VACCINE DELIVERY RESEARCH DIGEST

UNIVERSITY OF WASHINGTON STRATEGIC ANALYSIS, RESEARCH & TRAINING (START) CENTER

REPORT TO THE BILL & MELINDA GATES FOUNDATION

PRODUCED BY: ARAKAKI L, BABIGUMIRA JB

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Appendix

Details of Articles

1. Estimating the distribution of morbidity and mortality of childhood diarrhea, measles, and pneumonia by wealth group in low- and middle-income countries

Chang AY, Riumallo-Herl C, Salomon JA, Resch SC, Brenzel L, Verguet S.

BMC Med. 2018 Jul 4;16(1):102.

PubMed ID: 29970074

ABSTRACT

BACKGROUND:

Equitable access to vaccines has been suggested as a priority for low- and middle-income countries (LMICs). However, it is unclear whether providing equitable access is enough to ensure health equity. Furthermore, disaggregated data on health outcomes and benefits gained across population subgroups are often unavailable. This paper develops a model to estimate the distribution of childhood disease cases and deaths across socioeconomic groups, and the potential benefits of three vaccine programs in LMICs.

METHODS:

For each country and for three diseases (diarrhea, measles, pneumonia), we estimated the distributions of cases and deaths that would occur across wealth quintiles in the absence of any immunization or treatment programs, using both the prevalence and relative risk of a set of risk and prognostic factors. Building on these baseline estimates, we examined what might be the impact of three vaccines (first dose of measles, pneumococcal conjugate, and rotavirus vaccines), under five scenarios based on different sets of quintile-specific immunization coverage and disease treatment utilization rates.

RESULTS:

Due to higher prevalence of risk factors among the poor, disproportionately more disease cases and deaths would occur among the two lowest wealth quintiles for all three diseases when vaccines or treatment are unavailable. Country-specific context, including how the baseline risks, immunization coverage, and treatment utilization are currently distributed across quintiles, affects how different policies translate into changes in cases and deaths distribution.

CONCLUSIONS:
Our study highlights several factors that would substantially contribute to the unequal distribution of childhood diseases, and finds that merely ensuring equal access to vaccines will not reduce the health outcomes gap across wealth quintiles. Such information can inform policies and planning of programs that aim to improve equitable delivery of healthcare services.

WEB: 10.1186/s12916-018-1074-y
IMPACT FACTOR: 9.09
CITED HALF-LIFE: 3.10

START COMMENTARY

Chang et al. created a framework to examine morbidity and mortality of childhood diarrhea, measles, and pneumonia and the impact of vaccination and treatment for 41 low- and middle-income countries by wealth quintiles (see Additional file 1 for results for all countries). The five scenarios included 1) no vaccination/treatment, 2) current quintile-specific vaccine/treatment coverage rates, 3) national average vaccine/treatment coverage for all quintiles, 4) vaccine/treatment coverage proportional to quintile-specific baseline mortality risks, and 5) equal baseline morbidity/mortality risk with current quintile-specific vaccine/treatment coverage rate (i.e., reducing morbidity and mortality risk to the lowest level quintile while maintaining current vaccine/treatment coverage). Authors noted a limitation to their study was lack of data by wealth quintile, which prevented authors from performing a more nuanced analysis (e.g., incorporating a dynamic transmission model). Other limitations included lack of uncertainty ranges for some parameters, such as vaccine coverage and treatment coverage, and the inability to validate estimates with empirical data. Authors highlighted that the methodological approach they presented could be expanded to examine other diseases, interventions, and intervention scenarios.

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2. Sub-national variation in measles vaccine coverage and outbreak risk: a case study from a 2010 outbreak in Malawi

Kundrick A, Huang Z, Carran S, Kagoli M, Grais RF, Hurtado N, et al.

BMC Public Health. 2018 Jun 15;18(1):741.

PubMed ID: 29902976

ABSTRACT

BACKGROUND:

Despite progress towards increasing global vaccination coverage, measles continues to be one of the leading, preventable causes of death among children worldwide. Whether and how to target sub-national areas for vaccination campaigns continues to remain a question. We analyzed three metrics for prioritizing target areas: vaccination coverage, susceptible birth cohort, and the effective reproductive ratio (RE) in the context of the 2010 measles epidemic in Malawi.

