Diarrheal disease is one of the world’s leading killers of children, and rotavirus is the most common cause of severe diarrhea. Each year, nearly a quarter of a million children under the age of five die from rotavirus and hundreds of thousands more are hospitalized [1,2]. Five countries, including Nigeria and the Democratic Republic of the Congo (DRC), account for half of the rotavirus deaths in the world [3].

On average, rotavirus kills more than 330 African children under age five every day and causes a significant proportion of diarrheal disease hospitalizations [3]. In 2010, rotavirus accounted for 42% of all diarrheal disease hospitalizations in sub-Saharan Africa [4].

The World Health Organization (WHO) recommends that all countries introduce rotavirus vaccines into their national immunization programs.

Safe and effective rotavirus vaccines are available today

Two WHO prequalified, orally administered rotavirus vaccines are available today: Rotarix® (GlaxoSmithKline) and RotaTeq® (Merck & Co., Inc.). Both vaccines have been shown to be safe and effective in large-scale clinical studies in Asia, Africa, the Americas, and Europe [5-20].

Rotavirus vaccines provide broad protection, even against virus strains not included in the vaccine. They have also been shown to reduce rotavirus-related hospitalizations among children and adults who are too old to be vaccinated, demonstrating herd immunity [5-8, 21].

33 African countries have introduced rotavirus vaccines into their national immunization programs to date, but many of the countries with the highest rotavirus mortality rates—like the Central African Republic, Chad, the Democratic Republic of the Congo, Nigeria, and Somalia—have yet to introduce rotavirus vaccines.

Rotavirus takes an economic toll on families and health systems

In Uganda, in-patient admission for one episode of severe rotavirus diarrhea costs 10% of the average family’s monthly income [22].

Recent studies show that national rotavirus vaccination programs will be highly cost-effective and also reduce healthcare costs due to rotavirus-related illness [22-25].
Rotavirus vaccines demonstrate substantial impact in Africa

Since South Africa became the first African country to introduce rotavirus vaccines in 2009, 33 countries in Africa have introduced rotavirus vaccines into their national immunization programs [26].

- After Rwanda became the first low-income country in the world to introduce the pentavalent rotavirus vaccine in 2012, hospital admissions for acute gastroenteritis decreased by about half [33]. Researchers also noted a decrease in rotavirus diarrhea hospitalizations in almost every age group, suggesting herd immunity [33].
- Within two years of vaccine introduction, Zambia experienced 51% and 31% reductions in rotavirus hospitalizations for infants and one-year-olds, respectively [32].
- In Botswana, there has been a 43% and 48% reduction in gastroenteritis-related hospitalizations and deaths in infants during the rotavirus season, respectively [27].
- In Malawi, a low-income country where health expenditures have substantially increased in the last decade, rotavirus vaccine is highly cost-effective [25].
- Togo’s June 2014 introduction of monovalent rotavirus vaccine has already demonstrated impressive results in the first rotavirus season post-introduction: 43% reduction in rotavirus hospitalizations for infants [34].
- In the first two years following introduction in South Africa, all-cause diarrhea hospitalizations declined by one-third for children under five [34]; a recent study in urban Soweto observed a 34-57% reduction in the overall incidence of all-cause diarrhea hospitalization in children under five [31]. The vaccine has been effective in reducing the incidence of both rotavirus and uninfected children [31].

Over 20 years, implementing the rotavirus vaccine in Malawi’s national immunization program will avert US$8 to US$9 million in health care costs [25].

<table>
<thead>
<tr>
<th>Country</th>
<th>Year of national rotavirus vaccine introduction</th>
<th>Data time period Pre-vaccine</th>
<th>Data time period Post-vaccine</th>
<th>Reduction in rotavirus diarrhea hospitalizations among children &lt;5 years following introduction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ghana [28]</td>
<td>2012</td>
<td>Jan 09 - Mar 12</td>
<td>Apr 12 - Dec 14</td>
<td>49%</td>
</tr>
<tr>
<td>Rwanda [33]</td>
<td>2012</td>
<td>Jan 09 - Dec 11</td>
<td>Jan 12 - Dec 14</td>
<td>61-70%</td>
</tr>
<tr>
<td>South Africa [34]</td>
<td>2009</td>
<td>May - Dec 09</td>
<td>May - Dec 10; May - Dec 11</td>
<td>54-58%</td>
</tr>
<tr>
<td>Togo [35]</td>
<td>2014</td>
<td>Jul 08 - Jun 14</td>
<td>Jul 14 - Jun 15</td>
<td>32%</td>
</tr>
<tr>
<td>Botswana [27]</td>
<td>2012</td>
<td>Jan 09 - Dec 12</td>
<td>Jan 13 - Dec 14</td>
<td>43%*</td>
</tr>
<tr>
<td>Ghana [28]</td>
<td>2012</td>
<td>Jan 09 - Mar 12</td>
<td>Apr 12 - Dec 14</td>
<td>52%</td>
</tr>
<tr>
<td>Malawi [29]</td>
<td>2012</td>
<td>Jan 12 - Jun 12</td>
<td>Jan 13 - Jun 15</td>
<td>48.2%</td>
</tr>
<tr>
<td>Rwanda [30]</td>
<td>2009</td>
<td>Jan 09 - Dec 11</td>
<td>Jan 12 - Dec 14</td>
<td>51-55%</td>
</tr>
<tr>
<td>South Africa [31]</td>
<td>2009</td>
<td>Jan 06 - 2008</td>
<td>Jan 10 - Dec 14</td>
<td>44.9-65.4%</td>
</tr>
<tr>
<td>Zambia [32]</td>
<td>2013</td>
<td>Jan 09 - Dec 11</td>
<td>Jan 13 - Dec 14**</td>
<td>18-29%</td>
</tr>
</tbody>
</table>

Study methodologies differ, so the studies are not directly comparable. RotaTeq used in Rwanda, all others used Rotarix.

* During rotavirus season; ** 2012 excluded as transition year

Rotavirus vaccines are essential to a comprehensive approach to fighting childhood diarrhea disease, and the ROTA Council strongly endorses the recommendation by WHO that all countries introduce rotavirus vaccines as soon as possible.

References: