Foundations in HIV prevention, diagnosis and management

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SOUTHEAST STD/HIV PREVENTION TRAINING CENTER
CONNECTING · PROVIDERS · PRACTICE · & PATIENTS

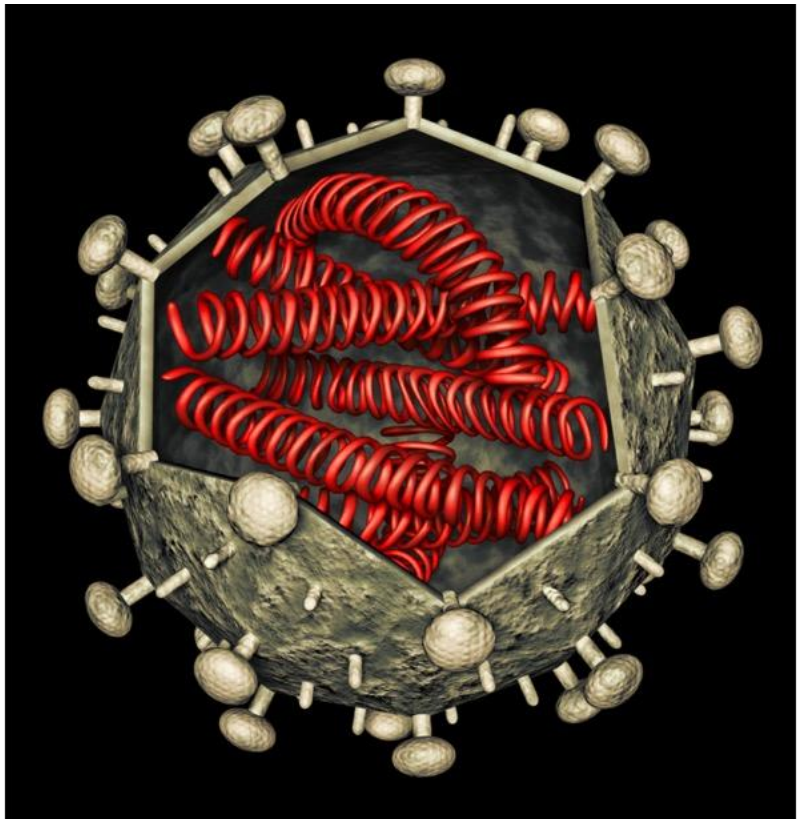
AETC AIDS Education & Training Center Program Southeast

Disclosures

- None

HIV

- Initially identified in 1983/84
  - Luc Montanier
  - Robert Gallo & Jay Levy
- Two types
- Crossed species from chimpanzees to humans in the last 100 years
- Earliest known samples isolated in 1959/60.
- Evolves rapidly
  - Error-prone replication of genetic material
  - Replicates rapidly



Andrews SM, Rowland-Jones S. Recent advances in understanding HIV evolution. F1000Res. 2017 Apr 28;6:597. doi: 10.12688/f1000research.10876.1. PMID: 28529718; PMCID: PMC5414815.

HIV – 1981, First Cases Recognized

- June, 5 young homosexual men with fatal or life-threatening PCP pneumonia.
- July 4, an unusual skin cancer -- Kaposi's sarcoma, is killing young, previously healthy men in New York City and California.
- December, 337 cases of severe immune deficiency are reported in the United States. Of those, 130 die.

AIDS Memorial Quilt, 1987

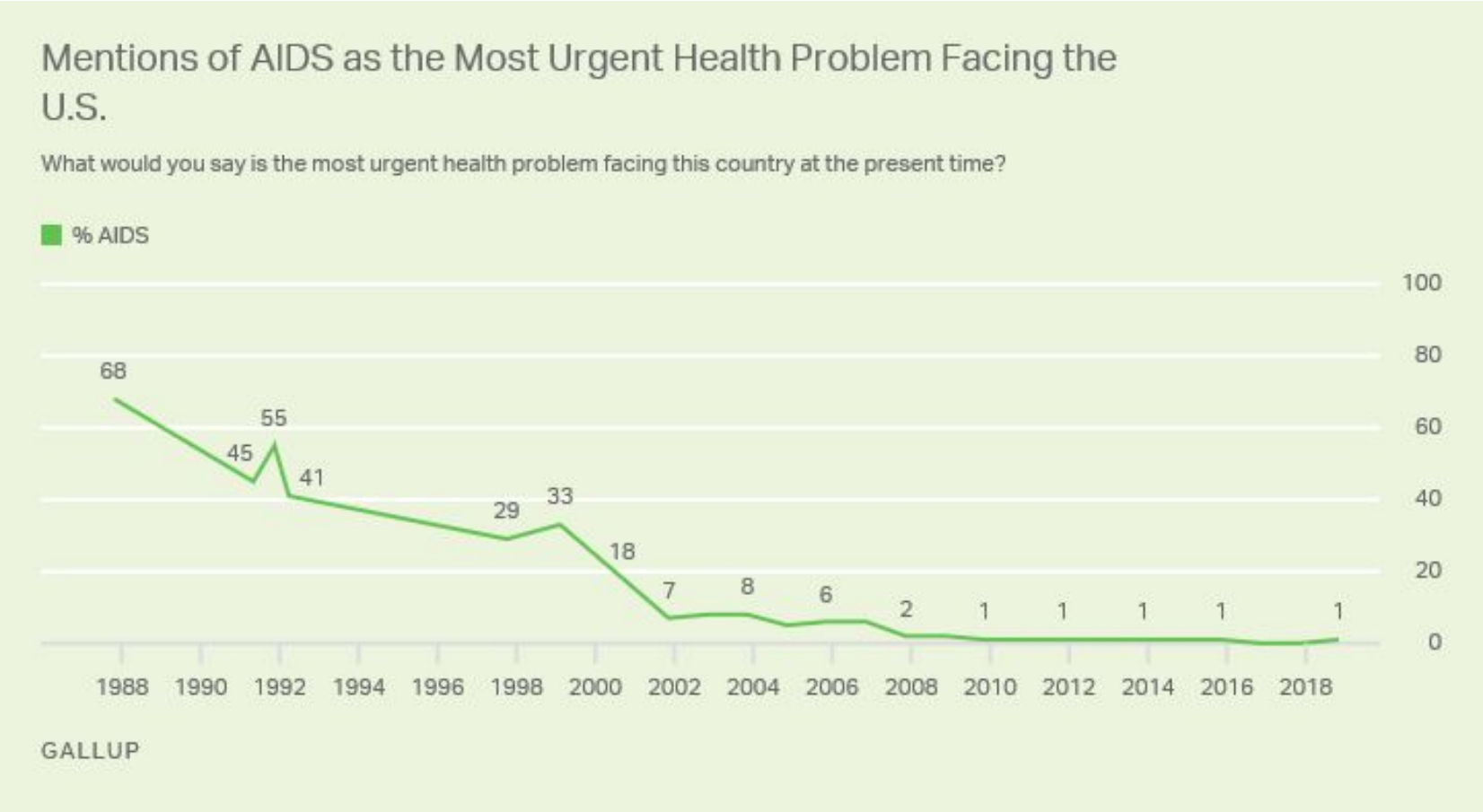
https://billofrightsinstitute.org/activities/aids-memorial-quilt-1987

Deaths from complications of HIV
>700,000 in the U.S.
40.1 million worldwide

https://www.webmd.com/hiv-aids/ss/slideshow-aids-retrospective

https://www.who.int/data/gho/data/themes/hivaids#:~:text=Global%20situation%20and%20trends%3A,at%20the%20end%20of%202021.

Fear and Anxiety about HIV have Declined

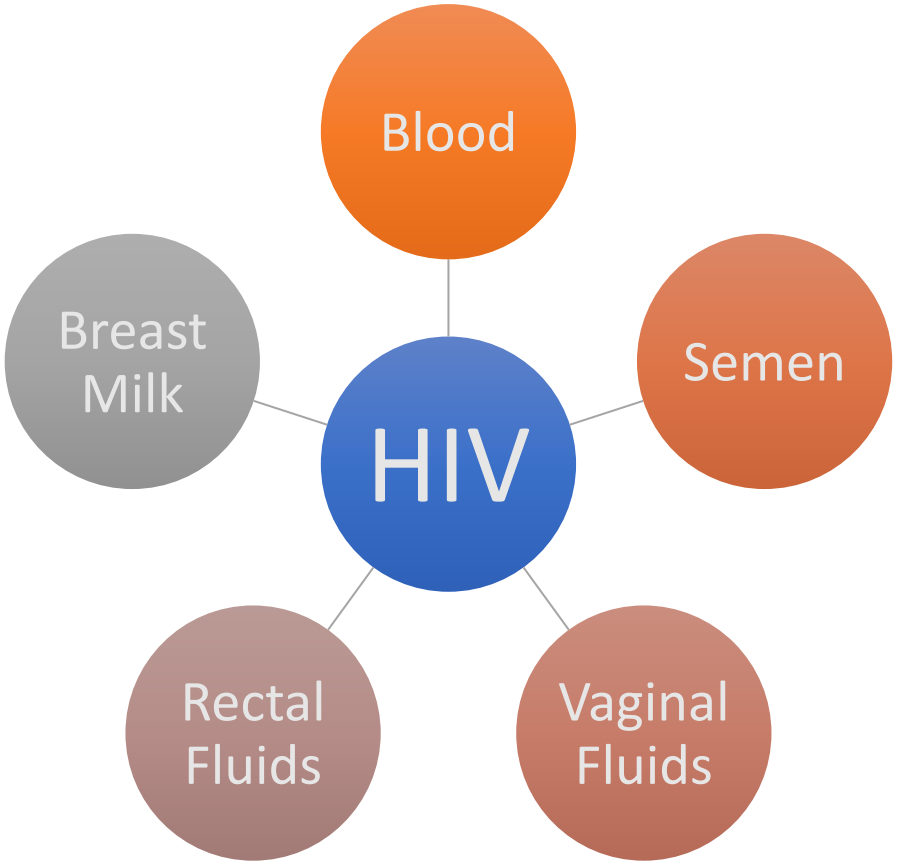


https://news.gallup.com/vault/259643/gallup-vault-fear-anxiety-during-1980s-aids-crisis.aspx

Objectives

- Understand HIV modes of transmission, epidemiology and natural history including opportunistic infections
- Learn how to prevent HIV in the occupational and non-occupational settings
- Gain knowledge about HIV screening and management including pertinent federal and state laws

HIV Transmission – Body Fluids



For transmission to occur, these fluids must:

- Come into contact with mucous membrane
- Come into contact with damaged tissue
- Be directly injected into the bloodstream

HIV Transmission

Estimated Per-Act Probability of Acquiring HIV from an Infected Source, by Exposure Act*

Type of Exposure	Risk per 10,000 Exposures
Parenteral	
Blood Transfusion	9,250
Needle-Sharing During Injection Drug Use	63
Percutaneous (Needle-Stick)	23
Sexual	
Receptive Anal Intercourse	138
Insertive Anal Intercourse	11
Receptive Penile-Vaginal Intercourse	8
Insertive Penile-Vaginal Intercourse	4
Receptive Oral Intercourse	Low
Insertive Oral Intercourse	Low

* Factors that may increase the risk of HIV transmission include sexually transmitted diseases, acute and late-stage HIV infection, and high viral load. Factors that may decrease the risk include condom use, male circumcision, antiretroviral treatment, and pre-exposure prophylaxis. None of these factors are accounted for in the estimates presented in the table.

^ HIV transmission through these exposure routes is technically possible but unlikely and not well documented.

Source

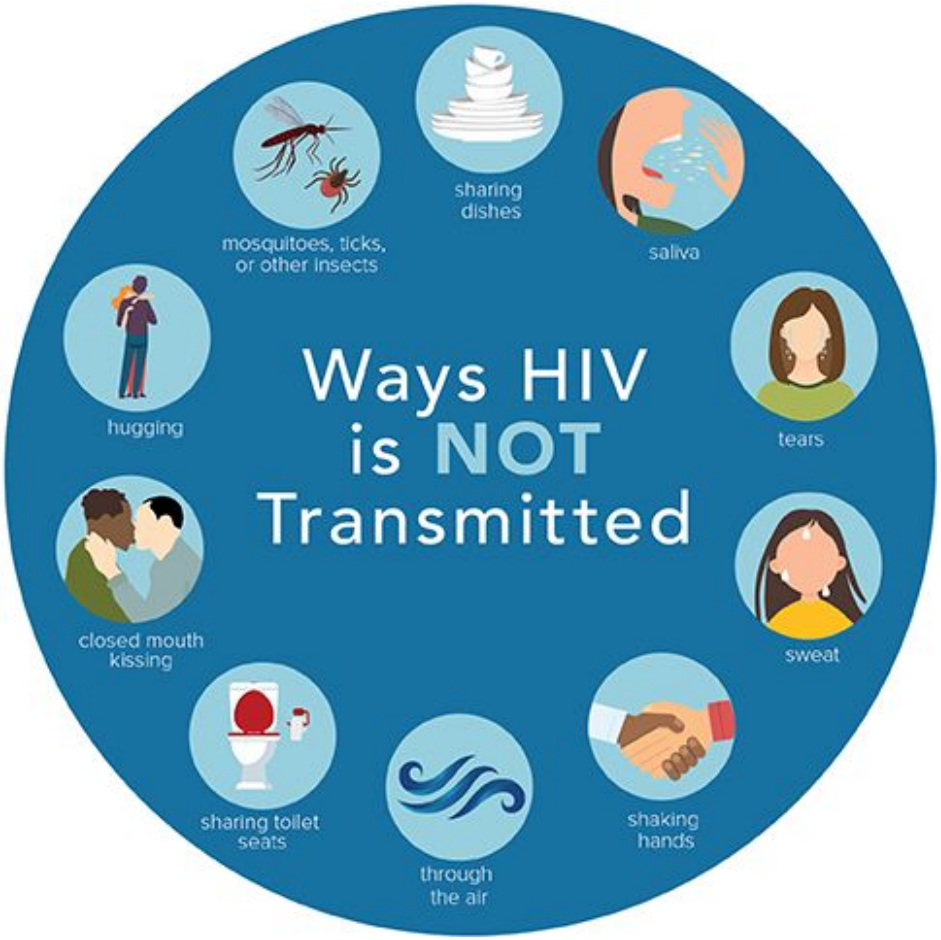
- Patel P, Borkowf CB, Brooks JT. Et al. Estimating per-act HIV transmission risk: a systematic review. AIDS. 2014. doi: 10.1097/QAD.0000000000000298.
- Pretty LA, Anderson GS, Sweet DJ. Human bites and the risk of human immunodeficiency virus transmission. Am J Forensic Med Pathol 1999;20(3):232-239.

HIV Transmission

Factors Influencing HIV Transmission

- Viral Load – transmission is more likely when viral load is high versus when it is controlled and low
- Community Viral Load – exposure to HIV is more likely in communities with a high HIV prevalence
- Sexually Transmitted Infections (STIs) – an active STI increases HIV transmission risk
- Alcohol and Drug Use – substance use may impact decision-making, potentially decreasing the use of preventive methods, like condoms
- Sexual Positioning – The receptive sexual partner (bottom) has a higher chance of acquiring HIV than the insertive partner (top)

HIV Transmission

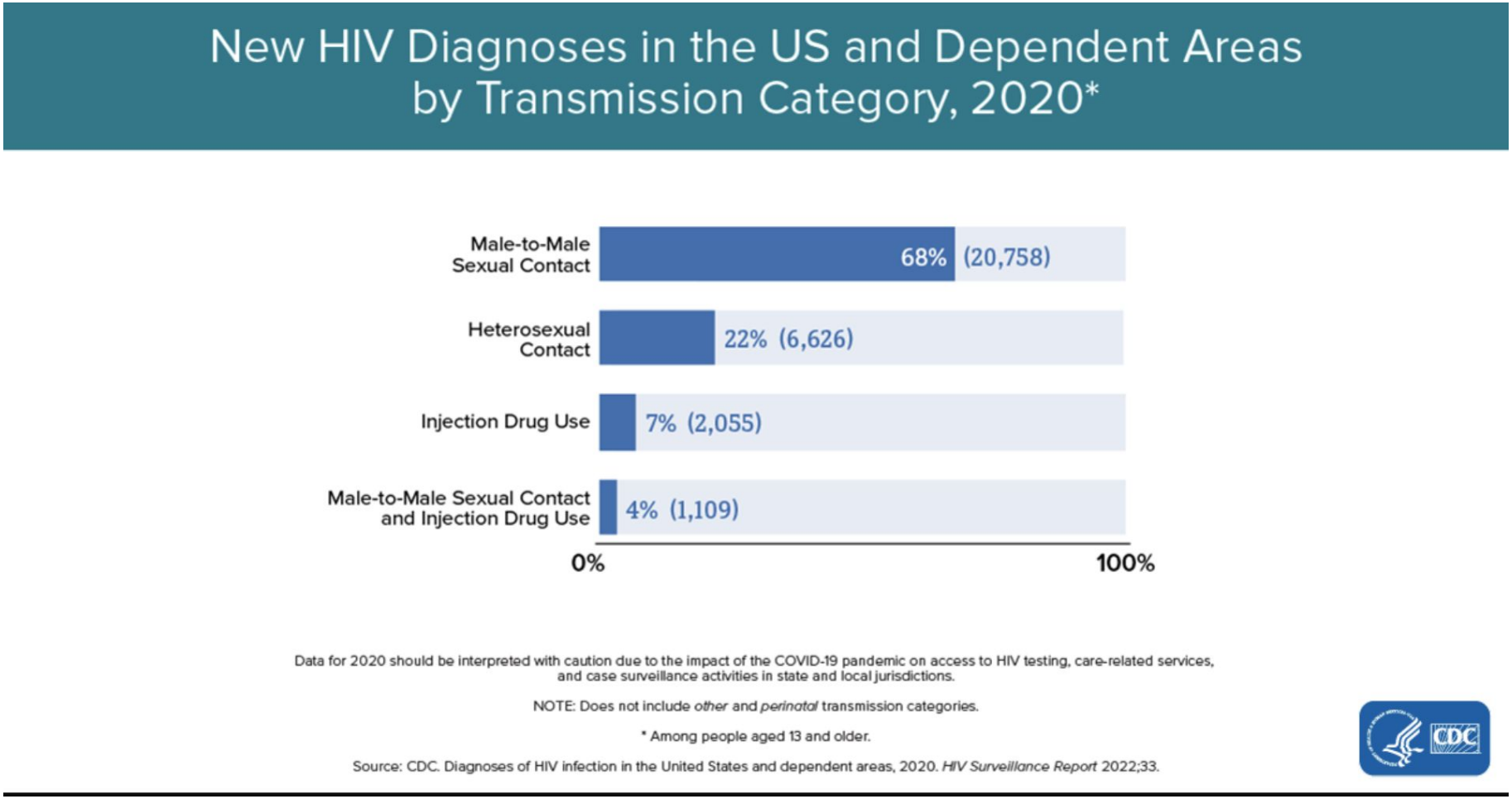


HIV **CANNOT** be transmitted by casual contact such hugging, touching, shaking hands, through food, through utensils, through toilet seats, kissing, massaging, etc.

