



## Selected National HIV Prevention and Care Outcomes

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- Used to gauge progress towards national HIV prevention and care goals and direct resources
- Monitor steps required from the time a person receives an HIV diagnosis to achieving viral suppression using data from the National HIV Surveillance System (NHSS):
  - Diagnosis of HIV infection
  - Linkage to care
  - Receipt of care
  - Retained in care
  - Virally suppressed
- Monitor persons classified as having been prescribed pre-exposure prophylaxis (PrEP) relative to the estimated number of persons with indications for PrEP (PrEP coverage)



## National Indicators

- Represent the best available data for measuring progress
- Use National HIV Surveillance System (NHSS) data
  - Timely and routine
  - Can stratify by demographic characteristics
  - Allow states the ability to monitor their progress toward national goals in their jurisdictions using prioritized data sources available at the state level
- Use different denominators for each measure

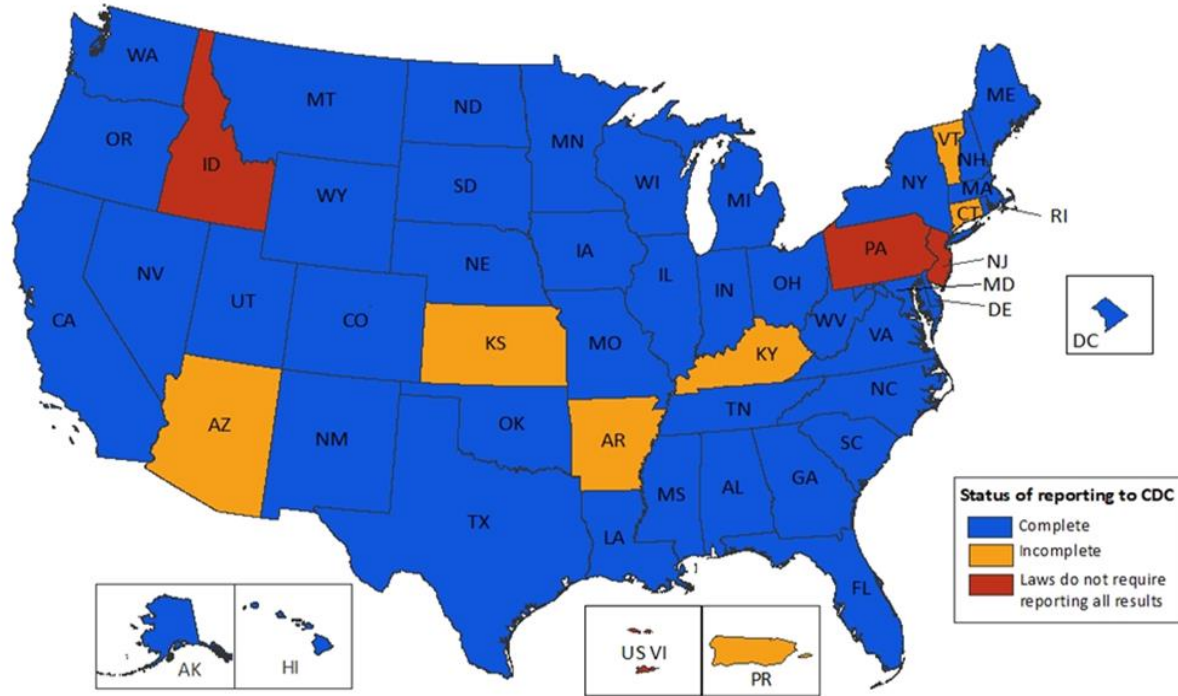


## Calculation of NHSS Indicators

- The following indicators only use NHSS data from areas with complete reporting of CD4 and viral load test results to CDC (41 states and the District of Columbia):
  - Linkage to care (within 1 month)
  - Receipt of care
  - Retention in care
  - Viral suppression within 6 months of HIV diagnosis in 2018
  - Viral suppression among persons living with diagnosed HIV



# HIV Surveillance Reporting Areas with Complete Reporting of CD4 and Viral Load Test Results to the National HIV Surveillance System, as of December 2019



Note. Complete reporting was defined as: The jurisdiction’s laws/regulations required the reporting of all CD4 and viral load results to the state or local health department. Laboratories that perform HIV-related testing for the jurisdiction had reported a minimum of 95% of HIV-related test results to the state or local health department. As of December 31, 2019, the jurisdiction had reported (to CDC) at least 95% of all CD4 and viral load test results received from January 2017 through September 2019.



## Calculation of NHSS Indicators

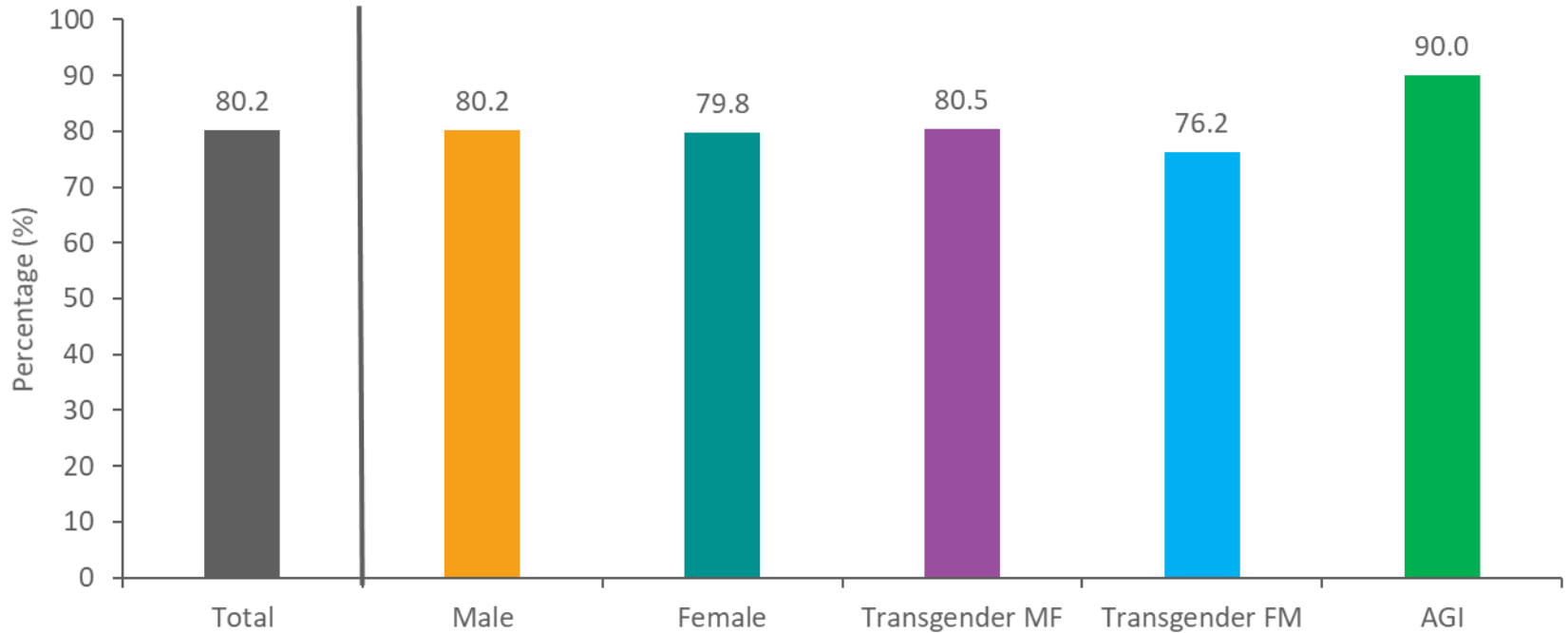
- Linkage to care, viral suppression within 6 months of HIV diagnosis
  - Numerator:
    - Linkage to care: persons aged  $\geq 13$  years with HIV diagnosed during 2018 and who had  $\geq 1$  viral load (VL) or CD4 test within 1 month of HIV diagnosis
    - Viral suppression within 6 months of HIV diagnosis: persons aged  $\geq 13$  years with HIV diagnosed during 2018 and who had a VL test result of  $< 200$  copies/mL within 6 months of HIV diagnosis
  - Denominator: persons aged  $\geq 13$  years with HIV infection diagnosed during 2018 (41 states and the District of Columbia)

## Calculation of NHSS Indicators

- Receipt of care, retention in care, viral suppression
  - Numerator:
    - Receipt of care: persons with  $\geq 1$  test (CD4 or VL) in 2018
    - Retention in care: persons with  $\geq 2$  tests (CD4 or VL)  $\geq 3$  months apart in 2018
    - Viral suppression among persons living with diagnosed HIV: persons with  $< 200$  copies/mL on their most recent VL test
  - Denominator: persons aged  $\geq 13$  years with HIV diagnosed by the end of 2017 and alive at year-end 2018 (41 states and the District of Columbia)



# Linkage to HIV Medical Care within 1 Month after HIV Diagnosis during 2018, among Persons Aged $\geq 13$ Years, by Gender—41 States and the District of Columbia



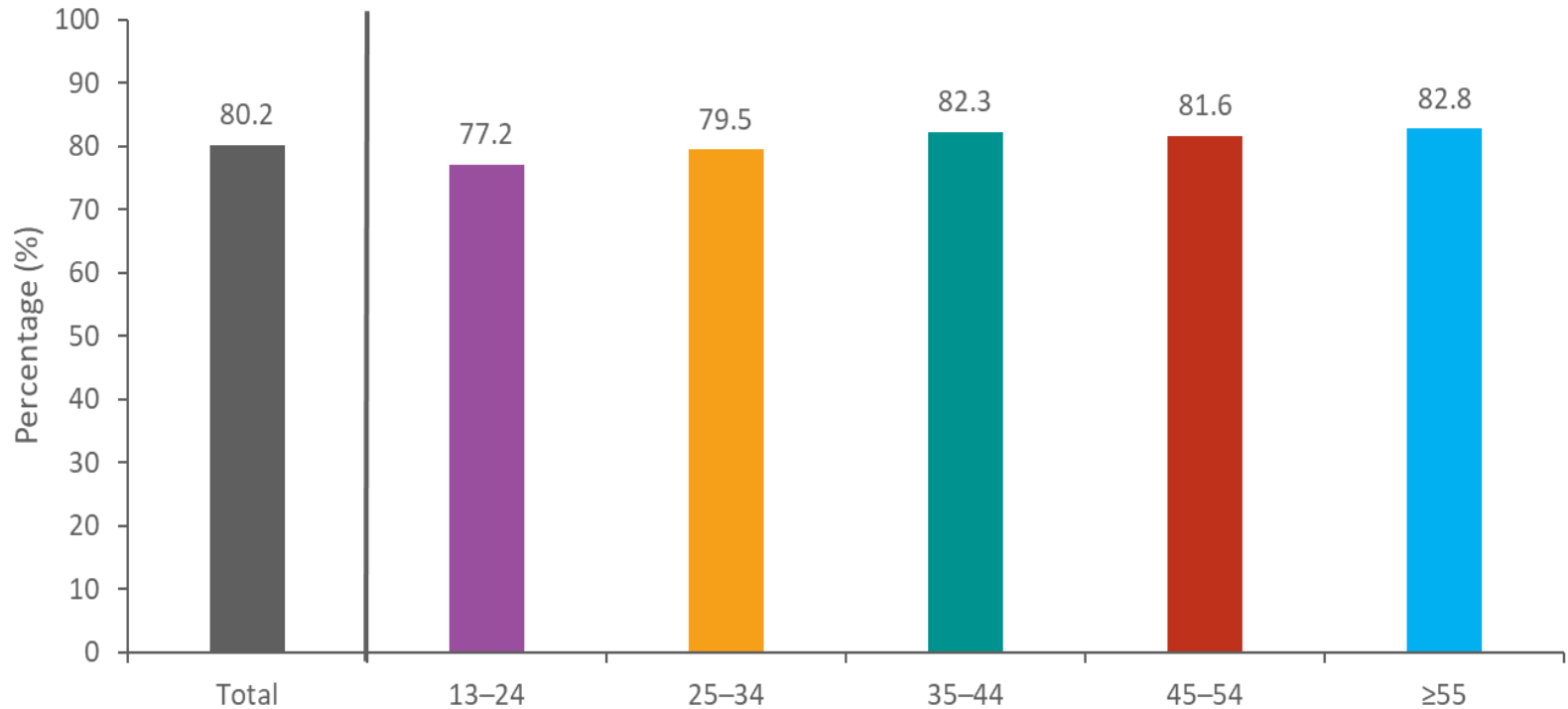
Abbreviations: MF, male-to-female; FM, female-to-male; AGI, additional gender identity. Additional gender identity include bigender, gender queer, and two-spirit.

Note. Linkage to HIV medical care was defined as having a CD4 or VL test  $\leq 1$  month after HIV diagnosis.