METHODS:

Using case-based surveillance data from the 2010 measles outbreak in Malawi, we estimated vaccination coverage from the proportion of cases reporting with a history of prior vaccination at the district and health facility catchment scale. Health facility catchments were defined as the set of locations closer to a given health facility than to any other. We combined these estimates with regional birth rates to estimate the size of the annual susceptible birth cohort. We also estimated the effective reproductive ratio, RE, at the health facility polygon scale based on the observed rate of exponential increase of the epidemic. We combined these estimates to identify spatial regions that would be of high priority for supplemental vaccination activities.

RESULTS:

The estimated vaccination coverage across all districts was 84%, but ranged from 61 to 99%. We found that 8 districts and 354 health facility catchments had estimated vaccination coverage below 80%. Areas that had highest birth cohort size were frequently large urban centers that had high vaccination coverage. The estimated RE ranged between 1 and 2.56. The ranking of districts and health facility catchments as priority areas varied depending on the measure used.

CONCLUSIONS:

Each metric for prioritization may result in discrete target areas for vaccination campaigns; thus, there are tradeoffs to choosing one metric over another. However, in some cases, certain areas may be prioritized by all three metrics. These areas should be treated with particular concern. Furthermore, the spatial scale at which each metric is calculated impacts the resulting prioritization and should also be considered when prioritizing areas for vaccination campaigns. These methods

may be used to allocate effort for prophylactic campaigns or to prioritize response for outbreak response vaccination.

WEB: 10.1186/s12889-018-5628-x
IMPACT FACTOR: 2.42
CITED HALF-LIFE: 3.90

START COMMENTARY

In a retrospective review of measles surveillance data in Malawi, Kundrick et al. calculated three metrics on two geographic scales to investigate potential target areas for vaccination programs. Authors stated using vaccine coverage and susceptible birth cohort estimates as guides for vaccine prioritization may decrease population at risk or prevent spread of an outbreak, whereas using the effective reproductive ratios may help identify where an outbreak may occur. In Figure 4, Kundrick et al. compared the geographic distribution of each metric at the district (vaccine coverage and susceptible birth cohort only) and health facility polygon level, depicting areas of overlap, as well as heterogeneity, between metrics and regions. The study was limited by data completeness (22% of records were excluded due to missing data) and data captured by surveillance.

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3. Use of the revised World Health Organization cluster survey methodology to classify measles-rubella vaccination campaign coverage in 47 counties in Kenya, 2016

Subaiya S, Tabu C, N'ganga J, Awes AA, Sergon K, Cosmas L, et al.

PLoS ONE. 2018 Jul 2;13(7):e0199786.

PubMed ID: 29965975

ABSTRACT

INTRODUCTION:

To achieve measles elimination, two doses of measles-containing vaccine (MCV) are provided through routine immunization services or vaccination campaigns. In May 2016, Kenya conducted a measles-rubella (MR) vaccination campaign targeting 19 million children aged 9 months-14 years, with a goal of achieving ≥95% coverage. We conducted a post-campaign cluster survey to estimate national coverage and classify coverage in Kenya's 47 counties.

METHODS:

The stratified multi-stage cluster survey included data from 20,011 children in 8,253 households sampled using the recently revised World Health Organization coverage survey methodology (2015). Point estimates and 95% confidence intervals (95% CI) of national campaign coverage were calculated, accounting for study design. County vaccination coverage was classified as 'pass,' 'fail,' or 'intermediate,' using one-sided hypothesis tests against a 95% threshold.

RESULTS:

Estimated national MR campaign coverage was 95% (95% CI: 94%-96%). Coverage differed significantly ($p < 0.05$) by child's school attendance, mother's education, household wealth, and other factors. In classifying coverage, 20 counties passed (≥95%), two failed (<95%), and 25 were intermediate (unable to classify either way). Reported campaign awareness among caretakers was 92%. After the 2016 MR campaign, an estimated 93% (95% CI: 92%-94%) of children aged 9 months to 14 years had received ≥2 MCV doses; 6% (95% CI: 6%-7%) had 1 MCV dose; and 0.7% (95% CI: 0.6%-0.9%) remained unvaccinated.

CONCLUSIONS:

Kenya reached the MR campaign target of 95% vaccination coverage, representing a substantial achievement towards increasing population immunity. High campaign awareness reflected the comprehensive social mobilization strategy implemented in Kenya and supports the importance of including strong communications platforms in future vaccination campaigns. In counties with sub-

optimal MR campaign coverage, further efforts are needed to increase MCV coverage to achieve the national goal of measles elimination by 2020.

WEB: 10.1371/journal.pone.0199786
IMPACT FACTOR: 2.77
CITED HALF-LIFE: 2.70

START COMMENTARY

Subaiya et al. conducted an assessment of vaccine coverage following a measles-rubella vaccination campaign in Kenya in 2016. They used the updated WHO Coverage Survey manual to inform their methodology and included probabilistic sampling, a strength of their study. Authors noted that the intermediate category did not provide decision-makers with a clear path forward. A limitation of the study included potential underrepresentation of populations that may not have been captured by the survey because they were not included in the sampling frame or they were inadequately sampled; authors noted that the 2009 census, with partial updates in 2012–2013 and 2014–2016 were used to define the sampling frame. Another limitation of the study was potential misclassification of vaccine history, which relied on parental recall and use of finger marking during the campaign.

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4. Measles-Rubella Supplementary Immunization Activity Readiness Assessment - India, 2017-2018

Gurnani V, Haldar P, Khanal S, Bhatnagar P, Singh B, Ahmed D, et al.

MMWR Morb Mortal Wkly Rep. 2018 Jul 6;67(26):742–746.

PubMed ID: 29975677

ABSTRACT

In 2013, during the 66th session of the Regional Committee of the World Health Organization (WHO) South-East Asia Region (SEAR), the 11 SEAR countries adopted goals to eliminate measles and control rubella and congenital rubella syndrome by 2020. To accelerate progress in India, a phased nationwide supplementary immunization activity (SIA) using measles-rubella vaccine and targeting approximately 410 million children aged 9 months-14 years commenced in 2017 and will be completed by first quarter of 2019. To ensure a high-quality SIA, planning and preparation were monitored using a readiness assessment tool adapted from the WHO global field guide by the India Ministry of Health and Family Welfare. This report describes the results and experience gained from conducting SIA readiness assessments in 24 districts of three Indian states (Andhra Pradesh, Kerala, and Telangana) during the second phase of the SIA. In each selected area, assessments were conducted 4-6 weeks and 1-2 weeks before the scheduled SIA. At the first assessment, none of the states and districts were on track with preparations for the SIA. However, at the second assessment, two (67%) states and 21 (88%) districts were on track. The SIA readiness assessment identified several preparedness gaps; early assessment results were immediately communicated to authorities and led to necessary corrective actions to ensure high-quality SIA implementation.

WEB: 10.15585/mmwr.mm6726a3

IMPACT FACTOR: 12.89

CITED HALF-LIFE: data not available

START COMMENTARY

In a coordinated effort to assess supplemental immunization activity (SIA) readiness of the measles-rubella vaccine, the WHO India Country Office adapted a tool and checklist from the WHO field guide for planning and implementing measles-rubella supplementary immunization activities for the national, state, district, and block levels. Initial results found lack of logistics and training materials and nonengagement of schools as gaps in preparedness. A rapid assessment of unvaccinated children identified a frequent reason for not vaccinating was that the child was sick. Authors noted

limitations of their study included no control groups for comparison and the inability to conduct a post-SIA assessment.

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5. Forecasting demand for maternal influenza immunization in low- and lower-middle-income countries

Debellut F, Hendrix N, Ortiz JR, Lambach P, Neuzil KM, Bhat N, et al.

PLoS ONE. 2018 Jun 22;13(6):e0199470.

