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Background

- The first comprehensive HIV prophylaxis clinical practice guidelines for PrEP use among men-who-have-sex-with-men population (MSM) was released by the US Public Health Service on May 14, 2014.
- These guidelines were developed by a federal inter-agency working group led by CDC, based on strong evidence powered by the iPREX trial1.
- The guidelines recommend use of PrEP in the form of Emtricitabine and Tenofovir combination pill taken once every day consistently for MSM population, who are HIV-negative and are at a substantial high risk to contract HIV infection.
- Taking into account that the iPREX trial had a shorter follow up, we evaluated the value of these recommendations over a short run and long run time horizon.

Objectives

To evaluate the cost-effectiveness of PrEP (Emtricitabine-Tenofovir) combination pill along with usual care prophylaxis compared to usual care prophylaxis alone from a US payer perspective, using short run and long run outcomes.

Methods

- We designed a decision analytical model using Excel® 2013 that replicated the iPREX trial environment to compare costs and outcomes of PrEP plus usual care versus usual care alone (i.e. condom use, HIV testing and counselling, STD testing). Outcomes included HIV cases averted over the trial period of 3 years and life years gained (LYG) over a lifetime time horizon2.
- Model Assumptions:
  a) Beyond trial follow up period of 3 years, HIV positive and HIV negative lifetime costs were used as a reflection of the patient experience from the 3rd year of prophylaxis until death of the patient.
  b) All MSM patients, if HIV positive, were assumed to be adherent with the anti-retroviral drug use since the time they enter into HIV care.
  c) All MSM patients, if HIV negative, were assumed to be on prophylaxis throughout the lifetime of the patient.
  d) Condom use consistency or correctness in both PrEP and usual care groups could not be measured in the trial and therefore was assumed to be 100%.

Decision Model

Drug adherence is defined as at least one intracellular drug component of Emtricitabine triphosphate present.

Results

<table>
<thead>
<tr>
<th>BASE CASE COST-EFFECTIVENESS ANALYSIS</th>
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<tbody>
<tr>
<td>3 Year costs</td>
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<tr>
<td>PrEP + usual care</td>
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<tr>
<td>Usual care</td>
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<tr>
<td>Lifetime cost</td>
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<td>PrEP + usual care</td>
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<td>Usual care</td>
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TORNADO ANALYSIS (LIFE TIME HORIZON)

Condum effectiveness is defined as probability of being HIV-negative as a result of usual care HIV prophylaxis.

ONE WAY SENSITIVITY ANALYSES PER LIFE YEAR GAINED

As condom effectiveness decreases below 92%, the usual care only becomes less effective and more expensive; therefore, PrEP becomes cost saving in this scenario.

COST-EFFECTIVENESS SCATTER PLOT (5000 ITERATIONS)

The density of ICER scatter is spread out in the first and second quadrant. However, the highest density of scatter is found in the first quadrant.

COST-EFFECTIVENESS ACCEPTABILITY CURVE

The probability of PrEP cost-effectiveness is at least 50% if the payer WTP is a minimum of $45,000-$50,000 per life year gained.

Cost of PrEP decreases below $30 per pill, the usual care only becomes more expensive and less effective; therefore, PrEP becomes cost saving in this scenario.

References
