

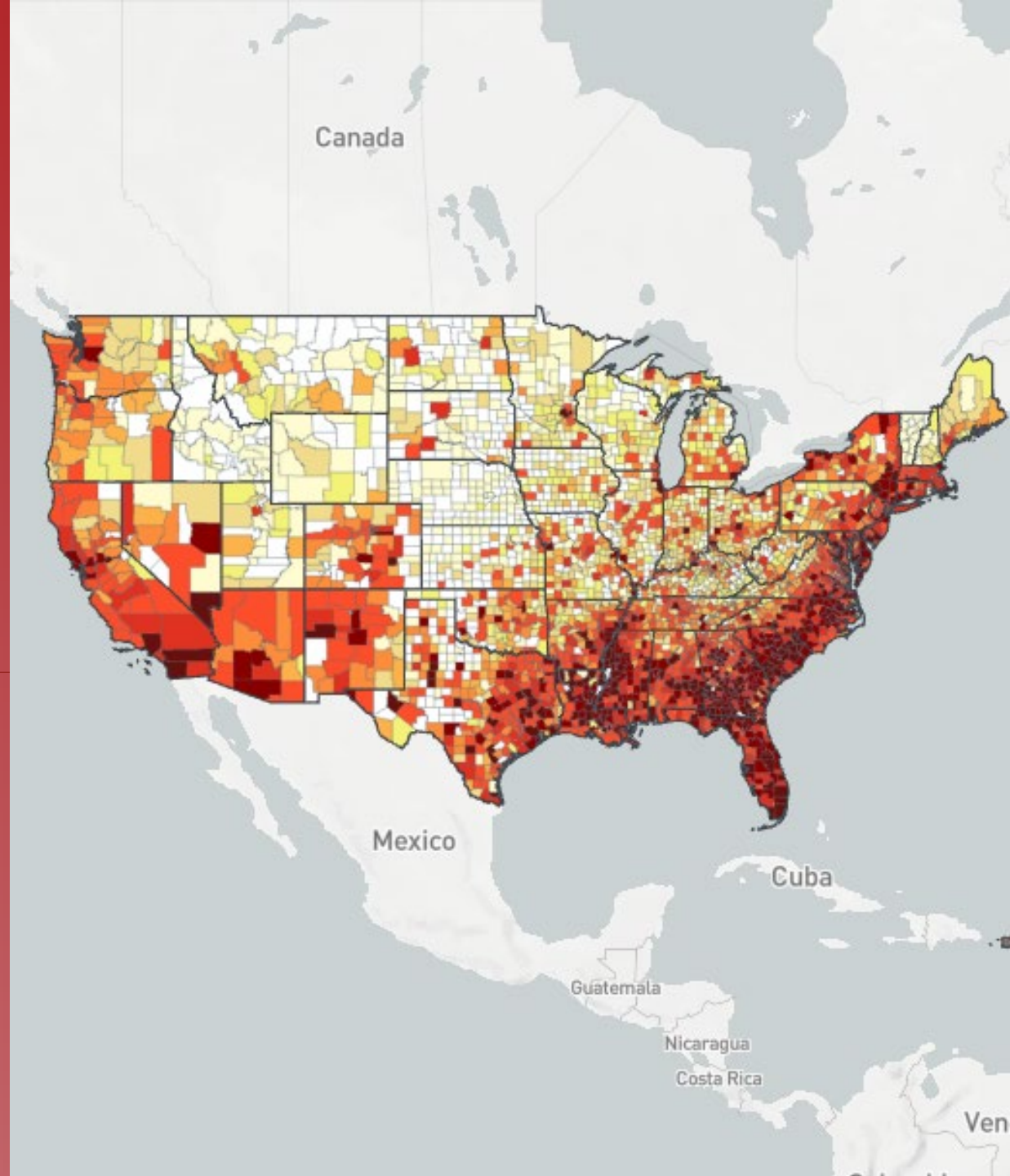


Update on Uptake: PrEP usage and equity in the Florida and the United States

Understanding & Visualizing the HIV Epidemic

New Metrics for Measuring Equity in HIV
Prevention

AIDSVu.org | Facebook.com/AIDSVu | [@AIDSVu](https://twitter.com/AIDSVu)



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 and 2012, adults and adolescents, by metropolitan statistical area of residence—United States and Puerto Rico

MSA of residence	Diagnoses, 2014				Prevalence of diagnosed HIV infection, year-end 2013		
	No.	Estimate ^a			No.	Estimate ^a	
		No.	Rate	Rank ^b		No.	Rate
Albany, OR	87	80	8.3	88	867	880	141.8
Albany-Schenectady-Troy, NY	84	87	7.8	92	2,052	2,058	278.2
Albuquerque, NM	84	79	8.2	82	1,888	1,948	178.7
Alcorno-Bethlehem-Easton, MA-NH	84	82	8.8	86	1,888	1,883	204.8
Atlanta-Sandy Springs-Roswell, GA	1,282	1,480	21.8	7	27,288	27,888	818.8
Austin-Richmond County, TX-MD	77	88	25.8	28	2,114	2,181	448.7
Aspen-South Fork, CO	88	88	28.8	24	4,888	4,888	318.4
Bakersfield, CA	114	122	17.4	38	1,778	1,778	261.8
Baltimore-Columbia-Forest, MD	847	878	28.8	11	18,827	18,771	888.8
Baton Rouge, LA	848	888	23.8	1	4,888	4,878	471.7
Birmingham-Hoover, AL	182	188	17.8	88	5,884	5,787	488.8
Boston City, MA	18	18	1.8	108	888	887	88.8
Boston-Cambridge-Newton, MA-NH ^c	488	888	13.7	84	12,888	12,888	333.8
Boston Division	848	888	18.7	—	7,718	7,848	478.8
Cambridge Division	188	211	18.8	—	4,888	5,887	288.2
Bridgeport-Stamford-Norwalk, CT	88	101	12.8	82	2,711	2,888	343.3
Buffalo-Chester-Getzville-Paris, NY	188	118	11.8	88	2,818	2,818	288.2
Butte-Vallejo-Napa, CA	84	102	17.2	42	1,888	1,888	284.2
Chattanooga-Knox, TN-GA	108	147	24.2	18	2,888	2,888	387.1
Chattanooga-Gadsden, GA-NC	428	447	23.8	22	7,288	7,187	371.2
Chattanooga, TN-GA	88	88	13.8	88	1,784	1,748	248.1
Chicago-Naperville-Elgin, IL-IN-WI	1,847	1,887	18.8	88	88,482	88,882	388.2
Chicago Division	1,888	1,887	23.8	—	27,781	27,888	488.8
High Division	87	88	18.8	—	827	828	133.3
Day Division	88	84	18.8	—	1,284	1,288	288.8
DeKalb County Division	48	88	8.8	—	888	882	118.8
Dayton, OH	287	218	12.8	42	3,884	3,888	283.8
Dayton-Kimberly, OH	281	344	13.8	88	4,887	4,848	283.8
Dayton-Spring, OH	88	41	7.8	88	818	884	148.8
Columbia, SC	184	288	38.8	8	4,822	4,827	887.3
Columbus, OH	248	287	18.8	48	5,881	5,821	521.4
Dallas-Fort Worth-Arlington, TX	1,888	1,488	24.7	14	22,488	22,748	414.8
Dallas Division	1,888	1,228	23.1	—	17,887	18,128	888.2
Fort Worth Division	288	287	14.1	—	4,827	4,821	288.1
Dayton, OH	87	79	18.4	78	1,478	1,488	218.8
Dayton-Captain Beach-Corona Beach, FL	108	114	21.4	22	1,482	1,488	283.8
Dayton-Aurora-Lakewood, CO	282	288	13.1	88	5,888	5,888	488.8
Dayton-Kimberly, OH	84	88	7.2	88	818	817	128.7
Dayton-Kimberly, OH	828	888	18.8	47	18,888	18,888	278.1
Dayton Division	282	288	28.2	—	7,228	7,278	488.8
Dayton Division	188	174	8.1	—	2,772	2,778	188.2
Dayton-Chapel Hill, NC	82	84	18.4	22	2,848	2,828	481.4
Dayton, TX	108	118	17.8	28	1,878	1,877	283.7
Daytonville-Springdale-Highway, AL-NC	18	21	8.1	102	828	828	124.8
Dayton, CA	112	121	18.8	88	1,821	1,827	218.8
Dayton-Rapid City, SD	88	88	8.1	88	1,887	1,887	128.8
Dayton-High Point, NC	114	122	18.2	21	2,488	2,488	388.2
Dayton-Anderson-Mauldin, SC	182	188	18.2	88	1,878	1,878	228.8
Dayton-Carroll, PA	88	82	18.8	71	1,881	1,888	283.7
Dayton-Highway-Baltimore, MD	88	84	8.2	88	3,482	3,488	333.8
Dayton, OH	117	81	8.8	78	1,878	1,878	282.8

HIV Surveillance Supplemental Report

13

Vol. 21, No. 1

Introduction to AIDSVu

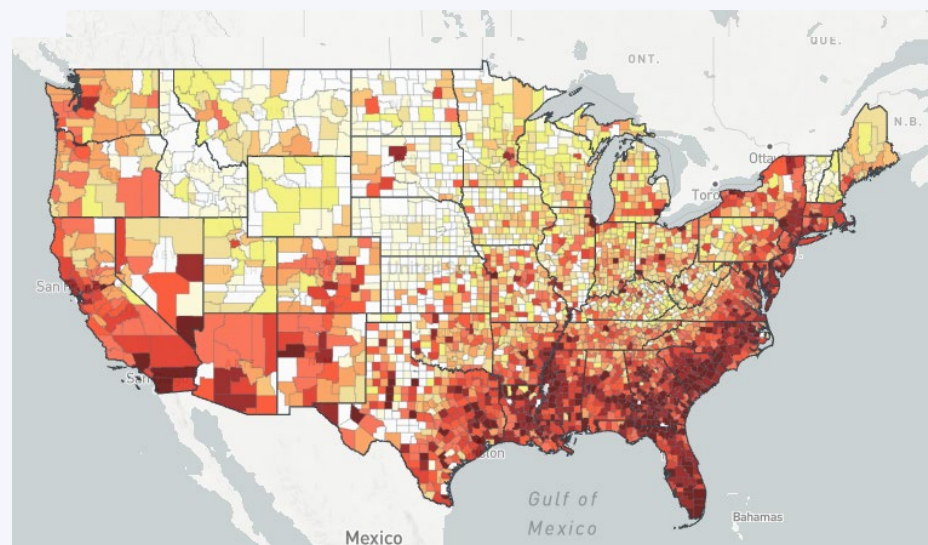
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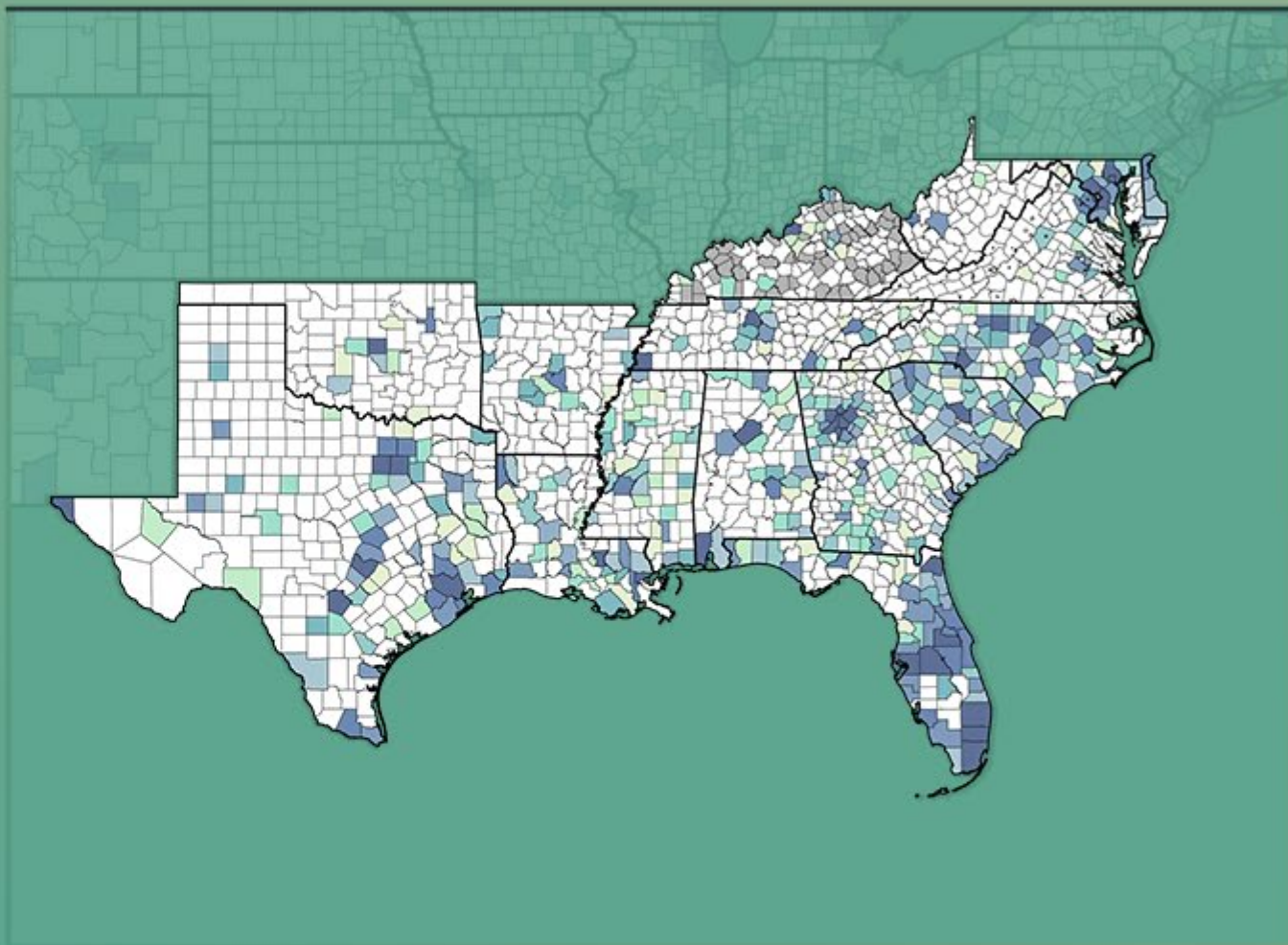
Table 1a. Diagnoses of HIV infection, 2014, and persons living with diagnosed HIV infection (prevalence), year-end 2013, adults and adolescents, by metropolitan statistical area of residence—United States and Puerto Rico

