Translation of Modeled Evidence for Decision-Making Research

India Research Findings
Access Health International

July 2022

Table of Contents

- Executive Summary..3
- Background & Context...10
- Methods..15
- Findings..20
- Discussion & Recommendations..62

Executive Summary

Objectives

Understand how to structure modeling-to-policy and -program efforts to be effective at bridging the gap between modeled evidence and policy/program decision-making by:

1. **Identify factors & approaches** that facilitate/inhibit exchange between decision-makers and modelers.
2. **Evaluate current practices and partnerships** in forums where translation work is already occurring.
3. **Offer recommendations** to inform changes on funding approaches, organizational structures & country/global policies to enable success.

Methodology

55 Survey Participants

25 Key Informant Interviews

Participants:

- **Modeling organizations**: in-country organizations/researchers that produce modeled evidence
- **Boundary/brokering organizations:** help to translate evidence, distill findings, foster dialogue, and impact policy or practice
- **Decision-makers:** users/potential users of modeled evidence and those who participate in making decisions for national health policies & practice

Key Findings

- In India, **modeled evidence is used in public health research**—both **epidemiological modeling** for infectious and non-communicable diseases and **economic modeling** for health systems research
- **Modeling efforts are used for evidence-based policy making** in TB, HIV, Malaria, COVID-19 and economic/cost-effectiveness modeling for Health Technology Assessments
- **Modeling efforts are concentrated within government institutions**/think tanks including ICMR, NCDC, IIT, and ISI and **public health research organizations** like PHFI and ISB both within government/quasi-government and private institutions and also do both epidemiological and economic modeling
- There is **considerable overlap between modeling and knowledge brokering organizations** in India. Many organizations do both modeling and knowledge translation efforts

Key Facilitators

	As Reported by Decision-Makers	As Reported by Modelers/Boundary Orgs
Individual & Interpersonal Factors	· Presence of **experienced modelers and modeling capacity** in the country · **Understanding the importance** of using modeled evidence for evidence-based decision making · Involving decision-makers in the process	· Presence of **experienced modelers in academic and research institutions** · **Advocacy skills** of academic and research institutions involving the decision makers in the process
Organizational & Inter-Organizational Factors	· **Institutions dedicated to communicating models** to different decision-making audiences · Presence of lines of **communication between modelers and high-level decision-makers**	· **Institutions dedicated to communicating models** to different decision-making audiences · Presence of **direct lines of communication between modelers and high-level decision-makers**
Environmental Factors	· Presence of a **crisis (COVID-19) driving demand for models** to compensate for lack of empirical evidence · Task forces and technical committees convened by the Ministry of Health benefit from **input of various health sector stakeholders**	· **Several fields**—including cost effectiveness, nutritional science, and veterinary science—have a **history of working with models that have built capacity** over time · Research sub-committees that provide **technical assistance in design and conduct of research** for particular health issues · **Technical working groups and task forces** that advise the Ministry of Health in particular health programs · **Availability of funding** to develop models from funders such as the Bill & Melinda Gates Foundation, Jhpiego, and other development partner institutions

Key Inhibitors

Type of Org	As Reported by Decision-Makers	As Reported by Modelers/Boundary Orgs
Individual & Interpersonal Factors	· **Lack of training/capacity** to understand modeling evidence · The **abstract, complex and labor-intensive** nature of modeling	· Modelers **lack training/capacity** to communicate with non-scientific audiences · **Lack of transparency** from modelers where they fail to disclose their model codes, assumptions, and data used to develop models
Organizational & Inter-Organizational Factors	· **Lack of dedicated, targeted strategies** for engaging in knowledge translation	· **Lack of funding** both domestic and external specifically designated to develop models · **Lack of collaboration** within and across stakeholders in the ecosystem
Environmental Factors	· **Lack of high-quality data** to inform models · **Competing interests** within the Ministry of Health and from other stakeholders including businesspeople · **Low uptake** of models/modeled evidence	· **Lack of high-quality data** · **Lack of donor support** for long-term modeling capacity development · **Sustainability of the modeling ecosystem** in the country · **Lack of intersectoral collaboration**

Key Themes

Capacity Development

Capacity to undertake modeled evidence and the capacity of decision-makers to interpret the evidence should be improved with the help of technical workshops as well as consultative meetings.

Collaboration

COVID-19 presented decision-makers with the opportunity to collaborate with modelers and knowledge brokers. Need to create platforms for collaborative efforts in evidence-based decision-making.

Sustainability of the Modeling Ecosystem

Need for building a sustainable model which can help in sharing, interpreting, and accumulating knowledge on modeled evidence.

Background & Context

Modeled Evidence

Modeled evidence: mathematical models that **simulate different potential health scenarios**, including scenarios around disease transmission, and/or the impact of different policy interventions on health outcomes.

- Modeled evidence can be a **valuable tool** for helping decision-makers choose between **complex trade-offs**.
- The inability to ensure decisions are informed by the best modeling possible results in **losses of efficiency, effectiveness, and impact**.

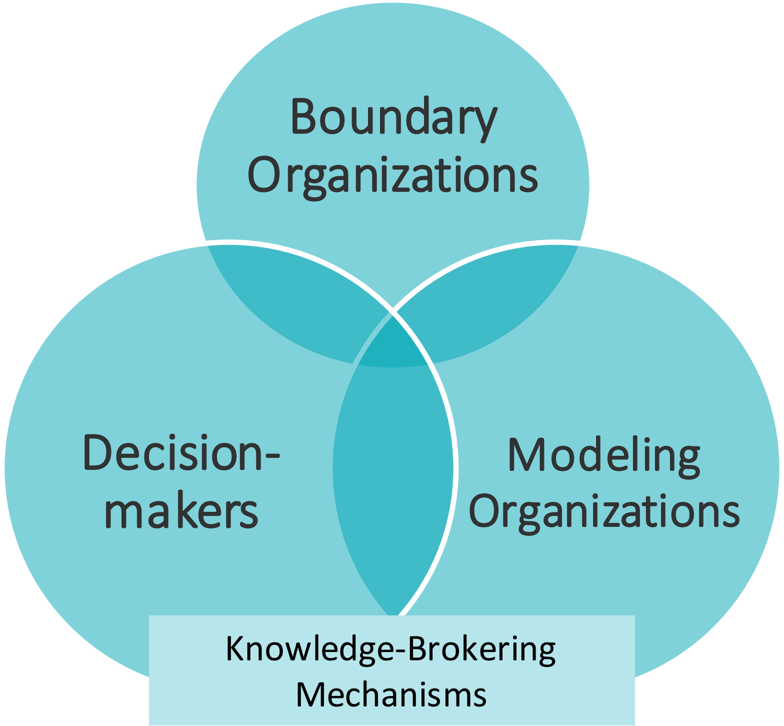
Relevant literature (Oliver, et al., 2014) highlights the following as the barriers to evidence use:

- The availability of **timely and relevant research**
- The absence of a **connection between researchers and decision-makers**

India - Country Context

- In India, **modeled evidence is used in public health research**—both **epidemiological modeling** for infectious and non-communicable diseases and **economic modeling** for health systems research
- Department of Health Research (DHR), the Indian Council for Medical Research (ICMR), and the National Centre for Disease Control (NCDC) are the **key stakeholders in the policymaking** at the federal level
- At the state level, **academic and research institutions** like Indian Institutes of Technology (IITs), Regional Institutes of ICMR like ICMR National Centre for Diseases Informatics and Research and ICMR National Institute of Epidemiology provide **technical support**
- **Boundary organizations/knowledge brokers** like the Public Health Foundation of India (PHFI), and its affiliate institutes Administrative Staff College of India (ASCII), **support evidence translation** at the federal and provincial levels
- **High capacity exists** across national institutes and boundary organizations **for conducting mathematical modeling** in public health and health systems research

Modeling to Decision-Making Ecosystem


Boundary Organizations
Decision-makers
Modeling Organizations
Knowledge-Brokering Mechanisms

Organizations may play more than one of these roles

Modeling organizations: in-country organizations/researchers that produce modeled evidence

Boundary organizations: stand-alone organizations that help to translate evidence, distill findings, foster dialogue, and impact policy or practice

Knowledge-brokering mechanisms: task forces/working groups/or other formal, collaborative mechanisms that may sit within modeling or decision-making organizations or include them in their membership and help to translate evidence, distill findings, foster dialogue, and impact policy or practice

Decision-makers: users/potential users of modeled evidence and those who participate in making decisions for national health policies & practice

Research Questions

The goal of this study is to develop a shared understanding of what it means to be an effective boundary organization – the **traits and functions that facilitate research-to-policy collaboration and exchange in public health**.

