

# The Impact of Pre-Exposure Prophylaxis (PrEP) on HIV Incidence in 19 Fast Track Cities (FTCs) in the US between 2012-2017

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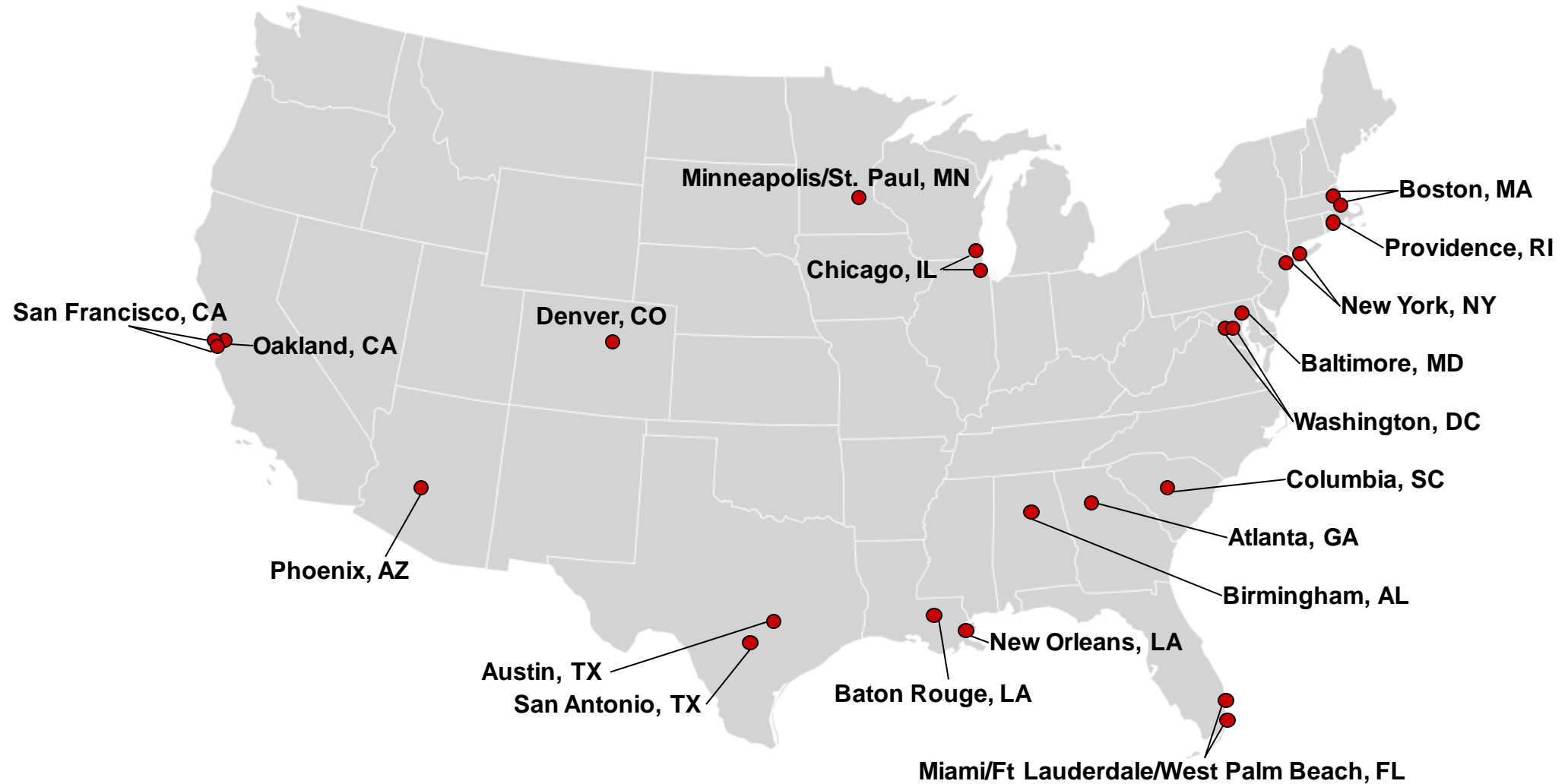
<sup>1</sup>Gilead Sciences