MSA of residence	Diagnoses, 2014				Prevalence of diagnosed HIV infection, year-end 2013			
	Estimate ^a		Rate ^b		Estimate ^a		Rate ^b	
	No.	Rate	No.	Rate	No.	Rate	No.	Rate
Alaska, AK	47	8.0	88	8.0	807	141.9		
Alaska-North Slope, AK	84	8.7	7.5	82	2,082	2,082	278.2	
Alaska-South Slope, AK	66	7.0	9.2	82	1,338	1,340	176.7	
Alaska-Yukon-Charley, AK	13	12.3	8.8	86	1,488	1,483	208.8	
Alaska-Yukon-Charley, AK	1,282	14.0	21.4	7	27,508	27,508	618.8	
Alaska-Yukon-Charley, AK	77	8.8	20.8	28	2,114	2,181	448.7	
Alaska-Yukon-Charley, AK	302	33.0	28.4	24	4,838	4,838	314.4	
Alaska-Yukon-Charley, AK	111	12.3	17.9	34	1,778	1,778	281.8	
Alaska-Yukon-Charley, AK	547	47.8	28.8	11	18,327	18,771	600.8	
Alaska-Yukon-Charley, AK	348	38.8	33.8	1	4,880	4,870	673.7	
Alaska-Yukon-Charley, AK	162	18.8	17.8	38	5,834	5,791	488.8	
Alaska-Yukon-Charley, AK	18	18	1.0	124	488	487	88.8	
Alaska-Yukon-Charley, AK	408	48.8	13.7	84	13,836	13,330	332.8	
Alaska-Yukon-Charley, AK	248	28.8	18.7	—	7,710	7,843	478.8	
Alaska-Yukon-Charley, AK	188	21.8	10.8	—	4,838	4,837	288.2	
Alaska-Yukon-Charley, AK	88	10.1	12.8	80	2,718	2,699	343.8	
Alaska-Yukon-Charley, AK	108	11.8	11.8	88	2,310	2,310	238.2	
Alaska-Yukon-Charley, AK	88	10.2	17.2	48	1,888	1,888	288.2	
Alaska-Yukon-Charley, AK	108	14.7	24.2	18	2,388	2,388	387.1	
Alaska-Yukon-Charley, AK	428	44.7	23.8	22	7,288	7,187	373.2	
Alaska-Yukon-Charley, AK	88	48	13.8	88	1,188	1,148	248.1	
Alaska-Yukon-Charley, AK	1,341	1,837	18.3	30	38,482	38,882	388.2	
Alaska-Yukon-Charley, AK	1,488	1,347	22.2	—	27,781	27,888	488.8	
Alaska-Yukon-Charley, AK	81	88	18.8	—	487	428	123.8	
Alaska-Yukon-Charley, AK	88	84	18.8	—	1,228	1,228	288.8	
Alaska-Yukon-Charley, AK	48	80	8.8	—	880	882	118.8	
Alaska-Yukon-Charley, AK	287	21.8	12.3	42	3,888	3,882	288.8	
Alaska-Yukon-Charley, AK	231	244	13.8	83	4,837	4,848	283.8	
Alaska-Yukon-Charley, AK	38	41	7.3	83	810	808	148.8	
Alaska-Yukon-Charley, AK	188	228	38.8	8	4,222	4,227	687.3	
Alaska-Yukon-Charley, AK	343	387	18.8	48	8,281	8,231	321.4	
Alaska-Yukon-Charley, AK	1,388	1,488	28.7	14	23,488	23,748	414.8	
Alaska-Yukon-Charley, AK	1,888	1,228	23.1	—	17,887	18,128	888.0	
Alaska-Yukon-Charley, AK	243	287	16.1	—	4,837	4,821	248.1	
Alaska-Yukon-Charley, AK	87	78	18.4	78	1,478	1,480	218.8	
Alaska-Yukon-Charley, AK	108	114	21.4	23	1,482	1,488	283.8	
Alaska-Yukon-Charley, AK	282	288	12.1	58	8,288	8,288	428.8	
Alaska-Yukon-Charley, AK	34	38	7.2	84	818	817	128.7	
Alaska-Yukon-Charley, AK	528	588	18.8	47	18,288	18,281	278.1	
Alaska-Yukon-Charley, AK	362	384	28.2	—	7,228	7,278	488.8	
Alaska-Yukon-Charley, AK	188	174	8.1	—	2,772	2,778	188.2	
Alaska-Yukon-Charley, AK	88	84	18.4	20	2,848	2,828	481.4	
Alaska-Yukon-Charley, AK	108	118	17.8	28	1,878	1,871	283.7	
Alaska-Yukon-Charley, AK	18	21	8.1	100	838	838	134.8	
Alaska-Yukon-Charley, AK	112	121	18.8	48	1,831	1,827	218.8	
Alaska-Yukon-Charley, AK	48	48	8.1	88	1,887	1,887	128.8	
Alaska-Yukon-Charley, AK	114	122	18.2	81	2,428	2,388	288.2	
Alaska-Yukon-Charley, AK	122	128	18.0	48	1,878	1,878	238.8	
Alaska-Yukon-Charley, AK	48	42	18.8	71	1,341	1,334	282.7	
Alaska-Yukon-Charley, AK	88	84	9.2	88	1,482	1,488	133.8	
Alaska-Yukon-Charley, AK	77	81	9.8	78	1,878	1,878	282.8	

HIV Surveillance Supplemental Report 13 Vol. 21, No. 1



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

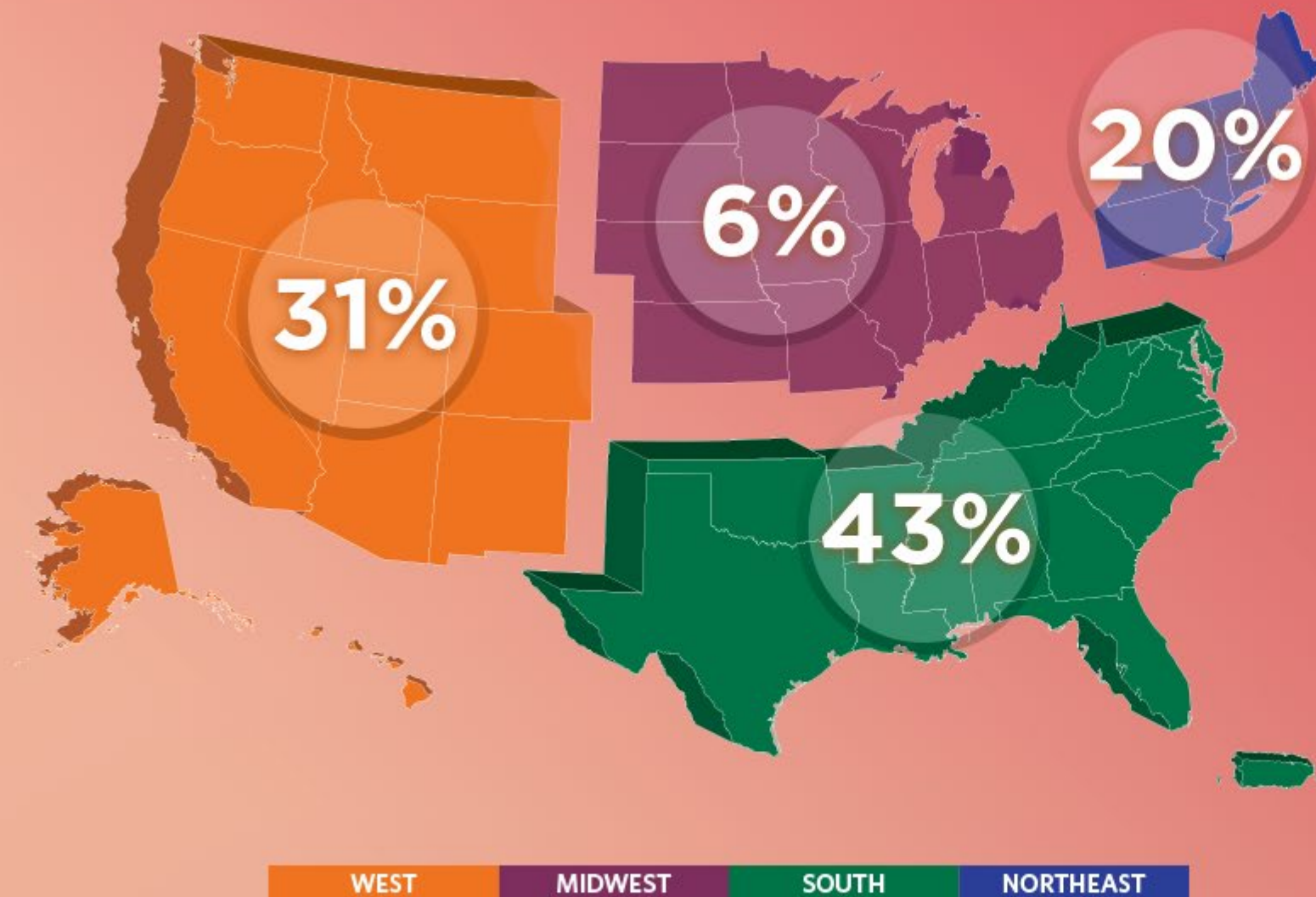
14 - 18

19 - 27

28 - 46

47 - 101

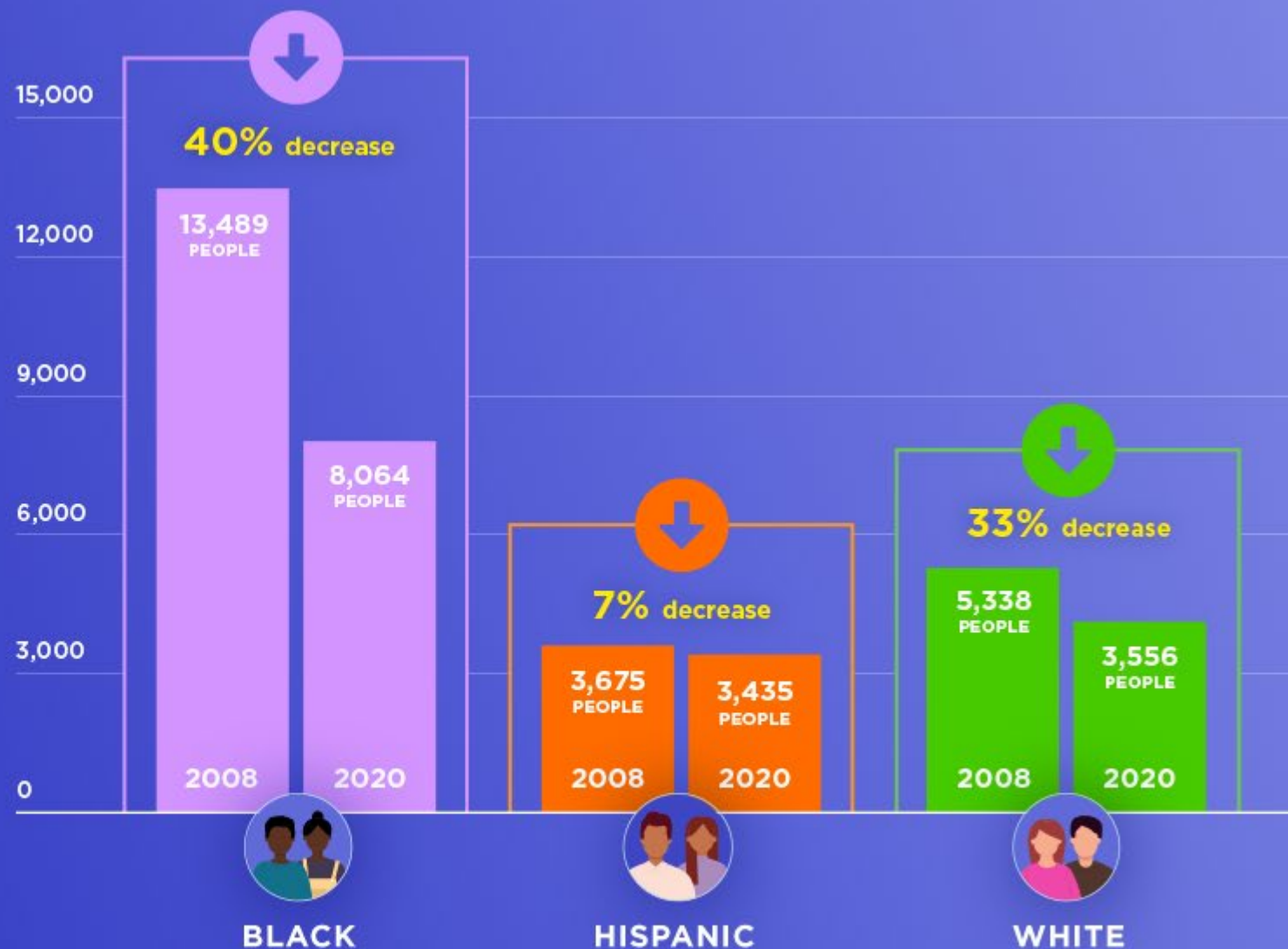
102+



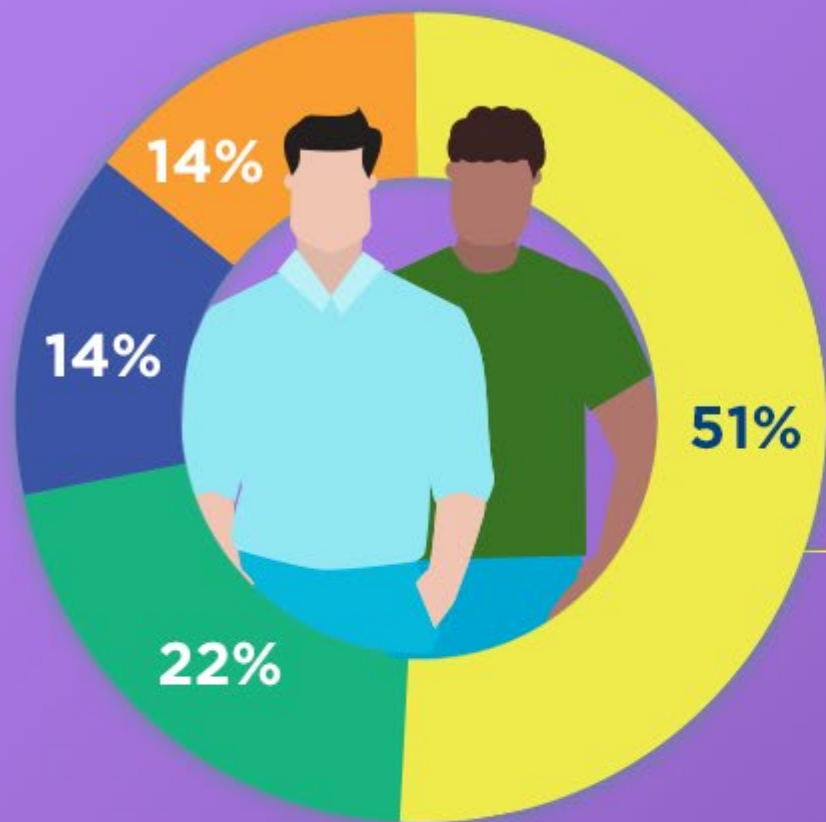
In 2016, the **Western** and **Southern U.S.** accounted for nearly **75%** of all new **Hispanic/Latinx** HIV diagnoses.

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



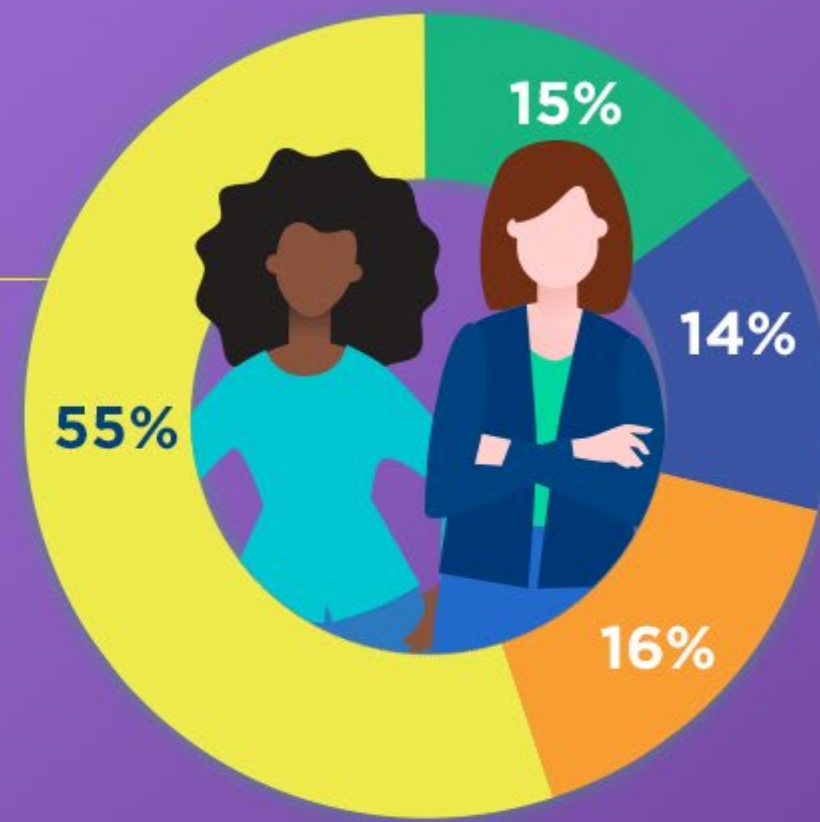
MALE

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

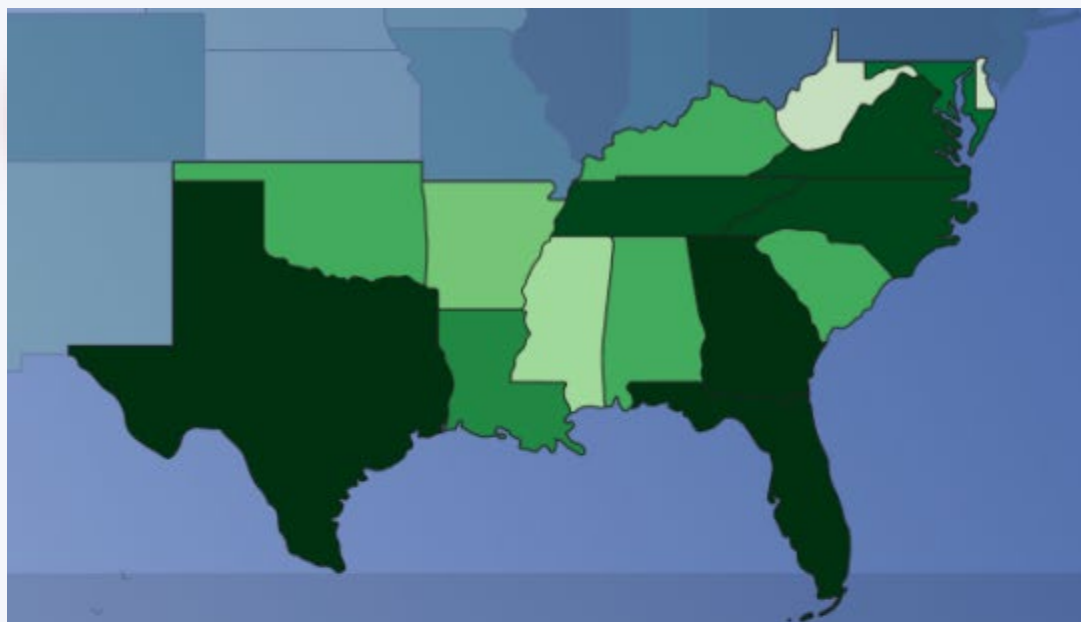


SOUTH



WEST

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



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

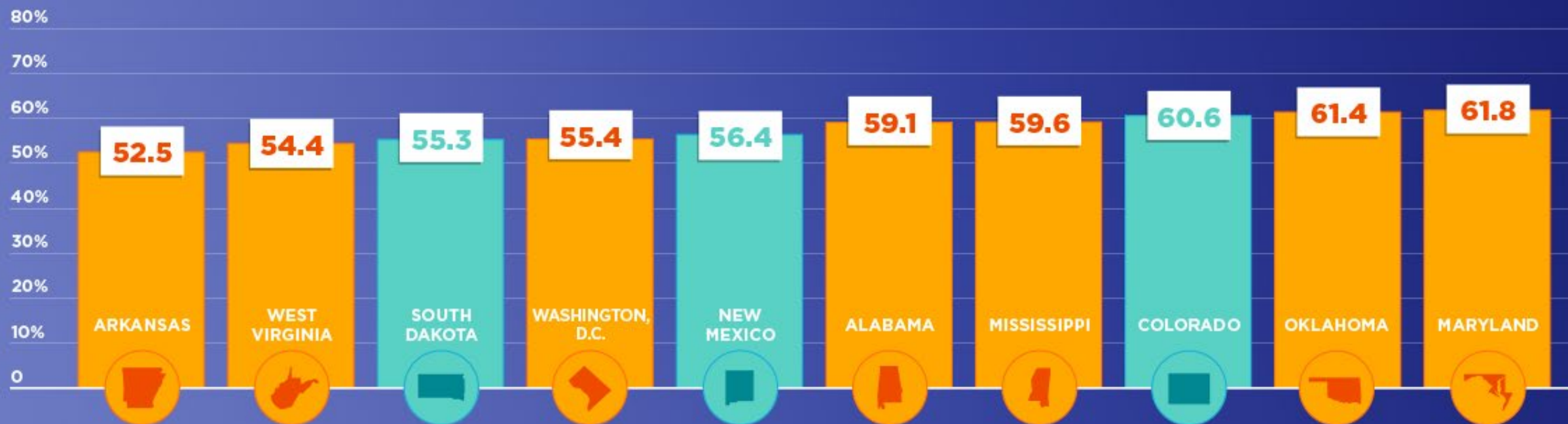
5 - 378	379 - 649	650 - 1,028	1,029 - 1,661	1,662 - 2,717	2,718 - 4,000	4,001 - 5,271	5,272 - 7,446	7,447 - 13,567	13,568+
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**PrEP-to-Need Ratio (PNR) is the ratio of the number of PrEP users in 2022 to the number of people newly diagnosed with HIV in 2020. It is a measurement for whether PrEP use appropriately reflects the need for HIV prevention. A lower PNR indicates more unmet need.*

In 2021, of the **10 states** with the **lowest rates of 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.

2030 Goal: 90% Viral Suppression



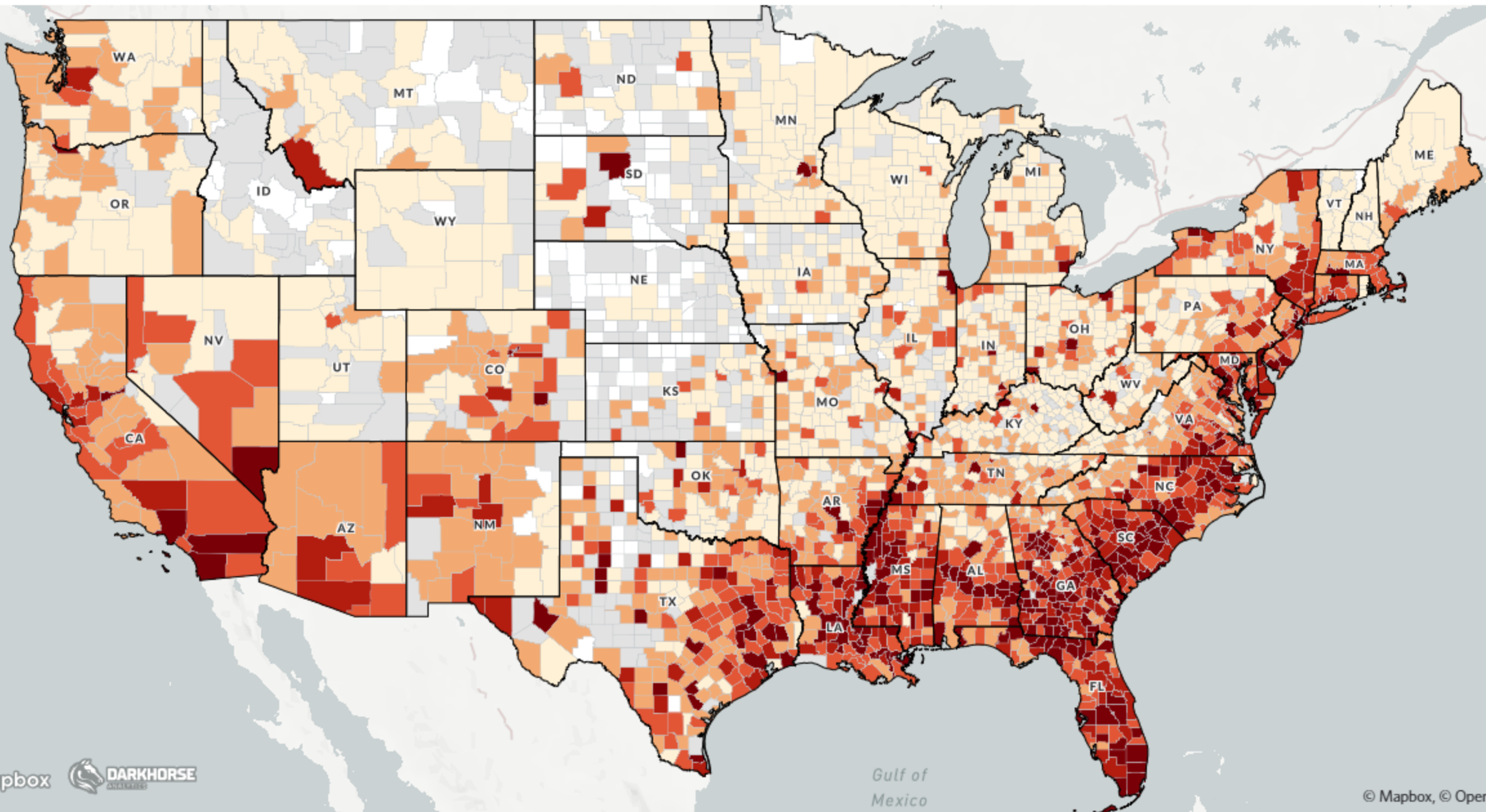
Viral Suppression*, 2021

**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



- 0
- Data not shown
- Data not available



HIV Prevalence in Florida

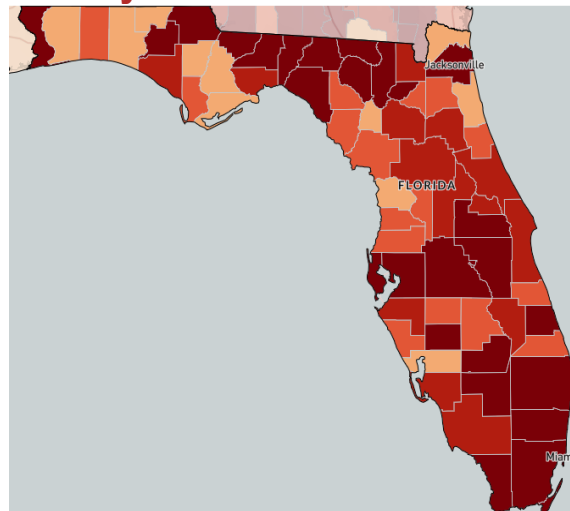
State



0 - 100 101 - 120 121 - 150 151 - 180 181 - 220 221 - 300 301 - 340 341 - 380 381 - 560 561+

Georgia - Rates of Persons Living with HIV, 2021

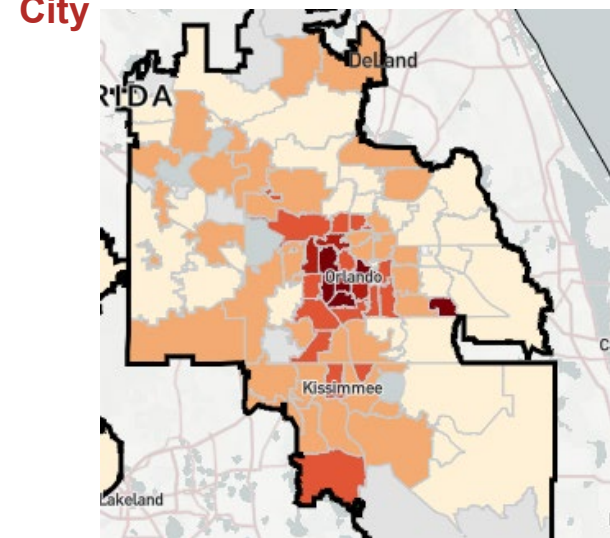
County



0 - 60 61 - 80 81 - 90 91 - 120 121 - 150 151 - 190 191 - 250 251 - 380 381+

Florida- Rates of Persons Living with HIV, 2022

City



0 - 132 133 - 190 191 - 257 258 - 331 332 - 406 407 - 501 502 - 700 701 - 1000 1001 - 1700 1701+

Atlanta - Rates of Persons Living with HIV, 2021



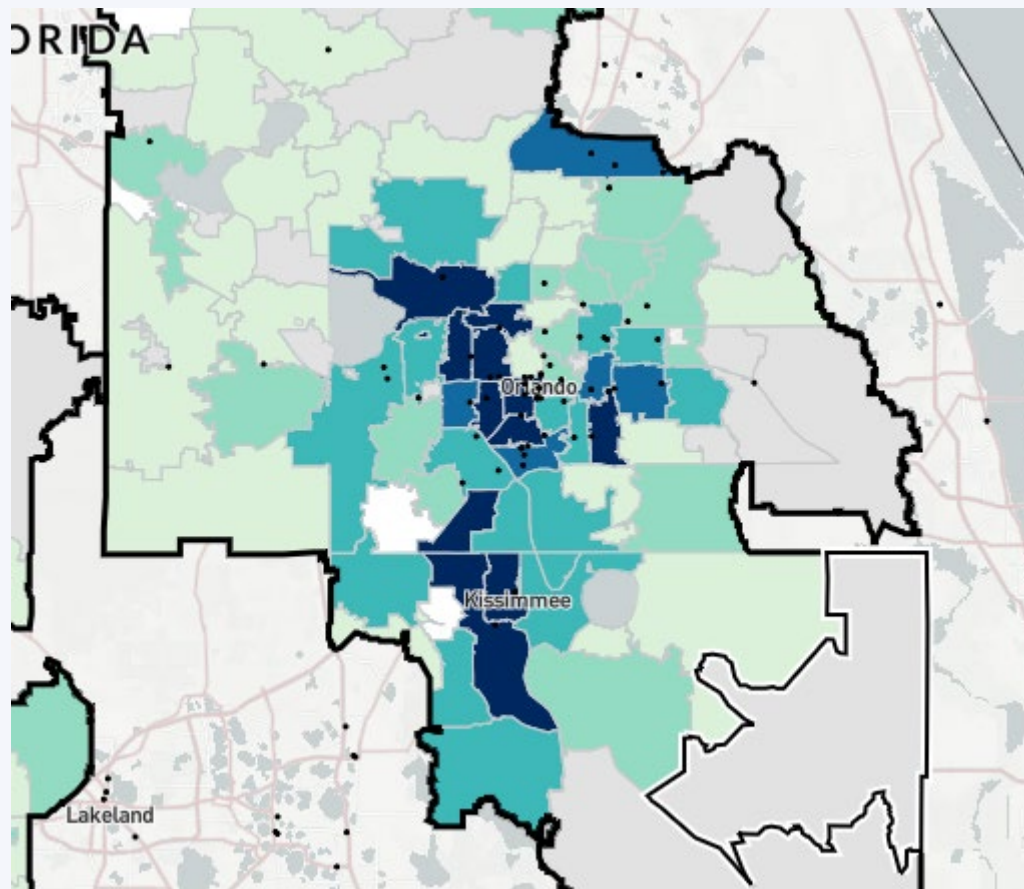
Evaluating service locations relative to need with AIDSVu

New HIV Diagnoses in Orlando

Number of Persons Newly Diagnosed with HIV, 2018-2022

Orlando, Zip Code 34773

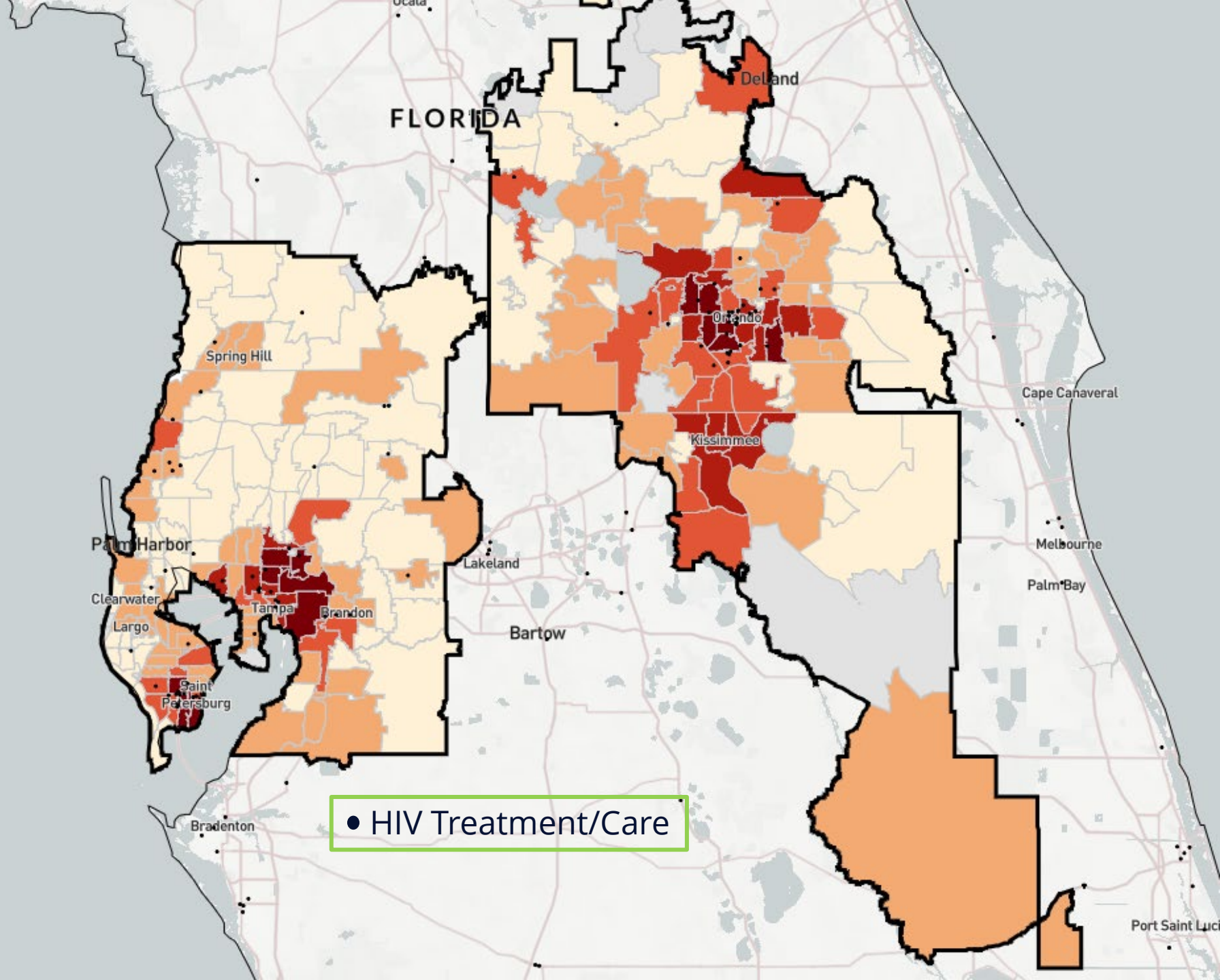
⚠ Data are not shown to protect privacy because a small number of cases and/or a small population size.