1. **Understand a range of factors** at various levels (from the individual level to the ecosystem level) that **facilitate or inhibit exchange between decision-makers and modelers**.
2. **Evaluate partnership structures that support evidence translation** including but not limited to knowledge brokers and boundary organizations in target countries to deeply understand the challenges they face, what they are doing well, how they are learning, and where they need support.
3. **Offer recommendations to inform changes** to funding approaches, organizational structures, and practices including evaluative thinking and learning, and country or global policies that may better enable decisions to be informed by the best evidence possible.

Methods

Research Team

Team Profile

ACCESS health international

Research Partner

Maulik Chokshi - Principal Investigator
Arun B Nair - Co-Investigator
Tushar Mokashi - Co-Investigator
Latha Chilgod - Qualitative Specialist

RESULTS FOR DEVELOPMENT

Coordinator

BILL & MELINDA GATES foundation

Funder*

**The findings and conclusions contained within this report are those of the authors and do not necessarily reflect the positions or policies of the Bill & Melinda Gates Foundation.*

Research Timeline: Sept 2021-June 2022

Workstream	Sept 2021	Oct 2021	Nov 2021	Dec 2021	Jan 2022	Feb 2022	Mar 2022	Apr 2022	May 2022	June 2022
Landscaping Research	▨	▨	▨							
Survey Research				▨	▨	▨	▨			
Interview Research					▨	▨	▨	▨		
Synthesis						▨	▨	▨	▨	▨

Survey Process

55 Survey Participants

- **13 Decision-Makers**
- **10 Modelers**
- **32 Knowledge Broker/Boundary Organization Representatives**

- Online survey was conducted using Survey Monkey from 12th December to 31st December 2021
- Stakeholders were identified through stakeholder mapping and snowball sampling
- Data were analyzed and summarized using Microsoft Excel

Key Information Interview (KII) Process

25 KIIs

- **7 Decision-Makers**
- **6 Modelers**
- **12 Knowledge Broker/Boundary Organization Representatives**

- KIIs took place between January and April 2022
  - 20 male participants
  - 5 female participants
- Interviews were conducted virtually using Zoom
- Stakeholder mapping was done to identify key informants working in public health and economic modeling, key program decision-makers, and organizations working in knowledge translation
- Research was approved by an ethics committee
- Interviews were transcribed and coded using a pre-developed thematic codebook in the software QDA Miner Lite

Findings

Participants

Type of Participant	Decision-Maker	Modeler	Boundary Org Rep
Survey Participant	13	10	32
Key Informant Interviewee	7	6	12
Gender	**Female**	**Male**	**Other**
Survey Participant	13	42	0
Key Informant Interviewee	5	20	0
Organization Level	**Local/Regional**	**National**	**International**
Survey Participant	16	29	10
Key Informant Interviewee	14	7	4

India Landscape: key actors and sectors in the modeling to decision-making ecosystem

15-25

Average size of modeling organizations

TB

HIV/AIDS

NTDs

Sector/Disease Areas

Health Systems

Health Technology

THE WORLD BANK

BILL & MELINDA GATES foundation

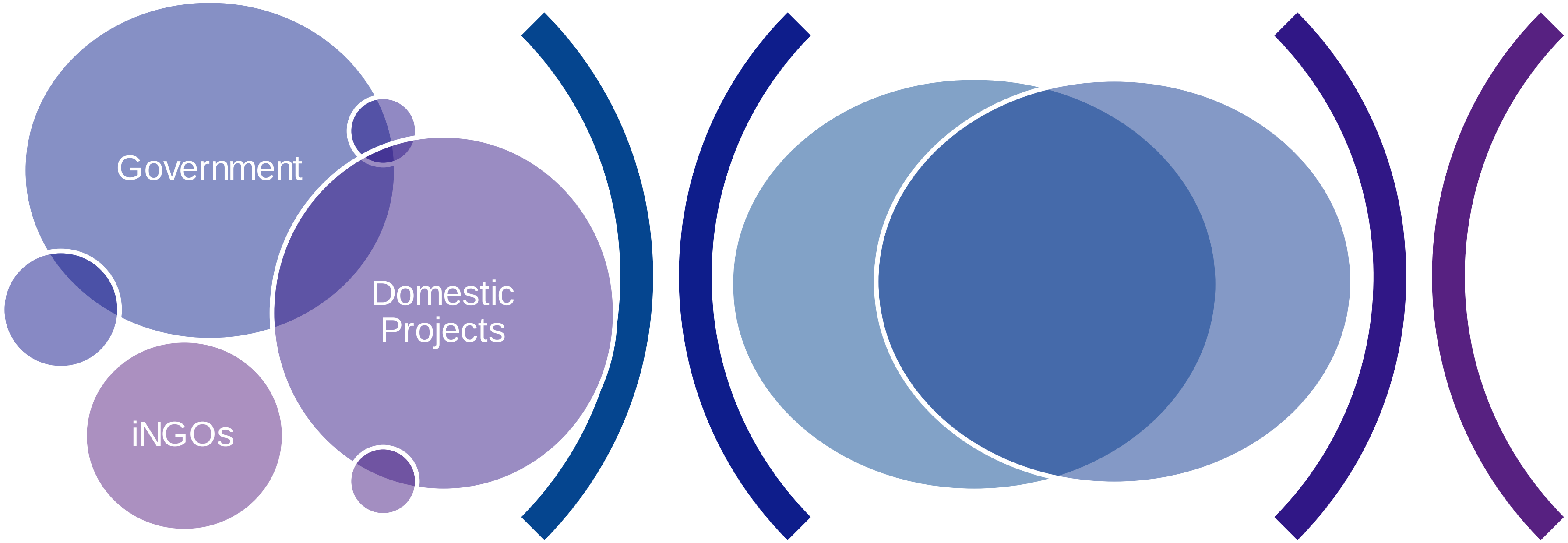
Major Funders

jhpiego
Saving lives. Improving health. Transforming futures.

सत्यमेव जयते
Department of Health Research
Ministry of Health and Family Welfare
Government of India

