Changes, Patterns and Predictors of Sexually Transmitted Infections in Gay and Bisexual Men Using PrEP

Interim Analysis from the PrEPX Study


Michael Traeger, MSc(Epi)
The Burnet Institute, Melbourne, Australia

International AIDS Conference, Amsterdam, July 2018
Abstract THAC0502

*Co-senior authors
Conflicts of interest

Nothing to disclose
Background

PrEP in Australia

Small pilot studies begin in Melbourne and Sydney

1. Lee et al. 2016
2. Lee et al. 2017
Background

PrEP in Australia

Small pilot studies begin in Melbourne and Sydney

2014

Daily PrEP approved by TGA

2016

6% of GBM in Melbourne using PrEP¹

2017

2018

1. Lee et al. 2016
2. Lee et al. 2017
Background

PrEP in Australia

Small pilot studies begin in Melbourne and Sydney

2014

Daily PrEP approved by TGA

2015

6% of GBM in Melbourne using PrEP¹

2016

Large implementation studies across Victoria and NSW begin enrolment

2017

2018

1. Lee et al. 2016
2. Lee et al. 2017
Background

PrEP in Australia

Small pilot studies begin in Melbourne and Sydney

2014

Daily PrEP approved by TGA

2015

Large implementation studies across Victoria and NSW begin enrolment

2016

6% of GBM in Melbourne using PrEP\(^1\)

2017

18% of GBM in Melbourne using PrEP\(^2\)

2018

PrEP listed for public subsidy

1. Lee et al. 2016
2. Lee et al. 2017
Background

PrEP in Australia

Small pilot studies begin in Melbourne and Sydney

- 2014

Daily PrEP approved by TGA

- 2015

Large implementation studies across Victoria and NSW begin enrolment

- 2016

18% of GBM in Melbourne using PrEP\(^2\)

- 2017

PrEP listed for public subsidy

- 2018

6% of GBM in Melbourne using PrEP\(^1\)

- More than 15,000 enrolled in PrEP studies nationwide
- PrEP currently available for $39.90 / month
- PrEP can be prescribed by any doctor or nurse practitioner

1. Lee et al. 2016
2. Lee et al. 2017
The PrEPX Study

Victoria, Australia

- **Multi-site implementation study**
  - More than 10 metropolitan, regional and rural clinics

- **Study duration July 2016 – March 2018**
  - 4,275 participants, mostly gay and bisexual men
  - 1000 enrolled in first 3 weeks

- **Participants returned every 3 months**
  - HIV and STI testing
  - Behavioural survey
The PrEPX Study

Victoria, Australia

- **Multi-site implementation study**
  
  More than 10 metropolitan, regional and rural clinics

- **Study duration** July 2016 – March 2018
  
  4,275 participants, mostly gay and bisexual men
  
  1000 enrolled in first 3 weeks

- **Participants returned every 3 months**
  
  HIV and STI testing
  
  Behavioural survey

- **Primary outcome**: Reduction in population-level HIV incidence

- **Secondary outcome**: Sexually transmissible infections among PrEP users
STIs in PrEP Users

- Evidence suggests STIs increase among PrEP users$^{1,2}$

1. Traeger et al. 2018
2. Lal et al. 2017
3. Kirby Institute 2017
4. Holt et al. 2017
STIs in PrEP Users

- Evidence suggests STIs increase among PrEP users\(^1,2\)
- Many studies lack pre-PrEP STI incidence data

1. Traeger et al. 2018
2. Lal et al. 2017
3. Kirby Institute 2017
4. Holt et al. 2017
STIs in PrEP Users

- Evidence suggests STIs increase among PrEP users\(^1,^2\)
- Many studies lack pre-PrEP STI incidence data
- High screening in PrEP users introduces detection bias
  