- Indicates PrEP service location

People Living with HIV in Orlando

Orlando
by the Numbers:



• HIV Treatment/Care

AIDSVu PrEP Data Resources and Research



Background on PrEP

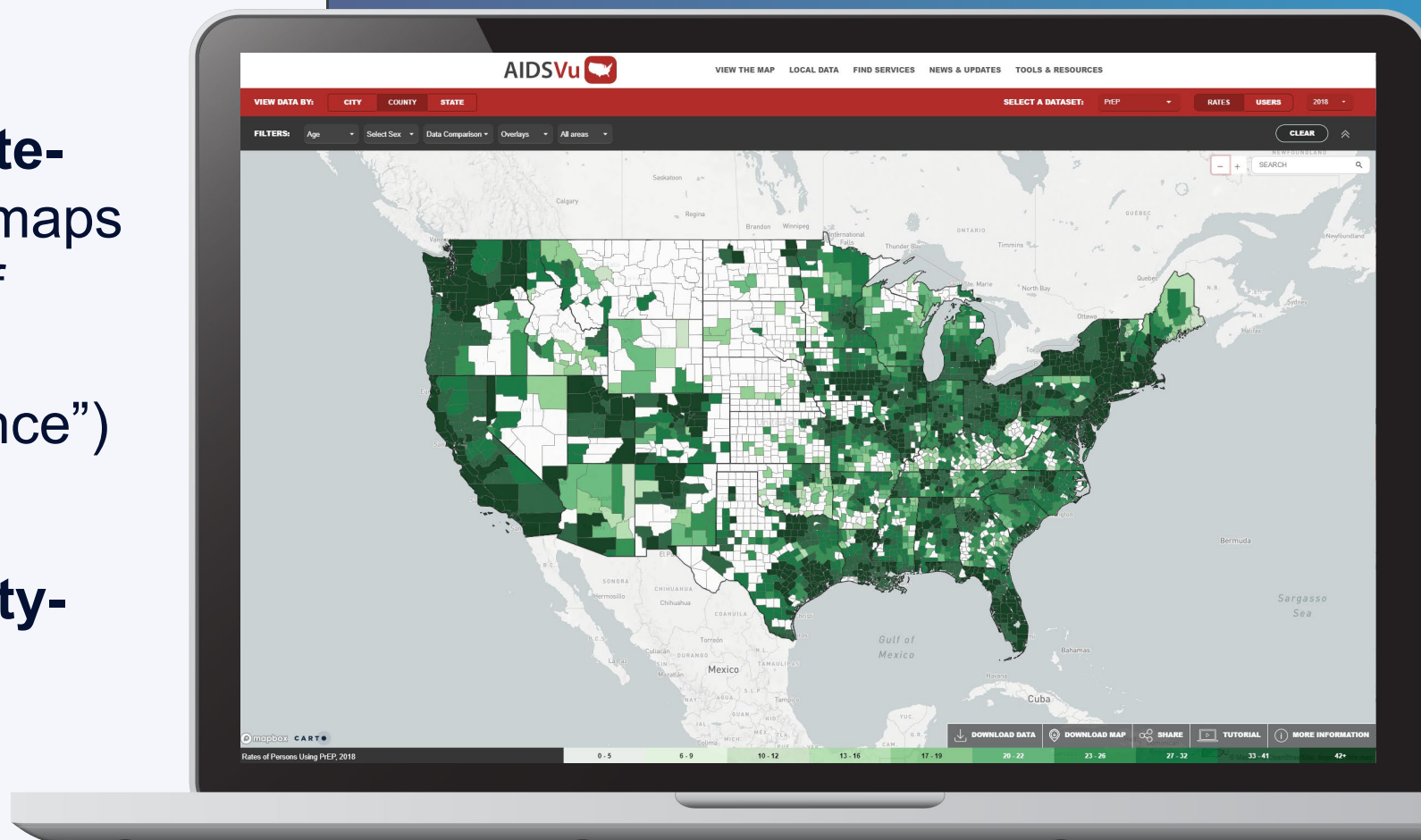
- CDC estimates that approximately 1.2 million people are at high-risk for HIV exposure and could benefit from comprehensive HIV prevention strategies, including PrEP
- Number of PrEP users has increased by more than 1,700% since 2012
- PrEP use varies significantly across different sexes, age groups,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



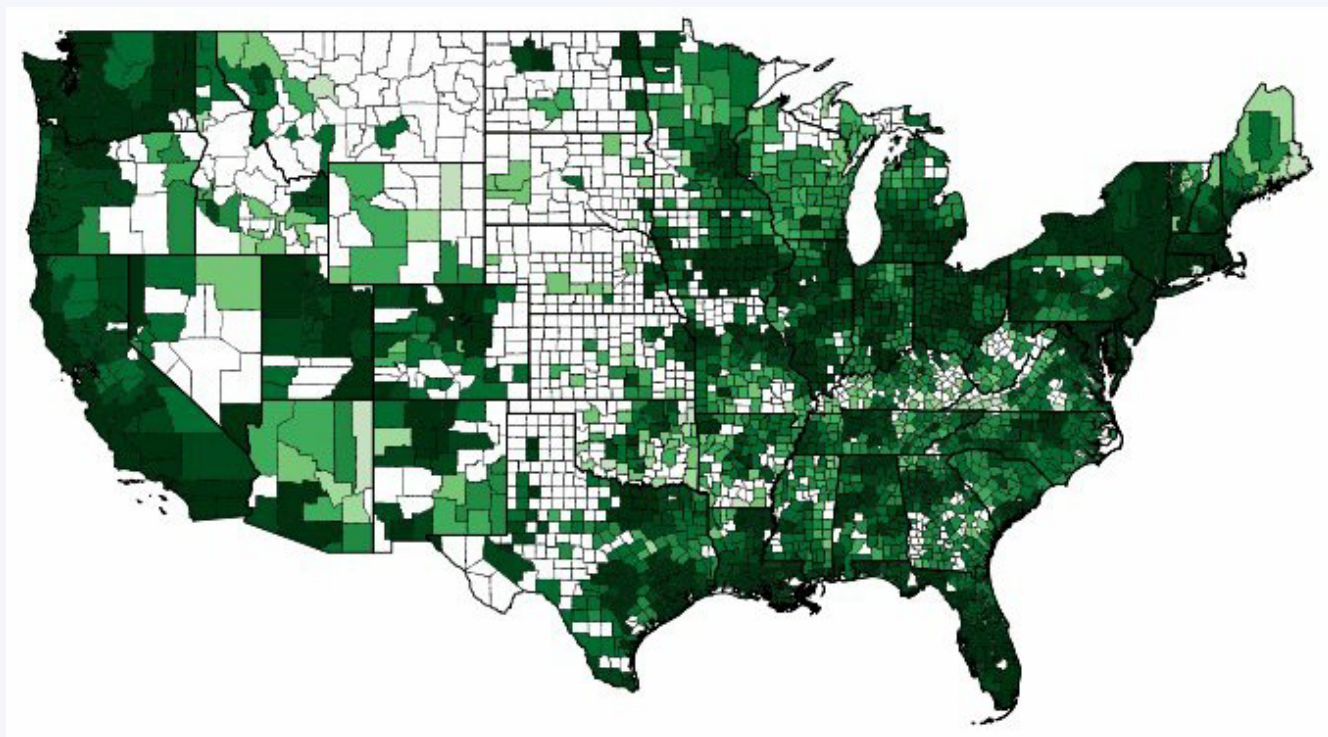
PrEP Data on AIDSVu

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



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

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

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

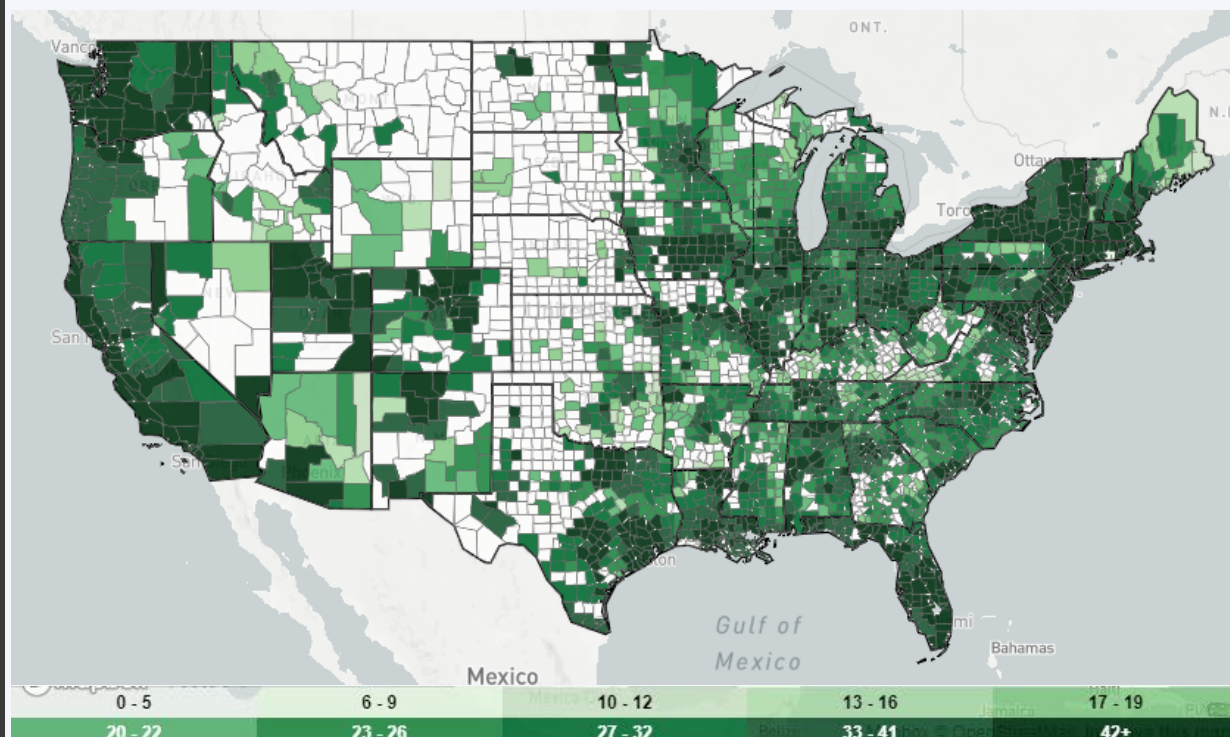
Sullivan et al.'s article in *Annals of Epidemiology*, **Methods for County-Level Estimation of Pre-exposure Prophylaxis Coverage and Application to the U.S. Ending the HIV Epidemic Jurisdictions**



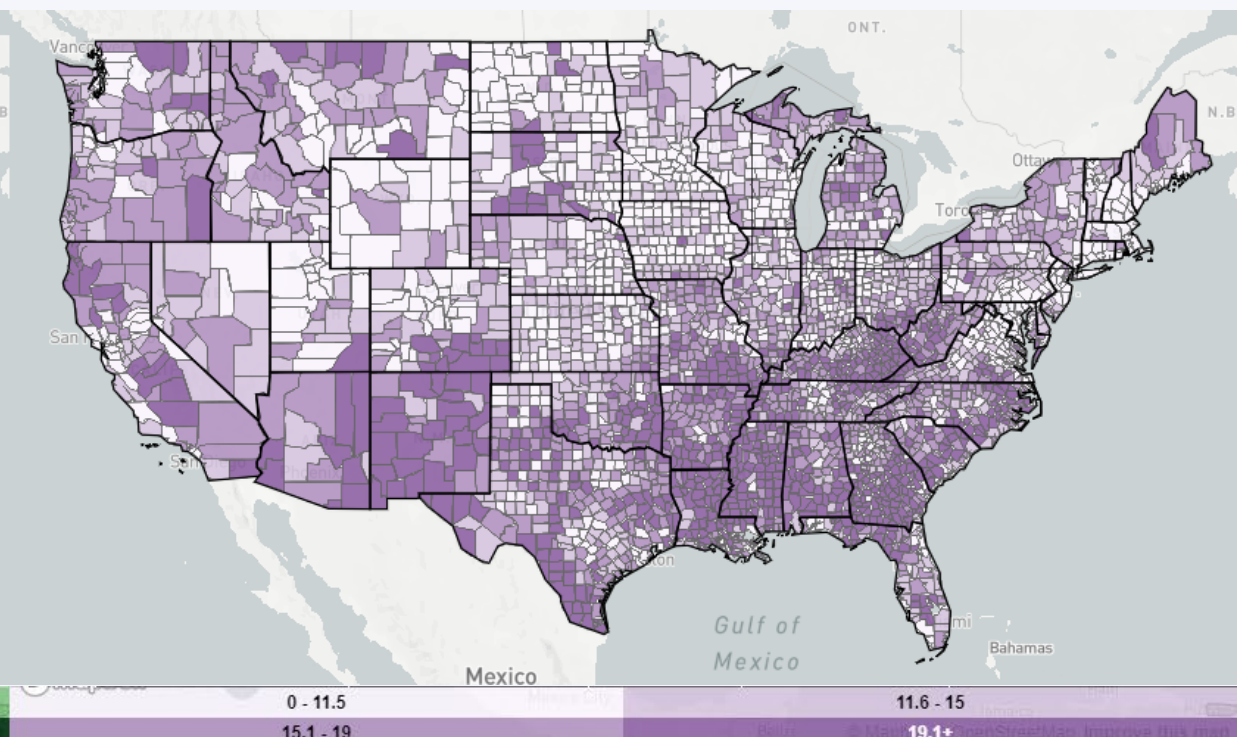
Siegler et al.'s article in *Annals of Epidemiology*, **Policy and County-Level Associations with HIV Pre-exposure Prophylaxis Use, United States, 2018**



PrEP Users & SDOH Data Comparisons



Rates of Persons Using PrEP, 2018

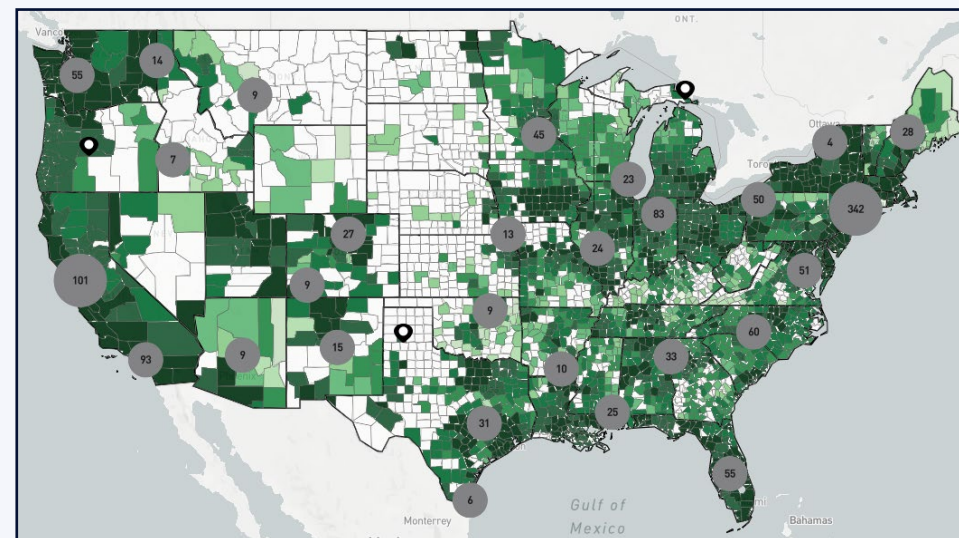


Percent of Population Living in Poverty, 2016

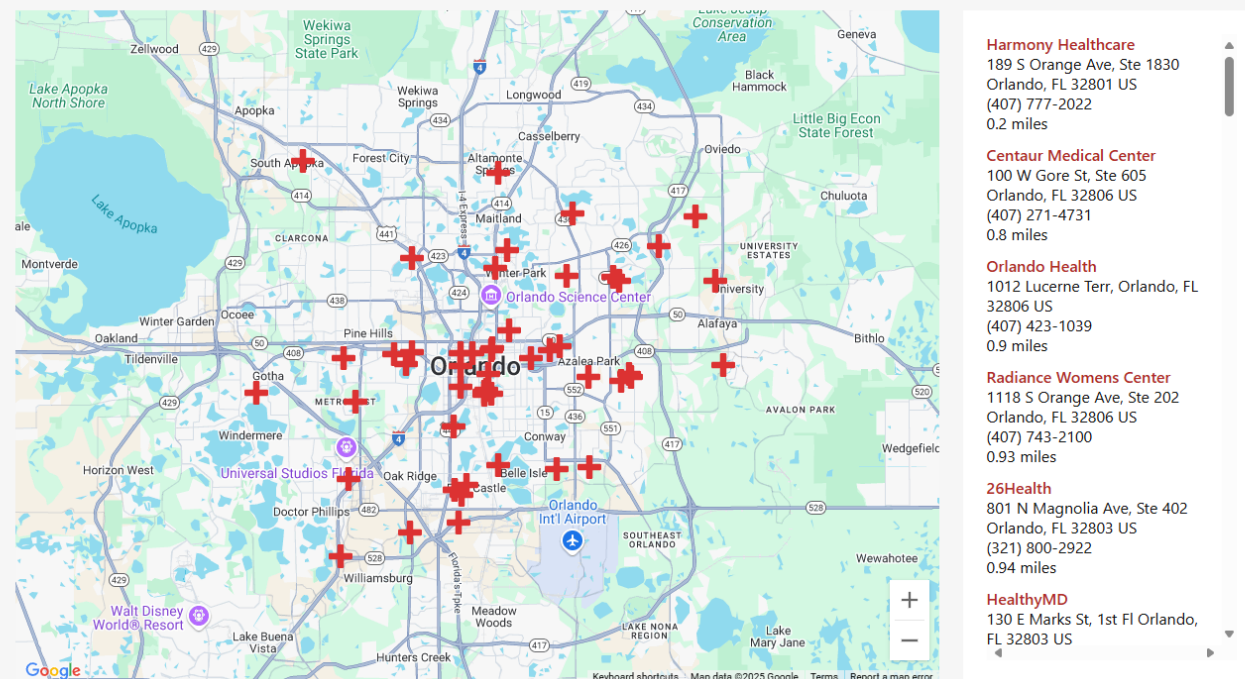
Note: All PrEP maps, data, and insights are pending finalization

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.