PubMed ID: 29933402

ABSTRACT

Immunization of pregnant women against seasonal influenza remains limited in low- and lower-middle-income countries despite being recommended by the World Health Organization (WHO). The WHO/PATH Maternal Influenza Immunization Project was created to identify and address obstacles to delivering influenza vaccines to pregnant women in low resource setting. To gain a better understanding of potential demand from this target group, we developed a model simulating pregnant women populations eligible for vaccination during antenatal care (ANC) services in all low- and lower-middle-income countries. We assessed potential vaccine demand in the context of both seasonal and year-round vaccination strategies and identified the ways that immunization programs may be affected by availability gaps in supply linked to current vaccine production cycles and shelf life duration. Results of our analysis, which includes 54 eligible countries in 2015 for New Vaccine Support from Gavi, the Vaccine Alliance, suggest the demand for influenza vaccines could be 7.7 to 16.0 million doses in 2020, and 27.0 to 61.7 million doses by 2029. If current trends in production capacity and actual production of seasonal influenza vaccines were to continue, global vaccine supply would be sufficient to meet this additional demand-although a majority of countries would face implementation issues linked to timing of supply.

WEB: 10.1371/journal.pone.0199470
IMPACT FACTOR: 2.77
CITED HALF-LIFE: 2.70

START COMMENTARY

Debellut et al. conducted an analysis that forecasted the demand of maternal influenza immunization in 54 Gavi-eligible countries from 2020 to 2029 to inform supply strategies and estimate potential future markets. The model considered country introduction years, the population of pregnant women expected to attend antenatal care (the avenue through which influenza immunizations would be delivered), influenza seasonality and vaccine formulation, and wastage and buffer stock to create forecasted demand. Debellut et al. also identified potential gaps in vaccine supply by mapping the

months of southern and northern hemisphere vaccine availability to months of virus circulation for each country (see Table 1). The forecast model was built upon several assumptions regarding the implementation of a maternal influenza immunization program and seasonality of influenza in countries without data. Country-specific data on availability and acceptance of influenza vaccination were also an identified gap in knowledge.

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6. Modelling population-level impact to inform target product profiles for childhood malaria vaccines

Hogan AB, Winskill P, Verity R, Griffin JT, Ghani AC.

BMC Med. 2018 Jul 13;16(1):109.

PubMed ID: 30001708

ABSTRACT

BACKGROUND:

The RTS,S/AS01 vaccine for Plasmodium falciparum malaria demonstrated moderate efficacy in 5-17-month-old children in phase 3 trials, and from 2018, the vaccine will be evaluated through a large-scale pilot implementation program. Work is ongoing to optimise this vaccine, with higher efficacy for a different schedule demonstrated in a phase 2a challenge study. The objective of our study was to investigate the population-level impact of a modified RTS,S/AS01 schedule and dose amount in order to inform the target product profile for a second-generation malaria vaccine.

METHODS:

We used a mathematical modelling approach as the basis for our study. We simulated the changing anti-circumsporozoite antibody titre following vaccination and related the titre to vaccine efficacy. We then implemented this efficacy profile within an individual-based model of malaria transmission. We compared initial efficacy, duration and dose timing, and evaluated the potential public health impact of a modified vaccine in children aged 5-17 months, measuring clinical cases averted in children younger than 5 years.

RESULTS:

In the first decade of delivery, initial efficacy was associated with a higher reduction in childhood clinical cases compared to vaccine duration. This effect was more pronounced in high transmission settings and was due to the efficacy benefit occurring in younger ages where disease burden is highest. However, the low initial efficacy and long duration schedule averted more cases across all age cohorts if a longer time horizon was considered. We observed an age-shifting effect due to the changing immunological profile in higher transmission settings, in scenarios where initial efficacy was higher, and the fourth dose administered earlier.

CONCLUSIONS:

Our findings indicate that, for an imperfect childhood malaria vaccine with suboptimal efficacy, it may be advantageous to prioritise initial efficacy over duration. We predict that a modified vaccine could outperform the current RTS,S/AS01, although fourth dose timing will affect the age group that derives the greatest benefit. Further, the outcome measure and timeframe over which a vaccine is assessed are important when prioritising vaccine elements. This study provides insight into the most

important characteristics of a malaria vaccine for at-risk groups and shows how distinct vaccine properties translate to public health outcomes. These findings may be used to prioritise target product profile elements for second-generation childhood malaria vaccines.