  Australian PrEP guidelines recommend quarterly STI screening

1. Traeger et al. 2018
2. Lal et al. 2017
3. Kirby Institute 2017
4. Holt et al. 2017
STIs in PrEP Users

- Evidence suggests STIs increase among PrEP users\(^1,^2\)
- Many studies lack pre-PrEP STI incidence data
- High screening in PrEP users introduces detection bias
  Australian PrEP guidelines recommend quarterly STI screening
- STI rates were increasing prior to the introduction of PrEP
  Gonorrhea, chlamydia and syphilis increasing among Australian GBM since 2010\(^3\)
- Consistent condom use has been decreasing
  Condomless sex among Australian GBM increased from 27% to 39%, 2000 to 2015\(^4\)

1. Traeger et al. 2018
2. Lal et al. 2017
3. Kirby Institute 2017
4. Holt et al. 2017
Aims

1. Calculate STI incidence and distribution among PrEPX participants

2. Explore behavioural characteristics associated with STI risk

3. Identify changes in STI incidence before and after using PrEP
Data Collection

Australian Collaboration for Coordinated Enhanced Sentinel Surveillance
A national STI and BBV sentinel surveillance system
Over 100 sites nationally

- Most participants enrolled in PrEPX at ACCESS clinics
- Track participant movement between clinics
- Include between-study-visit test events
## Participant characteristics

<table>
<thead>
<tr>
<th>Participants enrolled at ACCESS sites</th>
<th>n=2,981</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (median, range)</td>
<td>34 (16-72)</td>
</tr>
<tr>
<td>Gay or bisexual</td>
<td>2,922 (98%)</td>
</tr>
<tr>
<td>Transgender Female</td>
<td>4 (0.1%)</td>
</tr>
<tr>
<td>Transgender Male</td>
<td>11 (0.4%)</td>
</tr>
<tr>
<td>Used PrEP before enrolment</td>
<td>834 (28%)</td>
</tr>
<tr>
<td>STI diagnosed in 3 months prior to / at baseline</td>
<td>775 (26%)</td>
</tr>
<tr>
<td>CRAI in 3 months prior to baseline</td>
<td>1430 (48%)</td>
</tr>
</tbody>
</table>
## 1. STIs during PrEPX follow-up

### STI Incidence

- Study period July 2016 – March 2018
- Total follow-up: 3180 person-years (median, 14.4 months)

<table>
<thead>
<tr>
<th>STI</th>
<th>Incidence rate (per 100 person-years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any STI</td>
<td>91.9</td>
</tr>
<tr>
<td>Chlamydia</td>
<td>44.8</td>
</tr>
<tr>
<td>Gonorrhea</td>
<td>38.6</td>
</tr>
<tr>
<td>Syphilis</td>
<td>8.0</td>
</tr>
<tr>
<td>Any rectal infection</td>
<td>56.6</td>
</tr>
<tr>
<td>Any urethral infection</td>
<td>22.4</td>
</tr>
<tr>
<td>Any pharyngeal infection</td>
<td>23.5</td>
</tr>
</tbody>
</table>
1. STIs during PrEPX follow-up

**Distribution of STIs**

- 1,554 with 0 STIs
- 691 with 1 STI
- 344 with 2 STIs
- 203 with 3 STIs
- 93 with 4 STIs
- 96 with 5+ STIs

Total participants: 2981

48% diagnosed with ≥1 STI

Number of STI diagnoses per participant
1. STIs during PrEPX follow-up

Distribution of STIs

- 1,554 participants (52%) had 0 STIs.
- 691 participants had 1 STI.
- 344 participants had 2 STIs.
- 203 participants had 3 STIs.
- 93 participants had 4 STIs.
- 96 participants had 5 or more STIs.

