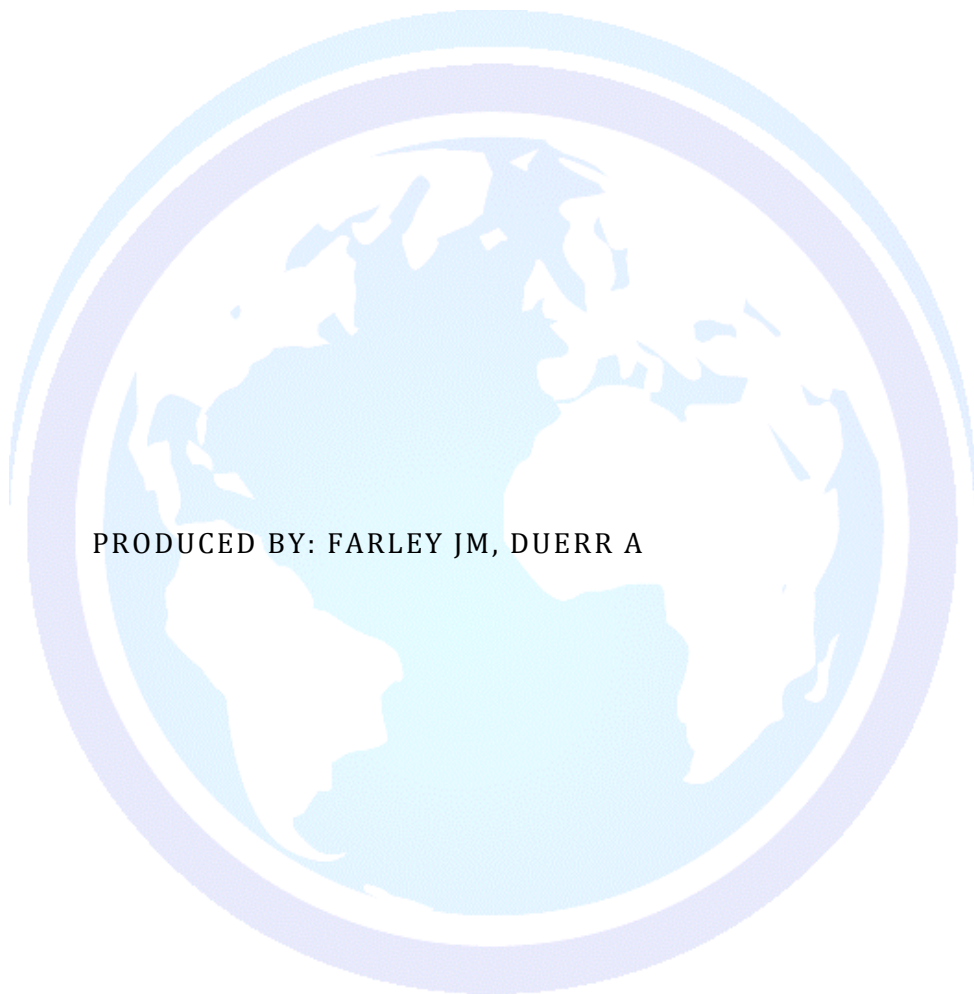


VACCINE DELIVERY RESEARCH DIGEST

UNIVERSITY OF WASHINGTON GLOBAL HEALTH START PROGRAM
REPORT TO THE BILL AND MELINDA GATES FOUNDATION

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TABLE OF CONTENTS

1. Immunization Equity.	3
○ A study using surveys to explore immunization equity, and a discussion of initiatives to address equity.	
2. Landscaping the structures of GAVI country vaccine supply chains and testing the effects of radical redesign.	4
○ An analysis of supply chains in 57 GAVI-eligible countries.	
3. Acceptability and Feasibility of Delivering Pentavalent Vaccines in a Compact, Prefilled, Autodisable Device in Vietnam and Senegal.	5
○ A logistic, programmatic, and anthropological study to evaluate the feasibility of CPADs for vaccine delivery.	
4. Estimating the cost of cholera-vaccine delivery from the societal point of view: A case of introduction of cholera vaccine in Bangladesh.	6
○ A study providing cost data for cholera vaccine introduction in Bangladesh.	
5. Does introducing an immunization package of services for migrant children improve the coverage, service quality and understanding? An evidence from an intervention study among 1548 migrant children in eastern China.	7
○ A pre- and post-test study to evaluate an EPI intervention package.	
6. Effectiveness of Using Mobile Phone Image Capture for Collecting Secondary Data: A Case Study on Immunization History Data Among Children in Remote Areas of Thailand.	8
○ A study comparing data entry via phone image capture to hand transcription.	
7. Methodological challenges in measuring vaccine effectiveness using population cohorts in low resource settings.	9
○ A discussion of methodological considerations in cohort studies.	
8. Use of Mobile Information Technology during Planning, Implementation and Evaluation of a Polio Campaign in South Sudan.	10
○ A study mapping immunization coverage during a polio campaign.	
9. Effects of three interventions and determinants of full vaccination among children aged 12-59 months in Nyanza province, Kenya.	11
○ A cross-sectional study using three datasets to identify determinants of immunization.	
10. How a New Health Intervention Affects the Health Systems? Learnings from Pentavalent Vaccine Introduction in India.	12
○ A post-introduction evaluation of pentavalent vaccine.	
Appendix: PubMed Search Terms	13



1. IMMUNIZATION EQUITY.

Hinman AR, McKinlay MA.

Am J Prev Med. 2015 Aug 14. pii: S0749-3797(15)00202-0.[Epub ahead of print]

PMID: 26282089

ABSTRACT

Health inequities are the unjust differences in health among different social groups. Unfortunately, inequities are the norm, both in terms of health status and access to, and use of, health services. Childhood immunizations reduce the incidence of vaccine-preventable diseases and represent a cost-effective way to foster health equity. This paper reflects a 2015 review of data from surveys conducted in developing countries from 2005 to 2011 that show significant inequities in