

Vaccine Impact Modelling Consortium

Annual meeting 2017 - Summary meeting report

Windsor, UK
February 28 – March 2, 2017



Objectives of the Vaccine Impact Modelling Consortium

The Vaccine Impact Modelling Consortium (VIMC) coordinates the ongoing work of modelling groups providing vaccine impact estimates to Gavi, the Vaccine Alliance, and the Bill & Melinda Gates Foundation (BMGF). The Consortium strives to emphasize consistency, quality and efficiency amongst the employed models aiming to include at least two independent models per disease, in order to assess the robustness of estimates to structural assumptions. Furthermore, the consortium facilitates answering to Gavi and BMGF needs for further analyses to guide policy decisions.

The Consortium will provide major vaccine impact estimates in 2017, 2019 and 2021 to support Gavi and BMGF strategy and decision making. The Consortium will also establish a delivery platform to streamline the generation of the modelled impact estimates. In addition, twice a year the Consortium secretariat will provide a modified updated of the estimates to ensure that Gavi and BMGF have the most up-to-date data.

The Consortium is currently funded until the end of 2021 by Gavi and the BMGF through a grant to Imperial College London, which is sub-contracting individual modelling groups to contribute disease-specific estimates of the vaccine impact.

Background

The VIMC first annual meeting took place in Windsor, UK on February 28-March 2, 2017. The meeting was set to occur early in the year and shortly after the Consortium announcement.

The key objectives of the meeting were a) to introduce all the modelling groups to the secretariat members and to each other (especially relevant for the new members); b) to disseminate the information on the overall consortium operations and future strategy; c) to solicit feedback on a range of strategy topics from all participating modellers; and d) to establish small working groups focusing on the technical topics of relevance across all disease models.

Summary

Day 1: Tuesday, 28 February 2017

Welcome and opening lectures:

The Consortium annual meeting participants were welcomed by Tove Ryman, Programme Officer at the BMGF, Olivia Bullock, Programme Officer at Gavi, and Tini Garske, the VIMC Co-ordinator. The presentations on behalf of the two funders focused on contextualising the VIMC: the underlying motivation for establishing the Consortium and the importance of the vaccine impact estimates. The use of the data generated across the modelling groups was also discussed. The VIMC Co-ordinator, Tini Garske, welcomed the meeting attendees and gave a brief overview of the Consortium; she stated the main objectives for the annual meeting welcoming input from the attendees on the various Consortium processes and future strategy.

Neil Ferguson, Professor of Mathematical Biology and Director of the MRC Centre for Outbreak Analysis and Modelling, and Azra Ghani, Chair of Infectious Disease Epidemiology at Imperial College London, presented opening lectures focusing on the field of vaccine modelling, with dengue and malaria vaccine examples.

Day 2: Wednesday, 1 March 2017

Modelling group introductions:

The morning included brief presentations by all attending modelling groups (13 in total). Each group was asked to introduce their team members and describe key model developments from the past year as well as the foreseen challenges and future model development direction.

VIMC introduction:

Following the brief Consortium introduction from the previous day, Dr Tini Garske presented a more in-depth discussion of the VIMC structure, scientific aims and operations for the next five years.

The Consortium will be led by the VIMC secretariat based at Imperial College London. The Management Group, consisting of senior academics and Gavi and BMGF representatives, will serve as the direction-setting and decision-making body with input from the Scientific Advisory Board (named members available as an appendix to this document). The Consortium as a whole will be supported by the secretariat administrative and technical teams, who were introduced to the meeting participants (the Consortium structure diagram available as an appendix to this document).

The VIMC will prioritise consistency of the existing Gavi vaccine modelling portfolio and, with time, aim to improve the quality and efficiency of the impact estimates generation. As part of the efficiency agenda, the secretariat will work on developing a delivery platform infrastructure to host the disease burden and vaccine impact estimates. The VIMC will facilitate annual meetings and visits between the modelling groups; will hold country workshops in high-burden countries identified by the funders: Pakistan, India, Nigeria, and Ethiopia (PINE). The secretariat's research agenda will focus on the methodological development of the employed models and the aggregation of estimates across diseases, while keeping in mind the risk of double-counting the benefits from several vaccines, etc.

The Consortium funding scheme and the implications for the sub-agreements with the participating modelling groups were also discussed. Imperial College London was awarded funding for five years through two research agreements: one with the BMGF to cover secretariat costs, travel, meeting, publications fees, and one with Gavi to fund the sub-contractors' work. The sub-agreements with the modelling groups will need to comply with the terms and conditions presented to Imperial College, specifically relating to annual budget review and sensitivity around the timing of publications.