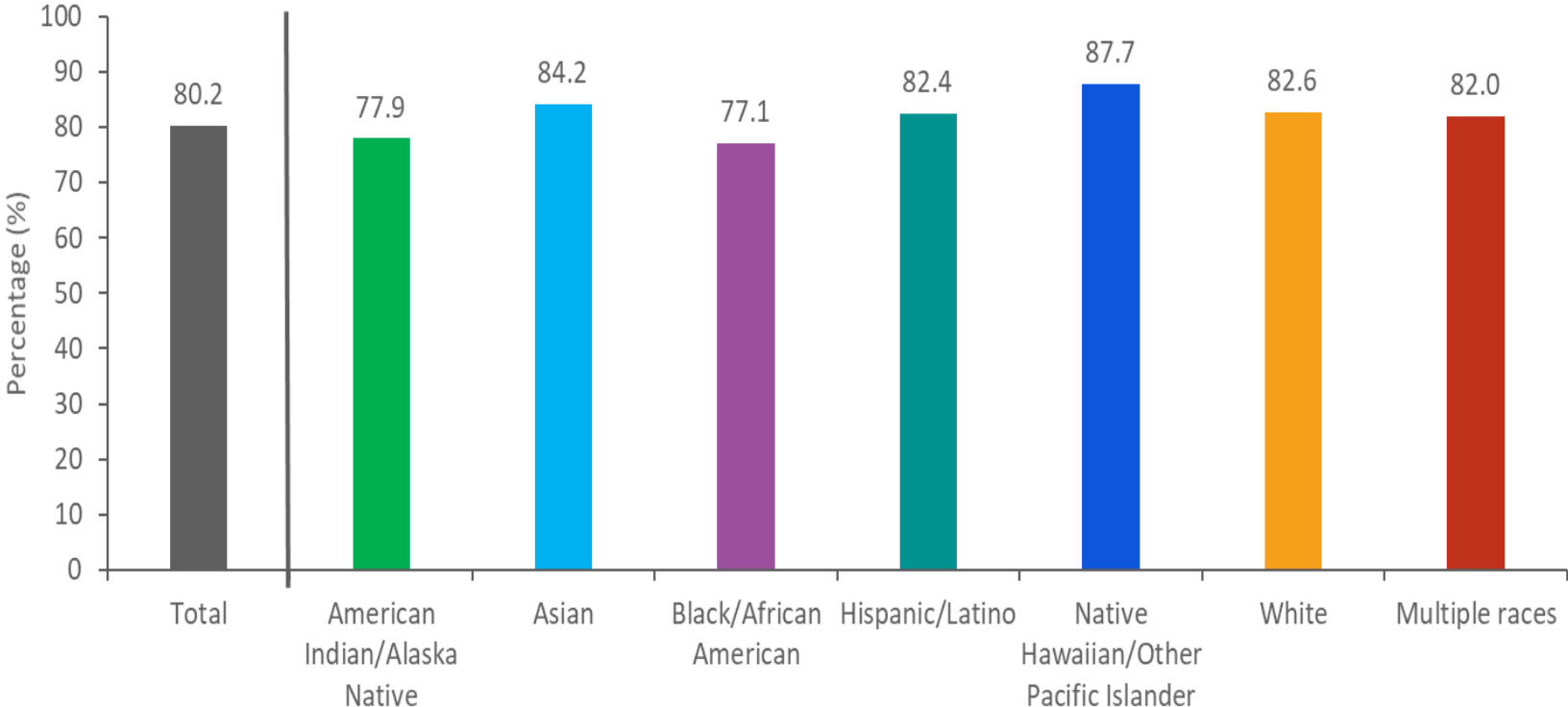
# Linkage to HIV Medical Care within 1 Month after HIV Diagnosis during 2018, among Persons Aged $\geq 13$ Years, by Age—41 States and the District of Columbia



Note. Linkage to HIV medical care was defined as having a CD4 or VL test  $\leq 1$  month after HIV diagnosis.



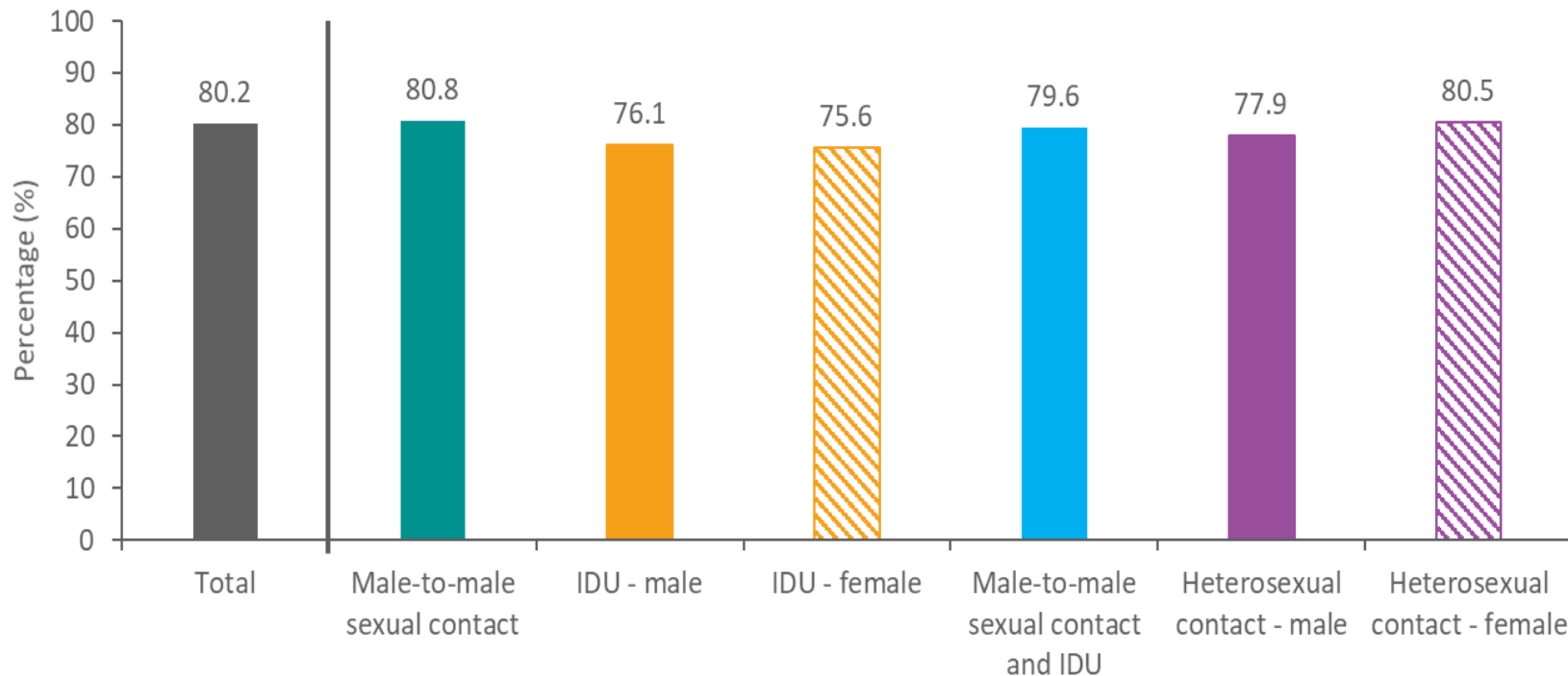
# Linkage to HIV Medical Care within 1 Month after HIV Diagnosis during 2018, among Persons Aged $\geq 13$ Years, by Race/Ethnicity—41 States and the District of Columbia



Note. Linkage to HIV medical care was defined as having a CD4 or VL test  $\leq 1$  month after HIV diagnosis. Hispanics/Latinos can be of any race.



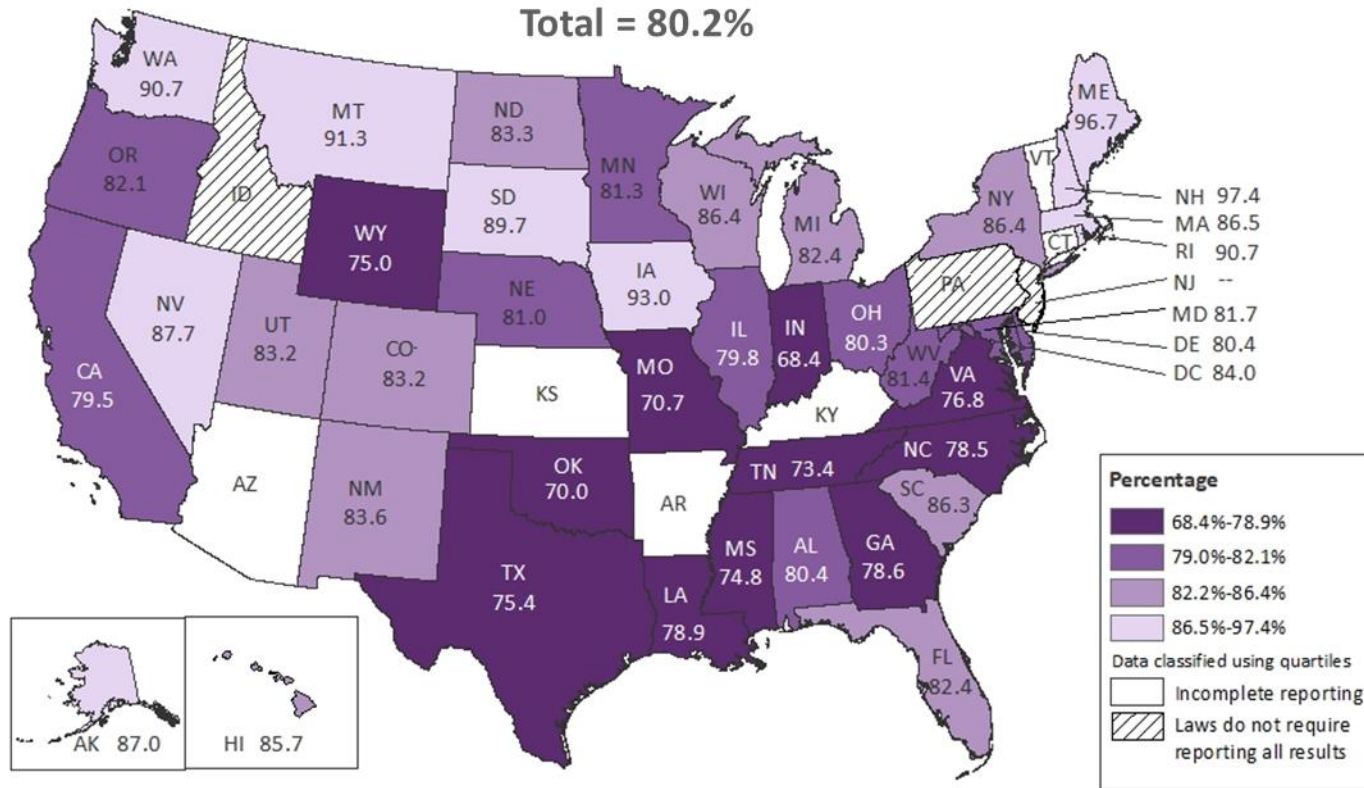
# Linkage to HIV Medical Care within 1 Month after HIV Diagnosis during 2018, among Persons Aged $\geq 13$ Years, by Transmission Category—41 States and the District of Columbia



Note. Linkage to HIV medical care was defined as having a CD4 or VL test  $\leq 1$  month after HIV diagnosis. Heterosexual contact is with a person known to have, or be at high risk for, HIV infection. IDU, injection drug use



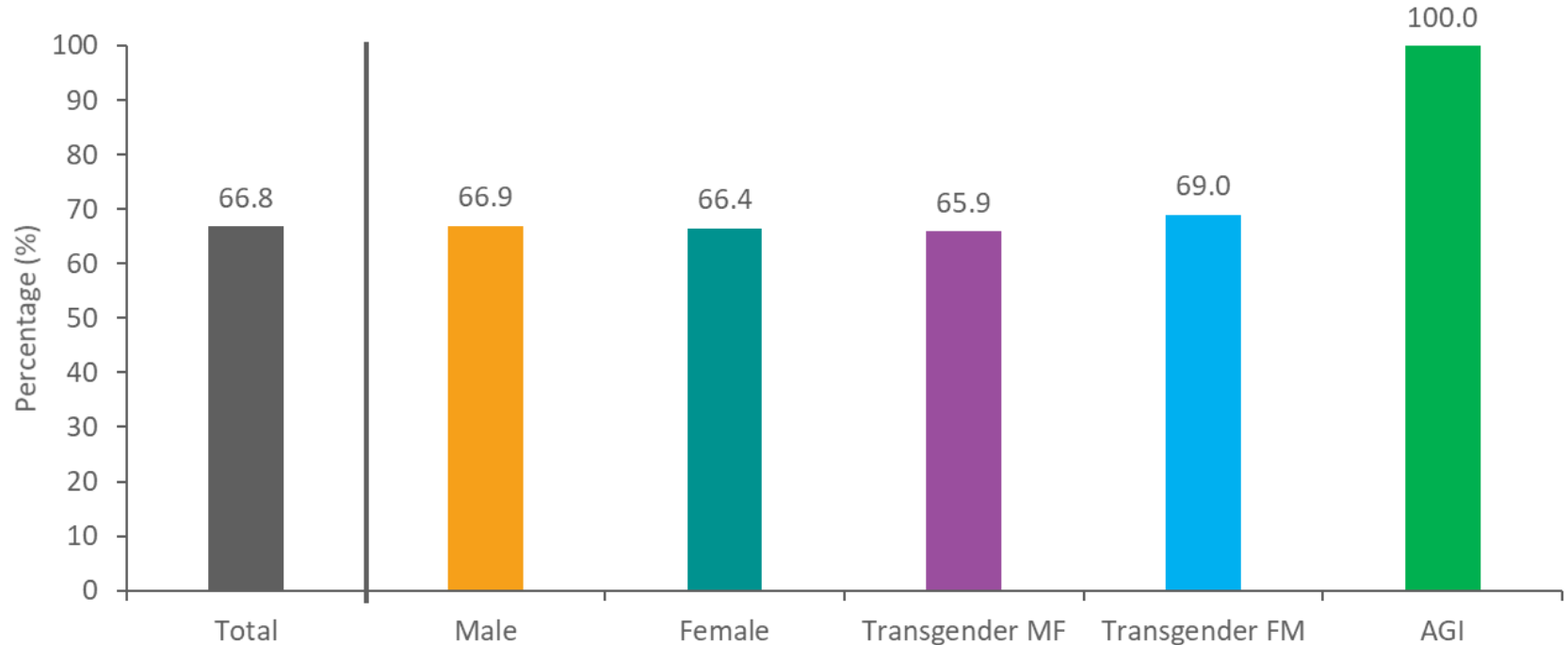
# Linkage to HIV Medical Care within 1 Month after HIV Diagnosis during 2018, among Persons Aged $\geq 13$ Years—41 States and the District of Columbia



Note. Linkage to HIV medical care was defined as having a CD4 or VL test  $\leq 1$  month after HIV diagnosis. Data are based on residence at diagnosis.



# Viral Suppression within 6 Months of HIV Diagnosis among Persons Aged $\geq 13$ Years, by Gender—41 States and the District of Columbia

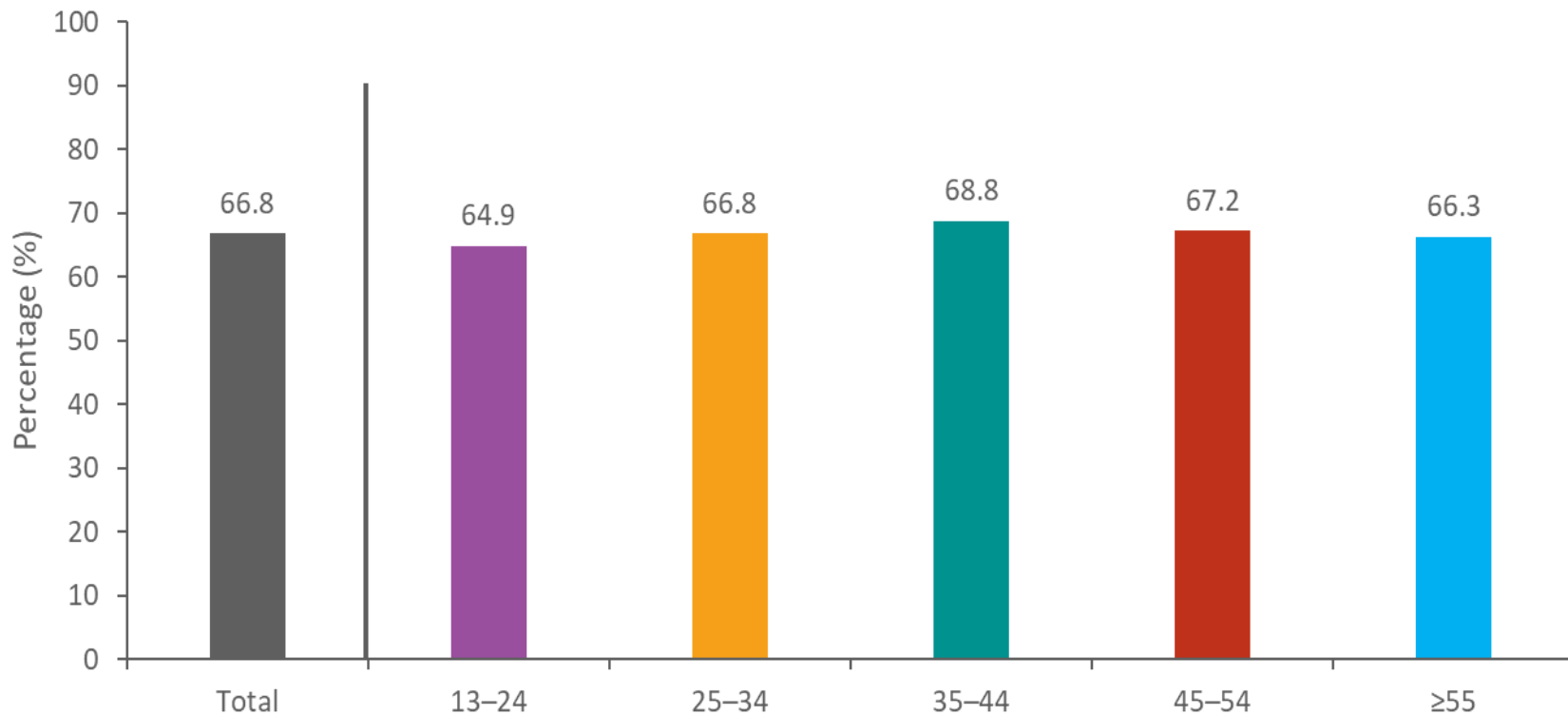


Abbreviations: MF, male-to-female; FM, female-to-male; AGI, additional gender identity.

Note. Viral suppression was defined as  $<200$  copies/mL on a VL test within 6 months of HIV diagnosis in 2018.



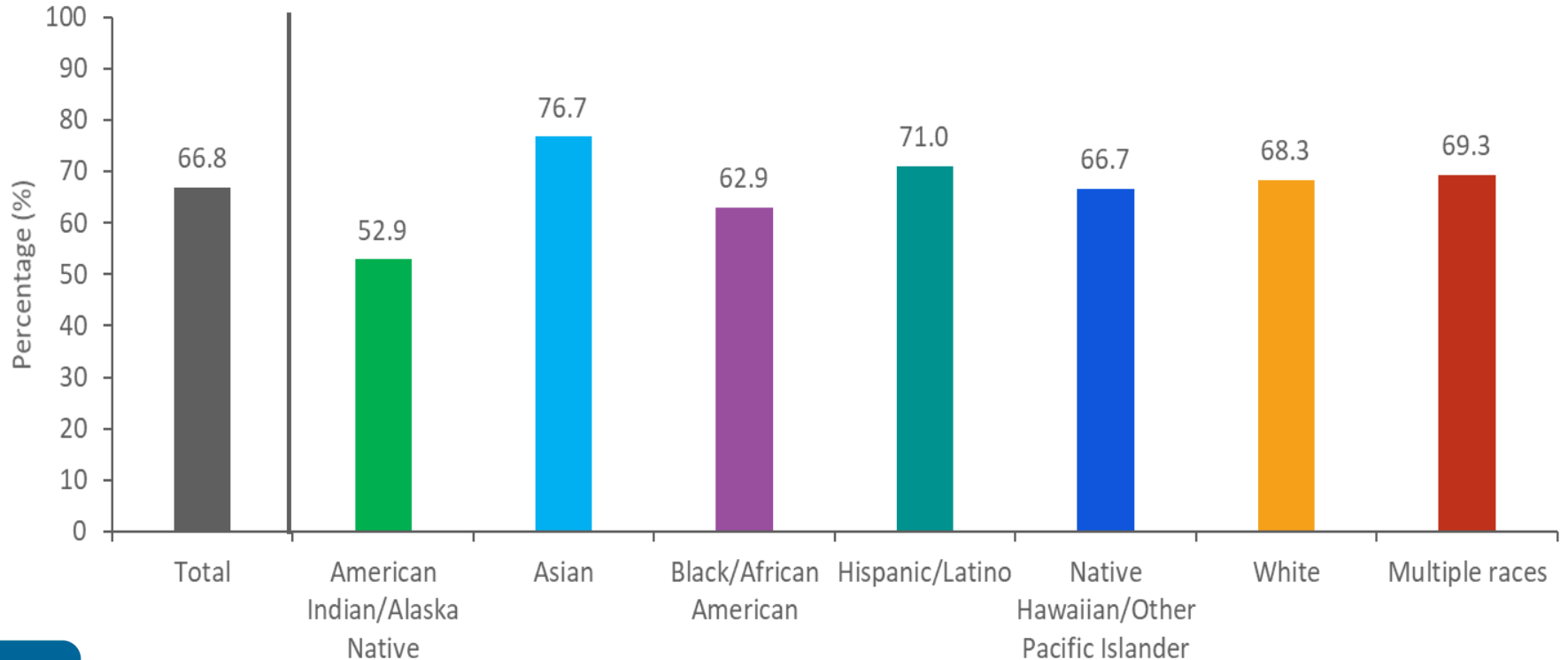
# Viral Suppression within 6 Months of HIV Diagnosis among Persons Aged $\geq 13$ Years, by Age—41 States and the District of Columbia



Note. Viral suppression was defined as  $<200$  copies/mL on a VL test within 6 months of HIV diagnosis in 2018.



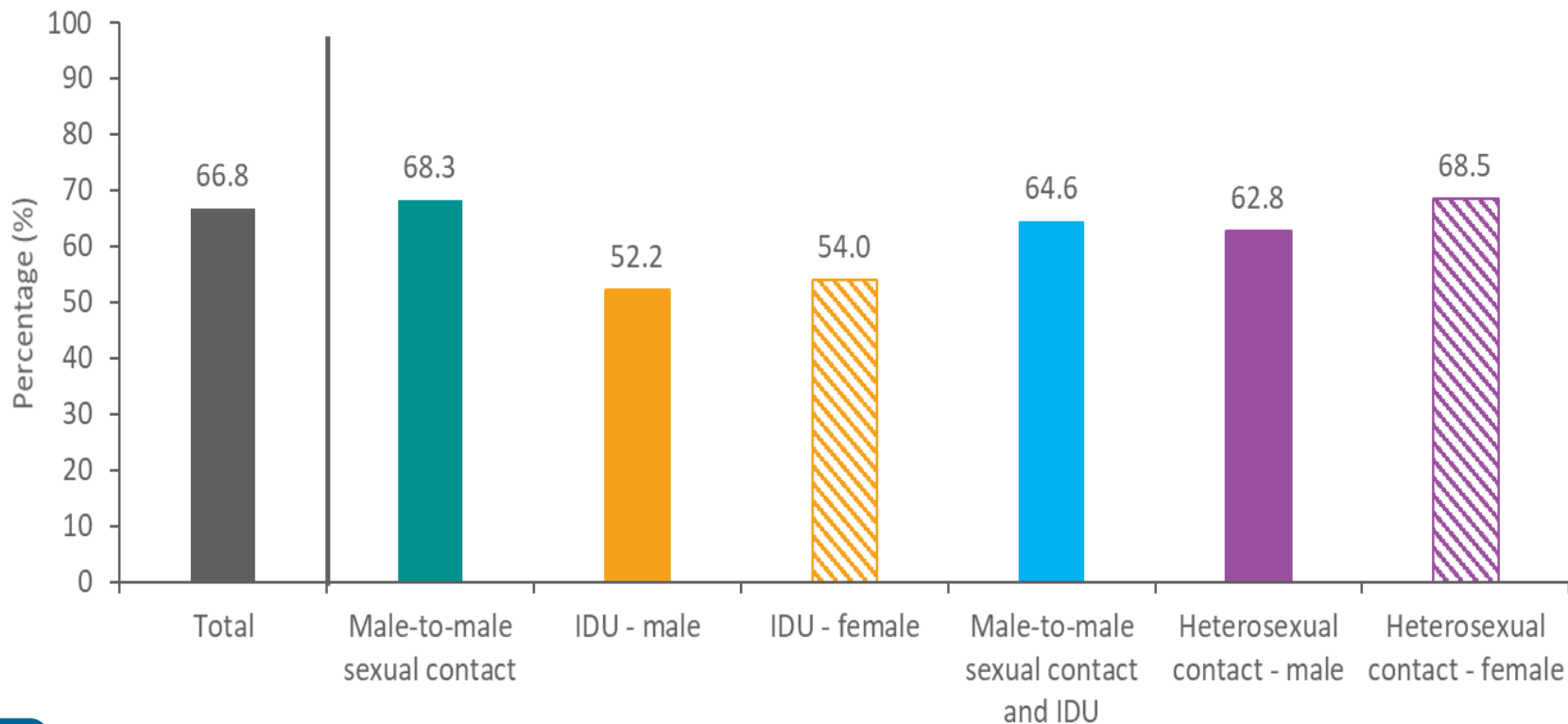
# Viral Suppression within 6 Months of HIV Diagnosis among Persons Aged $\geq 13$ Years, by Race/Ethnicity—41 States and the District of Columbia



Note. Viral suppression was defined as  $<200$  copies/mL on a VL test within 6 months of HIV diagnosis in 2018.



# Viral Suppression within 6 Months of HIV Diagnosis among Persons Aged $\geq 13$ Years, by Transmission Category—41 States and the District of Columbia

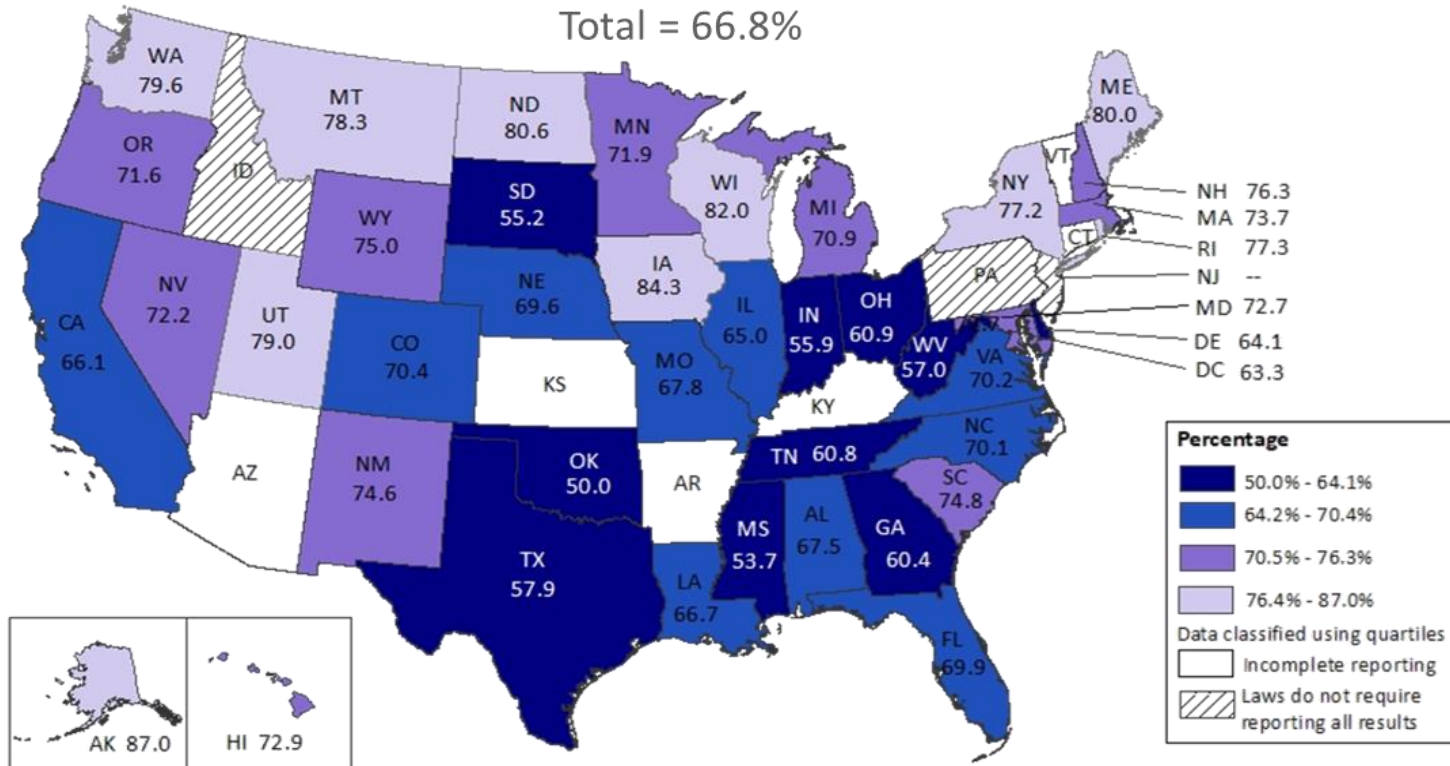


Note. Viral suppression was defined as  $<200$  copies/mL on a VL test within 6 months of HIV diagnosis in 2018. Heterosexual contact is with a person known to have, or be at high risk for, HIV infection. IDU, injection drug use





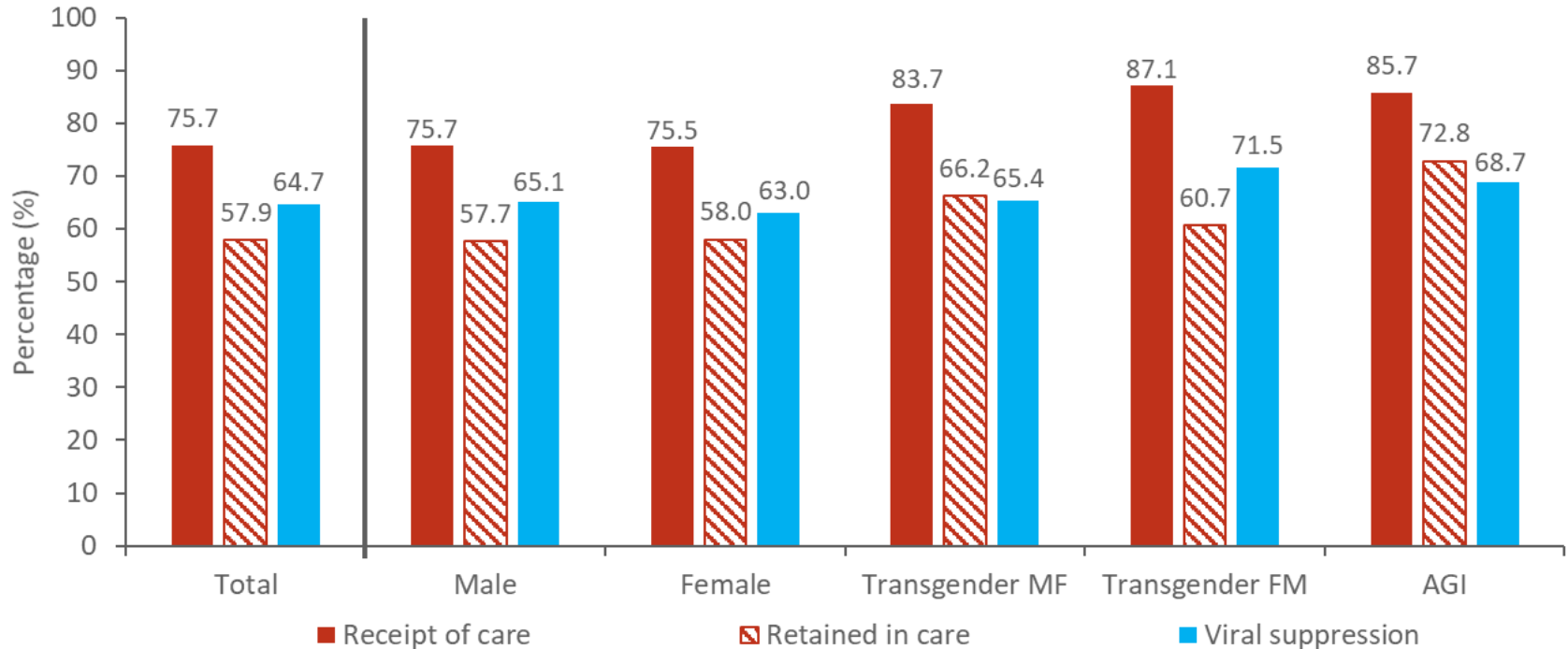
# Viral Suppression within 6 months of Diagnosis among Persons Aged ≥13 Years, 2018—41 States and the District of Columbia



Note. Viral suppression was defined as <200 copies/mL on a VL test within 6 months of HIV diagnosis in 2018. Data are based on residence at diagnosis.



# Receipt of HIV Medical Care, Retention in care, and Viral Suppression among Persons Aged $\geq 13$ Years Living with Diagnosed HIV Infection, by Gender 2018—41 States and the District of Columbia

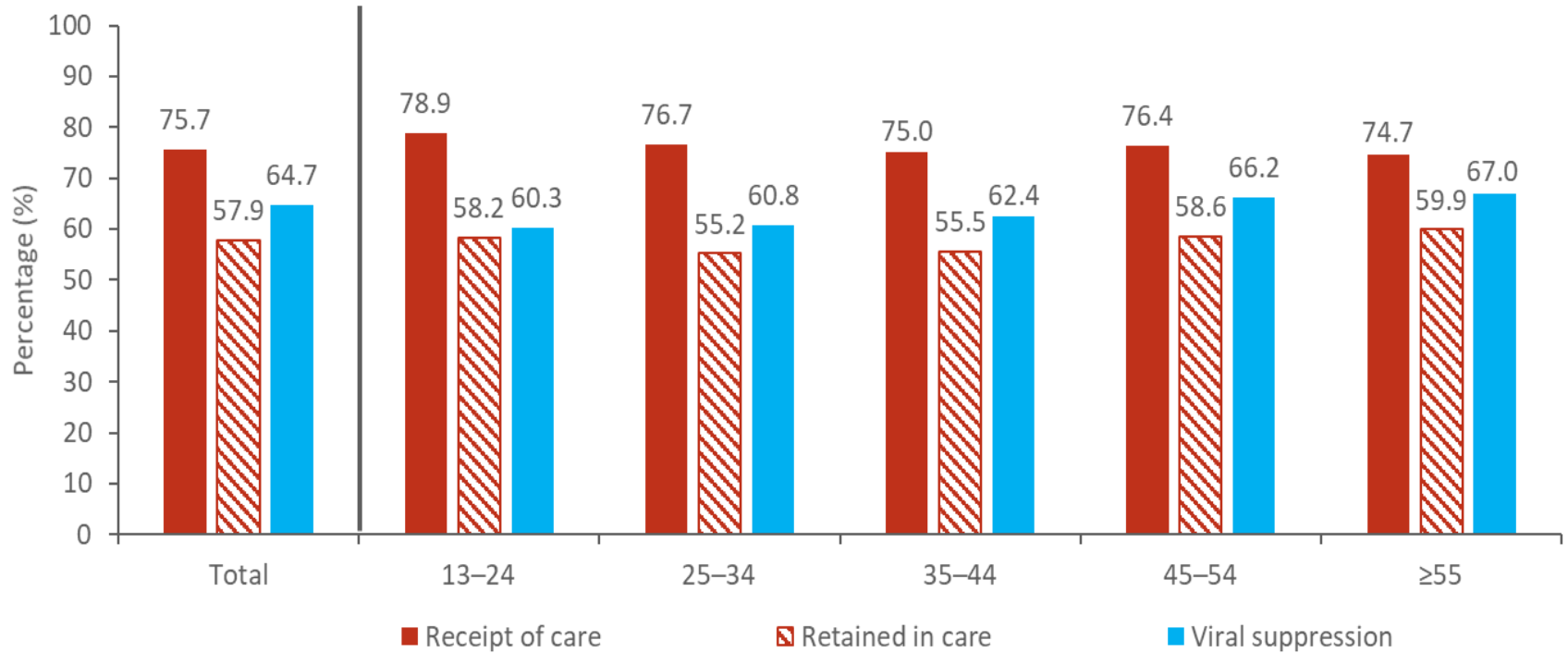


Abbreviations: MF, male-to-female; FM, female-to-male; AGI, additional gender identity.

Note. Receipt of medical care was defined as  $\geq 1$  test (CD4 or VL) in 2018. Retained in continuous medical care was defined as  $\geq 2$  tests (CD4 or VL)  $\geq 3$  months apart in 2018. Viral suppression was defined as  $< 200$  copies/mL on the most recent VL test in 2018.



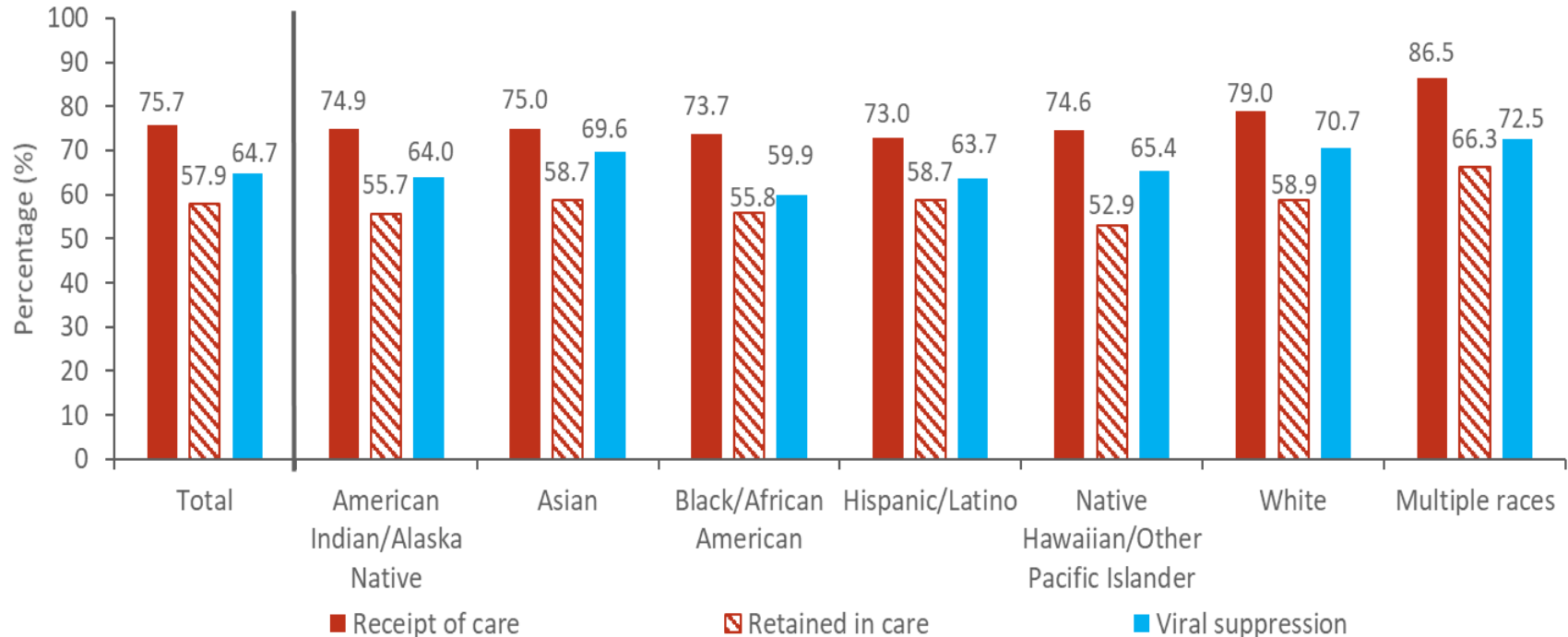
# Receipt of HIV Medical Care, Retention in care, and Viral Suppression among Persons Aged $\geq 13$ Years Living with Diagnosed HIV Infection, by Age 2018—41 States and the District of Columbia



Note. Receipt of medical care was defined as  $\geq 1$  test (CD4 or VL) in 2018. Retained in continuous medical care was defined as  $\geq 2$  tests (CD4 or VL)  $\geq 3$  months apart in 2018. Viral suppression was defined as  $< 200$  copies/mL on the most recent VL test in 2018.



