

# Oral cholera vaccines to control endemic disease: an economic and epidemiological modelling analysis

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## Abstract

**Background** Cholera is endemic in several Asian and African countries and has gained increased attention in recent years after large outbreaks. Interest is growing about use of oral cholera vaccine to control cholera in endemic settings. We analysed the economics and epidemiology of oral cholera vaccines for this purpose.

**Methods** We assessed repeated cholera vaccination campaigns to prevent outbreaks in high-risk endemic areas. We used a demand forecast to predict the potential year of adoption for various cholera-endemic countries based on country characteristics. We used a dynamic disease transmission model to assess the population-level effect of cholera vaccination programmes on disease incidence and mortality.

**Findings** Demand from 33 endemic countries in Africa and Asia is predicted to be 6–18 million doses in 2015 rising to 62–141 million doses per year by 2022, depending on the assumed programme option. Costs will range from US\$18 million to \$49 million in 2015 and increase to \$140 million–319 million per year by 2022. Between 2015 and 2022, the vaccination programmes could prevent 2.3 million–4.9 million cases of cholera and 75 000–154 000 deaths. All programme options were very cost-effective compared with regional average GDP, with the cost per DALY averted ranging from \$151–785.

**Interpretation** A targeted programme of cholera vaccination using the oral killed whole-cell vaccine in 33 endemic countries would significantly reduce the cholera disease burden and risk of epidemics, and would be cost-effective.