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PrEP, though rapidly gaining global traction, is still a vastly underutilized HIV prevention tool.

- ~300,000 Americans, out of 1.2 million (25%) w/a treatment indication were prescribed PrEP in 2020.
Individuals seeking PrEP must navigate a number of steps to reap the full benefit of this prevention tool.

- CDC guidelines recommend:
  - HIV + GC/CT + Syphilis testing @ initiation and 1 time every 3 months
  - Kidney function, Hep B, cholesterol level testing depending on treatment

- Provider adherence to guidelines is variable and represents an additional barrier to achievement of optimal PrEP care outcomes

In reality, individuals often cycle in and out of PrEP care over time.

Adapted from: Ehrenkranz et. al. 2021
Longitudinal PrEP care engagement data is limited, but existing evidence suggests persistence in care is poor.

- Of 14,000 individuals linked to PrEP care:
  - 52.2% (95% CI, 48.9%-55.7%) discontinued PrEP at least once during the study period

Longitudinal PrEP care engagement data is limited, but existing evidence suggests persistence in care is poor.

• Of 14,000 individuals linked to PrEP care:
  • 52.2% (95% CI, 48.9%-55.7%) discontinued PrEP at least once during the study period
  • 60.2% (95% CI, 52.2%-68.3%) of whom subsequently reinitiated
Understanding engagement in PrEP care over time can allow us to identify distinct interventions that are needed and when they are needed.

- Different implementation gaps require different interventions/implementation strategies:
  - Poor lab monitoring = innovative ways to increase access to lab monitoring and improve provider fidelity to guidelines
  - Extended periods of disengagement = proactive efforts to re-engage individuals in care
  - Particularly critical in Ending the HIV Epidemic priority states such as Missouri
Novel multi-state analytic methods can illuminate the most vulnerable periods for disengagement from PrEP care

- Models for understanding a process
- Individuals move through or occupy one of several states at a time
- States are mutually exclusive and exhaustive (e.g., in care, out of care, dead)
We aimed to address existing gaps in the literature by:

• Characterizing transitions between PrEP care states over time

• Quantifying the proportion of individuals in each care state at distinct timepoints following enrollment into the cohort
We leveraged data from a cohort of PrEP initiators at an ID clinic in St. Louis, Missouri

- June 2014-November 2021
- Electronic Health Record data + REDCap Survey data
  - Clinic appointment dates
  - First PrEP prescription date
  - HIV/GC/CT/Syphilis lab dates
  - Age, gender, race/ethnicity, relationship status, education, employment, insurance
Motivation

Aims

Methods

Findings

Implications

Conceptual (Multi-state) Model

- **Linked** - date of intake visit from RedCap
- **Prescribed** - 1st PrEP prescription date in RedCap
- **Lab status** - entered cohort “up to date”; After, considered “late” when a 6-month gap in GC/CT, syphilis, or HIV testing occurred. After, “up to date” 1st date all labs were current.
- **Clinic engagement** - “disengaged” from care on the 1st date individual had 6-month gap in clinic visits. “Re-engaged” at next PrEP clinic visit
Statistical Methods

- Descriptive statistics (counts/proportions; medians/IQRs)
- Longitudinal methods of inquiry:
  - Nonparametric multistate analytic techniques (Aalen-Johansen estimator) to estimate proportion of individuals in each state at different time points following enrollment
  - Cumulative incidence of disengagement from care following PrEP initiation and re-engagement in care following a clinical lapse
## Study Population

<table>
<thead>
<tr>
<th>Category</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>420 (90.3)</td>
</tr>
<tr>
<td>Age (Median/IQR)</td>
<td>29 (25-36)</td>
</tr>
<tr>
<td>Race/Ethnicity</td>
<td></td>
</tr>
<tr>
<td>White, non-Hispanic</td>
<td>243 (52.9)</td>
</tr>
<tr>
<td>Black, non-Hispanic</td>
<td>136 (29.6)</td>
</tr>
<tr>
<td>Single</td>
<td>346 (74.4)</td>
</tr>
<tr>
<td><strong>College+</strong></td>
<td><strong>298 (68.5)</strong></td>
</tr>
<tr>
<td>Employed</td>
<td>295 (67.7)</td>
</tr>
<tr>
<td>Insurance</td>
<td></td>
</tr>
<tr>
<td>Private insurance</td>
<td>319 (73.0)</td>
</tr>
<tr>
<td>Uninsured</td>
<td>57 (13.0)</td>
</tr>
</tbody>
</table>
Proportion of individuals in each care state following cohort enrollment

- **Prescribed:**
  - 81.1% (95% CI: 78.2, 83.8) same day
  - 95.7% (95% CI: 94.4, 97.1) within 90 days

- **Disengaged:**
  - 48.3% (95% CI: 45.1, 451.8) 1-year following enrollment
  - 70.0% (95% CI: 66.7, 73.5) 2-years following enrollment
Proportion of individuals in each care state following cohort enrollment

- **Lab coverage:**
  - 16.8% (95% CI: 13.8, 19.3) in care but not up to date at 12-months; ~1/3 of those engaged or re-engaged in PrEP care
  - 11.0% (95% CI: 8.7, 13.2) in care but not up to date at 24-months; ~38% of those engaged or re-engaged in PrEP care

- **Seroconversion:** 5 (1.1%) across entire follow-up
Proportion of individuals in each care state following disengagement

- **Re-engagement among those who disengaged:**
  - 30.8% (95% CI: 25.8, 35.2) by month 18
  - 26.7% (95% CI: 22.6, 30.5) by month 24

![Chart showing the proportion of individuals in each care state over time, with Clinical States including: Prescribed PrEP, current on labs, Prescribed PrEP, not up to date on labs, Reinitiated PrEP, current on labs, Reinitiated PrEP, not up to date on labs, Disengaged from care after first PrEP Prescription, Initiated PrEP care, Disengaged from care prior to first PrEP prescription, and Seroconversion.]
Of the unique lab lapses that were independent of lapses in care, a majority were lapses in GC/CT and Syphilis testing.

### Lapses in labs

- **GC/CT+SYP**: 50%
- **GC/CT**: 13%
- **SYP**: 10%
- **HIV+GC/CT+SYP**: 20%
- **HIV+GC/CT**: 20%
- **HIV+SYP**: 2%
- **HIV**: 5%

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**Methods**

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**Implications**
Targeted public health planning is needed to improve PrEP engagement.

- Clinic lapses are common, even when allowing for 6 months between visits
- Lab lapses are common, and represent a missed opportunity for screening and treating STIs
- Among those who disengage from PrEP care, few re-engage
- Flexible care options (e.g., telehealth, at-home lab testing and medication delivery) and unique interventions that address each of these barriers are needed to optimize the benefits of PrEP
- Multi-state methods can capture these patterns and help target public health planning related to PrEP care
Questions? Get in touch:
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