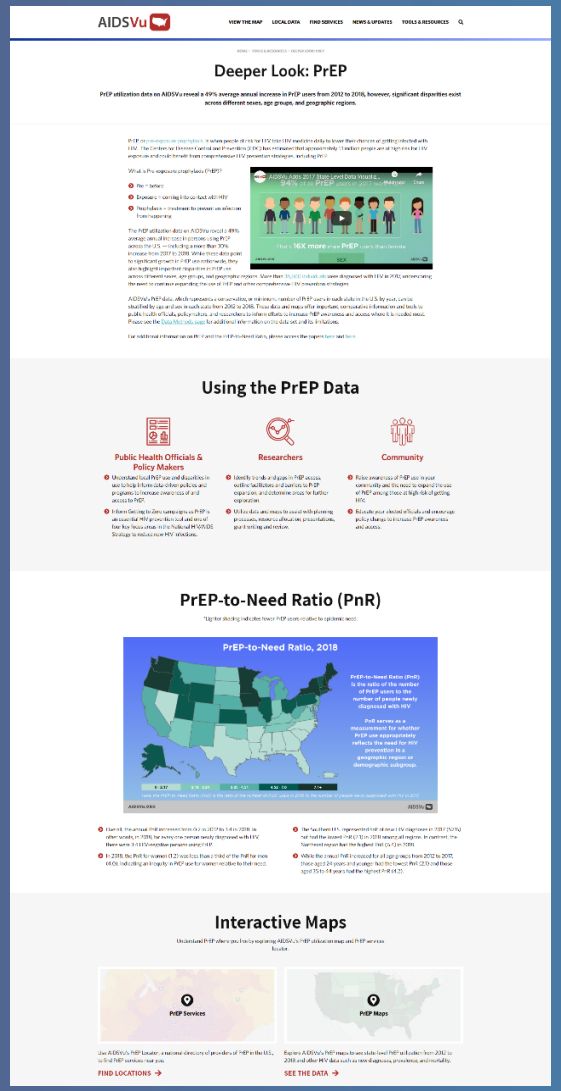
26Health
801 N Magnolia Ave, Ste 402
Orlando, FL 32803 US
(321) 800-2922
0.94 miles

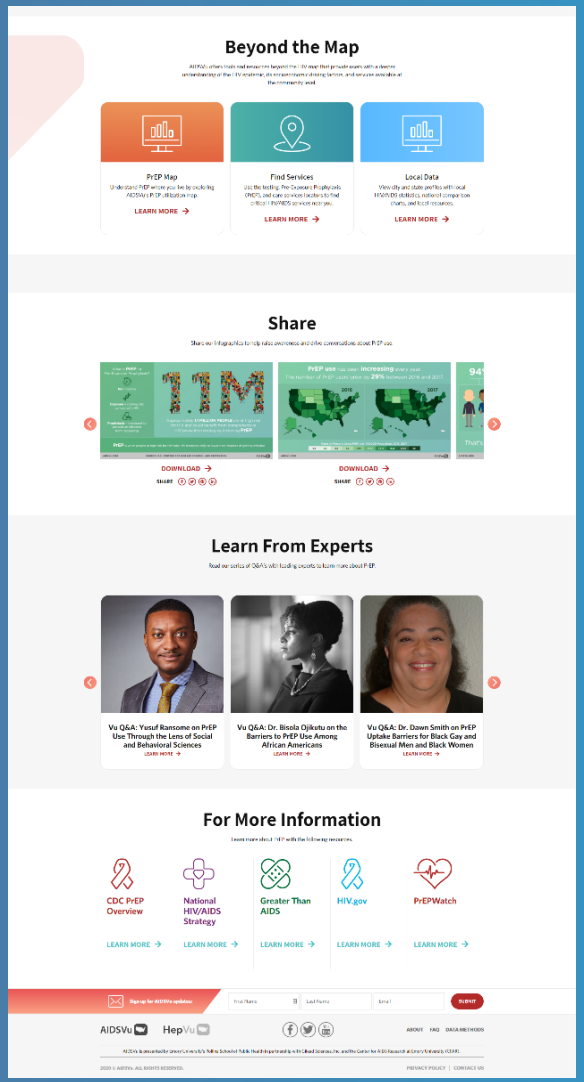
HealthyMD
130 E Marks St, 1st Fl Orlando, FL 32803 US

Deeper Look: PrEP

Comprehensive Resource for PrEP on AIDSVu

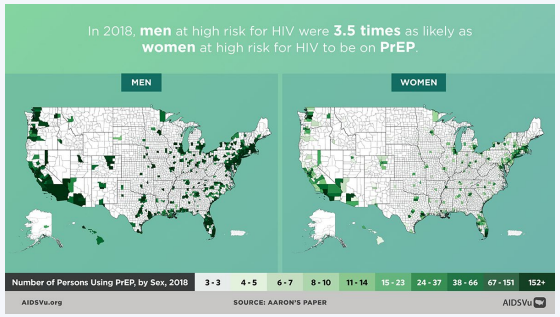
- Maps and Service Locator
- Infographics & Video
- Why it Matters
- Guest Blogs
  - Dr. Bisola Ojikutu
  - Dr. Yusuf Ransome

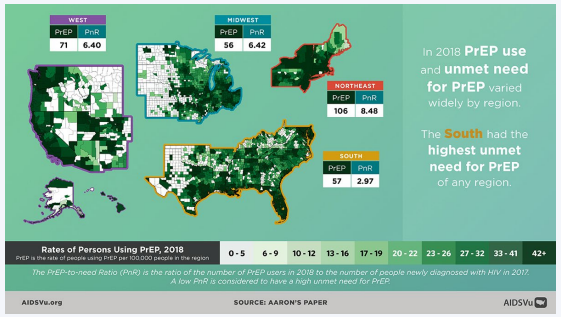


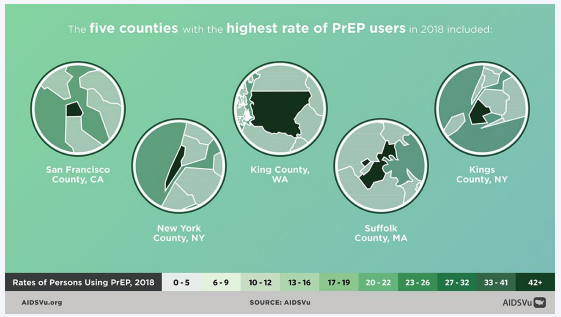


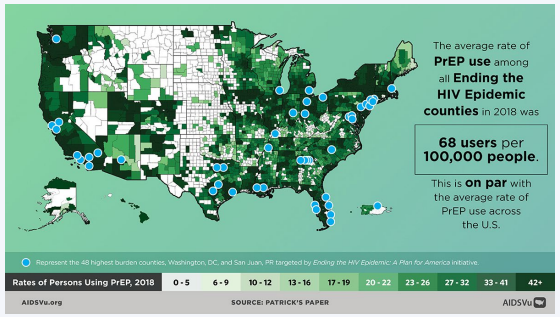
Note: All PrEP maps, data, and insights are pending finalization