Regional Resource Centers

Health Technology Assessment in India (HTAIn)
सर्वे सन्तु निरामयाः।



Government

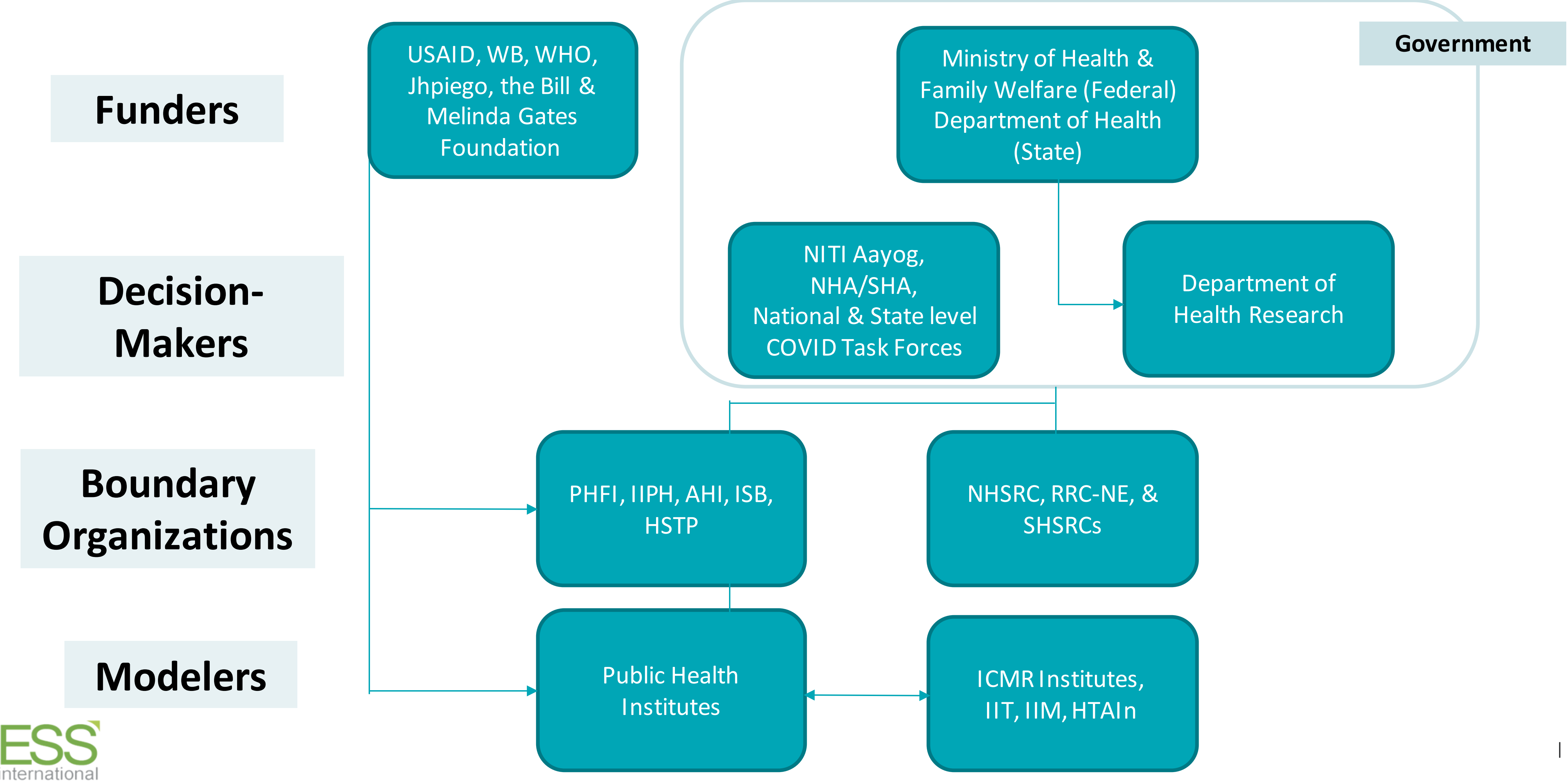
Domestic Projects

iNGOs

Modelers/Boundary Orgs

Decision-Makers

India Modeling to Decision-Making Ecosystem



Funders

Decision-Makers

Boundary Organizations

Modelers

USAID, WB, WHO, Jhpiego, the Bill & Melinda Gates Foundation

Government

Ministry of Health & Family Welfare (Federal) Department of Health (State)

