



# Research Matters

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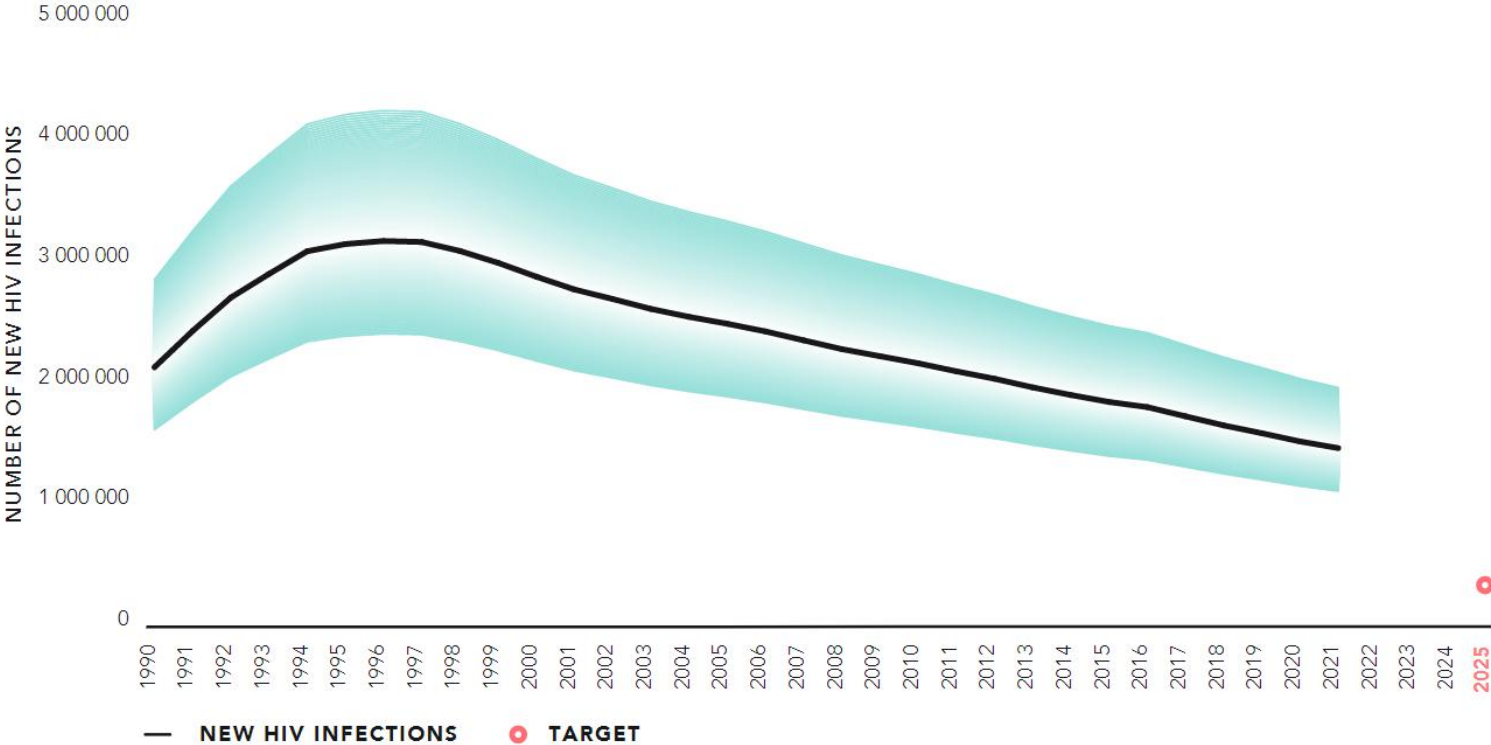
**HPTN 2023**

June 6, 2023

# Introduction

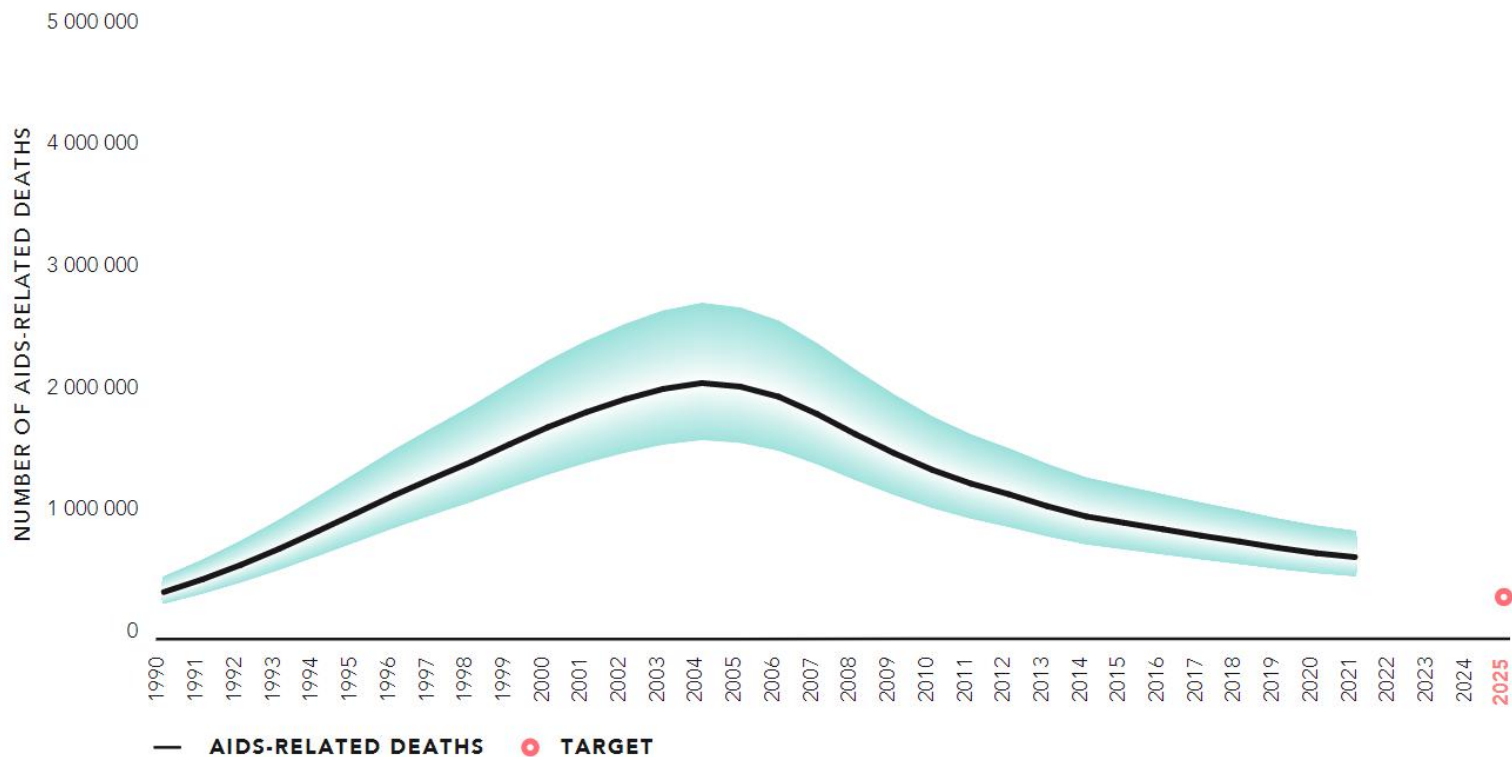
- **State of the HIV epidemic**
- **Continuum of public health and syndemic approaches to prevention**
- **High impact prevention science**
- **Science of maximally reducing health inequities**

**FIG. 1.01a.** Number of new HIV infections, global, 1990–2021, and 2025 target



Source: UNAIDS epidemiological estimates, 2022 (<https://aidsinfo.unaids.org/>).

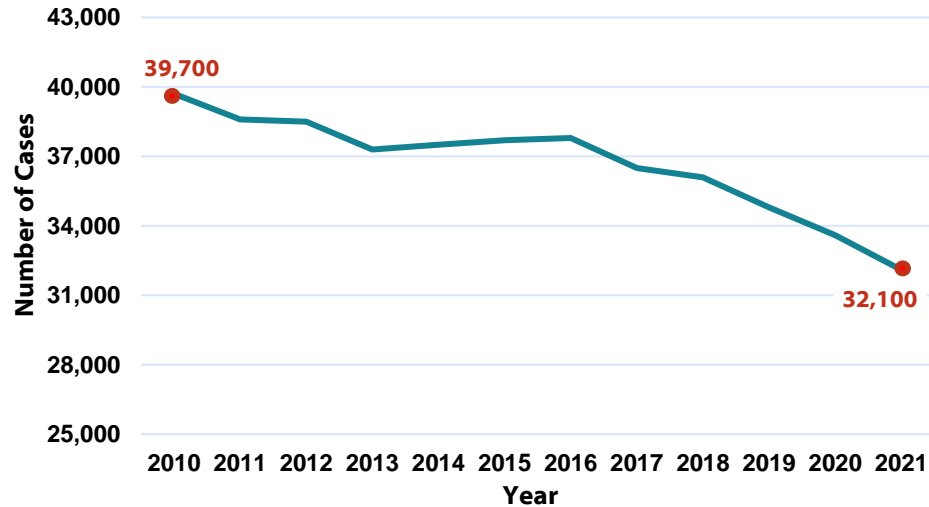
**FIG. 1.02a.** Number of AIDS-related deaths, global, 1990–2021, and 2025 target



Source: UNAIDS epidemiological estimates, 2022 (<https://aidsinfo.unaids.org/>).

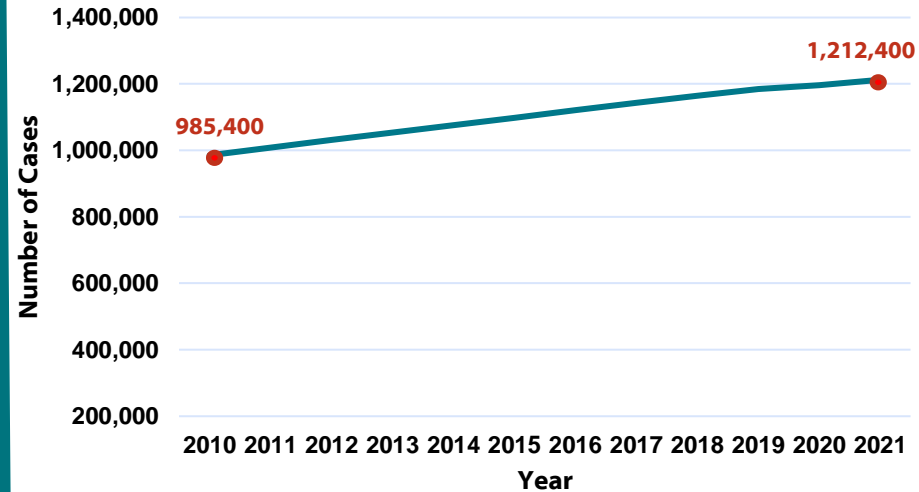
# In U.S. HIV Incidence is declining; Prevalence is increasing

## Estimated HIV Incidence 2010-2021



**>\$15 billion saved over time**

## Estimated HIV Prevalence 2010-2021\*



\*Includes both diagnosed and undiagnosed cases

**Number of people with HIV increased >50% since 2000**

# Trends in Annual Age-Adjusted\* Rates of Death with HIV Disease as the Underlying Cause, 1987–2020—United States

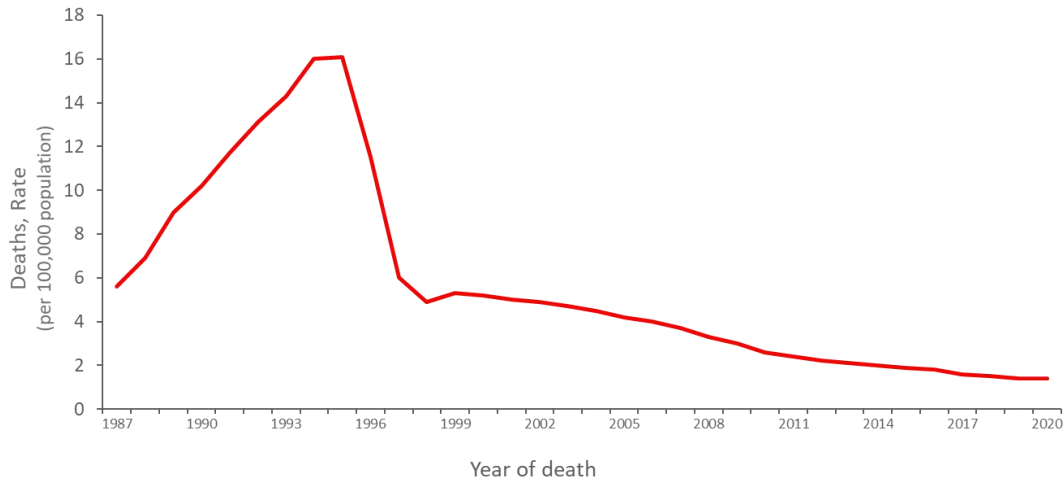
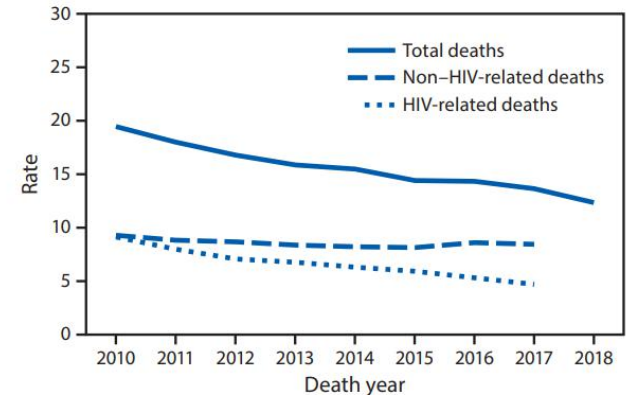


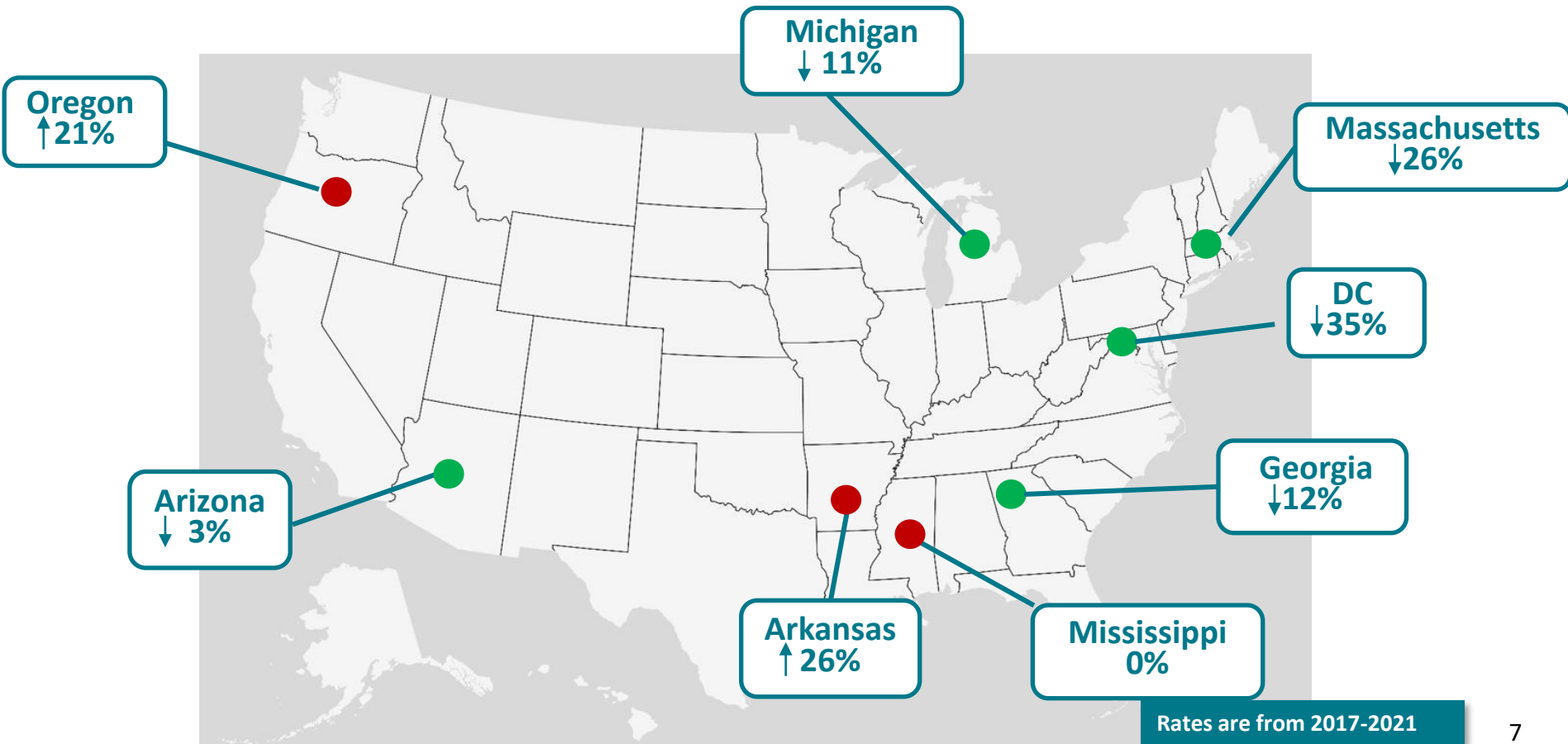
FIGURE 1. Age-adjusted rates\* of total deaths,<sup>†</sup> human immunodeficiency virus (HIV)-related deaths,<sup>§</sup> and non-HIV-related deaths among persons aged  $\geq 13$  years with diagnosed HIV infection — United States, 2010–2018<sup>¶</sup>



Note. 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.

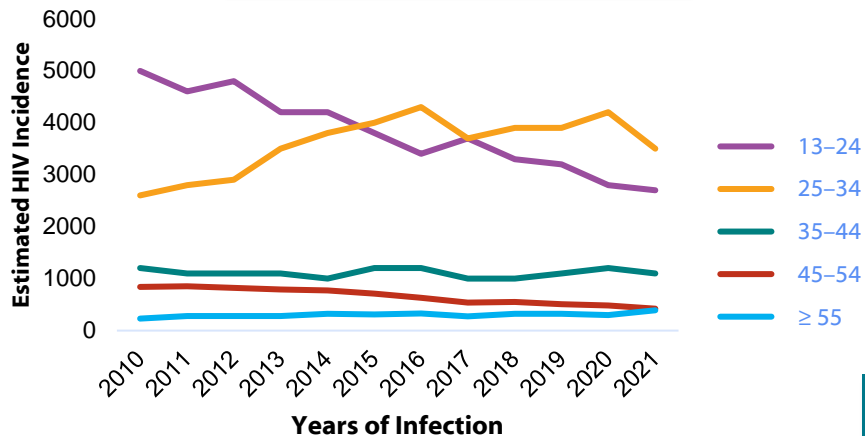
\*Standard: age distribution of 2000 US population.

# HIV incidence trends vary across cities and states

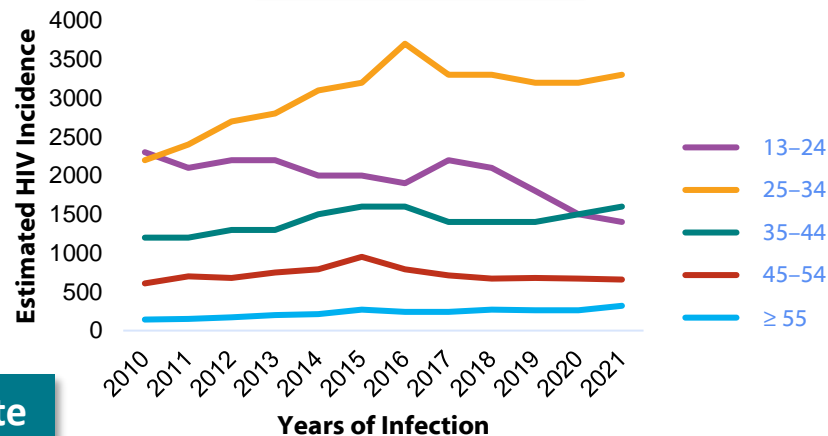


# HIV incidence among MSM

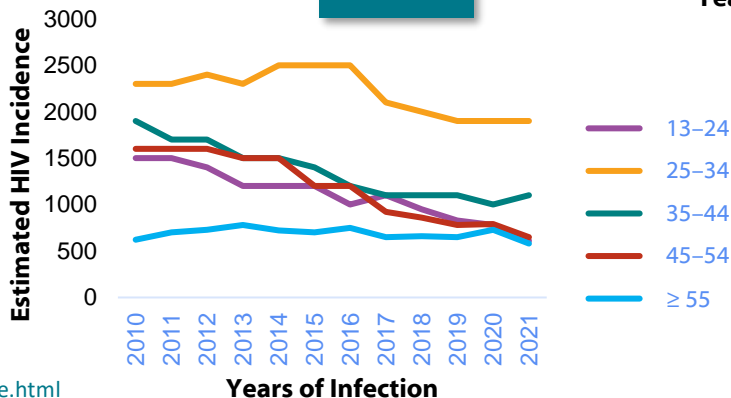
## Black/African American



## Hispanic/Latino



## White





# What is high impact prevention science for HIV?

# Research along the continuum of public health

**Basic research**

**Applied research and clinical trials**

**Operational research**

**Pilot projects**

**Program implementation**

**Policy change**

**Long-acting antiretroviral therapy**

**Multiplex diagnostics**

**Long-acting PrEP**

**HIV self-testing**

**Syringe services programs**

**Basic care package**

**Routine HIV screening**

**Community and mobile medication and care**

**Government care and community provided services**

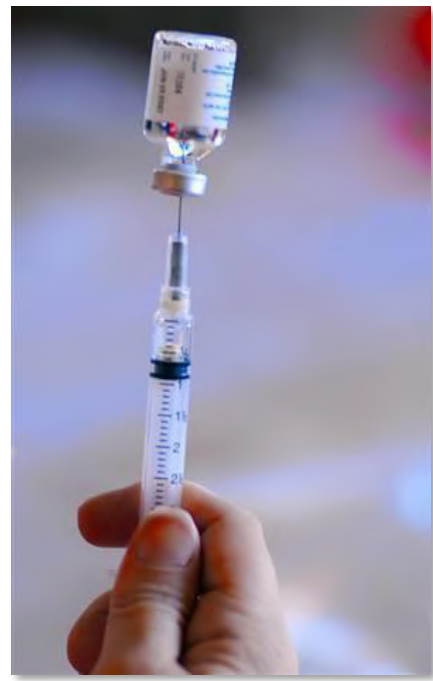
**Pro- and anti-LGBTQ laws**

# Syndemic approach to HIV and health

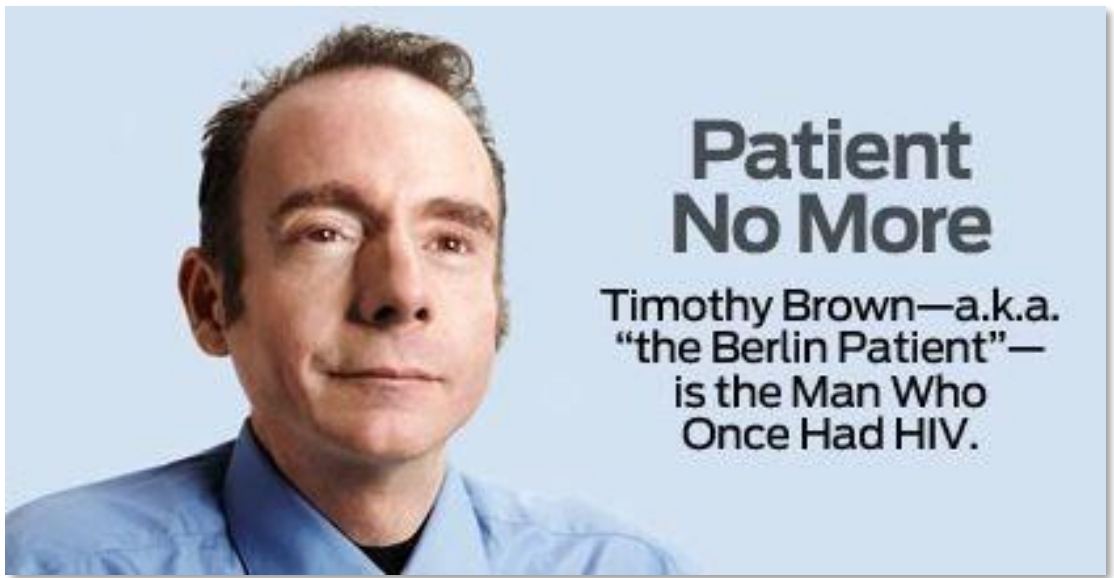


# Ideal prevention and treatment—HPTN future

Vaccine



Cure

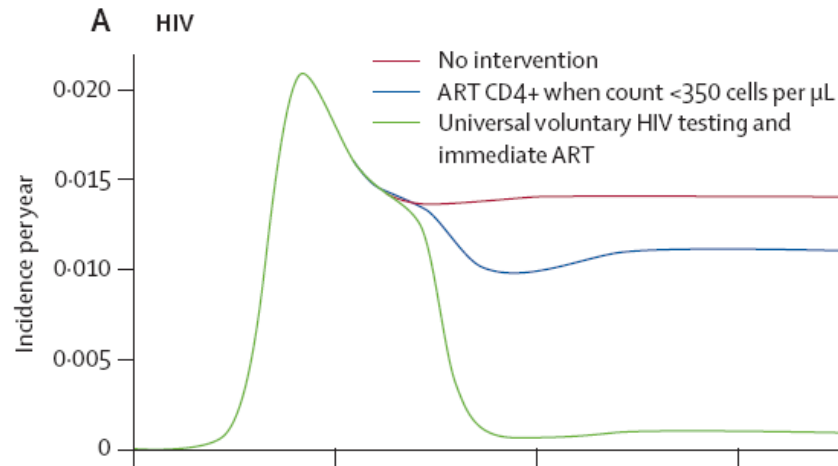


# We should be able to test and treat ourselves out of the epidemic

Lancet 2009; 373: 48-57

Universal voluntary HIV testing with immediate antiretroviral therapy as a strategy for elimination of HIV transmission: a mathematical model

Reuben M Granich, Charles F Gilks, Christopher Dye, Kevin M De Cock, Brian G Williams