HIV does not survive long outside the human body (such as on surfaces), and it cannot reproduce outside a human host.

https://www.cdc.gov/hiv/basics/hiv-transmission/not-transmitted.html

HIV - Epidemiology

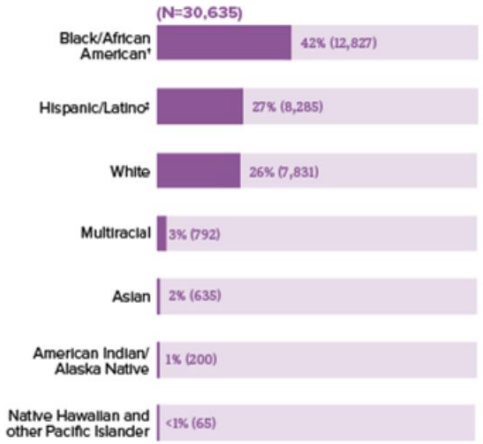


https://www.cdc.gov/hiv/statistics/overview/diagnoses.html

HIV - Epidemiology

New HIV Diagnoses in the US and Dependent Areas by Race/Ethnicity, 2020*

Racial and ethnic differences in HIV diagnoses persist.



Data for 2020 should be interpreted with caution due to the impact of the COVID-19 pandemic on access to HIV testing, care-related services, and case surveillance activities in state and local jurisdictions

* Among people aged 13 and older.

† *Black* refers to people having origins in any of the Black racial groups of Africa. *African American* is a term often used for people of African descent with ancestry in North America.

‡ Hispanic/Latino people can be of any race.

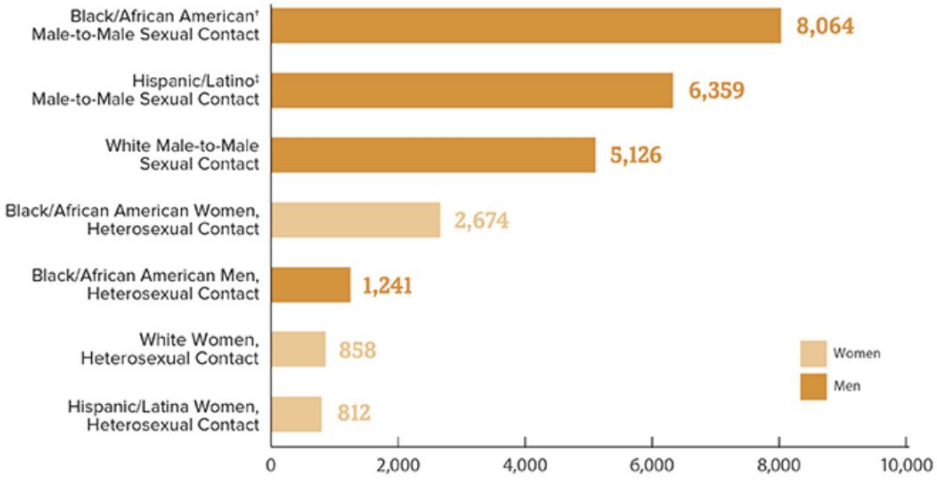
Source: CDC. Diagnoses of HIV infection in the United States and dependent areas, 2020. *HIV Surveillance Report* 2022;33.

https://www.cdc.gov/hiv/statistics/overview/diagnoses.html

HIV - Epidemiology

New HIV Diagnoses Among the Most-Affected Populations in the US and Dependent Areas, 2019*

Gay and bisexual men are the population most affected by HIV.



Data for 2020 should be interpreted with caution due to the impact of the COVID-19 pandemic on access to HIV testing, care-related services, and case surveillance activities in state and local jurisdictions

NOTE: Subpopulations representing 2% or less of all people who received an HIV diagnosis in 2020 are not represented in this chart.

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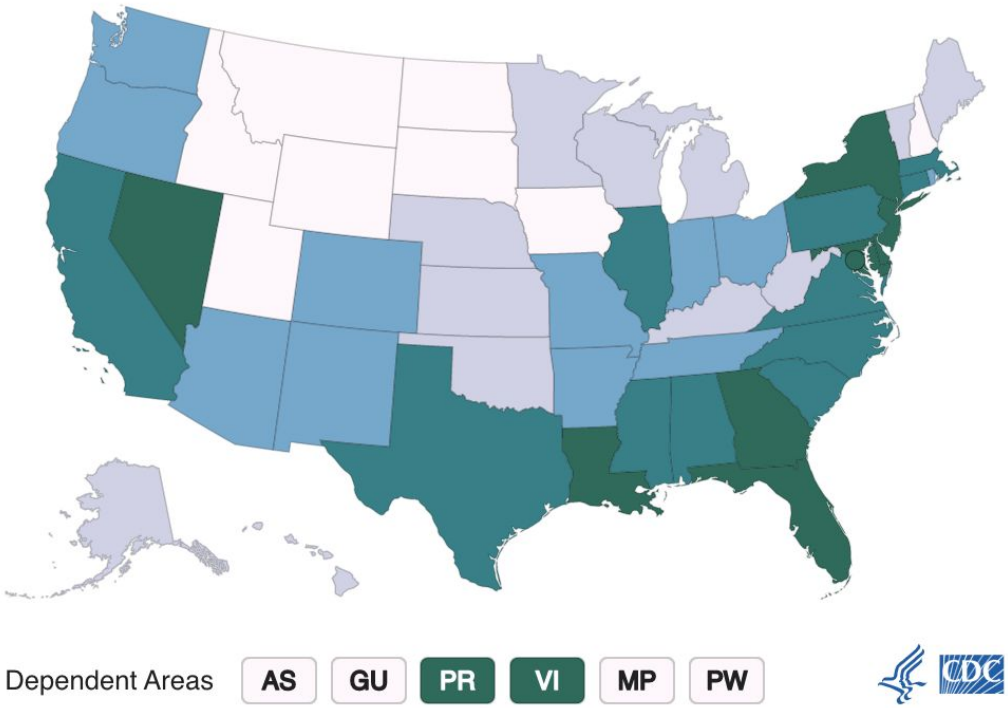
Source: CDC. Diagnoses of HIV infection in the United States and dependent areas, 2020. *HIV Surveillance Report* 2022;33.

https://www.cdc.gov/hiv/statistics/overview/diagnoses.html

HIV - Epidemiology: 1,189,700

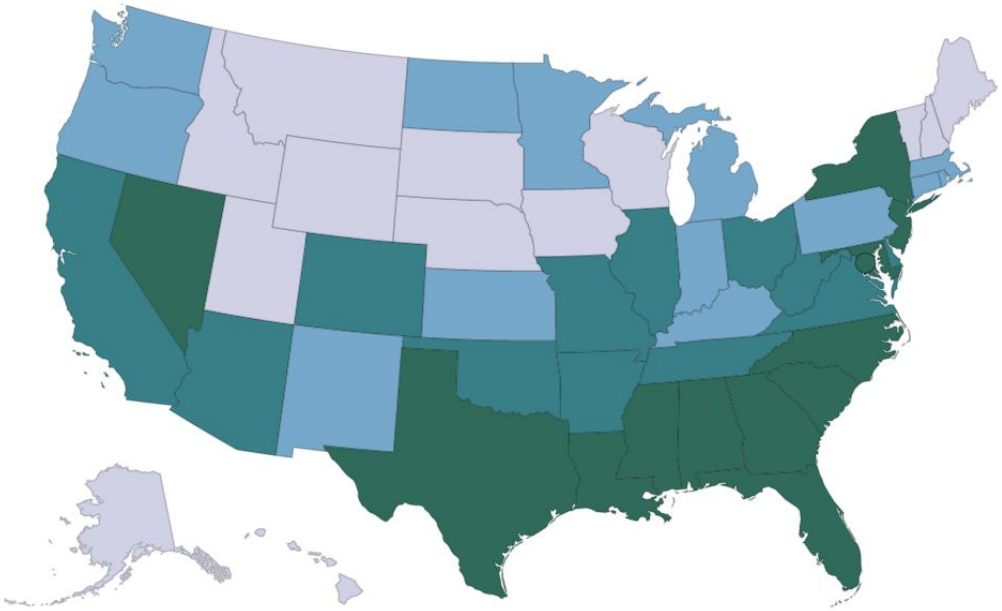
People Living with HIV in the US and Dependent Areas, 2020



https://www.cdc.gov/hiv/basics/statistics.html

HIV - Epidemiology: 30,635

People Newly Diagnosed with HIV in the US and Dependent Areas, 2020



Legend

New HIV Diagnoses

Rate per 100,000 people

0 | 1.9 - 5.4 | 5.4 - 9 | 9.1 - 13.6 | 14.1 - 42.2

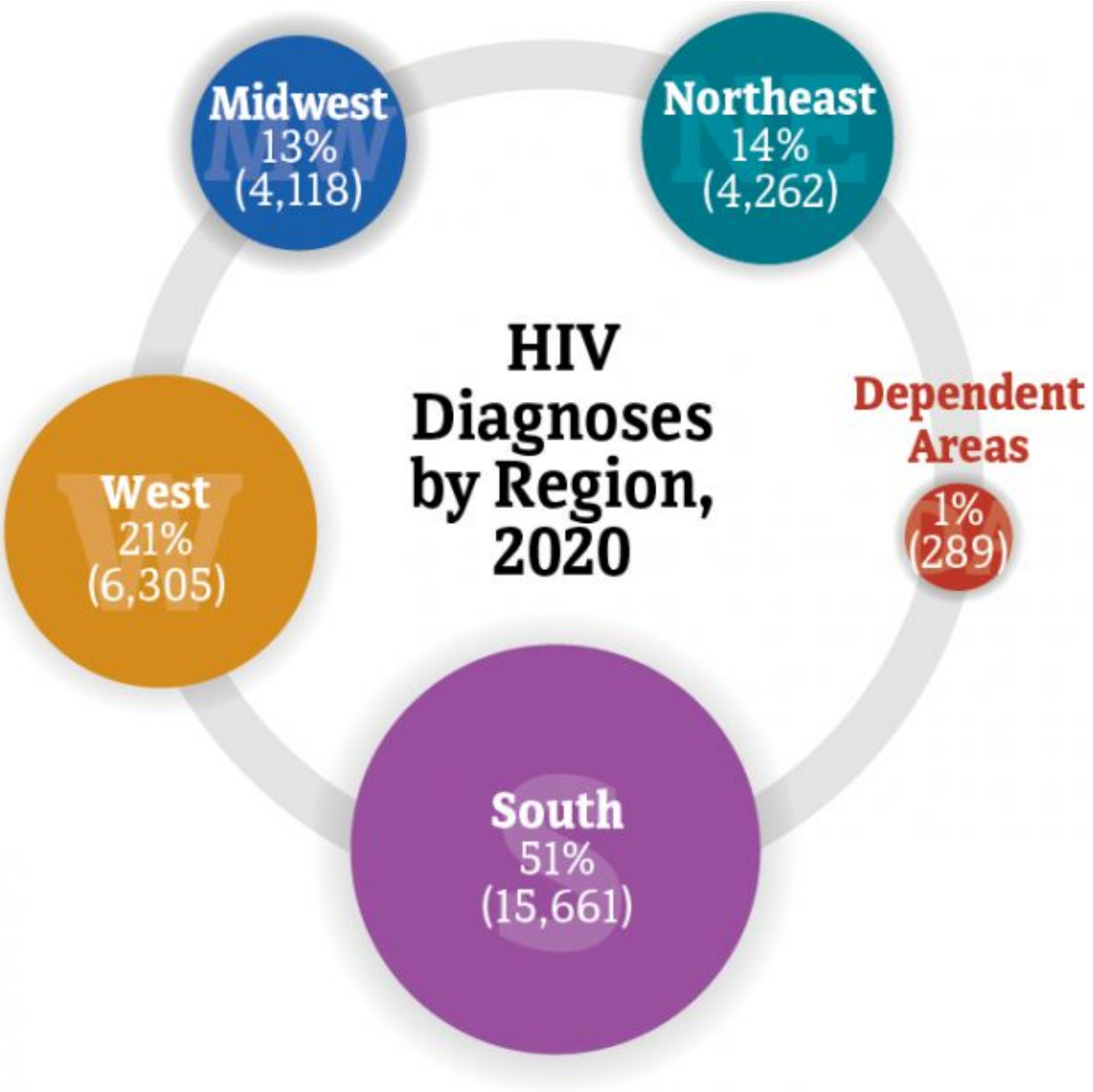
US Dependent Areas: AS | GU | PR | VI | MP | PW

Data Table: New HIV Diagnoses and People with Diagnosed HIV by Area of Residence

Location	Number	Rate per 100,000 people
Alabama	638	15.5
Florida	4378	23.7
Georgia	2439	27.6

https://www.cdc.gov/hiv/basics/statistics.html

HIV - Epidemiology



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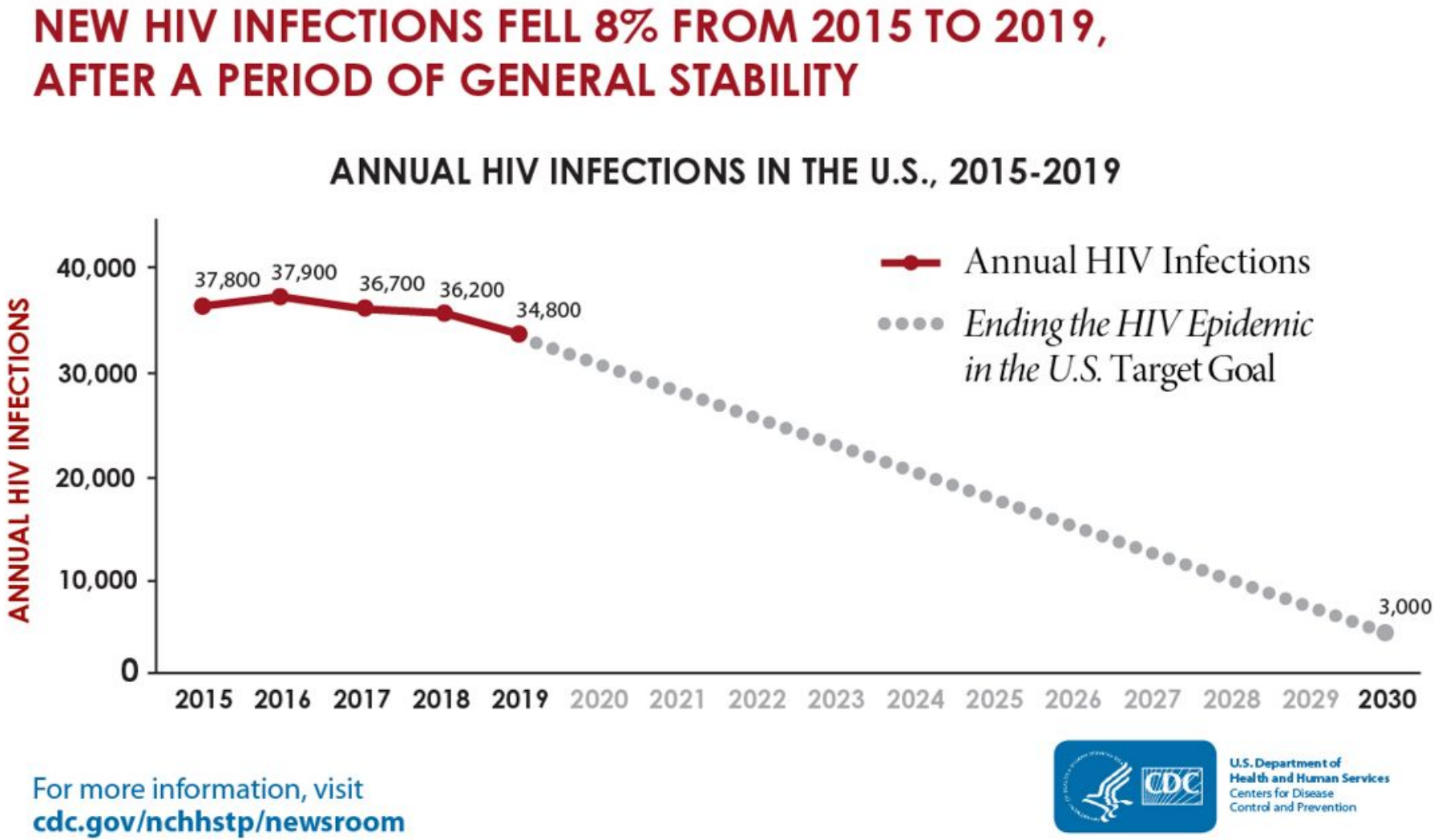
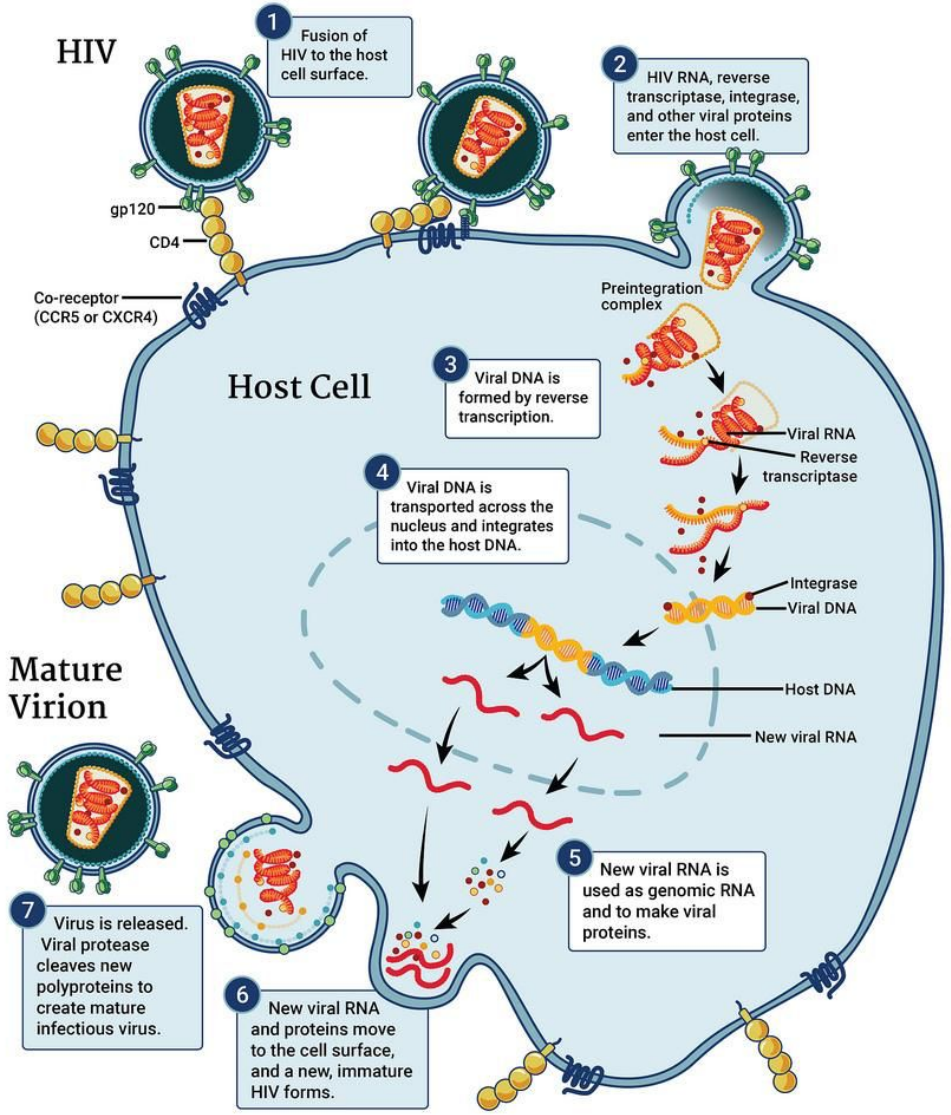
HIV - Epidemiology



