Costing

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1. The costs of introducing a malaria vaccine through the expanded program on immunization in Tanzania


Guy Hutton and Fabrizio Tediosi

Abstract

This report presents an approach to costing the delivery of a malaria vaccine through the expanded program on immunization (EPI), and presents the predicted cost per dose delivered and cost per fully immunized child (FIC) in Tanzania, which are key inputs to the cost-effectiveness analysis. The costs included in the analysis are those related to the purchase of the vaccine taking into account the wastage rate; the costs of distributing and storing the vaccine at central, zonal, district, and facility level; those of managing the vaccination program; the costs of delivery at facility level (including personnel, syringes, safety boxes, and waste management); and those of additional training of EPI personnel and of social mobilization activities. The average cost per FIC increases almost linearly from US$4.2 per FIC at a vaccine price of US$1 per dose to US$31.2 at vaccine price of US$10 per dose. The marginal cost is approximately 5% less than the average cost. Although the vaccine price still determines most of the total delivery costs, the analysis shows that other costs are relevant and should be taken into account before marketing the vaccine and planning its inclusion into the EPI.


Raymond Hutubessy, Ann Levin, Susan Wang, Winthrop Morgan, Mariam Ally, Theopista John and Nathalie Broutet

Keywords

Human papillomavirus (HPV); vaccines; immunization programs; costing; planning; United Republic of Tanzania; low- and middle-income countries; GAVI Alliance; GAVI eligible countries

Abstract

Background The purpose, methods, data sources and assumptions behind the World Health Organization (WHO) Cervical Cancer Prevention and Control Costing (C4P) tool that was developed to assist low- and middle-income countries (LMICs) with planning and costing their nationwide human papillomavirus (HPV) vaccination program are presented. Tanzania is presented as a case study where the WHO C4P tool was used to cost and plan the roll-out of HPV vaccines nationwide as part of the national comprehensive cervical cancer prevention and control strategy.

Methods The WHO C4P tool focuses on estimating the incremental costs to the health system
of vaccinating adolescent girls through school-, health facility- and/or outreach-based strategies. No costs to the user (school girls, parents or caregivers) are included. Both financial (or costs to the Ministry of Health) and economic costs are estimated. The cost components for service delivery include training, vaccination (health personnel time and transport, stationery for tally sheets and vaccination cards, and so on), social mobilization/IEC (information, education and communication), supervision, and monitoring and evaluation (M&E). The costs of all the resources used for HPV vaccination are totaled and shown with and without the estimated cost of the vaccine. The total cost is also divided by the number of doses administered and number of fully immunized girls (FIGs) to estimate the cost per dose and cost per FIG.

**Results** Over five years (2011 to 2015), the cost of establishing an HPV vaccine program that delivers three doses of vaccine to girls at schools via phased national introduction (three regions in year 1, ten regions in year 2 and all 26 regions in years 3 to 5) in Tanzania is estimated to be US$9.2 million (excluding vaccine costs) and US$31.5 million (with vaccine) assuming a vaccine price of US$5 (GAVI 2011, formerly the Global Alliance for Vaccines and Immunizations). This is equivalent to a financial cost of US$5.77 per FIG, excluding the vaccine cost. The most important costs of service delivery are social mobilization/IEC and service delivery operational costs.

**Conclusions** When countries expand their immunization schedules with new vaccines such as the HPV vaccine, they face initial costs to fund critical pre-introduction activities, as well as incremental system costs to deliver the vaccines on an ongoing basis. In anticipation, governments need to plan ahead for non-vaccine costs so they will be financed adequately. Existing human resources need to be re-allocated or new staff need to be recruited for the program to be implemented successfully in a sustainable and long-term manner. Reaching a target group not routinely served by national immunization programs previously with three doses of vaccine requires new delivery strategies, more transport of vaccines and health workers and more intensive IEC activities leading to new delivery costs for the immunization program that are greater than the costs incurred when a new infant vaccine is added to the existing infant immunization schedule. The WHO C4P tool is intended to help LMICs to plan ahead and estimate the programmatic and operational costs of HPV vaccination.

3. **Systematic review of incremental non-vaccine cost estimates used in cost-effectiveness analysis on the introduction of rotavirus and pneumococcal vaccines.**


Fernando De la Hoz-Restrepo, Carlos Castañeda-Orjuela, Angel Paternina, Nelson Alvis-Guzman,

**Keywords**

Costs and cost analysis; Cost-effectiveness analysis; Vaccines; Immunization programs; Rotavirus vaccines; Pneumococcal vaccines
Abstract

Objective To review the approaches used in the cost-effectiveness analysis (CEAs) literature to estimate the cost of expanded program on immunization (EPI) activities, other than vaccine purchase, for rotavirus and pneumococcal vaccines.

Methods A systematic review in PubMed and NHS EED databases of rotavirus and pneumococcal vaccines CEAs was done. Selected articles were read and information on how EPI costs were calculated was extracted. EPI costing approaches were classified according to the method or assumption used for estimation.

Results Seventy-nine studies that evaluated cost effectiveness of rotavirus (n = 43) or pneumococcal (n = 36) vaccines were identified. In general, there are few details on how EPI costs other than vaccine procurement were estimated. While 30 studies used some measurement of that cost, only one study on pneumococcal vaccine used a primary cost evaluation (bottom-up costing analysis) and one study used a costing tool. Twenty-seven studies (17 on rotavirus and 10 on pneumococcal vaccine) assumed the non-vaccine costs. Five studies made no reference to additional costs. Fourteen studies (9 rotavirus and 5 pneumococcal) did not consider any additional EPI cost beyond vaccine procurement. For rotavirus studies, the median for non-vaccine cost per dose was US$0.74 in developing countries and US$6.39 in developed countries. For pneumococcal vaccines, the median for non-vaccine cost per dose was US$1.27 in developing countries and US$8.71 in developed countries.

Conclusions Many pneumococcal (52.8%) and rotavirus (60.4%) cost-effectiveness analyses did not consider additional EPI costs or used poorly supported assumptions. Ignoring EPI costs in addition to those for vaccine procurement in CEA analysis of new vaccines may lead to significant errors in the estimations of ICERs since several factors like personnel, cold chain, or social mobilization can be substantially affected by the introduction of new vaccines.

4. Systematic review of studies on rotavirus disease cost-of-illness and productivity loss in Latin America and the Caribbean

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Keywords
Rotavirus; Cost of illness; Systematic review; Latin America and Caribbean

Abstract

Background Rotavirus is the most common cause of severe acute diarrhea among children in both developed and developing countries. Vaccination can reduce the disease burden and its incorporation into health care systems should consider future costs and benefits.

Objectives To systematically review studies on costs due to rotavirus infection in Latin America and Caribbean (LAC) region, considering their methods and results.

Methods A search of relevant databases including the Cochrane Central Register of Controlled Trials, Embase, MEDLINE via PubMed, the Latin American and Caribbean Health Sciences Literature database (LILACS), and the Brazilian Thesis Databank was performed. Inclusion criteria for studies were: (a) economic evaluation or cost-of-illness studies; (b) conducted in the LAC region; (c) assess economic burden of rotavirus disease or the economic impact of
rotavirus vaccination programs. Two authors independently screened the studies for eligibility.

Results
Of 444 studies initially retrieved, 21 met the eligibility criteria and were included (14 cost-effectiveness analyses of vaccination programs and 7 cost-of-illness studies). Direct medical costs were assessed in all 21 studies, but only 10 also investigated indirect and non-medical direct costs. The most commonly observed methods for cost estimation were retrospective database analysis and hospital-based surveillance study. Only one study was a household-based survey. A wide cost range was identified (e.g., inpatient care US$79.91 to US$858.40 and outpatient care US$13.06 to US$64.10), depending on the methods, study perspective, and type of costs included.

Conclusion Rotavirus-associated costs were assessed in 21 studies across the Latin America and Caribbean region. The majority of studies were made alongside economic evaluations of vaccination programs. Methods are broadly different among studies but administrative databases seem to be the most employed source of data.

5. Cost of dengue outbreaks: literature review and country case studies.


Stahl HC, Butenschoen VM, Tran HT, Gozzer E, Skewes R, Mahendrahdhata Y, Runge-Ranzinger S, Kroeger A, Farlow A.

Abstract

Background Dengue disease surveillance and vector surveillance are presumed to detect dengue outbreaks at an early stage and to save – through early response activities – resources, and reduce the social and economic impact of outbreaks on individuals, health systems and economies. The aim of this study is to unveil evidence on the cost of dengue outbreaks.

Methods Economic evidence on dengue outbreaks was gathered by conducting a literature review and collecting information on the costs of recent dengue outbreaks in 4 countries: Peru, Dominican Republic, Vietnam, and Indonesia. The literature review distinguished between costs of dengue illness including cost of dengue outbreaks, cost of interventions and cost-effectiveness of interventions.

Results Seventeen publications on cost of dengue showed a large range of costs from 0.2 Million US$ in Venezuela to 135.2 Million US$ in Brazil. However, these figures were not standardized to make them comparable. Furthermore, dengue outbreak costs are calculated differently across the publications, and cost of dengue illness is used interchangeably with cost of dengue outbreaks. Only one paper from Australia analysed the resources saved through active dengue surveillance. Costs of vector control interventions have been reported in 4 studies, indicating that the costs of such interventions are lower than those of actual outbreaks. Nine papers focused on the cost-effectiveness of dengue vaccines or dengue vector control; they do not provide any direct information on cost of dengue outbreaks, but their modelling methodologies could guide future research on cost-effectiveness of national surveillance systems.

The country case studies – conducted in very different geographic and health system settings - unveiled rough estimates for 2011 outbreak costs of: 12 million US$ in Vietnam, 6.75 million US$ in Indonesia, 4.5 million US$ in Peru and 2.8 million US$ in Dominican Republic (all in 2012 US$). The proportions of the different cost components (vector control; surveillance; information, education and communication; direct medical and indirect costs), as percentage of total costs, differed across the respective countries. Resources used for dengue disease control and treatment were country specific.
Conclusions The evidence so far collected, further confirms the methodological challenges in this field: 1) to define technically dengue outbreaks (what do we measure?) and 2) to measure accurately the costs in prospective field studies (how do we measure?). Currently, consensus on the technical definition of an outbreak is sought through the International Research Consortium on Dengue Risk Assessment, Management and Surveillance (IDAMS). Best practice guidelines should be further developed, also to improve the quality and comparability of cost study findings. Modelling the costs of dengue outbreaks and validating these models through field studies should guide further research.

6. **Estimating the costs of implementing the rotavirus vaccine in the national immunisation programme: the case of Malawi.**


Madsen LB, Ustrup M, Hansen KS, Nyasulu PS, Bygbjerg IC, Konradsen F.

Keywords
Malawi; cost analysis; costs; developing countries; immunisation programmes; rotavirus vaccines

Abstract
**Objectives** Worldwide, rotavirus infections cause approximately 453,000 child deaths annually. Two licensed vaccines could be life- and cost-saving in low-income countries where the disease burden is highest. The aim of our study was to estimate the total cost of implementing the rotavirus vaccine in the national immunisation programme of a low-income country. Furthermore, the aim was to examine the relative contribution of different components to the total cost.

**Methods** Following the World Health Organization guidelines, we estimated the resource use and costs associated with rotavirus vaccine implementation, using Malawi as a case. The cost analysis was undertaken from a governmental perspective. All costs were calculated for a 5-years period (2012-2016) and discounted at 5%. The value of key input parameters was varied in a sensitivity analysis.

**Results**
The total cost of rotavirus vaccine implementation in Malawi amounted to US$ 18.5 million over a 5-years period. This translated into US$ 5.8 per child in the birth cohort. With GAVI Alliance financial support, the total cost was reduced to US$ 1.4 per child in the birth cohort. Approximately 83% of the total cost was attributed to vaccine purchase, while 17% was attributed to system costs, with personnel, transportation and cold chain as the main cost components.

**Conclusions** The total cost of rotavirus vaccine implementation in Malawi is high compared with the governmental health budget of US$ 26 per capita per year. This highlights the need for new financing opportunities for low-income countries to facilitate vaccine implementation and ensure sustainable financing.

7. **Cost and sustainability of a successful package of interventions to improve vaccination coverage for children in urban slums of Bangladesh.**


Hayford K, Uddin MJ, Koehlmoos TP, Bishai DM.
Keywords
Bangladesh; Cost; Economic analysis; Economic evaluation; Immunization; Urban slum; Vaccination coverage

Abstract

Objective To estimate the incremental economic costs and explore satisfaction with a highly effective intervention for improving immunization coverage among slum populations in Dhaka, Bangladesh. A package of interventions based on extended clinic hours, vaccinator training, active surveillance, and community participation was piloted in two slum areas of Dhaka, and resulted in an increase in valid fully immunized children (FIC) from 43% pre-intervention to 99% post-intervention.

Methods Cost data and stakeholder perspectives were collected January-February 2010 via document review and 10 key stakeholders interviews to estimate the financial and opportunity costs of the intervention, including uncompensated time, training and supervision costs.

Results The total economic cost of the 1-year intervention was $18,300, comprised of external management and supervision (73%), training (11%), coordination costs (1%), uncompensated staff time and clinic costs (2%), and communications, supplies and other costs (13%). An estimated 874 additional children were correctly and fully immunized due to the intervention, at an average cost of $20.95 per valid FIC. Key stakeholders ranked extended clinic hours and vaccinator training as the most important components of the intervention. External supervision was viewed as the most important factor for the intervention’s success but also the costliest. All stakeholders would like to reinstate the intervention because it was effective, but additional funding would be needed to make the intervention sustainable.

Conclusions Targeting slum populations with an intensive immunization intervention was highly effective but would nearly triple the amount spent on immunization per FIC in slum areas. Those committed to increasing vaccination coverage for hard-to-reach children need to be prepared for substantially higher costs to achieve results.

8. Costs analysis of a population level rabies control programme in Tamil Nadu, India.


Abbas SS, Kakkar M, Rogawski ET; Roadmap to Combat Zoonoses in India (RCZI) initiative

Abstract
The study aimed to determine costs to the state government of implementing different interventions for controlling rabies among the entire human and animal populations of Tamil Nadu. This built upon an earlier assessment of Tamil Nadu’s efforts to control rabies. Anti-rabies vaccines were made available at all health facilities. Costs were estimated for five different combinations of animal and human interventions using an activity-based costing approach from the provider perspective. Disease and population data were sourced from the state surveillance data, human census and livestock census. Program costs were extrapolated from official documents. All capital costs were depreciated to estimate annualized costs. All costs were inflated to 2012 Rupees. Sensitivity analysis was conducted across all major cost
centres to assess their relative impact on program costs. It was found that the annual costs of providing Anti-rabies vaccine alone and in combination with Immunoglobulins was $0.7 million (Rs 36 million) and $2.2 million (Rs 119 million), respectively. For animal sector interventions, the annualised costs of rolling out surgical sterilisation-immunization, injectable immunization and oral immunizations were estimated to be $44 million (Rs 2,350 million), $23 million (Rs 1,230 million) and $11 million (Rs 590 million), respectively. Dog bite incidence, health systems coverage and cost of rabies biologicals were found to be important drivers of costs for human interventions. For the animal sector interventions, the size of dog catching team, dog population and vaccine costs were found to be driving the costs. Rabies control in Tamil Nadu seems a costly proposition the way it is currently structured. Policy makers in Tamil Nadu and other similar settings should consider the long-term financial sustainability before embarking upon a state or nation-wide rabies control programme.

9. **Costs of illness due to cholera, costs of immunization and cost-effectiveness of an oral cholera mass vaccination campaign in Zanzibar.**


**Abstract**

**Background** The World Health Organization (WHO) recommends oral cholera vaccines (OCVs) as a supplementary tool to conventional prevention of cholera. Dukoral, a killed whole-cell two-dose OCV, was used in a mass vaccination campaign in 2009 in Zanzibar. Public and private costs of illness (COI) due to endemic cholera and costs of the mass vaccination campaign were estimated to assess the cost-effectiveness of OCV for this particular campaign from both the health care provider and the societal perspective.

**Methodology** Public and private COI were obtained from interviews with local experts, with patients from three outbreaks and from reports and record review. Cost data for the vaccination campaign were collected based on actual expenditure and planned budget data. A static cohort of 50,000 individuals was examined, including herd protection. Primary outcome measures were incremental cost-effectiveness ratios (ICER) per death, per case and per disability-adjusted life-year (DALY) averted. One-way sensitivity and threshold analyses were conducted. The ICER was evaluated with regard to WHO criteria for cost-effectiveness. Base-case ICERs were USD 750,000 per death averted, USD 6,000 per case averted and USD 30,000 per DALY averted, without differences between the health care provider and the societal perspective. Threshold analyses using Shanchol and assuming high incidence and case-fatality rate indicated that the purchase price per course would have to be as low as USD 1.2 to render the mass vaccination campaign cost-effective from a health care provider perspective (societal perspective: USD 1.3).

**Conclusions** Based on empirical and site-specific cost and effectiveness data from Zanzibar, the 2009 mass vaccination campaign was cost-ineffective mainly due to the relatively high OCV purchase price and a relatively low incidence. However, mass vaccination campaigns in Zanzibar to control endemic cholera may meet criteria for cost-effectiveness under certain circumstances, especially in high-incidence areas and at OCV prices below USD 1.3.
10. **Estimation des coûts du programme élargi de vaccination dans le district sanitaire de Grand Bassam, Côte d’Ivoire**

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Alfred Douba ; Simplice N’Cho Dagnan ; Pétronille Zengbe-Acray ; Joseph Aka ; Nicaise Lépri-Aka

**Keywords**

Coûts Programme Élargi Vaccination district sanitaire Côte d’Ivoire

**Abstract**

Les vaccins du programme élargi de vaccination sont administrés gracieusement aux bénéiciaires. Cependant, leurs coûts sont supportés par chaque pays et ses partenaires. Ces dépenses nécessitent d’être estimées afin d’être mieux appréhendées. C’est la raison pour laquelle nous avons réalisé cette étude transversale descriptive des coûts du programme élargi de vaccination dans le district sanitaire de Grand-Bassam du 1er janvier au 31 décembre 2006 à l’aide de questionnaire visant à appréhender l’ensemble des coûts du point de vue de l’État et ses partenaires. Les objectifs étaient de déterminer le coût par niveau de dépenses, calculer le coût par enfant ayant reçu trois doses de DTChepB et le coût par stratégie. Les vaccins et consommables représentaient 49 % des coûts récurrents. Les véhicules et motos utilisés par les équipes représentaient 73 % des coûts non récurrents. Le coût récurrent par enfant ayant reçu trois doses de DTChepB était 10 797 FCFA soit 16 euros. Le coût récurrent par dose administrée était 1 041 FCFA (1,58 euros) pour la stratégie fixe, 4 232 FCFA (6,45 euros) pour la stratégie avancée et 4 058 FCFA (6,18 euros) pour la stratégie mobile. En raison de la rareté des ressources financières, l’État ivoirien doit renforcer les actions efficientes de santé publique notamment la vaccination.

11. **Economics of polio vaccination in the post-eradication era: should OPV-using countries adopt IPV?**


Khan MM.

**Keywords**

Post-certification era; Polio immunisation; Vaccination costs

**Abstract**

The continued use of oral polio vaccine (OPV) poses a threat to polio virus eradication. Stopping all polio vaccination in the post-certification era is no longer considered to be a practical option. Policy makers agree that OPV use must stop immediately after certification. Therefore, the pragmatic alternative is for the OPV-using countries to switch to IPV. This study estimates the
cost of switching to IPV, and the cost-effectiveness of this switch. Using data on the number of polio cases and the number of unvaccinated children in different countries of the world, the risks of polio and polio outbreaks have been calculated. The current cost of routine and intensive OPV immunisation is about US $2143 million in the 148 OPV-using countries. Routine use of IPV in these countries should cost US $1246 million. If the current costs of routine and intensive polio immunisation are considered, adopting IPV to replace OPV will not increase the total global cost. Even if the cost of intensive polio immunisation is ignored, cost-effectiveness ratio of adopting IPV remains less than the average GNI per capita of OPV-using countries. The incremental cost of adopting IPV to replace OPV is relatively low, about US $1 per child per year, and most countries should be able to afford this additional cost.

12. **The costs of scaling up vaccination in the world’s poorest countries.**


Bishai D, McQuestion M, Chaudhry R, Wigton A.

**Abstract**

We examine the relationship between country-level average costs and coverage levels for diphtheria-pertussis-tetanus (DTP) vaccines. Coverage data are from the World Health Organization, and cost data are from financial sustainability plans filed with the Global Alliance for Vaccines and Immunization (GAVI) by forty countries from 2000 to 2003. In this data set, average costs are lower for countries that vaccinate more children. At the highest numbers of covered children, there was no trend toward higher average costs. Vaccine programs in this set of poor countries have not yet scaled up to the point at which diminishing marginal returns are observed.

13. **Costs of illness due to typhoid fever in an Indian urban slum community: implications for vaccination policy.**


**Abstract**

Data on the burden of disease, costs of illness, and cost-effectiveness of vaccines are needed to facilitate the use of available anti-typhoid vaccines in developing countries. This one-year prospective surveillance was carried out in an urban slum community in Delhi, India, to estimate the costs of illness for cases of typhoid fever. Ninety-eight culture-positive typhoid, 31 culture-positive paratyphoid, and 94 culture-negative cases with clinical typhoid syndrome were identified during the surveillance. Estimates of costs of illness were based on data collected through weekly interviews conducted at home for three months following diagnosis. Private costs included the sum of direct medical, direct non-medical, and indirect costs. Non-patient (public) costs included costs of outpatient visits, hospitalizations, laboratory tests, and medicines provided free of charge to the families. The mean cost per episode of blood culture-confirmed typhoid fever was 3,597 Indian Rupees (US$ 1=INR 35.5) (SD 5,833); hospitalization
increased the costs by several folds (INR 18,131, SD 11,218, p<0.0001). The private and non-patient costs of illness were similar (INR 1,732, SD 1,589, and INR 1,865, SD 5,154 respectively, p=0.8095). The total private and non-patient ex-ante costs, i.e. expected annual losses for each individual, were higher for children aged 2-5 years (INR 154) than for those aged 5-19 years (INR 32), 0-2 year(s) (INR 25), and 19-40 years (INR 2). The study highlights the need for affordable typhoid vaccines efficacious at 2-5 years of age. Currently-available Vi vaccine is affordable but is unlikely to be efficacious in the first two years of life. Ways must be found to make Vi-conjugate vaccine, which is efficacious at this age, available to children of developing-countries.

14. **A case study using the United Republic of Tanzania: costing nationwide HPV vaccine delivery using the WHO Cervical Cancer Prevention and Control Costing Tool**


Raymond Hutubessy, Ann Levin, Susan Wang, Winthrop Morgan, Mariam Ally, Theopista John and Nathalie Broutet

**Abstract**

The purpose, methods, data sources and assumptions behind the World Health Organization (WHO) Cervical Cancer Prevention and Control Costing (C4P) tool that was developed to assist low- and middle-income countries (LMICs) with planning and costing their nationwide human papillomavirus (HPV) vaccination program are presented. Tanzania is presented as a case study where the WHO C4P tool was used to cost and plan the roll-out of HPV vaccines nationwide as part of the national comprehensive cervical cancer prevention and control strategy. The WHO C4P tool focuses on estimating the incremental costs to the health system of vaccinating adolescent girls through school-, health facility- and/or outreach-based strategies. No costs to the user (school girls, parents or caregivers) are included. Both financial (or costs to the Ministry of Health) and economic costs are estimated. Over five years (2011 to 2015), the cost of establishing an HPV vaccine program that delivers three doses of vaccine to girls at schools via phased national introduction (three regions in year 1, ten regions in year 2 and all 26 regions in years 3 to 5) in Tanzania is estimated to be US$9.2 million (excluding vaccine costs) and US$31.5 million (with vaccine) assuming a vaccine price of US$5 (GAVI 2011, formerly the Global Alliance for Vaccines and Immunizations). This is equivalent to a financial cost of US$5.77 per FIG, excluding the vaccine cost. The most important costs of service delivery are social mobilization/IEC and service delivery operational costs. The WHO C4P tool is intended to help LMICs to plan ahead and estimate the programmatic and operational costs of HPV vaccination.

15. **Projections of costs, financing, and additional resource requirements for low- and lower middle-income country immunization programs over the decade, 2011–2020**

Vaccine. 2013 Apr 18;31 Suppl 2:B137-48

Gian Gandhi,, Patrick Lydon,, Santiago Cornejo, Logan Brenzel, Sandra Wrobel, Hugh Chang

**Abstract**
The Decade of Vaccines Global Vaccine Action Plan has outlined a set of ambitious goals to broaden the impact and reach of immunization across the globe. A projections exercise has been undertaken to assess the costs, financing availability, and additional resource requirements to achieve these goals through the delivery of vaccines against 19 diseases across 94 low- and middle-income countries for the period 2011–2020. The exercise draws upon data from existing published and unpublished global forecasts, country immunization plans, and costing studies. A combination of an ingredients-based approach and use of approximations based on past spending has been used to generate vaccine and non-vaccine delivery costs for routine programs, as well as supplementary immunization activities (SIAs). Financing projections focused primarily on support from governments and the GAVI Alliance. Cost and financing projections are presented in constant 2010 US dollars (US$). Cumulative total costs for the decade are projected to be US$57.5 billion, with 85% for routine programs and the remaining 15% for SIAs. Delivery costs account for 54% of total cumulative costs, and vaccine costs make up the remainder. A conservative estimate of total financing for immunization programs is projected to be $34.3 billion over the decade, with country governments financing 65%. These projections imply a cumulative funding gap of $23.2 billion. About 57% of the total resources required to close the funding gap are needed just to maintain existing programs and scale up other currently available vaccines (i.e., before adding in the additional costs of vaccines still in development). Efforts to mobilize additional resources, manage program costs, and establish mutual accountability between countries and development partners will all be necessary to ensure the goals of the Decade of Vaccines are achieved.

Establishing or building on existing mechanisms to more comprehensively track resources and commitments for immunization will help facilitate these efforts.

16. Costs of Introducing and Delivering HPV Vaccines in Low and Lower Middle Income Countries: Inputs for GAVI Policy on Introduction Grant Support to Countries.


Levin A, Wang SA, Levin C, Tsu V, Hutubessy R.

Abstract

In November 2011, the GAVI Alliance made the decision to add HPV vaccine as one of the new vaccines for which countries eligible for its funding (less than $1520 per capita income) could apply to receive support for national HPV vaccination, provided they could demonstrate the ability to deliver HPV vaccines. This paper describes the data and analysis shared with GAVI policymakers for this decision regarding GAVI HPV vaccine support. The paper reviews why strategies and costs for HPV vaccine delivery are different from other vaccines and what is known about the cost components from available data that originated primarily from HPV vaccine delivery costing studies in low and middle income-countries.

Methods Financial costs of HPV vaccine delivery were compared across three sources of data: 1) vaccine delivery costing of pilot projects in five low and lower-middle income countries; 2) cost estimates of national HPV vaccination in two low income countries; and 3) actual expenditure data from national HPV vaccine introduction in a low income country. Both cost of resources required to introduce the vaccine (or initial one-time investment, such as cold chain equipment purchases) and recurrent (ongoing costs that repeat every year) costs, such as transport and health personnel time, were analyzed. The cost per dose, cost per fully immunized girl (FIG) and cost per eligible girl were compared across studies.
Results Costs varied among pilot projects and estimates of national programs due to differences in scale and service delivery strategy. The average introduction costs per fully immunized girl ranged from $1.49 to $18.94 while recurrent costs per girl ranged from $1.00 to $15.69, with both types of costs varying by delivery strategy and country. Evaluating delivery costs along programme characteristics as well as country characteristics (population density, income/cost level, existing service delivery infrastructure) are likely the most informative and useful for anticipating costs for HPV vaccine delivery.

Conclusions This paper demonstrates the importance of country level cost data to inform global donor policies for vaccine introduction support. Such data are also valuable for informing national decisions on HPV vaccine introduction.