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PRODUCED BY: MESIC A, BABIGUMIRA JB

AUGUST 2020

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1. Effect of vaccine reminder and tracker bracelets on routine childhood immunization coverage and timeliness in urban Pakistan (2017-18): a randomized controlled trial

Siddiqi DA, Ali RF, Munir M, Shah MT, Khan AJ, Chandir S.

BMC Public Health. 2020; 20: 1086. Published online 2020 Jul 11.

PubMed ID: 32652969

ABSTRACT

BACKGROUND: Inability to track children's vaccination history coupled with parents' lack of awareness of vaccination due dates compounds the problem of low immunization coverage and timeliness in developing countries. We evaluated the impact of two types of silicone immunization reminder bracelets for children in improving immunization coverage and timeliness of Pentavalent-3 and the Measles-1 vaccines.

METHODS: Children < 3 months were enrolled in either of the 2 intervention groups (Alma Sana Bracelet Group and Star Bracelet Group) or the Control group. Children in the intervention groups were provided the two different bracelets at the time of recruitment. Each time the child visited the immunization center, a hole was perforated in the silicone bracelet to denote vaccine administration. Each child was followed up till administration of Measles-1 vaccine or till 12 months of age (if they did not come to the center for vaccination). Data was analyzed using the intention-to-treat population between groups. The unadjusted and adjusted Risk Ratios (RR) and 95% confidence interval (CI) for Pentavalent-3 and Measles-1 coverage at 12 months of age were estimated through bivariate and multivariate analysis. Time-to-Pentavalent-3 and Measles-1 immunization curves were calculated using the Kaplan–Meier method.

RESULTS: A total of 1,445 children were enrolled in the study between July 19, 2017 and October 10, 2017. Baseline characteristics among the three groups were similar. Up-to-date coverage for the Pentavalent-3 /Measles-1 vaccine at 12 months of age was 84.6%/72.0%, 85.4%/70.5% and 83.0%/68.5% in Alma Sana Bracelet group, Star Bracelet group and Control group respectively but the differences were not statistically significant. In the multivariate analysis, neither the Alma Sana bracelet (adjusted RR = 1.01; 95% CI: 0.96-1.06), (adjusted RR: 1.05; 95% CI: 0.97-1.13) nor the

Star bracelet (adjusted RR = 1.01; 95% CI: 0.96-1.06) (adjusted RR: 1.03; 95% CI: 0.95-1.11) was significantly associated with Pentavalent-3 vaccination or Measles-1 vaccination.

CONCLUSION: Although we did not observe any significant impact of the bracelets on improved immunization coverage and timeliness, our findings add to the existing literature on innovative, low cost reminders for health and make several suggestions for enhancing practical implementation of these tools.

WEB: [10.1186/s12889-020-09088-4](https://doi.org/10.1186/s12889-020-09088-4)

IMPACT FACTOR: 2.521

CITED HALF-LIFE: 6.0

START COMMENTARY

Siddiqi *et al.* provide the results of a randomized controlled trial testing a wearable tool that addresses the underutilization of routine immunization services. Though the study did not find that it significantly improved rates of Measles-1 and Pentavalent-3 immunization rates, it does offer a potential alternative to existing paper immunization cards (which rely on literacy, and can easily be misplaced, lost, or damaged) and the more costly alternatives such as mobile-technology reminders, postal reminders, community-based counseling, and door-to-door awareness campaigns.

Though the bracelets were highly acceptable to caregivers, with about 55% of the caregivers reported using the EPI card and bracelet, the bracelets were not worn by the children constantly. Only 14.8% of children wore the bracelet all the time, whereas 49.2% wore it only before coming to the EPI center. The most common reasons for children not wearing the bracelet were that caregivers were afraid that the child would lose the bracelet, and that it was not an appropriate size/fit for the child, indicating that there may need to be some design improvements for the bracelets. These results are at odds with the proposed hypothesis in which the bracelet is intended to serve as a visible and durable reminder for caregivers, which is not attainable given the poor compliance.

