

Ending the HIV Epidemic: The Impact of PrEP

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Financial Relationships With Ineligible Companies (Formerly Described as Commercial Interests by the ACCME) Within the Last 2 Years:

Dr Buchbinder has no relevant financial relationships with ineligible companies to declare. (Updated 11/16/21)

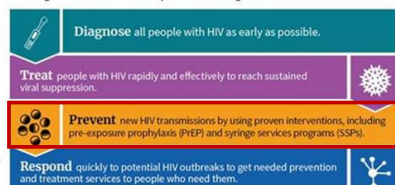
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Ending the HIV Epidemic Goals & Approaches

GOAL

75%
reduction
in new HIV
infections
in 5 years
and at least
90%
reduction
in 10 years.

HHS will work with each community to establish local teams on the ground to tailor and implement strategies to:



Outline

1. Who needs PrEP?
2. What does it take to have PrEP impact?
3. What evidence do we have of PrEP impact?
4. What do models tell us will be needed?
5. An example of putting PrEP into action: Getting to Zero SF

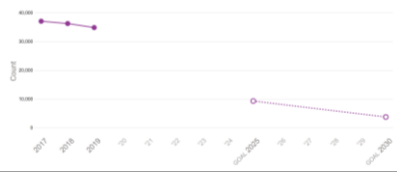
Outline

1. Who needs PrEP?
2. What does it take to have PrEP impact?
3. What evidence do we have of PrEP impact?
4. What about COVID?
5. What do models tell us will be needed?
6. An example of PrEP impact: San Francisco Getting to Zero

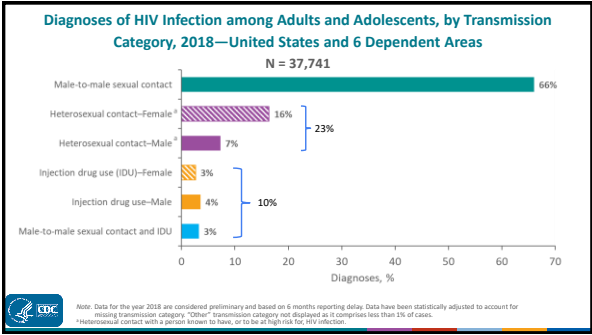
Ending the Epidemic Goals: How are We Doing?

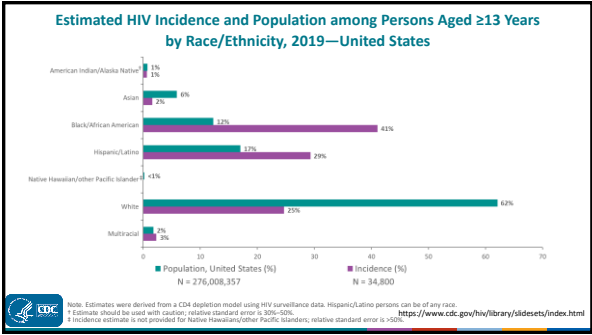
National Goals Reduce number of new HIV infections by 75% by 2025 and 90% by 2030. In 2019, there were an estimated 34,000 new HIV infections.

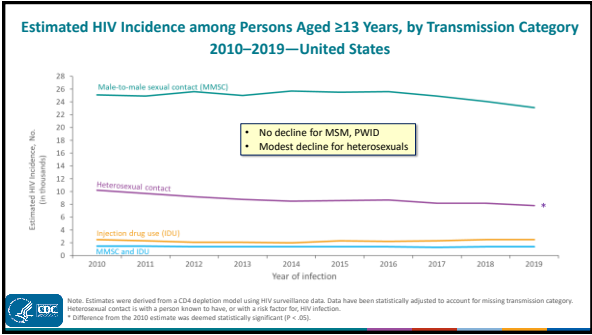
Estimated number of new HIV infections nationwide.