WEB: 10.1186/s12916-018-1095-6
IMPACT FACTOR: 9.09
CITED HALF-LIFE: 3.10

START COMMENTARY

Hogan et al. conducted a mathematical modeling study to examine how various parameters of a modified RTS,S/AS01 vaccine may impact childhood malaria and to inform the next generation malaria vaccine target product profile. Analysis of the impact of dosage and timing were informed by a small prior study by Regules et al. that showed higher vaccine efficacy among the group receiving a delayed, fractional third dose compared to a group with an immediate, full third dose. Authors stated that the absence of considering any immunity gained through partial vaccination was a limitation in their study. They also discussed the potential of other factors besides antibody titer, the measure used in their current study, that may influence or serve as a correlate of protection of a second-generation malaria vaccine.

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7. Variation in cost and performance of routine immunisation service delivery in India

Chatterjee S, Das P, Nigam A, Nandi A, Brenzel L, Ray A, et al.

BMJ Glob Health. 2018 Jun 22;3(3):e000794.
PubMed ID: 29946488

ABSTRACT

A comprehensive understanding of the costs of routine vaccine delivery is essential for planning, budgeting and sustaining India's Universal Immunisation Programme. India currently allocates approximately US$25 per child for vaccines and operational costs. This budget is prepared based on historical expenditure data as information on cost is not available. This study estimated the cost of routine immunisation services based on a stratified, random sample of 255 public health facilities from 24 districts across seven states-Bihar, Gujarat, Kerala, Meghalaya, Punjab, Uttar Pradesh and West Bengal. The economic cost for the fiscal year 2013-2014 was measured by adapting an internationally accepted approach for the Indian context. Programme costs included the value of personnel, vaccines, transport, maintenance, training, cold chain equipment, building and other recurrent costs. The weighted average national level cost per dose delivered was US$2.29 including vaccine costs, and the cost per child vaccinated with the third dose of diphtheria-pertussis-tetanus (DPT) vaccine (a proxy for full immunisation) was US$31.67 (at 2017 prices). There was wide variation in the weighted average state-level cost per dose delivered inclusive of vaccine costs (US$1.38 to US$2.93) and, for the cost per DTP3 vaccinated child (US$20.08 to US$34.81). Lower costs were incurred by facilities and districts that provided the largest number of doses of vaccine. Out of the total cost, the highest amount (57%) was spent on personnel. This costing study, the most comprehensive conducted to date in India, provides evidence, which should help improve planning and budgeting for the national programme. The budget generally considers financial costs, while this study focused on economic costs. For using this study's results for planning and budgeting, the collected data can be used to extract the relevant financial costs. Variation in cost per dose and doses administered across facilities, districts and states need to be further investigated to understand the drivers of cost and measure the efficiency of service delivery.

WEB: 10.1136/bmjgh-2018-000794
IMPACT FACTOR: none
CITED HALF-LIFE: none

START COMMENTARY

In this study, Chatterjee et al. conducted a large-scale assessment of the cost of routine immunizations in India from the government provider perspective. The authors used stratification and selection methods to ensure public health facilities from a range of geographies and health care utilization levels were represented. They found the cost of routine immunization delivery at a national level was US$737 million in 2013–2014 (at 2017 dollars), less than what was reported in the comprehensive multiyear plan (US$636 million, at 2017 dollars). Authors attributed the multiyear plan underestimation to its omission of shared costs of buildings and vehicles. Authors stated recall of time allocation towards service delivery, which was used to estimate personnel cost, as a limitation of the study. Understanding the cost of immunizations is important for future planning as India begins to transition from Gavi support and assume financial responsibility for its immunization program.

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8. Vaccine hesitancy around the globe: Analysis of three years of WHO/UNICEF Joint Reporting Form data-2015-2017

Lane S, MacDonald NE, Marti M, Dumolard L.

Vaccine. 2018 Jun 18;36(26):3861–3867.