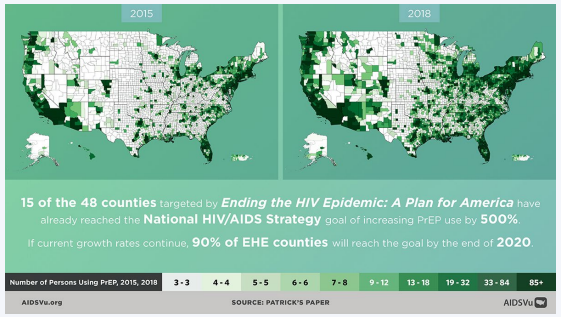
Infographics

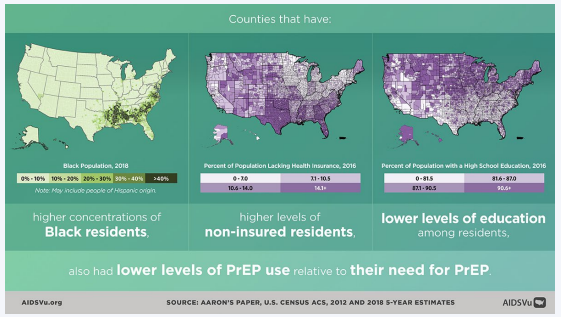


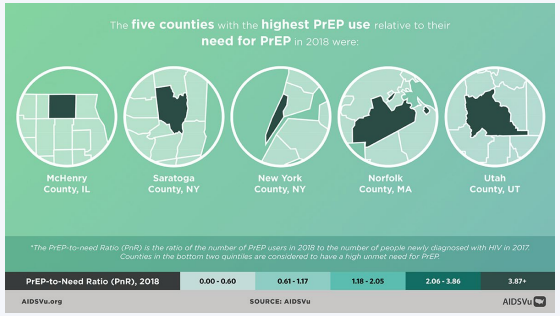


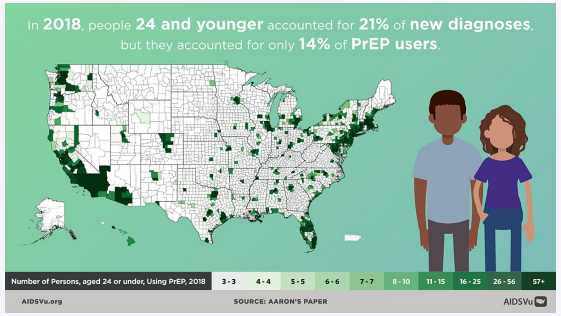


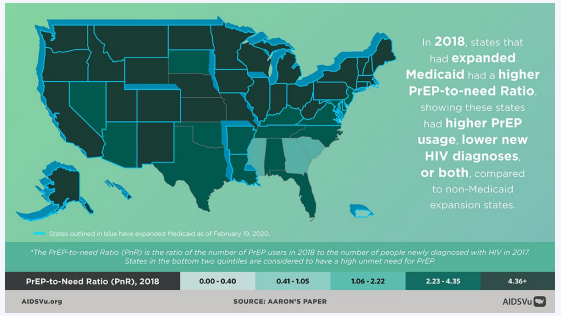








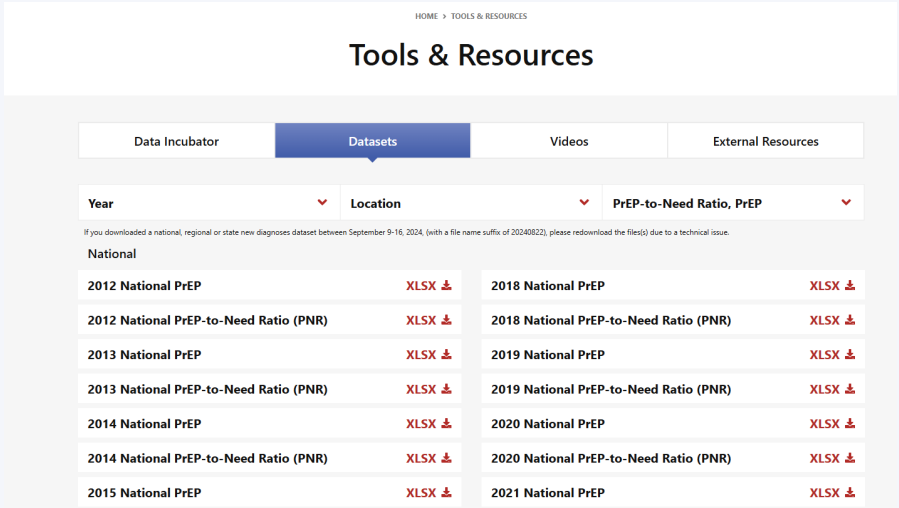


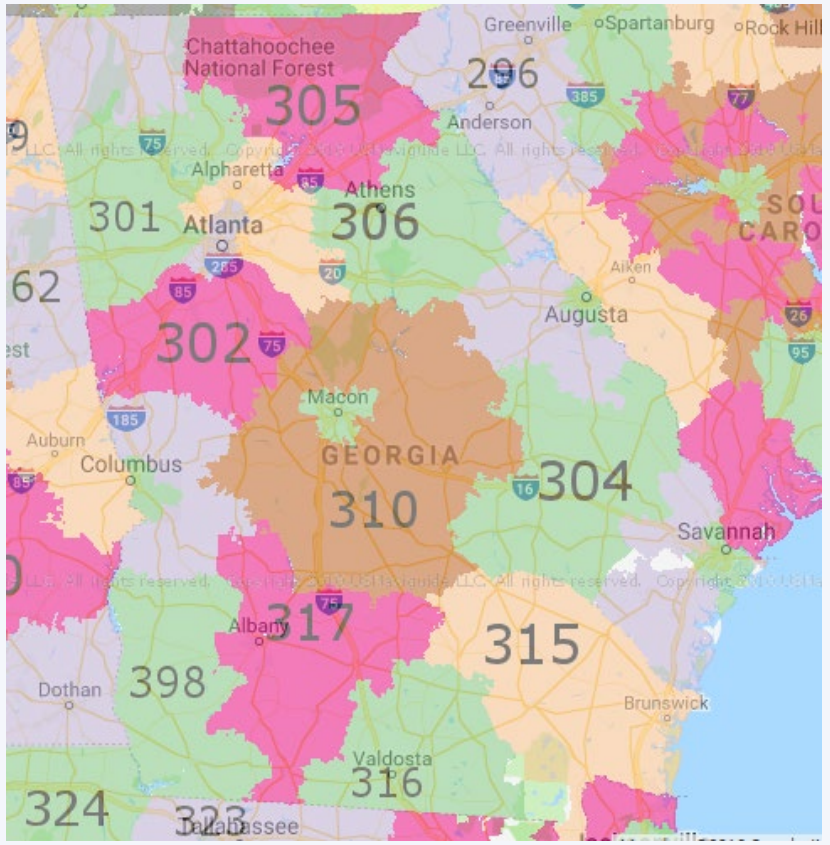


Downloadable PrEP Data Sets

- Downloadable PrEP datasets at the state-, county-, and ZIP3-level for researchers and health departments to utilize in their own analyses
- ZIP3 refers to the three digit ZIP Code prefix assigned by the U.S. Postal Service

Downloadable Datasets





ZIP3 boundary example for Georgia

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What is health equity?

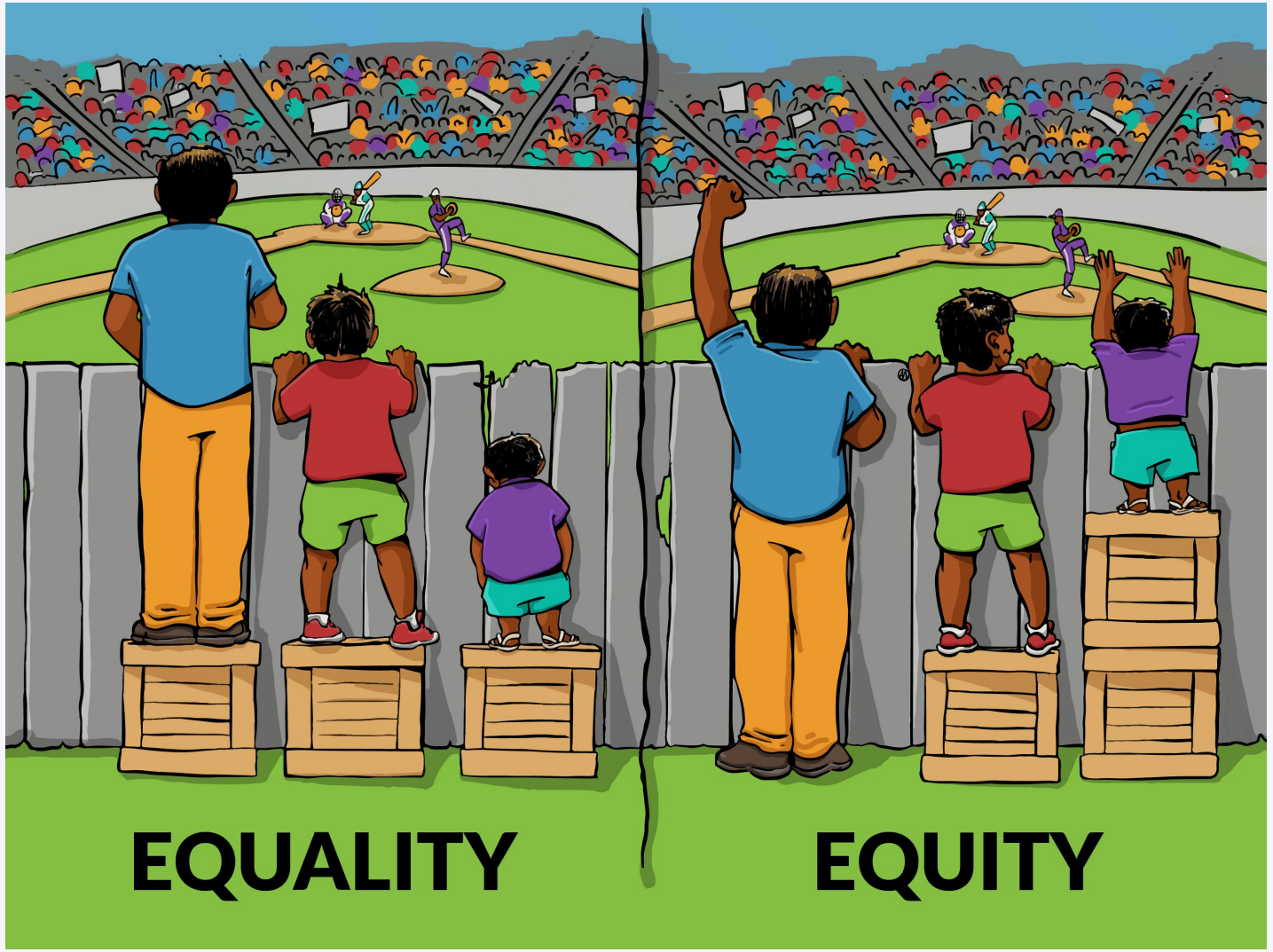
“Health equity means that everyone has a fair and just opportunity to be as healthy as possible. This requires removing obstacles to health such as poverty, discrimination, and their consequences, including powerlessness and lack of access to good jobs with fair pay, quality education and housing, safe environments, and health care”

- Robert Wood Johnson Foundation

Health equity is achieved when every person has the opportunity to "attain his or her full health potential" and no one is "disadvantaged from achieving this potential because of social position or other socially determined circumstances."