HIV – Infection

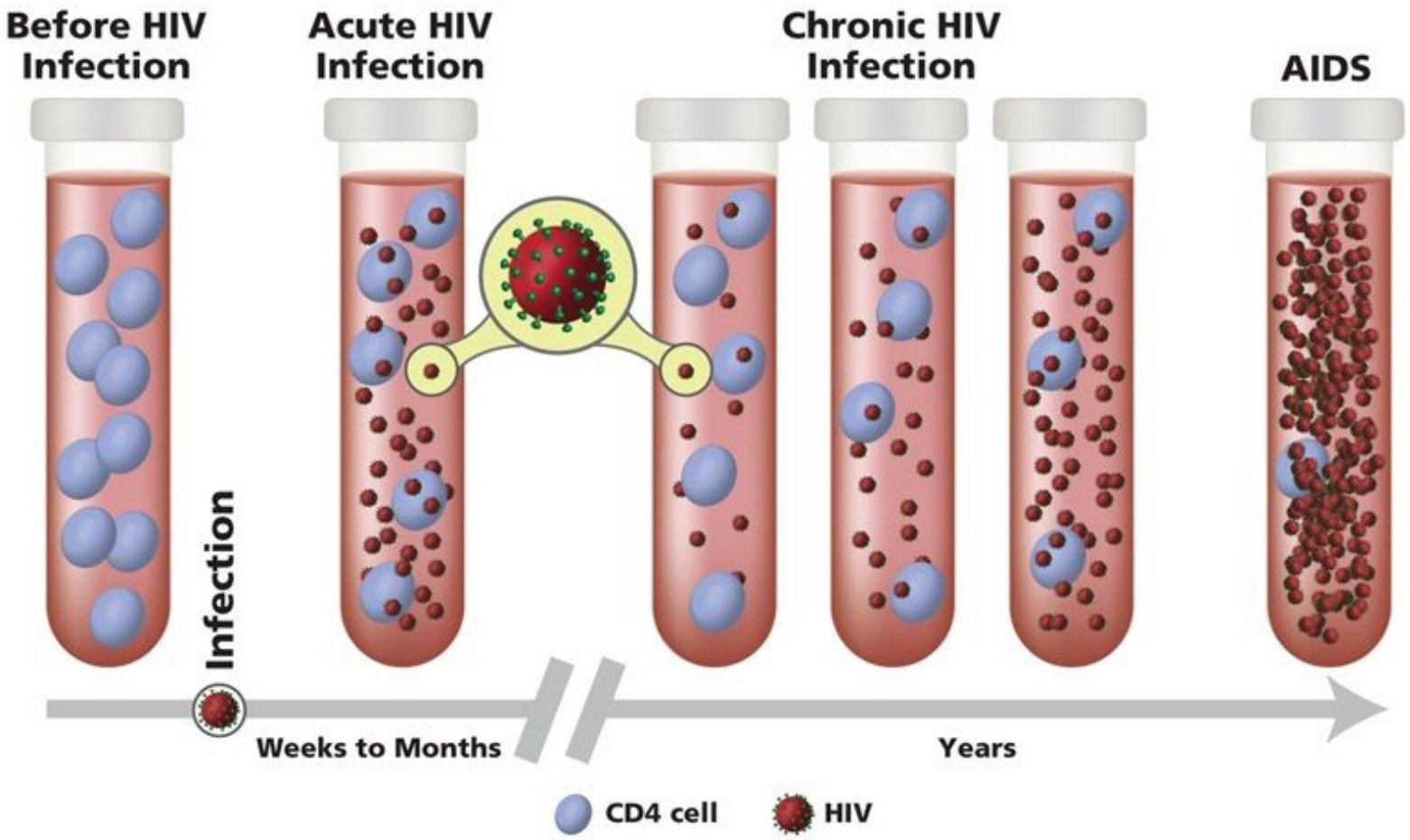
- Occurs when the virus attaches to the CD4 cell
- Kills cell it infects through replication
- About 10.3 Billion viruses are produced each day in persons not on therapy.



https://www.niaid.nih.gov/diseases-conditions/hiv-replication-cycle

https://www.aidsmap.com/about-hiv/hiv-lifecycle

HIV – Stages of Infection

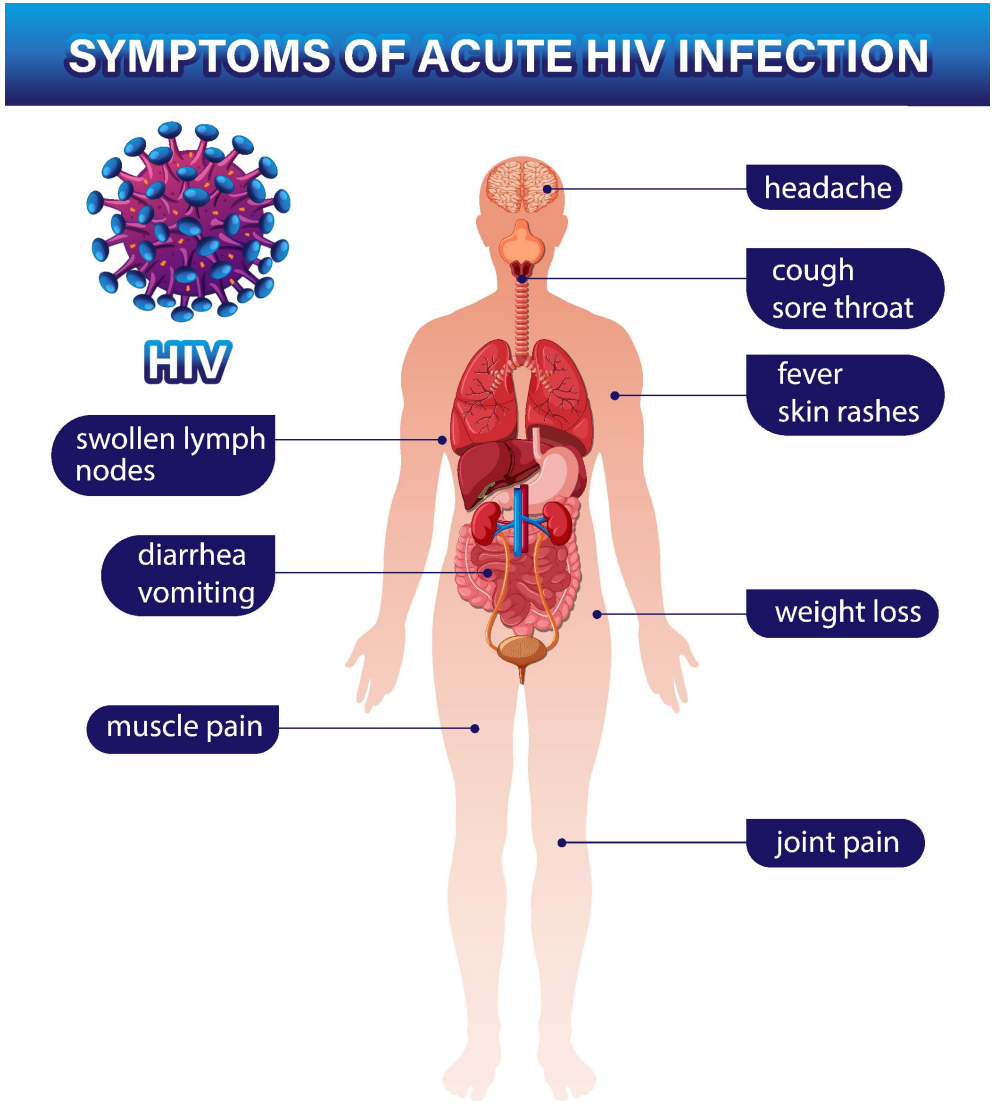


https://hivinfo.nih.gov/understanding-hiv/fact-sheets/stages-hiv-infection#:~:text=The%20three%20stages%20of%20HIV,one%20stage%20to%20the%20next.

HIV – Stages of Infection

Acute HIV

- Earliest phase
- 2-4 Weeks after infection
- “Flu-Like Symptoms
- HIV Viral Load is high
- Increased Risk of Transmission



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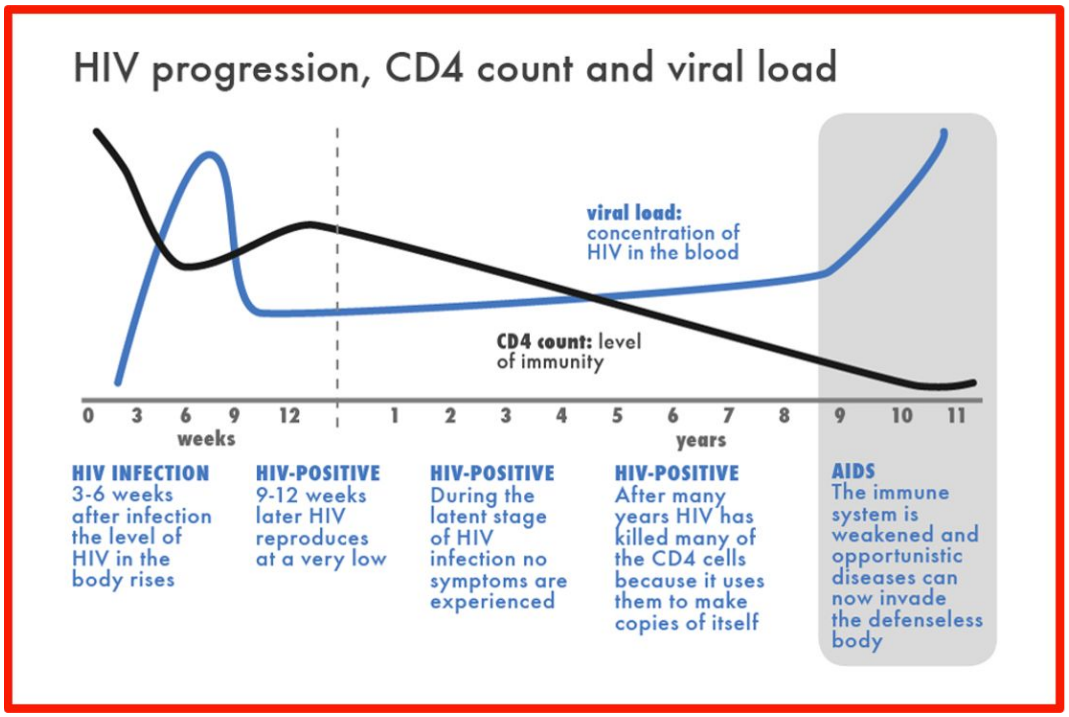
HIV – Stages of Infection

Chronic HIV (Asymptomatic Infection or Clinical Latency

- HIV replication continues
- No HIV-related symptoms
- Usually advances to AIDS after 10 years on average
- Possible to transmit HIV
- With therapy
  - Remain in this stage for decades
  - When HIV Viral Load is undetectable, no risk of transmission



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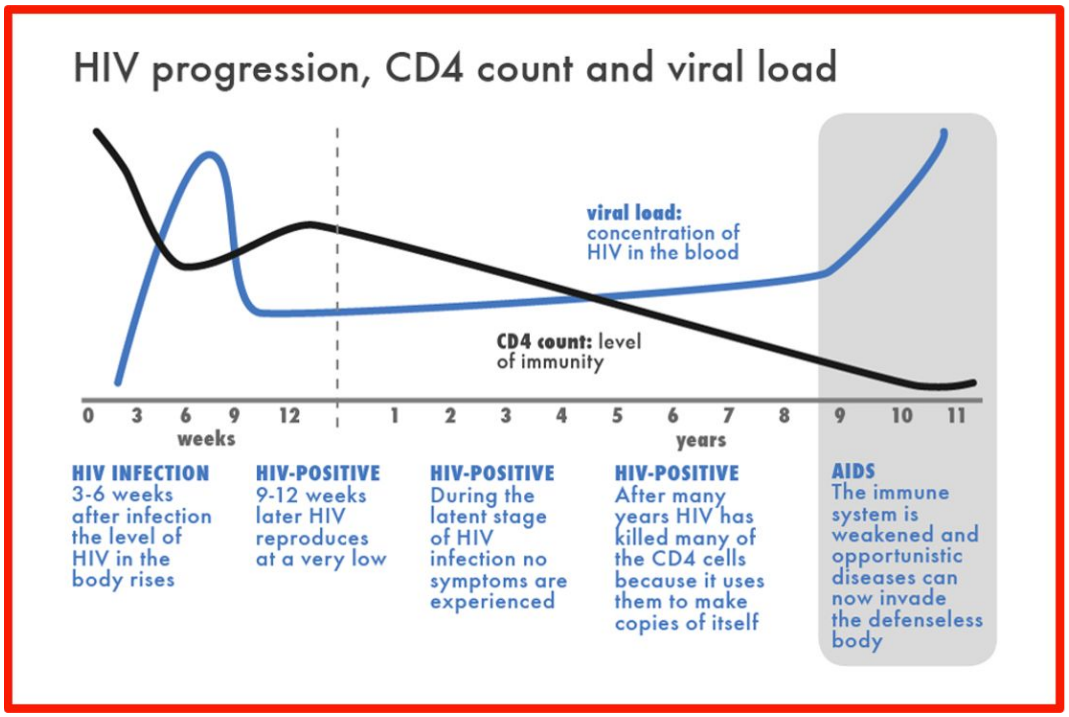
HIV – Stages of Infection

AIDS

- Most severe stage of HIV infection
- Damaged immune system unable to protect against opportunistic infections (OI)
- CD4 count less than 200 cells/mm^3 or if they develop OI
- Viral load increasing making transmission easier
- Without treatment survival is typically about 3 years.



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Opportunistic Infections - illnesses that occur more frequently and are more severe in people with HIV. This is because they have damaged immune systems.

Neurologic

- CNS mass Lesion
  - Toxoplasma
  - Primary CNS Lymphoma
  - Brain Abscess
- White Matter Lesion
  - PML
  - CMV
  - HIV encephalopathy

Meningitis

- Cryptococcus
- TB, Syphilis
- Bacterial, HSV, VZV

Undifferentiated Fever

- MAC
- TB
- Lymphoma
- Endemic fungi
- Bartonella
- Multicentric Castleman's
- Bacteria sepsis

Respiratory

- *S. pneumonia*
- PJP
- Tuberculosis
- Endemic fungi
- KS

Hepatobiliary

- Hep A, B, C, E
- MAC
- Endemic fungi
- Bartonella
- Cryptosporidia, microsporidiosis

Ocular

- CMV
- HSV, VZV
- Syphilis
- TB
- Bartonella

Gastrointestinal

- Upper GI
  - Candida, HSV, CMV, KS, Aphthous Ulcer
- Lower GI
  - *Salmonella, Campylobacter, C. diff*, etc
  - Giardia
  - Cryptosporidia, cystoisospora, Cyclospora, microsporidiosis
  - KS, MAC, Lymphoma

https://www.cdc.gov/hiv/basics/livingwithhiv/opportunisticinfections.html

HIV – Opportunistic Infections

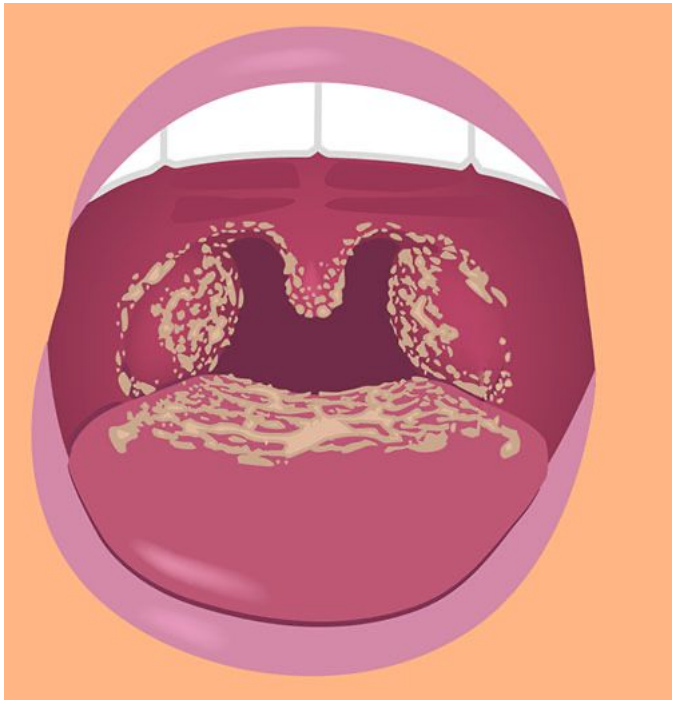
Thrush - *Candida* infection involving mucosal membranes, including the oropharynx and esophagus.

