

Potential Impact and cost-effectiveness of rotavirus vaccination in Afghanistan

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Introduction

Despite great progress made in child survival in the past 20 years, 5.9 million children under five years died in 2015, with 9% of these deaths due to diarrhea. Rotavirus is responsible for more than a third of diarrhea deaths. In 2013, rotavirus was estimated to cause 215,000 deaths among children under five years, including 89,000 in Asia. As of April 2017, 92 countries worldwide have introduced rotavirus vaccination in their national immunization program. Discussions around doing the study were concomitant to discussion about applying to Gavi for support. This study estimates the potential impact and cost-effectiveness of a national rotavirus immunization program in Afghanistan.

Methods

This study examined the use of Rotarix® (RV1) administered using a two-dose schedule at 6 and 10 weeks of age. We used the ProVac Initiative's UNIVAC model (version 1.2.09) to evaluate the impact and cost-effectiveness of a rotavirus vaccine program compared with no vaccine over ten birth cohorts from 2017 to 2026 with a 3% annual discount rate. All monetary units are adjusted to 2017 US\$.

Results

Rotavirus vaccination in Afghanistan has the potential to avert more than one million cases; 660,000 outpatient visits; approximately 50,000 hospital admissions; 650,000 DALYs; and 12,000 deaths, over 10 years (table 1). Not accounting for any Gavi subsidy, rotavirus vaccination can avert DALYs at US\$82/DALY from the government perspective and US\$80/DALY from the societal perspective. With Gavi support, DALYs can be averted at US\$29/DALY and US\$31/DALY from the societal and government perspective, respectively. The average yearly cost of a rotavirus vaccination program would represent 2.8% of the total immunization budget expected in 2017 and 0.1% of total health expenditure.

Conclusion

The introduction of rotavirus vaccination presents good value for money in Afghanistan, and even more so with a Gavi subsidy. In 2018, the country has introduced rotavirus vaccine and this study was instrumental in the decision making process and used for advocacy purposes.

Table 1: Changes in outcome with rotavirus vaccine introduction (10 cohorts)

	No vaccine	With vaccine	Averted
Health Outcomes			
Cases	5,045,332	3,824,319	1,221,013
Outpatient visits	2,734,395	2,072,648	661,746
Hospitalizations	203,327	154,120	49,207
Deaths	49,444	37,478	11,966

DALYs (discounted)	2,716,498	2,065,215	651,283
Economic Outcomes (discounted)			
Outpatient visits (Government perspective)	US\$4,085,537	US\$3,104,902	US\$980,635
Outpatient visits (Societal perspective)	US\$8,764,901	US\$6,661,097	US\$2,103,805
Hospitalizations (Government perspective)	US\$1,554,307	US\$1,181,233	US\$373,074
Hospitalizations (Societal perspective)	US\$2,815,416	US\$2,139,643	US\$675,773