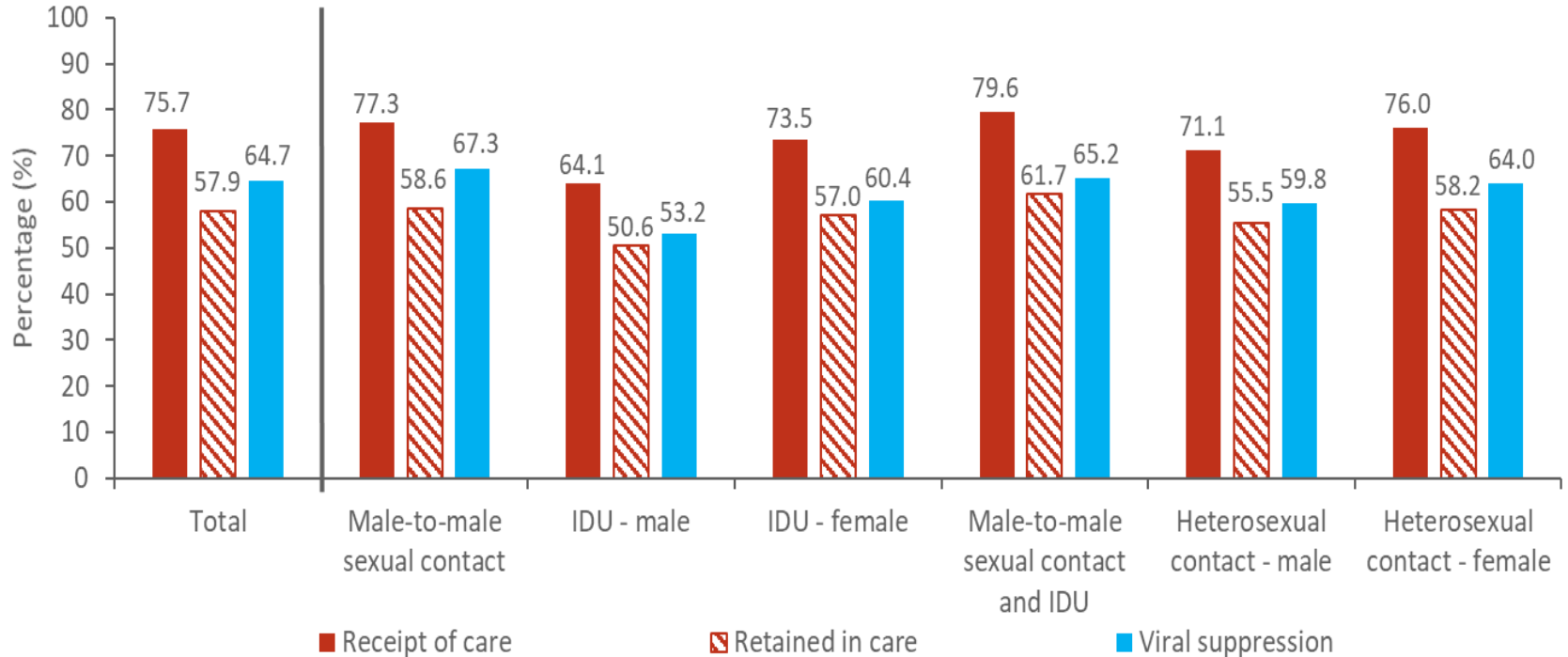
# Receipt of HIV Medical Care, Retention in Care, and Viral Suppression among Persons Aged $\geq 13$ Years Living with Diagnosed HIV Infection, by Race/Ethnicity 2018—41 States and the District of Columbia



Note. Receipt of medical care was defined as  $\geq 1$  test (CD4 or VL) in 2018. Retained in continuous medical care was defined as  $\geq 2$  tests (CD4 or VL)  $\geq 3$  months apart in 2018. Viral suppression was defined as  $< 200$  copies/mL on the most recent VL test in 2018. Asian includes Asian/Pacific Islander legacy cases. Hispanics/Latinos can be of any race.



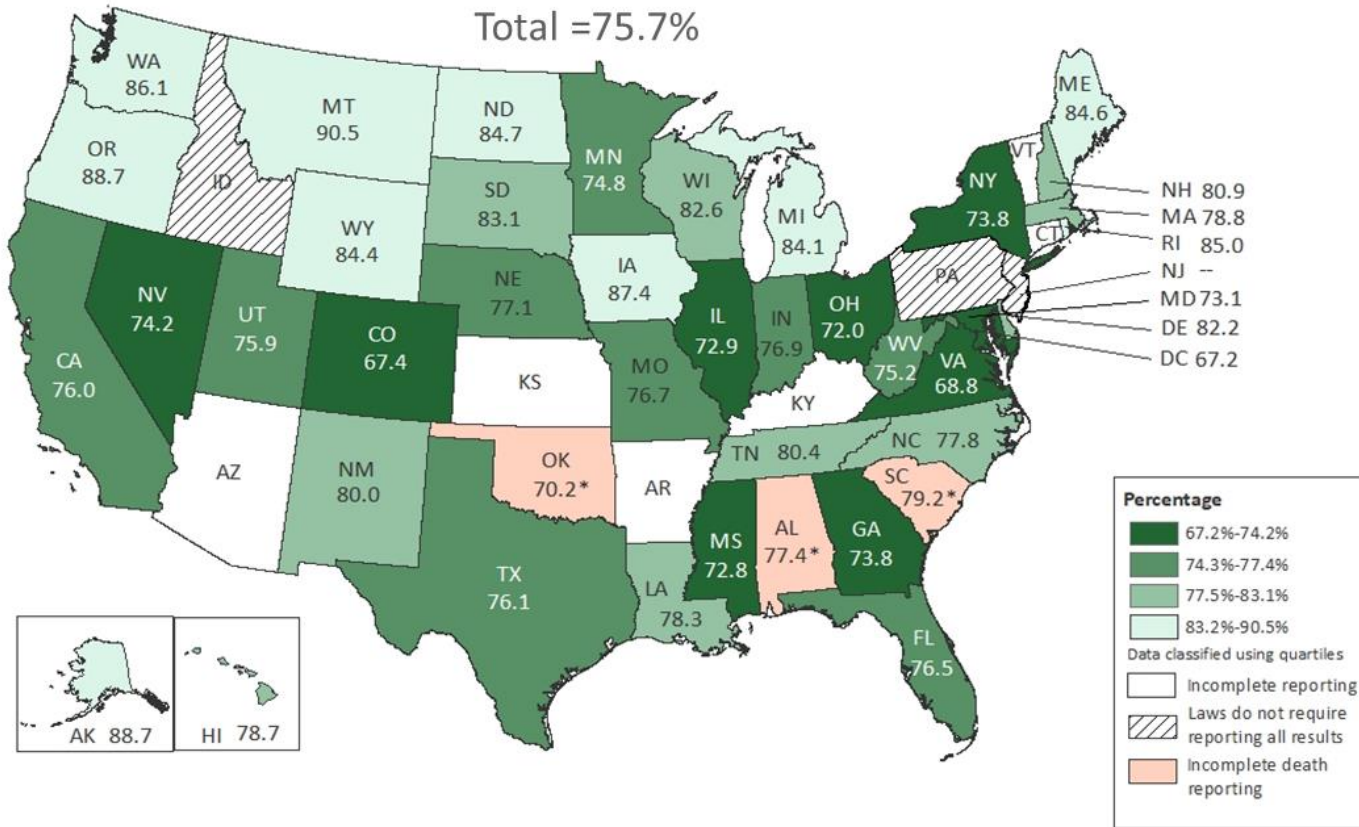
# Receipt of HIV Medical Care, Retention in Care, and Viral Suppression among Persons Aged $\geq 13$ Years Living with Diagnosed HIV Infection, by Transmission Category, 2018—41 States and the District of Columbia



Note. Receipt of medical care was defined as  $\geq 1$  test (CD4 or VL) in 2018. Retained in continuous medical care was defined as  $\geq 2$  tests (CD4 or VL)  $\geq 3$  months apart in 2018. Viral suppression was defined as  $< 200$  copies/mL on the most recent VL test in 2018. Heterosexual contact is with a person known to have, or be at high risk for, HIV infection. IDU, injection drug use



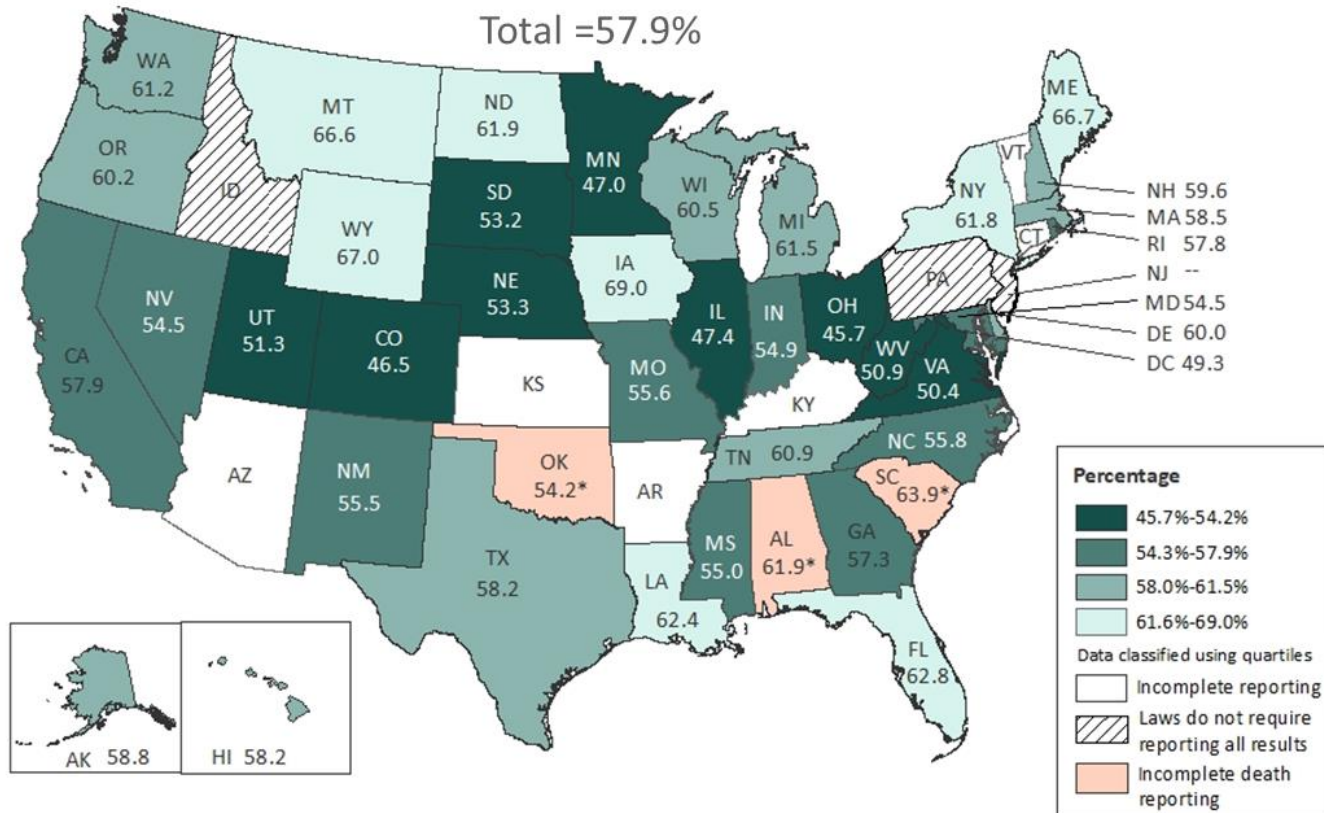
# Receipt of HIV Medical Care among Persons Aged ≥13 Years Living with Diagnosed HIV Infection. 2018—41 States and the District of Columbia



Note. Receipt of HIV medical care was defined as  $\geq 1$  test (CD4 or VL) in 2018. Residence was based on most recent known address as of year-end 2018. Data for the year 2018 are preliminary and based on death data received by CDC as of December 2019. Due to incomplete reporting of deaths for the year 2018\*, data for Alabama, Oklahoma, and South Carolina should be interpreted with caution.

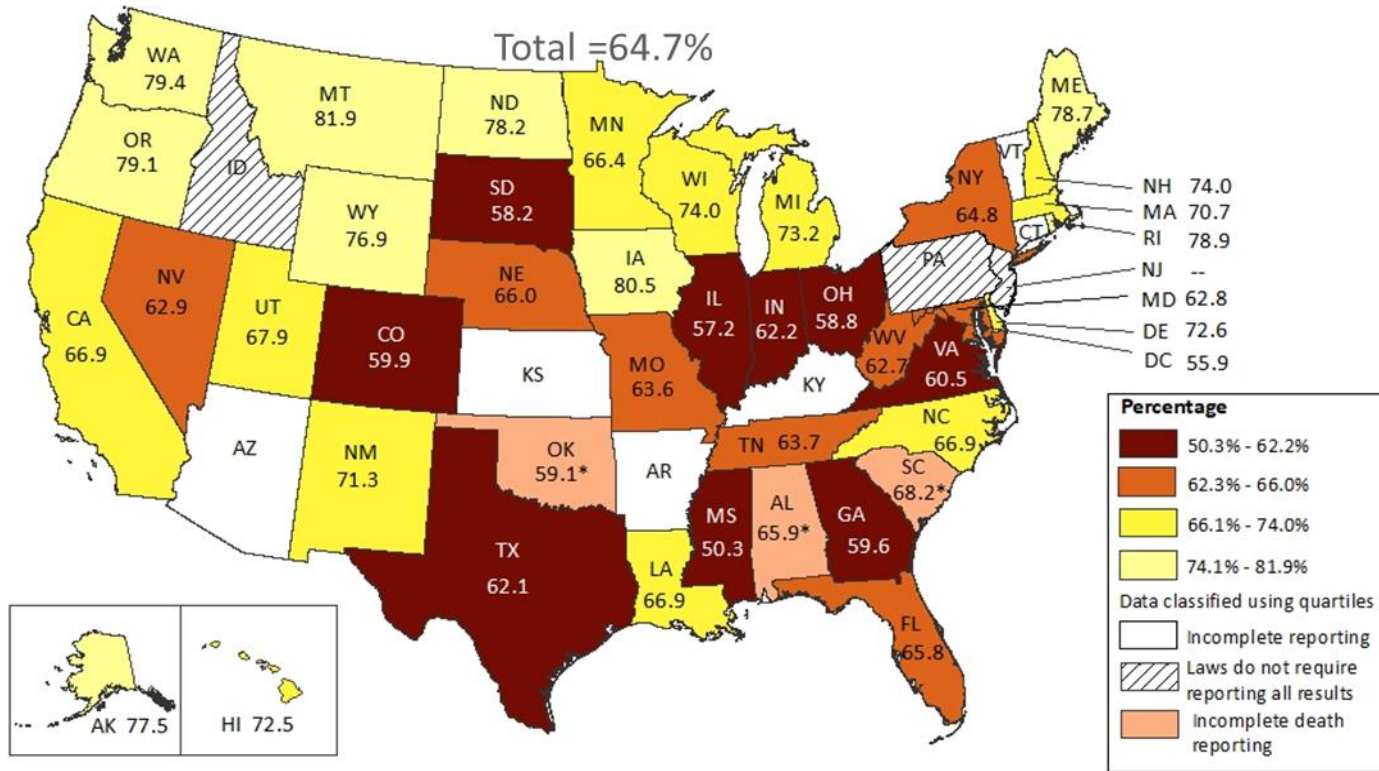


# Retention in HIV Medical Care among Persons Aged $\geq 13$ Years Living with Diagnosed HIV Infection, 2018—41 States and the District of Columbia



Note. Retained in continuous medical care was defined as  $\geq 2$  tests (CD4 or VL)  $\geq 3$  months apart in 2018. Residence was based on most recent known address as of year-end 2018. Data for the year 2018 are preliminary and based on death data received by CDC as of December 2019. Due to incomplete reporting of deaths for the year 2018\*, data for Alabama, Oklahoma, and South Carolina should be interpreted with caution.