- Symptoms
  - Cottony feeling in mouth
  - Loss of taste
  - Pain with eating and Swallowing

- Examination
  - Pseudomembranous: White plaque on buccal mucosa, palate, tongue, oropharynx
  - Atrophic: Seen in adults who wear upper dentures. Erythema without plaques

https://www.cdc.gov/fungal/diseases/candidiasis/thrush/index.html
www.uptodate.com

HIV – Opportunistic Infections

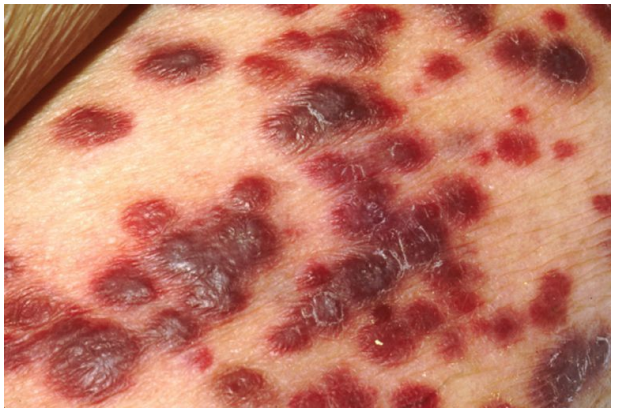


https://www.cdc.gov/fungal/diseases/candidiasis/thrush/index.html

https://phil.cdc.gov/Details.aspx?pid=1217

HIV – Opportunistic Infections

- Kaposi Sarcoma – Caused by Human Herpes Virus 8

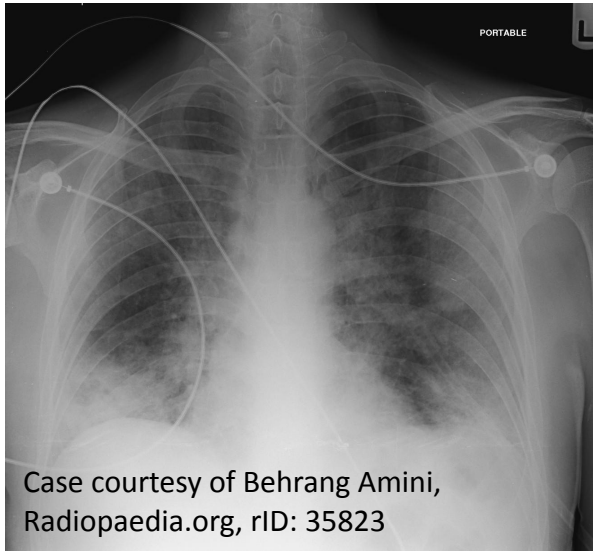


HIV – Opportunistic Infections

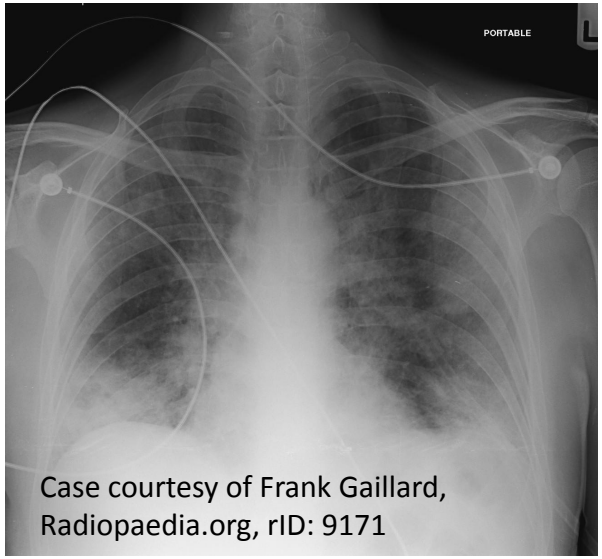
Pneumocystis jiroveci pneumonia (PJP) - unicellular fungi

- Progressive exertional dyspnea (95%)
- Fever (>80%)
- Nonproductive cough (95%)
- Chest discomfort.
- Weight loss.
- Chills.
- Hemoptysis (rare)

Medscape.com



Case courtesy of Behrang Amini, Radiopaedia.org, rID: 35823

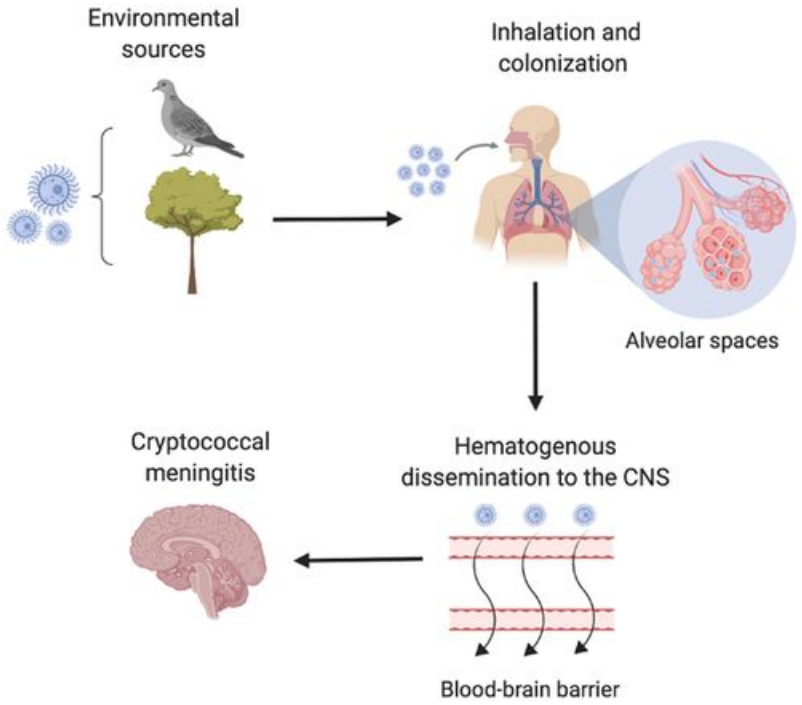


Case courtesy of Frank Gaillard, Radiopaedia.org, rID: 9171

HIV – Opportunistic Infections

Cryptococcal Meningitis – caused by the fungus cryptococcus after it spreads from the lungs to the brain

- Headache
- Fever
- Neck pain
- Nausea and vomiting
- Sensitivity to light
- Confusion or changes in behavior



Bermas, A, Geddes-McAlister, J. Combatting the evolution of antifungal resistance in *Cryptococcus neoformans*. *Mol Microbiol*. 2020; 114: 721– 734. https://doi.org/10.1111/mmi.14565

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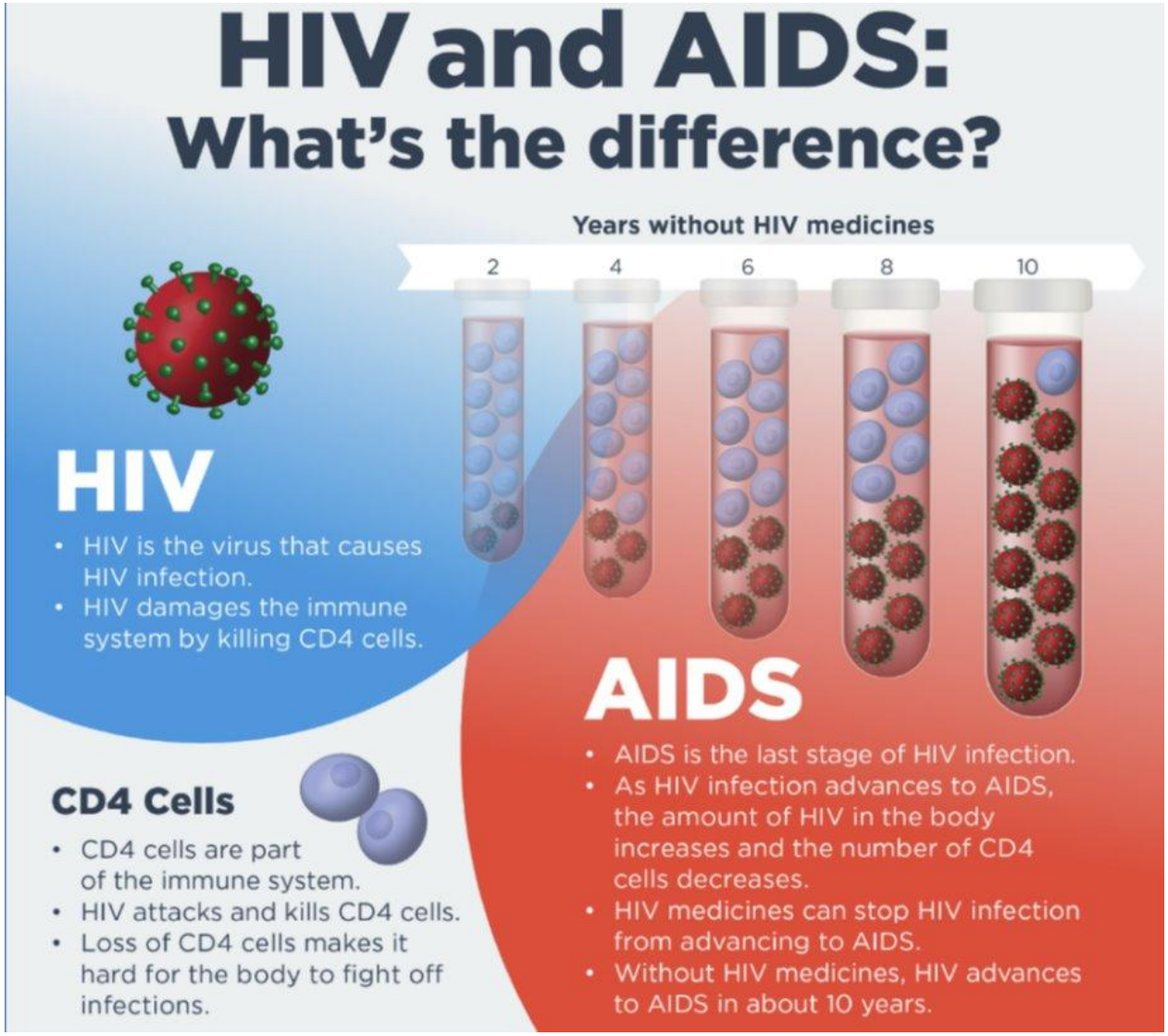
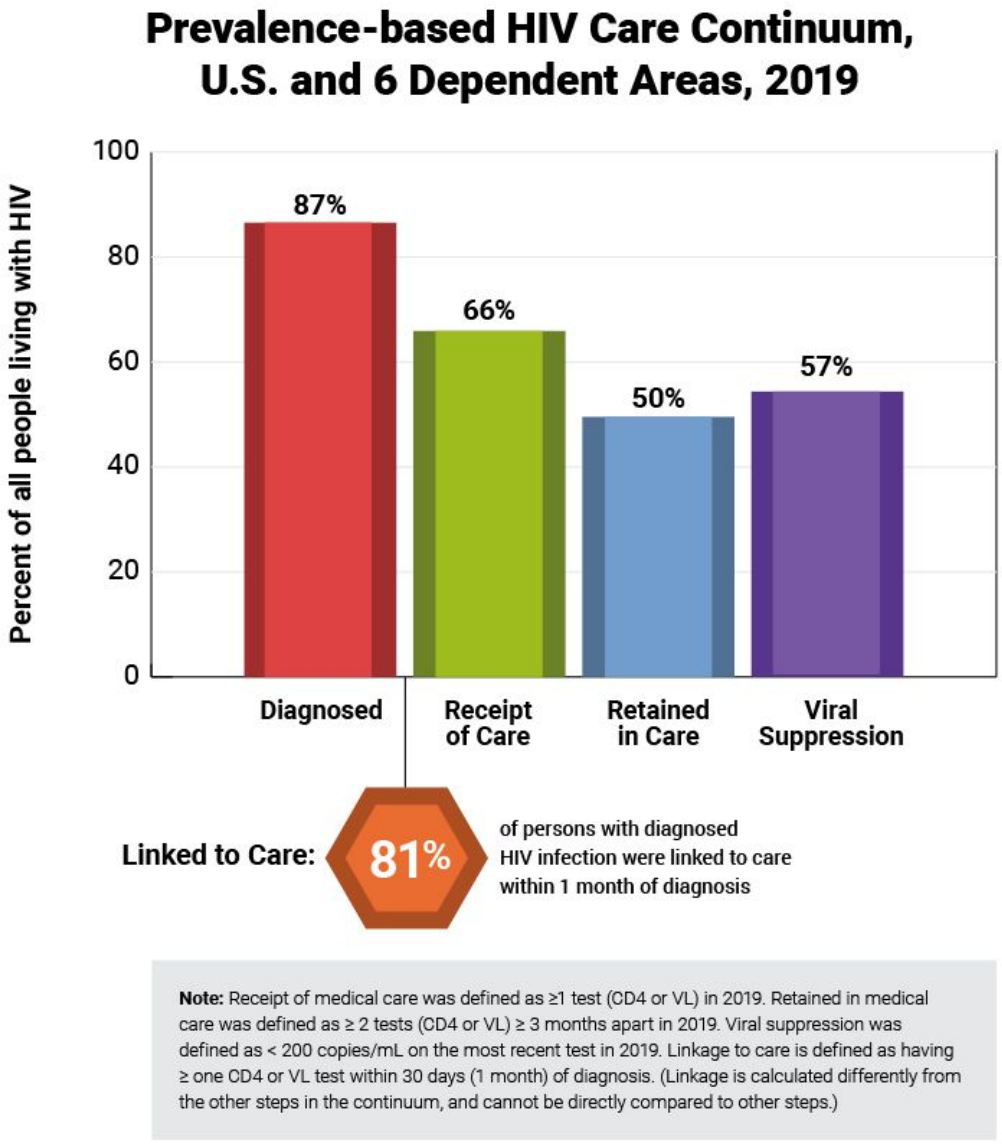
https://www.cdc.gov/hiv/basics/livingwithhiv/opportunisticinfections.html

HIV & AIDS – What's the Difference



https://www.hiv.gov/federal-response/policies-issues/hiv-aids-care-continuum



https://www.hiv.gov/federal-response/policies-issues/hiv-aids-care-continuum

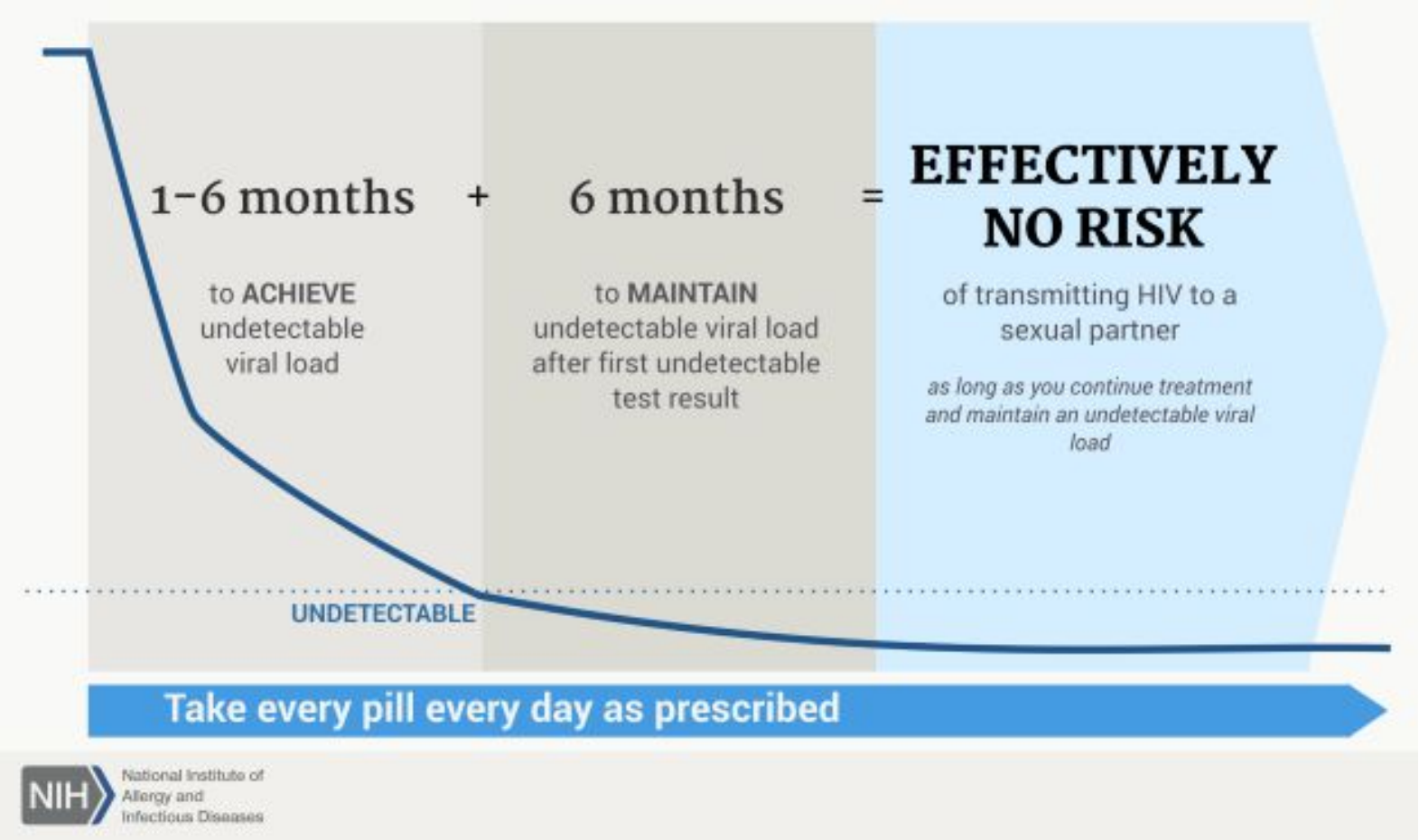
Data from the CDC in 2016 indicated that ~80% of new HIV infections were transmitted by people who either had HIV and were unaware/undiagnosed or who were diagnosed but not receiving HIV care