Total participants: 2981

25% diagnosed with ≥2 STIs, accounting for 76% of diagnoses.
1. STIs during PrEPX follow-up

Distribution of STIs

Number of STI diagnoses per participant

- 0 STIs: 1,554
- 1 STI: 691
- 2 STIs: 344
- 3 STIs: 203
- 4 STIs: 93
- 5+ STIs: 96

Total participants: 2981

13% diagnosed with ≥3 STIs
Accounting for 53% of diagnoses
2. Behavioural predictors of STIs

Methods

- Behavioural survey completed at baseline and every three months

- Cox proportional hazards regression model
  
  Time-varying behaviours were updated at each visit
  
  Outcome was diagnosis of chlamydia, gonorrhoea or syphilis
  
  Allowed for multiple diagnoses
2. Behavioural predictors of STIs

**Cox proportional hazards model**

<table>
<thead>
<tr>
<th></th>
<th>Adjusted Hazard Ratio (95% CI)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (5 year increase)</td>
<td>0.94 (0.90 – 0.97)</td>
<td>0.001</td>
</tr>
<tr>
<td>Diagnosed with an STI 3 months prior to enrolment</td>
<td>1.24 (1.05 – 1.45)</td>
<td>0.010</td>
</tr>
<tr>
<td>CRAI w/ casual partner 3 months prior to enrolment</td>
<td>1.15 (1.01 – 1.32)</td>
<td>0.039</td>
</tr>
<tr>
<td>GHB use during sex in last 6 months</td>
<td>1.24 (1.02 – 1.51)</td>
<td>0.027</td>
</tr>
</tbody>
</table>
## 2. Behavioural predictors of STIs

### Cox proportional hazards model

<table>
<thead>
<tr>
<th>Number of anal sex partners in last 6 months</th>
<th>Adjusted hazard ratio (95% CI)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-5</td>
<td>-reference-</td>
<td></td>
</tr>
<tr>
<td>6-10</td>
<td>1.27 (1.04 – 1.57)</td>
<td>0.020</td>
</tr>
<tr>
<td>11-20</td>
<td>1.88 (1.46 – 2.41)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>21 - 50</td>
<td>2.13 (1.54 – 2.95)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>more than 50</td>
<td>2.55 (1.59 – 4.09)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group sex in last 6 months</th>
<th>Adjusted hazard ratio (95% CI)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>-reference-</td>
<td></td>
</tr>
<tr>
<td>Once / a few times</td>
<td>1.28 (1.10 – 1.50)</td>
<td>0.002</td>
</tr>
<tr>
<td>At least monthly</td>
<td>1.47 (1.16 – 1.85)</td>
<td>0.001</td>
</tr>
<tr>
<td>At least weekly</td>
<td>1.67 (1.16 – 2.41)</td>
<td>0.006</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Condom use with casual partners in last 6 months</th>
<th>Adjusted hazard ratio (95% CI)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>-reference-</td>
<td></td>
</tr>
<tr>
<td>Usually (&gt;50%)</td>
<td>1.38 (0.96 - 1.97)</td>
<td>0.081</td>
</tr>
<tr>
<td>Sometimes (&lt;50%)</td>
<td>1.38 (0.96 - 1.99)</td>
<td>0.080</td>
</tr>
<tr>
<td>Never</td>
<td>1.31 (0.88 - 1.97)</td>
<td>0.183</td>
</tr>
</tbody>
</table>
## 2. Behavioural predictors of STIs

### Cox proportional hazards model

<table>
<thead>
<tr>
<th>Number of anal sex partners in last 6 months</th>
<th>Adjusted hazard ratio (95% CI)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-5</td>
<td>-reference-</td>
<td></td>
</tr>
<tr>
<td>6-10</td>
<td>1.27 (1.04 – 1.57)</td>
<td>0.020</td>
</tr>
<tr>
<td>11-20</td>
<td>1.88 (1.46 – 2.41)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>21 - 50</td>
<td>2.13 (1.54 – 2.95)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>more than 50</td>
<td>2.55 (1.59 – 4.09)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group sex in last 6 months</th>
<th>Adjusted hazard ratio (95% CI)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>-reference-</td>
<td></td>
</tr>
<tr>
<td>Once / a few times</td>
<td>1.28 (1.10 – 1.50)</td>
<td>0.002</td>
</tr>
<tr>
<td>At least monthly</td>
<td>1.47 (1.16 – 1.85)</td>
<td>0.001</td>
</tr>
<tr>
<td>At least weekly</td>
<td>1.67 (1.16 – 2.41)</td>
<td>0.006</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Condom use with casual partners in last 6 months</th>
<th>Adjusted hazard ratio (95% CI)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>-reference-</td>
<td></td>
</tr>
<tr>
<td>Usually (&gt;50%)</td>
<td>1.38 (0.96 - 1.97)</td>
<td>0.081</td>
</tr>
<tr>
<td>Sometimes (&lt;50%)</td>
<td>1.38 (0.96 - 1.99)</td>
<td>0.080</td>
</tr>
<tr>
<td>Never</td>
<td>1.31 (0.88 - 1.97)</td>
<td>0.183</td>
</tr>
</tbody>
</table>
2. Behavioural predictors of STIs