NITI Aayog, NHA/SHA, National & State level COVID Task Forces

Department of Health Research

PHFI, IIPH, AHI, ISB, HSTP

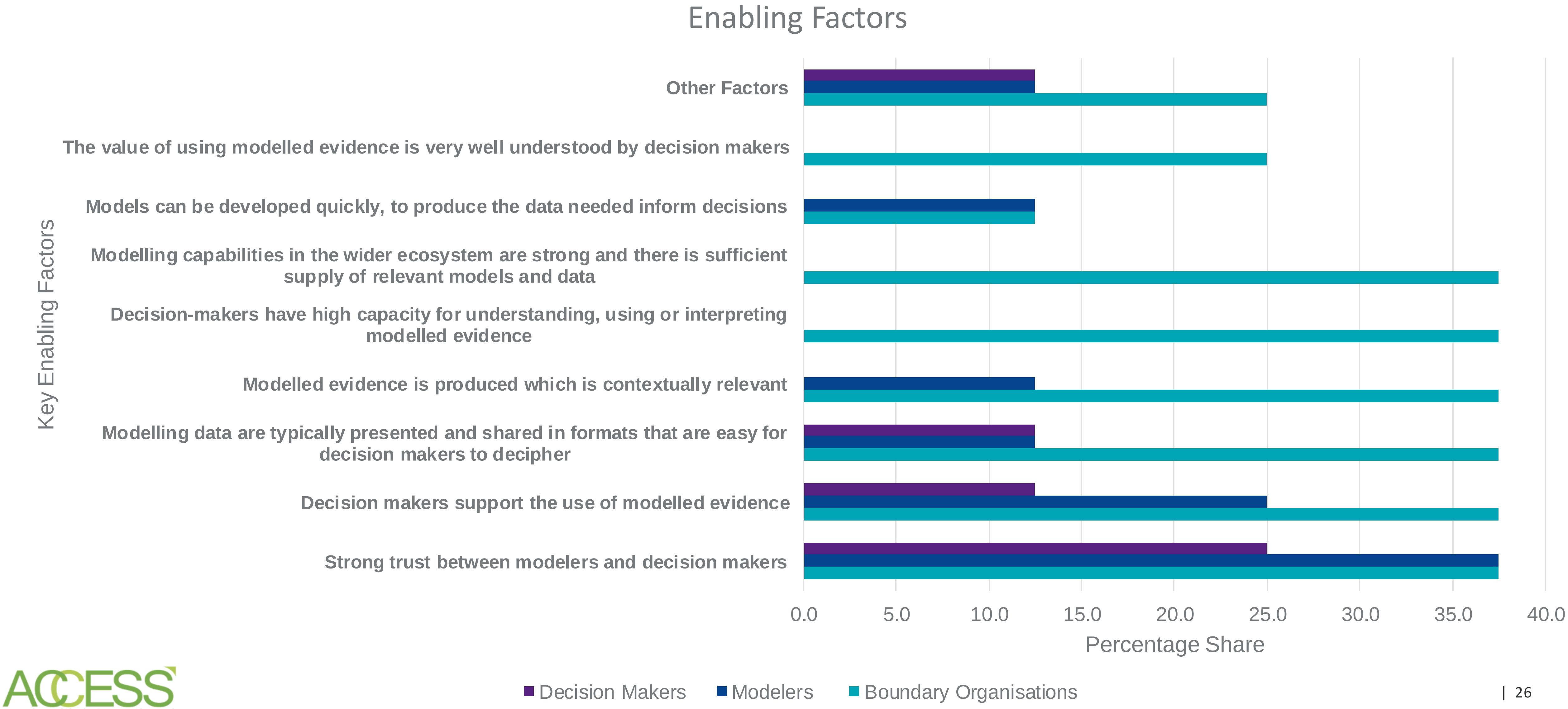
NHSRC, RRC-NE, & SHSRCs

Public Health Institutes

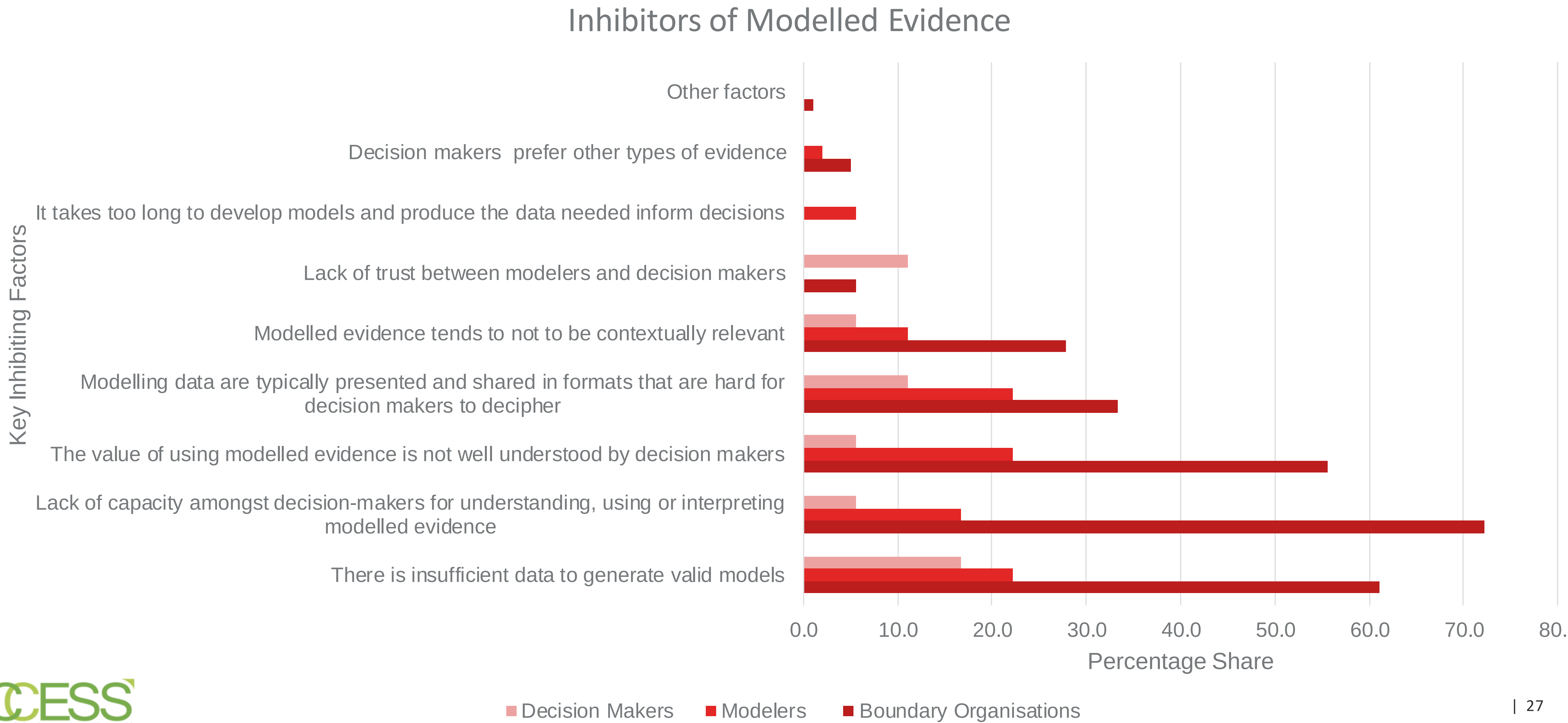
ICMR Institutes, IIT, IIM, HTAIn

Research Question 1: Facilitators & Inhibitors of Exchange

Enabling Factors of Modeled Evidence – Survey Results



Inhibiting Factors of Modeled Evidence – Survey Results



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Key Facilitators

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Organizational & Inter-Organizational Factors	· **Institutions dedicated to communicating models** to different decision-making audiences · Presence of lines of **communication between modelers and high-level decision-makers**	· **Institutions dedicated to communicating models** to different decision-making audiences · Presence of **direct lines of communication between modelers and high-level decision-makers**
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Facilitator: Involving decision-makers in the process

- Involvement of decision-makers at all stages of translation gives *ownership* to them and in turn allows for a smooth transition from the evidence to a decision
- Throughout the conceptualization, creation, and interpretation process, decision-makers' (ministers or bureaucrats) interest and ownership makes a clear difference

"...In terms of engagement, having the government engaged at whatever stage but engaged in a much more not just I am talking to you and I'm telling you what to do kind of way, but in a much more ownership kind of a way always helps."

- Knowledge broker from a regional institute

"I have seen decision-makers, they are now increasingly have started using this modeling evidence as compared to if I see, I started in 2018. So, things are changing slowly..."

-Representative of a regional modeling organisation

Facilitator: Establishing lines of communication between decision-makers and modelers

- Decision-makers work closely with certain preferred research/knowledge broker organizations for evidence-based policymaking

- Preferred institutions mean those which work closely with the departments, like national institutions (IIT, NIE, PGI, etc.) or research institutions (PHFI, IIPH, etc.) at both federal & state levels

- Decision-makers have a dedicated channel of communication which helps in the uptake of modeled evidence

"So there are few advocates who are very powerful. They know how to talk, how to manage things. So if you are lucky to get a good advocate in the team along with the good models, that's like you are in the win a win situation."

-Consultant from a regional modeling organisation

"So you and me who are outside the central funded Institute set up will find it difficult not only for acceptance from those people because for the reluctance to accept, I'm not sure why. The credibility of mine with 100 papers and also chairing an international committee on evidence, being invited by WHO to be the eight experts to guide their evidence on how they are generating. But since I'm not sitting in a PGI or AIIMS they're not going to take me seriously…I'm just saying that who speaks about the evidence also matters in this country and I think that's absolutely fair. But to debunk or disregard anybody who's not in the central University kind of Institute or ICMR kind of Institute and say these guys are outsiders, that doesn't make sense."

-Consultant from a regional modeling organisation

Facilitator: Built-in capacity, task forces and committees

- Use of modeled evidence by government think tanks (NITI AYOG), Ministry-funded institutions like ICMR, NCDC, etc.
- Constitution of specific task forces, committees by the federal and state departments involving academic/research institutions, and subject experts have contributed to use of modeled evidence

"…Earlier they were not bothered about the evidence. But nowadays without evidence, even if they cannot take any decision, they will be questioned. And because of the nature and kind of grilling that is going through, whether it is an academic or in administrators, evidence is definitely something which they cannot ignore and they have to generate. Either they generate by themselves or they have to take the help of the researchers and generate evidence."

-Knowledge broker from a regional institute

"…That is a continuous interaction and there is a willingness to understand each other's subjects…I was part of some of the webinars and other things that we have jointly organized to understand the model, its usage, and its applicability in an epidemiological context, especially with COVID. So we are putting a lot of effort into understanding how they think and how we think and what could be the common ground, what could be the common area which should be known to both of us."

-Knowledge broker from a regional institute

Facilitator: Presence of COVID-19

- COVID-19 has acted as a catalyst and many individuals and organizations have used available data and presented models
- The sheer gravity of the situation during the pandemic had let the stakeholders put aside the challenges and worked towards the outcome

"There is no doubt COVID is definitely a bad thing. A whole lot of people died. But the silver lining of the cloud is *that public health has been put at the forefront and the importance of investing in public health has been understood by a lot of people. So people who were not heard so much of us right now are being heard. So this is the right time to put forth and sensitize on the importance of the advantages of modeling data and things like health technical assistance and implementation."*

-Knowledge broker from a regional institute

"I think with COVID we have started understanding each other in a little bit better manner. But fundamentally, yes, we do work on different wavelengths. We do understand and see things in a different way. But I think with COVID lot of what you say, a deeper understanding between epidemiologists and the modelers are developing."

-Knowledge broker from a regional institute

Facilitator: Presence of COVID-19 continued...

- COVID-19 placed structures like task force committees in place wherein the roles and responsibilities of stakeholders were clearly defined

- The modeling capacity across fields came to the forefront

"So as far as COVID is concerned, I think in Gujarat, the things are quite clearly laid down at who will be taking care of which kind of decisions. The task is also quite segregated and they have constituted this task force committee. They have got certain agenda and tasks to deal with. So the things are quite clear in terms of who should be approached, who are the decision-maker, and what is the channel of communication. It is quite clear at this particular level."

-Knowledge broker from a regional institute

"I think COVID showed us that the capacity is available, may not be in health, but in other places, there is very competency. Some of our economic schools have the best people in econometrics. In fact, our guys head many of these economics departments across the world, partly because of the training they got in India. And India is pretty good at mathematics. I was impressed by the modeling ability..."

-Representative of a decision maker

Facilitator: Presence of COVID-19 continued…

- Dissemination of study results by media/social media gave visibility to the modelers and organizations alike to the decision-makers which can be perceived as an indirect way of reach
- Much of the modeling work during the pandemic has been volunteering with the intention of solidarity

"It was more from our own initiating, but media dis a lot. this was published or I would say the media was very much interested. They quoted us quite a bit we used Twitter, quite effectively. So we were communicating because once such a study happens, a lot of media reaches out and asked our opinion when this report was quoted quite regularly. And I know that most of the Health Department people were aware of the work we have done."

-Knowledge broker from a regional institute

"I think this particular pandemic, several groups actually volunteer who was working pro-Bono, actually came up and set up COVID-19 websites which provided data from the States."

-Representative of a regional modeling organisation

"That has happened where people have come together because there is solidarity. There is a sort of this expression that wants to be of use."