Nearly 40% of infections transmitted by those unaware they are infected

https://www.hiv.gov/federal-response/ending-the-hiv-epidemic/overview/

https://www.cdc.gov/hiv/testing/index.html

Treatment as prevention and U=U



EHE Initiative

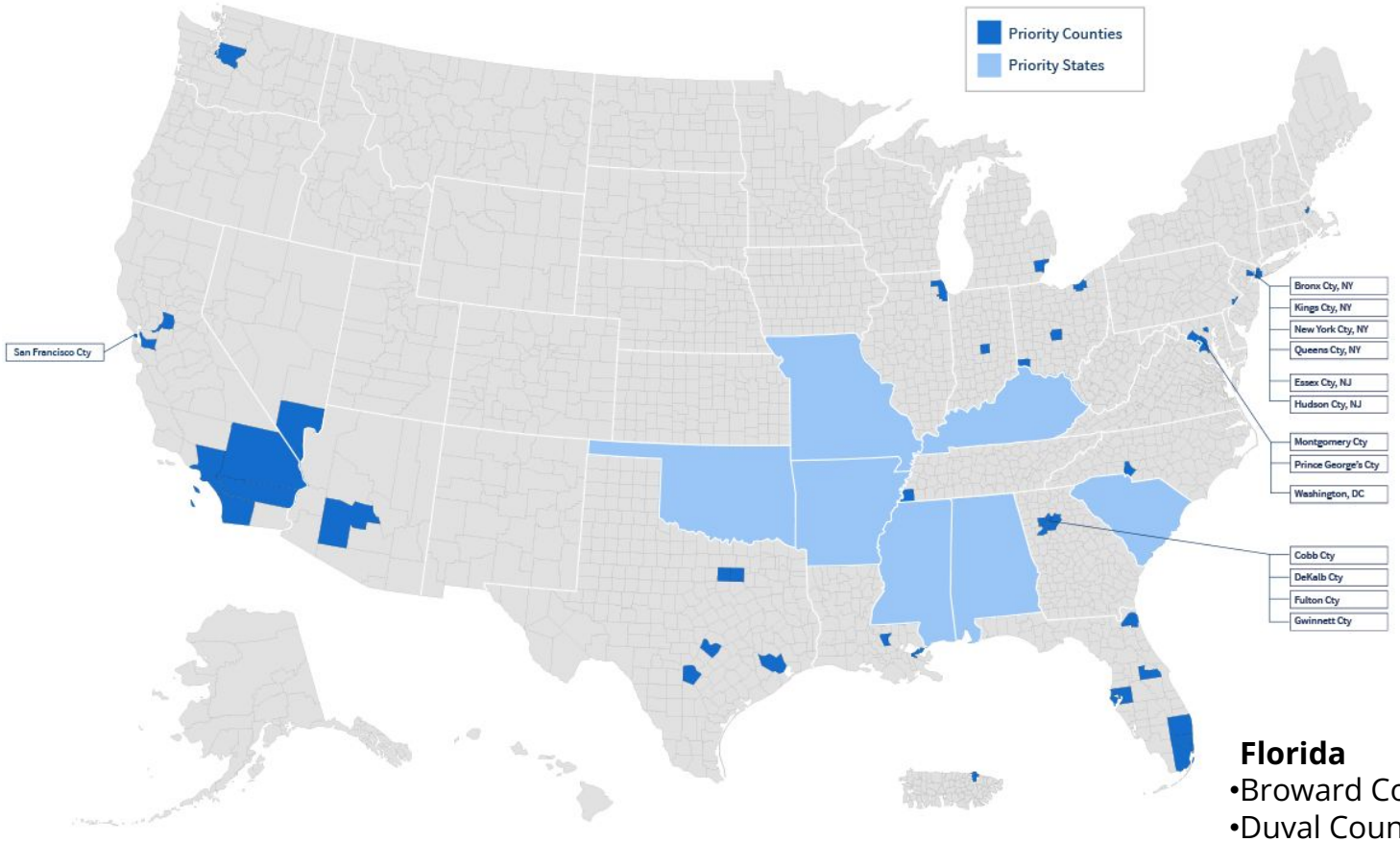
- *Ending the HIV Epidemic (EHE)* initiative launched by DHHS 2019

- Participating agencies include CDC, HRSA, US Public Health Service, SAMHSA, NIH, Indian Health Service

- Goal is to reduce 90% of new HIV infections in US by 2030

https://www.cdc.gov/endhiv/about.html

Priority counties and states

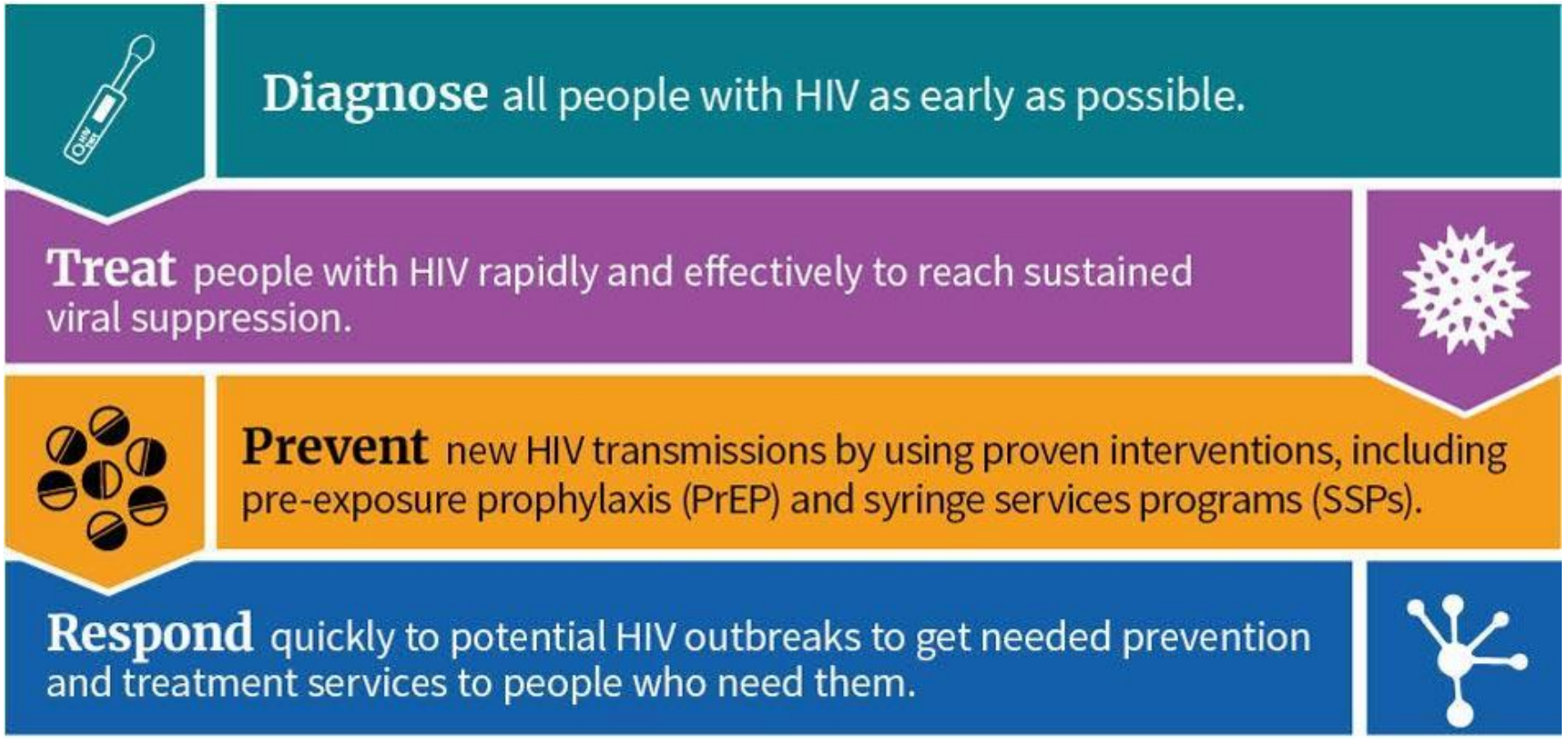


https://www.hiv.gov/federal-response/ending-the-hiv-epidemic/overview/

Florida

- Broward County
- Duval County
- Hillsborough County
- Miami-Dade County
- Orange County
- Palm Beach County
- Pinellas County

4 pillars of EHE



https://www.hiv.gov/federal-response/ending-the-hiv-epidemic/key-strategies/

First pillar of EHE: Diagnosis

- Identify risk for HIV and other STIs through sexual health history – Take a sexual health history at least annually in ALL patients
  - Test/treat for other STIs; site specific screening

- CDC recommendation: Everyone between age 13-64 get tested for HIV at least once as part of routine health care
  - Opt out testing: all patients tested unless they refuse (patient informed about the testing)

- Test patients with higher risk annually

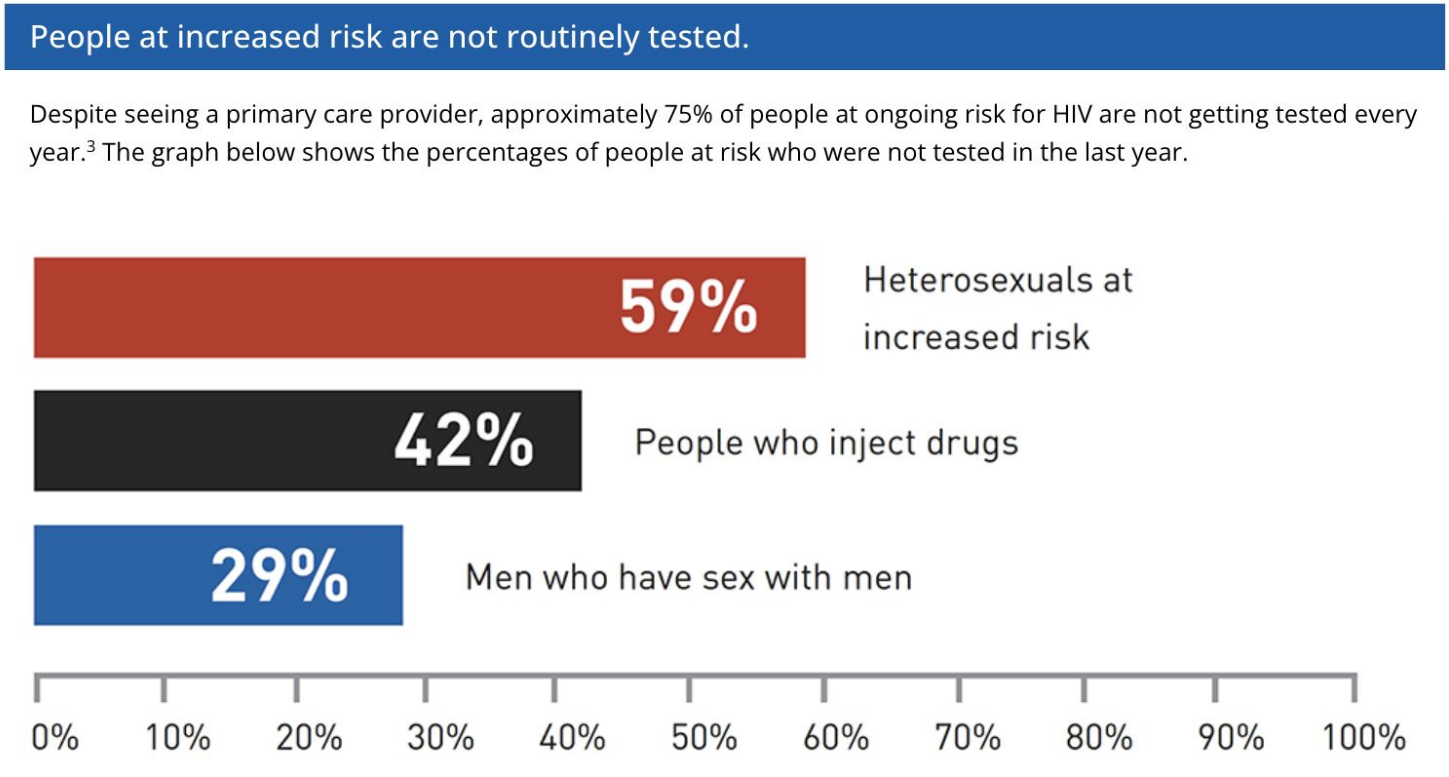
Risk factors for annual HIV testing

- Men who have sex with men (MSM)
- Anal or vaginal sex with someone who has HIV
- >1 sexual partner since last HIV test
- Sharing needles or other drug injection paraphernalia
- Exchanged sex for drugs or money
- Diagnosed/treated for another STI
- Diagnosed with viral hepatitis (Hepatitis B or C) or TB
- Sex with someone with above risk factors or with someone with unknown sexual history.

https://www.cdc.gov/hiv/basics/hiv-testing/getting-tested.html

HIV Screening

- Screen for HIV as a part of routine healthcare
  - Everyone between the ages of 13 and 64 at least once as part of routine health care.
  - For people with certain risk factors, CDC recommends getting tested at least once a year.



https://www.cdc.gov/hiv/clinicians/screening/index.html
https://www.cdc.gov/hiv/testing/index.html#:~:text=CDC%20recommends%20that%20everyone%20between,at%20least%20once%20a%20yea

HIV Screening Toolkit

HIV remains a serious public health problem.

All people between the ages of 13 and 64 should be tested for HIV at least once as part of routine health care, and those at ongoing risk should be tested more frequently. Read more about CDC's HIV Screening Guidelines.

- How Do I Screen for HIV?
- How Does Routine HIV Screening Benefit My Patients?
- Which HIV Tests Should I Use?
- How Do I Link My Patients to HIV Treatment and Care?
- How Can Partner Notification Services Help Me and My Patients?
- How Do I Discuss Sexual Health With Patients?

https://www.cdc.gov/hiv/clinicians/screening/index.html

HIV Screening Toolkit

HIV remains a serious public health problem.

All people between the ages of 13 and 64 should be tested for HIV at least once as part of routine health care, and those at ongoing risk should be tested more frequently. Read more about CDC's HIV Screening Guidelines.

- How Do I Screen for HIV?
- How Does Routine HIV Screening Benefit My Patients?
- Which HIV Tests Should I Use?
- How Do I Link My Patients to HIV Treatment and Care?
- How Can Partner Notification Services Help Me and My Patients?
- How Do I Discuss Sexual Health With Patients?

https://www.cdc.gov/hiv/clinicians/screening/index.html

HIV Screening

- *Revised Recommendations for HIV Testing of Adults, Adolescents, and Pregnant Women in Health-Care Settings*.
  - Separate written consent for HIV testing is not recommended.
  - Prevention counseling—defined as an interactive process of assessing risk of infection, recognizing specific behaviors that increase this risk, and developing a plan to reduce risk—should not be required with HIV diagnostic testing or as part of HIV screening programs in health-care settings.

https://www.cdc.gov/hiv/policies/law/states/testing.html

WHAT IS THE WINDOW PERIOD FOR THE HIV TEST I TOOK?

Nucleic Acid Test (NAT)*
window period
10-33 days

Antigen/Antibody Lab Test*
window period
18-45 days

Rapid Antigen/Antibody Test†
window period
18-90 days

Antibody Test‡
window period
23-90 days

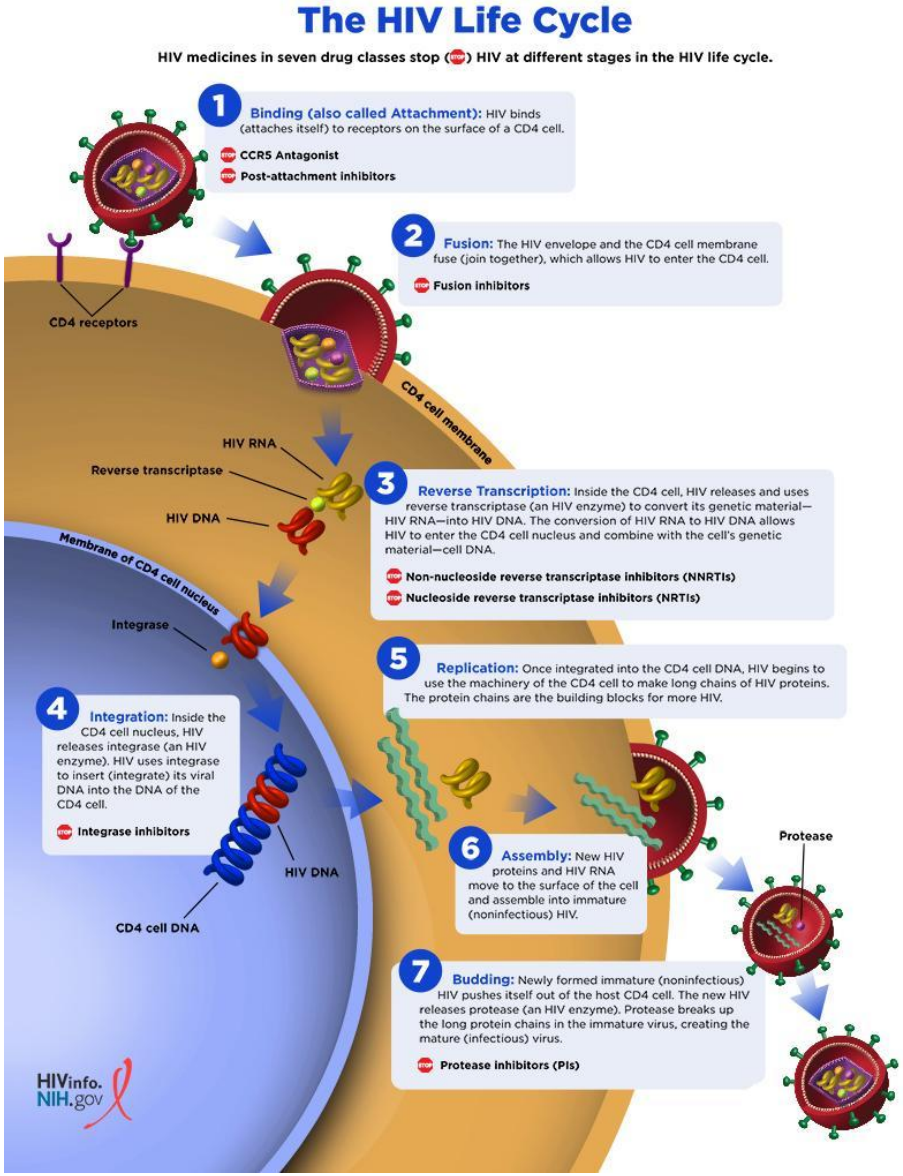
* Performed by a lab on blood from a vein.
† Done with blood from a finger stick.
‡ Most rapid tests and self-tests are antibody tests.

