The impact of vaccines and challenges in the current decade

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World Health Organization
THE GLOBAL VACCINE PLAN

1. The framework and its processes
2. Progress made
3. Shortcomings

KEY IMPLEMENTATION ISSUES

2. Systems related
3. Vaccine supply

THE WAYS FORWARD

3. Accountability and improved Coordination
4. Sustained Financing
Key Messages

Unprecedented large scale use of vaccines worldwide

Additional public and private investments required to reap the full benefits of vaccines

Coordinated country-led efforts are needed to apply transformative changes
Great Achievements:

Never been this close of polio-free world (Nigeria off endemic countries list)

Global measles deaths reduced by 78% (2000-2013)

Maternal and Neonatal Tetanus eliminated in 32/56 ‘problem’ countries

Americas - 1st region to be declared rubella-free

90 low- and middle-income countries have introduced 1+ new / under-utilized vaccine
Number of Vaccines/Antigens Introduced Nationwide in Immunization Schedules

Selected antigens are:
- Diphtheria, Tetanus, Pertussis, Measles, Polio - Hepatitis B,
- Haemophilus influenza type b,
- Pneumococcal conjugate,
- Rotavirus - Rubella

Map production: Immunization Vaccines and Biologicals, (IVB), World Health Organization

Date of slide: 11 March 2015

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The Strategic Advisory Group of Experts on Immunization (SAGE) – Critical role in policy-making

HPV- decreased doses from 3 to 2 for the 9-14 years

Influenza- pregnant women given highest priority

Combined Measles and Rubella instead of separate immunization

Meningococcal A- large scale for the African meningitis belt.

Yellow fever- only one dose needed

Topics for 2016 SAGE meetings:

Typhoid vaccines
Cholera vaccines
Tetanus elimination
Hepatitis B
Dengue vaccines
<table>
<thead>
<tr>
<th>Antigen</th>
<th>Recommendations for all immunization programmes</th>
<th>Adolescents</th>
<th>Adults</th>
<th>Considerations (see footnotes for details)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>BCG</strong></td>
<td>1 dose</td>
<td></td>
<td></td>
<td>Exceptions HIV</td>
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<tr>
<td><strong>Hepatitis B</strong></td>
<td>3-4 doses (see footnote for schedule options)</td>
<td>3 doses (for high-risk groups if not previously immunized) (see footnote)</td>
<td></td>
<td>Birth dose&lt;br&gt;Premature and low birth weight&lt;br&gt;Co-administration and combination vaccine&lt;br&gt;Definition high-risk</td>
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<tr>
<td><strong>Polio</strong></td>
<td>3-4 doses (at least one dose of IPV) with DTP</td>
<td>Booster (DTP) 1-6 years of age</td>
<td>Booster (Td) (see footnote)</td>
<td>OPV birth dose&lt;br&gt;Type of vaccine&lt;br&gt;Transmission and importation risk criteria</td>
</tr>
<tr>
<td><strong>DTP</strong></td>
<td>3 doses</td>
<td>Booster (DTP) 1-6 years of age</td>
<td>Booster (Td) in early adulthood or pregnancy</td>
<td>Delayed/interrupted schedule&lt;br&gt;Combination vaccine</td>
</tr>
<tr>
<td><strong>Haemophilus influenzae type b</strong></td>
<td></td>
<td></td>
<td></td>
<td>Single dose if &gt; 12 months of age&lt;br&gt;Not recommended for children &gt; 5 yrs old&lt;br&gt;Delayed/interrupted schedule&lt;br&gt;Co-administration and combination vaccine</td>
</tr>
<tr>
<td><strong>Pneumococcal (Conjugate)</strong></td>
<td>3 doses, with DTP</td>
<td>2 or 3 doses, with booster at least 6 months after last dose</td>
<td></td>
<td>Vaccine options&lt;br&gt;Initiate before 6 months of age&lt;br&gt;Co-administration&lt;br&gt;HIV+ and preterm neonates booster</td>
</tr>
<tr>
<td><strong>Option 1</strong></td>
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<tr>
<td><strong>Option 2</strong></td>
<td></td>
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<tr>
<td><strong>Rotavirus</strong></td>
<td>Rotarix: 2 doses with DTP ROTaTeq: 3 doses with DTP</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Measles</strong></td>
<td>2 doses</td>
<td></td>
<td></td>
<td>Combination vaccine; HIV early vaccination; Pregnancy</td>
</tr>
<tr>
<td><strong>Rubella</strong></td>
<td>1 dose (see footnote)</td>
<td>1 dose (adolescent girls and/or child bearing aged women if not previously vaccinated; see footnote)</td>
<td></td>
<td>Achieve and sustain 80% coverage&lt;br&gt;Combination vaccine and Co-administration&lt;br&gt;Pregnancy</td>
</tr>
<tr>
<td><strong>HPV</strong></td>
<td>2 doses (females)</td>
<td></td>
<td></td>
<td>Target 9-13 year old girls&lt;br&gt;Pregnancy&lt;br&gt;Older age groups ≥ 15 years 3 doses&lt;br&gt;HIV and immunocompromised</td>
</tr>
</tbody>
</table>