-Knowledge broker from a regional institute

Key Inhibitors

Type of Org	As Reported by Decision-Makers	As Reported by Modelers/Boundary Orgs
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Organizational & Inter-Organizational Factors	· **Lack of dedicated, targeted strategies** for engaging in knowledge translation	· **Lack of funding** both domestic and external specifically designated to develop models · **Lack of collaboration** within and across stakeholders in the ecosystem
Environmental Factors	· **Lack of high-quality data** to inform models · **Competing interests** within the Ministry of Health and from other stakeholders including businesspeople · **Low uptake** of models/modeled evidence	· **Lack of high-quality data** · **Lack of donor support** for long-term modeling capacity development · **Sustainability of the modeling ecosystem** in the country · **Lack of intersectoral collaboration**

Inhibitor: Lack of high-quality data

- Data is key to developing robust models. Data access, quality, and reliability hinder model development.

“The digital health mission would be I think a big thing was that, yes, a lot of unbelievable amounts of data would be available, but how we use the data is going to be the crux…I think the problem comes down to a much more analytical approach, whether it's in designing questionnaires or surveys or whether it's in doing the analysis for feeding into action. But I mean, I would analyze the problem as just a slight lack of analysis.”

-Knowledge broker from an international institute

“You can always have better data, but broadly, if you have a big sample and representative, you can draw very broad conclusions. And whatever is the data quality, there is something that you can do with it. So that is my answer to that. But of course, we need to have better data, especially at the state level. What you find is that all these fine differentiation between regions and between groups, that kind of data is not available.”

-Knowledge broker from a regional institute

Inhibitor: Issues in data structures

- In India, data are collected by different agencies (NFHS, NSSO, State Health Departments)
- Lack of interaction between the modeling community and data gathering entities, leading to redundancy
- Fragmented, program-specific data may/may not help the modeler on account of being partial or biased
- Considerable lag in publishing
- Transparency and accountability from either government or private partners

"One thing I understand is that you can't blame the system for not collecting useful data because people who use the data like us haven't communicated that this is what we want. There is a difference between the system, the system that is capable to collect the data, and the system that is capable to analyse it. But they haven't sat across the table and said that this is what we want."

-Knowledge broker from an international institute

"Sometimes program-specific data is biased because in the program there is always this pressure as nobody likes to say that you have failed or you have not met your target. So there's always be some fudging, some kind of adjustment, et cetera. So that is something that I think policymakers need to look into, that you should not give out the message that honesty is not appreciated."

-Knowledge broker from a regional institute

Inhibitor: Lack of capacity among modelers

- Modeling is an emerging field that needs capacity development
- Modelers have a limited capacity to produce relevant data/evidence
- Modelers need to be trained in data analysis

"I think the problem comes down to a much more analytical approach, whether it's in designing questionnaires or surveys or whether it's in doing the analysis for feeding into action. But I mean, I would analyze the problem as just a slight lack of analysis."

-Knowledge broker from an international institute

"If you take health services, for example, there are very few people who can really look at the data analysis, and that kind of capacity building doesn't happen…nowadays it's an age of data we need more and more people who can look at data and build models and draw conclusions and advise the policymakers. No. So at several levels, we need capacity building both in generating data as well as in what I would call crunching data."

-Knowledge broker from a regional institute

"No, I don't think we have that much capacity because in the process I know about operational research. There's an issue called I'm sure you must be also knowing we don't find [modelers]. In general, they are all very deeply integrated into complex research outside but I don't know that connect is missing."

-Knowledge broker from a regional institute

Inhibitor: Limited funding

- There is a need for dedicated funding for modeling studies

"And also I think funding may not be enough to do high-quality research as much."

-Knowledge broker from a regional institute

Inhibitor: Lack of dedicated, targeted strategies for engaging in knowledge translation

- The knowledge translation mechanisms lack dedicated strategies for communicating modeled evidence
- Absence of effective communication and knowledge exchange mechanisms
- Communication strategy not tailored to the needs of stakeholders

"We have to understand is that what we call as in the international parade, we call it knowledge broker. In Europe, that's a very designated person. That person actually converts this evidence into knowledge and presents it to the policymaker..."

-Knowledge broker from a regional institute

"Generally we publish our data or maybe in plain print or well-reputed peer-review journal. We compile it as a report also and give it to them for their further reading. But when we are directly interacting with them, it is in the form of presentation. So some time is allocated to us and adhering to those time limits. We prepare a few slides or presentations with the key findings which might have some good implications."

-Knowledge broker from a regional institute

"They are politicians and senior bureaucrats, except very few. They're not going to read your reports and you should know how to communicate. There is a whole lot of detection on how to communicate science to the politicians and especially health and of course, as you said. I think a PowerPoint presentation is very effective if you can make it very brief..."

-Knowledge broker from a regional institute

Inhibitor: Increased time taken for modeling

- Modeling takes an increased amount of time whereas decision-makers, especially while implementing health programs/schemes, don’t have ample time for evaluating the choices
- The timely help by the modelers as bureaucrats get very limited time for taking important policy decisions

“The study was commissioned but it took too long. Actually, the conduct of HTA took I think more than a year's time, and by then the study was already the decision already was taken by the, it was Maternal Child Health Division of the Ministry.”

-Representative of a regional modeling organisation

“Policymaker has a very short-term deadline because they have to report it or they have to make a decision. But for research, it requires a lot of time. So bringing the research and policymaking to a common place where they both understand the challenges and the requirement of each other, it's very crucial.”

-Representative of a regional modeling organisation

Inhibitor: Lack of capacity among decision makers

- Modeling is a relatively new and emerging field for decision-making
- Lack of understanding among decision-makers about the modeling process and use of modeled evidence
- Limited capacity within the decision-maker's team to review the outputs of the modeling exercise

"No, I don't think we have that much capacity because in the process I know about operational research. There's an issue called I'm sure you must be also knowing we don't find [modelers]. In general, they are all very deeply integrated into complex research outside but I don't know that connect is missing."

-Knowledge broker from a regional institute

"I think my experience is that decision-makers have their own considerations and many of them are not based on science or evidence, especially if you look at political people, they have considerations which are beyond evidence and evidence is something they might use to support, something that they would already like to do. But if the evidence is against what they would like to do, they generally don't accept that or they at least try to kind of tell us that probably we need to look into it more closely."

-Representative of a regional modeling organization

"The way to build trust is to first have some kind of in-house capacity [within government]. Maybe these people are not creating models themselves, but they can get to the next level of detail in the model…The team also facilitates data availability. So this is crucial because they know a little bit more about the model and they will help the researchers with opening up the doors. Then there will be some periodic checkpoints where the results are shared with the policymakers or the officials."

-Knowledge broker from a regional institute

Inhibitor: Lack of capacity among decision-makers

- Inherent considerations/ inhibitions to accept the evidence
- Inhibitions of breaking a pre-existing pattern of decision making

"An obvious conclusion that will come to eventually is that these policymakers, we need to build their capacity...The capacity that we need to build is to tell them what legitimate questions to ask of models, questions whose answers can be obtained from models."

-Knowledge broker from a regional institute

"Maybe in our policymaker's community, it's usually not considered wise to do things out of the box. It's already considered better to play safe and follow up on what the tradition is or how all the decision making is happening."

-Representative of a regional modeling organisation

"So…many times we do something which may not be very relevant. We may have done fantastic modeling and evidence either they will say no, it is either too complicated, we don't understand, or secondly, they say we already know it. So that's sort of a challenge…"

-Knowledge broker from a regional institute

India's Government Context

India’s decentralized context

- The structure of the health governance system of the country is another key aspect in deciding the uptake of modeled evidence
- Policy level interactions on key issues happen at the federal level, but the implementation of programs happens at the state level
- Data gathering for health programs and health system indicators also happen at the state level
- Capacity of the health system at the state level is a key factor in data collation, data quality, and use of data for decision-making

“But the problem with these models often is there is something a little bit abstract in the sense that for a policymaker, they do not sort of work in some kind of vacuum where you can regardless of whether it's populated with Indian equations and data or global equations and data, the factors that there are political constraints on what can be done, and particularly in the Indian context where you have the government of India and interaction at the state level. So in that sense, I think that's sort of the greater constraint in terms of the utility of these models for a decision-maker.”

-International Development Partner

“Many of the good quality surveys are national-level surveys, which means that the state-level data is only representative of the whole state and you can't draw conclusion about the subgroups within the state. So using that data becomes very difficult. So I think that States need to be at least in India, what I would say is the States need to move into a system where they also have very good systems for generating, especially in health state-level data and looking at the variation and looking at where there needs to be more stress on certain programs or whatever, so that is one important capacity-building exercise.”