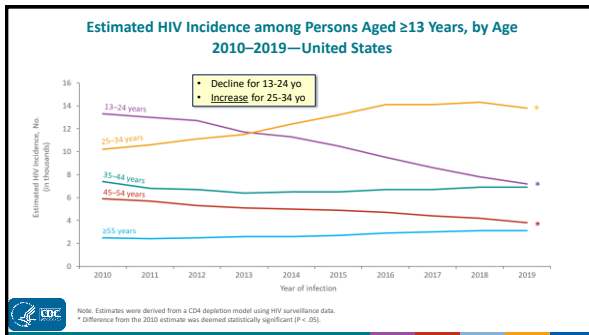


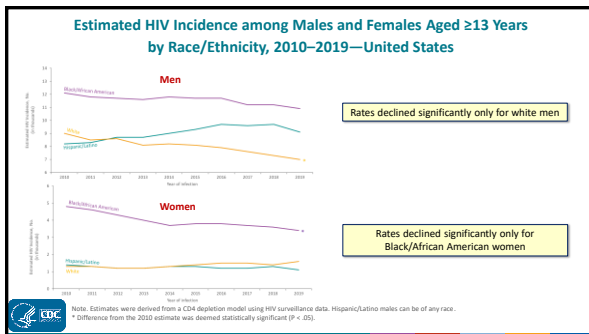
Ahead.Hiv.gov











Diagnoses of HIV Infection among Adults and Adolescents by Population of Area of Residence, 2018—United States

MSA Population	No.	Rate
≥500,000	29,975	16.1
50,000 – 499,999	4,702	9.6
Nonmetropolitan	2,347	6.0
Total	37,024	13.5

Note: Data for the year 2018 are considered preliminary and based on 6 months reporting delay. Data exclude persons whose county of residence is unknown. Rates are per 100,000 population.

Who Needs PrEP in the US: Summary

- Need PrEP for MSM, heterosexuals, PWID
- HIV infections increasing in 25-34 year olds
- Racial/ethnic disparities, particularly for Black/African Americans, Latinx
- Most infections in large cities, but smaller cities and rural in South and Midwest

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Individual and Population Level Requirements

- Individual level:
 - Awareness
 - Uptake
 - Persistence
- Population level
 - Demand: Coverage
 - Supply: Providers

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Category	Heterosexual 2016	MSM 2017	PWID 2018
Aware of PrEP	7.2	90.5	26.2
Discussed PrEP with provider	1	50.2	4.6
Took PrEP	0.2	34.7	0.8

James, AIDS and Behav 2021

[illegible]

FIGURE. Preexposure prophylaxis (PrEP) awareness,^a discussion,^b and use,^c by race/ethnicity, among men who have sex with men (MSM) with a likely indication for PrEP use^d (N = 4,056) — 23 urban areas, 2017



Finlayson, MMWR 2019
Kanny, MMWR 2019

PrEP Persistence

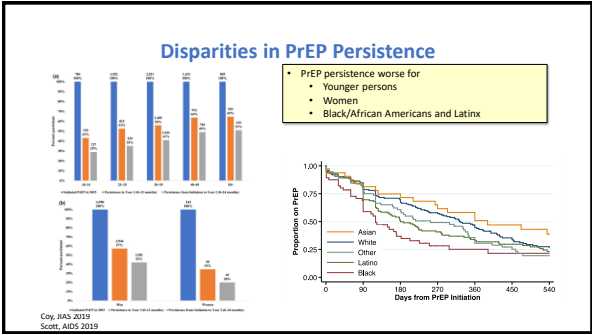
- Unlike ART, PrEP only needs to be used during "seasons of risk"
- Nonetheless, infection rates higher in people discontinuing PrEP
- Refill pharmacy data suggests persistence is improving over time

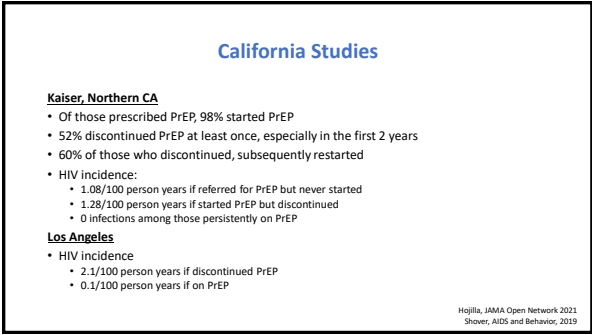
Month	2012	2013	2014	2015	2016	2017
0	100	100	100	100	100	100
3	75	80	85	90	95	98
6	55	60	65	70	75	80
9	45	50	55	60	65	70
12	25	30	35	40	45	85

