

# Translation of Modeled Evidence for Decision-Making India Policy Brief

## Introduction

Decision-making in the health sector without sufficient attention to evidence may lead to a lack of effectiveness, efficiency, and fairness in health systems. Policymakers face the dilemma of addressing the most pressing needs and often face choices and trade-offs. Modeled evidence - evidence generated using mathematical models that simulate different health scenarios - can be a valuable tool to help inform policy-and practice-level decisions, with 95% of surveyed modelers and decision-makers in the World Health Organization (WHO) survey agreeing that modeled evidence should be used to inform guidance for public health recommendations, particularly to determine the relative effectiveness and cost-effectiveness of various interventions (Norris et al., 2018).

However, decision-makers do not always use modeled evidence for reasons including a lack of policy-relevant models, the perception that models are too complex to understand or based on too many assumptions, and a lack of communication between decision-makers and modelers (Knight, G. M., 2016; Campbell et al., 2009; Innvær et al., 2002; Oliver et al., 2014). On the other hand, substantial resources are committed to modeling activities that could, in principle, support informed decision-making to assess the ex-ante or ex-post effect. Yet, in some cases, modeling does not speak to the right questions or the proper relationships and communication channels are missing for the evidence to enter the decision-making process. Ultimately, the inability to ensure that the best modeling informs decisions means losses in efficiency, effectiveness, and impact, which are felt by the end users of the health system. On the other hand, there are strong examples of effective engagement between decision makers and modeling work, with important lessons to offer.

*"Translating Modeled Evidence to Decision Making (TMED)"* aims to understand the facilitators and barriers to improved use of modeling evidence by key health system actors. TMED is a multi-country study in five countries: India, South Africa, Nigeria, Kenya, and Burkina Faso. The three main questions the research study seeks to address are:

- (1) What factors facilitate or inhibit exchange between decision makers and modelers?
- 2) What forums exist for translating modeled evidence into practice and policy? What are the challenges faced by them? How are they learning?
- 3) What recommendations can be drawn to strengthen the modeling-to-decision-making ecosystem in India?

## Study Methodology

The research processes included adapting the data gathering tools to the Indian context, identifying respondents, collecting and analyzing the data, synthesizing findings into reports and presentations, and facilitating discussions with stakeholders at a global level about how results can be translated into policy. The study used a mixed methods framework to analyze the nuances of the data in the decision-making ecosystem in India. In the initial phase, a stakeholder mapping was conducted to identify the key stakeholders, i.e., modelers, decision-makers, and boundary/knowledge brokers at the National and State level.<sup>1</sup> The stakeholders were identified through this mapping exercise and the snowball sampling method. The online survey had closed and open-ended questions to examine participants' views on using modeled evidence in decision-making and the barriers and enablers to promoting the use of modeled evidence in policy and programs. The survey findings helped shape the qualitative research, which focused on in-depth interviews with key informants. Key informant interviews were conducted with the decision makers at national and sub-national levels, modelers from national and regional institutions, and researchers engaged in knowledge translation efforts. The qualitative interviews were transcribed and coded using a pre-developed thematic codebook. The analysis was carried out in the software QDA Miner Lite. The results of each phase were presented to the global working groups for review, and their suggestions were incorporated.

### Modeling Landscape in India

The modeling landscape in India is robust, and an evidence-to-decision-making ecosystem has been around in the Indian context for the past few decades. Decision-making in health happens at two levels: at the federal level by the Ministry of Health and Family Welfare and at the sub-national or state level by the Departments of Health. Health is a State subject in India, and the Federal Government supplements