One of the key limitations of this study is the short follow up period which allowed for only follow up for the Measles-1 vaccination at 9 months, whereas there are higher dropout rates for the Measles-2 vaccination recommended at 15 months, which may have provided greater insight to the bracelets impact on follow up. However, one of the key strengths of this study was the impressive retention. The investigators expected 20% dropout but did not have any loss to follow up. This may have been a result of the data collection procedure in which the caregiver who had brought the child for immunization was asked to refer to the child's immunization card to determine the vaccines given and their dates. If the card was misplaced or unable to be read/interpreted, a household visit was conducted to document the immunization history. Though the bracelets did not have a significant impact on immunization coverage, it does show that this type of intervention is acceptable.

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2. A microneedle patch for measles and rubella vaccination: a game changer for achieving elimination

Suwantika AA, Kautsar AP, Supadmi W, et al.

Curr Opin Virol. 2020;41:68-76.

PubMed ID: 32622318

ABSTRACT

While morbidity and mortality associated with measles and rubella (MR) have dramatically decreased, there are still >100000 estimated deaths due to measles and an estimated 100000 infants born with congenital rubella syndrome annually. Given highly effective MR vaccines, the primary barrier to global elimination of these diseases is low vaccination coverage, especially among the most underserved populations in resource-limited settings. In contrast to conventional MR vaccination by hypodermic injection, microneedle patches are being developed to enable MR vaccination by minimally trained personnel. Simplified supply chain, reduced need for cold chain storage, elimination of vaccine reconstitution, no sharps waste, reduced vaccine wastage, and reduced total system cost of vaccination are advantages of this approach. Preclinical work to develop a MR vaccine patch has proceeded through successful immunization studies in rodents and non-human primates. On-going programs seek to make MR vaccine patches available to support MR elimination efforts around the world.

WEB: [10.1016/j.coviro.2020.05.005](https://doi.org/10.1016/j.coviro.2020.05.005)

IMPACT FACTOR: 4.985

CITED HALF-LIFE: 4.6

START COMMENTARY

In this commentary, Prausnitz *et al.* provide details on the potential use of microneedle patches as an alternative to hypodermic injection of measles and rubella vaccination to achieve elimination. Measles and rubella elimination goals have been established globally but are not being met due to a shortage of trained healthcare workers, a need for continuous cold chain and reconstitution, the generation of sharps and vaccine wastage, and high vaccine delivery costs. Microneedle patches have critical attributes (i.e. simplicity of administration, no requirements for specialized training, no reconstitution requirements, no generation of waste disposal) which make it a potential game

charger for increasing coverage. Authors note that to date, there has been an interest and commitment from large public health organization (e.g. a solicitation to develop an MR patch by the Bill and Melinda Gates Foundation; the development of the Measles-Rubella Micro-Array Patch Working Group at the WHO; the Center of Excellence for Micro-Array Patches and Patch Technology at PATH) and promising pre-clinical trials, but gaps remain in understanding the immunogenicity, safety, regulations, and financial model of the patch, which should be studied further.

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3. Use of controlled temperature chain and compact prefilled auto-disable devices to reach 2030 hepatitis B birth dose vaccination targets in LMICs: a modelling and cost-optimisation study

Seaman CP, Morgan C, Howell J, et al.

Lancet Glob Health. 2020;8(7):e931-e941.

PubMed ID: 32562649

ABSTRACT

BACKGROUND: Hepatitis B causes more than 800 000 deaths globally each year. Perinatal infections are a major driver of this burden but can be prevented by vaccination within 24 h of birth. Currently, only 44% of newborn babies in low-income and middle-income countries (LMICs) receive a timely birth dose. We investigated the effects and cost-effectiveness of implementing ambient storage of hepatitis B vaccines under a controlled temperature chain (CTC) protocol and the use of compact prefilled auto-disable (CPAD) devices for community births.

METHODS: In this mathematical modelling study of perinatal hepatitis B transmission and disease progression, we estimated the coverage impact and cost-effectiveness of implementing CTC and CPAD interventions in the six Global Burden of Disease (GBD) regions containing LMICs. Combinations of four different scenarios of birth dose delivery strategies (cold chain, CTC) and interventions (needle and syringe, CPAD) were modelled across facility or community birth locations. We also estimated the minimum cost and most cost-effective strategy to achieve the WHO 90% hepatitis B birth dose coverage target in GBD regions and in 46 LMICs with a reported coverage of less than 90%.

FINDINGS: Current delivery protocols achieved a maximum coverage of 65% (IQR 64-65) across GBD regions. Reaching 90% hepatitis B birth dose coverage across all GBD regions was estimated to cost a minimum of US\$687.5 million per annum (\$494.0 million more than the estimated current expenditure), of which \$516.5 million (75%) was required for CTC and CPAD interventions. Reaching 90% coverage in this way was estimated to be cost saving in five of the six regions (and in 40 of 46 LMICs individually assessed) due to the disease costs averted, with the cost per disability-adjusted life-years averted being less than \$83.27 otherwise.

INTERPRETATION: Hepatitis B birth dose coverage of 90% is unlikely to be reached under current protocols. CTC and CPAD vaccine strategies present cost-effective solutions to overcome coverage barriers.

WEB: [10.1016/S2214-109X\(20\)30231-X](https://doi.org/10.1016/S2214-109X(20)30231-X)

IMPACT FACTOR: 21.597

CITED HALF-LIFE: 3.1

START COMMENTARY

In this mathematical modeling study, Seaman *et al.* assess the coverage impact and cost-effectiveness of two delivery protocols for Hepatitis B vaccination, a controlled temperature chain (CTC) protocol and the use of compact pre-filled auto-disable (CPAD) devices. Both protocols show promise for Hepatitis B vaccination which requires immunization within 24 hours of birth, indicating that there should be a constant supply of vaccines at clinics. The first method would allow storage at temperatures up to 40 degrees Celsius for up to 4 weeks whereas the second would allow lay health workers to deliver the birth dose, and additionally, can be stored in non-cold chain conditions.

This article is impactful as it not only assess both methods, but also assess combinations of birth dose delivery strategies, which will likely be needed to achieve the target of 90% birth dose coverage in LMICs. The authors assess the following combinations: two delivery strategies (cold-chain and CTC); two interventions (needle/syringe and CPAD); and two birth locations (community and health facility). Seaman *et al.* present that in the southeast Asia, east Asia, and Oceania WHO region, 90% coverage was possible when CTC was implemented, whereas CTC and CPAD would be required in for the other regions to reach 90% coverage (Figure 2). Further, the authors provided estimates for the total cost and cost-effectiveness of coverage scenarios, highlighting that reaching 90% coverage in the optimal way was cost saving in all regions besides south Asia. In additional analyses of LMICs, authors found that high costs of community outreach resulted in the highest costs for reaching 90% coverage in south Asian countries. Limitations of this analysis include that it does not include costs for all programmatic aspects of vaccine delivery, such as demand-side activities (e.g. community awareness) which may be especially relevant given low birth attendance

by professional health workers in LMICs. Therefore, the estimates for total costs may be underestimated and the cost-effectiveness may be over-estimated.

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4. [Vaccine implementation factors affecting maternal tetanus immunization in low- and middle-income countries: Results of the Maternal Immunization and Antenatal Care Situational Analysis \(MIACSA\) project](#)

Giles ML, Mantel C, Muñoz FM, et al.

Vaccine. 2020;38(33):5268-5277.

PubMed ID: 32586763

ABSTRACT

OBJECTIVES: To examine the characteristics of existing maternal tetanus immunization programmes for pregnant women in low- and middle-income countries (LMICs) and to identify and understand the challenges, barriers and facilitators associated with maternal vaccine service delivery that may impact the introduction and implementation of new maternal vaccines in the future.

DESIGN: A mixed methods, cross sectional study with four data collection phases including a desk review, online survey, telephone and face-to-face interviews and in country visits.

SETTING: LMICs.

RESULTS: The majority of countries (84/95; 88%) had a maternal tetanus immunization policy. Countries with high protection at birth (PAB) were more likely to report tetanus toxoid-containing vaccine (TTCV) coverage targets > 90%. Less than half the countries included in this study had a TTCV coverage target of > 90%. Procurement and distribution of TTCV was nearly always the responsibility of the Expanded Programme on Immunization (EPI), however planning and management of maternal immunization was often shared between EPI and Maternal, Newborn and Child Health (MNCH) programmes. Receipt of TTCV at the same time as the antenatal care visit correlated with high PAB. Most countries (81/95; 85%) had an immunization safety surveillance system in place although only 11% could differentiate an adverse event following immunization (AEFI) in pregnant and non-pregnant women.

CONCLUSIONS: Recommendations arising from the MIACSA project to strengthen existing services currently delivering maternal tetanus immunization in LMICs include establishing and maintaining vaccination targets, clearly defining responsibilities and fostering collaborations between EPI and MNCH, investing in strengthening the health workforce, improving the design and use of existing record keeping for immunization, adjusting current AEFI reporting to differentiate pregnant women and endeavoring to integrate the provision of TTCV within ANC services where appropriate.

WEB: [10.1016/j.vaccine.2020.05.084](https://doi.org/10.1016/j.vaccine.2020.05.084)

IMPACT FACTOR: 3.143

CITED HALF-LIFE: 7.3

START COMMENTARY

In this mixed-methods cross-sectional study, Giles *et al.*, used a variety of methods to understand the implementation factors affecting maternal tetanus immunization globally. Specifically, authors reviewed published and unpublished data on pre-defined maternal and child health from 137 countries and conducted an 18-item online survey focused on tetanus immunization service delivery models with 116 LMICs. Then, based on performance, geographic representation, and recommendations from WHO regional offices, 26 LMICs were administered a 91-item telephone or face-to-face interview, and 10 countries were selected for in-country visits. In-country visits included observations, document review, and key informant interviews. The authors summarized key similarities and differences in maternal tetanus immunization programming including policies and targets, service delivery models, human resources, record keeping, immunization safety surveillance, and delivery of vaccine and cold chain across countries grouped by potential to protect mothers and infants from vaccine preventable diseases. This study has many strengths, including several data sources, the inclusion of many countries, and a wide array of indicators focused on tetanus immunization performance. However, most of data collection relied on self-report from countries about the programs, and very few countries (N=10) were visited. Further, within the countries that were visited, the health facility were purposively sampled based on recommendations from the respective Ministries of Health, indicating that these may be better performing facilities.

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5. [The potential impact of human visceral leishmaniasis vaccines on population incidence](#)

Le Rutte EA, Coffeng LE, Malvolti S, Kaye PM, de Vlas SJ.

PLoS Negl Trop Dis. 2020;14(7):e0008468.

PubMed ID: 32614857

ABSTRACT

Human visceral leishmaniasis (VL) vaccines are currently under development and there is a need to understand their potential impact on population wide VL incidence. We implement four characteristics from different human VL vaccine candidates into two published VL transmission model variants to estimate the potential impact of these vaccine characteristics on population-wide anthroponotic VL incidence on the Indian subcontinent (ISC). The vaccines that are simulated in this study 1) reduce the infectiousness of infected individuals towards sand flies, 2) reduce risk of developing symptoms after infection, 3) reduce the risk of developing post-kala-azar dermal leishmaniasis (PKDL), or 4) lead to the development of transient immunity. We also compare and combine a vaccine strategy with current interventions to identify their potential role in elimination of VL as a public health problem. We show that the first two simulated vaccine characteristics can greatly reduce VL incidence. For these vaccines, an approximate 60% vaccine efficacy would lead to achieving the ISC elimination target (<1 VL case per 10,000 population per year) within 10 years' time in a moderately endemic setting when vaccinating 100% of the population. Vaccinating VL cases to prevent the development of PKDL is a promising tool to sustain the low incidence elimination target after regular interventions are halted. Vaccines triggering the development of transient immunity protecting against infection lead to the biggest reduction in VL incidence, but booster doses are required to achieve perduring impact. Even though vaccines are not yet available for implementation, their development should be pursued as their potential impact on transmission can be substantial, both in decreasing incidence at the population level as well as in sustaining the ISC elimination target when other interventions are halted.

WEB: [10.1371/journal.pntd.0008468](https://doi.org/10.1371/journal.pntd.0008468)

IMPACT FACTOR: 3.885

CITED HALF-LIFE: 4.8

START COMMENTARY

In this mathematical modeling study, Le Rutte *et al.* report on a modeling study aimed at understanding four vaccine characteristics: 1) to reduce the infectiousness of infected individuals towards the sand fly, 2) to reduce the risk of developing symptoms after infection, 3) to reduce the risk of development of post-kala-azar dermal leishmaniasis (PKDL), or 4) to lead to the development of transient immunity to infection. and their impact on human visceral leishmaniasis (VL) population incidence in India. Though VL vaccines are not yet currently available for implementation, trials are ongoing highlighting a need to understand the minimum required effects of the vaccine characteristics to reach the VL elimination target incidence of 1 per 10,000 per year within 10 years of starting the intervention. Authors present the model variants and minimum required effects in Table 2. Key takeaways from this article include that all simulated characteristics show potential

reductions in VL incidence, with the most potential for those that reduce the chance of developing symptoms once infected or that reduce the infected individual's infectiousness. This study contributes to the literature on VL as it provides information on the potential of a vaccine strategy to reduce incidence, further warranting the development of these vaccines.

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6. [Combining cluster surveys to estimate vaccination coverage: Experiences from Nigeria's multiple indicator cluster survey / national immunization coverage survey \(MICS/NICS\), 2016-17](#)

Rhoda DA, Wagai JN, Beshanski-Pedersen BR, et al.

Vaccine. 2020;S0264-410X(20)30703-9.

PubMed ID: 32665164

ABSTRACT

In 2015 immunization stakeholders in Nigeria were proceeding with plans that would have fielded two nationally representative surveys to estimate vaccination coverage at the same time. Rather than duplicate efforts and generate either conflicting or redundant results, the stakeholders collaborated to conduct a combined Multiple Indicator Cluster Survey (MICS) / National Immunization Coverage Survey (NICS) with MICS focusing on core sampling clusters and NICS adding supplementary clusters in 20 states, to improve precision of outcomes there. This paper describes the organizational and technical aspects of that collaboration, including details on design of the sample supplement and analysis of the pooled dataset. While complicated, the collaboration was successful; it yielded a unified set of relevant coverage estimates and fostered some novel sub-national results dissemination work.

WEB: [10.1016/j.vaccine.2020.05.058](https://doi.org/10.1016/j.vaccine.2020.05.058)

IMPACT FACTOR: 3.143

CITED HALF-LIFE: 7.3

START COMMENTARY

Rhoda *et al.* provide details on efforts to estimate vaccine coverage in Nigeria by combining the UNICEF-supported Multiple Cluster Indicator Survey (MCIS) and the National Immunization Coverage Survey (NICS). This article provides a detailed account of why surveys were combined, the technical aspects of combining surveys, and the results and lessons learned for other contexts which may consider taking similar steps to minimize duplication, survey fatigue, and resource utilization associated with vaccine coverage surveys. Authors described key components of the development and implementation of the combined survey, including how and why supplementary clusters were selected, factors that could differentially bias results between the two surveys (Table 1), and implementation milestones (Table 2). The authors concluded that this approach of conducting a combined MCIS and NICS with supplementary clusters resulted in timely coverage data that were similar enough for pooled analysis. The authors also acknowledge that though there are many challenges with developing and implementing a combined survey, including technical expertise and substantial coordination, this approach did offer timely and useful results.

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7. Significantly Improved COVID-19 Outcomes in Countries with Higher BCG Vaccination Coverage: A Multivariable Analysis

Klinger D, Blass I, Rappoport N, Linial M.

Vaccines (Basel). 2020;8(3):E378.

PubMed ID: 32664505

ABSTRACT

The COVID-19 pandemic that started in China has spread within 3 months to the entire globe. We tested the hypothesis that the vaccination against tuberculosis by Bacille Calmette-Guérin vaccine (BCG) correlates with a better outcome for COVID-19 patients. Our analysis covers 55 countries complying with predetermined thresholds on the population size and number of deaths per million (DPM). We found a strong negative correlation between the years of BCG administration and the DPM along with the progress of the pandemic, corroborated by permutation tests. The results from multivariable regression tests with 23 economic, demographic, health-related, and pandemic restriction-related quantitative properties, substantiate the dominant contribution of BCG years to the COVID-19 outcomes. The analysis of countries according to an age-group partition reveals that the strongest correlation is attributed to the coverage in BCG vaccination of the young population (0-24 years). Furthermore, a strong correlation and statistical significance are associated with the degree

of BCG coverage for the most recent 15 years, but no association was observed in these years for other broadly used vaccination protocols for measles and rubella. We propose that BCG immunization coverage, especially among the most recently vaccinated population, contribute to attenuation of the spread and severity of the COVID-19 pandemic.

WEB: [10.3390/vaccines8030378](https://doi.org/10.3390/vaccines8030378)

IMPACT FACTOR: 4.086

CITED HALF-LIFE: 3.4

START COMMENTARY

Klinger *et al.* evaluated 55 countries which had a population greater than 3 million and 3 or more COVID-19 deaths per million to understand if the extent and spreading of COVID-19 could be associated with TB immunization by Bacille Calmette-Guerin vaccine (BCG). BCG has been found to result in reduced morbidity and mortality to other subsequent infections in numerous prior studies. The outcomes assessed included the difference in deaths per million, positively validated cases per million, hospitalization with serious and critical conditions per million, and recovered per million. Authors concluded that BCG coverage, especially among younger individuals, contributed to reduced spread and negative outcomes associated with COVID-19. Notably, there was no correlation between Measles and Rubella vaccination coverage and COVID-19 outcomes.

This article had several key strengths, such as the inclusion of 23 demographic, health-related, and pandemic-restricted related country-based variables to control for potential confounding. Further, another strength was that authors included considerations for the varying effect of each age group given that young people play a critical role in the spread of COVID-19. Some limitations may include the differences in measurement of outcomes across countries. Though the authors used one source for the COVID-19 outcomes (Worldometer), there are differences in reporting of deaths attributed to COVID-19 across countries. Further, As Klinger states, validated positive cases across countries is a result of the testing capacity of the country. Similarly, hospitalizations are affected by the healthcare capacity, which greatly varies across settings. Lastly, the definition for recovery was not standardized across settings. However, this article provides important insight on the potential positive impact of national BCG immunization policies on infectious disease incidence.

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8. [Rubella Vaccine Introduction in the South African Public Vaccination Schedule: Mathematical Modelling for Decision Making](#)

Motaze NV, Edoaka I, Wiysonge CS, Metcalf CJE, Winter AK

Vaccines (Basel). 2020;8(3):E383

PubMed ID: 32668819

ABSTRACT

BACKGROUND: Age structured mathematical models have been used to evaluate the impact of rubella-containing vaccine (RCV) introduction into existing measles vaccination programs in several countries. South Africa has a well-established measles vaccination program and is considering RCV introduction. This study aimed to provide a comparison of different scenarios and their relative costs within the context of congenital rubella syndrome (CRS) reduction or elimination.

METHODS: We used a previously published age-structured deterministic discrete time rubella transmission model. We obtained estimates of vaccine costs from the South African medicines price registry and the World Health Organization. We simulated RCV introduction and extracted estimates of rubella incidence, CRS incidence and effective reproductive number over 30 years.

RESULTS: Compared to scenarios without mass campaigns, scenarios including mass campaigns resulted in more rapid elimination of rubella and congenital rubella syndrome (CRS). Routine vaccination at 12 months of age coupled with vaccination of nine-year-old children was associated with the lowest RCV cost per CRS case averted for a similar percentage CRS reduction.

CONCLUSION: At 80% RCV coverage, all vaccine introduction scenarios would achieve rubella and CRS elimination in South Africa. Any RCV introduction strategy should consider a combination of routine vaccination in the primary immunization series and additional vaccination of older children.