-Knowledge broker from a regional institute

India’s decentralized context

- Generalizing the outcomes based on the sample is difficult due to differences among states and within the various regions of the states
- Each state may have a different mechanism of decision-making

“We need to have better data, especially at the state level. What you find is that all these fine differentiation between regions and between groups, that kind of data is not available.”

-Knowledge broker from a regional institute

“I think approach varies state-wise. I think we have worked in different States. Now we know who is actually very active for example, in an X state, everybody has their role so you have to reach out to everybody together but we know who is the key person from there you can actually move on. In Y state it is very surprising for example this COVID report, the mission director had no role, although the entire activities lot of COVID-related activities were actually done in the family welfare centers, Basti Dawakhana’s point of contact in Y state was never the mission director…The Minister had no role, it was a chief Secretary who was handling it directly...”

-Knowledge broker from a regional institute

India’s decentralized context

- Sample studies many a times are not representative of the population

“So the problem at the national level is that you are comparing those States that are not comparable, coming with an average value, which is unscientific, and for political reasons, the federal government doesn't want to say that this is actually state subject. You should not be asking us for the national average, but then most of your international reporting requirements require you to report as a nation. So modeling at the national level, I would say, is unscientific because modeling assumes that there's a certain amount of homogeneity in your sample. Because what happens when you do modeling unless you have the whole population data, is that you end up taking a sample, as you know better than me if the sampling is of a heterogeneous population unless you can ensure that there are an equal number of samples waited for each of those regions, your modeling is furious..”

-International Development Partner

Research Question 2: Structures to Enable Exchange Between Modelers & Decision-Makers

Knowledge Exchange Mechanism: Health Technology Assessment

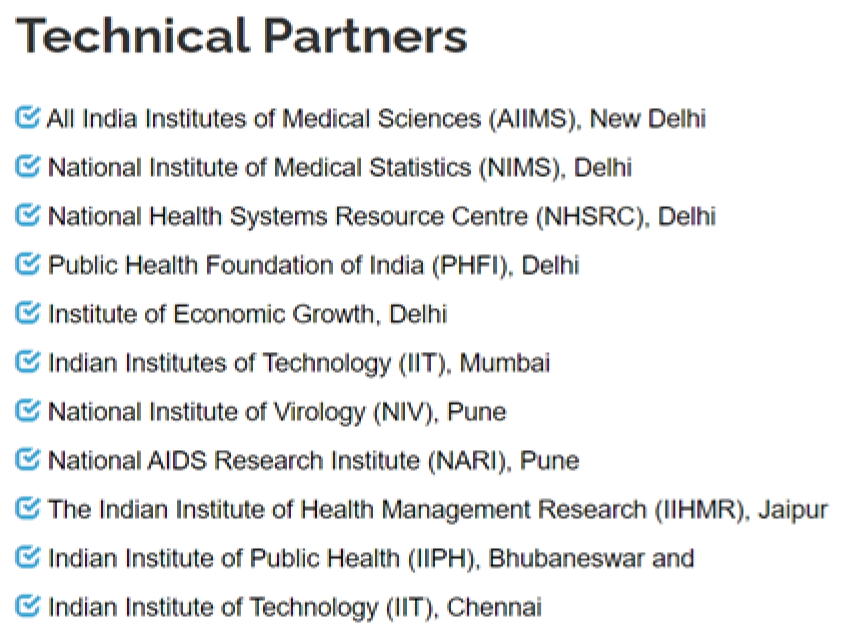
- Health Technology Assessment India Secretariat - Department of Health Research (DHR) has put in place the Health Technology Assessment (HTAIn) secretariat to facilitate the uptake of HTA
- The HTAIn model works through a collaborative effort of Regional Resource Centers and Technical Partners

"Whatever modeling projects are assigned to us by DHR HTAIn in particular so I used to do those things, starting from devising the protocol, then presenting it to Technical Appraisal Committee, then conducting the study, starting from designing the tools and then doing the primary data collection wherever required. Then if evidence needs to be generated from secondary data that we do, then we primarily use Excel to model the evidence and generate results of our models and do the sensitivity analysis after that, we prepare an outcome report and present the report to Technical Appraisal Committee again. And if they suggest any changes or if they have any specific queries regarding some of the parameters, then we tend to revise our models and then we present the final report to Tech and once it is approved by Tech we go ahead with publishing that."

-Representative of a regional modeling organisation

Knowledge Exchange Mechanism: Health Technology Assessment continued...

- Blended network of academic research institutions and departments of health
- Funding support from the Department of Health Research, Government of India; technical support by Imperial College, HITAP, Jhpiego, etc.
- Dedicated process workflow for knowledge dissemination/capacity strengthening/relationship building
- Technical workshops conducted on a regular basis - mentorship model for supporting the regional centers



Technical Partners

- ☑ All India Institutes of Medical Sciences (AIIMS), New Delhi
- ☑ National Institute of Medical Statistics (NIMS), Delhi
- ☑ National Health Systems Resource Centre (NHSRC), Delhi
- ☑ Public Health Foundation of India (PHFI), Delhi
- ☑ Institute of Economic Growth, Delhi
- ☑ Indian Institutes of Technology (IIT), Mumbai
- ☑ National Institute of Virology (NIV), Pune
- ☑ National AIDS Research Institute (NARI), Pune
- ☑ The Indian Institute of Health Management Research (IIHMR), Jaipur
- ☑ Indian Institute of Public Health (IIPH), Bhubaneswar and
- ☑ Indian Institute of Technology (IIT), Chennai

> *"And in November, only Tamil Nadu regional Resource Center has conducted a regional consultative workshop on HTA, which was inaugurated by the NHM director in their state. He is an IAS and we know that NHM director Is, an NHM director is having a very good say in the policymaking. And apart from that, there are seven user departments which were there and the overall aim of that consultative workshop was not to teach them modeling but to make them understand how to interpret the results."*
>
> -Knowledge broker from a regional institute

Strength: Health Technology Assessment

- Strong support from the federal department of health research and state health departments
- Network with policy- and decision-makers for understanding the policy challenges and conducting HTA studies concerning the issue
- Developed a strong network of regional institutions at the state level for undertaking HTA assessments

> *"If the study was commissioned by the user Department, for example, Punjab commissions some study to HTAIn or to PGI it would not be a problem. Definitely, they would be interested in listening to the results of the study also."*
>
> -Representative of a regional modeling organization

Challenge: Health Technology Assessment

- Improving capacity to undertake complex technology assessments at the state level
- Sustainability of the current model is an issue - attrition of technical staff and retention of human resources are a challenge
- Funding support at the regional level is meager

“One is there is not enough human resource to undertake this kind of study in the government sector in India. And the second thing is the lack of data. So in India, the current modeling evidence which is largely being generated has a lot of assumptions going into that. So it makes those recommendations very subjective.”

-Representative of a regional modeling organization

“So a handful of I would say regional resource centers for HTA, have reached that stage. The rest of them(regional resource centers) are still I would say in the nascent stage, it's variable, but not I would say as much as it should have been.”