Second EHE Pillar: Treatment

- ALL people diagnosed with HIV should be started on treatment with antiretroviral therapy (ART) as soon as possible
- Importance of linkage - “fast-tracking”
- Rapid ART
  - Starting ART as quickly as possible after HIV diagnosis
  - Also known as immediate ART, same day ART or treatment upon diagnosis
  - Potential benefits for personal & public health
    - Earlier engagement in care
    - Earlier viral suppression (less time during which virus could be transmitted to a sexual partner)
    - Acute HIV – may limit viral reservoir

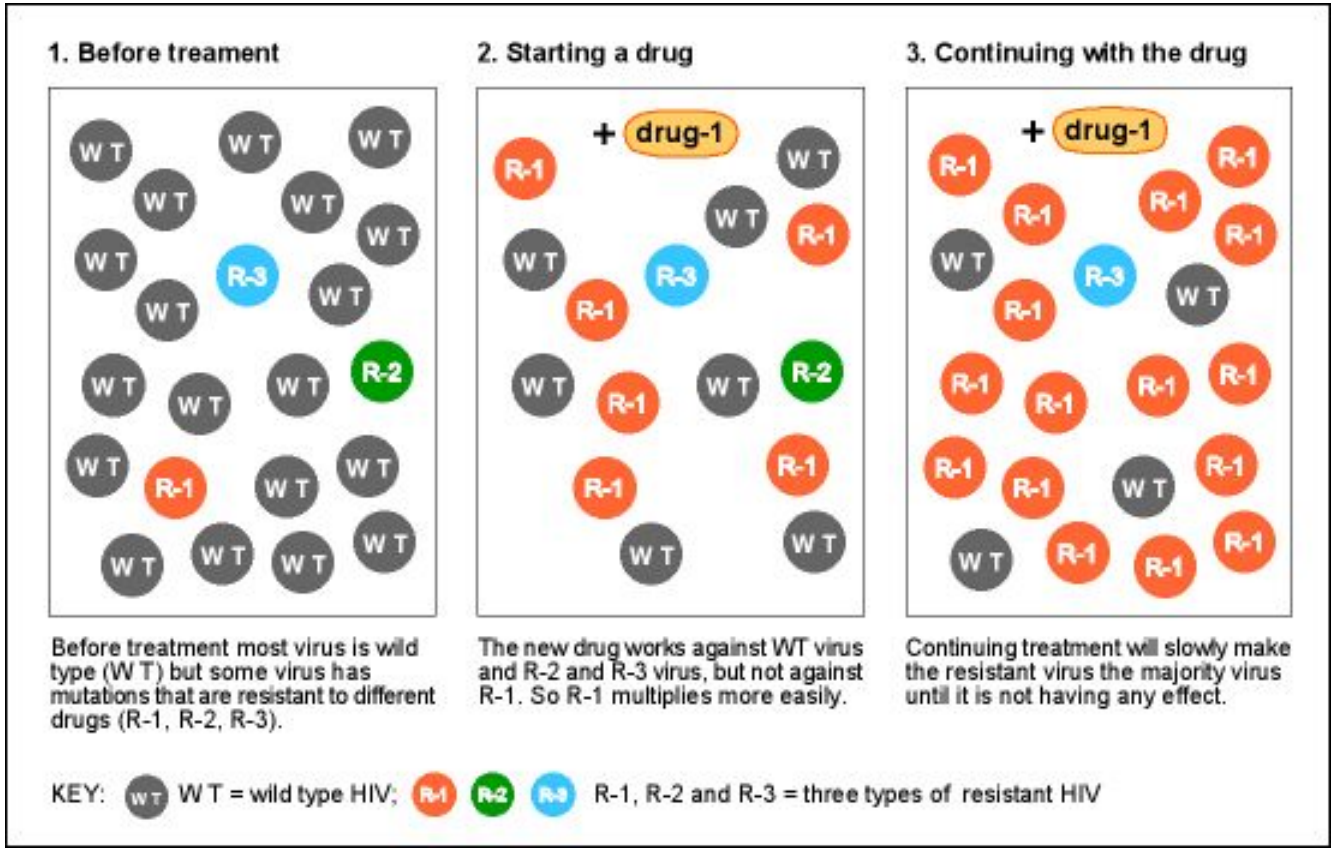
Mechanism of action of antiretroviral medications

Main principle of treatment: use 2-3 active agents to target virus at different points in the life cycle



https://hivinfo.nih.gov/understanding-hiv/fact-sheets/hiv-life-cycle

HIV and resistance to antiretroviral therapy



Common first regimens

- **Bictegravir (BIC)/tenofovir alafenamide (TAF)/emtricitabine (FTC)**
- Dolutegravir (DTG)/abacavir (ABC)/lamivudine (3TC) – can be used for patients who are HLA-B*5701 negative and do not have chronic hepatitis B virus (HBV)
- Dolutegravir (DTG) plus (tenofovir alafendamide (TAF) or tenofovir disoproxil fumarate [TDF] plus emtricitabine (FTC) or lamivudine (3TC)
- Dolutegravir (DTG)/lamivudine (3TC) - can't be used in patients with HIV RNA >500,000 copies/mL, HBV coinfection, or when starting ART prior to results of baseline genotype

https://clinicalinfo.hiv.gov/en/guidelines/hiv-clinical-guidelines-adult-and-adolescent-arv/what-start-initial-combination-regimens?view=full

HIV Medication Chart

Combination Antiretrovirals

- **Atripla** (EFV/TDF/FTC)
- **Biktarvy** (BIC/TAF/FTC)
- **Combivir**† (ZDV/3TC)
- **Complera** (RPV/TDF/FTC)
- **Delstrigo** (DOR/TDF/3TC)
- **Descovy** (TAF/FTC)
- **Dovato** (DTG/3TC)
- **Epzicom**† (ABC/3TC)
- **Genvoya** (EVG/COBI/TAF/FTC)
- **Juluca** (DTG/RPV)
- **Odefsey** (RPV/TAF/FTC)
- **Stribild** (EVG/COBI/TDF/FTC)
- **Symtuza** (DRV/COBI/TAF/FTC)
- **Triumeq** (DTG/ABC/3TC)
- **Truvada** (TDF/FTC)

Nucleoside/Nucleotide Reverse Transcriptase Inhibitors (NRTI)

- **Emtriva*** (emtricitabine, FTC)
- **Epivir*†** (lamivudine, 3TC)
- **Retrovir*†** (zidovudine, ZDV)
- **Viread*†** (tenofovir DF, TDF)
- **Ziagen*†** (abacavir, ABC)
- **Vemlidy** (tenofovir alafenamide, TAF) FDA approved for HBV only

Protease Inhibitors (PI)

- **Evotaz** (ATV/COBI)
- **Kaletra*** (lopinavir/ritonavir, LPV/RTV)
- **Lexiva*** (fosamprenavir, FPV)
- **Prezcobix** (DRV/COBI)
- **Prezista*** (darunavir, DRV)
- **Reyataz*†** (atazanavir, ATV)
- **Viracept*** (nelfinavir, NFV)

Non-Nucleoside Reverse Transcriptase Inhibitors (NNRTI)

- **Edurant** (rilpivirine, RPV)
- **Intelence** (etravirine, ETR)
- **Pifeltro** (doravirine, DOR)
- **Sustiva**† (efavirenz, EFV)
- **Viramune*†** (nevirapine, NVP)

Entry Inhibitors

- **Fuzeon** (enfuvirtide, T-20) Fusion Inhibitor
- **Selzentry** (maraviroc, MVC) CCR5 Antagonist
- **Trogarzo** (ibalizumab, IBA) Post-Attachment Inhibitor

Integrase Inhibitors (INSTI)

- **Isentress*▲** (raltegravir, RAL)
- **Isentress HD** (raltegravir, RAL)
- **Tivicay** (dolutegravir, DTG)

Boosting Agents

- **Norvir*†** (ritonavir, RTV)
- **Tybost** (cobicistat, COBI)

https://aidsetc.org/resource/hiv-medication-chart-pad

Long-acting injectable ART

- Cabotegravir/rilpivirine (INSTI + NNRTI)
- Approved by FDA in January 2021
- Monthly or every 2 month intramuscular injection

What do my lab results mean?

HIV and Laboratory Tests

You want your CD4 count to be **HIGH**

CD4 Cell Count

CD4 cells are specialized cells of the immune system destroyed by HIV. A CD4 cell count measures how many CD4 cells are in your blood. The higher your CD4 cell count, the healthier your immune system.

HIV Viral Load Test

An HIV viral load test, also called an HIV RNA test, tracks how many HIV particles are in a sample of your blood. This is called your viral load.

You want your viral load to be **LOW**

Taking a combination of HIV medicines every day prevents HIV from destroying CD4 cells and helps lower your viral load.

What are some other important tests?

DRUG RESISTANCE TEST

HIV can change form, making it resistant to some HIV medicines. A drug resistance test helps your health care provider choose the HIV medicines that will work for you.

TESTS FOR OTHER INFECTIONS

HIV weakens the immune system, leaving people vulnerable to other infections. Health care providers test for tuberculosis, hepatitis B and C infections, and other potential illnesses. The treatment for another infection may affect HIV treatment.

COMPLETE BLOOD COUNT

This test measures how many red blood cells, white blood cells, and platelets are in your blood. This helps health care providers keep track of your overall health and spot infections or other potential medical problems.

BLOOD CHEMISTRY TESTS

This group of tests measures several different chemicals in your blood to help monitor the health of your organs, especially your heart, liver, and kidneys. Health care providers use blood chemistry tests to look for side effects caused by HIV medicines.

For more information, visit HIVinfo.NIH.gov

https://hivinfo.nih.gov/understanding-hiv/infographics/what-do-my-lab-results-mean

ART and visit adherence

- Assess adherence to ART and visits on regular basis
- In patients with issues with adherence, take a nonjudgmental & collaborative approach. Motivational interviewing can be helpful.
- Elicit barriers to adherence & tailor approach to addressing them
- Multidisciplinary approach – provider, case manager or social worker, pharmacist, psychologist/psychiatrist, substance use disorder staff/providers

https://clinicalinfo.hiv.gov/en/guidelines/hiv-clinical-guidelines-adult-and-adolescent-arv/adherence-continuum-care

Barriers to ART or visit adherence

Behavioral barriers: Alcohol and substance use disorders

Personal barriers: work schedule, family responsibilities; medical beliefs; forgetfulness

Psychological barriers: Stigma, trauma, depression, anxiety, other mental illness

Structural barriers: lack of transportation, homelessness, clinic hours, difficulty getting appointments or refills

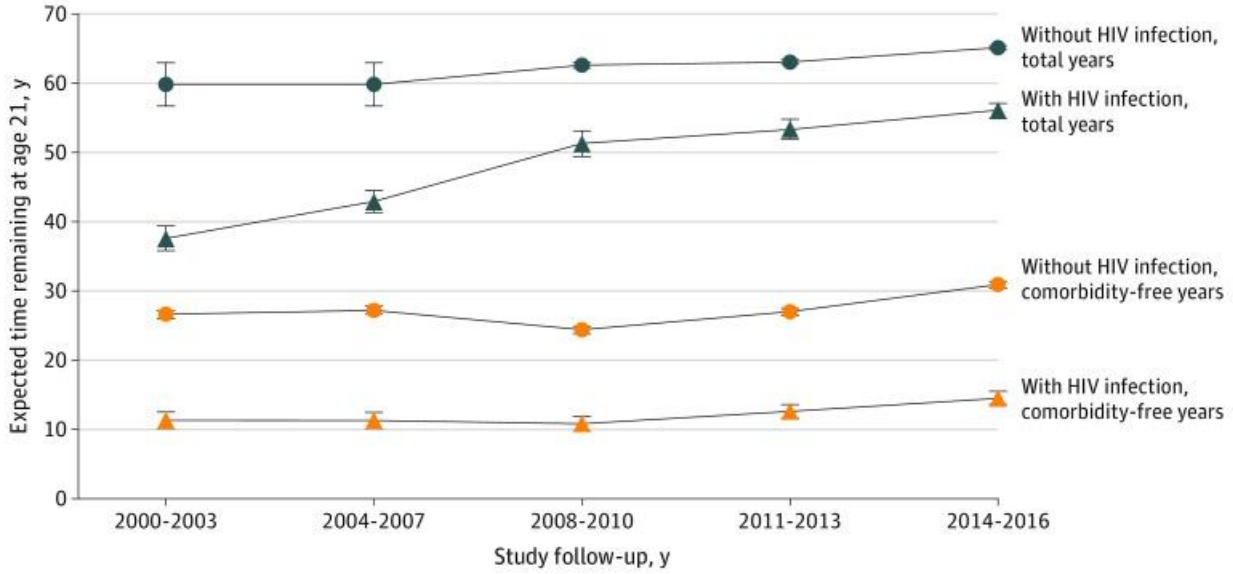
System barriers: copays, prior authorizations

Cognitive barriers: lack of knowledge or information; cognitive impairment

Medication related barriers: side effects or concern about side effects, dosing schedule, size of pills

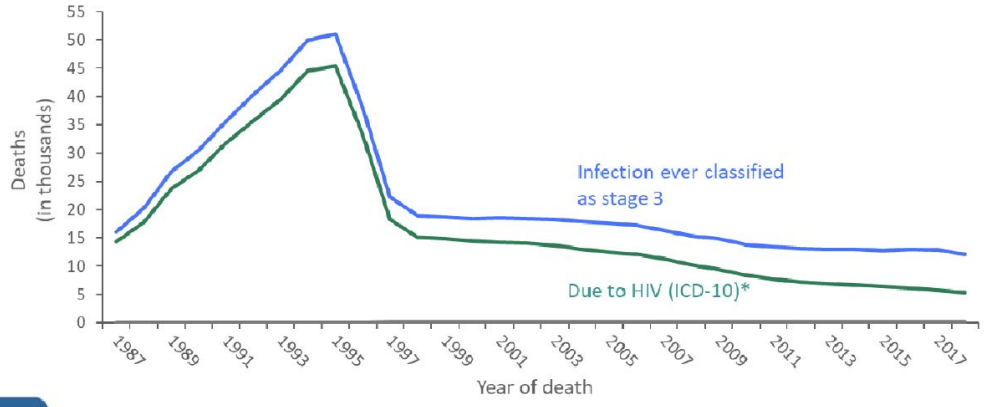
Special considerations in people living with HIV

- Mental health (depression, anxiety, PTSD)
- Substance use disorders
- Housing instability and homelessness
- Food insecurity
- Complex trauma
- Stigma



39,000 patients with HIV & 387,875 uninfected matched controls in Kaiser Permanente in California & mid-Atlantic states

Comparison of Deaths among persons with HIV Ever Classified as Stage 3 (AIDS) in National HIV Surveillance System and Deaths Reported in Death Certificates in which HIV was the Underlying Cause of Death, 1987–2018—United States



*For comparison with data for 1999 and later years, data for 1987–1998 were modified to account for *ICD-10* rules instead of *ICD-9* rules.

Many people with HIV are living a normal or near normal lifespan.

Higher risk for co-morbidities.

Third pillar of EHE: Prevention

- HIV Pre-exposure prophylaxis (PrEP)

- Comprehensive syringe services programs for injection drug users
  - Linkage to treatment for substance use disorder
  - Access to sterile syringes and injection equipment
  - Disposal of used syringes and injection equipment
  - Testing and linkage to care for infectious diseases including STIs and HIV

https://www.cdc.gov/ssp/index.html

Who should take PrEP?

- Anal or vaginal sex in last 6 months
  - Sexual partner with HIV if viral load unknown or detectable
  - Not consistently using condoms
  - Diagnosed with STI in last 6 months
- Inject drugs and have injection partner with HIV or they share needles, syringes or equipment
- Prescribed PEP and have ongoing risk factors or multiple courses of PEP
- Choose to take PrEP

What is PrEP? How is it taken?

