WHO estimates that 453,000 child deaths occurred during 2008 due to rotavirus infection. 82% of these deaths occurred in 20 countries.
40 Countries Have Introduced Rotavirus Vaccines by 2012

Data Source: Joint Reporting Form, 2011 and NUVI database

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

Date of slide: 11 September 2012

* Includes partial introductions
Countries that participated in 2011 WHO surveillance network with data reported each period and ≥100 children enrolled

Data Source: Joint Reporting Form, 2011 and NUVI database
Map production: Immunization Vaccines and Biologicals, (IVB), World Health Organization
Date of slide: 11 September 2012
* Includes partial introductions

- Introduced* (40 countries or 21%)
- Planned introduction in 2012 (10 countries or 5%)
- Planned introduction in 2013 (6 countries or 3%)
- Not Introduced (138 countries or 71%)
- Not applicable

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WHO Rotavirus surveillance Network, 2011

64 countries

185 sentinel sites

Source: WHO/IVB New Vaccines database
Data collected from WHO Regions.

58 Member States reported clinical data
6 Member States reported genotype data only
Annual Rotavirus Detection (2011): Criteria

- Countries with > 100 specimens tested
- Countries with specimens tested for each month to ensure information available for each season (seasonal variation in rotavirus disease)
Example of Rotavirus Detection in Member State that has Introduced Rotavirus Vaccine

**Honduras**

Vaccine introduced in 2007

<table>
<thead>
<tr>
<th>Year</th>
<th>% RV Detection</th>
<th>Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>30</td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>90</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>n= tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>1907</td>
</tr>
<tr>
<td>2009</td>
<td>1900</td>
</tr>
<tr>
<td>2010</td>
<td>1994</td>
</tr>
<tr>
<td>2011</td>
<td>2215</td>
</tr>
</tbody>
</table>

**Brazil**

Vaccine introduced in 2006

<table>
<thead>
<tr>
<th>Year</th>
<th>% RV Detection</th>
<th>Coverage</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>60</td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td>90</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Year</th>
<th>n= tested</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>705</td>
</tr>
<tr>
<td>2009</td>
<td>852</td>
</tr>
<tr>
<td>2010</td>
<td>779</td>
</tr>
<tr>
<td>2011</td>
<td>779</td>
</tr>
</tbody>
</table>
Global Rotavirus Information and Surveillance Bulletin

Volume 6: October 2012

Reporting period: January to December 2011

The Global Rotavirus Information and Surveillance Bulletin is produced by the World Health Organization (WHO) twice a year to share activities and data from the WHO-coordinated global surveillance network with partners at the national, regional and global levels.

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</tr>
<tr>
<td>o EMR RRL: NAMRU-3, Cairo, Egypt</td>
<td>2</td>
</tr>
<tr>
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<td>3</td>
</tr>
<tr>
<td>Microbiology, Minsk, Belarus</td>
<td></td>
</tr>
<tr>
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Spotlight on an Update from the Global and Regional Reference Laboratories:
The following updates from the laboratory network are provided to share information on the many activities undertaken to ensure this surveillance network produces high quality data that is useful for decision makers at national, regional, and global levels.

RRL: WHO AFR

Summary report on Rotavirus Activities during 2011-2012 at the Rotavirus Regional Reference Laboratory (RRL) for AFR: MEDUNSA, DPRU

WHO/AFRO and the Rotavirus Regional Reference Laboratory (RRL) in South Africa / MRC Diarrhoeal Pathogens Research Unit (DPRU) continue to support rotavirus surveillance in Africa.

The RRL with support from WHO/AFRO organised the 11th African Region Rotavirus Surveillance Network (AFR RSN) Rotavirus surveillance data reporting period: January - December 2011

Photo: Workshop at RRL MENDUSA

Percent Distribution of Rotavirus Genotypes among specimens typed by Country (n=4,736), 2011

Vietnam n=673
Papua New Guinea n=22
Mongolia n=133
Lao People’s Democratic Republic n=131
Fiji n=146
China n=120
Cambodia n=165
Ukraine n=88
Tajikistan n=50
Republic of Moldova n=49
Kyrgyzstan n=50
Georgia n=47
Belarus n=68
Armenia n=49
Azerbaijan n=56
Sudan n=489
Cuba n=31
Mexico n=281
Honduras n=50
Guatemala n=26
El Salvador n=131
Brazil n=323
Zimbabwe n=24
Zambia n=54
Uganda n=70
Togo n=51
United Republic of Tanzania n=335
South Africa n=45
Senegal n=50
Nigeria n=48
Niger n=1
Mauritius n=52
Kenya n=50
Guinea-Bissau n=48
Ghana n=74
Ethiopia n=55
Democratic Republic of the Congo n=127
Cote d’Ivoire n=14

0% 10% 20% 30% 40% 50% 60% 70% 80% 90% 100%
Making the most of rotavirus immunization
**Previously recommended Rotavirus immunization schedule (2009)**

<table>
<thead>
<tr>
<th>Vaccine</th>
<th>Age at 1st dose</th>
<th>No. Doses</th>
<th>Interval 1st to 2nd dose</th>
<th>Interval 2nd to 3rd dose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotarix RV1</td>
<td>6 weeks (min) with DTP1 \n15 weeks (max)</td>
<td>2</td>
<td>4 weeks (min) with DTP2 \nNo later than 32 weeks of age</td>
<td></td>
</tr>
<tr>
<td>Rota Teq RV5</td>
<td>6 weeks (min) with DTP1 \n15 weeks (max)</td>
<td>3</td>
<td>4 weeks (min) with DTP2 \nNo later than 32 weeks of age</td>
<td>4 weeks (min) with DTP3 \nNo later than 32 weeks of age</td>
</tr>
</tbody>
</table>
SAGE critically reviewed new evidence with the aim of assessing if additional deaths could be prevented (April 2012)