### Online Survey - 55 Participants

Survey was conducted in December 2021

Decision-Makers - 13

Modelers - 10

Boundary/Knowledge Organizations - 32

### Key Informant Interviews - 25 Participants

Interviews were conducted during January- April 2022

Virtual interviews over Zoom

Decision-Makers - 7

Modelers - 6

Boundary/Knowledge Organizations - 12

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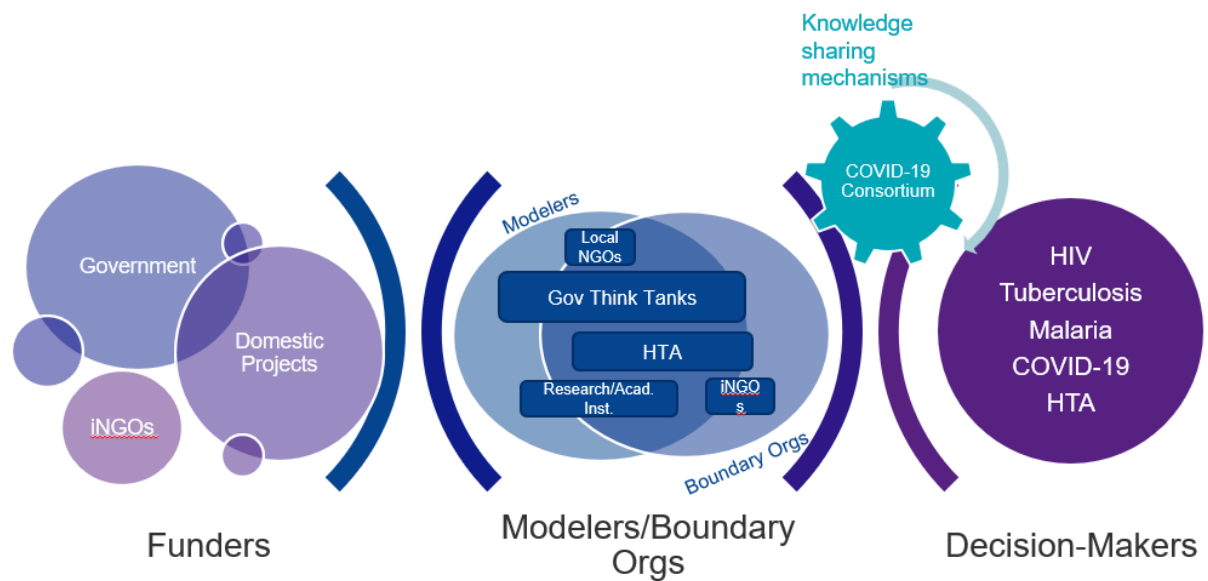
<sup>1</sup> Knowledge organization facilitates exchange and interaction between users and producers of evidence to increase knowledge and inform policy and practice-level decisions. Knowledge translators are typically embedded in research institutions. A boundary organization facilitates exchange between decision-makers and research and academic partners, but it is typically positioned as a separate entity focused on building relationships between the two groups.

the State Governments' efforts in delivering health services through various schemes for primary, secondary, and tertiary care.

The federal Department of Health Research (DHR) is critical in using modeled evidence for decision-making. The mandate of DHR includes promoting and coordinating basic, applied, and clinical research, including clinical trials and operational research in medical, health, biomedical, and medical professions and education through infrastructure, workforce, and capacity-building development. The Indian Council of Medical Research (ICMR), New Delhi, is the apex body in India for the formulation, coordination, and promotion of biomedical research. The Government of India funds it through the Department of Health Research, Ministry of Health, and Family Welfare. ICMR has built a network of national and regional Institutes across various states of India, such as the National Institute of Occupational Health, Ahmedabad, ICMR-National Centre for Disease Informatics and Research, Bengaluru, ICMR-National Institute of Epidemiology, Chennai, ICMR-National Institute for Research in Tuberculosis, Chennai, ICMR-National Institute for Research in Reproductive & Child Health, Mumbai, ICMR-National AIDS Research Institute, Pune, etc. All these institutes have well-developed modeling capacity and undertake epidemiological modeling in infectious and non-communicable diseases. The Department of Science and Technology in the Ministry of Science and Technology and parastatals like the Regional Resource Centers for Health Technology Assessments (HTAs) and Jawaharlal Nehru Center for Advanced Scientific Research are vital partners in commissioning models, analyzing and translating, and using data in decision-making. Modeling efforts are used for evidence-based policymaking in tuberculosis, HIV, Malaria, COVID-19, and economic/cost-effectiveness modeling for HTAs.

At the State level, modeling capabilities are robust and have been used to inform policy and practice level decisions on HIV/AIDS, tuberculosis, malaria, COVID-19, and other disease areas. Academic and research institutions like the Indian Institutes of Technology (IITs), Indian Institutes of Management (IIMs), academic institutions like Public Health Foundation of India (PHFI), and its affiliate institutes, Administrative Staff College of India (ASCI), are part of the modeling-to-decision-making ecosystem. Figure 1 depicts the modeling landscape and the role of critical actors.

**Figure - 1 Modeling Landscape in India**



Funding for modeled evidence is mostly through government institutions and research grants by ICMR, the National Centre for Disease Control (NCDC), the Ministry of Health, and State Departments of Health. International funding through development partners like World Health Organization (WHO), World Bank, and international non-governmental organizations (INGOs) like the Bill & Melinda Gates Foundation (BMGF), International Decision Support Initiative (iDSI), Jhpiego etc., primarily supports academic and research institutions like PHFI, ACCESS Health International (AHI) and other boundary/knowledge broker organizations. Boundary organizations support evidence translation at the federal and provincial levels. There exists high capacity across national institutes and boundary organizations for conducting mathematical modeling in public health and health systems research. In India, there is considerable overlap between modeling and boundary/knowledge translation organizations. A clear distinction between the modeling and boundary organizations is difficult as their roles are often interchangeable. Many organizations undertake modeling as well as knowledge translation efforts.

### **Facilitators and Inhibitors of Modeling**

The analysis found multiple factors for facilitating the modeling of the decision-making ecosystem in India. The most important among them is a robust modeling capacity across national and regional institutions in India. Further, there is a history of using modeled evidence for decision-making for national disease control programs and specific diseases like TB, HIV/AIDS, etc. The modeling ecosystem in the country with adequate resources, capabilities, and modeling skills to respond to the priorities of decision-makers is the critical facilitating factor for the exchange between modelers and decision-makers. The relationship between modelers and

decision makers was strengthened after the COVID-19 pandemic by establishing national and state task forces for evidence-based decision-making. Dedicated communication channels between policymakers in health departments and modelers from national/regional research institutions are another essential facilitator for the uptake of modeled evidence. Table 1 depicts the critical facilitating factors for the uptake of modeled evidence in India.

**Table 1 - Facilitating factors for modeling to decision-making ecosystem**

	As Reported by Decision-Maker	As Reported by Modeler/Boundary Org
<b>Individual &amp; Interpersonal Factors</b>	<ul style="list-style-type: none"> <li>· Presence of experienced modelers and modeling capacity in the country</li> <li>· Understanding the importance of using modeled evidence for evidence-based decision making</li> <li>· Involving the decision-makers in the process</li> </ul>	<ul style="list-style-type: none"> <li>· Presence of experienced modelers in academic and research institutions</li> <li>· Advocacy skills of academic and research institutions involving the decision makers in the process</li> </ul>
<b>Organizational &amp; Inter-Organizational Factors</b>	<ul style="list-style-type: none"> <li>· Institutions dedicated to communicating models to different decision-making audiences</li> <li>· Presence of lines of communication between modelers and high-level decision-makers</li> </ul>	<ul style="list-style-type: none"> <li>· Institutions dedicated to communicating models to different decision-making audiences</li> <li>· Presence of direct lines of communication between modelers and high-level decision-makers</li> </ul>
<b>Environmental Factors</b>	<ul style="list-style-type: none"> <li>· Presence of a crisis (COVID-19) driving demand for models to compensate for lack of empirical evidence.</li> <li>· Task forces , technical committees convened by the Ministry of Health benefit from input of various health sector stakeholders</li> </ul>	<ul style="list-style-type: none"> <li>· Several fields, including cost effectiveness, nutritional, veterinary sciences have a history of working with models that has built capacity over time</li> <li>· Research sub-committees that provide technical assistance in design and conduct of research for particular health issues</li> <li>· Technical working groups, task forces that advice the ministry of health in particular health programs</li> <li>· Availability of funding to develop models from funders such as BMGF, JPHIEGO, and other development partner institutions</li> </ul>

Even though there is considerable uptake of modeled evidence in the Indian health system, specific inhibitors hamper its optimal use. Policy makers’ timelines are mostly not aligned with research or evidence generation timelines. Policymakers generally have a very short time to develop a new policy or implement a new strategy for a health program. The government needs a quick “turnaround time” for inputs to decision-making, whereas evidence generation can take time. It is crucial to bring the research and policymaking to a common place where all actors understand the challenges and requirements. Further, there are competing interests within the decision-making space, such as balancing health policy priorities and the political viability of schemes and programs. Hence, policymakers are apprehensive about relying only on modeled evidence for decision-making.

Another key inhibitor is the lack of data for modeling exercises and poor data quality. These data challenges are the largest when developing evidence for questions related to health systems research. In India, health data is collected by different levels of government and also by various agencies. Data systems are fragmented, and common platforms are absent for accessing health data. Lack of interaction between the modeling community and data gathering entities is another challenge.

Lack of training in communicating the modeled evidence to decision makers is another important inhibitor. Modelers also lack clarity about the decision-making processes and understanding of issues faced by decision-makers, which is a

significant barrier to the effective use of modeled evidence. Simplifying the communication of modeled evidence and making it easy to understand for decision-makers can improve the uptake of modeled evidence. Table 2 presents the key inhibitors for the uptake of modeled evidence in India.

