

Rotavirus vaccine – Status & Coverage in Africa

Ved Singh¹, Debasish Saha¹, Bernd Benninghoff¹

¹GSK, Wavre, Belgium

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Before rotavirus (RV) vaccine introduction, RV diarrhea was responsible for 40% of diarrheal deaths among children under 5 years old worldwide. Sub-Saharan Africa suffered from the heaviest burden of RV disease. In 2000, the reported number of RV deaths in children <5 years was 249,612 in the region, representing 45.5% of all diarrheal deaths.[1]

In 2009, the World Health Organization (WHO) recommended universal RV vaccination and particularly in countries with high mortality caused by diarrhea. Since then, the overall burden of diarrheal diseases has decreased but remains high in the sub-Saharan region where an estimated 104,733 RV deaths were reported in children <5 years in 2016.[2]

By end of 2018, 34 out of the 47 countries in the WHO African region had introduced RV vaccination into their national immunization program (see Table) predominantly with 2 doses of the monovalent RV vaccine (RV1, *Rotarix*, GSK) or, in 4 countries, with 3 doses of the pentavalent RV vaccine (RV5, *Rotateq*, Merck). Since vaccines introduction, vaccination impact studies have reported declines of 17 to 57% in diarrhea-related hospitalizations and 35 to 80% decrease in RV-specific hospitalizations of children <5 years in countries having implemented RV vaccination programs.[3]

In Malawi, where a coverage of 90.6% for the 2-dose RV1 was reported between 2012 and 2015, a population-based birth-cohort study estimated a 31% decline of diarrhea-associated mortality in infants <1 year.[4] The vaccination impact on diarrhea-associated mortality was observed to increase from 39% to 68% when coverage rose from 89% to 95%.

In Rwanda, a coverage rate of 98–99% for RV vaccination with RV5 was reached in 2013 and 2014. During these two years following vaccine introduction, gastroenteritis hospitalizations decreased by 49% and 48% respectively, and RV-specific hospitalizations decreased by 61% and 70%.[5]

As exemplified in Malawi and Rwanda, the impact of vaccination is found to be driven by the coverage achieved. In countries from the Eastern and Southern African regions that have introduced RV vaccination, the decrease in RV positivity correlates the increase in vaccine coverage.[6]

Additionally, evidence of positive benefits beyond those already estimated during clinical development is observed – i.e. herd effects, reduction of nosocomial RV infections, significant cost savings for healthcare systems – while no higher risk of intussusception has been found in vaccinated children.[3,7]

Based on that body of evidence, coverage appears key for maximizing the impact of existing RV vaccination programs in Africa. Moreover, RV vaccination is yet to be introduced in some of the African countries suffering from the highest RV mortality rates. An estimated additional 273,000 hospitalizations and 47,000 deaths related to RV could be prevented annually in Africa with a vaccine coverage similar to other routine infant vaccinations.[3]

In conclusion, despite real-world data confirming the multiple benefits of RV vaccination, the overall uptake remains sub-optimal. Awareness of its great impact is critical for motivating healthcare professionals and caregivers to continue vaccinating and convincing policy makers that high coverage will be the key for a long-term, and sustained RV control.

Country	2013 RV Mortality Rate* per 100,000 (<5years)	RV vaccine and introduction year	2017 coverage (%)
Algeria	11.2		
Angola	240.8	RV1 - 2014	68

Benin	64.3		
Botswana	21.4	RV1 - 2012	72
Burkina Faso	83.5	RV5 - 2013	91
Burundi	81.8	RV1 - 2013	93
Cabo Verde	10.3		
Cameroon	90.4	RV1 - 2014	83
Central African Republic	122.9		
Chad	172.6		
Comoros	55.3		
Congo	19.8	RV1 - 2014	80
Côte d'Ivoire	85.2	RV5 - 2017	54
Democratic Republic of the Congo	113.6		
Equatorial Guinea	66.6		
Eritrea	38.9	RV1 - 2014	96
Ethiopia	47.8	RV1 - 2013	94
Gabon	27.3		
Gambia	45	RV1 - 2013	93
Ghana	48.6	RV1 - 2012	97
Guinea	69.1		
Guinea-Bissau	107.4	RV1 - 2015	82
Kenya	55.5	RV1 - 2014	67
Lesotho	62.8	RV1 - 2017	NA
Liberia	45.7	RV1 - 2016	87
Madagascar	41.2	RV1 - 2014	88
Malawi	38.7	RV1 - 2012	85
Mali	127.7	RV5 - 2014	73
Mauritania	75.3	RV1 - 2014	89
Mauritius	1.3	RV1 - 2015	90
Mozambique	60.8	RV1 - 2015	94
Namibia	27.4	RV1 - 2014	86
Niger	107.6	RV1 - 2014	89
Nigeria	100.8		
Rwanda	37.6	RV1 - 2012	99
Sao Tome and Principe	32.5	RV5 - 2016	95
Senegal	28.4	RV1 - 2014	94
Seychelles	0.6		
Sierra Leone	208.2	RV1 - 2014	92
South Africa	16.6	RV1 - 2009	81
Sudan	85.6	RV1 - 2011	95
Swaziland	60.4		
Togo	60.1	RV1 - 2014	90
Uganda	43.5	RV1 - 2018	
United Republic of Tanzania	29.5	RV1 - 2012	97
Zambia	65.6	RV1 - 2013	96
Zimbabwe	63.3	RV1 - 2014	96

RV Mortality rate and vaccination programs in WHO African countries.

RV, Rotavirus; RV1, monovalent rotavirus vaccine; RV5 pentavalent rotavirus vaccine; WHO, World Health Organization.

*from https://www.who.int/immunization/monitoring_surveillance/burden/estimates/rotavirus/en/
Vaccination data extracted from <http://www.view-hub.org>

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