Economic analyses for vaccine implementation in low- to middle-income countries

Raymond Hutubessy is a health economist affiliated to the Immunization, Vaccines and Biologicals (IVB) Department of the World Health Organization (WHO), and is the executive secretary of the WHO Immunization and Vaccines related Implementation Research (IVIR) Advisory Committee. His main research interests focus on economic and financial analyses of vaccine implementation in low- to middle-income countries.

1) What is the importance of conducting economic analyses for vaccine implementation?

Vaccines for prevention of communicable diseases have been shown to be extremely effective in terms of health outcomes. Therefore, conducting economic analyses to get the most value for money from vaccine implementation is of high importance; evidence and information resulting from these analyses are not the only input to the decision making process for vaccine implementation, but they are important ones.

The relationship between health and economic growth is one of the cornerstones of development economics: health status is determinant of productivity that can be shown to influence economic growth. Specifically, vaccines have a broader value in terms of their indirect effects (e.g. herd immunity) and other externalities (e.g. improvements in cognitive development of children, higher school attendance and attainment, macroeconomic impact). Therefore, in addition to the traditional economic appraisals for vaccine implementation, it is useful to policy makers and stakeholders involved with vaccine introduction decisions to demonstrate the broader added value of vaccine and investments in health in general.

Economic appraisals address different key issues with regard to decisions on vaccine introduction. These appraisals range from priority setting issues across vaccines and other competing health interventions, to
affordability and budget impact analysis, and costing and financing issues with regard to the implementation of immunization programs. For these different policy questions, different analytical tools are available, such as cost-effectiveness analysis, costing studies, budget impact and optimization analysis.

2) What are the main issues that should be considered?

First, because many economic evaluations are based on analytical decision tools such as mathematical infectious disease models, costing tools, decision trees models etc. transparency is needed on the choice of the modeling methodologies, parameters and country data used and assumptions made by the analyst. Standardization of methods of cost-effectiveness is therefore needed and analysts in the field should adhere to these guides. This allows users to make comparisons of different study results by different groups. The WHO, in addition to other organizations, has developed several guidelines on economic evaluations in health and vaccines and immunization programs in particular.

Second, to be relevant, local decision makers have country-specific policy questions and therefore need contextualized study results driven by specific country data and information with regard to demographics, epidemiology and economic data. However, this does not mean that for each country, (which, in my field of work, primarily involves low- to middle- income countries (LMICs)), economists and analysts need to start from scratch – they can built on work from other groups who recently start to put their models including the modeling codes in the public domain.

In light of this, efforts should be put into building local technical capacity in LMICs so that they are able to perform their own analysis and interpret their own results with the aim of increasing local ownership of the evidence generated. The WHO, along with partners (Pan American Health Organization (PAHO), Agence de Medicine Preventive (AMP), Program for Appropriate Technology in Health (PATH), Sabin Vaccine Institute and USA-Centres for Disease Control) recently started the ProVac International Working Group (IWG) to promote the use of economic
analysis for vaccine introduction decisions in LMICs.

3) Are there differences in conducting economic analyses for vaccine implementation between higher income versus resource-limited settings?

In principle, the methods applied and tools used are similar in higher income versus resource-limited settings. However, as country demographics, disease burden, epidemiological and socioeconomic background and health systems and infrastructure differ, the methods of measurement, valuation and the interpretation of results of economic evaluations will also differ.

For example, the price at which Human Papillomavirus (HPV) vaccine is considered to be cost-effective is heavily dependent on the existing local cervical cancer services and the ceiling ratio or cost-effectiveness threshold (i.e. societies’ willingness to pay for an additional health gain). In high income countries, access to health care services is better and delivery systems of vaccines to reach adolescent girls are more advanced than in LMICs. As a result, the affordability question in such resource-rich scenarios focused around the relatively high public market prices of HPV vaccines, which may go up to 150US$ per dose.

In contrast, in countries eligible for the Global Alliance for Vaccines and Immunization’s (GAVI) support, the manufacturers of one of the vaccines have offered an indicative price of 5 US$ per dose. This is a 64% reduction of the lowest public prices. As a result, rather than the vaccine price per se, it is the securing of the delivery costs to get the vaccine from the port of entry to those girls in need, that has become a main barrier in many of these countries. This barrier is in addition to other capacity issues, such as the existing delivery infrastructure being already over-stretched with traditional Expanded Programme on Immunization (EPI) vaccine and other competing new vaccines, such as rotavirus and pneumococcal vaccines.

4) Are there any specific ways in which these economic analyses have improved clinical outcomes?
In my opinion, economic analysis have not improved clinical and public health outcomes as such, but have helped to promote the use of effective and cost-effective health interventions. For example, by identifying barriers and uptake issues of vaccine implementation, economic analysis have contributed to bridge the link between the evidence on theoretical vaccine efficacy and real life effectiveness. Another example is that economic analyses do not just appraise vertical disease programs but also have an integrated and combined disease program perspective. This has the potential to account for synergistic effects and therefore will improve the overall public health impact.

5) Where can I find more information?

WHO websites – IVR/IVB, CHOICE

http://www.who.int/vaccine_research/implementation/health_economics/en/index.html

CHOosing Interventions that are Cost Effective (WHO-CHOICE) website:
http://www.who.int/choice/en/

Pan American Health Organization (PAHO ProVac)
http://new.paho.org/provac/

International Health Economics Association website
https://www.healtheconomics.org/

GAVI alliance website

http://www.gavialliance.org/support/nvs/human-papillomavirus-vaccine-support/

List of references:


