

<b>GVIRF 2016: New Technologies to Support Measles Elimination (Plenary 5)</b>	
<b>Rapporteur:</b> Birgitte Giersing, WHO	
<b>Session Outline</b>	<p><b>Chair:</b> David Durrheim</p> <p><b>Opening remarks:</b></p> <p>This will be the most exciting session of the conference because we will hear about the emergence of a potential game-changing technology that could bridge the measles immunization gap! Regional elimination can be achieved as a result of concerted efforts to achieve the 95% coverage rates required to prevent transmission, but in the absence of global eradication, elimination can be rapidly reversed by virus importation from an infected, unvaccinated individual, or from unvaccinated reservoirs.</p> <p><b>Presentations:</b></p> <p>What are the measles vaccination coverage gaps? (Peter Strebel, WHO)</p> <p>The investment case for measles eradication (Kim Thompson, Kids Risk)</p> <p>Progress report on research priorities since the previous GVIRF (Narendra Aurora, INCLEN Trust)</p> <p>An emerging delivery technology for measles elimination (Jim Goodson, CDC)</p> <p><b>Discussants:</b></p> <p>Peter Figueroa (University of the West Indies); Shabir Mahdi (National Institute for Communicable Diseases, South Africa); Narendra Arora; Jim Goodson.</p> <p><b>Closing Remarks:</b></p> <p>There are significant challenges on the road to measles eradication, but with innovative approaches that increase coverage, eradication can be accomplished. The benefits attained from investment in programmatic and R&amp;D efforts to innovate will go far beyond measles!</p>
<b>Objectives of the session</b>	<ul style="list-style-type: none"> <li>– To review the challenges of measles elimination with the currently available tools</li> <li>– To review the investment case for measles eradication based on the current global prevention and treatment costs</li> <li>– To understand the additional resources that would be required to achieve regional measles elimination and eventually global eradication with the current set of tools</li> <li>– To discuss the potential coverage impact of measles vaccine delivery by microarray patches (MAP)s.</li> </ul>
<b>Main outcome</b>	Broad consensus that the research agenda for new delivery tools, in parallel to efforts to increase coverage through building stronger national immunization programmes, is critical.
<b>Summary (400-500 words)</b>	High level measles control has been achieved, and while it has been possible to demonstrate regional elimination in the Americas, the mid-point GVAP goal of elimination in four regions by 2015 has been missed. Despite the availability of a highly effective vaccine, there are approx. 250,000 reported cases annually, and this is considered an under-estimate. At least 95% of coverage is needed to sustainably control disease, and this level of coverage must be <i>global</i> in order for eradication to become a reality. This is particularly challenging in hard to reach remote and migrating populations, or in areas of civil unrest. Any strategic innovation that enables measles delivery by house-to-house

	<p>vaccination rather than fixed or mobile post campaigns will significantly increase measles vaccine coverage, as has been the case with polio vaccines.</p> <p>The business case for measles eradication is compelling: in order to simply maintain the current levels of coverage costs \$2.3billion annually. In addition, the disability-adjusted life year (DALY) loss per measles infection is 2000-fold higher than per immunization dose (for adverse events). Eradication would save all treatment costs for measles infections (&gt;\$2 billion per year) and prevent DALY losses (~15 million DALYs per year valued at \$63 billion), and furthermore, once eradication has been achieved, countries could potentially reduce routine immunization schedules to only one measles dose, contributing an additional \$1billion to savings. Estimates modelled on polio suggest that it would take an incremental \$2 billion per year from today to 2020 – and a real global commitment to prioritise measles delivery in order to achieve eradication with the current tools and strategies.</p> <p>In acknowledgment of these challenges, a SAGE working group was established in 2011 with one of its terms of reference to identify gaps in essential evidence and programme barriers to achieving measles (and rubella) elimination targets. A survey was conducted in 13 countries to identify programme linked research priorities, and 50% of 24 research proposals were directed to increasing vaccine coverage among difficult to reach populations, identifying this as a clear and critical area of focus. This recommendation was endorsed by SAGE, and the WG has since been working to promote a comprehensive research agenda. A significant focus is on improving the quality of existing campaign activities, including improved methods for both intra-campaign coverage monitoring and post campaign coverage measurement, , and so that gaps - and possible reservoirs of infection - are not missed. In addition, more research is needed on the effect of immunizing infants earlier in life, e.g., at 6 and 12mo in order to provide protection in the face of earlier waning of maternal antibodies wane.</p> <p>Microarray patches (MAPs) have been proposed as a novel, and potentially game-changing strategy to increase coverage of measles vaccine by enabling house-to-house campaigns. There are several significant issues with the current method of delivery and administration of measles vaccine, that render it onerous to use, and deter health care workers from opening a vial if the majority of contents will be wasted. MAPs have the appearance of a small plaster, with invisible vaccine coated microneedles that dissolve into the skin with a few minutes of painless application. Initial feasibility studies suggest that this technology could stabilise measles vaccine so that it can be transported outside of the cold chain to remote areas, and administered by minimally trained healthcare workers, and initial indications from studies in rhesus monkeys suggest that that immunogenicity through MAP delivery is at least as good as that elicited with conventional needle and syringe. However, there are a number of unknowns and challenges with respect to the development pathway, and resources, willingness and co-ordinated planning are needed to get behind this technology and propel it onto the research agenda.</p>
<p><b>Key references or</b></p>	<p>Peter Figueroa: <i>'We are at a plateau with measles vaccination and cases. Investment in novel technologies to increase measles coverage is a no brainer'</i></p>

**quotes (up to 5)**

Shabir Madhi: We need better quality immunization campaigns. *'We don't know what the true level of coverage is, and we need to identify the under-vaccinated population for more effective SIAs and H2H campaigning.'*

Kate O'Brien (SAGE member): *'Doing more of the same will result in more of the same results'*. We need innovative approaches now.

Seth Berkley (CEO GAVI): *'GAVI would pay for innovation'*. But we need to understand if the regulators support these new technologies, and the pathway to licensure and implementation.