Rotavirus disease burden in Africa and the need to accelerate introduction of vaccines

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Diarrhoea is a major cause of death among children under five years of age globally. Rotavirus is the leading cause of severe diarrhoea, resulting in an estimated 453,000 deaths in 2008, most of which occurred in developing countries of sub-Saharan Africa and South-East Asia. Rotavirus also causes considerable morbidity, with global estimates of 2.3 million hospitalizations and 24 million outpatient visits annually among children aged under five years. Rotavirus vaccines are an essential part of an integrated approach to the control of diarrhoea that also includes interventions, such as access to safe drinking water, sanitation and hand washing facilities; breastfeeding; vitamin A and zinc supplementation; and appropriate case management. In 2009, WHO made a recommendation that Member States consider introducing rotavirus vaccines in all national immunization programmes and particularly in countries with high diarrhoea-related mortality.

This article, the result of a literature review, highlights published regional and country specific annual deaths in the WHO Regional Office for Africa.

Methods

In order to estimate the number of deaths attributable to rotavirus infection prior to widespread introduction of rotavirus vaccines, available published papers were reviewed to establish the baseline of rotavirus mortality before the introduction of rotavirus vaccines. PubMed was searched, with the keyword “rotavirus” as a primary search term, to identify studies published between

SUMMARY—It is important to establish the burden of rotavirus disease before and after the introduction of a rotavirus vaccine. Regional efforts have focused on building an unequivocal evidence base for rotavirus diarrhoea to support decision-making and sustained investment in new vaccine introduction. WHO recommends routine use of rotavirus vaccines in all countries, particularly in those with high mortality attributable to diarrhoeal disease. In countries where diarrhoeal deaths account for more than 10% of mortality in children aged under five years, the introduction of the vaccine is strongly recommended. This article reviews the available literature and summarizes the estimated number of deaths in children under five years attributable to rotavirus diarrhoea in the WHO African Region. Based on the available data, it can be concluded that the rotavirus disease burden is very high and that the introduction of rotavirus vaccines should be accelerated in the Region.

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January 2001 and January 2011 and before the roll out of rotavirus vaccines in the African Region. Papers citing data from countries that participated in the WHO-coordinated Rotavirus Surveillance Network during 2009 and which detected rotavirus-related diarrhoea with enzyme immunoassay (EIA) in at least 100 children under five years who were admitted to hospital with diarrhoea were included.6 For the countries with several sites, data from all sites were used. In this analysis, for countries that have introduced rotavirus vaccine into their national immunization programme, data subsequent to the introduction were excluded since the main objective was to establish a baseline of the rotavirus specific mortality pre-introduction of vaccines.

**Results**

Data from the regional Rotavirus Surveillance Network, a network of sentinel surveillance sites in over 21 countries, indicate that rotavirus is responsible for approximately 40% of acute gastroenteritis hospitalizations among children under five years prior to widespread use of rotavirus vaccination (Table 1). Some of these data from the Rotavirus Surveillance Network were cited in the literature reviewed.
In the published analysis, Tate et al (2012) estimate that worldwide, each year, rotavirus-related diarrhoea results in 453,000 deaths (ranging from 420,000 to 494,000) in children younger than five years, which account for 37% of diarrhoea-related deaths and 5% of all deaths in this age group. More than half of these deaths (230,000) occurred in African children. Rotavirus sentinel surveillance data available from sub-Saharan Africa were used in these disease estimates and the country specific rotavirus annual death rates in the African Region. The figures were modified from Tate et al (2012).

### Discussion

Country and regional specific data on annual rotavirus death exist and are available via published literature and the WHO web site.

Nine of the ten countries in the African Region with the highest annual deaths due to rotavirus have established sentinel surveillance, generating high quality data. Six of the ten countries have either introduced or are scheduled to introduce rotavirus vaccines in their national immunization programmes. Hence, it will be possible to use this established surveillance system to monitor the impact of rotavirus vaccines and conduct another analysis three years after vaccine introduction to determine the vaccination programme’s impact, including on circulating rotavirus strains.

### Conclusion

Survelliance data and data from other sources have been used to estimate deaths due to rotavirus. This information has been used to advocate for rotavirus vaccine introduction and to monitor the effect of vaccination on mortality before and after the introduction of vaccines. Introduction of commercially available rotavirus vaccines could substantially reduce deaths attributable to diarrhoea in the African Region.

### References


5. WHO. Rotavirus vaccines. WHO position paper.


