

The Impact of Alternative Weighting Methodologies on Cross-Indication Value-Based Pricing Estimates

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BACKGROUND

- With the recent emphasis on value-based health care,¹ value-based pricing (VBP) using the methods of cost-effectiveness analysis has gained traction as a means to promote efficiency in health care spending.²
- For drugs approved in multiple conditions, current product-specific pricing frameworks struggle to reflect differences in efficacy and value across indications accurately.^{3,4}
- VBP approaches based on a drug’s value in a single indication (e.g., first approval, minimum or maximum value) may negatively affect patients’ access to effective therapies in other indications (e.g., payers restricting coverage, manufacturers forgoing new indications).²⁻⁴
- While the policy discussion often focuses on multi-indication pricing, a more practical response to these scenarios is the use of a weighted cross-indication VBP approach that reflects the average value of a drug across indications.⁵⁻⁷
- Potential scenarios in which cross-indication VBP estimates may be relevant include early development decisions for a drug being investigated in multiple indications, the evaluation of a drug approved based on a basket trial, and pricing negotiations for a drug already approved in multiple indications.
- Multiple indication- and market-specific factors could be considered for generating weighted cross-indication VBP estimates, but the extent to which these factors influence these estimates is unclear.

OBJECTIVE

- The aim of this study is to demonstrate the impact of alternative weighting methodologies on cross-indication VBP estimates.

METHODS

- While traditional single-indication VBP approaches rely on the total lifetime drug use per patient in that indication,⁸ the total volume of a drug used across multiple indications depends on epidemiology and market share factors.⁷
 - In real-world settings, epidemiology factors may include incidence and prevalence; however, for the simplicity of this study, we use incidence only (e.g., for a drug used at the time of diagnosis of the approved indication).
- Based on these factors, we identified three cross-indication VBP weighting methodologies for consideration:
 - Method 1.** Weights based strictly on the number of patients eligible to begin using the drug for each indication (reflecting incidence)
 - Method 2.** Weights based on the number of patients expected to begin using the drug for each indication (reflecting incidence and the drug’s forecasted market share within each indication)
 - Method 3.** Weights based on the total amount of the drug predicted to be used for each indication (reflecting incidence, market share, and predicted total lifetime drug-units per patient within each indication)
- To demonstrate the use of these methods, we considered a hypothetical drug being evaluated across four indications. The assumed incidence, forecasted market share for the drug, and predicted total lifetime drug-units per patient are provided in Table 1.
- Also provided in Table 1 are hypothetical indication-specific VBP estimates for the drug reflecting value drivers unique to each indication, such as quality-adjusted life-years gained.

Table 1. Hypothetical Data for a Drug Approved in Four Indications

Indication	1	2	3	4
Incidence (Per 1,000)	5.0	3.0	1.0	0.5
Forecasted Market Share (% of Incidence)	10%	60%	90%	40%
Predicted Total Lifetime Drug-Units Per Patient	40	20	60	80
Indication-Specific VBP Estimate Per Drug-Unit	\$2,500	\$500	\$1,000	\$4,000

