IVI Value Model on Major Depressive Disorder
Frequently Asked Questions

IVI Mission: The Innovation and Value Initiative is a non-profit organization dedicated to advancing the science, practice, and use of patient-centered health technology assessment to support decisions that make healthcare more meaningful and equitable.

What is the purpose of the IVI models?

IVI uses the development of economic models as a learning laboratory to explore and operationalize novel methods and processes that can help us make HTA more patient-centered, transparent, and equitable.

- **Health Technology Assessment** is a multi-disciplinary process used to assess the value of a health technology such as a new drug or a medical device.

Why did IVI choose Major Depressive Disorder (MDD) for its next open-source economic model?

IVI chose MDD based on its prevalence, significant societal burden, and broad interest among multiple stakeholder groups (e.g., patients and employers). With such a high impact on people and society, IVI believes an open-source model in MDD can offer insights on how to seek better treatments and outcomes.

While the model focuses on MDD, the HTA methods and processes tested in this effort can often be applied to other disease areas.

What is the objective of the IVI-MDD Value Model?

The IVI-MDD Value Model serves as a laboratory to test novel methods and to improve the science and practice of health technology assessment in the U.S. The objective in developing a model through the Open-Source Value Project (OSVP) is not to produce a single assessment for a single treatment option with a specific set of assumptions and estimates. Rather, it is to explore and test ways to improve how we develop economic models to assess value, improve alignment with real-world decision needs, and advance dialogue about how best to use various methods (e.g., economic modeling) to inform resource allocation and other decisions in health care.

What are the core features of the MDD Model?

The MDD Model will allow users to evaluate the lifetime benefits and risks of various treatment sequences in US adults (age 18-64 years) newly diagnosed with MDD by a healthcare provider, and to compare such evaluations from multiple perspectives (i.e., private and public payers, employers, people with MDD, and society). The model will feature both a health economic module and a multi-criteria decision analysis (MCDA) module (to be released in Q1 2024).

What types of evaluations does the MDD Model support?

The MDD Model will allow users to evaluate benefits and risks of various treatment sequences in US adults (age 18-64 years) newly diagnosed with MDD.

Unlike traditional cost-effectiveness models, users will be able to consider:

- Both pharmaceutical and non-pharmaceutical treatment options;
- Multiple treatment pathways, including non-treatment, rather than a single technology against another;
- Transportation costs that are important to patients and family members;
- Flexible time horizon ranging from 1 year to a lifetime; and
- Differences in subgroups defined by age, race, and sex.

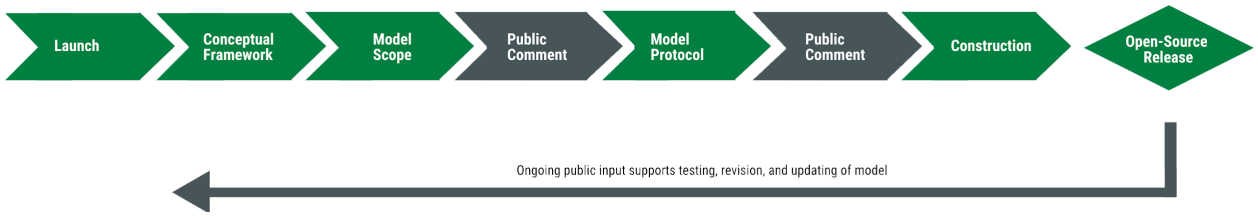
How is the MDD Model different from traditional economic models?

Compared with similar efforts (e.g., traditional cost-effectiveness models used in HTA assessment), the IVI-MDD model is different in multiple aspects:

- Its development was guided by continual engagement with a 20-member multi-stakeholder Advisory Group from the outset and throughout all phases of the development process;
- It seeks to incorporate direct patient input (e.g., patient preferences) in the model design wherever possible;
- It enables users to test and compare the use of different inputs and modeling assumptions;
- It seeks to evaluate sequences of treatments (vs. a single treatment) that better reflect real-world treatment pathways;
- It is completely open source -- all model coding is available for replication and enhancement by developers, health economists, and others with interest in improving the science and practice of value assessment.

What was the model development process?

The flowchart below depicts our overall modeling process. In line with IVI's commitment to an open and transparent model development process, we solicited continual input from a multi-stakeholder advisory group throughout the modeling process and public comment at every major stage shown below.[1] To learn more, contact us at **public.comment@thevalueinitiative.org**.



[1] Xie RZ, Malik E deFur, Linthicum MT, Bright JL. "Putting Stakeholder Engagement at the Center of Health Economic Modeling for Health Technology Assessment in the United States." *Pharmacoeconomics*. 2021;39(6):631-638.

What is the target population for the MDD Model?

The target population is treatment-naive adults (aged 18-64 years) newly diagnosed with major depressive disorder. The current target population is based on input from the MDD Advisory Group and the initial model scoping review.

- The MDD Advisory Group highlighted the need to model the entire treatment pathway once the patient is formally diagnosed, given the potential for delays in initiation of treatment or under-treatment.
- The initial version of the model will focus on the population aged 18 to 64 years, partly due to stakeholder interest in impacts on productivity.

While IVI had initially considered focusing on individuals with "treatment-resistant" depression, there is no consensus definition of this state in the literature or in clinical practice. However, the flexibility of the model set-up will allow users to adapt it for other patient populations, which IVI intends to explore in future extensions. For example, the model will include the flexibility to evaluate outcomes for subgroups who have failed specific numbers (or types) of treatments.

What do you mean by "treatment-naive" individuals?

Treatment-naive is a clinical term referring to a person who has never undergone treatment for a given disease. While the patient population at the start of the simulations will be "treatment-naive", the model set-up is designed to allow users to evaluate the long-term outcomes for patients that have failed a certain number or types of treatments.