### Cox proportional hazards model

<table>
<thead>
<tr>
<th>Number of anal sex partners in last 6 months</th>
<th>Adjusted hazard ratio (95% CI)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-5</td>
<td>-reference-</td>
<td></td>
</tr>
<tr>
<td>6-10</td>
<td>1.27 (1.04 – 1.57)</td>
<td>0.020</td>
</tr>
<tr>
<td>11-20</td>
<td>1.88 (1.46 – 2.41)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>21 - 50</td>
<td>2.13 (1.54 – 2.95)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>more than 50</td>
<td>2.55 (1.59 – 4.09)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group sex in last 6 months</th>
<th>Adjusted hazard ratio (95% CI)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>None</td>
<td>-reference-</td>
<td></td>
</tr>
<tr>
<td>Once / a few times</td>
<td>1.28 (1.10 – 1.50)</td>
<td>0.002</td>
</tr>
<tr>
<td>At least monthly</td>
<td>1.47 (1.16 – 1.85)</td>
<td>0.001</td>
</tr>
<tr>
<td>At least weekly</td>
<td>1.67 (1.16 – 2.41)</td>
<td>0.006</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Condom use with casual partners in last 6 months</th>
<th>Adjusted hazard ratio (95% CI)</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Always</td>
<td>-reference-</td>
<td></td>
</tr>
<tr>
<td>Usually (&gt;50%)</td>
<td>1.38 (0.96 - 1.97)</td>
<td>0.081</td>
</tr>
<tr>
<td>Sometimes (&lt;50%)</td>
<td>1.38 (0.96 - 1.99)</td>
<td>0.080</td>
</tr>
<tr>
<td>Never</td>
<td>1.31 (0.88 - 1.97)</td>
<td>0.183</td>
</tr>
</tbody>
</table>
## 2. Behavioural predictors of STIs

### Cox proportional hazards model

<table>
<thead>
<tr>
<th>Number of anal sex partners in last 6 months</th>
<th>Adjusted hazard ratio (95% CI)</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-5 - reference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6-10</td>
<td>1.27 (1.04 – 1.57)</td>
<td>0.020</td>
</tr>
<tr>
<td>11-20</td>
<td>1.88 (1.46 – 2.41)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>21 - 50</td>
<td>2.13 (1.54 – 2.95)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>more than 50</td>
<td>2.55 (1.59 – 4.09)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Group sex in last 6 months</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>None - reference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Once / a few times</td>
<td>1.28 (1.10 – 1.50)</td>
<td>0.002</td>
</tr>
<tr>
<td>At least monthly</td>
<td>1.47 (1.16 – 1.85)</td>
<td>0.001</td>
</tr>
<tr>
<td>At least weekly</td>
<td>1.67 (1.16 – 2.41)</td>
<td>0.006</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Condom use with casual partners in last 6 months</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Always - reference</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Usually (&gt;50%)</td>
<td>1.38 (0.96 - 1.97)</td>
<td>0.081</td>
</tr>
<tr>
<td>Sometimes (&lt;50%)</td>
<td>1.38 (0.96 - 1.99)</td>
<td>0.080</td>
</tr>
<tr>
<td>Never</td>
<td>1.31 (0.88 - 1.97)</td>
<td>0.183</td>
</tr>
</tbody>
</table>
3. Change in STIs before and after PrEPX