- Centers for Disease Control and Prevention

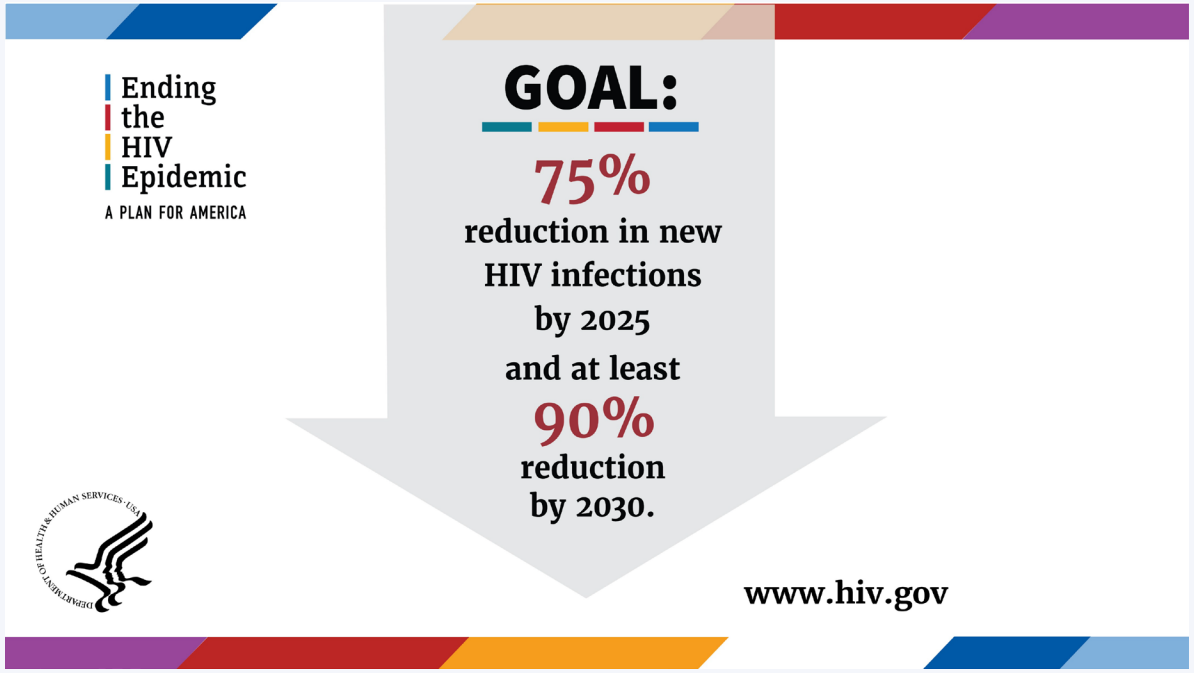
Is Equity the same as Equality?



Source: Interaction Institute for Social Cha

How does health equity relate to achieving public health goals?

- Many public health goals express “high level” goals within the overall population
- Overall goal populations are comprised of many subpopulations, each with different starting points and barriers
- Heavily impacted populations are often those with greatest inequities in determinants of health
- We can’t move the whole national rate of infections without starting with and succeeding in health equity populations



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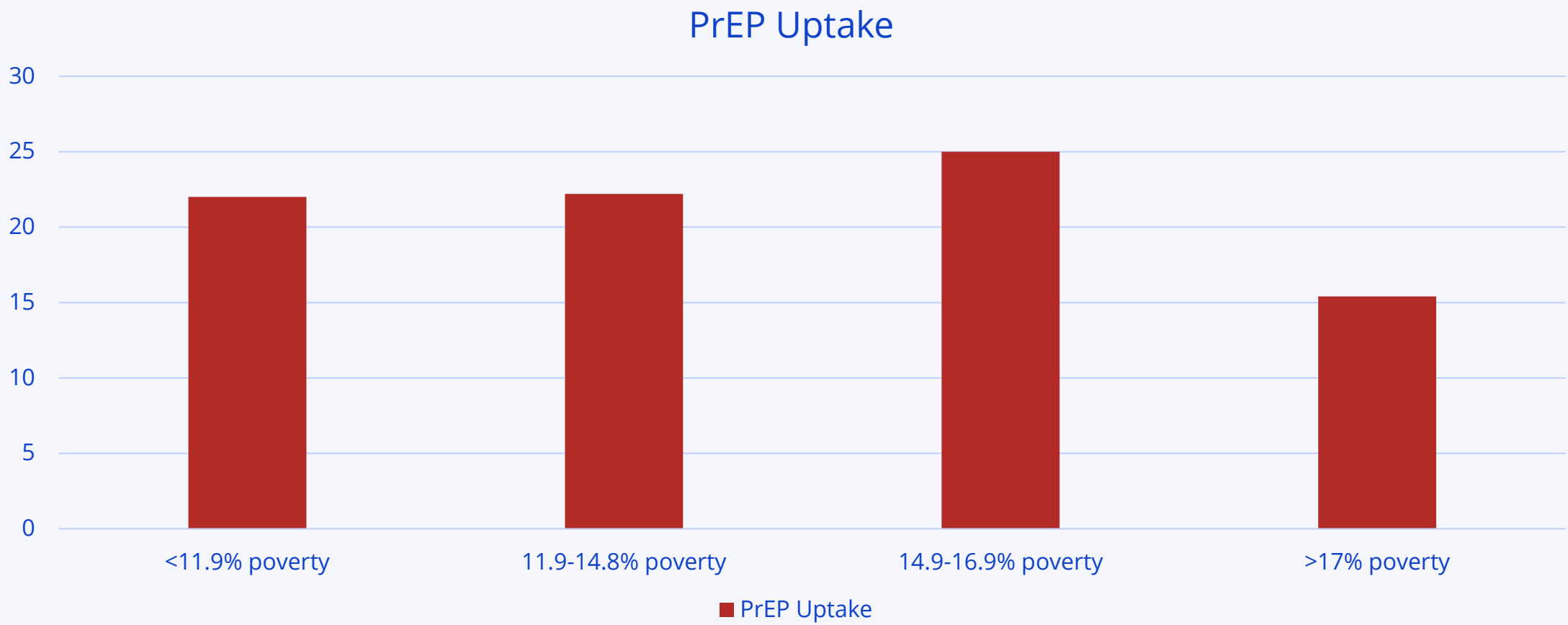
Example: PrEP to Need Ratio

- How do we measure PrEP uptake and compare among populations?
  - Percent of people in a population (Black, Hispanic, White; men or women)
    - Doesn't account for the fact that Black, Hispanic, transwomen and MSM have much higher epidemic impact.
  - "PrEP to Need Ratio"
  - Siegler et al, Annals of Epi 2018: 28:841-849

$$\frac{\text{Number of PrEP users in a year}}{\text{Number of new HIV diagnoses in the prior year}}$$