immunization coverage and discusses several initiatives currently underway (including Gavi, the Vaccine Alliance) that are directed at increasing childhood immunizations or reducing or abolishing overall health inequities. These initiatives have already had a significant impact on disease burden and childhood mortality and give rise to optimism that health disparities may further be reduced and health equity achieved as a result of investments made in immunization.

WEB: <http://dx.doi.org/10.1016/j.amepre.2015.04.018>

IMPACT FACTOR: 4.28

CITED HALF-LIFE: 6.00

UW EDITORIAL COMMENT: Initiatives to increase immunization equity have taken place at the national and international level. National initiatives include concerted efforts in Brazil, Ghana, Thailand, and India to address disparities through strategies such as focusing on EPI vaccines, government commitment to health infrastructure, and equity-specific strategies within Ministries of Health. International initiatives include the GAVI Alliance. Figure 1 shows the difference in DTP3 immunization coverage among 1-year olds by country according to wealth quintile ranked by the highest and lowest quintiles.



2. LANDSCAPING THE STRUCTURES OF GAVI COUNTRY VACCINE SUPPLY CHAINS AND TESTING THE EFFECTS OF RADICAL REDESIGN.

Lee BY, Connor DL, Wateska AR, Norman BA, Rajgopal J, Cakouros BE et al.

Vaccine. 2015 Aug 26;33(36):4451-8. Epub 2015 Jul 23.

PMID: 26209835

ABSTRACT

BACKGROUND: Many of the world's vaccine supply chains do not adequately provide vaccines, prompting several questions: how are vaccine supply chains currently structured, are these structures closely tailored to individual countries, and should these supply chains be radically redesigned?

METHODS: We segmented the 57 GAVI-eligible countries' vaccine supply chains based on their structure/morphology, analyzed whether these segments correlated with differences in country characteristics, and then utilized HERMES to develop a detailed simulation model of three sample countries' supply chains and explore the cost and impact of various alternative structures.

RESULTS: The majority of supply chains (34 of 57) consist of four levels, despite serving a wide diversity of geographical areas and population sizes. These four-level supply chains loosely fall into three clusters [(1) 18 countries relatively more bottom-heavy, i.e., many more storage locations lower in the supply chain, (2) seven with relatively more storage locations in both top and lower levels, and (3) nine comparatively more top-heavy] which do not correlate closely with any of the country characteristics considered. For all three cluster types, our HERMES modeling found that simplified systems (a central location shipping directly to immunization locations with a limited number of Hubs in between) resulted in lower operating costs.

CONCLUSION: A standard four-tier design template may have been followed for most countries and raises the possibility that simpler and more tailored designs may be warranted.

WEB: <http://dx.doi.org/10.1016/j.vaccine.2015.07.033>

IMPACT FACTOR: 3.49

CITED HALF-LIFE: 4.90

UW EDITORIAL COMMENT: Table 1 shows the characteristics of all GAVI-eligible countries, while Figure 1 shows the segmentation of four-level GAVI-country vaccine supply chains in three clusters: bottom-heavy supply chains, supply chains with storage locations at the top and bottom of the supply chain, and supply chains that are top-heavy. Most GAVI countries have a four-level supply chain, and the authors argue that many countries could benefit from a simplified and more tailored approach. While there are some benefits to a supply chain with many levels, such as decentralization and reduced vulnerability due to multiple storage locations and transport routes, there are also downsides, such as coordination complications and management responsibilities, as well as redundancies. Simplified systems can make logistics easier and save money.



3. ACCEPTABILITY AND FEASIBILITY OF DELIVERING PENTAVALENT VACCINES IN A COMPACT, PREFILLED, AUTODISABLE DEVICE IN VIETNAM AND SENEGAL.

Guillermot E, Dicko HM, Mai le TP, N'Diaye M, Hane F, Ba SO et al.

PLoS One. 2015 Jul 17;10(7):e0132292. eCollection 2015.

PMID: 26186456

ABSTRACT

BACKGROUND: Prefilled syringes are the standard in developed countries but logistic and financial barriers prevent their widespread use in developing countries. The current study evaluated use of a compact, prefilled, autodisable device (CPAD) to deliver pentavalent vaccine by field actors in Senegal and Vietnam.

METHODS: We conducted a logistic, programmatic, and anthropological study that included a) interviews of immunization staff at different health system levels and parents attending immunization sessions; b) observation of immunization sessions including CPAD use on oranges; and c) document review.

RESULTS: Respondents perceived that the CPAD would improve safety by being non-reusable and preventing needle and vaccine exposure during preparation. Preparation was considered simple and may reduce immunization time for staff and caretakers. CPAD impact on cold storage requirements depended on the current pentavalent vaccine being used; in both countries, CPAD would reduce the weight and volume of materials and safety boxes thereby potentially improving outreach strategies and waste disposal. CPAD also would reduce stock outages by bundling vaccine and syringes and reduce wastage by using a non-breakable plastic presentation. Respondents also cited potential challenges including ability to distinguish between CPAD and other pharmaceuticals delivered via a similar mechanism (such as contraceptives), safety, and concerns related to design and ease of administration (such as activation, ease of delivery, and needle diameter and length).

CONCLUSIONS: Compared to current pentavalent vaccine presentations in Vietnam and Senegal, CPAD technology will address some of the main barriers to vaccination, such as supply chain issues and safety concerns among health workers and families. Most of the challenges we identified can be addressed with health worker training, minor design modifications, and health messaging targeting parents and communities. Potentially the largest remaining barrier is the marginal increase in pentavalent cost - if any - from CPAD use, which we did not assess in our study.

WEB: <http://dx.doi.org/10.1371/journal.pone.0132292>

IMPACT FACTOR: 3.23

CITED HALF-LIFE: 2.40

UW EDITORIAL COMMENT: Figure 1 details the components of a Uniject device. Table 4 outlines the advantages and challenges of CPADs according to interviewees across five characteristics: design, safety, ease of use, dose, and supply chain. Limitations include the small number of participants interviewed, and the authors recommend a quantitative follow-up to this research in order to determine the relative importance of different issues surrounding CPADs.



4. ESTIMATING THE COST OF CHOLERA-VACCINE DELIVERY FROM THE SOCIETAL POINT OF VIEW: A CASE OF INTRODUCTION OF CHOLERA VACCINE IN BANGLADESH.

Sarker AR, Islam Z, Khan IA, Saha A, Chowdhury F, Khan AI et al.

Vaccine. 2015 Sep 11;33(38):4916-21. Epub 2015 Jul 30.

PMID: 26232545

ABSTRACT

Cholera is a major global public health problem that causes both epidemic and endemic disease. The World Health Organization recommends oral cholera vaccines as a public health tool in addition to traditional prevention practices and treatments in both epidemic and endemic settings. In many developing countries like Bangladesh, the major issue concerns the affordability of this vaccine. In February 2011, a feasibility study entitled, "Introduction of Cholera Vaccine in Bangladesh (ICVB)", was conducted for a vaccination campaign using inactivated whole-cell cholera vaccine (Shanchol) in a high risk area of Mirpur, Dhaka. Empirical data obtained from this trial was used to determine the vaccination cost for a fully immunized person from the societal perspective. A total of 123,661 people were fully vaccinated receiving two doses of the vaccine, while 18,178 people received one dose of the same vaccine. The total cost for vaccine delivery was US\$ 492,238 giving a total vaccination cost per fully-vaccinated individual of US\$ 3.98. The purchase cost of the vaccine accounted for 58% of the overall cost of vaccination. Attempts to reduce the per-dose cost of the vaccine are likely to have a large impact on the cost of similar vaccination campaigns in the future.

WEB: <http://dx.doi.org/10.1016/j.vaccine.2015.07.042>

IMPACT FACTOR: 3.49

CITED HALF-LIFE: 4.90

UW EDITORIAL COMMENT: This study provides cost data for cholera vaccine introduction in Bangladesh. The purpose of the study was to provide data on costs of vaccination and cost drivers from a pilot study on a limited population to inform large-scale health planning. The study found that purchase costs for vaccination account for 58% of total costs, and staff salary for 24% (a breakdown of all costs is included in Table 1). Conclusions suggest that lowering purchase cost would have the greatest effect on introduction feasibility.



5. DOES INTRODUCING AN IMMUNIZATION PACKAGE OF SERVICES FOR MIGRANT CHILDREN IMPROVE THE COVERAGE, SERVICE QUALITY AND UNDERSTANDING? AN EVIDENCE FROM AN INTERVENTION STUDY AMONG 1548 MIGRANT CHILDREN IN EASTERN CHINA.

Hu Y, Luo S, Tang X, Lou L, Chen Y, Guo J, Zhang B.

BMC Public Health. 2015 Jul 15;15:664

PMID: 26173803

ABSTRACT

BACKGROUND: An EPI (Expanded Program on Immunization) intervention package was implemented from October 2011 to May 2014 among migrant children in Yiwu, east China. This study aimed to evaluate its impacts on vaccination coverage, maternal understanding of EPI and the local immunization service performance.

METHODS: A pre- and post-test design was used. The EPI intervention package included: (1) extending the EPI service time and increasing the frequency of vaccination service; (2) training program for vaccinators; (3) developing a screening tool to identify vaccination demands among migrant clinic attendants; (4) Social mobilization for immunization. Data were obtained from random sampling investigations, vaccination service statistics and qualitative interviews with vaccinators and mothers of migrant children. The analysis of quantitative data was based on a "before and after" evaluation and qualitative data were analyzed using content analysis.

RESULTS: The immunization registration (records kept by immunization clinics) rate increased from 87.4 to 91.9% ($P = 0.016$) after implementation of the EPI intervention package and the EPI card holding (EPI card kept by caregivers) rate increased from 90.9 to 95.6% ($P = 0.003$). The coverage of fully immunized increased from 71.5 to 88.6% for migrant children aged 1-4 years ($P < 0.001$) and increased from 42.2 to 80.5% for migrant children aged 2-4 years ($P < 0.001$). The correct response rates on valid doses and management of adverse events among vaccinators were over 90% after training. The correct response rates on immunization among mothers of migrant children were 86.8-99.3% after interventions.

CONCLUSION: Our study showed a substantial improvement in vaccination coverage among migrant children in Yiwu after implementation of the EPI intervention package. Further studies are needed to evaluate the cost-effectiveness of the interventions, to identify individual interventions that make the biggest contribution to coverage, and to examine the sustainability of the interventions within the existing vaccination service delivery system in a larger scale settings or in a longer term.

WEB: <http://dx.doi.org/10.1186/s12889-015-1998-5>

IMPACT FACTOR: 2.32

CITED HALF-LIFE: 3.60

UW EDITORIAL COMMENT: Table 3 shows the immunization registration rate and EPI card holding rate among migrant children before and after the implementation of the EPI intervention, while Table 4 shows primary vaccination coverage among the same group before and after the intervention.



6. EFFECTIVENESS OF USING MOBILE PHONE IMAGE CAPTURE FOR COLLECTING SECONDARY DATA: A CASE STUDY ON IMMUNIZATION HISTORY DATA AMONG CHILDREN IN REMOTE AREAS OF THAILAND.

Jandee K, Kaewkungwal J, Khamsiriwatchara A, Lawpoolsri S, Wongwit W, Wansatid P.

JMIR Mhealth Uhealth. 2015 Jul 20;3(3):e75.

PMID: 26194880

ABSTRACT

BACKGROUND: Entering data onto paper-based forms, then digitizing them, is a traditional data-management method that might result in poor data quality, especially when the secondary data are incomplete, illegible, or missing...[text not shown]

OBJECTIVE: This study aimed to demonstrate the usefulness and to evaluate the effectiveness of mobile phone camera applications in capturing health-related data...[text not shown]

METHODS: In this study, the concept of "data entry via phone image capture" (DEPIC) was introduced and developed to capture data directly from source documents. This case study was based on immunization history data recorded in a mother and child health (MCH) logbook...[text not shown]

RESULTS: As a proof-of-concept, DEPIC captured immunization history records of 363 ethnic children living in remote areas from their MCH logbooks. Comparison of the 2 databases, DEPIC versus HCIS, revealed differences in the percentage of completeness and consistency of immunization history records. Comparing the records of each logbook in the DEPIC and HCIS databases, 17.3% (63/363) of children had complete immunization history records in the DEPIC database, but no complete records were reported in the HCIS database. Regarding the individual's actual vaccination dates, comparison of records taken from MCH logbook and those in the HCIS found that 24.2% (88/363) of the children's records were absolutely inconsistent. In addition, statistics derived from the DEPIC records showed a higher immunization coverage and much more compliance to immunization schedule by age group when compared to records derived from the HCIS database.

CONCLUSIONS: DEPIC, or the concept of collecting data via image capture directly from their primary sources, has proven to be a useful data collection method in terms of completeness and consistency. In this study, DEPIC was implemented in data collection of a single survey. The DEPIC concept, however, can be easily applied in other types of survey research, for example, collecting data on changes or trends based on image evidence over time. With its image evidence and audit trail features, DEPIC has the potential for being used even in clinical studies since it could generate improved data integrity and more reliable statistics for use in both health care and research settings.

WEB: <http://dx.doi.org/10.2196/mhealth.4183>

IMPACT FACTOR: 4.70

CITED HALF-LIFE: 0.00

UW EDITORIAL COMMENT: Table 2 shows a data analysis of immunization outcomes between DEPIC and HCIS, while Figure 4 shows status of compliance to immunization schedule by data source.



7. METHODOLOGICAL CHALLENGES IN MEASURING VACCINE EFFECTIVENESS USING POPULATION COHORTS IN LOW RESOURCE SETTINGS.

King C, Beard J, Crampin AC, Costello A, Mwansambo C, Cunliffe NA et al.

Vaccine. 2015 Sep 11;33(38):4748-55. Epub 2015 Jul 30.

PMID: 26235370

ABSTRACT

Post-licensure real world evaluation of vaccine implementation is important for establishing evidence of vaccine effectiveness (VE) and programme impact, including indirect effects. Large cohort studies offer an important epidemiological approach for evaluating VE, but have inherent methodological challenges. Since March 2012, we have conducted an open prospective cohort study in two sites in rural Malawi to evaluate the post-introduction effectiveness of 13-valent pneumococcal conjugate vaccine (PCV13) against all-cause post-neonatal infant mortality and monovalent rotavirus vaccine (RV1) against diarrhoea-related post-neonatal infant mortality. Our study sites cover a population of 500,000, with a baseline post-neonatal infant mortality of 25 per 1000 live births. We conducted a methodological review of cohort studies for vaccine effectiveness in a developing country setting, applied to our study context. Based on published literature, we outline key considerations when defining the denominator (study population), exposure (vaccination status) and outcome ascertainment (mortality and cause of death) of such studies. We assess various definitions in these three domains, in terms of their impact on power, effect size and potential biases and their direction, using our cohort study for illustration. Based on this iterative process, we discuss the pros and cons of our final per-protocol analysis plan. Since no single set of definitions or analytical approach accounts for all possible biases, we propose sensitivity analyses to interrogate our assumptions and methodological decisions. In the poorest regions of the world where routine vital birth and death surveillance are frequently unavailable and the burden of disease and death is greatest We conclude that provided the balance between definitions and their overall assumed impact on estimated VE are acknowledged, such large scale real-world cohort studies can provide crucial information to policymakers by providing robust and compelling evidence of total benefits of newly introduced vaccines on reducing child mortality.

WEB: <http://dx.doi.org/10.1016/j.vaccine.2015.07.062>

IMPACT FACTOR: 3.49

CITED HALF-LIFE: 4.90

UW EDITORIAL COMMENT: This article considers the study of vaccine effectiveness in two population settings in Malawi: a open cohort study and a demographic surveillance site. It discusses the impact of methodological definitions on assessment of effectiveness. Table 1 outlines the advantages and disadvantages of different target populations in a cohort study of vaccine effectiveness, while Box 2 shows the per-protocol analysis definitions of denominator, exposure, and outcome for this study.



8. USE OF MOBILE INFORMATION TECHNOLOGY DURING PLANNING, IMPLEMENTATION AND EVALUATION OF A POLIO CAMPAIGN IN SOUTH SUDAN.

Haskew J, Kenyi V, William J, Alum R, Puri A, Mostafa Y, Davis R.

PLoS One. 2015 Aug 7;10(8):e0135362. eCollection 2015.

PMID: 26252383

ABSTRACT

BACKGROUND: Use of mobile information technology may aid collection of real-time, standardised data to inform and improve decision-making for polio programming and response. We utilised Android-based smartphones to collect data electronically from more than 8,000 households during a national round of polio immunisation in South Sudan. The results of the household surveys are presented here, together with discussion of the application of mobile information technology for polio campaign planning, implementation and evaluation in a real-time setting.

METHODS: Electronic questionnaires were programmed onto Android-based smartphones for mapping, supervision and survey activities during a national round of polio immunisation. National census data were used to determine the sampling frame for each activity and select the payam (district). Individual supervisors, in consultation with the local district health team, selected villages and households within each payam. Data visualisation tools were utilised for analysis and reporting.

RESULTS: Implementation of mobile information technology and local management was feasible during a national round of polio immunisation in South Sudan. Red Cross visits during the polio campaign were equitable according to household wealth index and households who received a Red Cross visit had significantly higher odds of being aware of the polio campaign than those who did not. Nearly 95% of children under five were reported to have received polio immunisation (according to maternal recall) during the immunisation round, which varied by state, county and payam. A total of 11 payams surveyed were identified with less than 90% reported immunisation coverage and the least poor households had significantly higher odds of being vaccinated than the most poor. More than 95% of households were aware of the immunisation round and households had significantly higher odds of being vaccinated if they had prior awareness of the campaign taking place.

CONCLUSION: Pre-campaign community education and household awareness of polio is important to increase campaign participation and subsequent immunisation coverage in South Sudan. More emphasis should be placed on ensuring immunisation is equitable according to geographic area and household socio-economic index in future rounds. We demonstrate the utility of mobile information technology for household mapping, supervision and survey activities during a national round of polio immunisation and encourage future studies to compare the effectiveness of electronic data collection and its application in polio planning and programming.

WEB: <http://dx.doi.org/10.1371/journal.pone.0135362>

IMPACT FACTOR: 3.23

CITED HALF-LIFE: 2.40

UW EDITORIAL COMMENT: Figure 1 shows a map of households mapped during supervision activities, while Figure 2 shows a map detailing post-campaign immunization coverage. Despite the title of the article, most results presented focus on the polio campaign itself, rather than mobile technology.



9. EFFECTS OF THREE INTERVENTIONS AND DETERMINANTS OF FULL VACCINATION AMONG CHILDREN AGED 12-59 MONTHS IN NYANZA PROVINCE, KENYA.

Kawakatsu Y, Tanaka J, Ogawa K, Ogendero K, Honda S.

Public Health. 2015 Aug 13. pii: S0033-3506(15)00268-1. [Epub ahead of print]

PMID: 26278475

ABSTRACT

OBJECTIVES: The purpose of this study is to describe the effects of the three main interventions and identify the individual and community determinants of full vaccination coverage among children aged 12-59 months in Nyanza province, Kenya.

STUDY DESIGN: Cross-sectional study.

METHODS: We utilized three datasets. One is the Nyanza Province County-based Multiple Indicator Cluster Survey 2011. The other two datasets are the lists of community units and health facilities in Nyanza Province, Kenya. A three-level multilevel logistic regression analysis was performed.

RESULTS: In the final model, the highest wealth quintile (AOR: 2.49; 95% CI: 1.333-4.642; P = 0.004), the community with high coverage of media devices (AOR: 1.50; 95% CI: 1.029-2.198; P = 0.035), the participation of mass immunization campaigns (AOR: 1.63; 95% CI: 1.153-2.303; P = 0.006) were the significant determinants of complete child vaccination.

CONCLUSIONS: In conclusion, further implementation of mass immunization campaigns is the recommended intervention to increase the uptake of required vaccinations among children. In addition, further attention to the poor and the low coverage of media devices is necessary, since they are the most vulnerable population in terms of accessibility of vaccination services. Implementation community based activity, such as community health workers, would have a positive impact on vaccination coverage, if their performance is continuously high.

WEB: <http://dx.doi.org/10.1016/j.puhe.2015.07.008>

IMPACT FACTOR: 1.43

CITED HALF-LIFE: 0.00

UW EDITORIAL COMMENT: Table 3 shows the effects of interventions and determinants of full vaccination among children 12-59 months in the study area. While this study offers findings that are useful for policy development, there are some limitations. The cross-sectional design cannot fully measure the effect of the intervention, and more study is needed to determine if child vaccinations are being properly recorded.



10. HOW A NEW HEALTH INTERVENTION AFFECTS THE HEALTH SYSTEMS? LEARNINGS FROM PENTAVALENT VACCINE INTRODUCTION IN INDIA.

Lahariya C, Paruthi R, Bhattacharya M.

Indian J Pediatr. 2015 Aug 13. [Epub ahead of print].

PMID: 26264631

ABSTRACT

OBJECTIVES: To summarize the findings from a Post Introduction Evaluation (PIE) of pentavalent vaccine in Tamil Nadu and Kerala state of India and to understand how the health systems could be prepared for (prior to) introducing a new intervention and how such introduction could affect the health systems (afterwards).

METHODS: A post introduction evaluation (PIE) of Haemophilus influenzae type b (Hib) as pentavalent (DPT + HepB + Hib) vaccine was conducted in Tamil Nadu and Kerala states of India in July-Aug 2012. The PIE was conducted as per World Health Organization PIE methods and tools specifically adapted for India. This PIE adopted a 'mixed method approach' with qualitative data focus.

RESULTS: The planning for the introduction of pentavalent vaccine provided opportunities to strengthen various functions of the health system i.e., piloting of Open Vial Policy, strengthening surveillance system, improving Adverse Events Following Immunization (AEFI) reporting system and formation of the technical expert groups. It provided opportunity for bringing attention on the immunization programme in general as well. After the vaccine introduction, the beneficial effects were noted on stewardship (increased oversight by top level policy makers and programme managers), creating resources (investment and trainings of staff in immunization), service delivery (increased coverage with the vaccines and improved quality of services) and financing (increased financial allocation and reduced out of pocket expenditures as more people started attending public health facilities). The vaccine introduction was found to be associated with improvement in the health equity, efficiency and service utilization (effective coverage).

CONCLUSIONS: New vaccine introduction provides opportunities (both before and after) for strengthening the health systems in setting such as India. Preparing the health system for new challenges has potential to strengthen the health systems, if done in well-coordinated and planned manner. Considering that essential steps are largely similar, these lessons could be applicable for the introduction of other new health interventions in the similar settings.

WEB: <http://dx.doi.org/10.1007/s12098-015-1844-x>

IMPACT FACTOR: 0.92

CITED HALF-LIFE: 6.70

UW EDITORIAL COMMENT: This evaluation provided an opportunity to examine and improve different functions of the health system related to vaccine delivery: service delivery, creating resources (investment and training), health financing, and stewardship and governance. The effects of pentavalent vaccine introduction on these different functions is detailed in Table 3.



APPENDIX: PUBMED 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]) AND ("2015/07/15"[PDAT] : "2015/08/14"[PDAT]))

*On August 31, 2015, this search of English language articles published between July 15, 2015 and August 14, 2015 and indexed by the US National Library of Medicine resulted in 186 unique manuscripts.