-Representative of a regional modeling organization

Learning & M&E

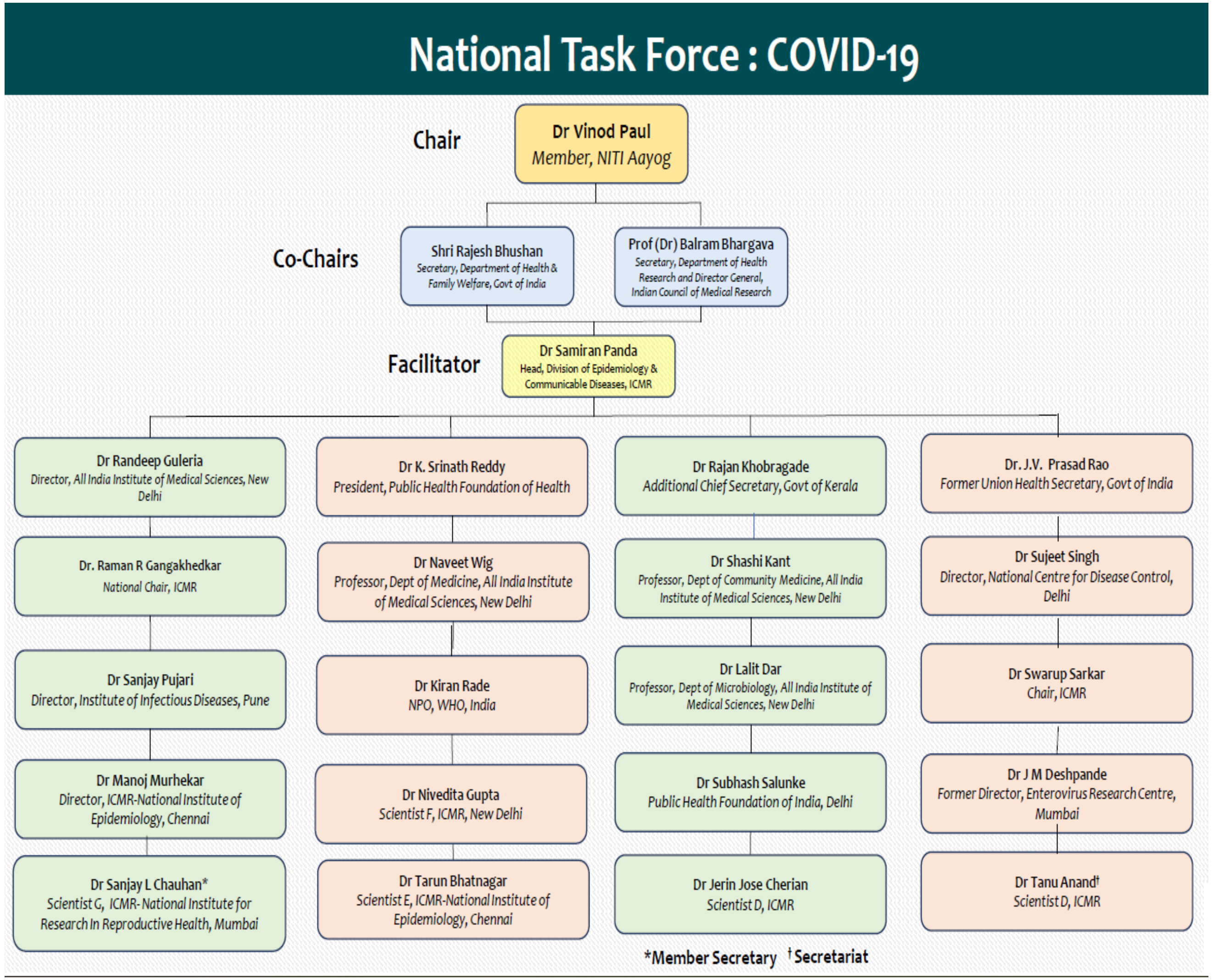
- Learning platforms are emerging in India which involve collaborative efforts of ICMR institutions, academic institutions, and international NGOs for building capacity on economic evaluation & Health Technology Assessment
  - e.g. Imperial College, HITAP, supports to HTAIn secretariat
  - The Campbell-Cochrane Collaboration: capacity building for economic evaluation
- Structured learning initiatives/platforms for capacity development of early- and mid-career professionals, and department officials
- Sensitization of policymakers about the concept and need for modeling for evidence development

"An obvious conclusion that will come to eventually is that these policymakers, we need to build their capacity…The capacity that we need to build is to tell them what legitimate questions to ask of models, questions whose answers can be obtained from models."

-Knowledge broker from a regional institute

National Task Force – COVID-19

- A National Task Force (NFT) for COVID-19 was set up by the Ministry of Health and Family Welfare in March 2020
- The NTF is comprised of 21 members including technical/domain experts from the government and outside the government with expertise in public health and/or epidemiology
- The task force had four expert groups in Epidemiology and Surveillance, Operations Research, Clinical Research, Diagnostics, and Biomarkers.
- This NFT used modeling studies for various aspects of COVID management like forecasting of pandemic trajectory, health system surge capacity management, etc.
- States also set up the state-level task forces and used modeling studies for pandemic management



National Task Force : COVID-19

Chair

Dr Vinod Paul
Member, NITI Aayog

Co-Chairs

Shri Rajesh Bhushan
Secretary, Department of Health & Family Welfare, Govt of India

Prof (Dr) Balram Bhargava
Secretary, Department of Health Research and Director General, Indian Council of Medical Research

Facilitator

Dr Samiran Panda
Head, Division of Epidemiology & Communicable Diseases, ICMR

Dr Randeep Guleria
Director, All India Institute of Medical Sciences, New Delhi

Dr. Raman R Gangakhedkar
National Chair, ICMR

Dr Sanjay Pujari
Director, Institute of Infectious Diseases, Pune

Dr Manoj Murhekar
Director, ICMR-National Institute of Epidemiology, Chennai

Dr Sanjay L Chauhan*
Scientist G, ICMR- National Institute for Research In Reproductive Health, Mumbai

Dr K. Srinath Reddy
President, Public Health Foundation of Health

Dr Naveet Wig
Professor, Dept of Medicine, All India Institute of Medical Sciences, New Delhi

Dr Kiran Rade
NPO, WHO, India

Dr Nivedita Gupta
Scientist F, ICMR, New Delhi

Dr Tarun Bhatnagar
Scientist E, ICMR-National Institute of Epidemiology, Chennai

Dr Rajan Khobragade
Additional Chief Secretary, Govt of Kerala

Dr Shashi Kant
Professor, Dept of Community Medicine, All India Institute of Medical Sciences, New Delhi

Dr Lalit Dar
Professor, Dept of Microbiology, All India Institute of Medical Sciences, New Delhi

Dr Subhash Salunke
Public Health Foundation of India, Delhi

Dr Jerin Jose Cherian
Scientist D, ICMR

Dr. J.V. Prasad Rao
Former Union Health Secretary, Govt of India

Dr Sujeet Singh
Director, National Centre for Disease Control, Delhi

Dr Swarup Sarkar
Chair, ICMR

Dr J M Deshpande
Former Director, Enterovirus Research Centre, Mumbai

Dr Tanu Anand†
Scientist D, ICMR

*Member Secretary †Secretariat

State Task Force – COVID-19

- States also set up state-level task forces which used modeling studies for pandemic management
- A good example of using modeled evidence for pandemic management is from the State of Kerala
- Kerala State used the modeling evidence by Cambridge Judge Business School for pandemic management in the State

> *"Every week we would give a report to the government of Kerala saying, look, this is where the epidemic is likely to go. This is the time you should clampdown. This is the time you should let go and so on. So that was we never went public with this, but this is something that we were sharing with everybody and the government respect our predictions because we proved to be fairly accurate. And then Paul got into producing a national tracker, and we've been doing that every week for a few days. That wasn't as useful. In Kerala, we are providing district-level growth and then district-level reproduction numbers, which meant that you could modulate your response to the district level. You could decide which district to clamp down, which district to let go, and so on..."*
>
> -State-Level Decision Maker

Research Question 3: Recommendations from Participants

Developing Models

- Improving access to data, especially program data, from ministry/departments and private sector
- Process flow for facilitating data use and access to programmatic data
- Harmonizing the data need of the modeling community with the health management information systems at the federal/state levels

“Need to put it because entirely we are depending on data and the kind of data we get. With COVID, it is a challenge. Certain things are segregated. Certain things might not work in our context because for modeling we go ahead with a lot of assumptions. So we need to specify these things quite prior when we are providing certain things, especially for a recommendation.”

-Knowledge broker from a regional institute

“Something as basic as connecting testing data with the hospitalization data has not happened in India from day one every modeler has been asking, guys, you have the data with you, give it to us or tell us what to do. We will only create platforms to integrate these two systems of data flow…data integration has not happened. The second thing is at least to share the data, and put it out on the open platform. It's not happened.”

-Knowledge broker from a regional institute

“The data, always you can always say that we need better data. That is never going to end. You can always have better data, but broadly, if you have a big sample and representative, you can draw very broad conclusions. And whatever is the data quality, there is something that you can do with it.”

-Knowledge broker from a regional institute

Developing a Collaborative Ecosystem

- Common platform for convergence of all stakeholders in the modeling ecosystem
- Collaboration between different resource persons across the fields helping in cross-learning
- Developing a communication network for facilitating the processes (CoP)

"It can be created like we definitely require such type of ecosystem which is enabling basically in the country to give solutions."