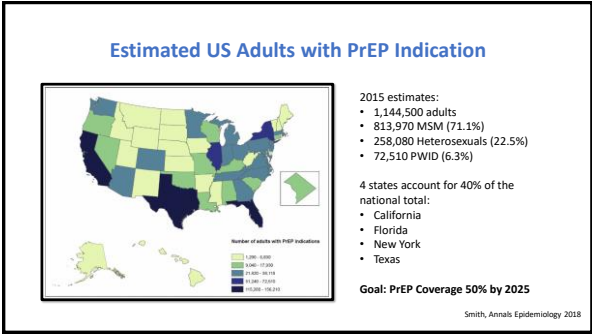
Figure 2: Rapid increase in PrEP persistence among U.S. users, by pharmacy refill data from 2012 to 2017. A greater proportion of PrEP users were refilling their prescriptions at six months (dashed line).
Data courtesy of Global Science Inc.

Pyra, IAS 2019
Scott, AIDS 2019

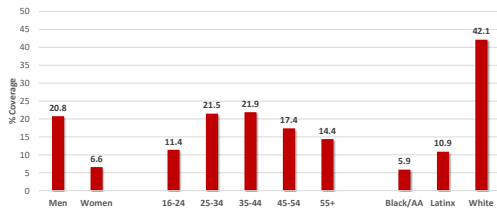
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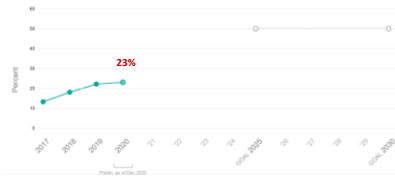
PrEP Coverage by Sex, Age, Race/Ethnicity Total: 18.1% in 2018



Ending the Epidemic Goal: 50% PrEP coverage by 2025

National Goals Increase PrEP coverage to 50% by 2025. In 2020, 33.0% of people estimated to have PrEP indications are prescribed PrEP.

Percentage of people with indications for PrEP classified as having been prescribed PrEP nationwide.

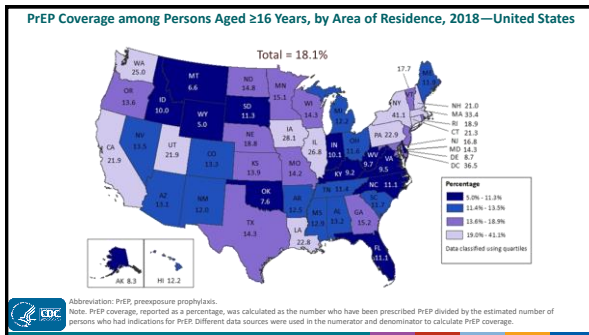


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PrEP Coverage: Disparities Are Widening



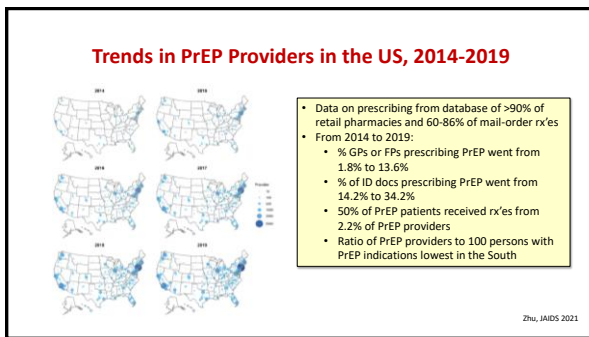
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**2018 PrEP Prevalence and PrEP:Need Ratio
(PrEP users:# new infxns)**