Refer to http://www.who.int/immunization/documents/positionpapers/ for most recent version of this table and position papers.

This table summarizes the WHO child vaccination recommendations. It is designed to assist the development of country specific schedules and is not intended for direct use by health care workers. Country specific schedules should be based on local epidemiologic, programmatic, resource and policy considerations.

While vaccines are universally recommended, some children may have contraindications to particular vaccines.
The SAGE report card on the Global Vaccine Action Plan mid-point targets

- **DTP3**: All countries >90% national coverage and >80% in every district by **end 2015**

- **Polio**: transmission stopped by **end 2014**

- **Maternal and neonatal tetanus**: eliminated by **2015**

- **Measles**: eliminated in 4 regions by **end-2015**

- **Rubella**: eliminated in 2 regions by **end-2015**

- **Introduction of under-utilized vaccines**: At least 90 low or middle income countries to have introduced one or more such vaccines by **2015**
The challenges ...
Five areas of weaknesses!

- Weak GVAP implementation
- Poor data quality and use
- Vaccine affordability and supply
- Failures of basic integration
- Situations disrupting immunisation

Source: SAGE GVAP assessment report, 2013
In 2014, 3.2 million infants did not receive 3rd dose of DTP in the Eastern Mediterranean Region - almost exclusively in security compromised countries.

Source: WHO-UNICEF estimates
Great efforts to reach all in EMR countries!
The global coverage with 3rd dose of DTP containing vaccines could be much higher with reduced drop-out between 1st and 3rd doses.


Immunization Vaccines and Biologicals, (IVB), World Health Organization
WHO Member States 194
Exit interviews - Missed opportunities study, Malawi 2015

N = 611
Total respondents

527 (86%)
Had vaccination card

434 (82%)
Eligible for vaccination

ONLY 101 (23%)
Vaccinated

Reasons for non vaccination during visits at health facilities

Vaccination Visits
- No vaccines
- Other supplies were out-of-stock
- Health worker did not ask

Medical Consultations
- Vaccine not the purpose of this visit
- Today not a vaccination day
- Vaccines can cause problems
- Vaccination area was closed

Source: WHO/MOH, draft 2015
Vaccine hesitancy

Special Issue on Vaccine Hesitancy, “Vaccine”, Aug 2015

Development of network of centres of excellence that can support countries

European Region guide to “tailoring programmes”
Canadian company offers help for Irish BCG vaccine shortage

Indian Academy of Paediatrics counsel parents to accept the vaccine's side-effects, which

Acute BCG vaccine shortage: Denying newborns precious gift of life

Babies hurting as shortage hits painless DPTP vaccines

Shortage of 6-in-1 vaccine leaves children vulnerable
Impact of stock-outs on coverage:

In 2014, 33 countries reported interruptions in immunization service delivery due to vaccine shortages, including low- and high-income countries.

In 17 countries, the estimated reduction in coverage due to stock-outs averaged 6.7% for DTP, 5.1% for Polio and 4.2% for BCG.

FOR BCG – in 2015, there is a shortfall of 16.5 m doses against the UNICEF total demand of 152.2 m doses.