Will I be able to use the model with my own data?

Yes. Users can easily modify model inputs through either the user interface or through the underlying source code. We welcome your feedback on the key model inputs that you would like to explore in the model and possible partnership opportunities to apply the model using data sources from you or your organizations.

Will I be able to use the MDD model to model populations such as the elderly or those with other co-occurring conditions?

Users can easily adapt the MDD model to generate useful insights for subpopulations of interest that do not exactly align with our target patient populations (e.g., by using the inputs specific to the population of interest). However, it should be noted that some key considerations for such populations might not have been explicitly modeled in the initial version of the model. For example, the initial version of the model will not explicitly model the impacts of MDD treatments on other co-occurring conditions (e.g., diabetes, cardiovascular disease). IVI intends to explore modeling other subpopulations in future versions of the model and welcomes opportunities to collaborate in such efforts. Comments on target conditions and examples of related modeling efforts are welcome in this process.

How can I use the MDD Model?
The MDD model is designed to be a flexible, rigorous, and open-source model that can aid different stakeholders in a wide range of decision contexts.

Some of the sample questions can include:

1. Evaluate how to personalize treatment pathways based on patient preferences, and the associated costs and benefits.
2. Determine how changes in coverage and reimbursement decisions or design affect patient outcomes and equity considerations (for example, whether a new treatment should be covered, and where along the treatment pathway it should be placed).
3. Which digital therapy tool to choose and how it should be built into the existing treatment pathway to optimize patient outcomes.
4. Examine how addressing provider shortages could help improve patient outcomes and narrow disparities across individuals of different socioeconomic status.

Why does IVI include the QALY as a model output?

Including QALY as a metric in the model along with many other key outcomes will allow the flexibility to understand and evaluate the importance of looking at a wide range of outcomes and will allow comparison with prior economic evaluations that have used this metric. While QALY is a commonly-used metric in existing economic evaluations, it has limitations and is considered by some to be discriminatory to certain patient subgroups (e.g., those with disabilities). Since any metric has strengths and limitations, IVI believes that it is important that decision makers not base decisions on any single metric (such as cost per QALY), but to consider a set of diverse clinical and economic outcomes for decision-making.

How will IVI use the Model?

Initially, IVI is conducting two research studies using data from the MDD model:

- **Multicriteria Decision Analysis (MCDA) Module**. IVI will hold a separate public comment period on its MCDA module in Q1 of 2024. This module will allow users to compare MCDA with traditional economic model evaluations.
- **Dynamic Pricing**. Traditional models rarely capture what happens to cost effectiveness evaluations when prices change. This study will model changes in pricing over time to reflect projected price changes due to competition or loss of exclusivity.

What is multi-criteria decision analysis?

MCDA is a structured deliberative approach used to evaluate different options based on multiple, and sometimes conflicting, criteria and priorities to identify the preferred solution in decision-making (e.g., select the best treatment by weighing time to relief, duration of relief, and out-of-pocket cost). Examples of questions that could be answered through MCDA include:

1. As a patient, my goal is to find a treatment that can provide me with early and lasting duration of complete response, so I would want to give more weight to these criteria.
2. As a clinician concerned about treatment adherence, I prefer to choose a treatment that incurs lower out-of-pocket expenses for the care recipient, so I will weigh more on this criterion.
3. As an employer, I prefer treatments that allow my employees to continue working at full capacity, so I give more weight to productivity impacts when considering which treatments should be covered.
4. As a researcher conducting a study comparing different interventions for depression, such as medication and psychotherapy, I may want to evaluate and rank these interventions based on weighting different long-term outcomes criteria, such as average duration of remission and number of relapses per patient during a certain simulation period.

5. As a policy-maker, I may want to explore different strategies to address depression on a population scale, including impacts on equity outcomes such as treatment access.
6. As a health insurance company evaluating different treatment options for MDD to determine coverage policies, I may assign higher weights to effectiveness and productivity criteria than equity criteria.

How will IVI synthesize and prioritize the feedback received during its public comment periods?

IVI will review all comments received and will post a copy of the comments on our website. In addition, we will consolidate comments based on topic area and themes. We will then discuss the comments with the MDD Advisory Group and the model developers. We will modify the model as needed, based on the following:

- New data sources or multiple recommendations to change an approach;
- Recommendations and suggestions from consultations with the MDD Advisory Group.

How did IVI incorporate patient perspectives in building this model?

IVI sees the inclusion of perspectives of people living with major depressive disorder as a key objective of the model. As such, we have sought to ensure that both the overall approach and the outputs reflect people's lived experiences in the real world. The MDD Advisory Group includes representatives from patient organizations, and we have consulted with the IVI Patient Advisory Council throughout the development process.

IVI has partnered with Carelon to conduct claim analyses to incorporate real world evidence to better understand treatment patterns in practice. In addition, IVI is collaborating with the University of Maryland's PAVE Center in a component project to understand what people living with MDD value most in treatments for MDD, and how they make trade-offs in selecting among different treatment options. We will continue to seek to incorporate such input into different aspects of the model design and applications to ensure that the model is patient-centric.

How can I stay informed about the development of this model?

In responding to IVI's public comment received, we will continue to keep you updated on our progress. All comments will be posted on the IVI Website, and we hope you will continue to provide feedback.

How can we get in touch with the IVI team if we want to share proprietary data sources or apply the MDD model?

Please contact Dr. Rick Chapman if you have data that you would like to share with IVI to include in the model. If you have additional research or recommendations, please share that information through public.comment@thevalueinitiative.org.

How can I provide feedback?

Please submit comments on letterhead via email at public.comment@thevalueinitiative.org. No anonymous comments will be accepted, and all comments will be published on our website.