Methods

• Subgroup analysis (n=1,378)
  Participants who had been visiting ACCESS clinics before enrolment

• Calculated STI incidence before and after enrolment
  Comparison: 12 months before enrolment vs During PrEPX follow-up

• Negative binomial regression model
  Adjusted for change in testing frequency
  Included individual testing rate before and after as a confounding variable
3. Change in STIs before and after PrEPX

## Incidence rates before and after PrEPX

<table>
<thead>
<tr>
<th>Incidence rate (per 100 person-years)</th>
<th>1 year before PrEPX</th>
<th>During PrEPX</th>
<th>IRR (95% CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any STI</td>
<td>69.5</td>
<td>98.4</td>
<td>1.42 (1.29 – 1.56)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>
### 3. Change in STIs before and after PrEPX

#### Incidence rates before and after PrEPX

<table>
<thead>
<tr>
<th></th>
<th>Incidence rate (per 100 person-years)</th>
<th>1 year before PrEPX</th>
<th>During PrEPX</th>
<th>IRR (95% CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any STI</td>
<td></td>
<td>69.5</td>
<td>98.4</td>
<td>1.42 (1.29 – 1.56)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Chlamydia</td>
<td></td>
<td>33.3</td>
<td>49.0</td>
<td>1.47 (1.30 – 1.66)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Gonorrhea</td>
<td></td>
<td>30.1</td>
<td>42.3</td>
<td>1.38 (1.21 – 1.57)</td>
<td>0.003</td>
</tr>
<tr>
<td>Syphilis</td>
<td></td>
<td>6.8</td>
<td>8.7</td>
<td>1.28 (0.98 – 1.68)</td>
<td>0.065</td>
</tr>
</tbody>
</table>
3. Change in STIs before and after PrEPX

<table>
<thead>
<tr>
<th></th>
<th>Incidence rate (per 100 person-years)</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1 year before PrEPX</td>
<td>During PrEPX</td>
<td>IRR (95% CI)</td>
</tr>
<tr>
<td>Any STI</td>
<td>69.5</td>
<td>98.4</td>
<td>1.42 (1.29 – 1.56)</td>
</tr>
<tr>
<td>Chlamydia</td>
<td>33.3</td>
<td>49.0</td>
<td>1.47 (1.30 – 1.66)</td>
</tr>
<tr>
<td>Gonorrhea</td>
<td>30.1</td>
<td>42.3</td>
<td>1.38 (1.21 – 1.57)</td>
</tr>
<tr>
<td>Syphilis</td>
<td>6.8</td>
<td>8.7</td>
<td>1.28 (0.98 – 1.68)</td>
</tr>
<tr>
<td>Rectal Infections</td>
<td>45.0</td>
<td>62.3</td>
<td>1.39 (1.22 – 1.57)</td>
</tr>
<tr>
<td>Pharyngeal Infections</td>
<td>16.3</td>
<td>23.3</td>
<td>1.43 (1.20 – 1.70)</td>
</tr>
<tr>
<td>Urethral Infections</td>
<td>17.6</td>
<td>25.9</td>
<td>1.47 (1.21 – 1.77)</td>
</tr>
</tbody>
</table>
### 3. Change in STIs before and after PrEPX