PubMed ID: 29605516

ABSTRACT

In order to gather a global picture of vaccine hesitancy and whether/how it is changing, an analysis was undertaken to review three years of data available as of June 2017 from the WHO/UNICEF Joint Report Form (JRF) to determine the reported rate of vaccine hesitancy across the globe, the cited reasons for hesitancy, if these varied by country income level and/or by WHO region and whether these reasons were based upon an assessment. The reported reasons were classified using the Strategic Advisory Group of Experts (SAGE) on Immunization matrix of hesitancy determinants (www.who.int/immunization/sage/meetings/2014/october/SAGE_working_group_revised_report_vaccine_hesitancy.pdf). Hesitancy was common, reported by >90% of countries. The list of cited reasons was long and covered 22 of 23 WHO determinants matrix categories. Even the most frequently cited category, risk- benefit (scientific evidence e.g. vaccine safety concerns), accounted for less than one quarter of all reasons cited. The reasons varied by country income level, by WHO region and over time and within a country. Thus based upon this JRF data, across the globe countries appear to understand the SAGE vaccine hesitancy definition and use it to report reasons for hesitancy. However, the rigour of the cited reasons could be improved as only just over 1/3 of countries reported that their reasons were assessment based, the rest were opinion based. With respect to any assessment in the previous five years, upper middle income countries were the least likely to have done an assessment. These analyses provided some of the evidence for the 2017 Assessment Report of the Global Vaccine Action Plan recommendation that each country develop a strategy to increase acceptance and demand for vaccination, which should include ongoing community engagement and trust-building, active hesitancy prevention, regular national assessment of vaccine concerns, and crisis response planning (www.who.int/immunization/sage/meetings/2017/october/1_GVAP_Assessment_report_web_version.pdf).

WEB: 10.1016/j.vaccine.2018.03.063

IMPACT FACTOR: 3.29

CITED HALF-LIFE: 5.50

START COMMENTARY

Lane et al. conducted an analysis of two vaccine hesitancy indicators—1) reasons for vaccine hesitancy and 2) percentage of countries that have assessed the level of hesitancy towards vaccination at the national or subnational level in the previous five years—via the WHO/UNICEF Joint Report Form (JRF) from 2014 to 2016. Overall response to indicator 1 increased over the three years from 73% to 78%, but was not consistent across WHO regions. The primary reason for hesitancy among low-income countries was knowledge/awareness in 2014 and 2015 (23% and 11%, respectively), but fell to the fourth common reason in 2016 (6%). Limitations included categorizing responses that fell into more than one category or for which not enough information was provided. Authors also noted that responses may be subject to personal perception of individuals filling out the JRF since classification of reasons were assessed via JRF and not directly measured.

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9. Strategic Response to an Outbreak of Circulating Vaccine-Derived Poliovirus Type 2 - Syria, 2017-2018

Mbaeyi C, Wadood ZM, Moran T, Ather F, Stehling-Ariza T, Nikulin J, et al.

MMWR Morb Mortal Wkly Rep. 2018 Jun 22;67(24):690–694.
PubMed ID: 29927908

ABSTRACT

Since the 1988 inception of the Global Polio Eradication Initiative (GPEI), progress toward interruption of wild poliovirus (WPV) transmission has occurred mostly through extensive use of oral poliovirus vaccine (OPV) in mass vaccination campaigns and through routine immunization services. However, because OPV contains live, attenuated virus, it carries the rare risk for reversion to neurovirulence. In areas with very low OPV coverage, prolonged transmission of vaccine-associated viruses can lead to the emergence of vaccine-derived polioviruses (VDPVs), which can cause outbreaks of paralytic poliomyelitis. Although WPV type 2 has not been detected since 1999, and was declared eradicated in 2015, most VDPV outbreaks have been attributable to VDPV serotype 2 (VDPV2). After the synchronized global switch from trivalent OPV (tOPV) (containing vaccine virus types 1, 2, and 3) to bivalent OPV (bOPV) (types 1 and 3) in April 2016, GPEI regards any VDPV2 emergence as a public health emergency. During May-June 2017, VDPV2 was isolated from stool specimens from two children with acute flaccid paralysis (AFP) in Deir-ez-Zor governorate, Syria. The first isolate differed from Sabin vaccine virus by 22 nucleotides in the VP1 coding region (903 nucleotides). Genetic sequence analysis linked the two cases, confirming an outbreak of circulating VDPV2 (cVDPV2). Poliovirus surveillance activities were intensified, and three rounds of vaccination campaigns, aimed at children aged <5 years, were conducted using monovalent OPV type 2 (mOPV2). During the outbreak, 74 cVDPV2 cases were identified; the most recent occurred in September 2017. Evidence indicates that enhanced surveillance measures coupled with vaccination activities using mOPV2 have interrupted cVDPV2 transmission in Syria.