Illustration of Equality versus Equity – PrEP Uptake



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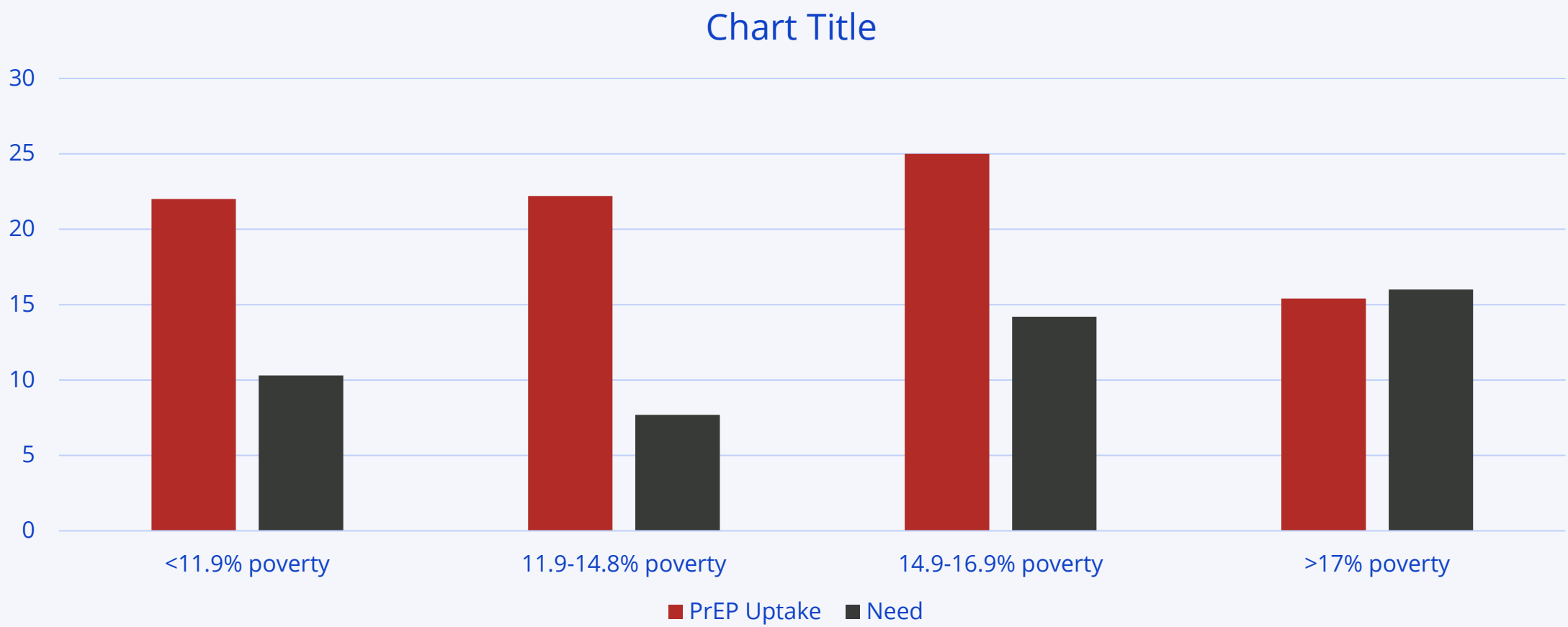

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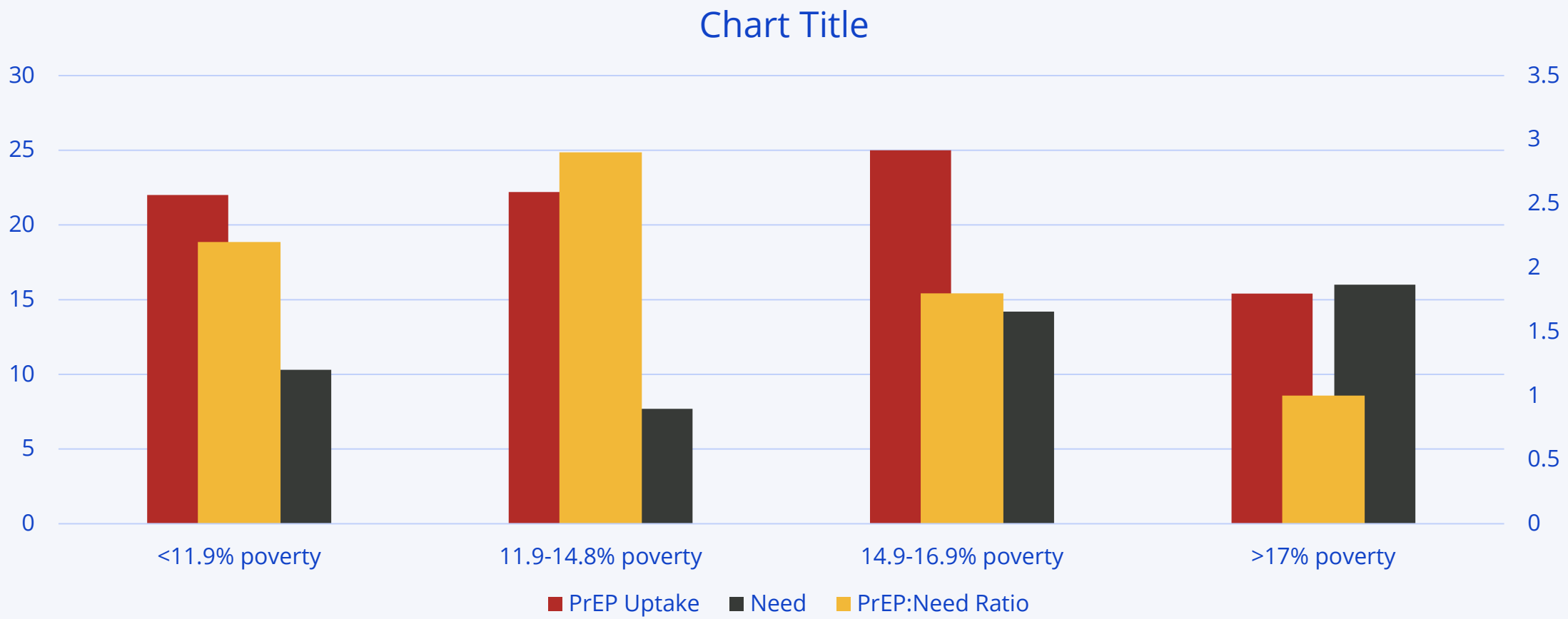
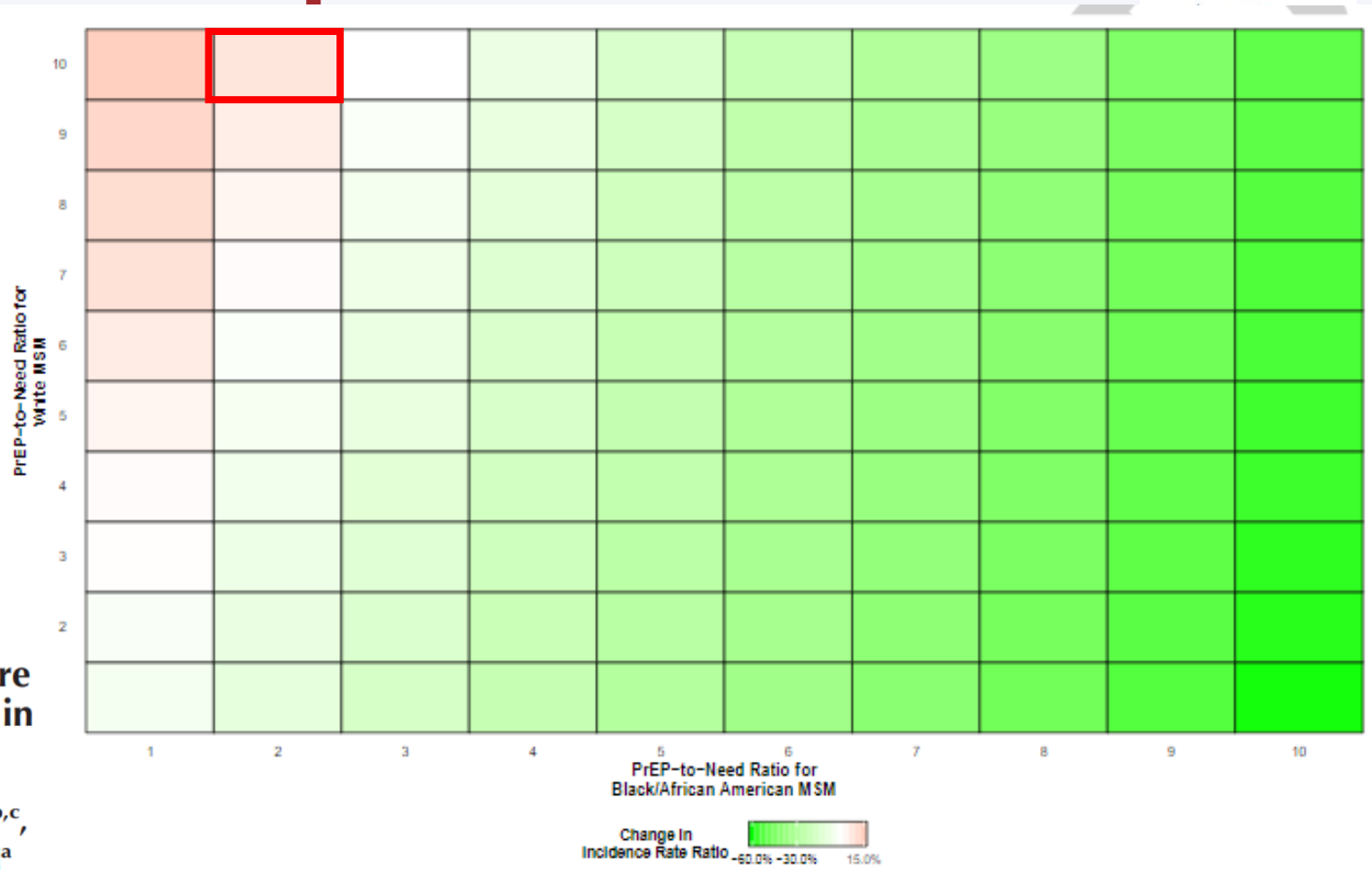
Illustration of Equality versus Equity – PrEP Uptake



Data Source: Siegler et al Annals of Epidemiology 2018; 28:841-849

Modeling health inequities

Question: What will happen to Black/white disparities in HIV if PrEP scaleup is not equitable (i.e., proportional to the epidemic need?)