## Disclosures

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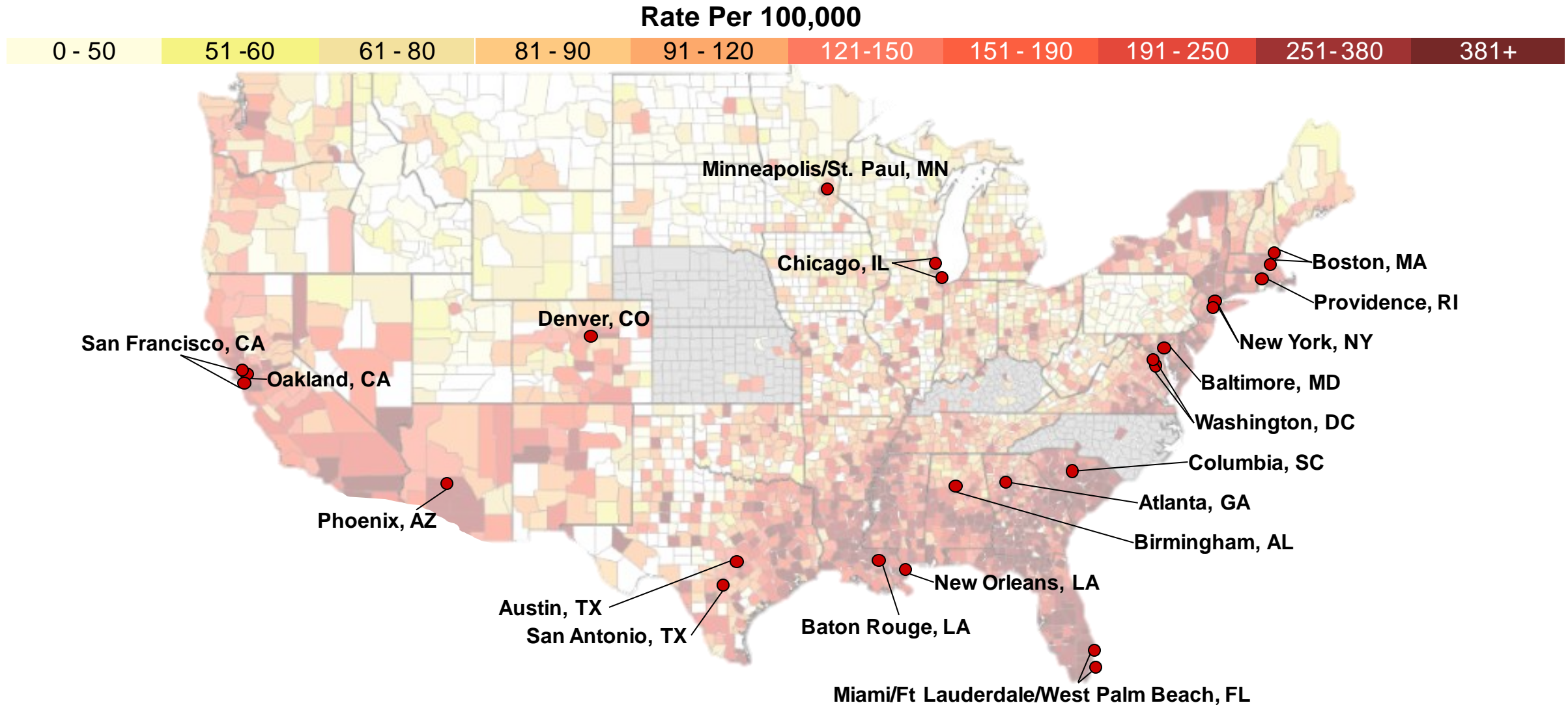
- All authors are full time employees of Gilead Sciences.

# US Fast Track Cities



# US Fast Track Cities vs HIV Prevalence :

The impact of PrEP in FTCs can serve as a surrogate of the impact of PrEP in cities with the highest HIV prevalence including those in the southern states.



Fast Track areas identified as 25 US Core Based Statistical Areas (CBSAs)

## Methods

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- Data Sources
  - CDC HIV surveillance data by MSA, published annually by CDC
  - Estimates of adults with indications for HIV pre-exposure prophylaxis by jurisdiction, transmission risk group, and race/ethnicity. CDC Annals of Epidemiology 2018.
  - National Real World Data source containing > 84% of all Truvada PrEP prescriptions in the US. Medical claims including procedures and diagnoses
  - US census population estimates for Metropolitan Statistical Areas (MSAs)
- Computation of the incidence rate per 100 person years
  - Numerator: Number of new HIV diagnoses by MSA / year
  - Denominator: (Number of adults with a PrEP indication x by 1 year) - (number of new HIV diagnosis x by the average exposed time to infection) – (number of subjects on PrEP x average exposed time without PrEP).

## Methods

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- PrEP utilization in the FTCs was calculated from a national pharmacy and medical claims data base and adjusted per number of persons at risk (PAR) of HIV from the CDC surveillance program published in 2018<sup>12</sup>. All FTCs had PrEP utilization data available.
- Among 19 FTCs, 25 Metropolitan Statistical Areas (MSAs) were included and all had HIV incidence and viral suppression rates available.
  - HIV Incidence used were via published 2012-2017 CDC data in 105 MSAs.
  - Viral Suppression Rates<sup>3</sup> were from 2011, 2014 & 2015 CDC reporting and were used as a proxy for treatment as prevention or (TASP).
- Incident rates (IR), incidence rate ratios (IRR) and 95% confidence intervals were calculated from a multilevel Poisson regression model that reflects change for each MSA over time after adjusting for the effect of PrEP and TasP.

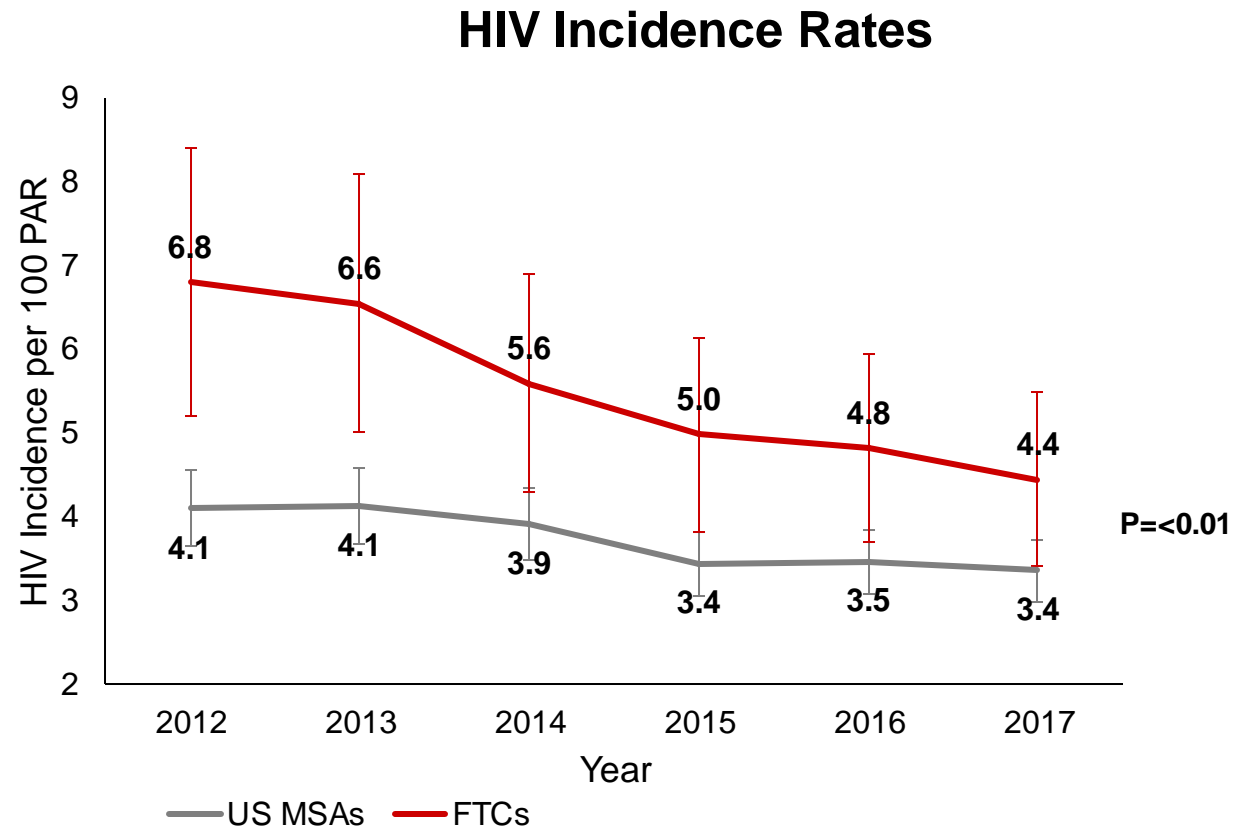
1. Annals of Epidemiology.