	PrEP Prevalence (Per 100k)	PrEP:Need Ratio
National	70.3	4.9
States with PrEP-DAP	100.6	6.4
States without PrEP-DAP	51.9	3.9
States with Medicaid expansion	80.3	6.6
States without Medicaid expansion	54.2	3.1
Northeast	106.3	8.5
West	73.7	6.4
Midwest	56.8	6.4
South	58.6	3.0
Men	135.3	5.7
Women	8.7	1.6

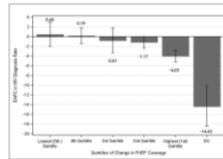
Singer, Ann Epidemiology 2020



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1. Who needs PrEP?
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5. An example of PrEP impact: San Francisco Getting to Zero

In the US, from 2012-2016, where PrEP coverage is high, HIV infections have fallen



- As PrEP coverage increases, the estimated annual percentage change (EAPC) in diagnosis rate declines
- When controlling for viral suppression rates, the state-specific EAPC for a given year decreased by 1.3% for every increase in PrEP coverage of 1 per 100 persons with indications

Smith, CID 2020

Seattle: PrEP Use Up and New Diagnoses Down

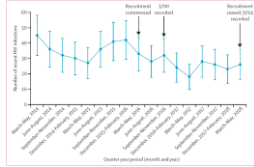
FIGURE 2-1. PrEP Awareness and Use among MSM in King County, Seattle Area, 2010-2019



FIGURE 2-2. Rate of New HIV Infections and Number of Persons Living with HIV in King County, 2010-2019



In NSW Australia, as PrEP increased in MSM, HIV infections declined

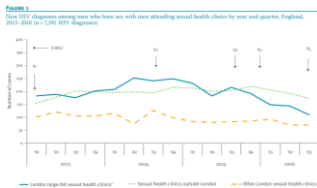


Follow-up study:

- PrEP was 92% effective over 3 years of follow-up among 10,000 MSM taking PrEP
 - All seroconversions occurred in men who had stopped taking PrEP
 - Among MSM who persistently took PrEP, there were no seroconversions

Gulich, Lancet HIV 2018
Gulich, Lancet HIV 2021

Drop in New HIV Diagnoses in London Sexual Health Clinics: 2014-2016

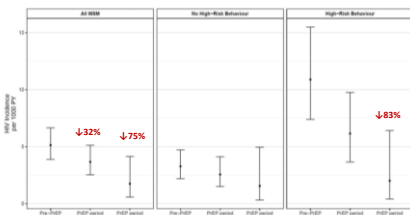


- New diagnoses among MSM fell
- In England, 17%
 - In London, 25%
 - In large sexual health clinics, 32%

Likely combination of early treatment of newly diagnosed and PrEP

Brown, Eurosurveillance 2017

Scotland's Ramp-Up of PrEP for MSM



Ramp-up PrEP use in sexual health clinics: 2017-2019

Reduction in new HIV infections, even among people not prescribed PrEP

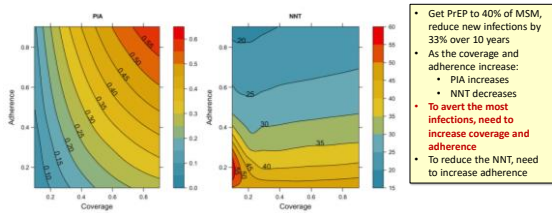
Greatest reductions in those on PrEP with high-risk behavior

Estcourt, AIDS 2021

Outline

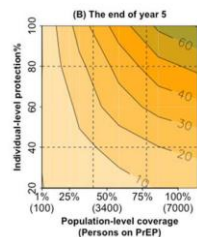
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Relationship of adherence and coverage to PIA (% infxns averted) and NNT (# needed to treat)



Model: What Will It Take?

