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[1. The projected impact of geographic targeting of oral cholera vaccination in sub-Saharan Africa: A modeling study](#)

Lee E, Azman A, Kaminsky J, Moore S, McKay H, Lessler J.

PLoS Med. 2019 Dec 30;16(12):e1003003.

PubMed ID: 31825965

ABSTRACT

BACKGROUND:

Cholera causes an estimated 100,000 deaths annually worldwide, with the majority of burden reported in sub-Saharan Africa. In May 2018, the World Health Assembly committed to reducing worldwide cholera deaths by 90% by 2030. Oral cholera vaccine (OCV) plays a key role in reducing the near-term risk of cholera, although global supplies are limited. Characterizing the potential impact and cost-effectiveness of mass OCV deployment strategies is critical for setting expectations and developing cholera control plans that maximize the chances of success.

METHODS AND FINDINGS:

We compared the projected impacts of vaccination campaigns across sub-Saharan Africa from 2018 through 2030 when targeting geographically according to historical cholera burden and risk factors. We assessed the number of averted cases, deaths, and disability-adjusted life years and the cost-effectiveness of these campaigns with models that accounted for direct and indirect vaccine effects and population projections over time. Under current vaccine supply projections, an approach optimized to targeting by historical burden is projected to avert 828,971 (95% CI 803,370-859,980) cases (equivalent to 34.0% of projected cases; 95% CI 33.2%-34.8%). An approach that balances logistical feasibility with targeting historical burden is projected to avert 617,424 (95% CI 599,150-643,891) cases. In contrast, approaches optimized for targeting locations with limited access to water and sanitation are projected to avert 273,939 (95% CI 270,319-277,002) and 109,817 (95% CI 103,735-114,110) cases, respectively. We find that the most logistically feasible targeting strategy costs US\$1,843 (95% CI 1,328-14,312) per DALY averted during this period and that effective geographic targeting of OCV campaigns can have a greater impact on cost-effectiveness than improvements to vaccine efficacy and moderate increases in coverage. Although our modeling approach does not project annual changes in baseline cholera risk or directly incorporate immunity from natural cholera infection, our estimates of the relative performance of different vaccination strategies should be robust to these factors.

CONCLUSIONS:

Our study suggests that geographic targeting substantially improves the cost-effectiveness and impact of oral cholera vaccination campaigns. Districts with the poorest access to improved water and sanitation are not the same as districts with the greatest historical cholera incidence. While OCV campaigns can improve cholera control in the near term, without rapid progress in developing water and sanitation services or dramatic increases in OCV supply, our results suggest that vaccine use alone is unlikely to allow us to achieve the 2030 goal.

WEB: [10.1371/journal.pmed.1003003](https://doi.org/10.1371/journal.pmed.1003003)

IMPACT FACTOR: 11.048

CITED HALF-LIFE: 8.2

START COMMENTARY

Lee et al. conducted a study assessing the health impact and cost-effectiveness of eight different oral cholera vaccination strategies—(incidence) rate optimized, rate-logistics optimized, case optimized, case-logistics optimized, water optimized, sanitation optimized, and water-sanitation optimized. They found that the rate optimized strategy would avert the most cases compared to the other strategies, but the rate-logistics optimized strategy would yield the most cost-effective result. That the WASH strategies did not yield similar results to the incidence-based results suggested areas of poor access to clean water and sanitation as measured by the Joint Monitoring Project (JMP) do not necessarily represent areas of high cholera burden. However, authors also noted that updated JMP WASH indicators may provide more insight into cholera risk. Table 1 briefly summarizes model parameters. For more details on model parameters and assumptions, refer to the Appendix. Limitations of the model included not incorporating immunity from natural infection and limited granularity of indirect effects of vaccination.

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2. [Religious affiliation and immunization coverage in 15 countries in Sub-Saharan Africa](#)

Costa J, Weber A, Darmstadt G, Abdalla S, Victora C.

Vaccine. 2019 Dec 03.

PubMed ID: 31791811

ABSTRACT

BACKGROUND:

Although religious affiliation has been identified as a potential barrier to immunization in some African countries, there are no systematic multi-country analyses, including within-country variability, on this issue. We investigated whether immunization varied according to religious affiliation and sex of the child in sub-Saharan African (SSA) countries.

METHODS:

We used data from 15 nationally representative surveys from 2010 to 2016. The major religious groups were described by country in terms of wealth, residence, and education. Proportions of fully immunized and unvaccinated children were stratified by country, maternal religion, and sex of the child. Poisson regression with robust variance was used to assess whether the outcomes varied according to religion, with and without adjustment for the above cited sociodemographic confounders. Interactions between child sex and religion were investigated.

RESULTS:

Fifteen countries had >10% of families affiliated with Christianity and >10% affiliated with Islam, and four also had >10% practicing folk religions. In general, Christians were wealthier, more educated and more urban. Nine countries had significantly lower full immunization coverage among Muslims than Christians (pooled prevalence ratio = 0.81; 95%CI: 0.79-0.83), of which seven remained significant after adjustment for confounders (pooled ratio = 0.90; 0.87-0.92). Four countries had higher coverage among Muslims, of which two remained significant after adjustment. Regarding unvaccinated children, six countries showed higher proportions among Muslims, all of which remained significant after adjustment [crude pooled ratio = 1.83 (1.59-2.07); adjusted = 1.31 (1.14-1.48)]. Children from families practicing folk religions did not show any consistent patterns in immunization. Child sex was not consistently associated with vaccination.

CONCLUSIONS:

Muslim religion was associated with lower vaccine coverage in several SSA countries, both for boys and girls. The involvement of religious leaders is essential for increasing immunization coverage and supporting the leave no one behind agenda of the Sustainable Development Goals.

WEB: [10.1016/j.vaccine.2019.11.024](https://doi.org/10.1016/j.vaccine.2019.11.024)

IMPACT FACTOR: 3.269

CITED HALF-LIFE: 3.1

START COMMENTARY

Costa et al. conducted a study to assess the relationship between religious affiliation and immunization coverage in 15 countries in sub-Saharan Africa using data from the DHS and MICS. Only countries with at least 10% of the sample identifying Christian and Muslim each were included in the analysis. A summary of vaccination coverage and religious affiliation by country was summarized in Table 2. Adjusted coverage ratios for full immunization and unvaccinated children were summarized in Figure 2. Limitations of the study included the assignment of religious affiliation was assessed based on different questions from DHS and MICS, inability to measure heterogeneity within the general religious groups (e.g., different sects of Christianity), and the inability to differentiate affiliation with individual beliefs and practices. This study, however, employed nationally representative surveys with comparable health indicators. With this study, authors highlighted multi-country differences in vaccination coverage between religious groups.

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[3. Using models to shape measles control and elimination strategies in low- and middle-income countries: A review of recent applications](#)

Cutts F, Dansereau E, Ferrari M, Hanson M, McCarthy K, Metcalf C, et al.

Vaccine. 2019 Dec 02.

PubMed ID: 31787412

ABSTRACT

After many decades of vaccination, measles epidemiology varies greatly between and within countries. National immunization programs are therefore encouraged to conduct regular situation analyses and to leverage models to adapt interventions to local needs. Here, we review applications of models to develop locally tailored interventions to support control and elimination efforts. In general, statistical and semi-mechanistic transmission models can be used to synthesize information from vaccination coverage, measles incidence, demographic, and/or serological data, offering a means to estimate the spatial and age-specific distribution of measles susceptibility. These estimates complete the picture provided by vaccination coverage alone, by accounting for natural immunity. Dynamic transmission models can then be used to evaluate the relative impact of candidate interventions for measles control and elimination and the expected future epidemiology. In most countries, models predict substantial numbers of susceptible individuals outside the age range of routine vaccination, which affects outbreak risk and necessitates additional intervention to achieve elimination. More effective use of models to inform both vaccination program planning and evaluation requires the development of training to enhance broader understanding of models and where feasible, building capacity for modelling in-country, pipelines for rapid evaluation of model predictions using surveillance data, and clear protocols for incorporating model results into decision-making.

WEB: [10.1016/j.vaccine.2019.11.020](https://doi.org/10.1016/j.vaccine.2019.11.020)

IMPACT FACTOR: 3.269

CITED HALF-LIFE: 3.1

START COMMENTARY

Cutts et al. illustrated how models can be used to enhance the use of empirical data through a series of program questions. Cutts et al. provided background to the question, problems with empirical data

to address the question, and contributions of models to address the empirical data problems. A summary of how models can be used to help answer program questions can be found in Table 1. Key examples included the use of geospatial and dynamic transmission models to answer questions about vaccination coverage and susceptibility. While the majority of the article was devoted to how models can use various data sources to provide valuable insights into measles control, the authors highlighted the limitations of models. Namely, “models are only as useful as the data that they are fit to and the assumptions made.” Investment in both modelling and collection of high-quality empirical data are important to strengthen evidence-based decision-making for measles control and elimination.

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4. Factors associated with full immunization of children 12-23 months of age in Ethiopia: A multilevel analysis using 2016 Ethiopia Demographic and Health Survey

Kinfe Y, Gebre H, Bekele A.

PLoS ONE. 2019 Dec 11;14(11):e0225639.

PubMed ID: 31774859

ABSTRACT

BACKGROUND:

Only 40% of World Health Assembly member states achieved 90% national full vaccination coverage in 2015. In the African region, 79% of the countries had not achieved the target in 2015. In Ethiopia, only 39% of children 12-23 months of age were fully vaccinated. Though different studies were conducted in Ethiopia, they were limited in scope and used single level analysis. Therefore, this study aimed to assess individual and community level factors associated with full immunization among children 12-23 months of age in Ethiopia.

METHODS:

The data was obtained from Ethiopia Demographic and Health Survey 2016, conducted from January 2016 to June 2016. The sample was taken using two stage stratified sampling. In stage one, 645 Enumeration Areas and in stage two 28 households per Enumeration Area were selected systematically. Weighted sample of 1929 children 12-23 months of age were included in the study. Data was extracted from <http://www.DHSprogram.com>. Multilevel logistic regression was employed. Akaike Information Criteria was used to select best fit model.

RESULTS:

Mother's education, husband employment, mother's religion, mother's antenatal care visit, presence of vaccination document, region and community antenatal care utilization were significantly associated with children full vaccination. The odds of full vaccination were 2.5 [AOR = 2.48 95% CI: 1.35, 4.56] and 1.6 [AOR = 1.58 95% CI: 1.1, 2.28] times higher in children of mothers with secondary or higher and primary education respectively than children of mothers with no education.

CONCLUSIONS:

This study showed that children full vaccination is affected both by the individual and community level factors. Therefore, efforts to increase children full vaccination status need to target both at individual and community level.

WEB: [10.1371/journal.pone.0225639](https://doi.org/10.1371/journal.pone.0225639)

IMPACT FACTOR: 2.776

CITED HALF-LIFE: 2.7

START COMMENTARY

Kinfe et al. conducted a multilevel analysis of individual- and community-level factors and full immunization among children 12–23 months of age in Ethiopia using the 2016 Ethiopia Demographic and Health Survey. Community-level variables were created by aggregating individual-level variables within regions and classifying as either high or low in relation to the national median values. These variables included: media exposure, women education, unemployment, poverty status, ANC utilization, institutional delivery and perceived distance to health facility. The survey was cross-sectional and, therefore, limited in its ability to make causal inference.

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5. Trends in Socioeconomic Inequalities in Full Vaccination Coverage among Vietnamese Children aged 12-23 Months, 2000-2014: Evidence for Mitigating Disparities in Vaccination

Vo H, Huynh L, Anh H, Do D, Doan T, Nguyen T, et al.

Vaccines (Basel). 2019 Dec 13;7(4).

PubMed ID: 31752228

ABSTRACT

There has been no report on the situation of socioeconomic inequalities in the full vaccination coverage among Vietnamese children. This study aims to assess the trends and changes in the socioeconomic inequalities in the full vaccination coverage among Vietnamese children aged 12-23 months from 2000 to 2014. Data were drawn from Multiple Indicator Cluster Surveys (2000, 2006, 2011, and 2014). Concentration index (CCI) and concentration curve (CC) were applied to quantify the degree of the socioeconomic inequalities in full immunization coverage. The prevalence of children fully receiving recommended vaccines was significantly improved during 2000-2014, yet, was still not being covered. The total CCI of full vaccination coverage gradually decreased from 2000 to 2014 (CCI: from 0.241 to 0.009). The CC increasingly became close to the equality line through the survey period, indicating the increasingly narrow gap in child full immunization amongst the poor and the rich. Vietnam witnessed a sharp decrease in socioeconomic inequality in the full vaccination coverage for over a decade. The next policies towards children from vulnerable populations (ethnic minority groups, living in rural areas, and having a mother with low education) belonging to lower socioeconomic groups may mitigate socioeconomic inequalities in full vaccination coverage.

WEB: [10.3390/vaccines7040188](https://doi.org/10.3390/vaccines7040188)

IMPACT FACTOR: 4.760

CITED HALF-LIFE: 6.9

START COMMENTARY

Vo et al. conducted a study to assess the association between socioeconomic inequalities, as calculated from the wealth asset index (a measure of socioeconomic status), and childhood vaccination in Vietnam among children aged 12–23 months from 2000 to 2014. The wealth asset

index was estimated using principal component analysis. Proportion of children receiving full vaccination was roughly 50%, with children of mother's in the lowest wealth quintile having the lowest full vaccination coverage. Limitations of the study included the inability to establish causality between full vaccination and socioeconomic status due to the cross-sectional nature of the MICS survey, potential bias from missing vaccination cards, and inability to assess cultural and religious factors that may influence immunization. This study, however, demonstrated the need for prioritization of children in lower socioeconomic levels and further studies into barriers to vaccine uptake in underserved groups.

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6. [Re-evaluating the potential impact and cost-effectiveness of rotavirus vaccination in 73 Gavi countries: a modelling study](#)

Debellut F, Clark A, Pecenka C, Tate J, Baral R, Sanderson C, et al.

Lancet Glob Health. 2019 Dec 13;7(12):e1664-e1674.

PubMed ID: 31708147

ABSTRACT

BACKGROUND:

Previous studies have found rotavirus vaccination to be highly cost-effective in low-income countries. However, updated evidence is now available for several inputs (ie, rotavirus disease mortality rates, rotavirus age distributions, vaccine timeliness, and vaccine efficacy by duration of follow-up), new rotavirus vaccines have entered the market, vaccine prices have decreased, and cost-effectiveness thresholds have been re-examined. We aimed to provide updated cost-effectiveness estimates to inform national decisions about the new introduction and current use of rotavirus vaccines in Gavi countries.

METHODS:

We calculated the potential costs and effects of rotavirus vaccination for ten successive birth cohorts in 73 countries previously and currently eligible for Gavi support, compared with no vaccination. We used a deterministic cohort model to calculate numbers of rotavirus gastroenteritis cases, outpatient visits, hospitalisations, and deaths between birth and 5 years, with and without rotavirus vaccination. We calculated treatment costs from the government and societal perspectives. The primary outcome measure was the incremental cost-effectiveness ratio (discounted US\$ per disability-adjusted life-year averted). Country-specific model input parameters were based on the scientific literature, published meta-analyses, and international databases. We ran deterministic and probabilistic uncertainty analyses.

RESULTS:

Over the period 2018-27, rotavirus vaccination has the potential to prevent nearly 600 000 deaths in Gavi countries. Averted outpatient visits and hospitalisations could lead to treatment savings of approximately \$484.1 million from the government perspective and \$878.0 million from the societal perspective. The discounted dollars per disability-adjusted life-year averted has a very high probability (>90%) of being less than 0.5 times the gross domestic product per capita in 54 countries, and less than 1.0 times gross domestic product per capita in 63 countries.

CONCLUSIONS:

Rotavirus vaccination continues to represent good value for money across most Gavi countries despite lower rotavirus mortality estimates and more stringent willingness-to-pay thresholds.

WEB: [10.1016/S2214-109X\(19\)30439-5](https://doi.org/10.1016/S2214-109X(19)30439-5)

IMPACT FACTOR: 15.873

CITED HALF-LIFE: 2.5

START COMMENTARY

Debellut et al. conducted a modeling study assessing the health impact and cost-effectiveness of rotavirus vaccination for 73 Gavi countries over the course of ten birth cohorts (2018–2027). They used a static model (UNIVAC) to calculate cases, clinic visits, hospitalizations, and deaths averted. Strengths of this study include the use of updated burden and costing data, including sensitivity analyses to address uncertainty in parameters, and considering more stringent willingness-to-pay thresholds to better align with new definitions of cost-effectiveness. One limitation of the study was the inability to assess indirect impact of rotavirus vaccination using a static model. Another limitation was the use of using proxy values for missing empirical data to inform parameters. Despite these limitations, Debellut et al. demonstrated rotavirus vaccine as a cost-effective intervention. Even for countries with low rotavirus burden and phasing out of Gavi eligibility, the new lower-cost vaccines may provide a more cost-effective option.

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[7. Potential effect of age of BCG vaccination on global paediatric tuberculosis mortality: a modelling study](#)

Roy P, Vekemans J, Clark A, Sanderson C, Harris R, White R.

Lancet Glob Health. 2019 Dec 13;7(12):e1655-e1663.

PubMed ID: 31708146

ABSTRACT

BACKGROUND:

BCG has been recommended at birth in countries with a high tuberculosis burden for decades, yet delayed vaccination is widespread. To support a WHO guidance review, we estimated the potential global tuberculosis mortality benefit of administering BCG on time and consequences of later administration.

METHODS:

We estimated age-specific BCG coverage in 152 high-burden countries using data from large, nationally representative household surveys, to parameterise a static mathematical model, calibrated to global childhood tuberculosis deaths in 2016. 12 hypothetical scenarios explored the effect of BCG delivery at birth, 6 weeks, 6 months, or 9-12 months, on tuberculosis deaths per global birth cohort by age 15 years, including delivery at the time of the first diphtheria-tetanus-pertussis vaccine (DTP1) or the first measles-containing vaccine (MCV1). We assumed constant vaccine efficacy by age, but varied coverage and degree of vaccination delay, including no delay.

RESULTS:

In 152 high-burden countries, we estimated that BCG coverage in 2016 was 37% at 1 week of age, 67% at 6 weeks, and 92% at 3 years. Modelled scenarios in which 92% BCG coverage was achieved at birth reduced tuberculosis deaths in the global birth cohort by 5449 (95% uncertainty range 218-15 071) or 2.8% (0.1-7.0) by age 15 years. 100% coverage at birth reduced tuberculosis deaths by 16.5% (0.7-41.9). Later administration increased tuberculosis deaths-eg, BCG vaccination at 6 weeks, the recommended age of DTP1, increased tuberculosis deaths by 0.2% (0-0.4), even if BCG reached DTP1 coverage levels (94% at 3 years).

CONCLUSIONS:

Reducing delays and increasing coverage at birth would substantially reduce global paediatric tuberculosis mortality. Modelled scenarios whereby BCG was administered later in the infant schedule were all estimated to increase tuberculosis deaths, even with increased coverage. The WHO recommendation for BCG at birth should be maintained and emphasised.

WEB: [10.1016/S2214-109X\(19\)30444-9](https://doi.org/10.1016/S2214-109X(19)30444-9)

IMPACT FACTOR: 15.873

CITED HALF-LIFE: 2.5

START COMMENTARY

Roy et al. conducted a study to assess the impact of timely and delayed administration of BCG vaccination on tuberculosis mortality using a static mathematical model. Authors conducted uncertainty and sensitivity analyses to understand uncertainty around parameter estimates and test assumptions around treatment effects and age-group-specific mortality. Table 1 and the figure summarizes the different scenarios modelled. Table 4 summarizes the results of the analysis, showing scenarios in which BCG is delivered at birth as averting most tuberculosis deaths. Limitations of the study included limited age-specific tuberculosis mortality data and BCG vaccine efficacy. Additionally, authors considered the possibility of missing the potential full impact of BCG vaccine by assuming no impact among any HIV-infected neonate. Study strengths included being the first study to examine the impact of age of BCG vaccination on tuberculosis mortality, the use of household survey data to more accurately assess age of BCG vaccination, and the ability for the model to utilize updated data as they become available. Roy et al. concluded the recommendation to vaccinate at birth should be maintained.

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8. [HPV vaccination in Papua New Guinea to prevent cervical cancer in women: Gender, sexual morality, outsiders and the de-feminization of the HPV vaccine](#)

Kelly-Hanku A, Newland J, Aggleton P, Ase S, Aeno H, Fiya V, et al.

Papillomavirus Res. 2019 Dec 19;8:100171.

PubMed ID: 31212024

ABSTRACT

Papua New Guinea has among the highest estimated burden of cervical cancer globally, but currently lacks national cervical screening or human papillomavirus (HPV) vaccination programmes. The Papua New Guinean government is committed to introducing the HPV vaccine for primary prevention, but locally-relevant research evidence is not available to guide implementation. Experience from earlier Papua New Guinean health programmes suggests that appropriate engagement with local health cosmologies and cultures for health/wellbeing, illness/disease, and recognition of the role of 'outsiders' in preventing, promoting or contributing to sickness, are essential to the successful introduction of biomedical interventions in this setting. We describe findings from a multi-site qualitative study undertaken in three provinces in Papua New Guinea (2012-14). Twenty-one gender specific focus group discussions and 82 semi-structured interviews, with a total of 208 participants, were conducted. There was strong community support for the introduction of the HPV vaccine for cervical cancer prevention in Papua New Guinea. Significantly, and despite being officially discussed in the context of a planned future intervention focusing on vaccinating young girls to prevent cervical cancer, the intervention was de-feminised, where both girls and boys were supported to be vaccinated in any HPV programme in Papua New Guinea.

WEB: [10.1016/j.pvr.2019.100171](https://doi.org/10.1016/j.pvr.2019.100171)

IMPACT FACTOR: n/a

CITED HALF-LIFE: n/a

START COMMENTARY

Kelly-Hanku et al. conducted focus groups and semi-structured interviews to assess HPV knowledge and HPV vaccine readiness. A summary of the number of participants by gender, province, and data collection method (interview vs. focus group) is found in Table 2. Authors noted that most participants believed both boys and girls should be vaccinated, which deviates from a commonly

held perception that the HPV vaccine is a “girl’s vaccine.” Authors considered the potential prematurity of assessing HPV knowledge and perceptions as a limitation of the study since participants may have been introduced to HPV and cervical cancer at the time of their interview. They contemplated the potential for participants having limited time to form an opinion about HPV and the vaccine without exposure to alternative information and perceptions. However, authors also reasoned the impact of this limitation is likely small based on the robustness of the data obtained through interviews. The study demonstrated participants recognized the value and overall supported the HPV vaccine, an important component to successful introduction of a vaccination program.

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9. Seroprotection at Different Levels of the Healthcare System After Routine Vaccination With Diphtheria-Tetanus-Pertussis whole cell-Hepatitis B-Haemophilus influenzae Type B in Lao People's Democratic Republic

Hefele L, Syphan S, Xayavong D, Homsana A, Kleine D, Chanthavilay P, et al.

Clin Infect Dis. 2019 Dec 13;69(12):2136-2144.

PubMed ID: 30778522

ABSTRACT

BACKGROUND:

The Lao People's Democratic Republic continues to sustain a considerable burden of vaccine-preventable diseases because of incomplete vaccine coverage and weak vaccine responses. We have assessed seroconversion after routine vaccination with the pentavalent vaccine to capture weaknesses of vaccine management at the different levels of the healthcare system.

METHODS:

A total of 1151 children (aged 8-28 months) with 3 documented doses of the pentavalent vaccine delivered at central hospitals in Vientiane and the provincial hospital, 3 district hospitals, and 10 health centers in Bolikhamxay province were enrolled. Sociodemographic information was collected with a standardized questionnaire. Serum samples were analyzed for antibodies against vaccine components, and bivariate and multivariable analyses were performed to identify risk factors for low vaccine responses.

RESULTS:

Seroprotection rates at the provincial, district, and health center level were as high as in central hospitals, but seroprotection rates in areas covered by remote health centers were significantly lower. Protective levels also rapidly decreased with age at sampling. Seroprotection rates in Bolikhamxay against the different components reached 70%-77% and were up to 20% higher than in previous studies in the same region; 18.8% more children received the hepatitis B vaccine birth dose and the hepatitis B virus infection rate was 4 times lower.

CONCLUSIONS:

Vaccine immunogenicity has dramatically improved in a central province, likely due to training and investment in the cold chain. Nevertheless, there remains a need to focus on the "last mile" in remote areas where most children are vaccinated through outreach activities.

WEB: [10.1093/cid/ciz143](https://doi.org/10.1093/cid/ciz143)

IMPACT FACTOR: 9.055

CITED HALF-LIFE: 8.2

START COMMENTARY

A prior study found low protective titers against hepatitis B virus in children 8–28 months with 3 documented vaccine doses in 2013–2014, which could not be fully explained by waning immunity, malnutrition, and other factors measured. Hefele et al. sought to investigate this phenomenon by measuring immunogenicity levels against the pentavalent vaccine among children who received three documented vaccine doses. They found high levels of seroprotection, rapidly decreasing with age for diphtheria, tetanus and hepatitis B virus. Limitations of the study included inability to distinguish seropositivity due to the vaccine versus natural infection and reliance on parent recall for place of vaccination. Authors also observed mismatch between vaccination cards and health records. Authors posited that lower seroprotection found in 2013–2014 may either be due to waning immunity among older children or to improvements in vaccine cold chain. They called for more investigation on loss of immunity with age and potential vaccine failure.

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10. [Impact of Rotavirus Vaccine Introduction in Children Less Than 2 Years of Age Presenting for Medical Care With Diarrhea in Rural Matlab, Bangladesh](#)

Schwartz L, Zaman K, Yunus M, Basunia A, Faruque A, Ahmed T, et al.

Clin Infect Dis. 2019 Dec 13;69(12):2059-2070.

PubMed ID: 30753368

ABSTRACT

BACKGROUND:

Following the conclusion of a human rotavirus vaccine (HRV) cluster-randomized, controlled trial (CRT) in Matlab, Bangladesh, HRV was included in Matlab's routine immunization program. We describe the population-level impact of programmatic rotavirus vaccination in Bangladesh in children <2 years of age.

METHODS:

Interrupted time series were used to estimate the impact of HRV introduction. We used diarrheal surveillance collected between 2000 and 2014 within the 2 service delivery areas (International Centre for Diarrhoeal Disease Research, Bangladesh [icddr,b] service area [ISA] and government service area [GSA]) of the Matlab Health and Demographic Surveillance System, administered by icddr,b. Age group-specific incidence rates were calculated for both rotavirus-positive (RV+) and rotavirus-negative (RV-) diarrhea diagnoses of any severity presenting to the hospital. We used 2 models to assess the impact within each service area: Model 1 used the pre-vaccine time period in all villages (HRV- and control-only) and Model 2 combined the pre-vaccine time period and the CRT time period, using outcomes from control-only villages.

RESULTS:

Both models demonstrated a downward trend in RV+ diarrheal incidences in the ISA villages during 3.5 years of routine HRV use, though only Model 2 was statistically significant. Significant impacts of HRV on RV+ diarrhea incidences in GSA villages were not observed in either model. Differences in population-level impacts between the 2 delivery areas may be due to the varied rotavirus vaccine coverage and presentation rates to the hospital.

CONCLUSIONS:

This study provides initial evidence of the population-level impact of rotavirus vaccines in children <2 years of age in Matlab, Bangladesh. Further studies are needed of the rotavirus vaccine impact after the nationwide introduction in Bangladesh.

WEB: [10.1093/cid/ciz133](https://doi.org/10.1093/cid/ciz133)

IMPACT FACTOR: 9.055

CITED HALF-LIFE: 8.2

START COMMENTARY

Observed counts of rotavirus-positive and rotavirus-negative diarrhea presenting to Matlab Hospital over time were summarized in Figure 1. Coverage of the vaccine over time was summarized in Figure 2. Figures 3 and 4 provided graphical results of observed incidence and IRRs of rotavirus-positive and rotavirus-negative diarrhea presenting to Matlab Hospital. Limitations of the study included potential confounding due to other interventions or other unmeasured factors that may take place during vaccine introduction, potential misclassification of vaccination due to lack of health cards, and the inability to measure the impact of rotavirus vaccine on severe rotavirus diarrhea using the Vesikari score. Strengths of the study included the use of control villages and the pre-vaccine baseline data.

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Appendix

The literature search for the January 2020 Vaccine Delivery Research Digest was conducted on December 26, 2019. We searched English language articles indexed by the US National Library of Medicine and published between November 15, 2019 and December 14, 2019. The search resulted in 276 items.

SEARCH TERMS

(((((vaccine[tiab] OR vaccines[tiab] OR vaccination[tiab] OR immunization[tiab] OR immunisation[tiab] OR vaccine[mesh] OR immunization[mesh]) AND (logistics[tiab] OR supply[tiab] OR "supply chain"[tiab] OR implementation[tiab] OR expenditures[tiab] OR financing[tiab] OR economics[tiab] OR "Cost effectiveness"[tiab] OR coverage[tiab] OR attitudes[tiab] OR belief[tiab] OR beliefs[tiab] OR refusal[tiab] OR "Procurement"[tiab] OR timeliness[tiab] OR systems[tiab])) OR ("vaccine delivery"[tiab])) NOT ("in vitro"[tiab] OR "immune response"[tiab] OR gene[tiab] OR chemistry[tiab] OR genotox*[tiab] OR sequencing[tiab] OR nanoparticle*[tiab] OR bacteriophage[tiab] OR exome[tiab] OR exogenous[tiab] OR electropor*[tiab] OR "systems biology"[tiab] OR "animal model"[tiab] OR cattle[tiab] OR sheep[tiab] OR goat[tiab] OR rat[tiab] OR pig[tiab] OR mice[tiab] OR mouse[tiab] OR murine[tiab] OR porcine[tiab] OR ovine[tiab] OR rodent[tiab] OR fish[tiab])) AND (English[LA]) ("2019/11/15"[PDAT] : "2019/12/14"[PDAT]))