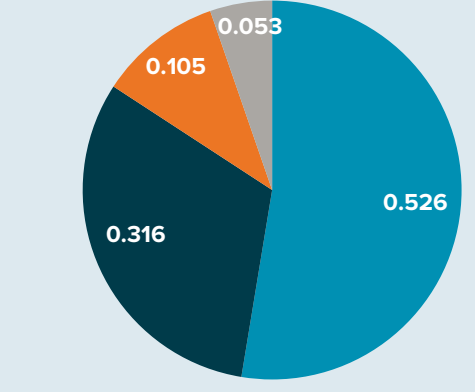
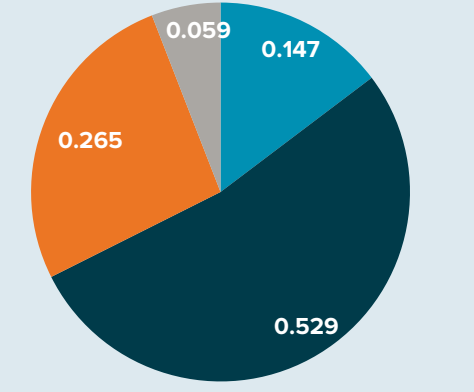
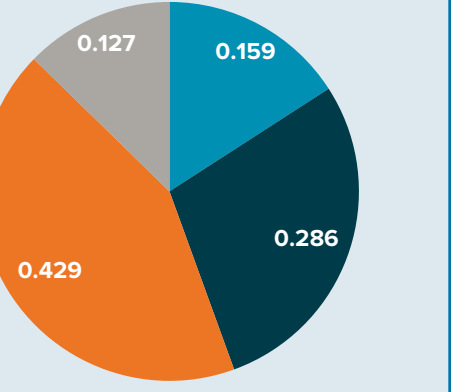
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RESULTS

- The weights for each indication across the weighting methodologies and the corresponding weighted cross-indication VBP estimates are shown in Table 2.

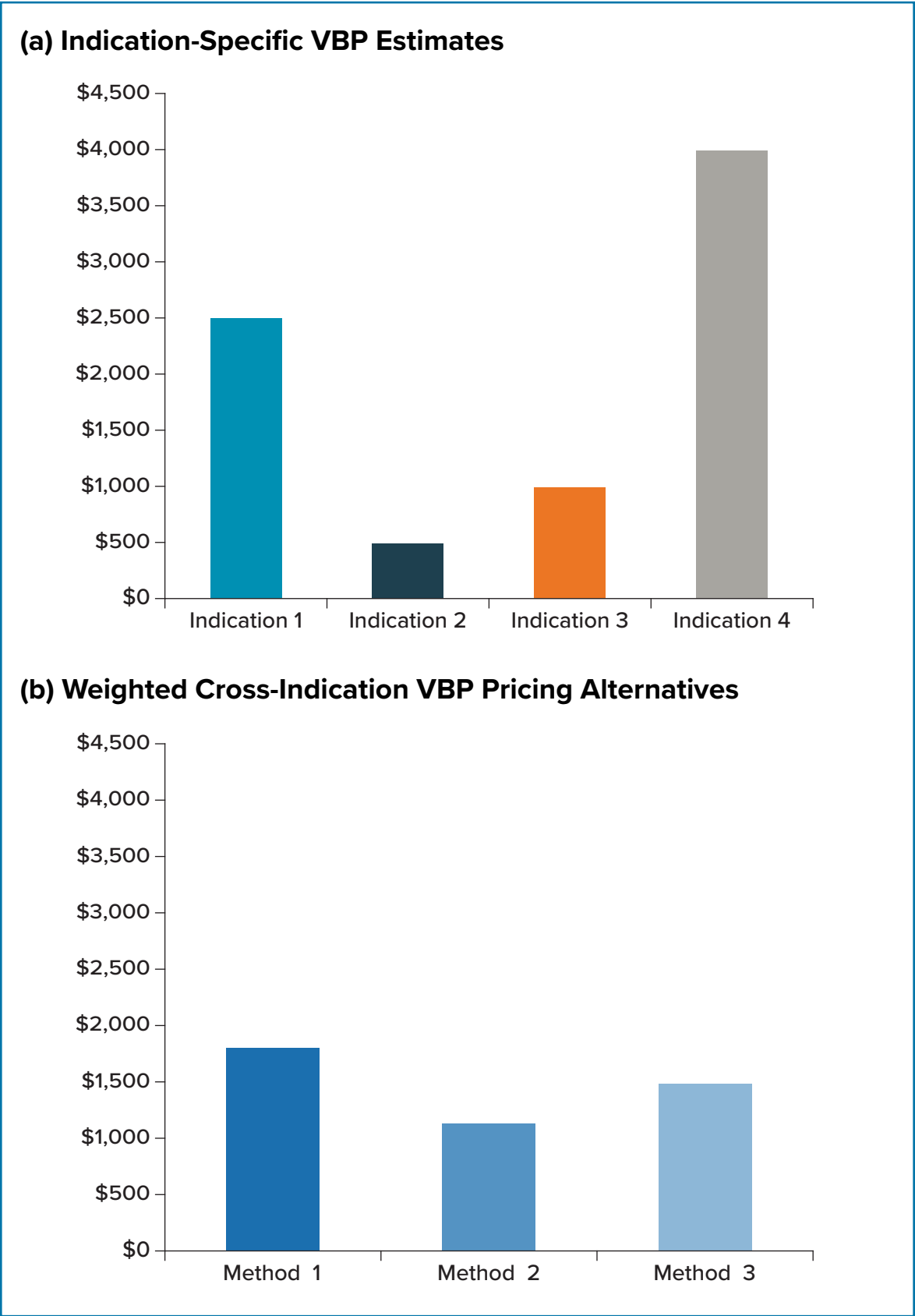
Table 2. Cross-Indication VBP Estimates Using Three Different Weighting Methods

