

GVIRF 2016: <i>The role of moderate efficacy vaccines in integrated disease control strategies</i>	
Rapporteurs: Thomas Cherian	
Session Outline	<p>Chair: Kate O'Brien</p> <p>Presentations:</p> <p>Introduction and lessons learnt from GVIRF 2014 – Kathy Neuzil</p> <p>Lessons learnt from rotavirus and pneumococcus vaccination programmes – Kate O'Brien</p> <p>Moderate efficacy malaria vaccines as part of a comprehensive malaria control programme – Salim Abdullah</p> <p>Reflexions on the use of future HIV vaccines as part of an integrated package of preventive measures</p> <p>Discussants: Kate O'Brien, Kathy Neuzil, Salim Abdullah, Walter Jaoko, Jon Abramson</p>
Objectives of the session	<p>To discuss approaches and consideration for integrating vaccines with moderate efficacy into integrated disease control packages</p> <ul style="list-style-type: none"> • Create an understanding of the vaccine performance measures that could be considered other than vaccine efficacy • Envision how limiting our assessment of vaccines to VE could create missed opportunities for disease prevention and health improvement • Provoke a discussion and deeper acceptance of the inclusion of vaccine performance measures other than vaccine efficacy for both licensure and policy decision making • Through concrete vaccine use examples, bridge the experience of existing vaccines that have moderate VE against various outcomes (i.e. Rotavirus vaccine and PCV for syndromic outcomes) to what is now being observed for malaria vaccine and what is anticipated for HIV vaccines
Main outcome	<ul style="list-style-type: none"> • All vaccines are partially efficacious; our understanding of their benefit should be assessed not only by effectiveness, but also importantly by the vaccine attributable rate reduction that can be achieved. Vaccination can be delivered with high coverage in communities, and offers a particular opportunity in those settings with highest burden of disease, some of which are less amenable to substantial improvements in coverage of non-vaccine interventions over the short-, or medium-term. Other interventions to protect and treat diseases can complement the effect of vaccination. Interventions to prevent, protect and treat can be delivered as a package, but requires clear communications to communities so that the introduction of one (e.g. vaccination) is not to the detriment of other partially effective interventions.
Summary (400-500 words)	<p>The session reviewed the main conclusions from GVIRF 2014, where a session on this topic mainly focused on the regulatory and public health challenges associated with vaccines with moderate efficacy. The 2016 GVIRF session advanced the understanding of barriers and opportunities of moderately</p>

effective vaccines by focusing on the ideas that all vaccines are only partially efficacious, depending on the outcome under consideration. This presents a frame-shift in how we perceive the new vaccines, presenting risk that they will be inappropriately undervalued, given that most of the vaccines used in national programs in the past had high efficacy against highly specific pathogen outcomes. While there were no defined efficacy thresholds that needed to be met for regulatory approval, it was noted that the regulatory and public health perspectives may be different.

There has been a rapid uptake of Pneumococcal Conjugate Vaccines (PCV) and rotavirus vaccines in recent years by many countries. It was noted that while PCV had high efficacy against vaccine type invasive pneumococcal disease, the efficacy against the syndrome of pneumonia, which is not specific for pneumococcus, was much lower and posed communication risks when the vaccine attributable rate reduction was ignored. For rotavirus, the efficacy against rotavirus confirmed diarrhea varied by geography and population groups as well as by disease syndrome. In this example, the vaccine attributable reduction in disease burden was often inversely related to the estimate of vaccine efficacy, e.g. the vaccine efficacy estimate may be lowest for a non-specific disease syndrome, or a given geography, but which carries the highest burden of disease and therefore results in the greatest absolute reduction in disease rate.

It was also noted that the public health impact of a vaccine often extended beyond that shown in efficacy trials, because of the significant herd effects of some vaccines.

While there are a number of alternate interventions with moderate or high efficacy for diseases that are also targeted by vaccines, the ability to deliver them to the most vulnerable populations may be limited and consequently coverage may be lower than with vaccines, emphasizing that the value of vaccines is not singularly expressed by efficacy measures.

There are a number of interventions against malaria, but most of them are of moderate efficacy. Furthermore, the effectiveness of some of the alternate interventions is declining as a result of resistance of mosquitoes to insecticides and of the malarial parasite to anti-malarial drugs. Hence, it is critical that vaccines, even those of moderate efficacy, be included as part of the armamentarium for malaria control.

Similarly, with HIV, though the existing preventive measures have resulted in substantial declines in HIV prevalence, the total number of infections is still rising. Mathematical models predict that even with vaccines of moderate efficacy, if used widely, substantial further reduction in incident cases would ensue.

The questions as to whether vaccines of moderate efficacy might inadvertently reduce confidence in vaccination as a whole (because some vaccinated children will still develop disease) or lead to increase in high risk behaviour (because individuals perceive they are fully protected) was discussed by the panellists. The need for clear communications about risks and benefits from vaccination

	and the need to avoid high-risk behaviours, or to continue the use of non-vaccine control measures was considered to be important when introducing vaccines of moderate efficacy.
Key references or quotes (up to 5)	“Vaccine efficacy depends on geography, disease syndrome and pathogen subtype. Often the vaccine attributable disease impact is inversely related to measures of vaccine efficacy” “Vaccines do not prevent disease, vaccination does”