HIV treatment and prevention are cost-saving

# We should be able to prevent all new HIV infections

## Pre-Exposure Prophylaxis (PrEP)

- PrEP is ~99% effective at preventing HIV acquisition through sex

## Syringe Services Programs (SSPs)

- SSPs reduce new HIV and hepatitis C infections by ~50%

## Behavior Change

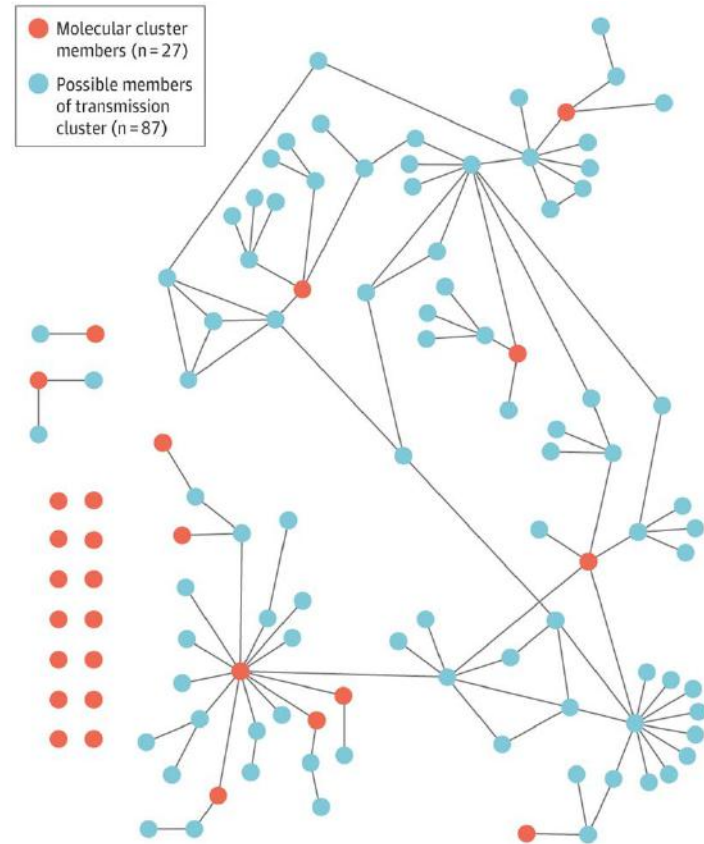
- Condoms prevent HIV acquisition



Good HIV prevention is cost-saving

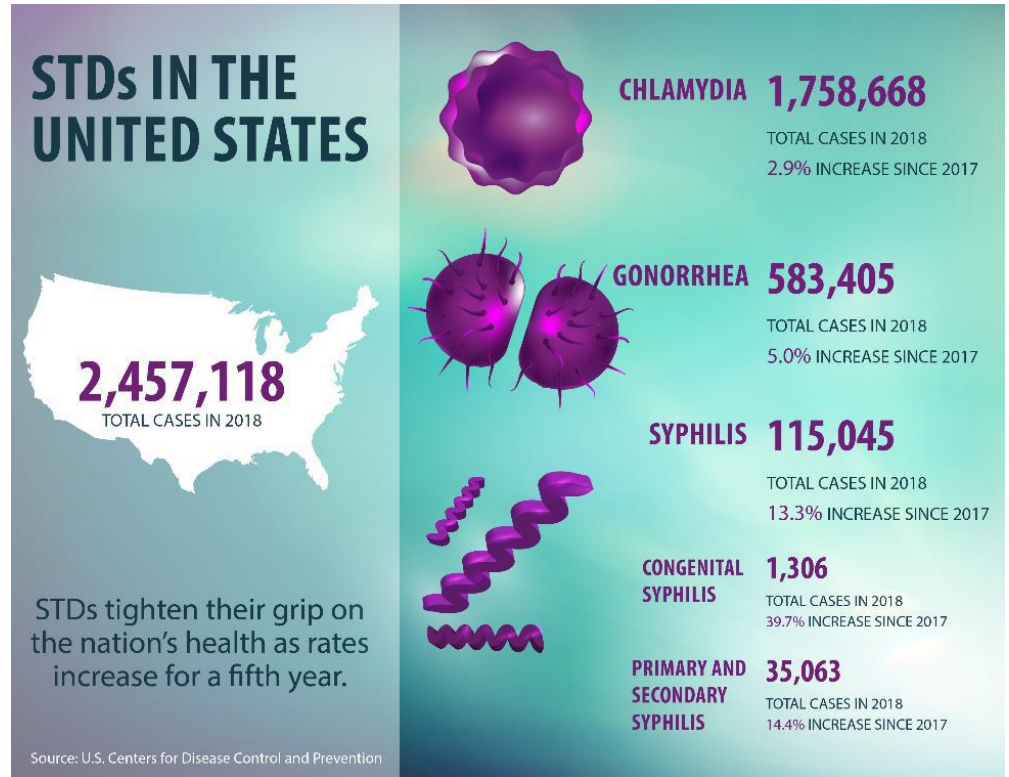
# We should be able to detect outbreaks and prevent new infections

- CDC identified 60 growing HIV clusters
- 44 new infections per 100 person years compared with the national average of less than 4



# Preventing STDs are part of solution for HIV

- STDs associated with 2-times increase in acquisition and transmission of HIV
- About half of men diagnosed with syphilis have HIV
- Substantial fraction of HIV due to STDs
- Develop vaccines for STDs
- Doxycycline PEP





# Nudging toward success



NIAID is funding research on 4 types of long-acting HIV prevention.

## INTRAVAGINAL RING (IVR)



Polymer ring inserted into the vagina releases antiretroviral drug over time.

## IMPLANT



Device implanted in the body releases antiretroviral drug over time.

## INJECTABLE



Long-acting antiretroviral drug is injected into the body.

## ANTIBODY



Antibody is infused or injected into the body.

## New Self-Lubricating Condom Would Revolutionize Safe Sex

Developed by Boston University CAS and ENG researchers, it could reduce disease spread and unwanted pregnancies

# Positive use of digital media

## Know the HIV Risk

**Person 1**

Status:  HIV -  HIV +

Activity: Choose an activity

Factor:  Condom  PrEP  STD

**Person 2**

Status: HIV+

Activity: \_\_\_\_\_

Factor:  Condom  ART  STD  Acute HIV

Find Condoms

Condoms can protect you against STDs and HIV. Get them near you.

Search within: 25 miles of Zip Code

## Get Tested

Find an HIV testing site near you.

Enter ZIP code or City

**Go**

Help CDC NPIN Share



## Small Talks ABOUT Regular, Ongoing Care

How health care providers can help keep patients engaged in HIV care

PREVENTION CARE

The cost of PrEP may be covered by health insurance. Contact your nearest provider to discuss payment options.

## Find a PrEP provider near you.

NPIN PrEP Locator

Nearby

With great teeth...

## WHATEVER YOU'RE INTO, GMHC IS HERE TO HELP YOU.

For hook-up tips and more info about PrEP and HIV testing, contact GMHC.