Source: WHO/UNICEF, JRF, 2014
Some thoughts on the ways forward
THE NEW “REALITY” OF EPI

1980s realities  |  2010 reality
--- | ---
**Diseases vaccinated against** | 2.5x
**Vaccine doses per child (#)** | 3.0x
**Vaccine volume per fully immunized child (cm³)** | 11.0x
**Immunization cost per child ($)**
(including delivery cost) | 2.5x
**Population growth** | 1.7x
**Age groups targeted for vaccination** | Life course

Source: BMGF/WHO
Immunity Profile, Polio Vaccination Status of Non Polio Acute Flaccid Paralysis Cases, AFR Region

NP AFP Cases with Zero Doses
Last 12 months

Polio vaccination Status of NP AFP Cases, 6-59 Months
AFR 2008-2014

Source: AFP case based surveillance database, 2014
Meeting the GVAP goals requires “TO REACH EVERY COMMUNITY”

- Additional service delivery points
- Additional contacts (2nd year booster doses; Adolescent vaccination...)
- Increased managerial capacity
Work together towards simplified policies/procedures

Controlled Temperature Chain (CTC)

Low-dose vaccine vials

Delivery technology & vaccine presentation
Need to improve recording and retention of information on individual vaccinations

Prevalence of home-based records - latest national estimates, MICS or DHS survey results, 2000-2013
Sustained financing -

Increased national funding

GAVI support and market shaping efforts

Projection of Future Resource Requirements**

- Campaigns
- Other capital equipment
- Cold chain equipment
- Vehicles
- Other routine recurrent costs
- Transportation
- Personnel
- Injection supplies
- New Vaccines
- Underused Vaccines
- Traditional Vaccines

Resource requirements, EPI/Mozambique, 2014-18
Improved accountability

**Countries** to establish an annual process for monitoring and accountability through an independent body, for example the National Immunization Technical Advisory Group (NITAG).

**Regions** to strengthen the process of annual progress review through their regional technical advisory committees and report annually to the respective Regional Committees.
• At global level, each year, thorough independent reviews by SAGE and discussions at WHA on GVAP progress

• Side technical meetings during WHA as appropriate
Major causes of under 5 deaths, 2000 and 2013

- Other
- Injuries
- Congenital anomalies
- Sepsis/newborn infectious conditions
- Birth asphyxia/trauma
- Prematurity
- Malaria
- Meningitis/encephalitis
- Measles
- Tetanus
- Pertussis
- Acute respiratory infections
- Diarrhoeal diseases
- HIV/AIDS

Reported Measles Incidence Rate, Aug 2014-Jul 2015

REACHING AND SUSTAINING HIGH AND EQUITABLE COVERAGE IS IMPERATIVE!

Outbreaks represent cases reported to WHO through Aug 2015 except where noted †:
DRC through Epi Week 31 of 2015
Somalia through Epi Week 27 of 2015

Data source: surveillance DEF file
Conclusions

The 40 years of evolution of EPI has led to remarkable progress and also increasing complexity, exposing the fragility of the health systems – As such, the full potential of immunization is still untapped

The Global Vaccine Action Plan offers solutions, which implementation requires greater country ownership as well as sustained and concerted efforts of stakeholders

Ebola, Conjugate Meningitis A vaccines offer lessons on the need for developing vaccines suitable for use against diseases affecting mostly the developing countries. The DCVMN has a major role to play.
Together we can make it happen!

http://www.who.int/immunization/global_vaccine_action_plan/en/
delivery technologies ...

Tetanus Toxoid Uniject and Penta Uniject

Compact, pre-filled, auto-disable injection technology:

- Correct dosage
- All-in-one design: reduces logistics workload
- Well accepted by health workers and clients
- Reduction in time required by the health worker to deliver vaccination
- Reliance on outreach services for delivery of vaccination
- Crowded & busy health centres: time-saving
- Where opened vial wastage is high
MenAfriVac roll-out 2010 – 2014

Men A cases declined from 75% in 2009 to 2% in 2014 in African meningitis belt

Number of Persons Vaccinated (Millions)

- 2010: 19.2
- 2011: 54.6
- 2012: 103.2
- 2013: 153.6
- 2014: 217.1
- 2015: 58.8
- 2016: 276.7
HPV: The challenge is to ensure that girls are protected in areas where the risk is greatest

Data Source: WHO/IVB Database, as at 23 January 2014
Map production: Immunization Vaccines and Biologicals, (IVB), World Health Organization

Risk of cervical cancer

HPV vaccine introduced

* Includes partial introduction

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