BACKGROUND
• Budget impact models (BIMs) help healthcare decision makers evaluate the financial impact of shifts in market share for a selection of pharmaceutical products within the same therapeutic area.1
• BIMs can be highly sensitive to the model assumptions and inputs used, including those related to utilization and costs.1
• Methodological guidelines are available, but there is no consensus on the appropriate frequency of updating model costs and market-share values.2
• Recent drug trend analyses have reported average drug price changes by a modeled drug each year.
• Annual prescription drug price changes were consistently higher on average than inflation rates from 2006 to 2015, with variances as high as 15.4% from inflation.2
• Drugs in the top 3 most expensive therapy classes of 2016 had an average unit cost change of 9.6% to 15.1% from 2015.3
• Human immunodeficiency virus-1 (HIV-1) is associated with high pharmacy costs that are increasing annually (16.2% increase in 2016).4
• Using HIV-1 as an example, cost scenario analyses can be conducted with a pharmacy BIM to assess how variations in drug prices over 1 year influence the budget impact.

OBJECTIVES
• To assess the percent change in the average wholesale prices (AWPs) of HIV-1 therapies compared to the top 50 branded drugs from 2017 to 2018.
• To investigate the effect of drug price updates on the results of an HIV-1 pharmacy BIM, holding other inputs constant.

METHODS
Model Design
• An Excel-based pharmacy BIM was developed to test how changes in drug prices alone can alter the model results.
• The model estimated the total pharmacy costs associated with treating adults with HIV-1 and the impact of market-share fluctuations over 1 year for a hypothetical 1 million-member US health plan (Figure 1).

Figure 1. Model Structure

Total Plan Population
Disease Prevalence
Treated Population
Current Market
Treatment Utilization
Pharmacy Costs (2017 or 2018 Values)
Total Costs
Budget Impact (Difference)

New Market
Treatment Utilization
Pharmacy Costs (2017 or 2018 Values)
Total Costs

Table 2. BIM Cost Scenario Analysis

<table>
<thead>
<tr>
<th>Tool</th>
<th>Current Market</th>
<th>New Market</th>
<th>Total Budget Impact</th>
<th>PMPM Budget Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario 1: 2017 Costs</td>
<td>$15,856,720</td>
<td>$15,493,489</td>
<td>-$361,230</td>
<td>-$0.030</td>
</tr>
<tr>
<td>Scenario 2: 2018 Costs</td>
<td>$16,161,828</td>
<td>$16,292,924</td>
<td>$131,095</td>
<td>$0.011</td>
</tr>
<tr>
<td>Difference (Scenario 2 vs 1)</td>
<td>$6,305,109</td>
<td>$6,787,435</td>
<td>$492,326</td>
<td>$0.041</td>
</tr>
</tbody>
</table>

• The model inputs were based on the 2017 and 2018 pharmacy BIMs when pharmacy costs are anticipated to change during the model time horizon.

LIMITATIONS
• The model does not include rebates or discounts when estimating costs, which do not reflect real-world pricing.
• Findings from the model are specific to HIV-1 and the comparators and inputs used, which limits the generalizability of the results.
• Further research is recommended to assess how price changes influence budget impact analyses for other therapeutic areas.

CONCLUSION
• While HIV-1 drug costs on average changed by <12% in 1 year, updating the costs in the model led to a substantial change in budget impact.
• This analysis highlights the importance of regularly updating cost inputs for models, as pharmacy BIMs can be sensitive to changes in drug price.
• Cost calculations should be exercised using extended time horizons in BIMs when pharmacy costs are anticipated to change during the model time horizon.

REFERENCES

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