Dismiss Learn More

# Information, disinformation, misinformation: a major gap in research



Instagram



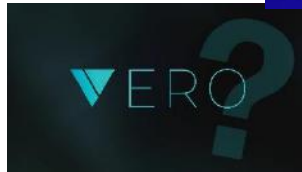
twitter



reddit



YouTube



**Policy**

# Housing, health care, substance use, mental health

- Being homeless associated with 2.5 higher odds detectable viral load
- For uninsured patients, receiving Ryan White services associated with viral suppression (77% vs 39%)
- Medication assisted therapy decreases HIV incidence by 54% among PWID, and improves viral suppression among persons with HIV



MacArthur GJ et al. *BMJ* 2012 [Lou et al., \*Clin Infect Dis.\* 2016](#)

Bradley, et al. *Clin Infect Dis.* 2016. HRSA. *Ryan White HIV/AIDS Program Services Report (RSR) 2017.* Clemenzi-Allen Open Forum for ID 2018

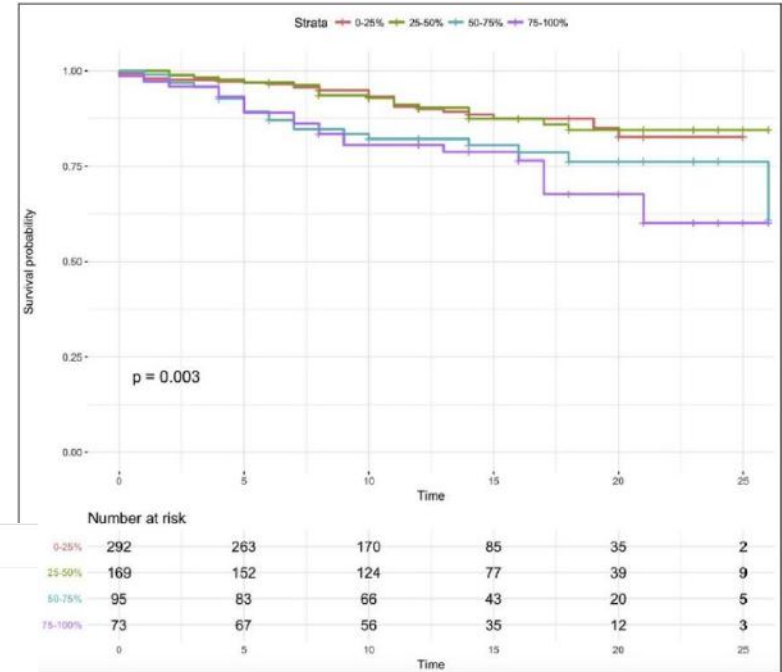
# Structural stigma and policies affects health

Sexual minorities who live in areas with the most structural LGBT stigma experience higher mortality than heterosexual counterparts

LGBT-protective laws associated with 2-3% lower mortality among persons with HIV

The New York Times

*Ugandan President Signs Anti-Gay Law That Includes Death Penalty as a Punishment*



# HIV treatment guidelines correlated with decreased mortality

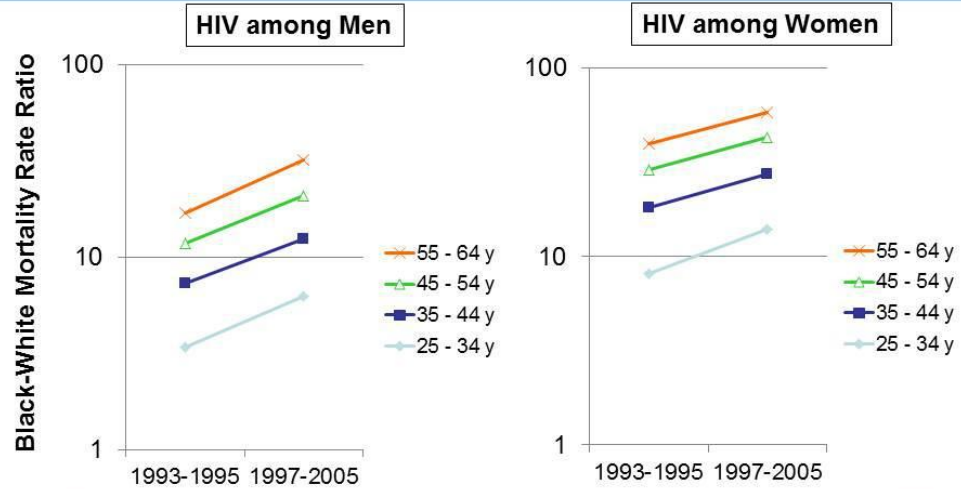
HHS changed guidelines to initiate ART regardless of CD4 count in 2012



Following guidelines, 3-year average HIV mortality rate decreased 6%

# Absolute disparities in HIV mortality decreased, but relative disparities increased with highly-active ART

## Racial Disparities in HIV-associated Mortality



➤ **Racial disparities in mortality increased with the availability of HAART**

Levine et al. AJPH. 2010 Nov;100 (11):2176-2184.



# Conclusion

- **Many trends in HIV incidence, morbidity, and mortality are positive, but not equal across populations or rapid enough**
- **Research focus could be better aligned with highest impact along the continuum of public health and nexus of syndemics**
- **Reducing health inequities requires standardized approach to measurement and explicit focus on outcomes**