**Incidence rates before and after PrEPX**

<table>
<thead>
<tr>
<th></th>
<th>1 year before PrEPX</th>
<th>During PrEPX</th>
<th>IRR (95% CI)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Any STI</td>
<td>69.5</td>
<td>98.4</td>
<td>1.42 (1.29 – 1.56)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Chlamydia</td>
<td>33.3</td>
<td>49.0</td>
<td>1.47 (1.30 – 1.66)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Gonorrhea</td>
<td>30.1</td>
<td>42.3</td>
<td>1.38 (1.21 – 1.57)</td>
<td>0.003</td>
</tr>
<tr>
<td>Syphilis</td>
<td>6.8</td>
<td>8.7</td>
<td>1.28 (0.98 – 1.68)</td>
<td>0.065</td>
</tr>
<tr>
<td>Rectal Infections</td>
<td>45.0</td>
<td>62.3</td>
<td>1.39 (1.22 – 1.57)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Pharyngeal Infections</td>
<td>16.3</td>
<td>23.3</td>
<td>1.43 (1.20 – 1.70)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Urethral Infections</td>
<td>17.6</td>
<td>25.9</td>
<td>1.47 (1.21 – 1.77)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Previous PrEP users</td>
<td>92.4</td>
<td>104.1</td>
<td>1.13 (0.98 – 1.28)</td>
<td>0.072</td>
</tr>
<tr>
<td>PrEP naïve participants</td>
<td>55.1</td>
<td>94.2</td>
<td>1.71 (1.49 – 1.98)</td>
<td>&lt;0.001</td>
</tr>
</tbody>
</table>
3. Change in STIs before and after PrEPX

Overall testing rate increased by 48% in PrEP-naïve participants
3. Change in STIs before and after PrEPX

Overall testing rate increased by 48% in PrEP-naïve participants

### Adjusted negative binomial model

<table>
<thead>
<tr>
<th></th>
<th>Unadjusted</th>
<th>Adjusted*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IRR (95% CI)</td>
<td>p-value</td>
</tr>
<tr>
<td>PrEP naïve participants</td>
<td>Any STI</td>
<td>1.71 (1.49 – 1.98)</td>
</tr>
</tbody>
</table>

*Adjusted for differential testing frequency
3. Change in STIs before and after PrEPX

Overall testing rate increased by 48% in PrEP-naïve participants

**Adjusted negative binomial model**

<table>
<thead>
<tr>
<th>PrEP naïve participants</th>
<th>Unadjusted</th>
<th>Adjusted*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>IRR (95% CI)</td>
<td>p-value</td>
</tr>
<tr>
<td>Any STI</td>
<td>1.71 (1.49 – 1.98)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Chlamydia</td>
<td>1.84 (1.55 – 2.20)</td>
<td>&lt;0.001</td>
</tr>
<tr>
<td>Gonorrhea</td>
<td>1.69 (1.42 – 2.01)</td>
<td>0.003</td>
</tr>
<tr>
<td>Syphilis</td>
<td>1.24 (0.87 – 1.78)</td>
<td>0.065</td>
</tr>
</tbody>
</table>

*Adjusted for differential testing frequency
1. **STIs during PrEPX follow-up**
   - Overall STI incidence of 91/100 person-years
   - Over half of participants (52%) were not diagnosed with an STI
   - STIs were highly concentrated among PrEP users experiencing repeat infections
Summary

1. **STIs during PrEPX follow-up**
   - Overall STI incidence of 91/100 person-years
   - Over half of participants (52%) were not diagnosed with an STI
   - STIs were highly concentrated among PrEP users experiencing repeat infections

2. **Behavioural predictors of STI risk**
   - STI risk among PrEPX participants was driven more by numbers of partners and participation in group sex rather than condom use
Summary

1. **STIs during PrEPX follow-up**
   - Overall STI incidence of 91/100 person-years
   - Over half of participants (52%) were not diagnosed with an STI
   - STIs were highly concentrated among PrEP users experiencing repeat infections

2. **Behavioural predictors of STI risk**
   - STI risk among PrEPX participants was driven more by numbers of partners and participation in group sex rather than condom use

3. **Before and after PrEP**
   - STI incidence increased among GBM after enrolling in PrEPX, especially among those starting PrEP for the first time
   - Partly explained by increase in testing frequency
   - After adjusting for testing frequency, GBM using PrEP for the first time experienced a moderate but significant increase for any STI diagnosis and chlamydia infection
Implications

