



New IVI Research Brief: Structural Uncertainty in Traditional Cost-Effectiveness Models May Lead to Inaccurate Estimates

Alexandria, VA – September 4, 2019 – The Innovation and Value Initiative (IVI), a non-profit improving the science and practice of value assessment, released a new research brief showing how different scientifically-defensible ways to structure cost-effectiveness models can lead to varied estimates of value.

The research brief, part of IVI’s *Value Blueprints* series, highlights the significance of current limitations in cost-effectiveness studies for decision makers, and urges health economics and outcomes researchers (HEOR) to “explicitly incorporate and report effects of structural uncertainty to ensure that real-world decisionmakers relying on cost-effectiveness estimates to guide their decision about treatment options have complete information about the certainty estimates.”

“Models are estimates relying on structural assumptions that may impact results and thus our conclusions about value,” said Jennifer Bright, IVI’s executive director. “Structural uncertainty is generally not accounted for in value assessment. We conducted this research to demonstrate how the use of flexible models, like IVI’s model for Rheumatoid Arthritis (IVI-RA), can give decisionmakers a line of sight into structural uncertainty and its impact on cost-effectiveness estimates.”

To conduct the research, IVI employed its open-source simulation model to assess value in rheumatoid arthritis using 28 distinct model structures. For each model structure, the researchers simulated the benefits and costs associated with sequential treatment with biologic disease-modifying anti-rheumatic drugs (DMARDs) relative to treatment with conventional DMARDs among moderate-to-severe RA patients in the United States. Based on estimated total costs and Quality-Adjusted Life Years (QALYs), the incremental net monetary benefit (iNMB) and the incremental cost-effectiveness ratio (ICER) were calculated as measures of value.

Results of this analysis show that different model assumptions used in the IVI-RA model led to varying cost-effectiveness estimates. In fact, 21 out of 28 analyses conducted suggest the incremental benefits of biologic DMARD intervention strategy exceed the incremental costs, whereas seven analyses suggest they do not.

“At a time when all decision makers are striving to understand and invest in value over volume, it is imperative that they have transparent insight into the complex assumptions that comprise value assessment models,” Bright said. “Structural uncertainty is an important element that helps decisionmakers have confidence in the evidence and their ability to make relevant and credible determinations of value.”

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