Introduction

- Expanded use of ART may reduce HIV incidence and Eventually HIV prevalence at the population level, assuming significant behavioral HIV risk disinhibition does not occur.

- In San Francisco, where HIV prevalence among Men-who-have-Sex-with-Men (MSM) is 23% and the majority are aware of their HIV serostatus, we sought to estimate the effects of expanded ART treatment strategies on the SF MSM HIV epidemic.

Methods

- We used a mathematical model to quantify the effect of 3 expanded ART treatment strategies on the MSM HIV epidemic in San Francisco:
  - Model input parameters, population sizes, and progression rates were taken from observed epidemiologic data collected in San Francisco and published data.
  - Infections averted were calculated by subtracting incident case totals between models with the standard of care as the referent.

ART Strategy Scenarios

Evaluate 3 Expanded ART scenarios versus Standard of care arm:
(Treat MSM with CD4<350)
1. Treat all MSM with CD4<500 cells/mm³
2. Treat all MSM
3. Treat all MSM and perform annual HIV testing to detect new infections

Results

- Predicted HIV Prevalence by ART Strategy

- Sensitivity Analysis

HIV Infections Averted*

<table>
<thead>
<tr>
<th>Year</th>
<th>TxC500</th>
<th>TxA</th>
<th>Test &amp; Tx A</th>
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<tbody>
<tr>
<td>2014</td>
<td>1,554</td>
<td>2,169</td>
<td>2,810</td>
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<td>2019</td>
<td>3,102</td>
<td>4,550</td>
<td>6,040</td>
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<td>2029</td>
<td>4,940</td>
<td>8,221</td>
<td>12,189</td>
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*Cumulative from 2009

- All 3 treatment strategies resulted in reduction of new HIV infections post implementation compared to current practice.
- The percent reduction in incident infections seen with the 3 strategies was 49%, 71%, and 91% over the first 10 years for strategies 1, 2, & 3 respectively.

Conclusions

In a city with a mature HIV epidemic where the majority of individuals have known HIV status, the successful application of widespread ART would prevent large numbers of HIV incident cases and produce a decline in HIV prevalence when combined with annual HIV testing to detect new cases.

The Effect of Expanded Antiretroviral Treatment (ART) Strategies on the MSM HIV Epidemic in San Francisco

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