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



AIDSVu [VIEW THE MAP](#) [LOCAL DATA](#) [FIND SERVICES](#) [NEWS & EVENTS](#) [TOOLS & RESOURCES](#)

Deeper Look: PrEP

PrEP utilization data on AIDSVu reveal a 40% average annual increase in PrEP users from 2015 to 2018, however, significant disparities exist across different races, age groups, and geographic regions.

What is PrEP (pre-exposure prophylaxis)?

- **Definition:** PrEP is a way to prevent HIV by taking medicine before you have sex.
- **How it works:** PrEP works by blocking the HIV virus from entering your body.
- **Who can take it:** Anyone who is at risk of getting HIV can take PrEP.

The PrEP utilization data on AIDSVu reveal a 40% average annual increase in PrEP users from 2015 to 2018, however, significant disparities exist across different races, age groups, and geographic regions. More than 10,000 PrEP users were reported with HIV in 2018, underscoring the need to continue expanding access to PrEP and increasing awareness.

AIDSVu PrEP data, which represents a combination of national and state-level data, is available for each state from 2015 to 2018. These data are made available to help researchers, public health officials, and community organizations understand PrEP utilization and areas where it is needed most. Please see the [Data Hub](#) for additional information on data and analysis.

Using the PrEP Data

- Public Health Officials & Policy Makers**
 - Understand local PrEP use and disparities in order to target interventions and policies to increase access to PrEP.
 - Identify gaps in PrEP use and disparities in order to target interventions and policies to increase access to PrEP.
- Researchers**
 - Identify trends in PrEP use and disparities in order to target interventions and policies to increase access to PrEP.
 - Identify gaps in PrEP use and disparities in order to target interventions and policies to increase access to PrEP.
- Community**
 - Understand local PrEP use and disparities in order to target interventions and policies to increase access to PrEP.
 - Identify gaps in PrEP use and disparities in order to target interventions and policies to increase access to PrEP.

PrEP-to-Need Ratio (PnR)

The PrEP-to-Need Ratio (PnR) is the ratio of the number of PrEP users to the number of people who are at risk of getting HIV. A PnR of 1.0 indicates that the number of PrEP users is equal to the number of people who are at risk of getting HIV. A PnR greater than 1.0 indicates that the number of PrEP users is greater than the number of people who are at risk of getting HIV. A PnR less than 1.0 indicates that the number of PrEP users is less than the number of people who are at risk of getting HIV.

Interactive Maps

Understand PrEP utilization by geographic region and PrEP services location.

PrEP Services

Use AIDSVu's PrEP locator to understand the geographic distribution of PrEP services in your area.

PrEP Maps

Explore AIDSVu's PrEP maps to understand the geographic distribution of PrEP services in your area.

Beyond the Map

AIDSVu offers more than just maps. We provide a comprehensive overview of the HIV epidemic, its consequences, and the resources available to the community.

- PrEP Map**
Understand PrEP services by geographic region. [LEARN MORE](#)
- Find Services**
Use the PrEP locator to find PrEP services in your area. [LEARN MORE](#)
- Local Data**
View city and state-level data on HIV, PrEP, and other health issues. [LEARN MORE](#)

Share

Share our infographics to help raise awareness and drive conversations about PrEP.

Download [Download](#) [Download](#) [Download](#)

Learn From Experts

Read our series of Q&A's with leading experts in the field of PrEP.

- Yu Q&A: Yusuf Ransome on PrEP Use Through the Lens of Social and Behavioral Sciences** [LEARN MORE](#)
- Yu Q&A: Dr. Bisola Ojikutu on the Barriers to PrEP Use Among African Americans** [LEARN MORE](#)
- Yu Q&A: Dr. Dawn Smith on PrEP Update Barriers for Black, Gay and Bisexual Men and Black Women** [LEARN MORE](#)

For More Information

Learn more about PrEP with the following resources:

- [CDC PrEP Overview](#) [LEARN MORE](#)
- [National HIV/AIDS Strategy](#) [LEARN MORE](#)
- [Greater Than AIDS](#) [LEARN MORE](#)
- [HIV.gov](#) [LEARN MORE](#)
- [PrEPWatch](#) [LEARN MORE](#)

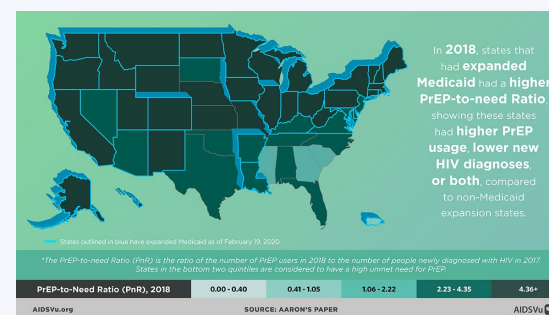
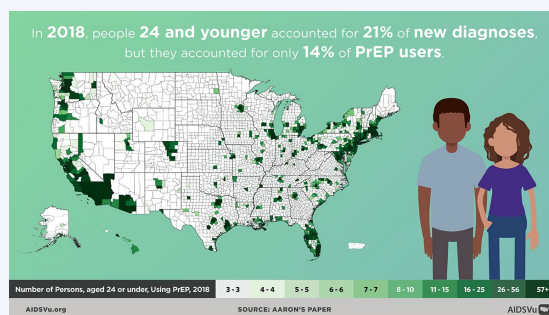
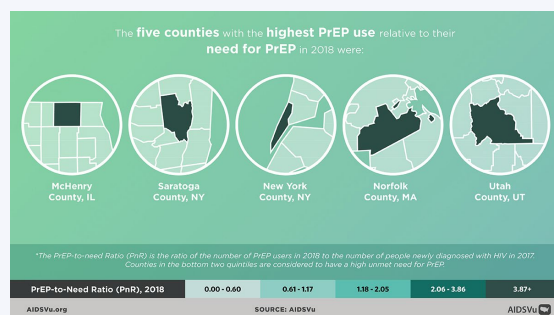
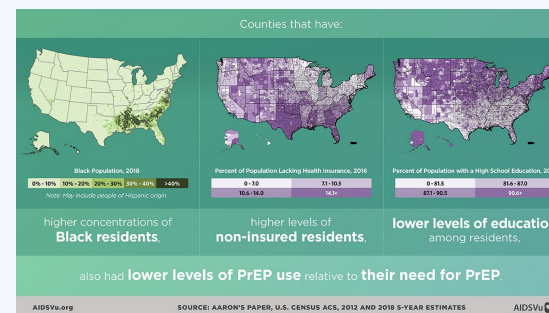
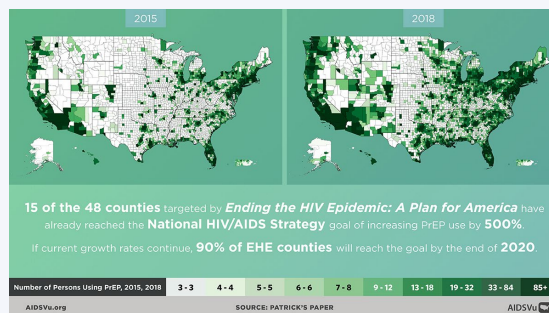
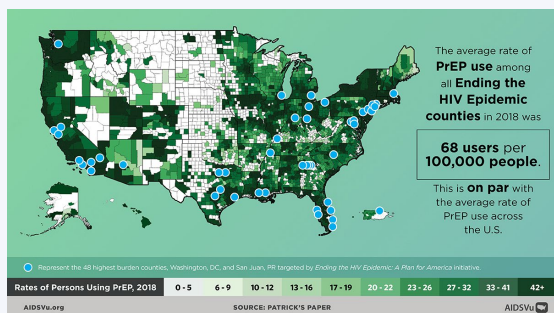
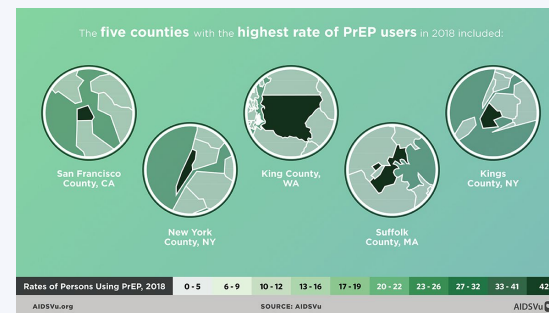
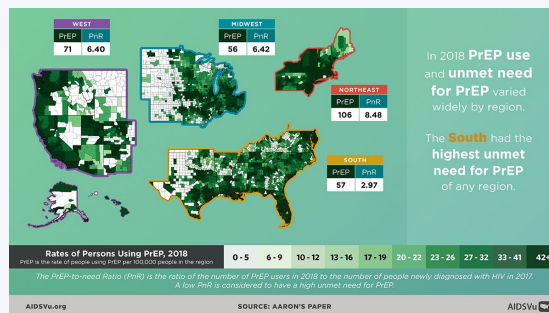
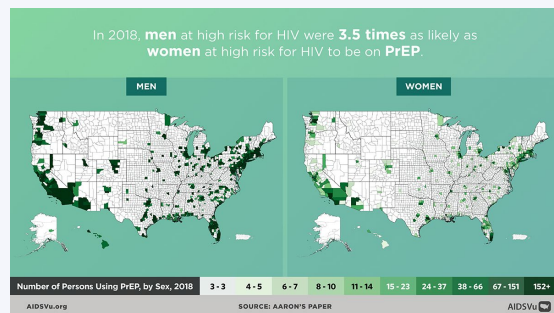
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AIDSVu is a federally-funded project of the University of California, San Francisco, in partnership with the University of California, Los Angeles, and the University of California, Berkeley. AIDSVu is a 501(c)(3) non-profit organization. © 2019 AIDSVu. All rights reserved. PRIVACY POLICY | CONTACT US

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

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[Tools & Resources](#)

Tools & Resources

Data Incubator

Datasets

Videos

External Resources

Year

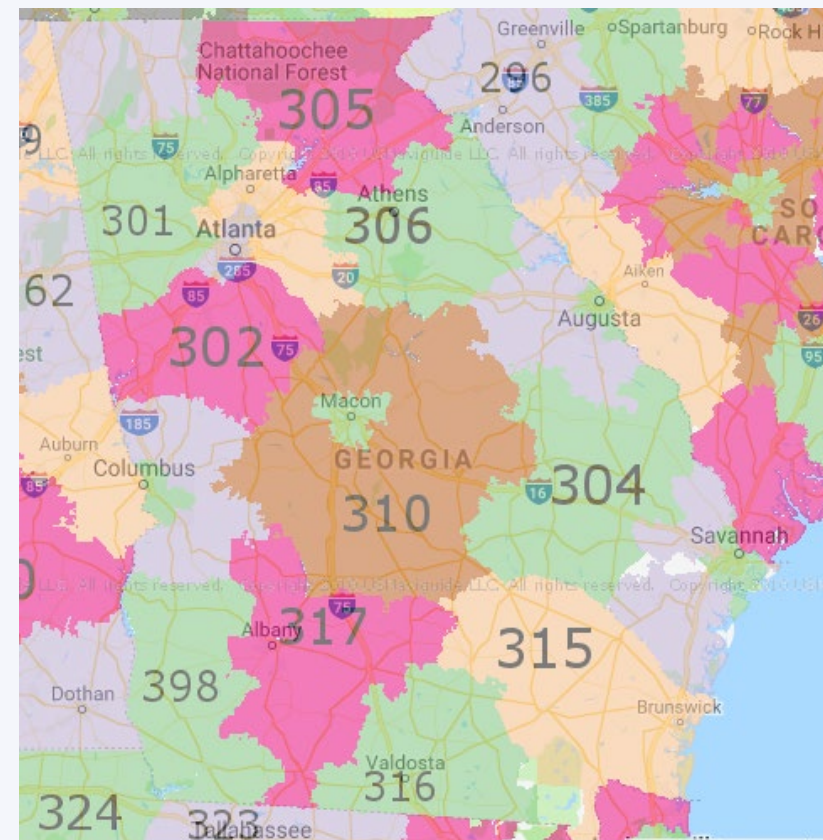
Location

PrEP-to-Need Ratio, PrEP

If you downloaded a national, regional or state new diagnoses dataset between September 9-16, 2024, (with a file name suffix of 20240822), please redownload the file(s) due to a technical issue.

National

2012 National PrEP	XLSX	2018 National PrEP	XLSX
2012 National PrEP-to-Need Ratio (PNR)	XLSX	2018 National PrEP-to-Need Ratio (PNR)	XLSX
2013 National PrEP	XLSX	2019 National PrEP	XLSX
2013 National PrEP-to-Need Ratio (PNR)	XLSX	2019 National PrEP-to-Need Ratio (PNR)	XLSX
2014 National PrEP	XLSX	2020 National PrEP	XLSX
2014 National PrEP-to-Need Ratio (PNR)	XLSX	2020 National PrEP-to-Need Ratio (PNR)	XLSX
2015 National PrEP	XLSX	2021 National PrEP	XLSX



ZIP3 boundary example for Georgia

What is health equity?