2. Calculation of person time at risk excluded those taking PrEP or who became HIV positive

3. Viral suppression data available for 38 US states and Washington DC

## Results: HIV Incidence

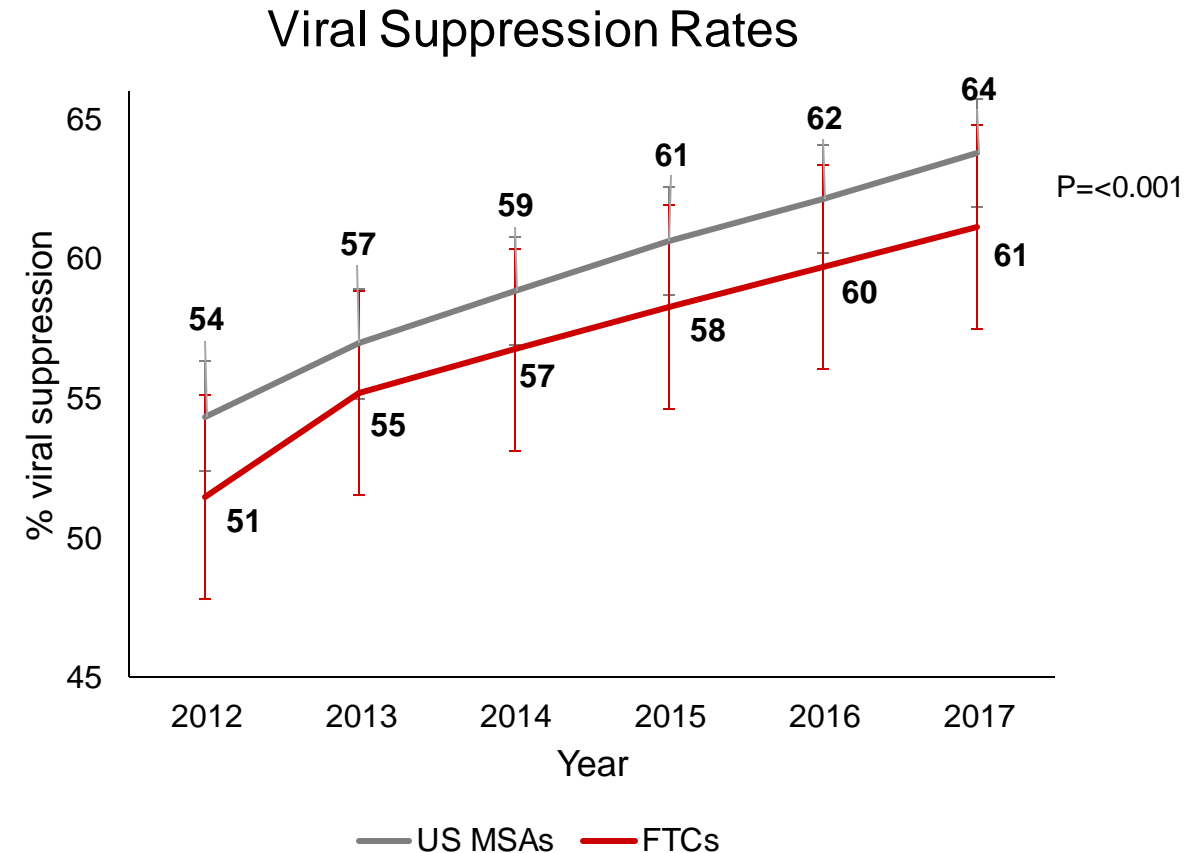
- The HIV rate was significantly higher in FTCs compared to the US overall. (**IRR 1.5**, 95% CI 1.1,1.9%)
- The mean HIV Incidence rate in the 19 FTCs declined **43.5%** from 2012-2017 vs. **33.5%** in the US overall<sup>2</sup>
- The EAPC<sup>1</sup> was **8.7%**<sup>1</sup> per year (95% CI 8.4,9.0%) for the 19 FTCs Vs. **6.6%**<sup>1</sup> (95% CI 6.4, 6.9%) for the US overall.