-Representative of a decision maker

"Conferences are accepted platforms and modalities to have that conversation. We can just create more opportunities for this kind of dialogue."

-Knowledge broker from a regional institute

"What we need is an academic Institute that can impart this capacity on a daily basis, either through fellowship or Masters or a PhD. You need people with epidemiology, mathematics, engineering, health economics to come together to build this capacity. Probably there. Once that moment becomes a little bit larger, say five years down the line is where you might see that this consolidation can happen."

-Consultant from a national modeling organisation

Communicating Modeled Evidence

- Communication to decision-makers by using simple language with clear outcomes
- Policy briefs and presentations are the preferred way of communication
- The sensitization of decision-makers to the topics, intent, outcomes, and involvement all throughout the process

"It's almost like a negotiation skill that you need to have both ways of communication, negotiation with policymakers, how to feature a compromise, all of that. It's just very important and there could be training for that or even like policy briefs and notes that can be taught."

-Knowledge broker from an international institute

"They would be interested in very brief communication…. the only interest would be to read a one-page policy brief or even one paragraph in which they want us to summarise that."
-Representative of a regional modeling organisation

"PowerPoint presentation is very effective if you can make it very brief."
-Knowledge broker from a regional institute

"A lot of very basic questions about the model assumptions are raised by policymakers, which should be taken for granted. That model, of course, has assumptions. At that stage, you can't say, oh, these models are of no use because they have assumptions. I mean, that is the starting premise. Yes, the discussion should be next level. Which assumption is sensitive and does it change the results dramatically? And if so, what actions will I have to take in my programme."

-Knowledge broker from a regional institute

Communicating Modeled Evidence continued…

- Tailored way of communication to decision-makers to help them understand

“When we are bringing evidence to the decision-maker I think they might not be having much background or understanding related to models so we try to make it really simple in terms of the key findings or the outcomes which might have policy implications rather than focusing on the methodology or the models that we have chosen for deriving this kind of thing or coming up with the confusion or the prediction how we have done this simulation and rest of the things rather than focusing on that we focus on what do you call outcome strength and its limitations."

-Knowledge broker from a regional institute

“I was part of some of the webinars and other things that we have jointly organized to understand the model, its usage, its applicability in epidemiological context, especially with COVID. So we are putting a lot of effort into understanding how [policymakers] think and how [modelers] think and what could be the common ground, what could be the common area that should be known to both of us. So now we have started putting efforts into this area."

-Knowledge broker from a regional institute

Use of Modeled Evidence

- Creating enough capacity to comprehend the language, use, and interpretation of modeled evidence by policy/program decision-makers
- Collaborative environment to facilitate exchange among modelers, boundary organizations, and decision-makers

“First is the capacity to undertake modeled evidence and the capacity of decision-makers to interpret the evidence that should be improved with the help of technical workshops as well as consultative meetings…There should be a uniform reference case so that whatever evidence is being generated head-to-head comparison between that evidence can be made while making priority settings…So this consistency, method, consistency, this process consistency, this should be there.”

-Knowledge broker from a regional institute

“Modelers should not insist that oh, but I told you this answer and why are you doing that? The policymakers should not say I was going to make this policy decision but your model is saying something else because the policy is a complex phenomenon and there will be multiple inputs. As long as both parties understand that model is one input among many complex issues that go into policy-making then we can go somewhere.”

-Knowledge broker from a regional institute

Discussion & Recommendations

Key Themes - Multisectoral Collaboration

- Multisectoral collaboration among various actors: evidence generation through inclusion/representation across fields with resources/actors who excel in their area of interest
- The need for the collaboration/platform to aid in facilitating the evidence to a decision by asking the research questions to answer the need of the hour, to cross learn, facilitating conversations among stakeholders, identifying what might impact decisions, and including them in the recommendations
- The outcome of using the evidence in making the decisions by the policymakers will boost the ecosystem in the right way

> *"If you see, data-driven decision making is only a theory unless it is taken to some logical end. And here not just one organization, probably many organizations will have to come together and create a platform. Even then, until the state government or the central government starts using these results, it will not be realized. So I think getting that culture changed is a greater responsibility and that has to happen both from within sort of facilitated by others…"*
>
> -Knowledge broker from a regional institute

Key Themes - Capacity Development

- Capacity to undertake modeled evidence and the capacity of decision-makers to interpret the evidence that should be improved with the help of technical workshops as well as consultative meetings
- Policymakers should be made aware of what the models can do, what they cannot do, and how they can use models as additional input for their policymaking

> *"If you see, data-driven decision making is only a theory unless it is taken to some logical end. And here not just one organisation, probably many organisations will have to come together and create a platform. Even then, until the state government or the central government starts using these results, it will not be realized. So I think getting that culture changed is a greater responsibility and that has to happen both from within sort of facilitated by others…"*
>
> -Knowledge broker from a regional institute

Key Themes - Sustainability

- Working on ways of sustaining the modeling/knowledge brokering/decision-making atmosphere in the country through practices /processes which can help in sharing, interpreting, and accumulating knowledge on modeled evidence
- Embedding the process/practices to ensure modeling/use of modeled evidence is in the DNA of the government that can withstand political change
- Credibility among the stakeholders is a key factor for translation of modeled evidence to decision-making

"Also think about building capacity for future leaders, right? Not just those who are today, because those who are at the top of policymaking are going to retire in one or two years anyway. So we need to think about all levels…"

-Knowledge broker from a regional institute)

"Different secretaries or different leaders might have different preferences. There might be ideological preferences as well, which are becoming much more important across the world...I think it will become a hugely important factor that how can you maintain objectivity so that irrespective of whoever is in power, you have the credibility to at least have a conversation. You know, you have to reach out to the government. So I think as a research organization, that is very important in terms of, I think, government preferences..."

-Knowledge broker from an international institute

Recommendations to Improve Modeling for Decision-Making in India

Recommendations for Funders & Global Policy Leaders

- Funding for modeled evidence needs to be **aligned with the health sector's policy priorities** at the federal and state level.

- **Funding** by international development partners/academic institutions needs to be channelized through the **government institutions**.

- Global funding support can be channelized for **capacity building and developing collaborative platforms and knowledge management initiatives**, e.g. - IDSI support to HTAIn, Campbell Cochrane Collaboration

- Funding support for **strengthening domestic collaborative platforms** like HTAIn and regional resource centers at the state level

Recommendations for Decision-Makers & Policymakers in India

- **Capacity building for decision-makers** to interpret modeled evidence through consultative workshops

- Institutional mechanism needs to be strengthened for **collaboration and participation of modelers and decision-makers** in the decision-making process. Decision-makers should be involved in the process of modeling from the initial stage.
  e.g. – National Task Force for COVID-19; HTAIn Secretariat

- **Facilitate platforms for access to data** for modelers and boundary organizations.
  https://data.gov.in/ - effort to synthesize data sources and facilitate data availability

- Improve efforts toward **digitization of health data** for improving transparency and quality of Management Information Systems (MIS)

- **Facilitate interaction between the federal/state-level health information and MIS** to understand the data gaps and data requirements of modelers

- **Initiate a review mechanism** within the Department of Health/Health Research for ensuring process consistency and validity of modeled evidence

Recommendations for Modeling Organizations in India

- **Facilitate multisectoral/multi-departmental collaboration** for modeling efforts at the national and sub-national levels

- **Capacity building of modelers on effective strategies for communicating evidence** to decision-makers

- **Strengthen efforts to improve access, quality, and reliability of health data** through collaboration with health management information systems and survey organizations. These efforts can help in identifying and improving data "trust" both for modelers and decision-makers.

- **Modeling efforts need to be strengthened at the state level**, and this would allow for catering to the heterogeneous population and delivering robust results

Recommendations for Knowledge Broker Organizations in India

- **Sensitize modelers on the priorities of policymakers** and the decision-making process and decision-makers on the interpretation of modeled evidence
- Facilitate the development of a **collaborative platform involving modelers with different skill sets** (statisticians, epidemiologists, economists)
- **Develop a comprehensive database/portal** for sharing research studies and a Community of Practice (CoP) platform for convening all stakeholders

Thank You.

For more information, please contact:
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