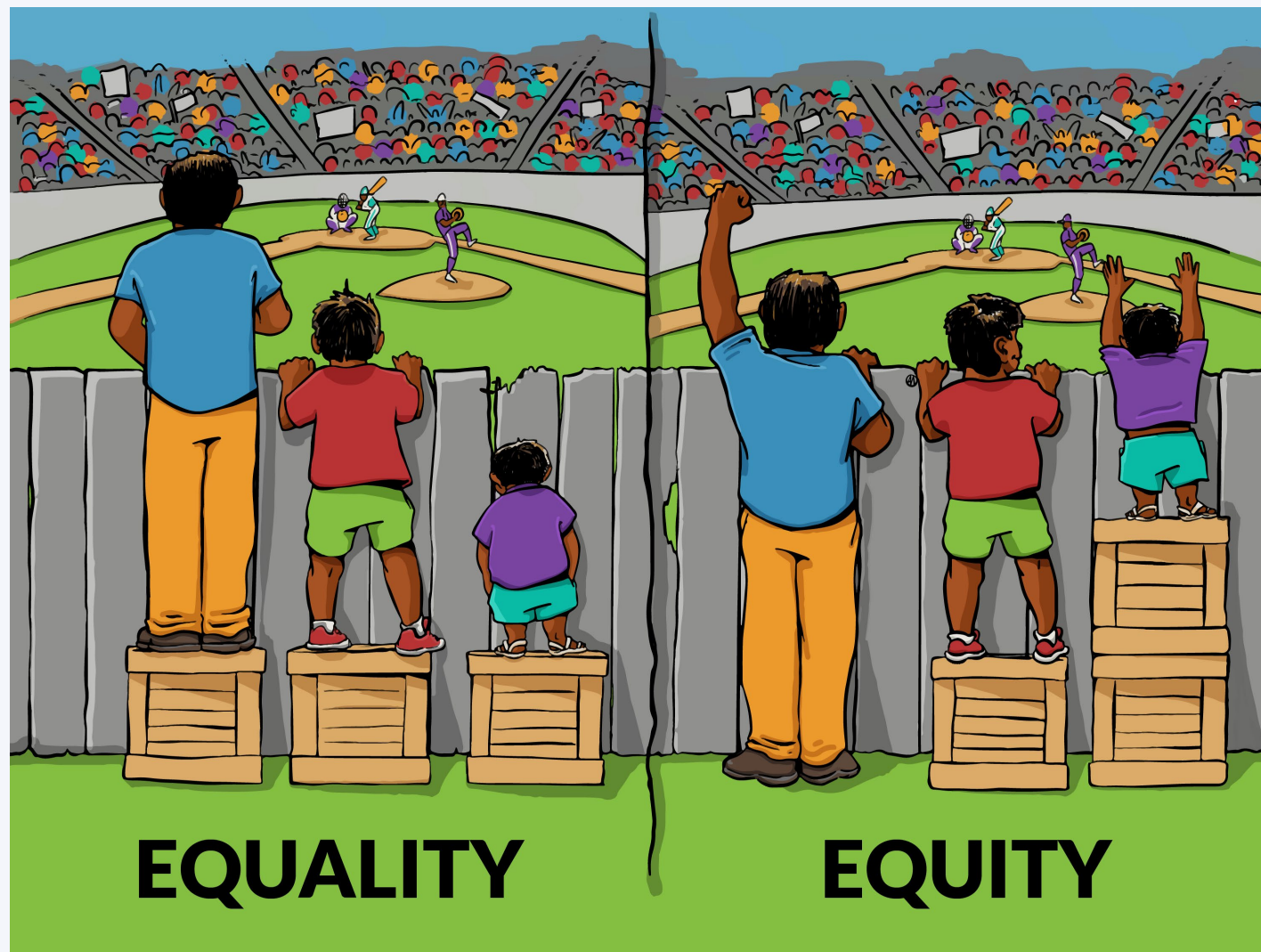
“Health equity means that everyone has a fair and just opportunity to be as healthy as possible. This requires removing obstacles to health such as poverty, discrimination, and their consequences, including powerlessness and lack of access to good jobs with fair pay, quality education and housing, safe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

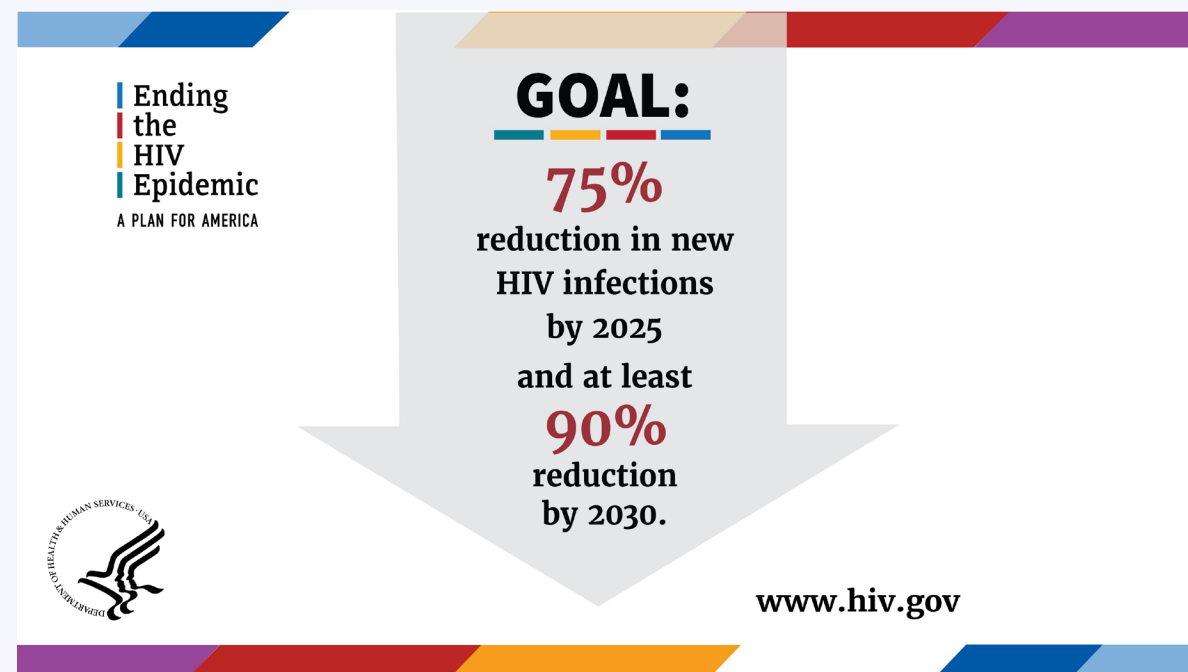
- Centers for Disease Control and Prevention

Is Equity the same as Equality?



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



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

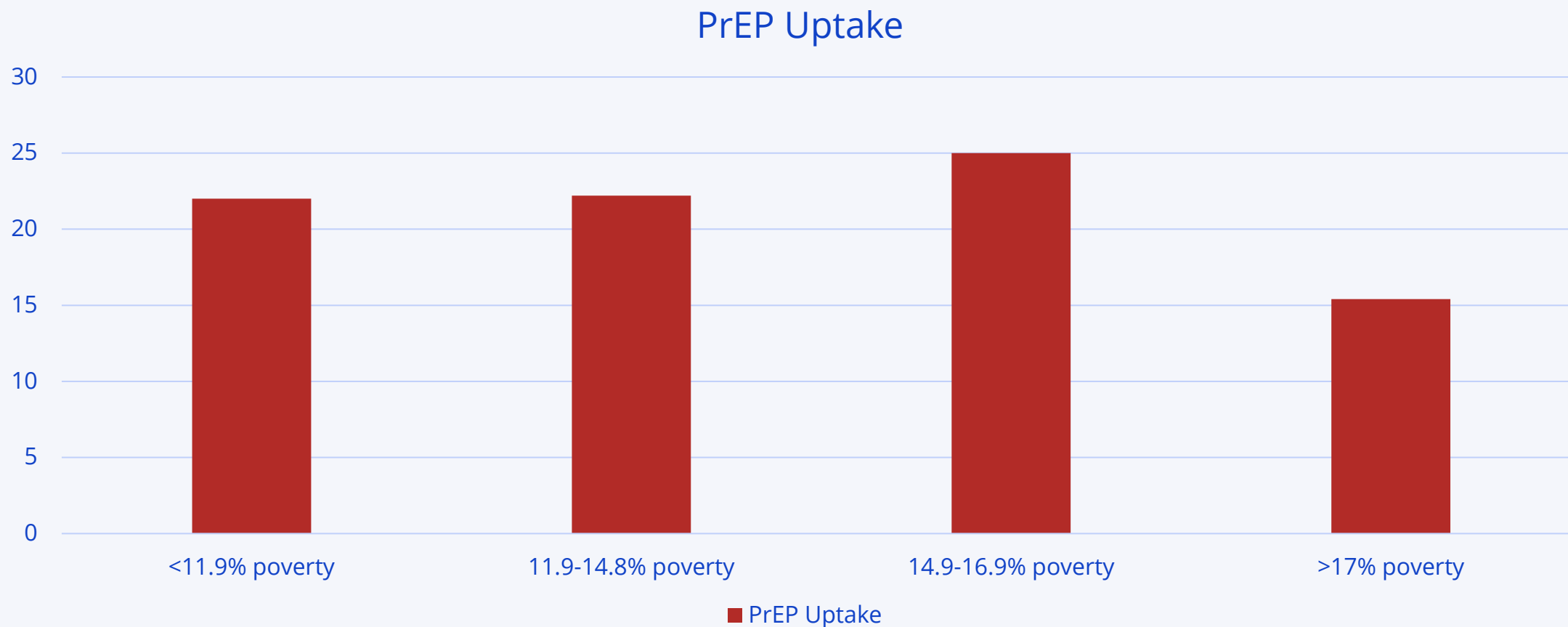


Illustration of Equality versus Equity – PrEP Uptake

Chart Title

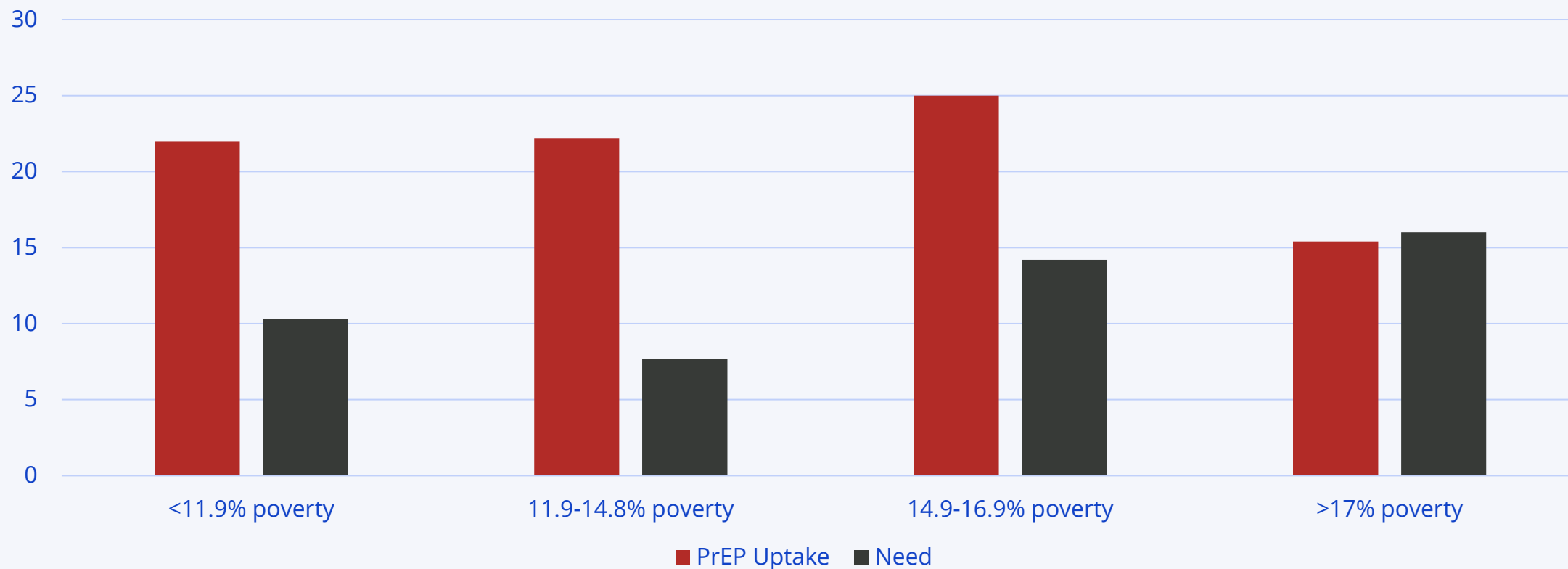
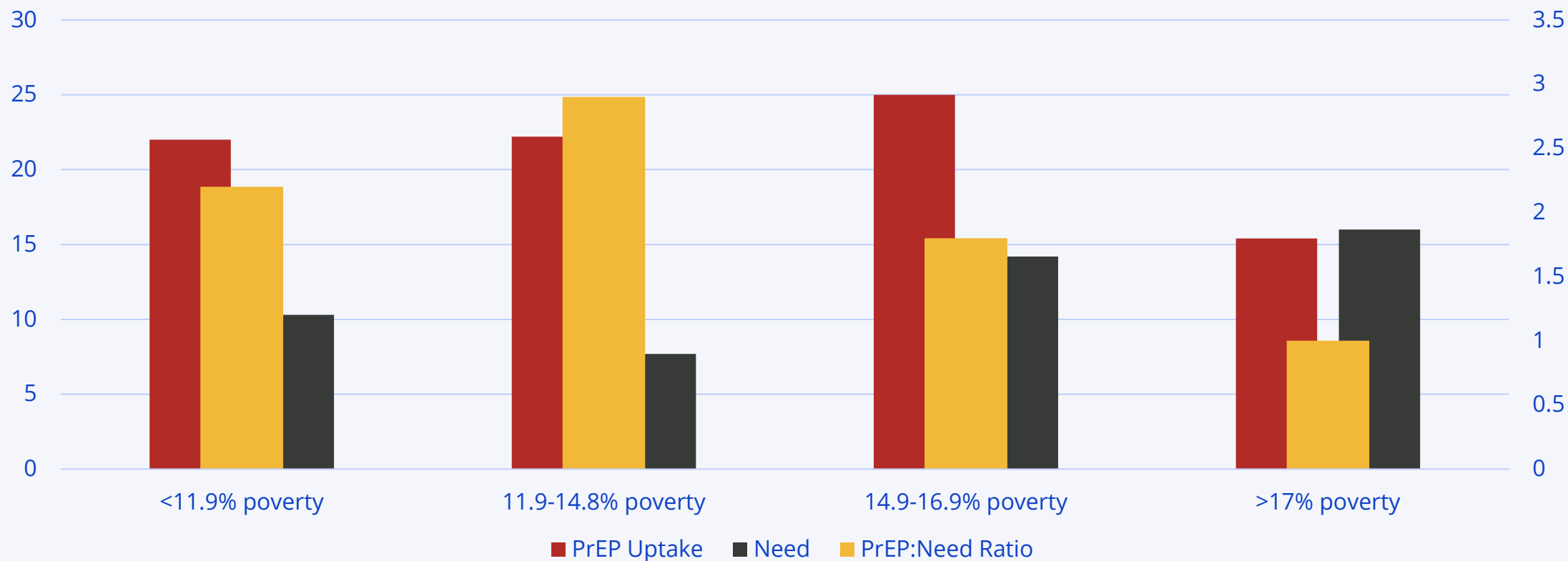


Illustration of Equality versus Equity – PrEP Uptake

Chart Title





Modeling health inequities

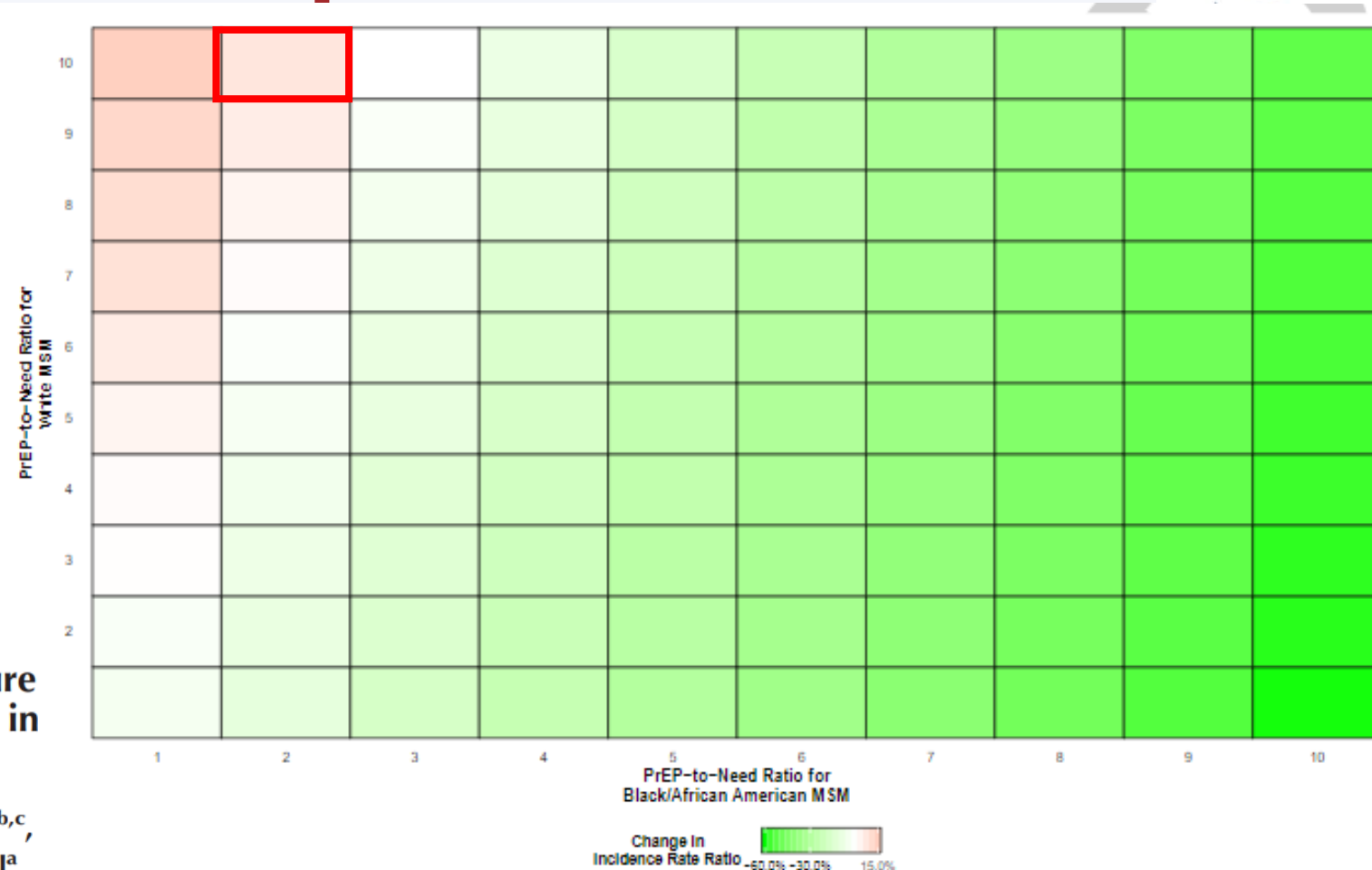
Question: What will happen to Black/white disparities in HIV if PrEP scaleup is not equitable (i.e., proportional to the epidemic need?)

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



Interested in Florida PrEP to Need Ratios?



PrEP Use Data in Action

What can we do to 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

Annals of Epidemiology 45 (2020) 24–31



Contents lists available at [ScienceDirect](#)

Annals of Epidemiology



Original article

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



Aaron J. Siegler, PhD ^{a,*}, C. Christina Mehta, PhD ^b, Farah Mouhanna, MS ^{a,c}, Robertino Mera Giler, MD, PhD ^d, Amanda Castel, MD, MPH ^c, Elizabeth Pembleton, MPH ^e, Chandni Jaggi, MPH ^e, Jeb Jones, PhD ^e, Michael R. Kramer, PhD ^e, Pema McGuinness, MPH ^d, Scott McCallister, MD ^d, Patrick S. Sullivan, DVM, PhD ^e

^a Department of Behavioral Sciences and Health Education, Rollins School of Public Health, Emory University, Atlanta, GA

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^e Department of Epidemiology, Rollins School of Public Health, Emory University, Atlanta, GA

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				
<i>Males</i>	177433 (94)	135.3	23.5	5.7
<i>Females</i>	11932 (6)	8.7	5.3	1.6
Age groups				
<i>Less than 25 years</i>	26777 (14)	51.5	15.6	3.3
<i>25 to 34 years</i>	75096 (39)	170.5	30.2	5.6
<i>35 to 44 years</i>	44724 (23)	110.0	18.0	6.1
<i>45 to 54 years</i>	30566 (16)	70.9	13.1	5.4
<i>55 years and older</i>	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) ^o	New HIV Diagnoses per 100,000 population ^o	PrEP-to-Need Ratio (PnR) ⁴
<i>Policy</i>				
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) ^o	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

Effect	County, State, Region		
	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

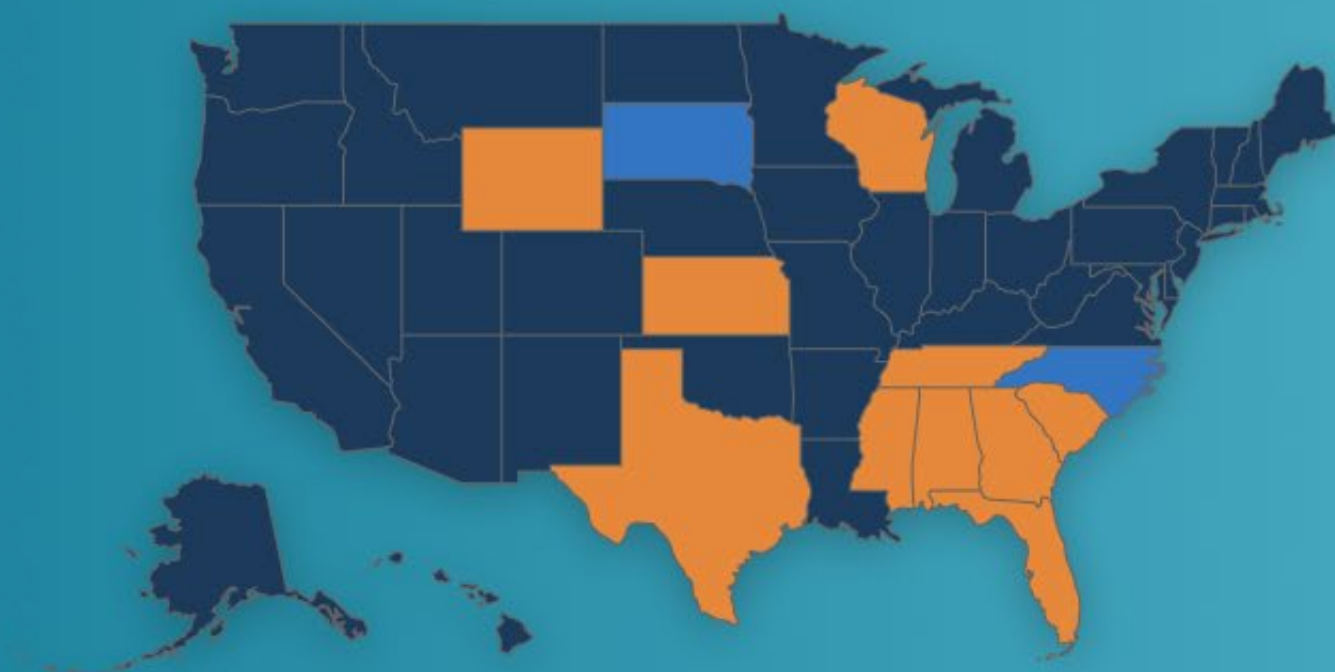
Summary: PrEP and Policy

- 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.*

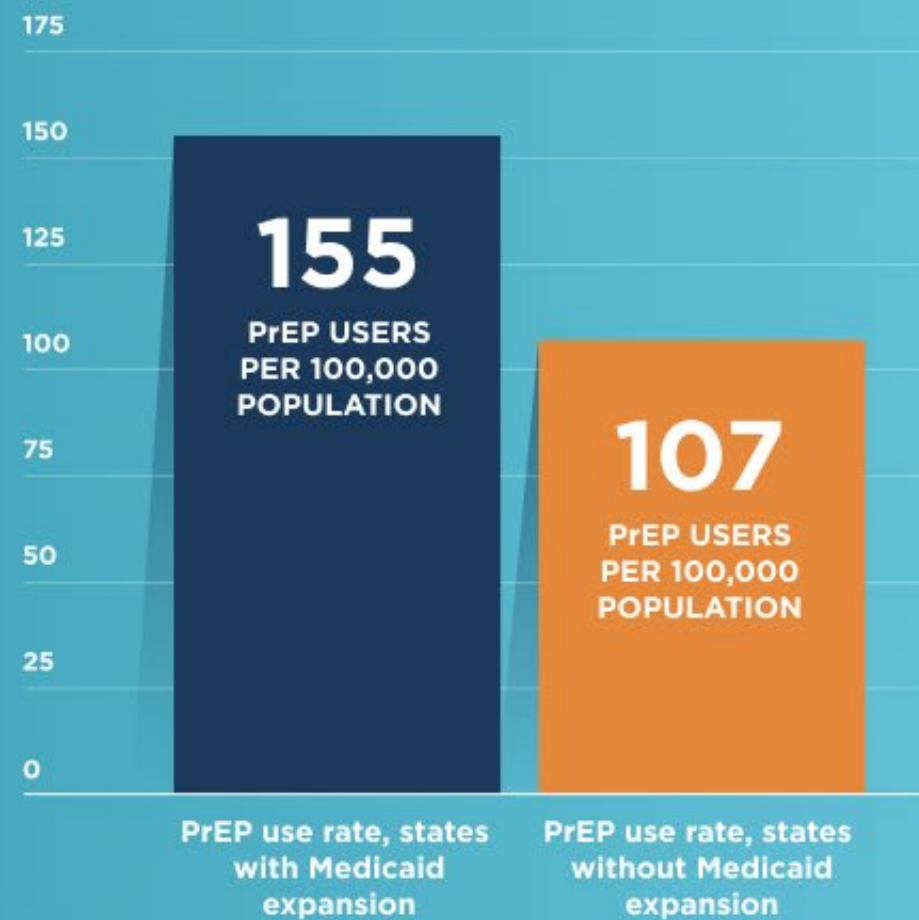
39 out of 51 states **expanded Medicaid**
as of December 2022.



Adopted and Implemented

Adopted but Not Implemented

Not Adopted

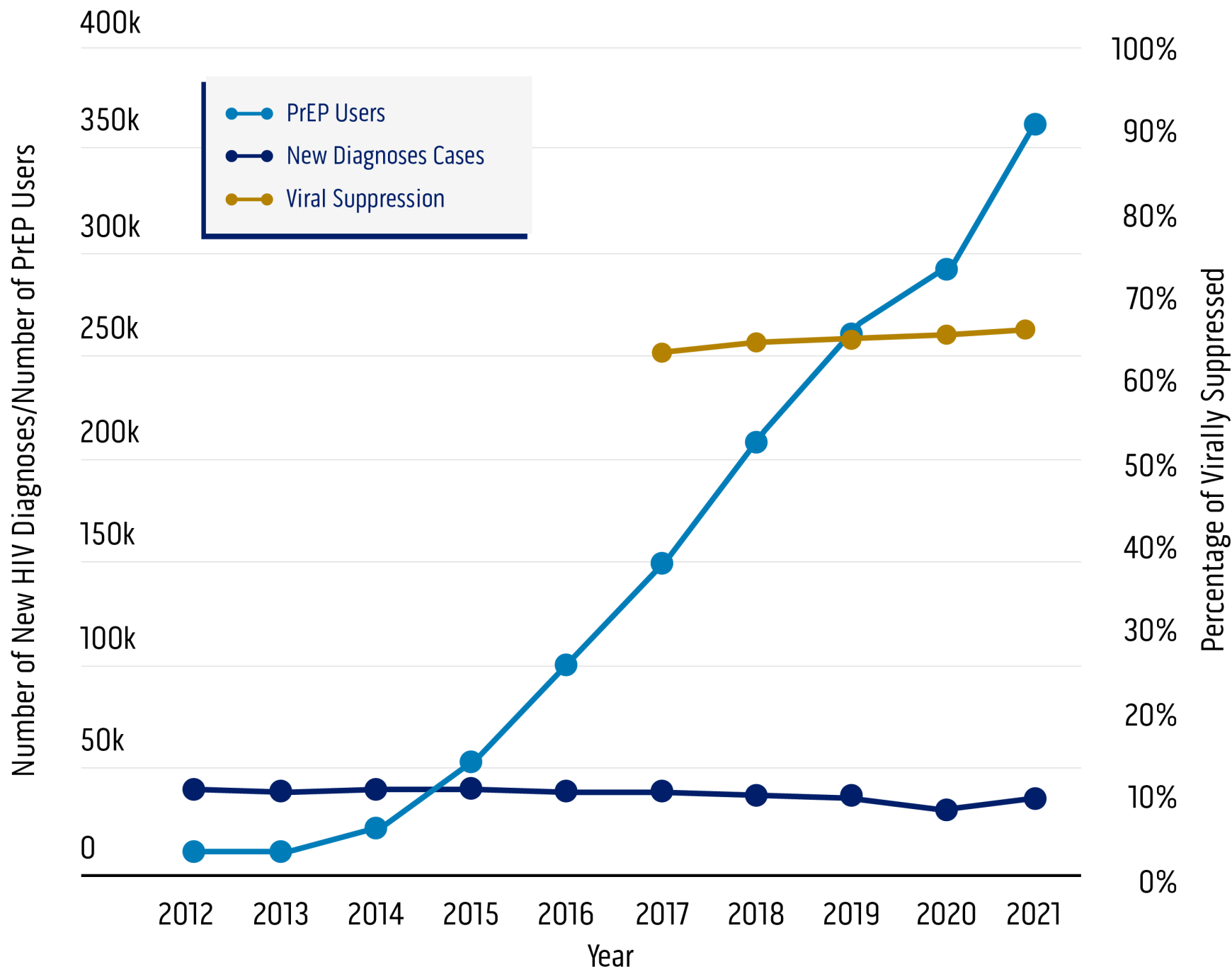


Equity of PrEP uptake by race, ethnicity, sex and region in the United States in the first decade of PrEP: a population-based analysis

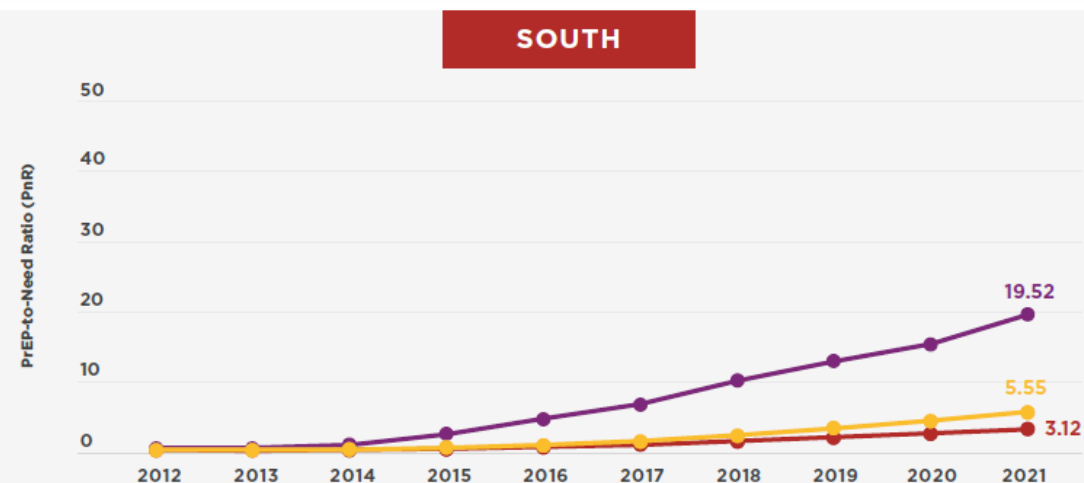
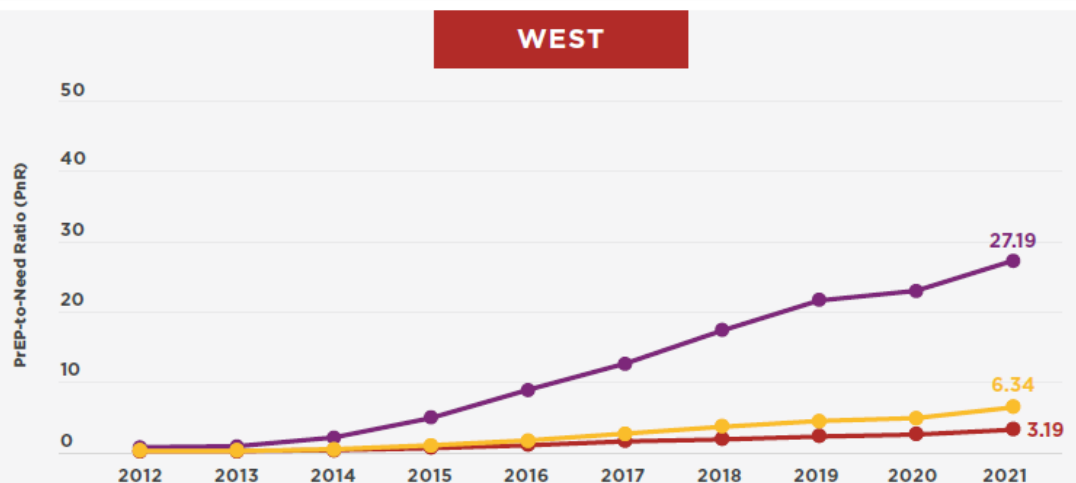
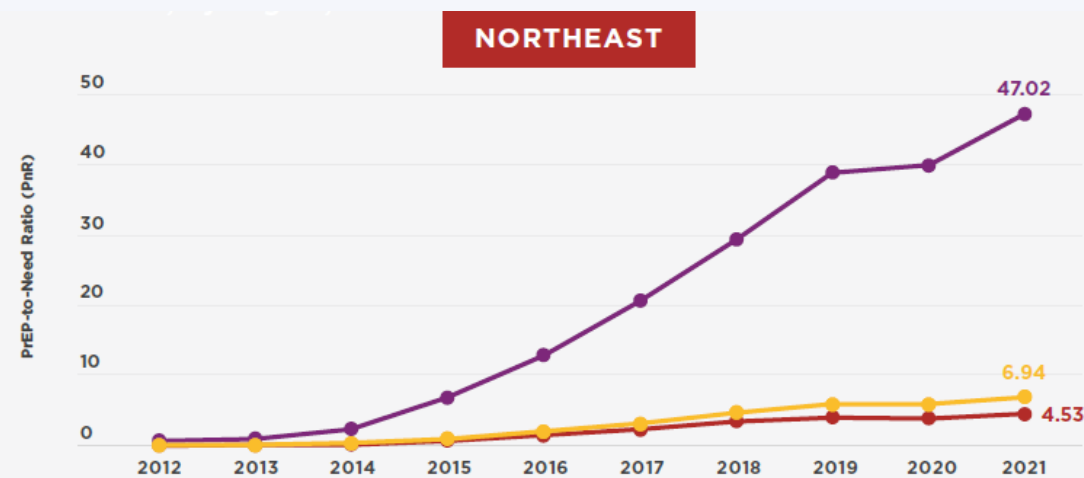
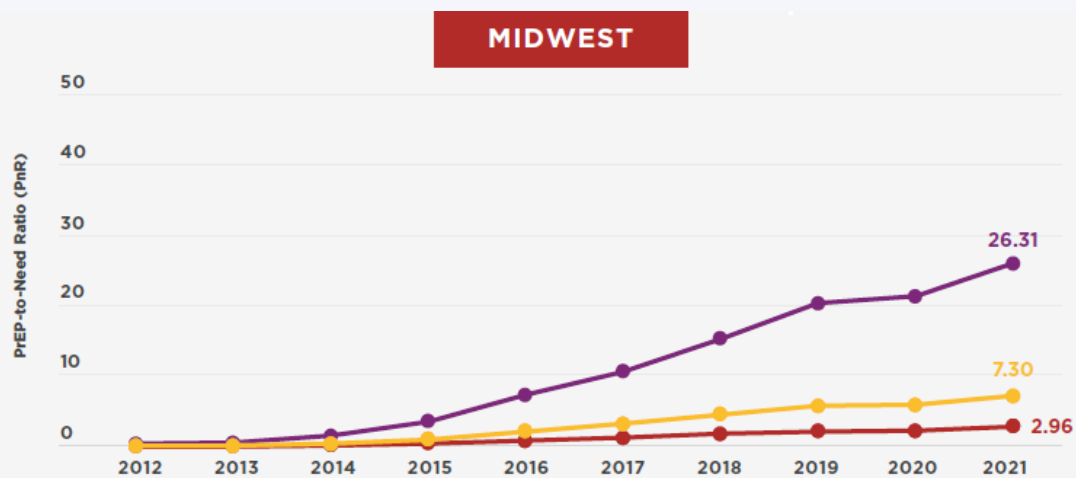
Patrick Sullivan, DVM, PhD; Stephanie DuBose, MPH; Amanda Castel, MD, MPH; Karen Hoover, MD; Marta Juhasz, MPH; Gordon Le, MPH; Shamaya Whitby; Aaron Siegler, PhD