Projecting the impact of equity-based preexposure prophylaxis implementation on racial disparities in HIV incidence among MSM

William C. Goedel[a], S. Bessey[a], Mark N. Lurie[a], Katie B. Biello[b,c], Patrick S. Sullivan[d], Amy S. Nunn[b] and Brandon D.L. Marshall[a]

Background: It is unknown what levels of preexposure prophylaxis (PrEP) use are needed to reduce racial disparities in HIV incidence among men who have sex with men (MSM). Using an agent-based model, we quantified the impact of achieving PrEP coverage targets grounded in equity on racial disparities in HIV incidence among MSM in an urban setting in the Southeastern United States.

Methods: An agent-based model was adapted to simulate HIV transmission in a

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Interested in Florida PrEP to Need Ratios?

PrEP Use Data in Action

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What can we to do improve health with PrEP data?

- Quantify PrEP equity and set public health goals based on equity
- Make the policy case for the public health impact of PrEP programs
- Document what policies are likely to favor equitable PrEP use

How do we measure health equity?

- Outcomes
  - Disease-specific surveillance systems
  - Equitable access to health services – geographic, financial
  - Mechanisms of access to healthcare
  - Monitoring of policies, laws, and systems

Modeling of Policy Variables Related to Equitable PrEP Use

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Original article

Policy- and county-level associations with HIV pre-exposure prophylaxis use, the United States, 2018

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Data and Analyses

- All counties in the United States
  - State policies (PrEP-DAP and Medicaid Expansion)
  - All PrEP users, by county
  - PrEP prevalence (per population)
  - PnR (per new HIV diagnosis)
  - Descriptive analyses by county characteristics
  - Multilevel model (GLM , log link)

Table 1. PrEP users, prevalence, and PnR by demographics and state policies in the US, 2018

	PrEP users N (%)	PrEP users per 100,000 population (prevalence)	New HIV Diagnoses per 100,000 population	PrEP-to-Need Ratio (PnR)
Total	188546 (100)	70.3	14.2	4.9
Demographics of PrEP Users				
Sex				
Males	177433 (94)	135.3	23.5	5.7
Females	11932 (6)	8.7	5.3	1.6
Age groups				
Less than 25 years	26777 (14)	51.5	15.6	3.3
25 to 34 years	75096 (39)	170.5	30.2	5.6
35 to 44 years	44724 (23)	110.0	18.0	6.1
45 to 54 years	30566 (16)	70.9	13.1	5.4
55 years and older	14112 (7)	15.9	4.3	3.7

Table 1. PrEP users, prevalence, and PnR by demographics and state policies in the United States, 2018

	PrEP users [1, 2, 3] N (%)	PrEP users per 100,000 population (prevalence)°	New HIV Diagnoses per 100,000 population°	PrEP-to-Need Ratio (PnR)[4]
Policy				
PrEP-DAP States (NASTAD)				
No	86677 (46)	51.9	13.3	3.9
Yes	101869 (54)	100.6	15.8	6.4
Medicaid Expansion States				
No	55613 (29)	54.2	17.4	3.1
Yes	132933 (71)	80.3	12.2	6.6

Table 2. PrEP users, prevalence, and PnR by population quartile of	PrEP users per 100,000 population (prevalence)°	PrEP-to-Need Ratio (PnR)[4]
Black Concentration		
[0.0%, 3.2%)	41.1	7.6
[3.2%, 8.2%)	71.2	6.5
[8.2%, 18.5%)	80.9	5.5
[18.5%, 100.0%]	87.8	3.4
Percent bachelor's degree or higher		
[0.0%, 22.7%)	36.5	3.6
(22.7%, 30.8%]	55.4	3.4
(30.8%, 37.3%]	85.0	5.1
[37.3%, 100.0%]	103.3	7.6
Percent Uninsured		
[0.0%, 7.0%)	85.4	10.2
[7.0%, 10.2%)	62.8	6.0
[10.2%, 12.9%)	65.9	4.0
[12.9%, 100.0%]	67.1	3.1

Table 3. Regressions of factors associated with PrEP Prevalence in the United States, 2018

	County, State, Region		
Effect	**RR**	**95% CI LB**	**95% CI UB**
Black Concentration 5% †	1.04	1.03	1.05
Latinx/Hispanic Concentration 5% †	1.02	1.01	1.03
Percent Poverty 5% †	1.00	0.98	1.02
Percent Bachelor degree or higher 5% †	1.08	1.07	1.08
Percent Uninsured 5% †	1.05	1.02	1.08
Urbanicity	0.91	0.90	0.92
PrEP-DAP OR Medicaid Expansion vs. None	1.25	1.09	1.45
PrEP-DAP AND Medicaid Expansion vs None	1.99	1.60	2.48
Census Region: Northeast vs Midwest	1.19	0.97	1.46
Census Region: South vs Midwest	1.02	0.86	1.20
Census Region West vs Midwest	0.87	0.72	1.04

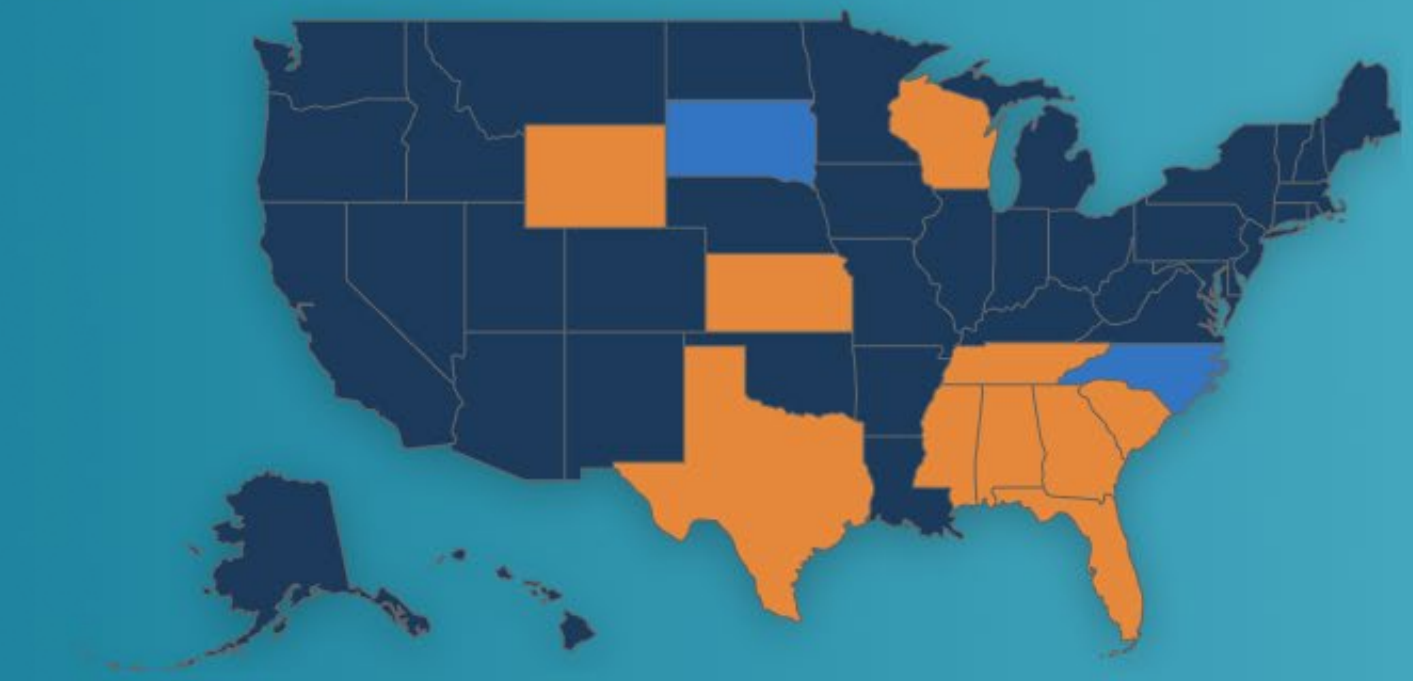
Summary: PrEP and Policy

- States with PrEP-DAP OR Medicaid expansion versus neither program had 25% higher PrEP prevalence
- States with BOTH Medicaid Expansion and PrEP-DAP programs had double the PrEP prevalence
- Progressively higher PrEP coverage is associated with reductions in new HIV diagnoses, even controlling for viral suppression
- Preserving ACA policies, promoting state PrEP-DAP programs, and promoting Medicaid expansion are likely to improve PrEP coverage and reduce new HIV infections

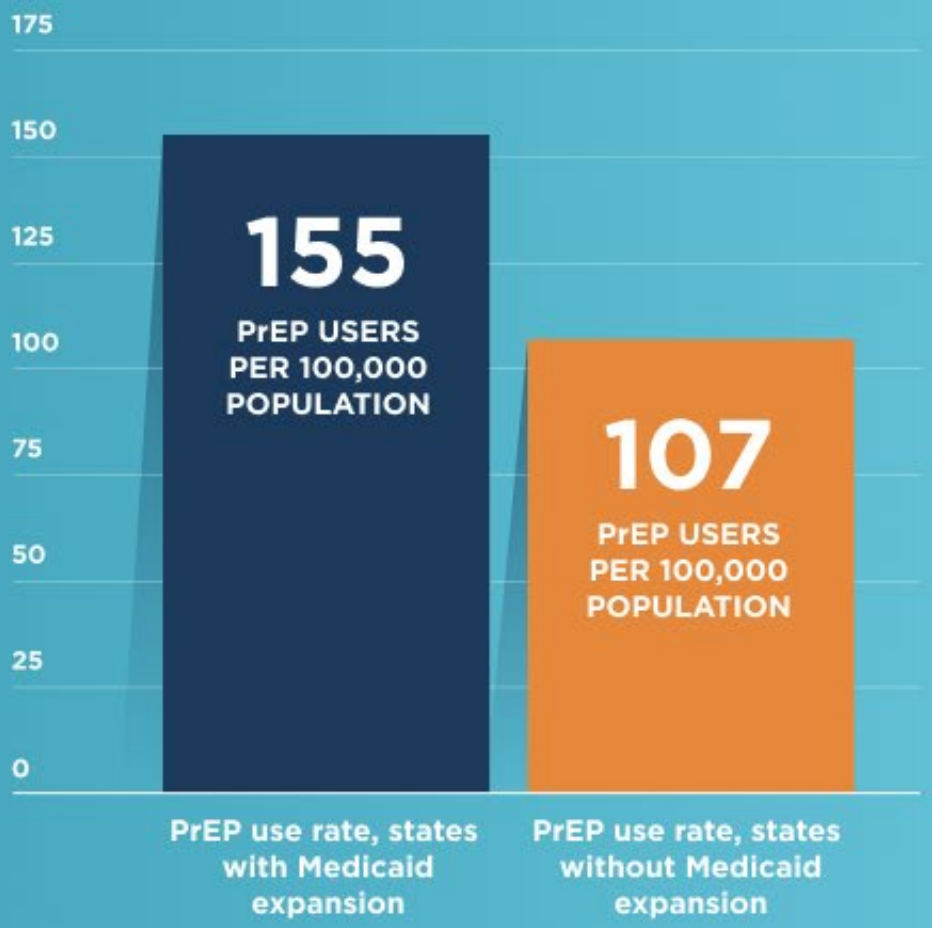
In **2022**, states that **expanded their Medicaid programs** had **PrEP use rates** that were **1.4X higher** than states that **did not expand Medicaid.**

**For purposes of this analysis, District of Columbia is treated as a state.*

39 out of 51 states expanded Medicaid as of December 2022.



Adopted and Implemented | **Adopted but Not Implemented** | **Not Adopted**



Equity of PrEP uptake by race, ethnicity, sex and region in the United States in the first decade of PrEP: a population-based analysis

Patrick Sullivan, DVM, PhD; Stephanie DuBose, MPH; Amanda Castel, MD, MPH; Karen Hoover, MD; Marta Juhasz, MPH; Gordon Le, MPH; Shamaya Whitby; Aaron Siegler, PhD

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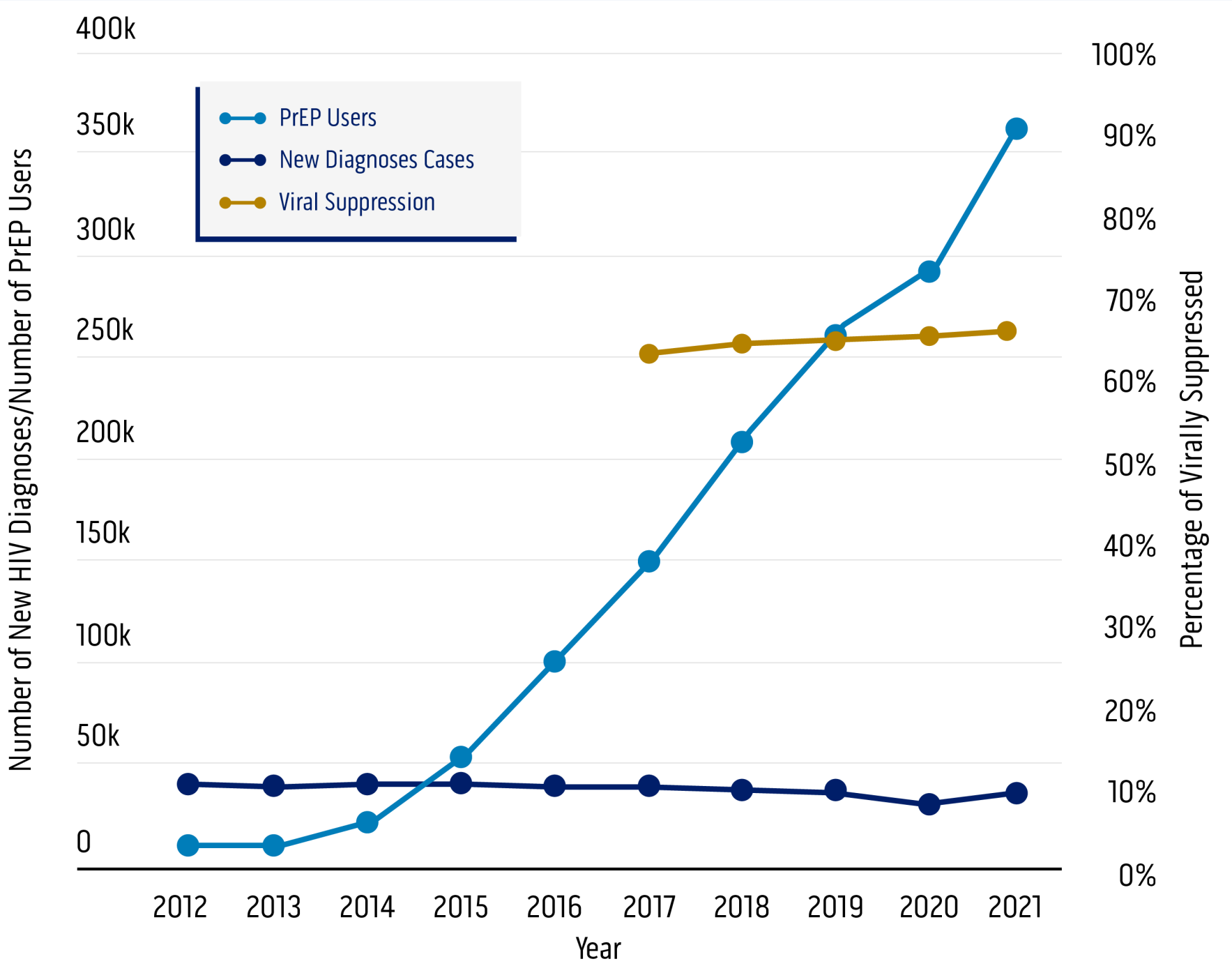
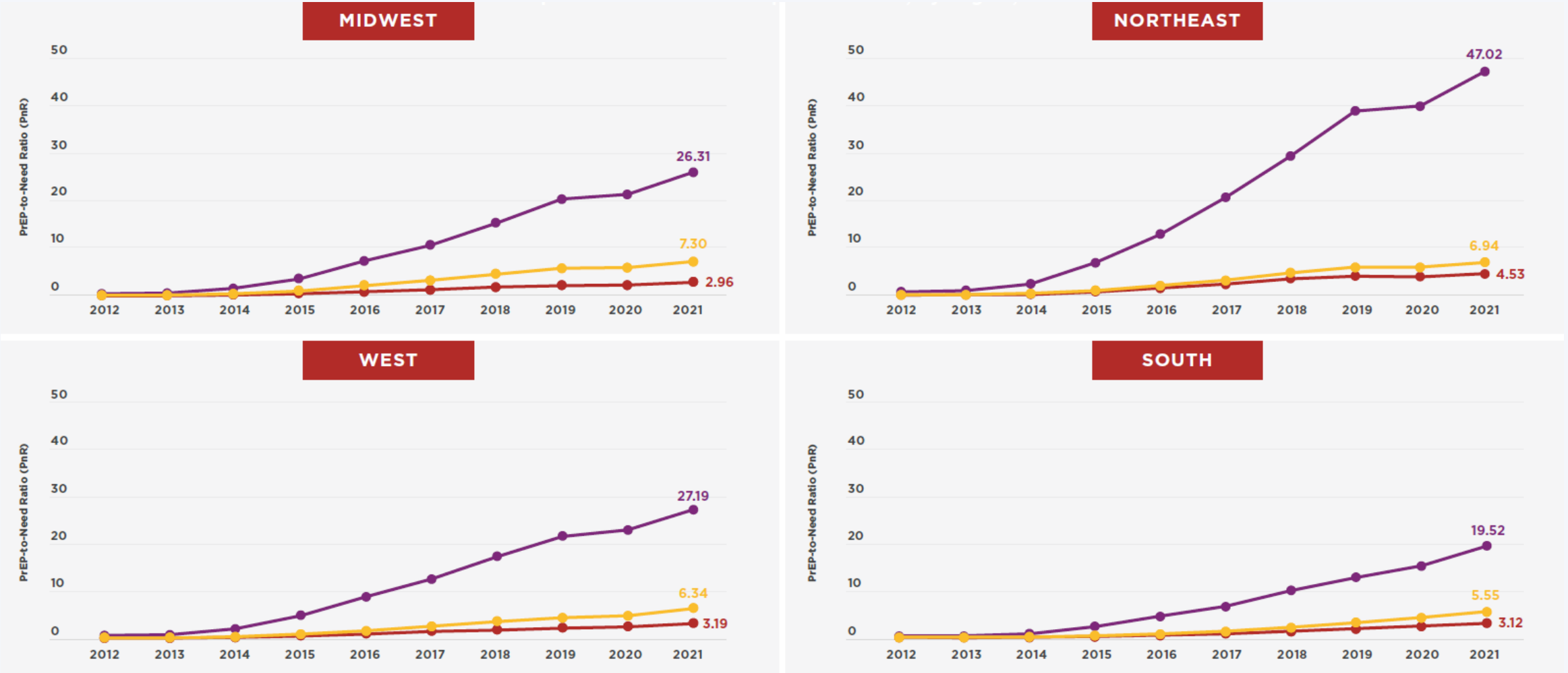
PrEP users, new HIV diagnoses and VS overall, United States2012-2021



PnR by Race/Ethnicity and US Region, 2012-2021



Black people represented only **14% of PrEP users (2022) but accounted for 40% of new HIV diagnoses (2021), indicating a significant unmet need for PrEP.**

Black People

Hispanic/ Latinx People

White People

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SOURCE: AIDSVu

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Higher State-level PrEP Coverage is Associated with Larger Declines in Population-level HIV Diagnoses, United States, 2012-2021

Patrick Sullivan, DVM, PhD[1]; Marta Juhasz, MPH[2]; Gordon Le, MPH[1]; Kamaria Brisco, MPH[1]; Stephanie DuBose, MPH[1]

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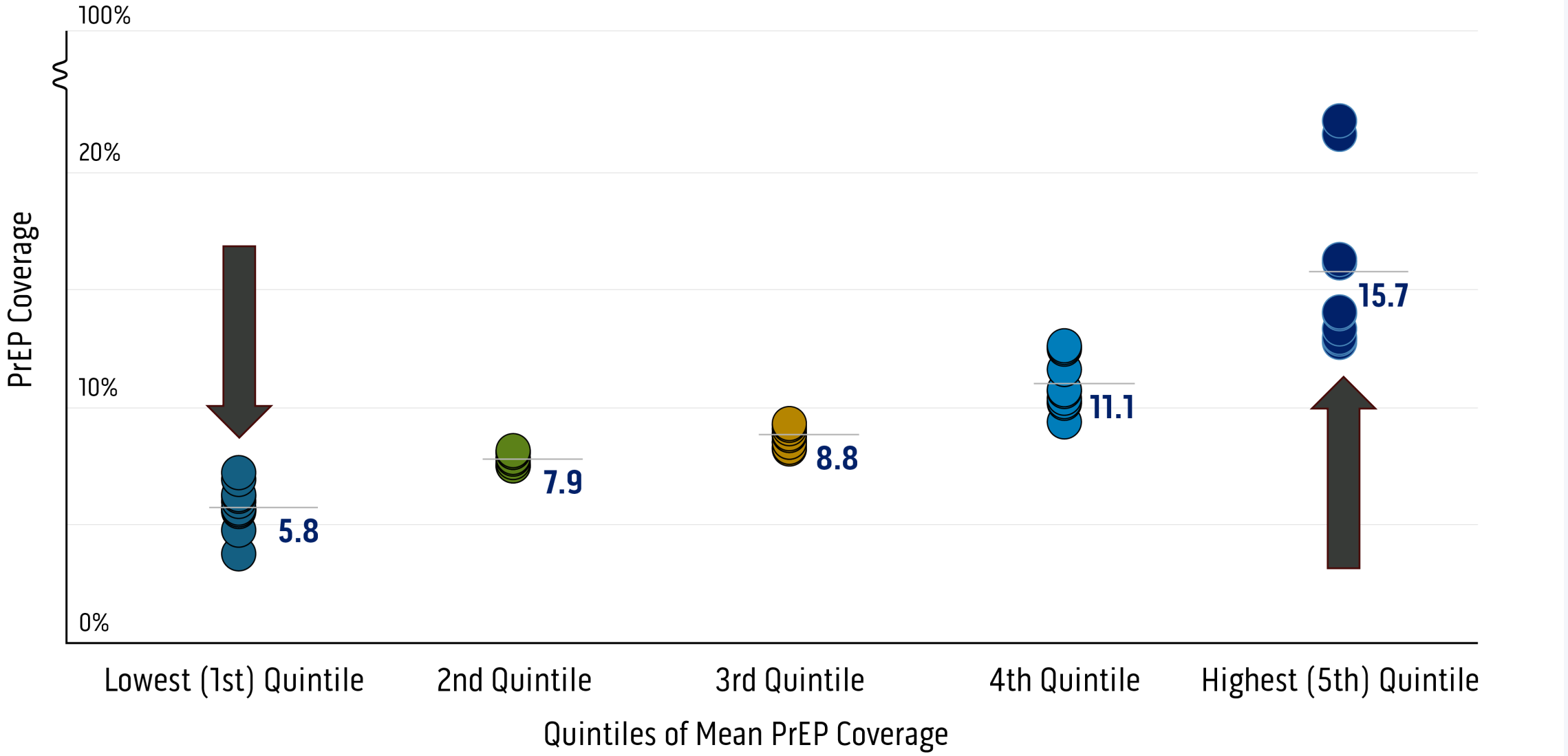
Background

- Pre-Exposure prophylaxis was approved in 2012 for people at risk for HIV with an indication to reduce the risk of HIV acquisition
- Uptake of PrEP has increased steadily from 2012-2022, with an estimated 363,957 PrEP users in 2022
- Prior analysis examined the ecological associations of PrEP uptake and trends in new HIV diagnoses in US states through 2017, and found a significant dose-response relationship between state-level PrEP prescriptions and new HIV diagnoses
- The impact of PrEP use on reducing new infections is potentially modified by the extent to which those who receive PrEP are at risk for HIV infection and is potentially confounded by parallel HIV prevention and treatment interventions in populations.

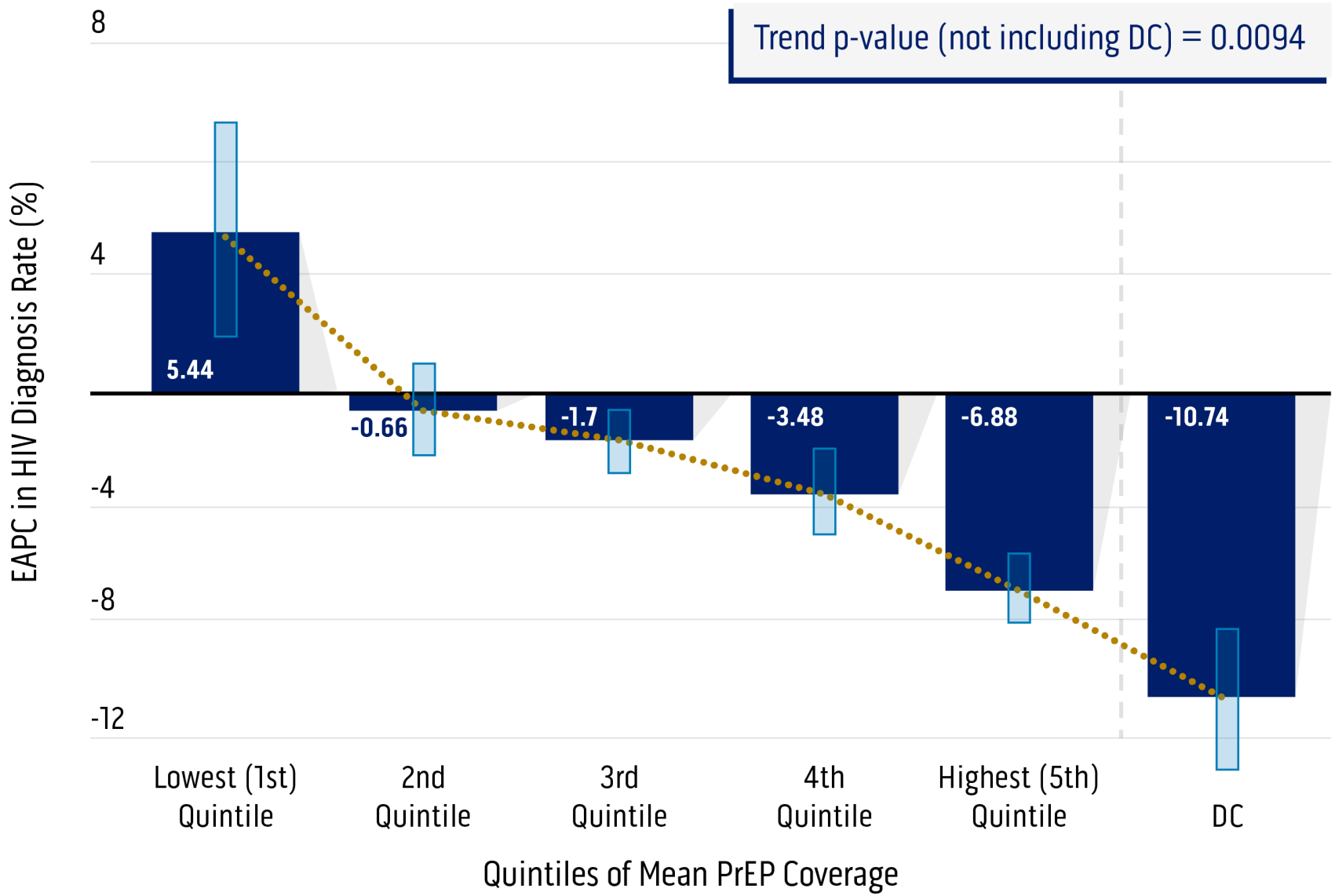
Methods

- State-specific PrEP prescriptions were calculated using commercial data on pharmacy fills and a validated algorithm for PrEP indications
- Public use datasets from AIDSVu.org were used for PrEP users, viral suppression, new HIV diagnoses; CDC data on people with PrEP indications
- PrEP coverage: number of PrEP users/100 persons with indications
- Estimated annual percent change (EAPC) was calculated using Joinpoint Trend Analysis methods from the National Cancer Institute, implemented with PROC GLIMMX. We controlled for yearly jurisdiction-specific viral suppression.
- We present mean PrEP coverage by PrEP Quintile, overall EAPC in US HIV diagnoses from 2012-2021, EAPC in HIV diagnoses by quintile of PrEP coverage, the trend for EAPC across quintiles of PrEP coverage among states.

Mean PrEP Coverage by PrEP Quintile of Use, 50 US States. 2012-2021

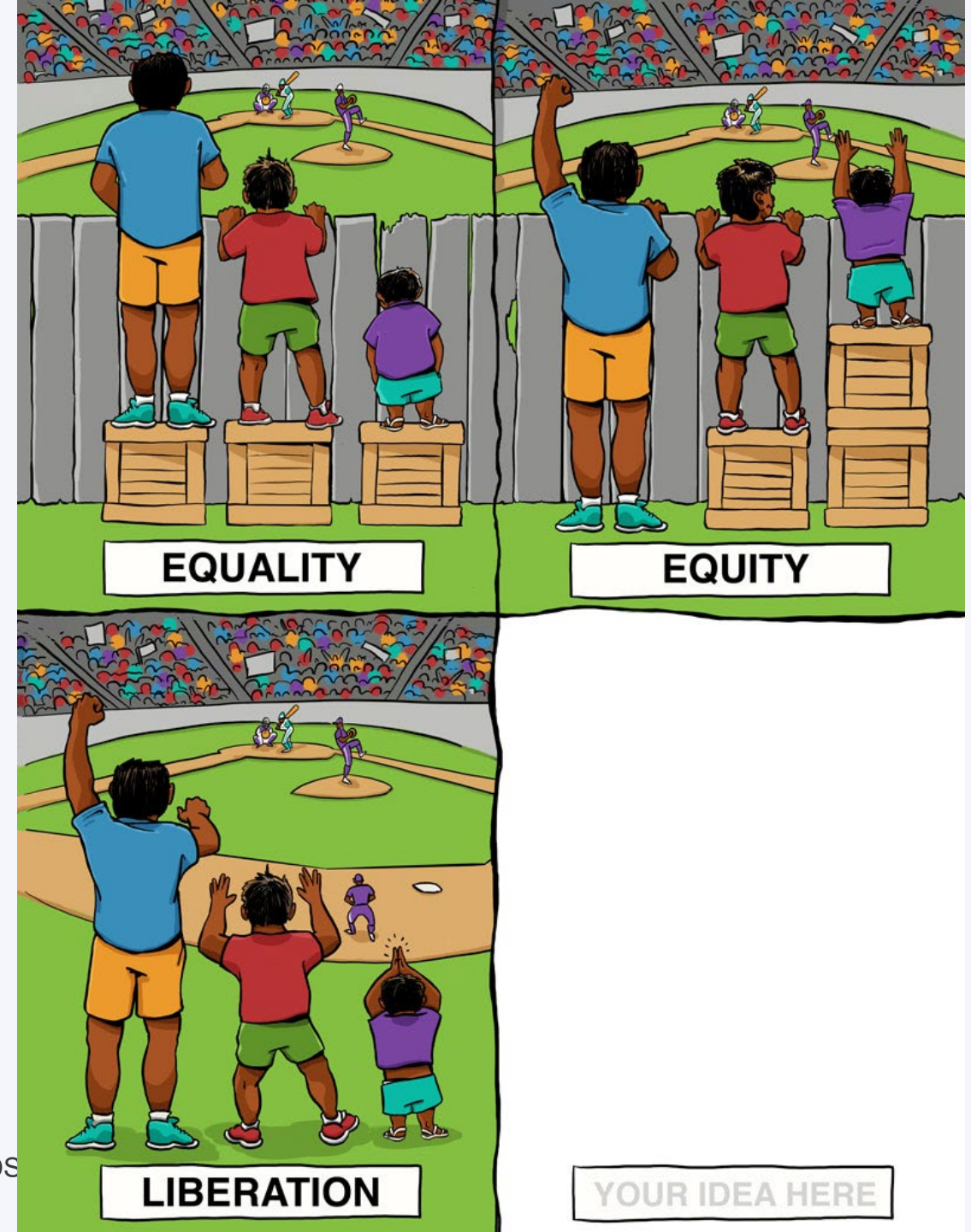


Quintile-specific Estimated Annual Percent Change in HIV Diagnoses Rates, Adjusted for Viral Suppression Rates, by Quintile of Mean PrEP Coverage, 50 U.S. States and the District of Columbia, 2012-2021



Limitations

- There are multiple factors that influence changes in HIV diagnoses
- Potential for confounding with local public health investment, viral suppression, other prevention programs, HIV testing patterns
- Risk heterogeneity in PrEP users; the extent to which PrEP impacts HIV transmission depends on the extent to which we reach those at highest risk for HIV with PrEP equitably (i.e., PrEP-to-Need Ratio)
- Ecological associations do not prove causal associations
- Changes in HIV testing during the COVID pandemic affected 2020 and 2021 new diagnoses



Source: Interaction Institute for Social

Questions?

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