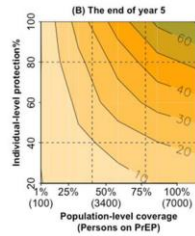
- Provide PrEP to MSM with >1 partner:
- 40% coverage with enough adherence for protection 40% of days, reduce HIV incidence by 9.5% in 5 years
 - BUT, if 80% coverage on 80% of days, would have a 43% reduction in incidence in 5 years



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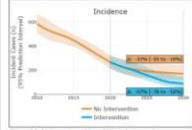


Kasile JAIDS 2017

The Johns Hopkins Epidemiologic and Economic Model A Mathematical Model in Service of Ending the HIV Epidemic in the US

The JHEEM is a mathematical model of HIV transmission calibrated to 32 US cities. It generates local predictions of the HIV epidemic under potential interventions that include HIV testing, viral suppression among people with HIV (PWH), and pre-exposure prophylaxis (PrEP).

Projected HIV Incidence for Baltimore, MD



The modeled intervention achieves 90% viral suppression among people with HIV who are aware of their diagnosis.

Getting Started:

Prerun Interventions let you quickly visualize projections for interventions that we have already defined and run ahead of time.

Custom Interventions let you simulate in real time any combination of HIV testing, viral suppression among PWH, and/or PrEP, targeted to demographic subgroups of your choosing.

<https://jheem.shinyapps.io/EndingHIV/>

For San Francisco/Oakland/Berkeley, increasing PrEP for MSM will increase impact on infections averted by 2030

Baseline levels of PrEP uptake	Reduction in new HIV infections
No change	33%
30%	57%
40%	67%
50%	74%
75%	85%

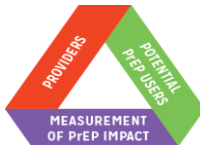
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Getting to Zero – PrEP Increased supply & demand and measurement

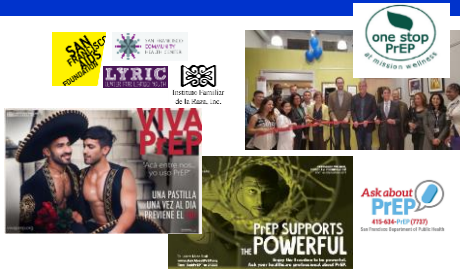
- Common protocol
- Academic detailing
- New PrEP clinics
- PrEP navigators at major providers
- Navigation "boot camps"
- Youth fund for meds & transportation



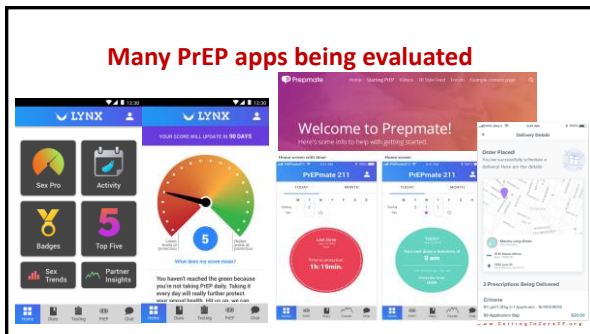
- Triangulate data from multiple sources
- Collate data from funded CBOs
- Online survey "Quickie" to measure PrEP cascade

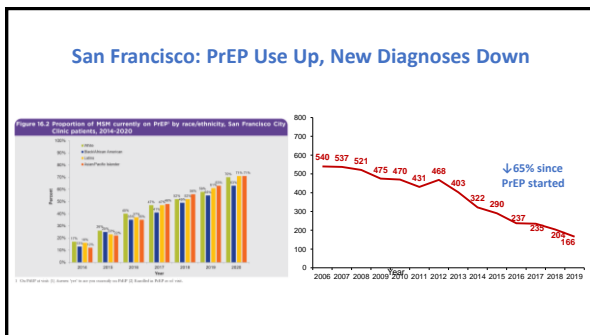
- PrEP social media campaigns
- Online PrEP navigator to answer questions
- PrEP "ambassadors"
- Data-to-PrEP program
- Pleasepreme.org

PrEP









Conclusions

- PrEP scale-up needed, particularly for Black/AA and Latinx MSM, 25-34 year olds, and heterosexuals and PWID
- Already seeing population level impacts from PrEP, but disparities could worsen unless roll-out is equitable
- Comprehensive scale-up at city-level, with particular focus on addressing disparities, can result in substantial reductions of new infections

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