# Viral Suppression among Persons Aged ≥13 Years Living with Diagnosed HIV Infection, 2018—41 States and the District of Columbia



Note. Viral suppression was defined as <200 copies/mL on the most recent VL test in 2018. Residence was based on most recent known address as of year-end 2018. Data for the year 2018 are preliminary and based on death data received by CDC as of December 2019. Due to incomplete reporting of deaths for the year 2018\*, data for Alabama, Oklahoma, and South Carolina should be interpreted with caution.





## Prevalence-Based Care Continuum

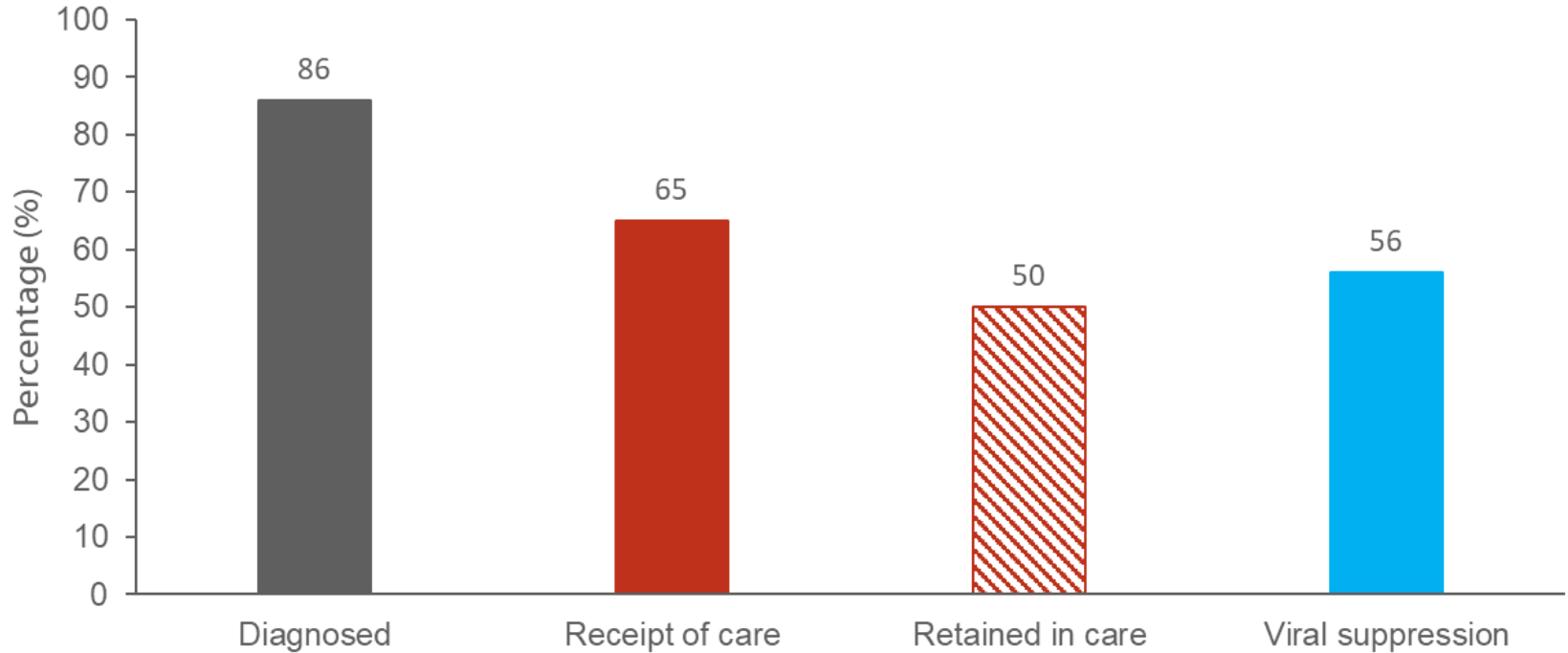
- Describes each step of the continuum as a percentage of the total number of people living with HIV (diagnosed or undiagnosed)
- Denominator: Estimated number of persons aged  $\geq 13$  years living with diagnosed or undiagnosed HIV infection at year-end 2018
  - Calculated using the first CD4 test after HIV diagnosis and a CD4 depletion model indicating disease progression\*
- Numerator: Extrapolated from the 42 jurisdictions with complete CD4 and viral load reporting
  - Apply percentage from 42 jurisdictions to the total number of people living with diagnosed HIV in the United States

\* Song R, Hall HI, Green TA, Szwarcwald CL, Pantazis N. Using CD4 data to estimate HIV incidence, prevalence, and percent of undiagnosed infections in the United States. *J Acquir Immune Defic Syndr* 2017;74(1):3–9. doi:10.1097/QAI.0000000000001151.



# Persons Living with Diagnosed or Undiagnosed HIV Infection

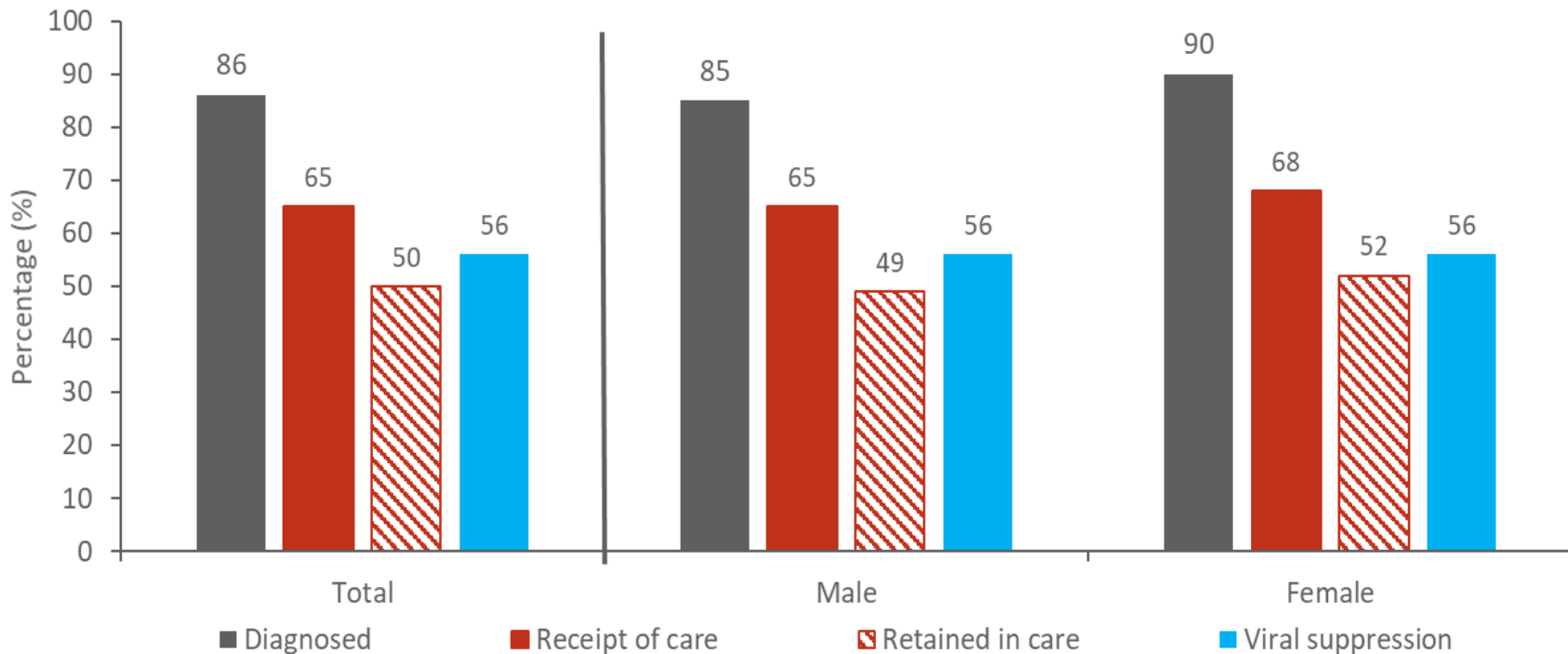
## HIV Care Continuum Outcomes, 2018—United States



Note. Receipt of medical care was defined as  $\geq 1$  test (CD4 or VL) in 2018. Retained in continuous medical care was defined as  $\geq 2$  tests (CD4 or VL)  $\geq 3$  months apart in 2018. Viral suppression was defined as  $< 200$  copies/mL on the most recent VL test in 2018.



# Persons Living with Diagnosed or Undiagnosed HIV Infection HIV Care Continuum Outcomes, by Sex, 2018—United States

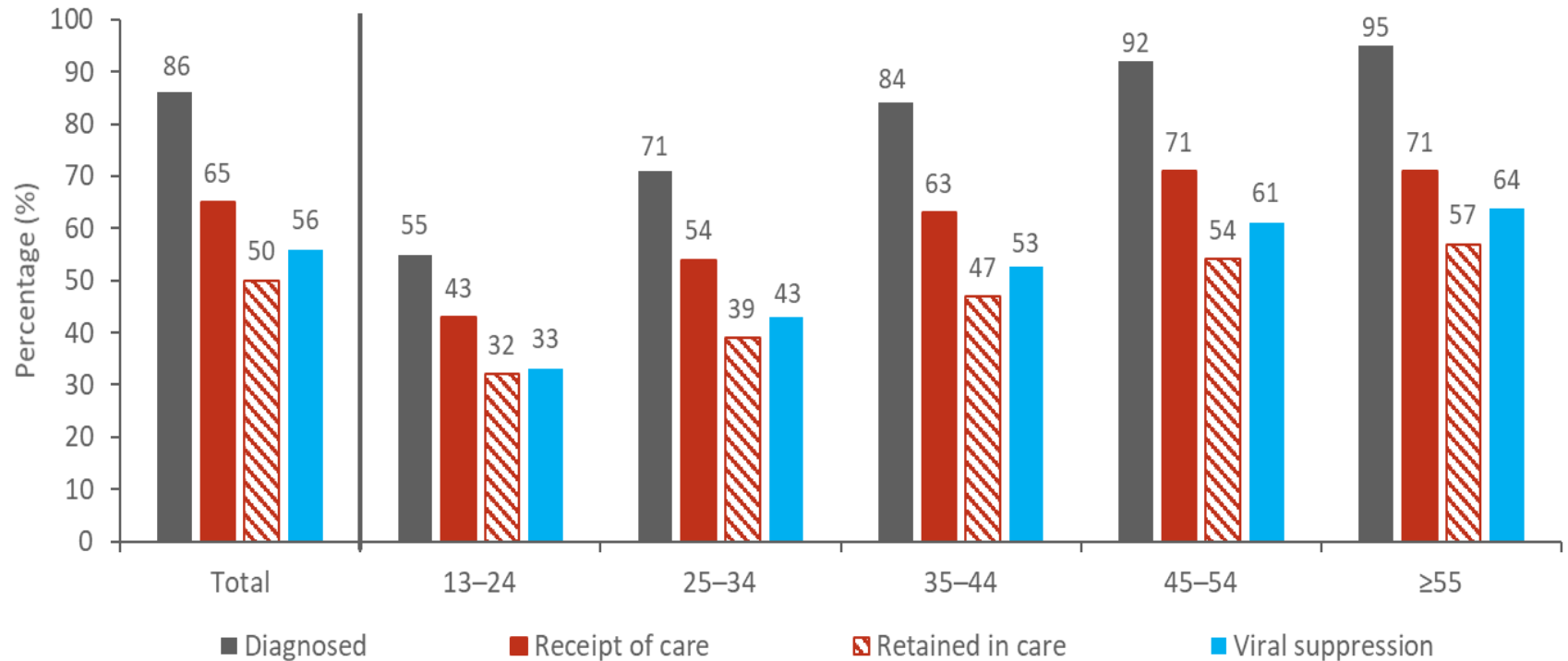


Note. Receipt of medical care was defined as  $\geq 1$  test (CD4 or VL) in 2018. Retained in continuous medical care was defined as  $\geq 2$  tests (CD4 or VL)  $\geq 3$  months apart in 2018. Viral suppression was defined as  $< 200$  copies/mL on the most recent VL test in 2018.