Truvada

- Generic Emtricitabine – Tenfovir disoproxil (white tablet)
- TDF/FTC
- One pill once daily

Descovy

- Emtricitabine – Tenofovir alafenamide
- TAF/FTC
- No generic
- One pill once daily

Apretude

- Cabotegravir (CAB)
- Initial monthly injection x 2 months
- Then every other month
- Intramuscular
- Given at clinic by nurse or healthcare provider

TDF/FTC is indicated for anyone who is prescribed PrEP

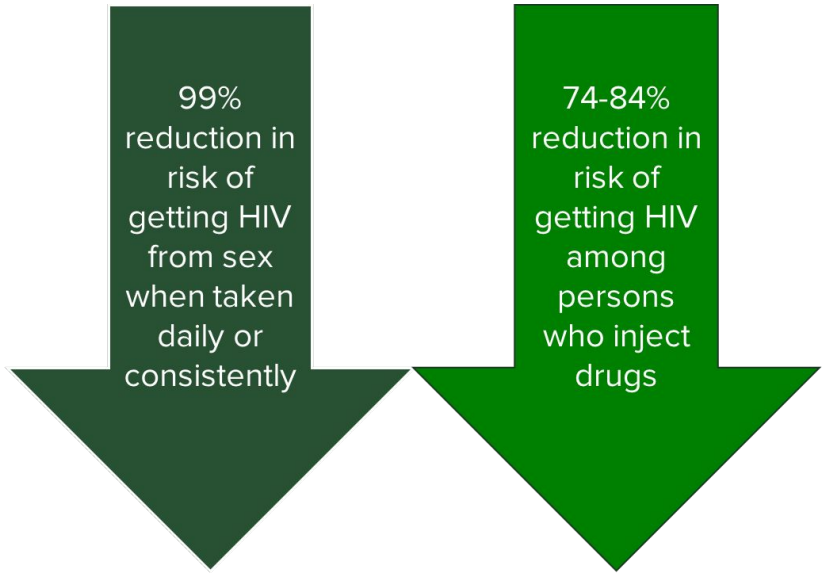
TAF/FTC is not used for cis-gender women due to lack of data on prevention of HIV acquisition with receptive vaginal sex

Cabotegravir is not recommended for injection drug users due to lack of data

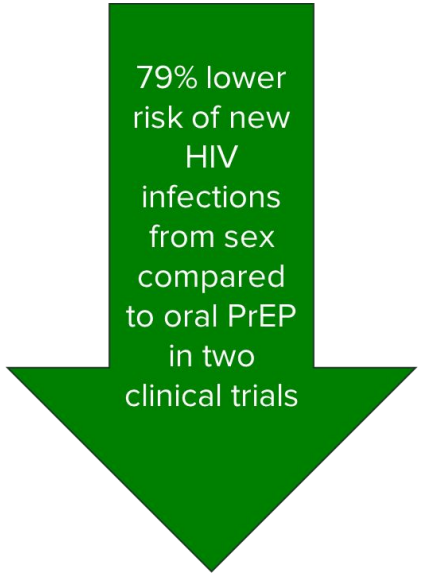
Photo credits: Michael Maloney via Shutterstock https://www.shutterstock.com/image-photo/boston-massachusetts-july-5-2017-close-685373920 ; Tony Webster via Flickr https://www.flickr.com/photos/diversey/49765063118/in/photolist-2iPyXtC-2iPBFzq-2iPyXy7-2inVB6r; Viiv Healthcare

How effective is PrEP?

Oral PrEP



Injectable PrEP



Oral PrEP takes 7 days to be effective for anal receptive intercourse and 21 days for vaginal receptive intercourse and IDU. Lack of data on insertive anal and vaginal sex. Lack of data on injectable PrEP

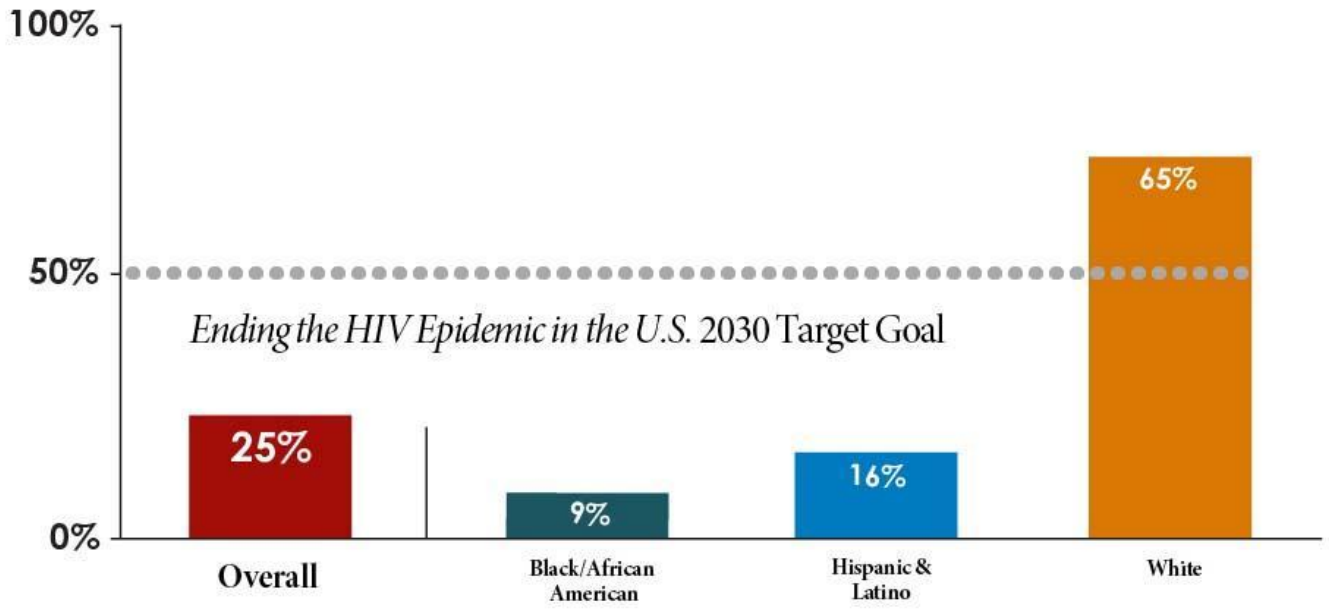
https://www.cdc.gov/hiv/basics/prep/prep-effectiveness.html

https://www.who.int/news/item/28-07-2022-who-recommends-long-acting-cabotegravir-for-hiv-prevention#:~:text=Together%2C%20these%20landmark%20studies%20found%20a%20challenge.

https://www.cdc.gov/hiv/risk/estimates/preventionstrategies.html#anchor_1562942347

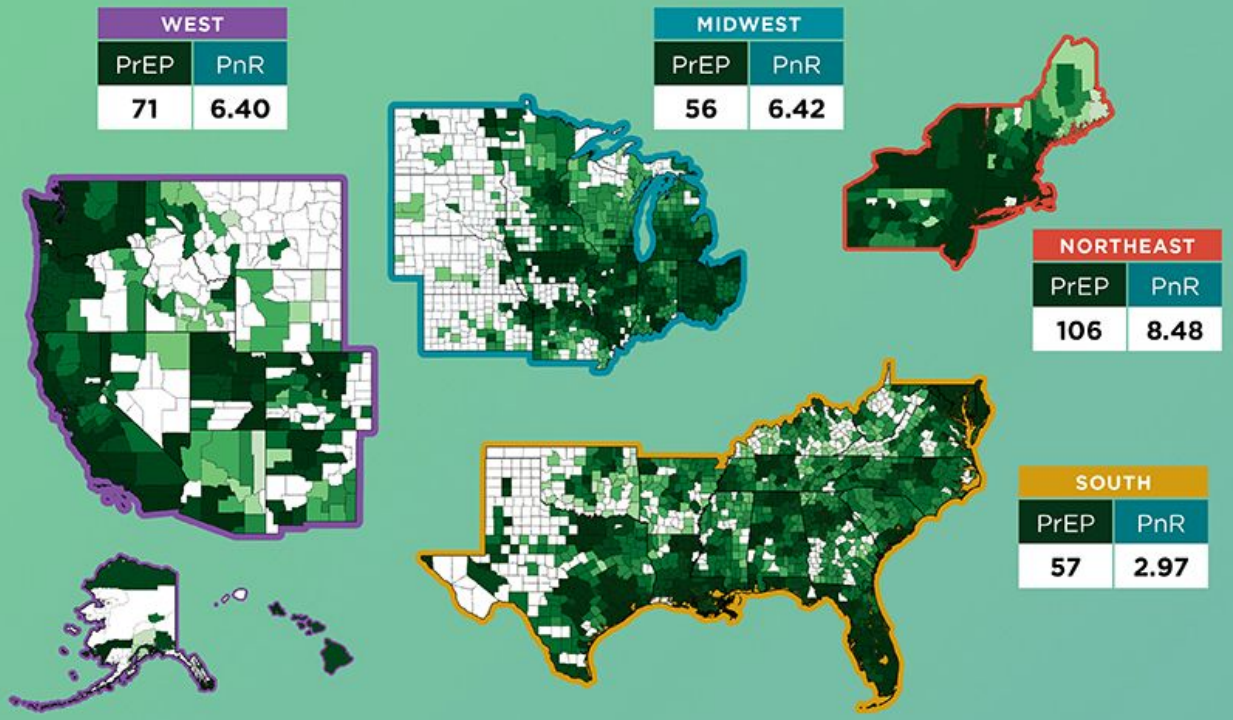
WHILE 25% OF PEOPLE ELIGIBLE FOR PREP WERE PRESCRIBED IT IN 2020, COVERAGE IS NOT EQUAL

PREP COVERAGE IN THE U.S. BY RACE/ETHNICITY, 2020



For more information, visit
cdc.gov/nchhstp/newsroom

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention



PrEP use varies widely by region.

In 2018, there were **only 3 PrEP users for every new HIV diagnosis** in the **South**, compared to **8.5 PrEP users for every new HIV diagnosis** in the **Northeast**.

PrEP The rate of persons using PrEP per 100,000 people in the region.

PnR The PrEP-to-need Ratio (PnR) is the ratio of the number of PrEP users in 2018 to the number of people newly diagnosed with HIV in 2017. A low PnR is considered to have a high unmet need for PrEP.

Rates of Persons Using PrEP, 2018

0 - 5	6 - 9	10 - 12	13 - 16	17 - 19	20 - 22	23 - 26	27 - 32	33 - 41	42+

AIDSVu.org

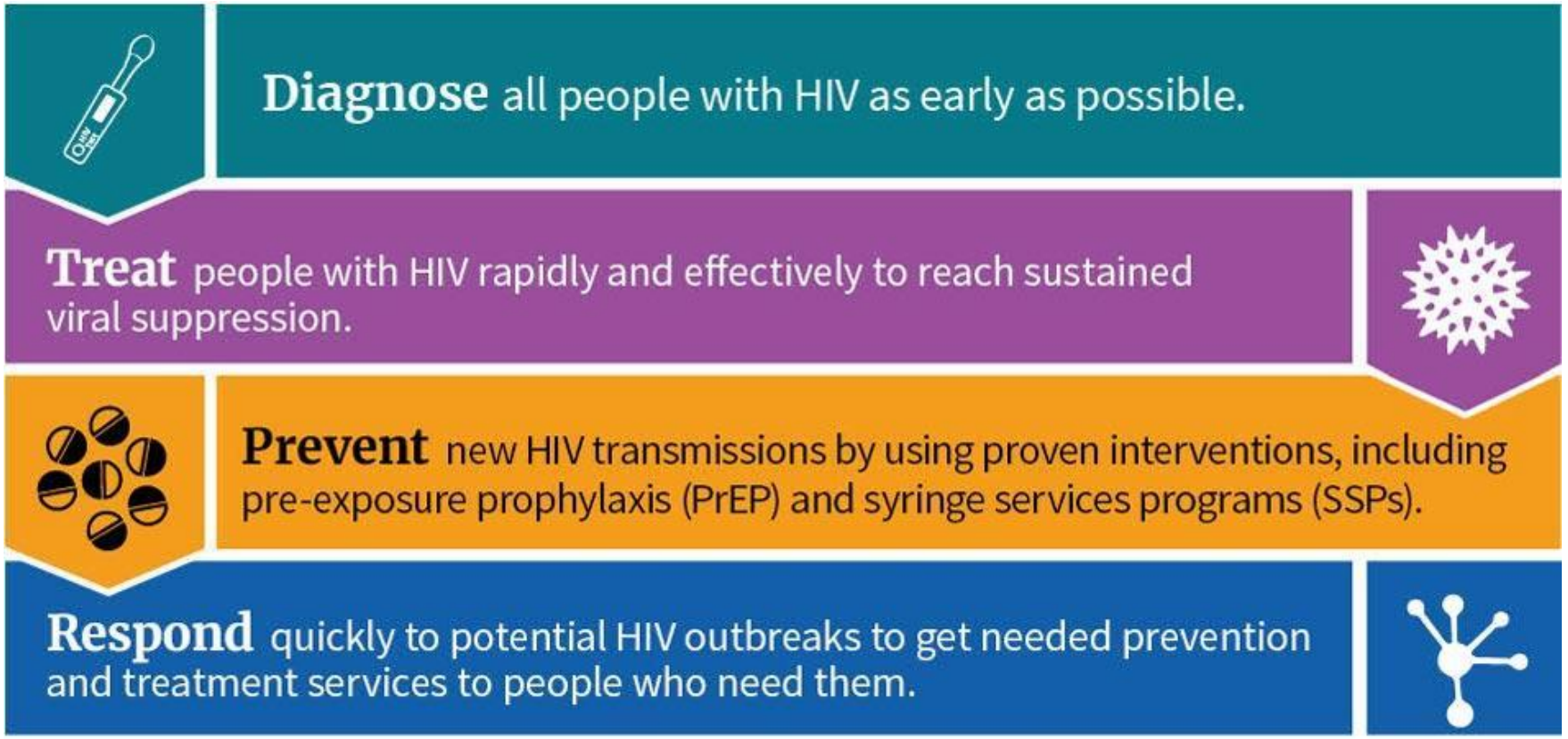
SOURCE: Siegler AJ, et al "Policy and County-Level Associations with HIV Pre-exposure Prophylaxis Use, United States, 2018", Annals of Epidemiology

AIDSVu

Special considerations in people living with HIV

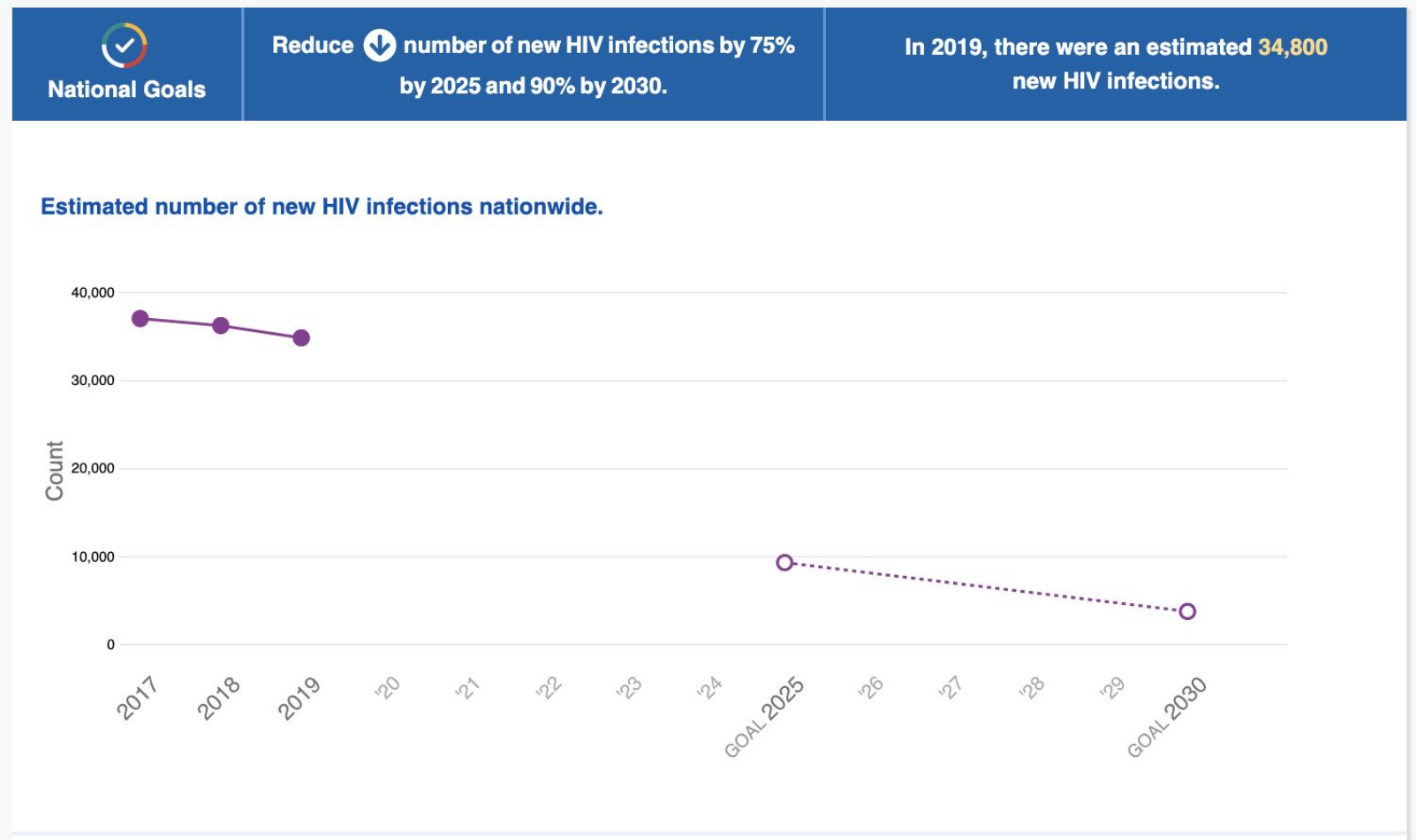
- Mental health (depression, anxiety, PTSD)
- Substance use disorders
- Housing instability and homelessness
- Food insecurity
- Complex trauma
- Stigma