The overall project timeline was presented as below:

- o 2017: First set of impact estimates within the consortium / Focus on consistency
- o 2018 – 2019: Model review and comparisons / Define targets for development
- o 2020 – 2021: Continued model improvements

Finally, the proposed work plan for 2017 was reviewed taking into account the deliverables deadlines for the modelling groups in order to present the first set of vaccine impact estimates generated by the VIMC to the funders in early 2018.

Delivery platform demo:

Following the VIMC introduction, Rich FitzJohn, Senior R Application Developer from Imperial College London, presented a pilot demo of the delivery platform. Among other features, the

platform will aim to establish an audit trail between original data and reports, foster consistency across data sets, minimise *ad-hoc* data modification, and simplify data validation.

Gavi Operational Forecast:

Gavi vaccine implementation and market shaping team (Karine Ammar, Jon Pearman, and Matt Blakely) presented the background information on the updated methodology for the organisation's demand forecast. The presenters highlighted the importance of documenting and understating all the assumptions used in the forecasting process. It is essential for the modellers interacting with the Gavi forecast to be aware of the applied methodology.

VIMC Strategy discussions:

In the afternoon, the meeting participants were split into smaller groups to discuss four topics pertaining to the VIMC operations and strategy. The main goal of the session was to collect input from the participating modellers to shape future decisions and processes.

- **Model quality standards:** The Consortium aims to drive methodological development of all models towards more robust and consistent estimates. In order to provide Gavi and BMGF with a transparently developed, well-documented set of estimates, employment of quality standards across all models is proposed.
- **Model review and improvement process:** After the delivery of 2017 outputs, the Consortium plans to review the models based on a set of agreed quality and consistency improvement goals for all models.
- **Cross-consortium collaboration:** The Consortium will enhance collaboration opportunities across the modelling groups and will offer a platform for knowledge transfer between the modellers from different disease areas.
- **Consortium publication strategy:** A key role of the secretariat is to support and coordinate scientific publications that the VIMC will generate over the next five years. An agreed strategy is required. Publications based on sensitive input data provided by Gavi (in particular future vaccination scenarios) may be subject to prior approval from Gavi.

Day 3: Thursday, 2 March 2017

Health economic and systems modelling:

The morning session was opened by a joint presentation shared between several groups focusing on health economics. Samantha Clark presented the latest results on the antimicrobial costs averted on behalf of the DOVE team, followed by a presentation from Stephane Verguet on poverty and equity benefits of vaccines using extended cost-effectiveness analysis. The session was closed by a presentation by Mark Jit and a discussion on the focus of the health economics questions that the Consortium could aim to address over the next five years.

Burden estimation and data gaps:

Lisa Lee opened the discussion on important data gaps that the modellers face during the process of impact estimates generation. Tini Garske then posed a question to all participating modelling groups on the use of counter-factual scenarios and impact by year of vaccination.

Sub-national country estimates:

The morning session was closed by a presentation by Nick Grassly focusing on the use of sub-national country estimates. The benefits of using sub-national estimates include avoiding bias in vaccine impact and burden estimates and helping with advocacy and planning. However, using sub-national data could also pose challenges as it can be complex and time-consuming. There is a need therefore to identify the appropriate geographic scale and take advantage of the existing sub-national data sources. The presentation was followed by a discussion on the availability of sub-national data and feasibility of including this level of detail when producing impact estimates.

Technical working groups:

The afternoon was allocated to small working groups focusing on several topics of relevance to the wider consortium.

Summary of the meeting outcomes and next steps

The main objectives set for the first VIMC annual meeting were successfully met. The modelling groups were introduced to the secretariat members as well as the new modellers joining the Consortium. The structural set-up and administrative processes of the consortium were presented to the modelling groups. Considerable time was dedicated to fruitful discussions among consortium members regarding strategic plans and technical topics of interest across diseases, which provided valuable feedback to the secretariat and will shape the future directions of the consortium. This led to many concrete action points and further questions, and several technical working groups were conceived.

The main work streams for the first year will comprise of the delivery platform development, maintaining consistency across the Gavi portfolio and successfully producing the 2017 round of impact estimates as well as establishing the processes to support the wider Consortium operations (i.e. model review and improvement process, data access and quality, general collaboration). The secretariat will coordinate the responsibilities across various teams based on the next steps and suggestions.