PrEP users, new HIV diagnoses and VS overall, United States 2012-2021

AIDSVu.org



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



● Black ● White ● Hispanic

The PrEP-to-Need Ratio (PnR) is the number of PrEP users divided by the number of new diagnoses in a given year. PnR serves as a measurement of how PrEP use compares to the need for PrEP in a population.



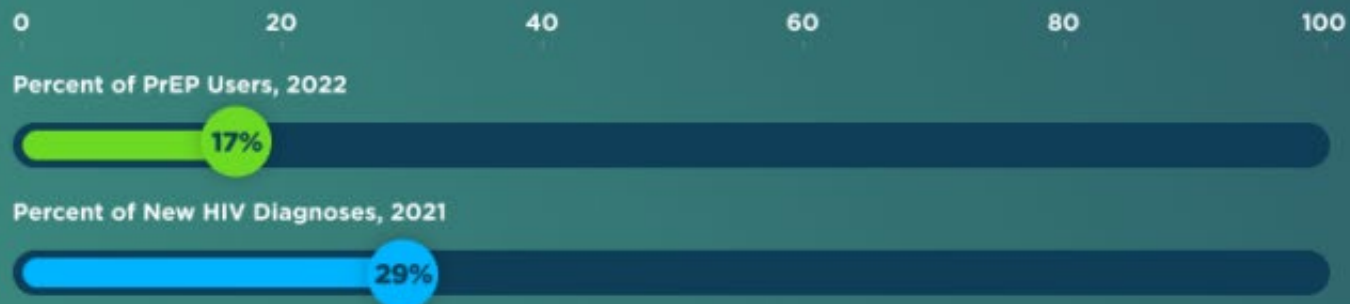
Black people represented only **14% of PrEP users (2022)** but accounted for **40% of new HIV diagnoses (2021)**, indicating a significant unmet need for PrEP.



Black People



**Hispanic/
Latinx People**



White People



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

Patrick Sullivan, DVM, PhD¹; Marta Juhasz, MPH²; Gordon Le, MPH¹; Kamaria Brisco, MPH¹; Stephanie DuBose, MPH¹

1. Emory University
Rollins School of Public Health
Atlanta, Georgia

2. Saluda Analytics, Budapest, Hungary

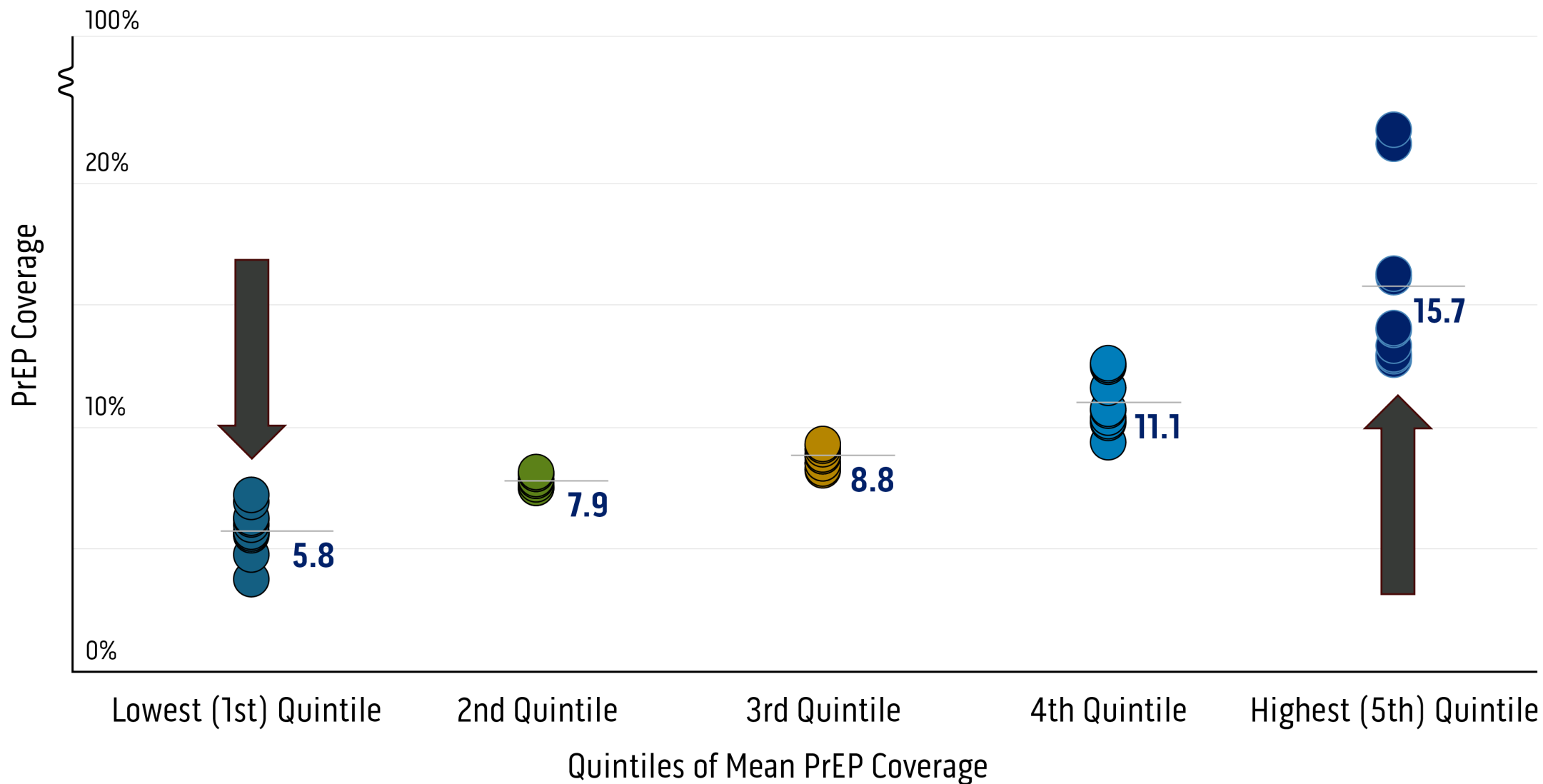
Background

- 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.

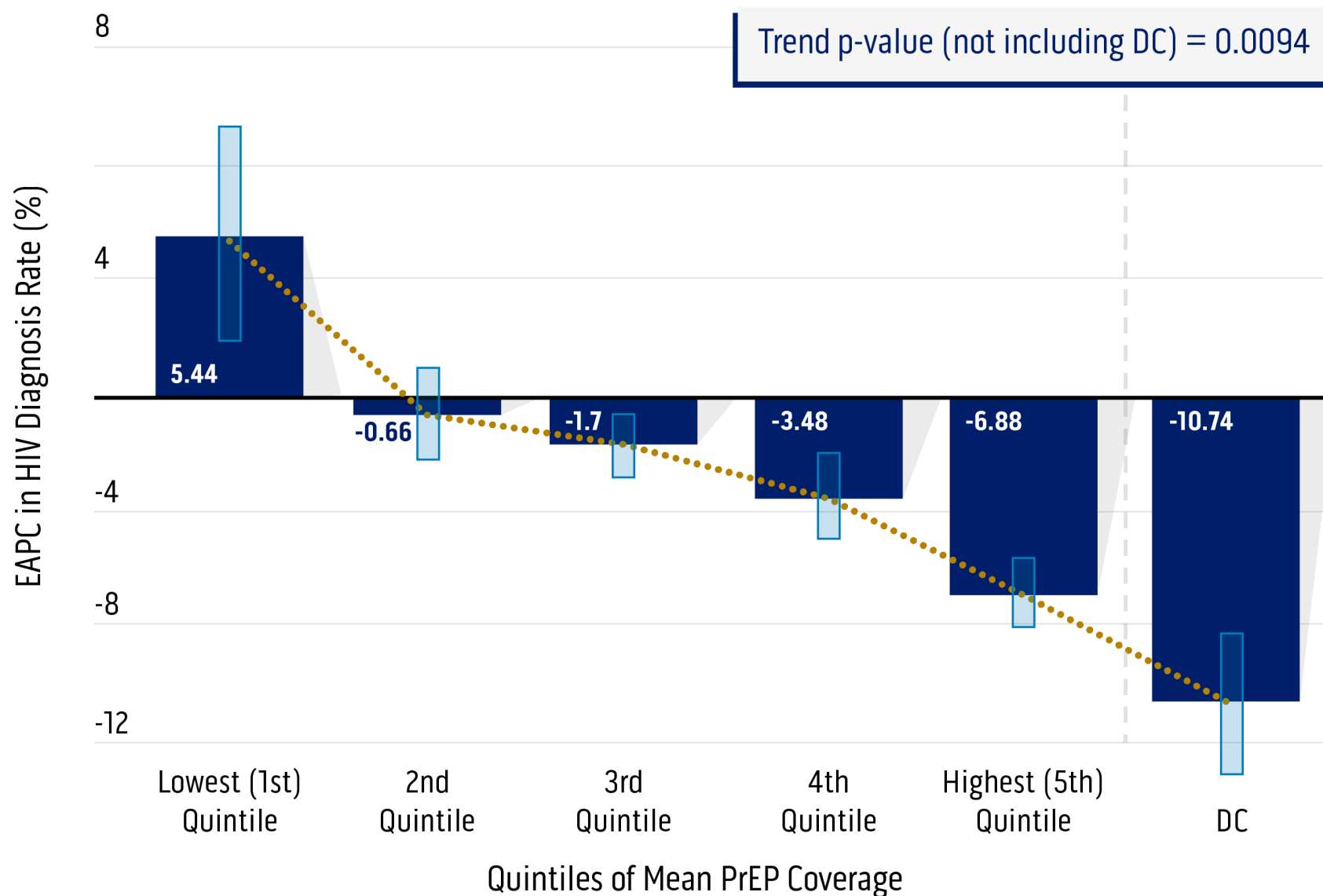
Methods

- 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

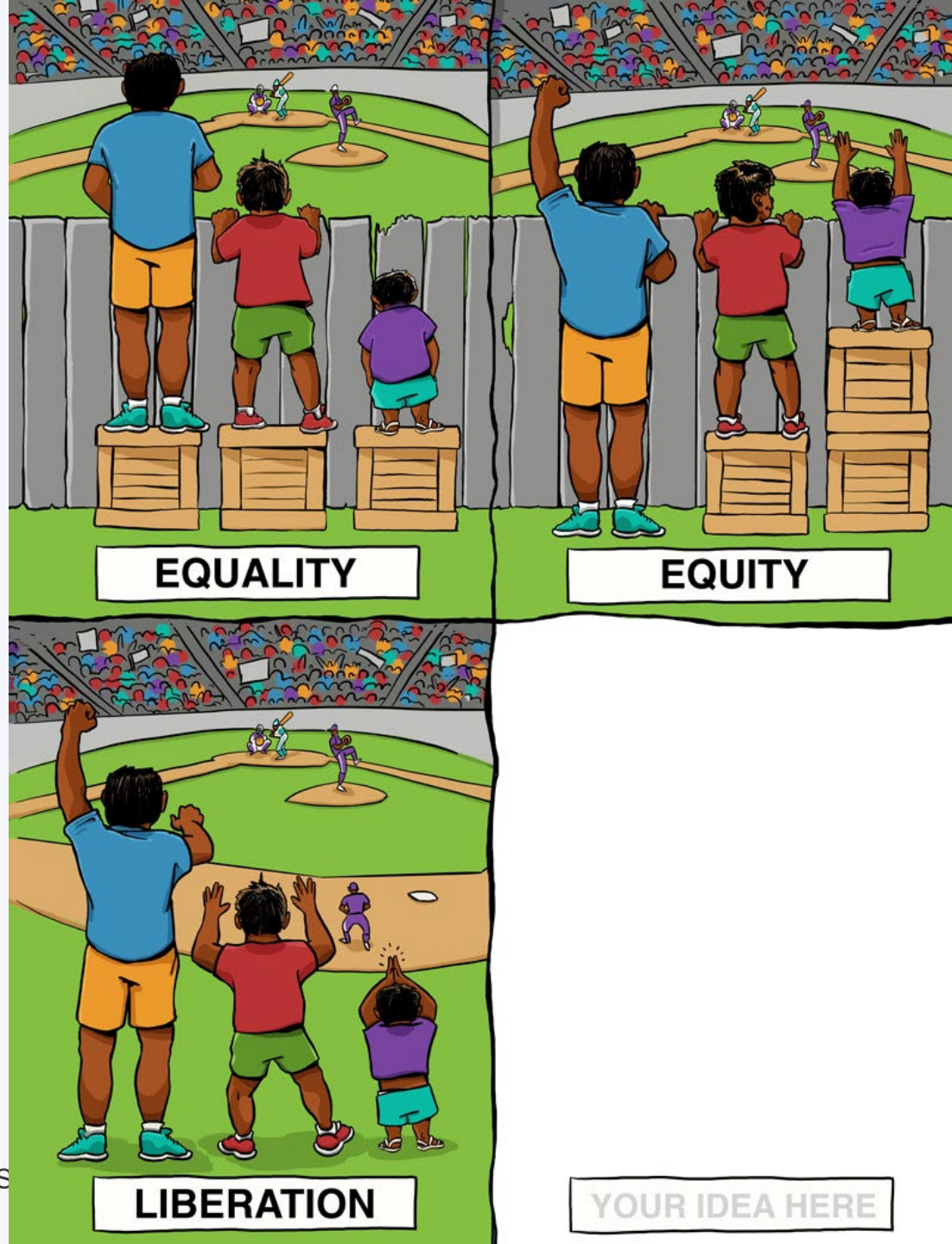


Quintile-specific Estimated Annual Percent Change in HIV Diagnoses Rates, Adjusted for Viral Suppression Rates, by Quintile of Mean PrEP Coverage, 50 U.S. States and the District of Columbia, 2012-2021



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



Questions?

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