1. Estimated annual percent change (EAPC)
2. 'US Overall' does NOT include the 19 FTCs

## Results: Viral Suppression

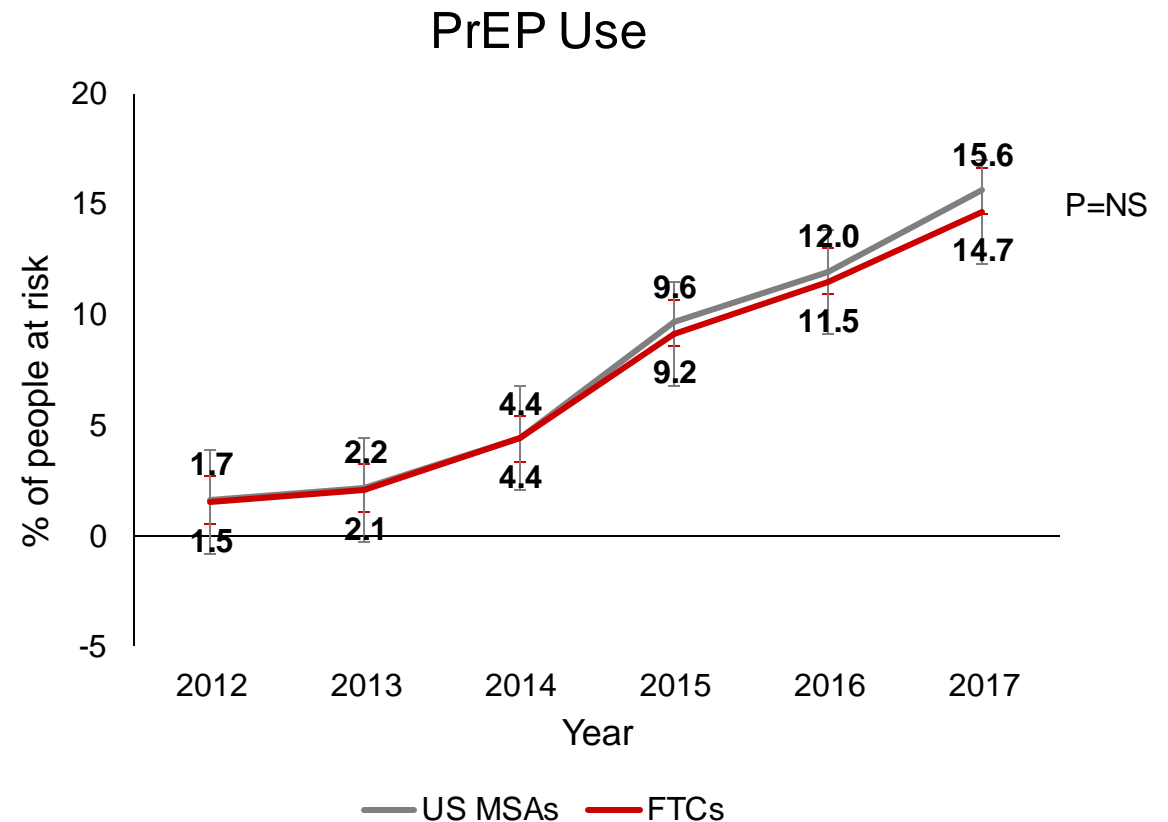
- FTCs had a significantly lower HIV viral suppression rate (-2.4, 95% CI - 4, -0.68%) than the US overall.
- HIV viral suppression rates in FTCs overall increased by 1.3% per year (95% CI 0.9,1.7%).





