

TECHNICAL NOTES

The effects of losing PS21-2102 for a single year

- We estimate that the 96 CBOs funded by PS21-2102 newly diagnosed 684 people with HIV in 2024.
- If those 684 people would otherwise get diagnosed within the median time of three years, these cuts would lead to 328 avoidable infections over 10 years, costing \$180,320,265 over that same timespan.
  - 71 of those avoidable infections would go undiagnosed long enough to progress to AIDS

The effects of losing PS21-2102 over 10 years

- If PS21-2102 were cut, those 684 diagnoses would continue to be missed year after year.
- Even if those with avoidable infections got diagnosed in the national median time of three years, losing PS21-2102 over the next 10 years would lead to:
  - 6,840 missed diagnoses
  - 1,993 avoidable infections
    - 432 of which would go undiagnosed long enough to progress to AIDS
  - \$1.093 billion in avoidable medical costs
    - 2026 USD
    - \$1,093,725,697.20

US Regional Analysis

| Region  | Imp. ALL CBOs Tests N | Imp. PS21 CBOs Tests N | Regional Pos Rates | Imp PS21 Positives N* | Healthcare Settings Tests N | Healthcare Settings Positives N | Healthcare Settings Pos Rates |
|---------|-----------------------|------------------------|--------------------|-----------------------|-----------------------------|---------------------------------|-------------------------------|
| NE      | 6,131.09              | 3,923.90               | 0.014              | 54.35                 | 271,799                     | 659                             | 0.00242                       |
| South** | 50,578.19             | 32,370.04              | 0.014              | 452.40                | 731,543                     | 1,942                           | 0.00265                       |
| MW      | 6,893.22              | 4,411.66               | 0.014              | 58.25                 | 147,174                     | 411                             | 0.00279                       |
| West    | 11,744.54             | 7,516.51               | 0.014              | 101.75                | 249,502                     | 831                             | 0.00333                       |
| Total   | 75,347                | 48,222.11              | 0.014              | 666.74***             | 1,400,018                   | 3,843                           | 0.00274                       |

\* Limited such that, if ALL non-healthcare settings found e.g., 5 positives, then the PS21 CBOs can't have found 5.2 positives.

\*\* Data from Mississippi are not included in this report due to incomplete data submission to CDC.

\*\*\* Doesn't match the 684 total missed diagnoses due to rounding and some tests missing location data.

Linkage to Care Analysis

- Marano-Lee et al. (2024) found that CBOs' linkage to care rates average 86.7%.
- If, in 2024, all healthcare settings linked newly diagnosed HIV-positive people to care at an 86.7% rate, an additional 554 people would have been linked to care.
- If, in 2024, all non-healthcare settings linked newly diagnosed HIV-positive people to care at an 86.7% rate, an additional 477 people would have been linked to care.

## Modeling Equations

The effects of losing PS21-2102 for a single year

MODEL 3 - NO CONTINUOUS CONTRIBUTION,  
HOMOGENEOUS EXITS

$$\begin{aligned} p &:= \text{linkage to care rate} = 0.867 \\ \mathcal{L} &:= \text{diagnosis 'hazard' rate} = \frac{\ln(2)}{3} \\ r &:= \text{transmission rate} = 0.0996 \end{aligned}$$

$$k = r - \mathcal{L}$$

$$\begin{aligned} U(t) &:= \text{transmissible population at time } t \\ U(t) &= m * e^{kt} \end{aligned}$$

$$\begin{aligned} N(T) &:= \text{cumulative number of avoidable infections} \\ N(T) &= rm \cdot \int_0^T e^{kt} dt \end{aligned}$$

$$\begin{aligned} c(t) &:= \text{lifetime cost of care from } N(t) \\ c(t) &= N(t) * 548680 \end{aligned}$$

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CDC PROJECTIONS MODEL 3 WITH HOMOGENEOUS EXITS

$$\begin{aligned} m &:= \text{missed diagnoses/yr} = 684.04 \\ p &:= \text{linkage to care rate} = 0.867 \\ \mathcal{L} &:= \text{diagnosis 'hazard' rate} = \frac{\ln(2)}{3} \\ r &:= \text{transmission rate} = 0.0996 \end{aligned}$$

$$\begin{aligned} k &= r - \mathcal{L} \\ U(t) &:= \text{transmissible population at time } t \\ U(t) &= \frac{m}{k} (e^{kt} - 1) \end{aligned}$$

$$\begin{aligned} N(T) &:= \text{cumulative number of avoidable infections} \\ N(T) &= \frac{rm}{k} \int_0^T (e^{kt} - 1) dt \end{aligned}$$

$$\begin{aligned} c(t) &:= \text{lifetime cost of care from } N(t) \\ c(t) &= N(t) * 548680 \end{aligned}$$

## AIDS Progression Analysis:

### Missed Diagnoses Lead to Eventual AIDS Diagnoses

- In addition to the 432 people whose avoidable infections lead to AIDS cases due to late diagnoses, the 6,840 people who missed their CBO diagnoses are also at risk of progressing to AIDS.
- Specifically, we estimate that 1,484 of the 6,840 people who missed their diagnoses at a CBO would go on to progress to AIDS before being diagnosed.