Re-evaluating the cost and cost-effectiveness of rotavirus vaccination in Bangladesh, Ghana, and Malawi: a comparison of three rotavirus vaccines

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Background

Diarrhea is a leading cause of mortality worldwide and rotavirus accounts for many of these deaths. More than 90 countries have introduced rotavirus vaccines into their national immunization programs. Two rotavirus vaccines, Rotarix® and RotaTeq®, have been WHO-prequalified since 2009, with Rotarix® being the preferred product of most Gavi-supported countries. ROTAVAC® and ROTASIIL® have recently been prequalified.

Methods

We reevaluated the costs and cost-effectiveness of rotavirus vaccination in Bangladesh, Ghana, and Malawi and compared Rotarix®, ROTAVAC®, and ROTASIIL® in each country. For consistency with previous estimates, we used the same Excel-based cohort model and much of the same data as the original analyses. We varied the expected price (with and without Gavi subsidy), wastage, and incremental health system costs associated with each vaccine. We assumed the same efficacy and waning assumptions following administration of two or three doses for the respective product.

Results

The discounted cost per DALY averted compared to no vaccination ranged from 0.3 – 1.3 times GNI per capita for all vaccines. With the Gavi subsidy, the average cost-effectiveness ratios were below 0.3 times GNI per capita in all three countries. Though critical empirical cost data are not yet available, Rotarix® is the least costly and most cost-effective product in the countries examined in this modelling study. However, small decreases in the incremental health system cost for other products could result in cost and cost-effectiveness outcomes that match or surpass those of Rotarix®.

Conclusion

Countries may wish to consider new rotavirus vaccines entering the market. Countries should carefully examine multiple product attributes including price and the incremental health system costs associated with each vaccine. These costs will vary by country and may be a defining factor in determining the least costly and most cost-effective product for the population.