**Table 2 - Inhibiting factors for modeling to decision-making ecosystem**

Type of Org	As Reported by Decision-Maker	As Reported by Modeler/Boundary Org
<b>Individual &amp; Interpersonal Factors</b>	<ul style="list-style-type: none"> <li>· Lack of training/capacity to understand modelling evidence</li> <li>· The abstract, complex and labor-intensive nature of modeling</li> </ul>	<ul style="list-style-type: none"> <li>· Modelers lack training/capacity to communicate with non-scientific audiences</li> <li>· Lack of transparency from modelers where they fail to disclose their model codes, assumptions and data used to develop the models</li> </ul>
<b>Organizational &amp; Inter-Organizational Factors</b>	<ul style="list-style-type: none"> <li>· Lack of a dedicated, targeted strategies for engaging in knowledge translation</li> </ul>	<ul style="list-style-type: none"> <li>· Lack of funding specifically designated to develop models</li> <li>· Lack of collaboration within and across stakeholders in the ecosystem</li> </ul>
<b>Environmental Factors</b>	<ul style="list-style-type: none"> <li>• Lack of high-quality data to inform models</li> <li>• Competing interests within the ministry of health and from other stakeholders e.g. businesspeople</li> <li>• Low uptake of models/modelled evidence</li> </ul>	<ul style="list-style-type: none"> <li>• Lack of high-quality data</li> <li>• Lack of donor support for long-term modeling capacity development</li> <li>• Sustainability of the modelling ecosystem in the country</li> <li>• Intersectoral collaboration</li> </ul>

## Recommendations

Creating a collaborative ecosystem to facilitate continuous engagement between the three key actors -- policy- and decision-makers, modelers, and knowledge brokers/boundary organizations -- is key to improving modeling for decision-making in India. Developing a sustainable model that can facilitate sharing, interpretation, and accumulation of knowledge on modeled evidence is critical. The Health Technology Assessment in India (HTAiN) model is an excellent example of a sustainable model for evidence generation and knowledge translation. HTAiN has developed the institutional framework, process, and workflow for supporting the process of decision-making in health care at the Federal and State policy level by providing reliable information based on scientific evidence for appraising health interventions and technologies. Building the capacity of the decision-makers and modelers through partnerships with local institutions such as ICMR institutes, PHFI, ASCII, State Health Systems Resource Centers, National & State Health Agencies, etc., can help develop the modeling ecosystem at the State level. The key recommendations for (1) Funders/global policymakers, (2) Modeling organizations, (3) Decision makers (4) Boundary/knowledge brokering organizations are presented in the table below.

**Table 3 - Recommendations to Improve Modeling for Decision-Making in India:**

<p><b>For Funders &amp; Global Policy Leaders</b></p>	<ul style="list-style-type: none"> <li>▪ Funding must be aligned with the health sector's policy priorities at the federal and state levels.</li> <li>▪ Funding by international development partners/academic institutions should be channeled through government institutions.</li> <li>▪ Global funding should support capacity building, collaborative platforms, and knowledge management initiatives.</li> </ul>
<p><b>For India's Decision-Makers &amp; Policy-Makers</b></p>	<ul style="list-style-type: none"> <li>▪ Strengthen the capacity of decision-makers to interpret modeled evidence through consultative workshops.</li> <li>▪ Strengthen institutional mechanisms that promote collaboration and participation of modelers and decision-makers in the decision-making process. E.g., National Task Force for COVID; HTAI Secretariat</li> <li>▪ Facilitate platforms for access to data for modelers and boundary organizations. <a href="https://data.gov.in/">https://data.gov.in/</a> represents an effort to synthesize data sources and facilitate data availability.</li> <li>▪ Facilitate interaction between the federal/state-level health information and management information systems to understand modelers' data gaps and requirements.</li> </ul>
<p><b>For Modeling Organizations in India</b></p>	<ul style="list-style-type: none"> <li>▪ Facilitate multisectoral/multi-departmental collaboration for national and sub-national-level modeling efforts.</li> <li>▪ Strengthen the ability of modelers to communicate evidence effectively to decision-makers.</li> <li>▪ Strengthen efforts to improve health data access, quality, and reliability through collaboration with health management information systems and survey organizations.</li> <li>▪ Develop a review mechanism to ensure modeled evidence's process consistency and validity.</li> <li>▪ Strengthen modeling efforts at the state level to ensure the needs of India's heterogeneous population are met and deliver robust results.</li> </ul>
<p><b>For Boundary Organizations/ Knowledge</b></p>	<ul style="list-style-type: none"> <li>▪ Sensitize modelers on policymakers' priorities, decision-making processes, and decision-makers interpretation of modeled evidence.</li> </ul>

<b>Brokers in India</b>	<ul style="list-style-type: none"> <li>▪ Facilitate the development of a collaborative platform involving modelers with different skill sets (statisticians, epidemiologists, economists).</li> <li>▪ Develop a comprehensive database/portal for sharing research studies and a community of practice (CoP) platform for convening all stakeholders and better coordinating modeling efforts.</li> </ul>
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