# Persons Living with Diagnosed or Undiagnosed HIV Infection

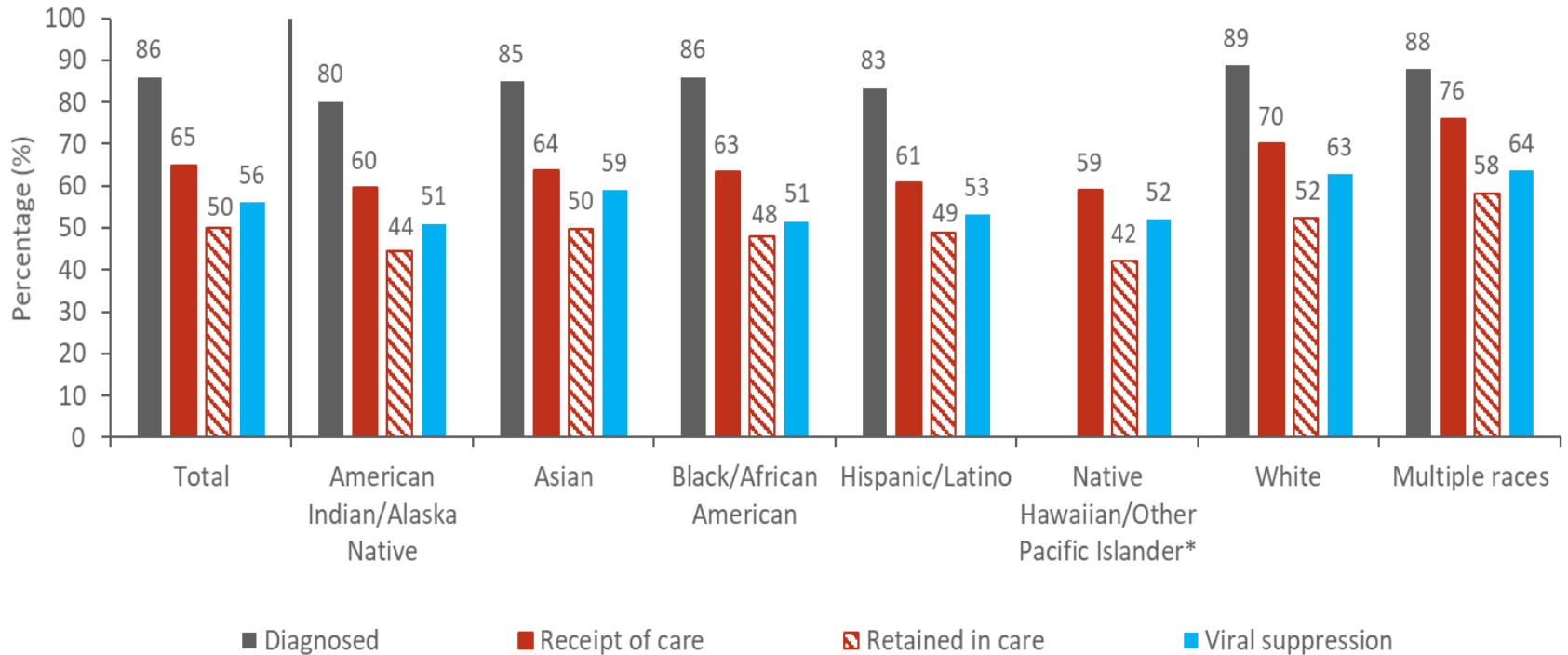
## HIV Care Continuum Outcomes, by Age, 2018—United States



Note. Receipt of medical care was defined as  $\geq 1$  test (CD4 or VL) in 2018. Retained in continuous medical care was defined as  $\geq 2$  tests (CD4 or VL)  $\geq 3$  months apart in 2018. Viral suppression was defined as  $< 200$  copies/mL on the most recent VL test in 2018.



# Persons Living with Diagnosed or Undiagnosed HIV Infection HIV Care Continuum Outcomes, by Race/Ethnicity, 2018—United States



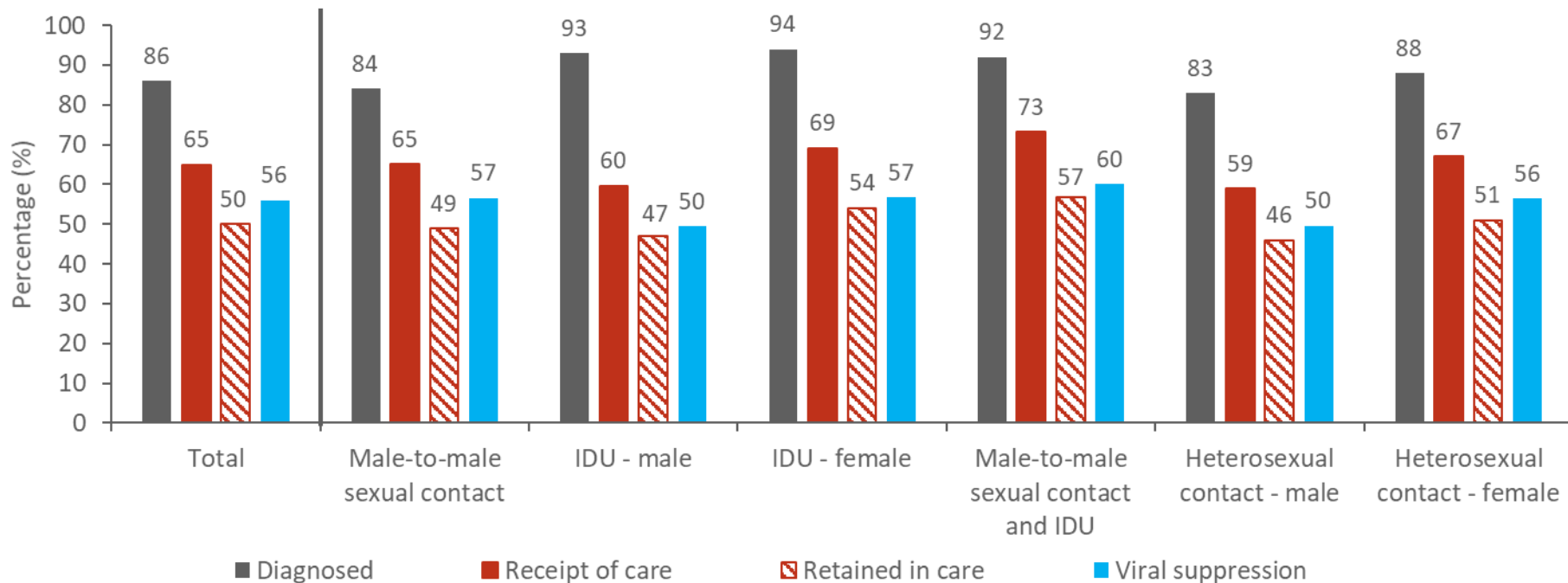
Note. Receipt of medical care was defined as  $\geq 1$  test (CD4 or VL) in 2018. Retained in continuous medical care was defined as  $\geq 2$  tests (CD4 or VL)  $\geq 3$  months apart in 2018. Viral suppression was defined as  $< 200$  copies/mL on the most recent VL test in 2018. Asian includes Asian/Pacific Islander legacy cases. Hispanics/Latinos can be of any race.

\*The estimated percentage of Native Hawaiians/other Pacific Islanders living with HIV in the United States is unreliable and not presented.



# Persons Living with Diagnosed or Undiagnosed HIV Infection

## HIV Care Continuum Outcomes, by Transmission Category, 2018—United States



Note. Receipt of medical care was defined as  $\geq 1$  test (CD4 or VL) in 2018. Retained in continuous medical care was defined as  $\geq 2$  tests (CD4 or VL)  $\geq 3$  months apart in 2018. Viral suppression was defined as  $< 200$  copies/mL on the most recent VL test in 2018. Heterosexual contact is with a person known to have, or be at high risk for, HIV infection. IDU, injection drug use



## Calculation of PrEP Coverage

- Numerator
  - Number of persons aged  $\geq 16$  years who have been classified as having been prescribed PrEP during the specified year
- Denominator\*
  - Estimated number of persons who had indications for PrEP during the specified year

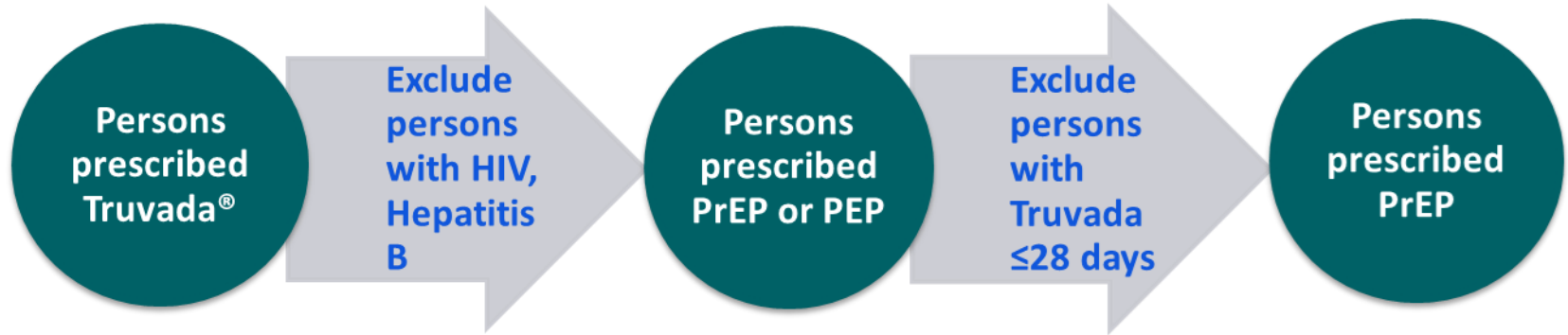
Abbreviation: PrEP: preexposure prophylaxis.

Note. Different data sources were used in the numerator and denominator to calculate PrEP coverage.

\*Denominator year lags approximately 1 year after year of interest due to the availability of data sources used for the denominator (e.g. 2018 PrEP coverage calculated using 2018 numerator and 2017 denominator).



# Numerator for PrEP Coverage: PrEP Algorithm



Abbreviation: PrEP: preexposure prophylaxis.

Note. Algorithm has been validated by electronic health records with 96% sensitivity and 99% specificity.



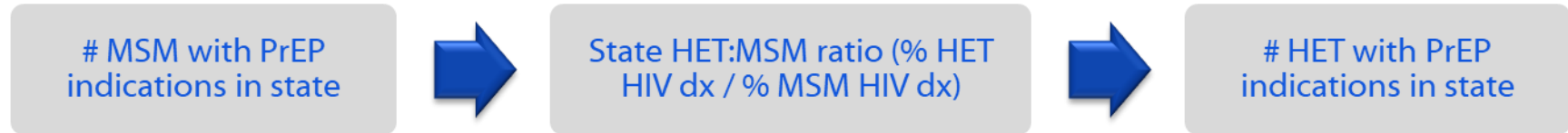


# Denominator for PrEP Coverage: Estimating the Number of Persons with Indications for PrEP, by Transmission Risk Group

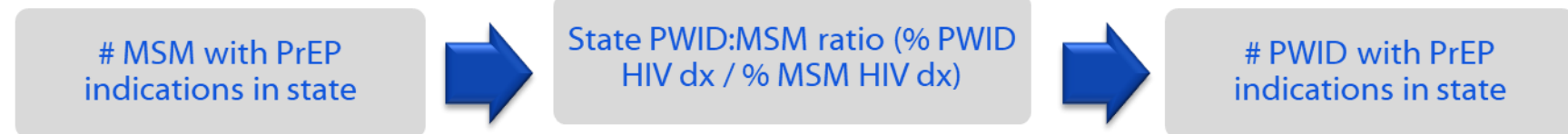
## Men who have sex with men (MSM):



## Heterosexuals (HET):



## Persons who inject drugs (PWID):

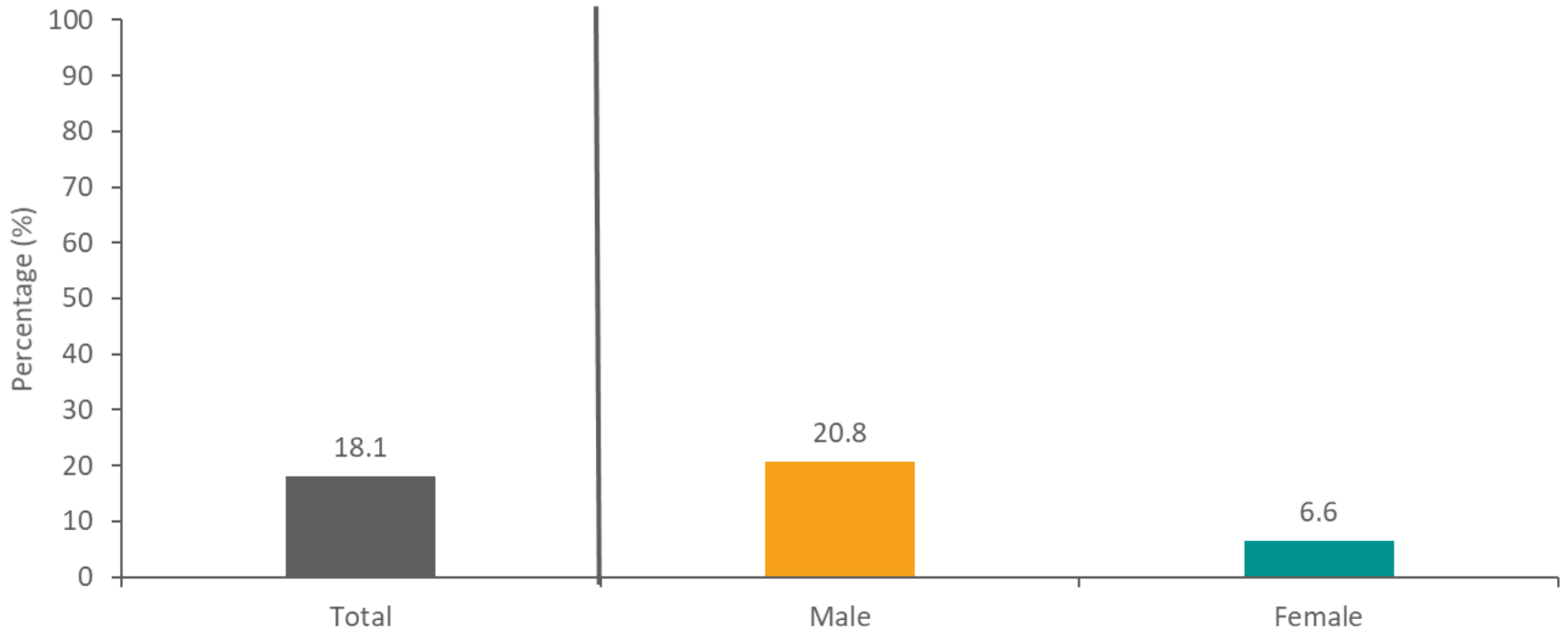


Abbreviation: PrEP: preexposure prophylaxis.