	Method 1. Weights Based on the Number of Patients Eligible to Begin Using the Drug	Method 2. Weights Based on the Number of Patients Expected to Begin Using the Drug	Method 3. Weights Based on the Total Amount of the Drug Predicted to Be Used
Weight for indication j	$W_j^1 = \frac{I_j}{\sum_{i=1}^4 I_i}$	$W_j^2 = \frac{I_j M_j}{\sum_{i=1}^4 I_i M_i}$	$W_j^3 = \frac{I_j M_j U_j}{\sum_{i=1}^4 I_i M_i U_i}$
Weights by indication			
Indication 1 Indication 2 Indication 3 Indication 4			
Weighted VBP estimates	\$1,789	\$1,132	\$1,476

I_j = incidence of indication j ; M_j = forecasted market share of the drug in indication j ; U_j = predicted total lifetime drug-units per patient in indication j .

- Compared with weights based on incidence only (Method 1), the additional considerations of forecasted market share (as in Method 2) and predicted total drug-units per patient (as in Method 3) each had a meaningful impact on the weights for each indication.
 - The weight for an indication with high incidence was markedly decreased when considering the low market share for the drug in this indication (Indication 1).
 - The additional weight given to an indication with relatively high market share for the drug was offset by the low predicted total drug use per patient in this indication (Indication 2).
 - The weight for an indication with relatively low incidence was increased when considering the high market share for the drug in this indication and the relatively high predicted total drug use per patient (Indication 3).
 - The weight for an indication with high predicted total drug use per patient remained relatively low across all methods because of the low incidence of this indication (Indication 4).
- While the indication-specific VBPs in this hypothetical example ranged from \$500 to \$4,000 per unit, the weighted cross-indication VBP estimates fell in a narrower range regardless of the weighting methodology (\$1,132 to \$1,789 per unit) (Figure 1).
- Compared with strictly incidence-based weights, incorporating market share resulted in a 37% reduction in the weighted cross-indication VBP estimate, while incorporating both market share and lifetime drug-units per patient resulted in an 18% reduction in the weighted cross-indication VBP estimate.

Figure 1. Comparison of (a) Indication-Specific VBP Estimates With (b) Weighted Cross-Indication VBP Pricing Alternatives



CONCLUSIONS

- Our results underscore the challenges in capturing the true value to health care systems of drugs with multiple indications and highlight the importance of considering epidemiology, market share, and total drug use per patient in cross-indication VBP estimates.
- Drug manufacturers and health care decision makers can use the results of this analysis to inform development, coverage, and pricing decisions for drugs with demonstrated or potential efficacy and value in multiple indications.

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