- epidemiology in young children from more than 30 countries
- vaccine efficacy and effectiveness of different immunization schedules in different settings;
- improved estimates of actual age at vaccination, coverage and the benefits in different epidemiological settings;
- and revised estimates of the risk of intussusception after rotavirus vaccination.
SAGE was informed by separate reviews by:

- the **Global Advisory Committee on Vaccine Safety**
- the **Immunization Practice Advisory Committee** and
- An ad-hoc Rotavirus experts consultation.
Immunizing children against rotavirus: Making the most of every contact

Malawi
To maximize its impact rotavirus vaccine has to be given before Rotavirus Gastro-Enteritis occur.

Hospital admissions due to Rotavirus Gastro-Enteritis in Malawi

% of all cases aged < 60 months occurring each week

Source: Turner et al
Analysis by Sanderson C et al (2011)
It is critical to administer each dose of vaccine at the recommended age & to achieve high coverage.
Rotavirus vaccine coverage needs to be high among children at higher risk of rotavirus infection and death.

![Graph of Malawi DHS 2007-9: DTP1 coverage by age and wealth quintile](image)

Analysis by Sanderson C et al 2012
The benefits of rotavirus vaccine outweigh the potential risks

453,000 deaths due to rotavirus infection globally

<table>
<thead>
<tr>
<th>Immunization schedule</th>
<th>Potential vaccine associated intussusception deaths</th>
<th>Estimated rotavirus deaths averted</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age restricted</td>
<td>288 (99 to 688)*</td>
<td>156,100 (110,100 to 201,800)</td>
</tr>
<tr>
<td>No age restriction</td>
<td>605 (310 to 1,133)*</td>
<td>199,200 (140,700 to 255,400)</td>
</tr>
</tbody>
</table>

**Difference**

| 317 additional vaccine associated IS deaths (211 to 445) | 43,100 additional rotavirus deaths (30,600 to 53,500) |

Source: Patel M, Clark A et al 2012)
The risk benefit analysis continues to favour rotavirus vaccination

The previous age restrictions for the first dose (=<15 weeks) and last dose (=<32 weeks) were preventing vaccination of many vulnerable children.
By removing age restrictions, programmes will be able to immunize children who are currently excluded from the benefits of rotavirus vaccines and this is likely to include some of the children most vulnerable to severe rotavirus disease.

Many thousands more deaths would be averted, but with a small additional increase in intussusception cases.
SAGE also noted that in view of the age distribution of rotavirus disease, providing rotavirus vaccine to children older than 24 months of age will be of little benefit.
SAGE continues to recommend that the first dose of rotavirus vaccine be administered along with DTP doses, as soon as possible after 6 weeks of age as this maximizes disease protection.
SAGE recognized that countries have

- different burdens of disease and

- may or may not have introduced rotavirus vaccines.

For this reason, countries should develop country-specific plans on how the removal of age restrictions on vaccine administration can be introduced in a manner that supports existing programmes.
SAGE requests WHO to develop tools to support country decision-making and

where possible National Immunization Technical Advisory Groups (NITAGs) and

Regional Technical Advisory Groups (RTAGs) should assist this process.
Due to the small risk of intussusception after rotavirus vaccine administration, caregivers should be informed of this risk and be adequately counselled to recognize early signs of intussusception, and encouraged to present cases immediately for medical attention.
SAGE recognized that a comprehensive communication strategy that explains the reasons for this change of schedules should be developed and made available to all stakeholders including policymakers, programme managers, communities and parents, and requested WHO to develop appropriate tools.
Global evidence used to inform SAGE recommendation  http://perso.epita.fr/~costa_k/RotavirusProjectVersion2/
To maximize rotavirus vaccine impact

- Vaccine has to be given before Rotavirus Gastro-Enteritis (RVGE) occurs.
- It is critical to administer the 1st dose at 6 weeks or soon thereafter.
- Vaccine coverage needs to be high, specially among children at higher risk of rotavirus death and in poor settings.
- The benefits of rotavirus vaccine (estimated RVGE deaths averted) outweighs the risks (potential intussusception deaths associated with rotavirus vaccine).
To ensure adequate implementation of these SAGE recommendations countries should:

• Develop country-specific plans on how rotavirus vaccine can be introduced in a manner that strengthen existing immunization programmes.

• Enrich and contrast global data with other locally relevant data

• Use NITAG members, decision makers at the national immunization programme and other key stakeholders to review and discuss this data together with any other available evidence.
Information Resources

- WHO pre-qualified vaccines

- Vaccine introduction guidelines

- Rotavirus vaccine resources

- Global evidence used to inform SAGE recommendation
  - [http://perso.epita.fr/~costa_k/RotavirusProjectVersion2/](http://perso.epita.fr/~costa_k/RotavirusProjectVersion2/)
TODAY's evidence comes from…

- Epidemiology data (29 countries)
- Observational studies (11 countries)
- RCTs (20 countries)

The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted lines on maps represent approximate border lines for which there may not yet be full agreement.

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