Note. The estimated number of persons with indications for PrEP in the 3 major transmission risk groups (MSM, heterosexuals [HET], persons who inject drugs [PWID]) in each jurisdiction were then summed to yield a state- or county-specific estimate. State estimates were then summed for a national total of persons with indications for PrEP.



# PrEP Coverage among Persons Aged ≥16 Years, by Sex at Birth 2018—United States

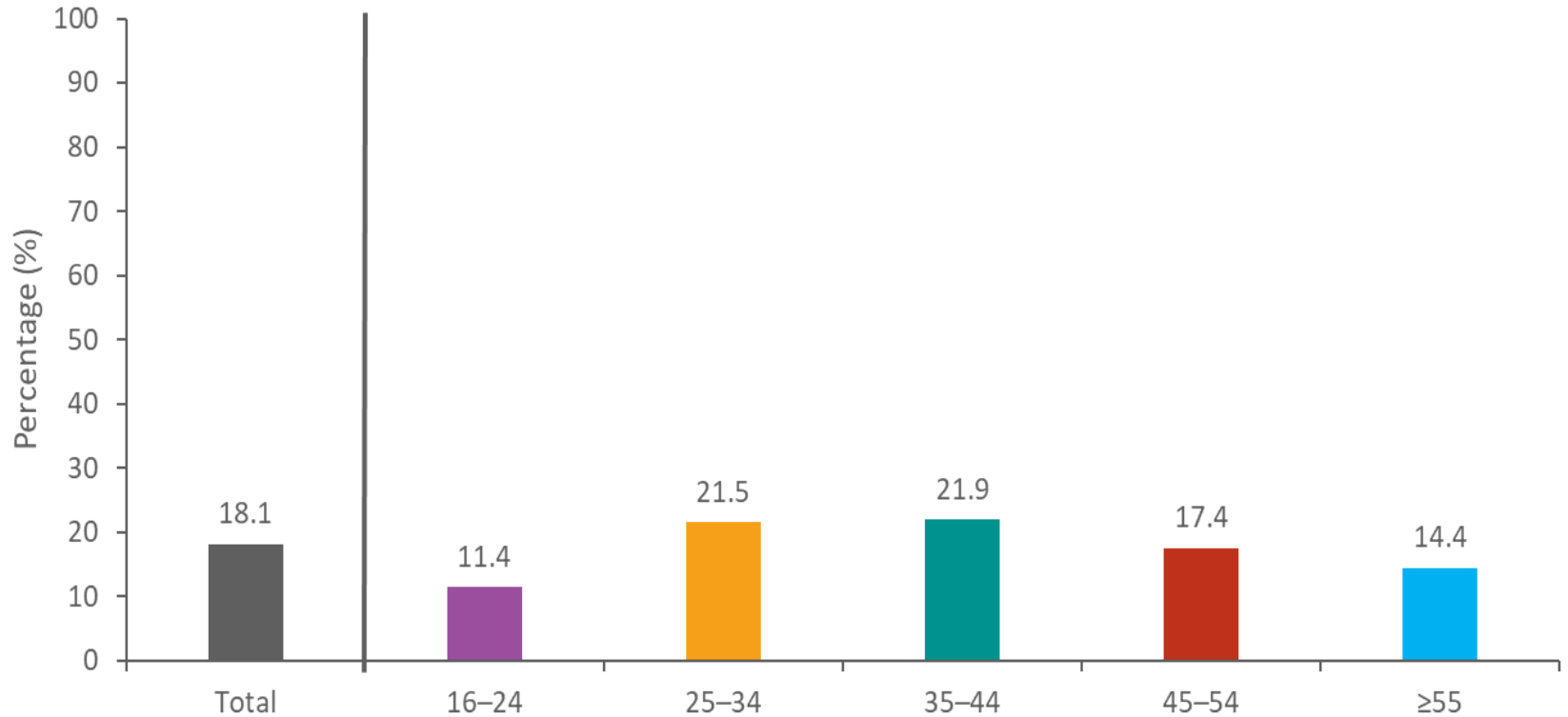


Abbreviation: PrEP, preexposure prophylaxis.

Note. PrEP coverage, reported as a percentage, was calculated as the number who have been prescribed PrEP divided by the estimated number of persons who had indications for PrEP. Different data sources were used in the numerator and denominator to calculate PrEP coverage.



# PrEP Coverage among Persons Aged ≥16 Years, by Age 2018—United States

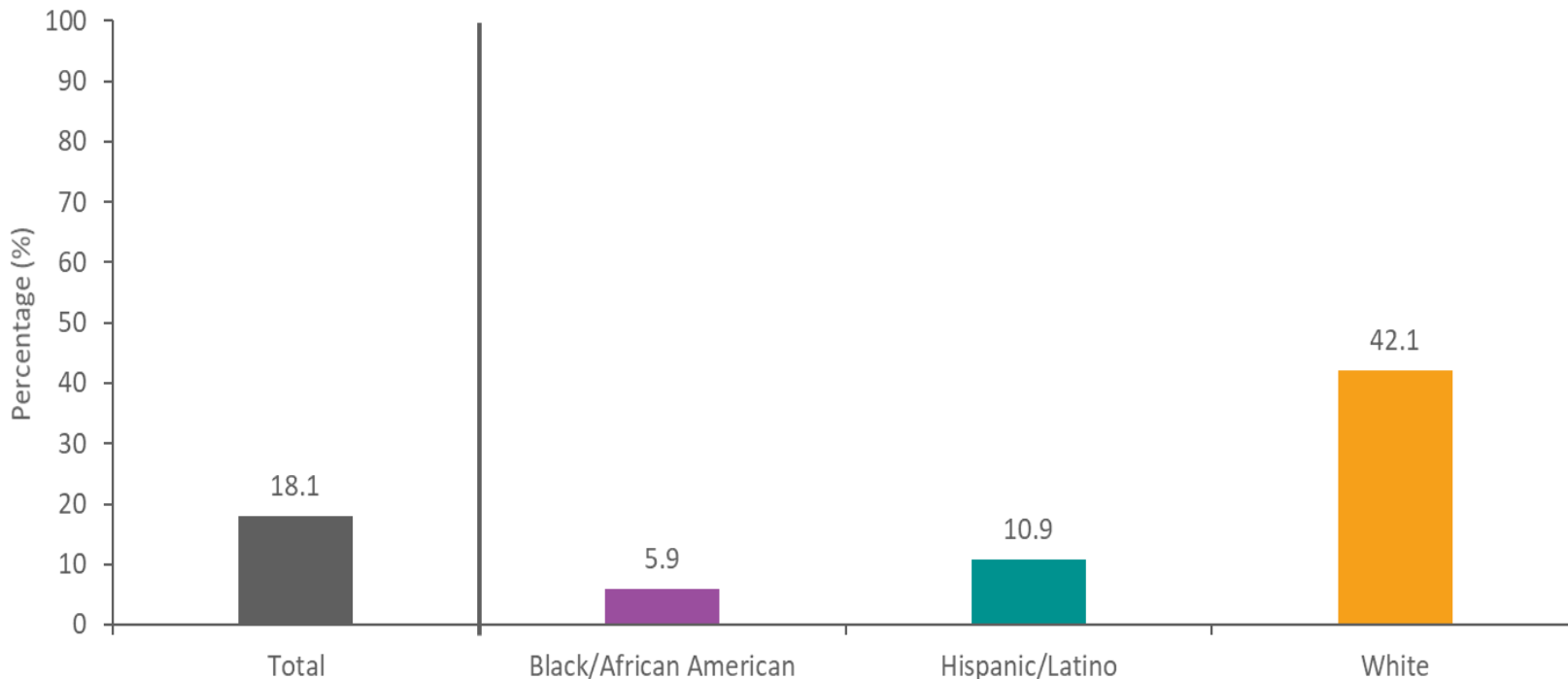


Abbreviation: PrEP, preexposure prophylaxis.

Note. PrEP coverage, reported as a percentage, was calculated as the number who have been prescribed PrEP divided by the estimated number of persons who had indications for PrEP. Different data sources were used in the numerator and denominator to calculate PrEP coverage.



# PrEP Coverage among Persons Aged ≥16 Years, by Race/ethnicity 2018—United States

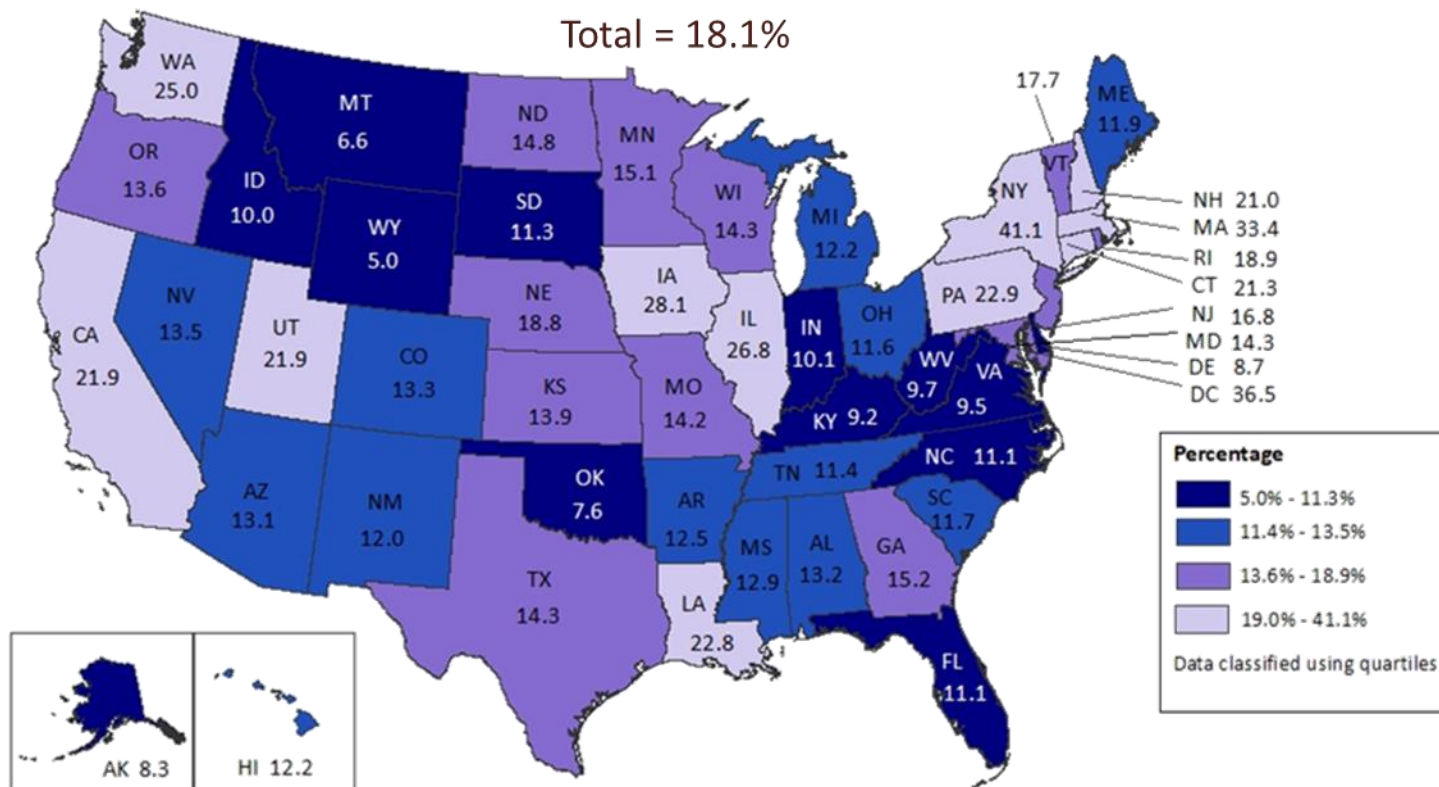


Abbreviation: PrEP, preexposure prophylaxis.

Note. PrEP coverage, reported as a percentage, was calculated as the number who have been prescribed PrEP divided by the estimated number of persons who had indications for PrEP. Race/ethnicity data were only available for 35% of persons prescribed PrEP in 2018. Number prescribed PrEP and PrEP coverage for race/ethnicity reported in the table were adjusted applying the distribution of records with known race/ethnicity to records with missing race/ethnicity. Different data sources were used in the numerator and denominator to calculate PrEP coverage.



# PrEP Coverage among Persons Aged ≥16 Years, by Area of Residence, 2018—United States



Abbreviation: PrEP, preexposure prophylaxis.

Note. PrEP coverage, reported as a percentage, was calculated as the number who have been prescribed PrEP divided by the estimated number of persons who had indications for PrEP. Different data sources were used in the numerator and denominator to calculate PrEP coverage.

