

Report on the Immunization and Vaccines Related Implementation research (IVIR)

Advisory Committee Meeting
Geneva, 17-19 September 2014



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1. Executive Summary

THEME: Research to conduct *impact* evaluation of vaccines in use

Comprehensive *WHO VPD burden and impact assessment framework*

Is the proposed framework useful?

Were there any emerging gaps presented or any concerns?

- IVIR-AC welcomes the proposed framework and agrees with WHO's role in facilitating a hub of burden of disease and impact assessment work including an associated network of experts.
- IVIR-AC's role and scope within the proposed framework should entail: reviewing evidence, identifying gaps, biases and limitations, assessing research methodology, commenting on analytic approaches, correctly utilizing models, and maintaining participation of at least two IVIR-AC members in each sub-group to be established.
- Sub-groups should identify any clear gaps and both value-added and unnecessary duplication of effort to better direct future modeling and vaccination program work.
- In order to sustain the impact framework in line with relevant policy questions at global and local levels, institutional capacity is needed while funding from various partners is streamlined according to the proposed framework.
- IVIR-AC encourages partners in the immunization field and other interested parties to contribute to the framework and to utilize it.

Pertussis impact modeling review

What are the best modeling approaches to address policy questions defined by SAGE regarding pertussis vaccines?

- The models seem to be appropriate in terms of structure to better understand both schedule optimization in various countries and transmission settings, and how high-income country (HIC) experiences can inform potential resurgences in low-and-middle-income countries (LMICs).
- Availability and quality of data is the key problem, thus IVIR-AC calls for better surveillance systems in all countries, particularly in LMICs where virtually no data exist.

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- An IVIR-AC sub-group under the WHO VPD burden and impact assessment framework will be formed to identify specific data needs as an input for various models by conjoining modeler needs with epidemiologic expertise.
 - IVIR-AC members P. Beutels, P. McIntyre and B. Gessner volunteered to join the sub-group and report back to the IVIR-AC in 2015.

WHO pertussis burden modeling

Does the proposed model provide reliable burden of pertussis estimations?

- IVIR-AC recognized that the new global pertussis burden model had significant limitations in that results from the expert solicitation exercise were too broad, the age groups too wide (should be focused on children under age five years only if the primary objective is to estimate the burden of severe disease, including death) and the very wide range of potential estimates for model parameters that it utilized did not reduce uncertainty in pertussis burden estimates in a useful way.
- IVIR-AC suggests convening a sub-group to explore the potential way forward to revise the presented global pertussis model in combination with new pertussis data available since 2012 in the literature and from the WHO IER group. This sub-group should include the mathematical modeling groups presented in the previous pertussis impact modelling session.

Meningitis A impact assessment

Is the proposed approach adequate to assess meningitis A vaccination?

- IVIR-AC agreed the dynamic model presented is the appropriate approach to understanding the long-term impact of current campaigns and of future meningitis A vaccination strategies.
- Assumptions of the model need further sensitivity and uncertainty analysis, such as varying assumptions of duration of natural immunity following infection or carriage, age structure determinants of the model, and a term to force seasonality into the model, among others within the model. IVIR-AC recommends that an improved presentation of results is needed to capture the stochastic nature of the model i.e. reporting the uncertainty intervals around average model predictions.
- Finally, IVIR-AC emphasized the need to understand investments in prevention of serogroup meningococcal meningitis by estimating the economic impact and benefits of MenAfriVac, vaccination programme, as well as of various vaccination strategies for the future.

Impact evaluation of Hep B vaccines

Is the proposed approach adequate to assess hepatitis B vaccination?

- IVIR-AC found the work presented to be of high quality and exemplary of how sub-groups under the WHO VPD burden and impact assessment framework may function, both in terms of process (i.e., IVIR-AC's involvement) and activities carried out (e.g., comprehensive and detailed systematic literature reviews).
- IVIR-AC highlighted the need for modeling of scenarios to also include comparisons of no birth dose versus birth dose; in particular, there would be value in defining the impact of a birth dose in terms of immunogenicity, and to better understand the issues related to its implementation, such as cost and cost-effectiveness across local, country and regional levels.
- To better inform decision makers in middle-income countries (MICs), IVIR-AC identified the need to incorporate liver cancer screening, treatment options, and outcomes into models.
- IVIR-AC suggested that there is value in comparing the current model with a previously developed model used by Gavi and WHO. These comparisons should include provisions to compare outcomes of both models with the same data inputs and model assumptions.
- IVIR-AC identified the need for addressing quality of life with chronic hepatitis infection in addition to mortality outcomes in impact evaluation studies.

Decade of Vaccine Economics (DOVE)

Is the proposed approach adequate? Do the individual model components meet the state of the art modeling requirements?

- IVIR-AC recognized that the ambitious nature of the DOVE study aims to provide global estimates of resources needed for accomplishing the objectives of the Global Vaccine Action Plan (GVAP) and providing return on investment information to donors. IVIR-AC made the following observations about limitations of methodology used and recommended these be acknowledged and addressed more thoroughly in order to enhance the utility of the document for donors and vaccine agencies.
- Many of the individual disease model components do not meet idealized state-of-the-art modeling requirements, but IVIR-AC acknowledges that this is a massive

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