WEB: [10.3390/vaccines8030383](https://doi.org/10.3390/vaccines8030383)

IMPACT FACTOR: 4.086

CITED HALF-LIFE: 3.4

START COMMENTARY

In this mathematical modeling study, Motaze *et al.* use an age-structured rubella transmission model to explore the effects of several rubella-containing vaccine (RCV) introduction scenarios on the incidence of rubella infection and congenital rubella syndrome. Additionally, authors report the costs associated with the scenarios to inform the government of South Africa's decision-making process as RCV is introduced into the public vaccination schedule. Table 1 describes six scenarios with differing target age groups for routine vaccination, initial mass campaigns, and follow up mass campaigns, and different timing of the follow up mass campaigns. For the cost evaluation, the authors considered the additional cost per dose of the RCV compared to the current measles-only

containing vaccine that is administered in South Africa. A key takeaway from this study is that when RCV coverage is at least 80% for each scenario, the CRS incidence is reduced to less than 1 per 100,000 live births (compared to about 15-69 per 100,000 live births in 2005). Rubella cases and CRS incidence decreases over time in all RCV introduction scenarios, but the decrease is slower in scenarios that do not include mass campaigns. Further, cumulative cases averted were highest in scenarios with the highest number of mass campaigns. This article is highly relevant for decision-making of RCV in South Africa, given the context-specific scenarios, but could be used to guide other similar studies that may have similar immunization schedules for measles and rubella.

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9. [Landscape analysis of pharmacovigilance and related practices among 34 vaccine manufacturers' from emerging countries](#)

Hartmann K, Pagliusi S, Precioso A.

Vaccine. 2020;38(34):5490-5497.

PubMed ID: 32591289

ABSTRACT

Developing Countries' Vaccine Manufacturers Network was tasked with the strategic goal of seeking solutions, jointly with manufacturers, for enabling the stable, sustainable supply of quality vaccines to developing countries to increase global immunization. As vaccines are given to millions of healthy people, including children, to prevent life-threatening diseases, vaccines must meet high safety standards. Vaccine safety monitoring is of paramount importance to maintain trust in vaccination programs globally. Once a vaccine is licensed and recommended for use, its safety and effectiveness must be monitored during its whole lifecycle, as the safety profile and protective effectiveness may change over time. A well-established safety governance model across the organization with underlying processes for data collection, signal and risk management and communication is essential. A "fit for purpose" pharmacovigilance system may vary as it depends on several factors. However, all vaccine manufacturers strive to achieve a pharmacovigilance system satisfying Good Pharmacovigilance Practices, in compliance with national, international and supranational requirements, as applicable. A landscape analysis, using a questionnaire covering nine pharmacovigilance key areas related to an effective system, was conducted to understand the existing pharmacovigilance structures, practices and expertise of vaccine manufacturers from emerging countries, on an institutional level. 34 of the 43 contacted manufacturers participated voluntarily. The survey results show that all respondents have established vaccine safety capacity,

mainly in collecting and handling adverse events following immunization and implementing standardized processes; the survey also shows differences in the maturity of the manufacturers' pharmacovigilance system, Quality Management System, signal and risk management, and safety governance. The analysis provides a tool for manufacturers to gain a "bird's-eye" view of the structure of pharmacovigilance key areas and the operational dimensions covered by each area, to benchmarking against international expectations, serving as a basis to further strengthen pharmacovigilance systems, to support accelerated global vaccine supply.

WEB: [10.1016/j.vaccine.2020.06.016](https://doi.org/10.1016/j.vaccine.2020.06.016)

IMPACT FACTOR: 3.143

CITED HALF-LIFE: 7.3

START COMMENTARY

In this cross-sectional landscape analysis, Hartmann *et al.* provided a detailed review of pharmacovigilance (PV) structures, practices, and expertise on an institutional level across vaccine manufacturers in developing countries. An understanding of PV across developing countries is critical given the importance of high levels of quality, coverage, trust, and safety of vaccination programs and the relevance given recent infectious disease outbreaks. A questionnaire focused on PV activities was distributed to 43 vaccine manufacturing companies that are part of the Developing Countries' Vaccine Manufacturers Network (DCVMN) across 13 countries. One of the key findings from this paper was that most vaccine manufacturers have an established capacity for vaccine safety, including PV requirements, procedures, and processes, such as a PV policy in place, the collection of passive and active adverse events after immunization reports, the maintenance of safety database systems and PV quality management systems, and agreements in place to exchange safety data as needed. The results of this study were presented to DCVMN members, who in exchange stated that their biggest challenge is the need for continuous, real-time access to safety data from national immunization programs to conduct high quality case analyses and subsequent signal and risk management.

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10. Trends in measles cases in Bayelsa state, Nigeria: a five-year review of case-based surveillance data (2014-2018)

Aworabhi-Oki N, Numbere T, Balogun MS, et al.

BMC Public Health. 2020;20(1):938.

PubMed ID: 32539691

ABSTRACT

BACKGROUND: Measles is a vaccine preventable, highly transmissible viral infection that affects mostly children under five years. It has been ear marked for elimination and Nigeria adopted the measles elimination strategies of the World Health Organization (WHO) African region to reduce cases and deaths. This study was done to determine trends in measles cases in Bayelsa state, to describe cases in terms of person and place, identify gaps in the case-based surveillance data collection system and identify risk factors for measles infection.

METHODS: We carried out a secondary data analysis of measles case-based surveillance data for the period of January 2014 to December 2018 obtained in Microsoft Excel from the State Ministry of Health. Cases were defined according to WHO standard case definitions. We calculated frequencies, proportions, estimated odds ratios (OR), 95% confidence intervals (CI) and multivariate analysis.

RESULTS: A total of 449 cases of measles were reported. There were 245(54.6%) males and the most affected age group was 1-4 years with 288(64.1%) cases. Of all cases, 289(9.35%) were confirmed and 70 (48.27%) had received at least one dose of measles vaccine. There was an all-year transmission with increased cases in the 4th quarter of the year. Yenegoa local government area had the highest number of cases. Timeliness of specimen reaching the laboratory and the proportion of specimens received at the laboratory with results sent to the national level timely were below WHO recommended 80% respectively. Predictors of measles infection were, age less than 5 years (AOR: 0.57, 95% CI: 0.36-0.91) and residing in an urban area (AOR: 1.55, 95% CI:1.02-2.34).

CONCLUSIONS: Measles infection occurred all-year round, with children less than 5 years being more affected. Measles case-based surveillance system showed high levels of case investigation with poor data quality and poor but improving indicators. Being less than 5 years was protective of measles while living in urban areas increased risk for infection. We recommended to the state government to prioritize immunization activities in the urban centers, start campaigns by the 4th quarter and continue to support measles surveillance activities and the federal government to strengthen regional laboratory capacities.

WEB: [10.1186/s12889-020-09070-0](https://doi.org/10.1186/s12889-020-09070-0)

IMPACT FACTOR: 2.521

CITED HALF-LIFE: 6.0

START COMMENTARY

Aworabhi-Oki *et al.* evaluate case-based surveillance data of measles from January 2014 and December 2018 and present information on cases, risk factors, and gaps in the measles surveillance system. Authors highlight an increase in the number of cases from 2014 to 2018 except in 2016 which had a sharp decline. The infections occurred throughout the year and children under 5 were most affected. It was found that only 145 (32.39%) of all cases had information on vaccination status, and of those, 70 (48.27%) had received at least one dose of measles, whereas 50.72% had not received any measles vaccine. This is worrying given that effective measles vaccinations are free and available from the time a child is nine months old. Further, the authors explored gaps in the case-based surveillance data collection system during the study period. It was found though there were high levels of case investigation with blood specimen collection, the timeliness of the specimens reaching the laboratory was persistently low, below the WHO recommended target of 80% of specimens reaching the laboratory within 3 days of collection. Further, of the specimens received, the WHO recommends that 80% of results are sent to the national lab within 7 days of specimen receipt at the laboratory, which was not met either. This article is informative as it can inform laboratory capacity, case-detection, and immunization efforts for measles in Bayelsa state.

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Appendix

The literature search for the August 2020 Vaccine Delivery Research Digest was conducted on July 29, 2020. We searched English language articles indexed by the US National Library of Medicine and published between June 15, 2020 and July 14, 2020. The search resulted in 333 items.

SEARCH TERMS

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(((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]) ("2020/06/15"[PDAT] : "2020/07/14"[PDAT]))
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