

# Impact of rotavirus vaccine on all-cause diarrhea and rotavirus hospitalizations in Madagascar the first four years after rotavirus vaccine introduction

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## Background

Rotavirus vaccine was introduced into the Extended Program on Immunization in Madagascar in May 2014. Nationally, rotavirus vaccination coverage increased from 39% in 2014 to 77% in 2017. We analyzed trends in prevalence of all cause diarrhea and rotavirus hospitalizations in children < 5 years of age before and after vaccine introduction at Centre Hospitalier Universitaire Mère Enfant Tsaralàlana (CHU MET).

## Methods

We reviewed the hospital admission logbook from January 2010 to December 2018 and recorded the number of hospitalizations due to all-cause acute gastroenteritis (AGE) among 11,540 children < 5 years old admitted during the peak diarrhea season. Peaks rotavirus season were in April-June and October-November. For the logbook analysis, we considered 2010-2013 to be the pre-rotavirus vaccine years and 2015-2018 to be the post-rotavirus vaccine years. Active sentinel hospital rotavirus surveillance was conducted June 2013-Dec 2018, with support from the World Health Organization. We compared the percentage of rotavirus positive stool specimens during the peak rotavirus season in the pre-rotavirus vaccine introduction period (June 2013-May 2014) with the post-vaccine period (June 2014-May 2018). Rotavirus was detected at the sentinel site laboratory by EIA from stool specimens of eligible children with gastroenteritis.

## Results

Diarrhoea hospitalizations decreased after rotavirus vaccine introduction. During the peak rotavirus season, the average proportion of hospitalizations due to AGE was 37% (range: 41% to 23%) before vaccine introduction; the proportion was 39% the year of vaccine introduction, 22% in 2015, 19% in 2016, 20% in 2017, and 16% in 2018. The post-vaccine introduction average is 44% lower than the proportion of hospitalizations due to AGE pre-vaccine introduction during the peak rotavirus season. Rotavirus positivity in the sentinel surveillance data paralleled patterns observed in AGE hospitalizations at the site. Before vaccine introduction, 68% of stool specimens tested positive for rotavirus during the peak diarrhea season; the percent positive was 47% in 2014/2015, 17% in 2015/2016, 25% in 2016/2017 and 20% in 2017/2018. The rotavirus positivity in 2017/2018 was reduced by 71% compared to the percentage of positive specimens in 2013/2014.

## Conclusion:

Following rotavirus vaccine introduction, AGE and rotavirus-specific hospitalizations declined dramatically during the peak rotavirus season in Madagascar. As vaccination coverage increased, we observed a corresponding decline in rotavirus diarrhea and AGE. While our study was limited to a single sentinel site in Antananarivo, the capital city of Madagascar, we expect these benefits in other parts of the country as coverage continues to improve nationwide. Ongoing sentinel surveillance should be supported to measure the long-term rotavirus vaccine impact in Madagascar.