WEB: 10.15585/mmwr.mm6724a5
IMPACT FACTOR: 12.89
CITED HALF-LIFE: data not available

START COMMENTARY

Mbaeyi et al. described the outbreak of vaccine-derived poliovirus type 2 and vaccine response in Syria in 2017 to 2018. Three rounds of monovalent oral poliovirus vaccine were administered in

Deir-ez-Zor and Raqqa governorates, and one round in Hasakeh, a neighboring governorate to those that experienced the outbreak. Administrative and post-campaign monitoring coverage percentages were reported for each round and governorate in the Table. Post-campaign monitoring percentages were conducted using cluster and market surveys by independent monitors to parents of children within the target age group and were considered more accurate than the administrative coverage percentages. As per Global Polio Eradication Initiative protocol, outbreak response also focused on containment of poliovirus by properly disposing of used and unused vials of vaccine, as well as on positive communication surrounding vaccination. The outbreak was an example of how humanitarian crises can bring about unique challenges to disease eradication efforts.

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10. The role of timely initiation of antenatal care on protective dose tetanus toxoid immunization: the case of northern Ethiopia post natal mothers

Mihret MS, Limenih MA, Gudayu TW.

BMC Pregnancy Childbirth. 2018 Jun 15;18(1):235.

PubMed ID: 29907139

ABSTRACT

BACKGROUND:

Globally, tetanus toxoid protective dose immunization of the mothers is one of the strategies of maternal and neonatal tetanus prevention. Ethiopia has planned the national tetanus protection at birth coverage to reach 86% by the year 2015. However, there is still low coverage with less identified associated factors. Therefore; the purpose of this study was to assess tetanus toxoid protective dose immunization at last birth and associated factors among mothers who gave birth within one year prior to the study in Debretabor town, Northwest Ethiopia, 2016.

METHODS:

A community based cross sectional study was conducted from May 1 to June 10 / 2016. A total of 511 mothers were included in the study. Structured questionnaire and checklists were used to collect the data. Face to face interview with cross checking documented record were employed. A systematic random sampling technique was used. The data were entered in to Epinfo version 7.0 and then exported to SPSS version 20.0 for analysis. Both bivariate and multivariable logistic regression model were fitted and crude and Adjusted Odds ratio with 95% confidence interval were computed. Finally, statistically significant association of variables was determined based on Adjusted Odds ratio with its 95% confidence interval and p-value ≤0.05.

RESULT:

The proportion of tetanus toxoid protective dose immunization among mothers was 56.2% (95% CI: 52-60%). In the multivariable analysis; formal education (AOR = 2.09; 95%CI: 1.12, 3.90), planned last pregnancy (AOR = 6.63; 95%CI: 2.36, 18.63), four or more antenatal care visits (AOR = 5.16; 95%CI: 2.93, 11.14), timely antenatal care visit (AOR = 4.29; 95%CI: 1.94, 9.49), and perceived good quality of service (AOR = 2.20; 95% CI: 1.26, 3.84) were positively associated with tetanus toxoid protective dose immunization.

CONCLUSION:

In this study, protective dose tetanus toxoid immunization is lower than the national target. Strengthening information education communication regarding tetanus and its prevention and encouraging timely initiation of and complete attendance of antenatal care is recommended.

WEB: 10.1186/s12884-018-1878-y
IMPACT FACTOR: 2.33
CITE HALF-LIFE: 3.70

START COMMENTARY

Mihret et al. conducted a cross-sectional analysis of factors associated with protective doses of tetanus toxoid immunization among mothers in Debretabor town, Ethiopia in 2016. Assessment of tetanus toxoid protective dose immunization was through self-report and documentation (either tetanus toxoid card or EPI registration book). Recommendations provided by the authors may be overstated given the cross-sectional design of the study.

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Appendix

The literature search for the August 2018 Vaccine Delivery Research Digest was conducted on July 20, 2018. We searched English language articles indexed by the US National Library of Medicine and published between June 15, 2018 and July 14, 2018. The search resulted in 227 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]) ("2018/6/15"[PDAT] : "2018/7/14"[PDAT]))