4 pillars of EHE



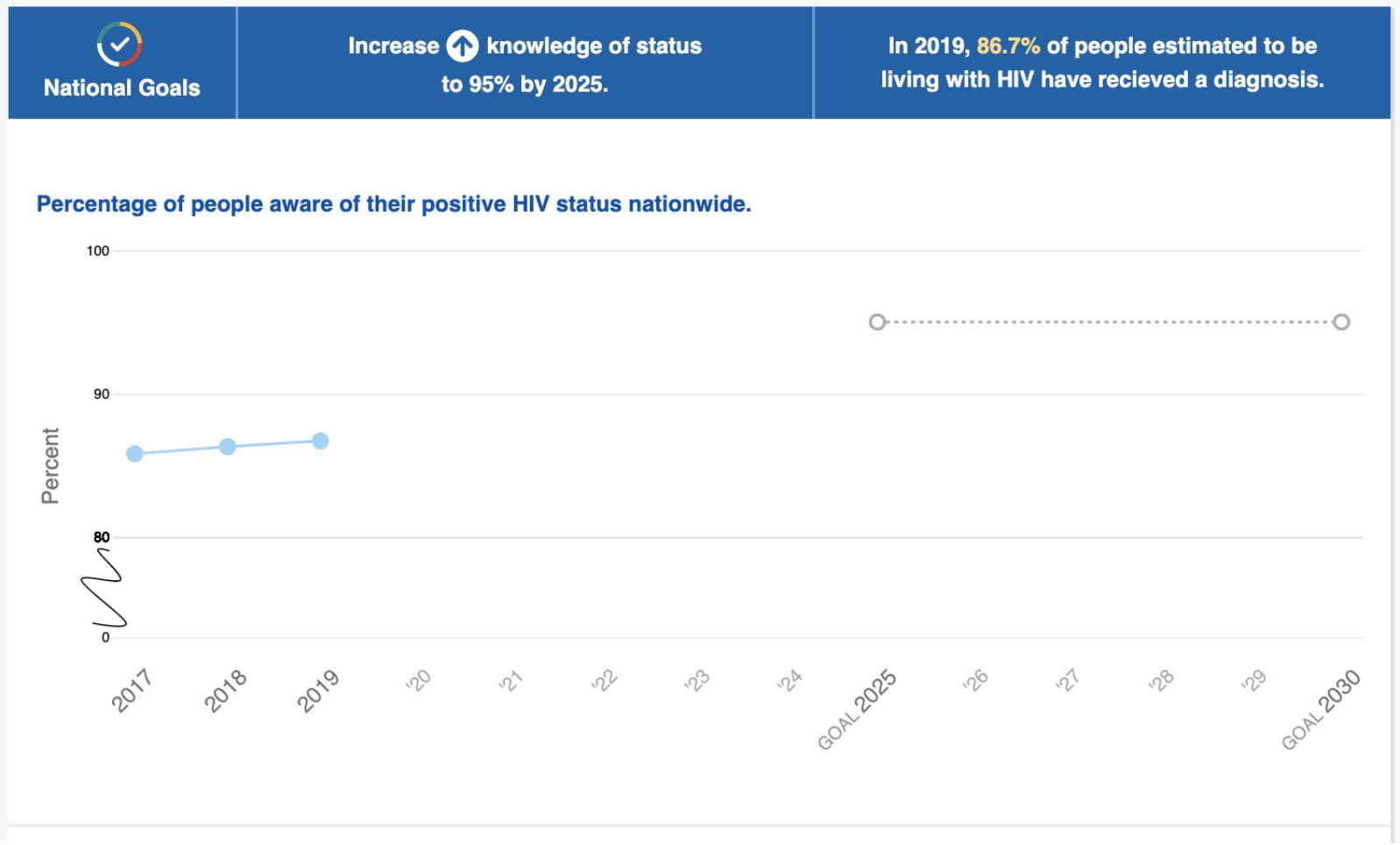
https://www.hiv.gov/federal-response/ending-the-hiv-epidemic/key-strategies/

Ending the HIV Epidemic Progress



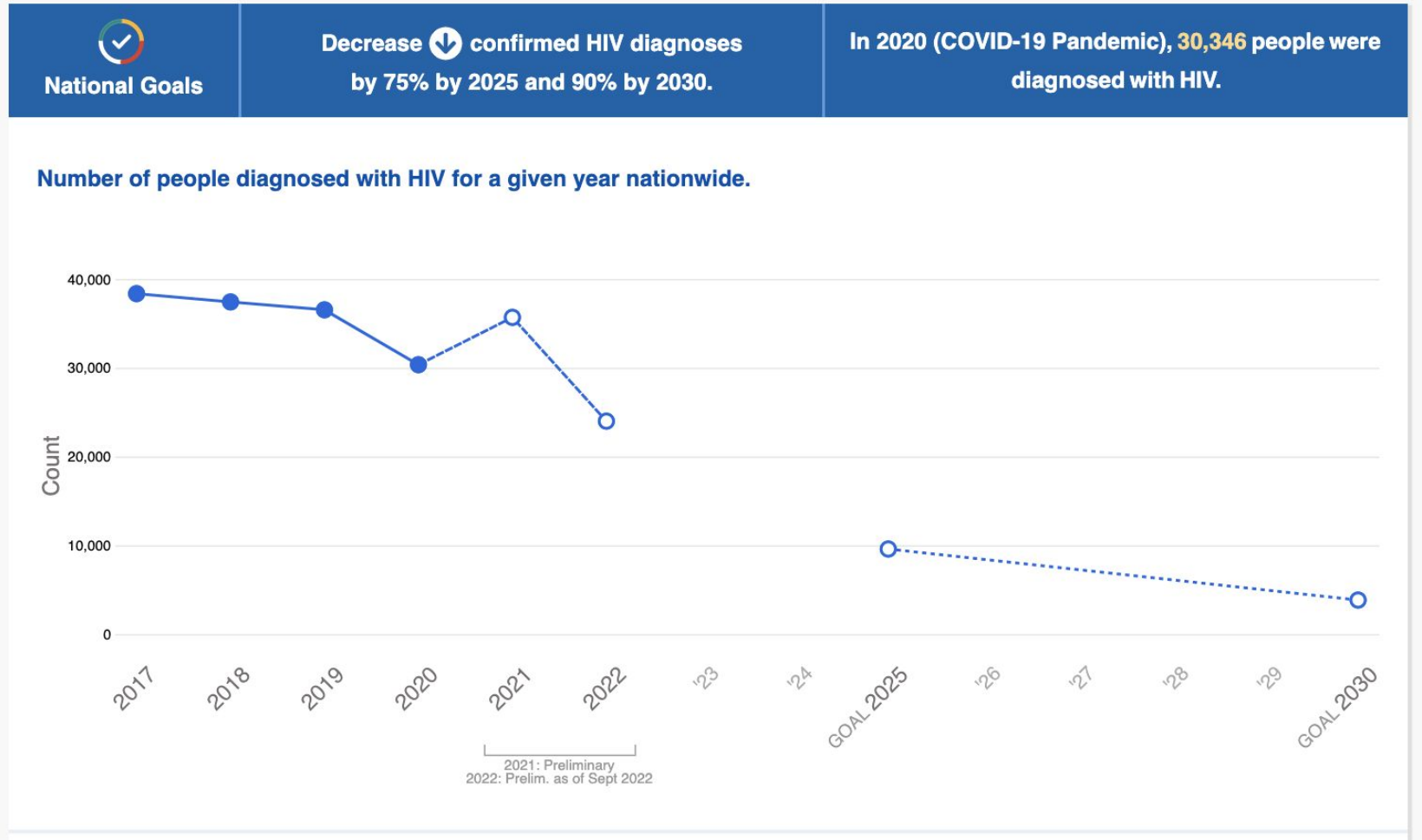
https://ahead.hiv.gov/

Ending the HIV Epidemic Progress



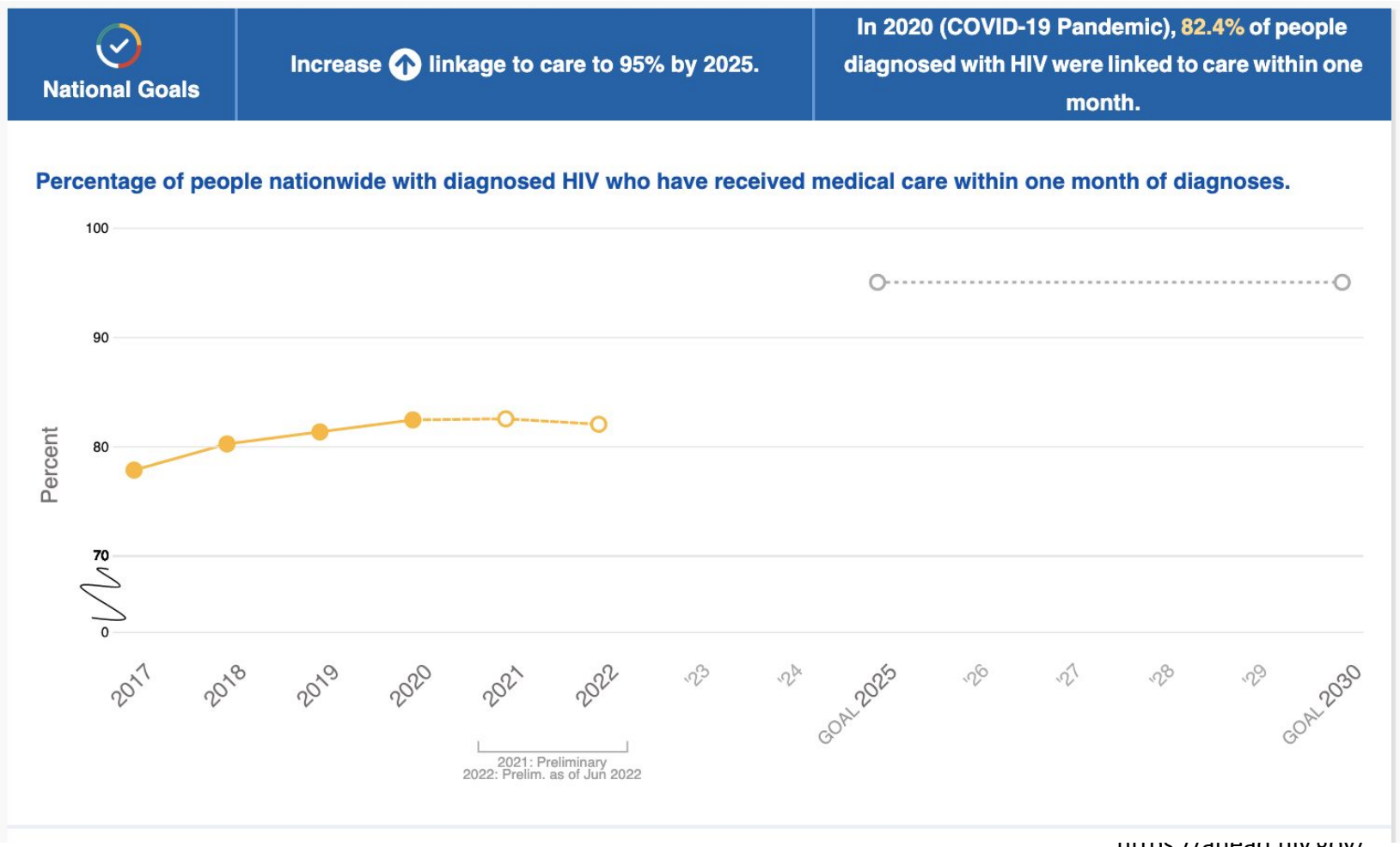
https://ahead.hiv.gov/

Ending the HIV Epidemic Progress



https://ahead.hiv.gov/

Ending the HIV Epidemic Progress

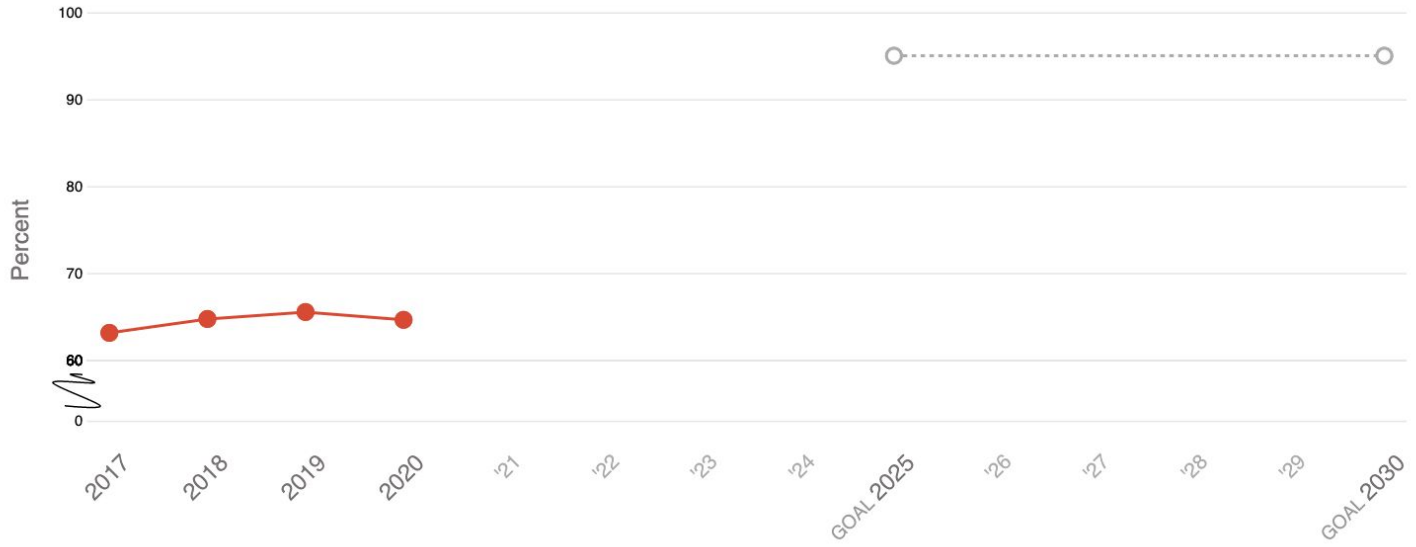


https://ahead.hiv.gov/

Ending the HIV Epidemic Progress

National Goals	Increase virally supressed people to 95% by 2025.	In 2020 (COVID-19 Pandemic), 64.6% of people living with diagnosed HIV have low viral load (<200 copies/mL).

Percentage of people nationwide living with diagnosed HIV who have an amount of HIV less than 200 copies/mL of blood.



Viral suppression is one of the six EHE indicators. Viral suppression is the percentage of people living with diagnosed HIV infection in a given year who have an amount of HIV that is less than 200 copies per milliliter of blood.

https://ahead.hiv.gov/

Preventing HIV in the Occupational Setting

Preventing HIV Transmission – Hospital Setting

Use gloves, goggles, and other barriers when anticipating contact with blood or body fluids

Wash hands and other skin surfaces immediately after contact with blood or body fluids.

Be careful when handling and disposing of sharp instruments during and after use

Use safety devices to prevent needle-stick injuries.

Dispose of used syringes or other sharp instruments in a sharps container

https://www.cdc.gov/hiv/workplace/healthcareworkers.html

HIV Transmission

Occupational Transmission: Extremely Rare

Route of exposure	Risk of exposure when source person is HIV positive	Factors increasing risk
Percutaneous	~ 1/435 episodes (0.23%)	Hollow bore needle, visibly bloody device, deep injury, and device used in an artery/vein
Mucous membrane	~ 1/1000 episodes (0.09%)	Large volume
Cutaneous	< 1/1000 episodes (0.09%)	Must involve non-intact skin

** Note: These estimates are from exposures to blood from HIV-positive source persons; risk for transmission from infectious fluids other than blood is probably considerably lower than for blood exposures.*

https://nccc.ucsf.edu/clinical-resources/pep-resources/pep-quick-guide-for-occupational-exposures/

Occupational Exposure

What immediate measures should be taken?

- Lightly wash needlestick/cut exposed area with soap and water
- Flush splashes to the nose, mouth, or skin with water
- Irrigate eyes with clean water, saline, or sterile irrigants

https://nccc.ucsf.edu/clinical-resources/pep-resources/pep-quick-guide-for-occupational-exposures/

Occupational Exposure

What is considered a potential infectious exposure to HV, HVB, HCV?

- **Infectious body fluid**
  - Blood, semen, vaginal fluid, amniotic fluid, breast milk, cerebrospinal fluid, pericardial fluid, peritoneal fluid, pleural fluid and synovial fluid can transmit HIV, HBV and HCV.

- **A portal of entry (percutaneous, mucous membrane, cutaneous with non-intact skin)**

If both of these factors are not present, there is no risk of blood borne pathogen transmission and further evaluation is not required.

https://nccc.ucsf.edu/clinical-resources/pep-resources/pep-quick-guide-for-occupational-exposures/

Occupational Exposure

- Efficacy is time sensitive
  - First dose should be given as soon as possible.
  - Optimal time to start PEP is within hours of exposure
  - Do not wait for SP test results (unless results will be available within an hour or two) to proceed with a PEP decision and initiation, when indicated.
  - 72 hours post-exposure as the outer limit of opportunity to initiate PEP;

https://nccc.ucsf.edu/clinical-resources/pep-resources/pep-quick-guide-for-occupational-exposures/

Pep Resources

Should I take PEP if I think I've been exposed to HIV at work?

If you think you've been exposed to HIV at work, see a health care provider, an emergency room doctor, or an urgent care provider right away.

- Report your exposure to the appropriate person at work and seek medical attention immediately.
- PEP must be started within 72 hours after an exposure. The sooner you start PEP, the better. Every hour counts.
- Careful practice of standard precautions can help reduce the risk of exposure while caring for patients with HIV.
- Learn more about occupational exposure to HIV and how to prevent it.

For Health Care Providers

Clinicians caring for workers who've had a possible exposure can **call the PEPline (1-888-448-4911)** for advice on managing occupational exposures to HIV.

Exposed workers may also call the PEPline, but they should seek local medical attention first.

https://www.cdc.gov/hiv/basics/pep/pep-workplace.html

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You are here: Home › Clinical Resources › PEP Resources › PEP Quick Guide for Occupational Exposures

PEP Quick Guide for Occupational Exposures

Objectives

- Understand HIV modes of transmission, epidemiology and natural history including opportunistic infections
- Learn how to prevent HIV in the occupational and non-occupational settings
- Gain knowledge about HIV screening and management including pertinent federal and state laws

Zero new infections

nvanwagoner@uabmc.edu

https://www.cdc.gov/hiv/library/reports/hiv-surveillance/vol-28-no-3/index.html?ACSTracking
DC%20Releases%20New%20HIV%20Surveillance%20Reports&deliveryName=USCDCNPIN_162

https://www.cdc.gov/hiv/library/reports/hiv-surveillance/vol-28-no-4/index.html?ACSTracking

https://www.cdc.gov/hiv/library/reports/hiv-surveillance/vol-28-no-4/index.html?ACSTrackin