

Vaccine Impact Modelling Consortium

Introduction

The Vaccine Impact Modelling Consortium (VIMC) was established in 2016 for a period of 5 years in response to an identified need by Gavi, the Vaccine Alliance and the Bill and Melinda Gates Foundation (BMGF) to coordinate the ongoing work of various modelling groups providing vaccine impact estimates.

The modelled vaccine impact scenarios are critical for the evaluation of the organisations' existing vaccination programs, potential future investments, and vaccine scale-up opportunities. The consortium will aim to deliver more sustainable, efficient, and transparent approach to generating disease burden and vaccine impact estimates for the Gavi portfolio.

The VIMC will include the modelling groups generating disease-specific vaccine impact estimates, and activities will be coordinated by the secretariat based at Imperial College London.

Summary of goals and objectives

The consortium will strive to emphasize consistency, quality and efficiency amongst the employed models aiming to include at least two independent models per diseases to assess the robustness of estimates to structural assumptions. Furthermore, the consortium will facilitate answering to Gavi and BMGF needs for further analyses to guide policy decisions.

The consortium will offer structured opportunities for the modellers to engage with each other through annual meetings and technical working groups. With the input from the Scientific Advisory Board (SAB), the consortium will develop a set of desired model features to guide the evaluation of the existing and new models and to drive further model development.

The Consortium will generate major vaccine impact estimates in 2017, 2019 and 2021 to support Gavi and BMGF strategy and decision making. In addition, twice a year the secretariat will be responsible for performing a modified updated of the estimates to ensure that Gavi and BMGF have the most up-to-date data to work with.

Furthermore, the VIMC will create a delivery platform to streamline the generation of the modelled impact estimates with a front-end to aggregate and visualise the estimates, making them more accessible to users such as Gavi and the BMGF.

Governance structure

The consortium will be led by the secretariat based at Imperial College London. Dr Tini Garske will serve as the Coordinator supported by administrative and technical teams. Priorities for the consortium and the secretariat will be set by the Management Group (MG), which consists of the Coordinator, senior academics within Imperial College and Gavi and BMGF representatives. The MG will provide primarily technical and operational oversight to the consortium.

The Scientific Advisory Board (SAB) will advise the MG. The SAB will include external experts in the field and major stakeholders.

For the smooth and effective running of the consortium, and to maintain the confidence of all stakeholders, robust governance procedures will be developed that set out the standards to which models will be held, the response to various issues, and the procedures by which modelling groups are selected. These procedures will be set out during the first year of the consortium operations with guidance from the SAB members and input from the MG, and implemented throughout the consortium's term.

VIMC annual meetings will facilitate connections between the modelling groups and provide an opportunity to guide future scientific direction for the consortium. Between these meetings, collaborations will be supported through technical working groups and visits between consortium members.

Research Agenda

While consistency of model estimates through time is important to Gavi and BMGF for the purposes of tracking progress and communication with their stakeholders, the VIMC will strive to improve reliability and credibility of model estimates through developing a Quality Agenda. This will bring a new focus on the validation and comparison of models to understand the reasons driving differences in estimates and develop more rigorous requirements for the technical specification of models. This will ensure that, as far as possible, models benefit from all available data, fully represent uncertainties present in underlying data sources and that model assumptions are well documented.

The secretariat's research agenda will also formally develop a framework for generation of ensemble estimates, wherein the results from multiple independent models are unified in a single estimate but also express the uncertainty arising from alternative model structures. The consortium will drive innovation in the epidemiological framework by which estimates of impact of different vaccines can be compared and combined.

The VIMC will develop an Efficiency Agenda, developing a web-based delivery platform, which will initially streamline the process of data exchange between those collecting data input to the models, the modelling groups, the secretariat and Gavi/BMGF. This platform will serve as a source for the updated model input data and a database for the vaccine impact estimates; it will have convenient interfaces and tools for downloading and uploading data and estimates with associated information. The VIMC secretariat will provide support in facilitating models and modellers using the platform.

The platform will also provide full 'open-access' to the model documentations, raw results and data input, and provide new tools in data visualization and analyses. In a second phase of development, the delivery platform will be extended (with simple RESTful APIs) to host models centrally. Overall, the delivery platform will bring a greater level of systematization to the estimate generation process, reducing workloads for modelling groups and will offer greater assurances and transparency for partners.