SENSE about SCIENCE

European Commission

# Using models for policymaking

## The questions you should ask when presented with the use of simulation models in policymaking

*Policy decisions must be transparently informed by evidence. Simulation models are increasingly used for supporting the policymaking process and analysing the impact of policy options in areas such as pandemic response, climate change and healthcare. So, ensuring models are open to scrutiny by policymakers, researchers and the public is essential to creating public trust.*

## What are simulation models?

> *Simulation models are computer-based, quantified analytical representations of the real world used to make projections or to assess the behaviour of a system under specific conditions. They can help us to make sense of complex information and to present that information clearly and coherently.*

In most cases, **models** are designed to better understand scenarios rather than to predict the future. Their strength is therefore not in providing a precise result but in revealing the relationship between events: does an increase in x lead to an increase in y?

Most importantly, models should be interpreted within their defined purpose and scope, because when the context changes, the assumptions of the model may no longer be applicable. For example, model of a disease in a specific cultural or social group may need to be adapted before being applied to another cultural or social group.

## Their use in policymaking

> *To understand, use and communicate model results, models need to be transparent and open to scrutiny. The more important the policy question is, the more impact the use of model results may have on society. The increased weight placed on model results means scrutiny is required now more than ever.*

When interpreting the findings of models for policy, **transparency** of the model contributes to the confidence of decision-makers, the public and other stakeholders. This is achieved by engaging with all relevant stakeholders to create shared understanding about a model's assumptions, strengths and limits.

Ongoing **validation** of new and old model outputs and regular review of their data further contributes to increasing model trustworthiness.

A continuous dialogue between **researchers and policymakers** is fundamental to understanding how models could and should be used for policy. So, how can we expand our scrutiny to question the quality of modelling exercises?

How can we interrogate the **quality, reliability** and **transparency** of models for policy?

# The questions you should ask

*Models must always be interpreted within their defined purpose and scope. The following questions will then help assess whether a certain model is the right tool to answer the policy question and to interpret the results correctly.*

## What do we know about the model?

### What do we know about the model data?

What are the sources?

Is it up to date?

What is the history and quality of the data?

What biases or limits exist?

What is missing, and is it relevant?

What are the relationships between the data?

What are the associated unknowns (uncertainties)?

### What do we know about the modelling assumptions?

Are they well-founded?

What has not been considered?

How accurate is it (model sensitivity)?

Is the model fit to answer the policy question it was created for?

## Is the model transparent?

Are model inputs and outputs publicly available?

Is the model code accessible and clearly described (annotated)?

Is model development and performance documentation available?

## What do we know about model quality?

Has the model been discussed in the scientific community and reviewed by independent experts?

Have assumptions and results been discussed and validated with as many stakeholder communities as possible?

Has the model been compared with other models?

Is there a statement on the unknowns (uncertainties) and is it explained?

Is the model being used in a new context? Does this introduce new limitations?

## Are model results communicated clearly and accurately?

Are the questions asked to the model clear and relevant for the problem at stake?

Are model results clearly presented (including graphical representations) and explained?

Do model results refer to a specific context?

Have the unknowns (uncertainties) been presented in a clear way?

Are limitations explained as well as their implications for results?

These questions have been developed by the European Commission **Competence Centre on Modelling and Decision Analysis** (CC-MOD) together with **Sense about Science EU,** and presented at the ▸ *2021 EU Conference on Modelling Support.* They were co-created with policymakers and civil society professionals to make sure the guide is user-friendly, easy to understand and easy to implement, to better enable policymakers and citizens to assess their use in different contexts. The Competence Centre can be contacted at *EC-CCMOD@ec.europa.eu.*
▸ *CC-MOD* promotes a responsible, coherent and transparent use of modelling to support the evidence base for EU policies in the framework of the ▸ *Better Regulation policy.*
CC-MOD also manages ▸ *MIDAS,* the European Commission inventory including the descriptions of models used in support to the policy cycle.
▸ *Sense about Science EU* is an independent charity that promotes the public interest in sound science and evidence.

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