## Results: PrEP Utilization

- FTCs had a slightly lower PrEP use  $-0.35$  per 100 PAR, (95% CI  $-1.39, +0.70$ ) than the US overall though  $P=NS$ .
- PrEP use increased 9.5-fold in US FTCs from  $1.54 \pm 1.1$  per 100 PAR in 2012 to  $14.7 \pm 1.1$  in 2017



## Results: PrEP Use vs. HIV Incidence Rate in the 19 FTCs

PrEP Quintiles	PrEP utilization in 2017 (Among People At Risk) (95% CI)	HIV Incidence Rate in 2017 (Per 100 PY PAR)
1 (Lowest)	1.1% (0.9 – 1.2)	5.39 (5.25 – 5.53)
2	2.7% (2.5 – 2.9)	5.27 (5.14 – 5.41)
3	5.6% (5.1 – 6.1)	5.22 (5.08 – 5.36)
4	9.6% (9.0 – 10.3)	5.15 (5.01 – 5.28)
5 (Highest)	18.5% (16.8 – 20.3)	4.55 (4.43 – 4.66)

**In 2017, HIV incidence was 15.7% lower among FTCs with the highest PrEP use (18.5 per 100 PAR) compared to those with the lowest PrEP use (1.1 per 100 PAR)**

## Limitations

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- Data on HIV diagnoses are subject to underreporting
- Viral suppression rates were from 2011, 2014 & 2015 and were extrapolated for the other years in this report
- Viral suppression rates were for people with HIV in the MSAs who are being treated. It does not measure rates of testing and linkage to care in those areas.
- PrEP use is underreported due to lack of medical claims on a portion of the subjects plus 15% of claims not reported to this database (e.g. VA, DOD).
- While this data does show an independent effect of PrEP on incidence rates it does not show the relative contributions of PrEP Vs TasP or Natural Decline (that data will be presented at ID week in Sept 2019)

## Summary

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- In 2012, FTC cities had higher incidence rates of HIV infection than the rest of the United States
- From 2012-2017, HIV incidence declined faster in FTCs than in the rest of the United States, despite these cities having higher HIV rates, lower viral suppression rates and slightly lower PrEP utilization rates
- The decline was fastest in the FTCs where PrEP use was highest
- This effect was independent of viral suppression rates
- Improvements to both PrEP uptake and viral suppression rates in FTCs could lead to even more significant declines in the rate of new HIV Diagnoses

# Thanks

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- CDC
  - Multiple Colleagues