• STIs increased at the individual-level after initiating PrEP
  • However, high screening rates reduce duration of infection
  • Models indicate that increased screening among PrEP users may lead to an overall decrease in population-level STI incidence\(^1\)
  • Monitor behavioural change at both individual and population-level

1. Jenness et al. 2017
Implications

• **STIs increased at the individual-level after initiating PrEP**
  • *However*, high screening rates reduce duration of infection
  • Models indicate that increased screening among PrEP users may lead to an overall decrease in population-level STI incidence\(^1\)
  • Monitor behavioural change at both individual and population-level

• **PrEP as a program - PrEP use must be combined with regular STI testing**
  Supports current Australian guidelines for 3 monthly STI testing

\(^1\) Jenness et al. 2017
Implications

- STIs increased at the individual-level after initiating PrEP
  - However, high screening rates reduce duration of infection
  - Models indicate that increased screening among PrEP users may lead to an overall decrease in population-level STI incidence\(^1\)
  - Monitor behavioural change at both individual and population-level

- PrEP as a program - PrEP use must be combined with regular STI testing
  Supports current Australian guidelines for 3 monthly STI testing

- Strategies can be targeted towards PrEP users experiencing high rates of reinfection

1. Jenness et al. 2017
Implications

- STIs increased at the individual-level after initiating PrEP
  - However, high screening rates reduce duration of infection
  - Models indicate that increased screening among PrEP users may lead to an overall decrease in population-level STI incidence\(^1\)
  - Monitor behavioural change at both individual and population-level

- PrEP as a program - PrEP use must be combined with regular STI testing
  - Supports current Australian guidelines for 3 monthly STI testing

- Strategies can be targeted towards PrEP users experiencing high rates of reinfection

- Community involvement critical to success of future measures to reduce STIs

1. Jenness et al. 2017
Acknowledgements

**PrEPX Study Team**
- **Edwina Wright** – Principal Investigator
- Brian Price
- Anne Mak
- Luxi Lal
- Dean Murphy
- Jude Armishaw
- Timmy Lockwood
- Olga Vujovic
- Christina Chang
- Vincent Cornelisse

**Burnet Institute**
- **Mark Stoove**
  - Jason Asselin
  - Long Nguyen
  - Carol El-Hayek
  - Kat Ryan

**Centre for Social Research and Health**
- Dean Murphy
- John De Wit

**Study Clinics**
- **Prahran Market Clinic**: Norm Roth
- **Northside Clinic**: Jeff Wilcox
- **MSHC**: Kit Fairley
- **PRONTO!**: Matt Penn
- **Centre Clinic**: BK Tee
- **ERA Health**: George Forgan-Smith
- **Alfred HIP Clinic and Nurse Led Clinics**

**Pharmacies**
- **John Silverii’s Pharmacy**: John Silverii
- **Newton and Leung Pharmacy**: Johnny Phu
- **Melbourne Sexual Health**: Anne Mak
- **Alfred Clinical Trials Pharmacy**: Anne Mak
- **Healthsmart**: Joseph Tesoriero
- **Central Pharmacy**: Manoj Vassan, Kie Lim
- **Russell Frajman Pharmacy**: Russell Frajman

**ACCESS**
- Burnet Institute, Kirby Institute & NRL

**Community Organisations**
- **VAC**: Simon Ruth, Colin Batrouney, Jeremy Wiggins
- **PrEP’DForChange**: Chris Williams
- **PrEPaccessNOW**: Jeff Montgomery & Michael Whelan
- **Living Positive Victoria**: Brent Allen
- **Victorian Aboriginal Controlled Community Health Organisation**: Kat Byron
- **Centre for Culture Ethnicity and Health**: Alison Coelho
- **Harm Reduction Victoria**: Jenny Kelsall

**Funding Bodies**
- **Victorian Department of Health and Human Services**: Michael West
- **Alfred Health (Study sponsor)**: Andrew Way
- **Victorian AIDS Council**: Simon Ruth

**Research Participants**
- PrEPX participants
- Participants in previous PrEP research
- Animals in PrEP efficacy studies
References


