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

REPORT TO THE BILL & MELINDA GATES FOUNDATION

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1. Influenza Vaccination Implementation in Sri Lanka: A Cost-Effectiveness Analysis.

Neighbors C, Myers E, Weerasinghe N, Wijayaratne G, Bodinayake C, Nagahawatte A, et al.
Vaccines (Basel). 2023 May 29;11(5).
PubMed ID: 37243036

ABSTRACT

Influenza causes an estimated 3 to 5 million cases of severe illness annually, along with substantial morbidity and mortality, particularly in low- and middle-income countries (LMICs). Currently, Sri Lanka has no influenza vaccination policies and does not offer vaccination within the public healthcare sector. Therefore, we performed a cost-effectiveness analysis of influenza vaccine implementation for the Sri Lankan population. We designed a static Markov model that followed a population cohort of Sri Lankans in three age groups, 0-4, 5-64, and 65+ years, through two potential scenarios: trivalent inactivated vaccination (TIV) and no TIV across twelve-monthly cycles using a governmental perspective at the national level. We also performed probabilistic and one-way sensitivity analyses to identify influential variables and account for uncertainty. The vaccination model arm reduced influenza outcomes by 20,710 cases, 438 hospitalizations, and 20 deaths compared to no vaccination in one year. Universal vaccination became cost-effective at approximately 98.01% of Sri Lanka's 2022 GDP per capita (incremental cost-effectiveness ratio = 874,890.55 Rs/DALY averted; 3624.84 USD/DALY averted). Results were most sensitive to the vaccine coverage in the 5-64-year-old age group, the cost of the influenza vaccine dose in the 5-64-years-old age group, vaccine effectiveness in the under-5-years-old age group, and the vaccine coverage in the under-5-years-old age group. No value for a variable within our estimated ranges resulted in ICERs above Rs. 1,300,000 (USD 5386.15) per DALY adverted. Providing influenza vaccines was considered highly cost-effective compared to no vaccines. However, large-scale national studies with improved data are needed to better inform estimates and determine the impact of vaccination implementation.

WEB: 10.3390/vaccines11050932
IMPACT FACTOR: 4.086
CITED HALF-LIFE: 3.4

START COMMENTARY

In this disease modelling and cost effectiveness analysis, *Neighbors et al.* assessed scenarios to reduce the annual burden from seasonal influenza in Sri Lanka through a national influenza vaccination policy. *Figure 1* shows a diagram of the decision model used to analyze the cost-effectiveness of a Sri Lankan influenza vaccination program. Authors used a static Markov model and did not account for transmission dynamics among the theoretical cohort (age groups: 0-4 years, 5-64, and 65+). Two potential scenarios were used: universal influenza vaccination and no influenza vaccination for one year (divided into twelve-monthly cycles). *Tables 1, 2, & 3* include parameters used in this analysis (1: population, epidemiological, and vaccine parameters, 2: costing parameters, 3: utility parameters). Results show a national influenza program to be cost effective, as compared with no influenza vaccination in Sri Lanka, however, additional data on disease burden, longer term cost implications should be included for future analyses.

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2. Optimizing next-generation RSV prevention in Mali: A cost-effectiveness analysis of pediatric vaccination, maternal vaccination, and extended half-life monoclonal antibody immunoprophylaxis.

Laufer R, Baral R, Buchwald A, Campbell J, Coulibaly F, Diallo F, et al.

PLOS Glob Public Health. 2023 May 08;3(5):e0001432.

PubMed ID: 37145993

ABSTRACT

Respiratory syncytial virus (RSV) is the most common cause of early childhood lower respiratory tract infection (LRTI) in low- and middle-income countries (LMICs). Maternal vaccines, birth-dose extended half-life monoclonal antibodies (mAbs), and pediatric vaccines are under development for prevention of respiratory syncytial virus (RSV) lower respiratory tract infection (LRTI) in young children. We analyzed the health and economic impact of RSV interventions used alone or in combinations in Mali. We modeled age-specific and season-specific risks of RSV LRTI in children through three years, using WHO Preferred Product Characteristics and data generated in Mali. Health outcomes included RSV LRTI cases, hospitalizations, deaths, and disability-adjusted life-years (DALYs). We identified the optimal combination of products across a range of scenarios. We found that mAb delivered at birth could avert 878 DALYs per birth cohort at an incremental cost-effectiveness ratio (ICER) of $597 per DALY averted compared to no intervention if the product were available at $1 per dose. Combining mAb with pediatric vaccine administered at 10/14 weeks, 1947 DALYs would be prevented. The ICER of this combination strategy is $1514 per DALY averted compared to mAb alone. Incorporating parameter uncertainty, mAb alone is likely to be optimal from the societal perspective at efficacy against RSV LRTI above 66%. The optimal strategy was sensitive to economic considerations, including product prices and willingness-to-pay for DALYs. For example, the combination of mAb and pediatric vaccine would be optimal from the government perspective at a willingness-to-pay above $775 per DALY. Maternal vaccine alone or in combination with other interventions was never the optimal strategy, even for high vaccine efficacy. The same was true for pediatric vaccine administered at 6/7 months. At prices comparable to existing vaccine products, extended half-life RSV mAbs would be impactful and efficient components of prevention strategies in LMICs such as Mali.

WEB: 10.1371/journal.pgph.0001432

IMPACT FACTOR: 3.356

CITED HALF-LIFE: NA

START COMMENTARY

In this cost-effectiveness analysis, *Laufer et al.* examine the health and economic impacts of respiratory syncytial virus (RSV) interventions in Mali, with the primary focus on early childhood lower respiratory tract infection (LTRI). Authors used a birth cohort model to simulate twelve monthly cohorts of infants from birth through 36 months of life, utilizing age-specific and season-specific incidence. *Table 1* includes the RSV LTRI prevention products, these include: 1) Extended half-life monoclonal antibody, 2: Maternal vaccine, 3: Pediatric vaccine at 10 and 14 weeks, and 4: Pediatric vaccine at 6 and 7 months. *Figure 1* shows health outcomes (A: RSV cases, B: LRTI episodes, C: Hospitalizations, and D: Deaths) for the modeled birth cohort; *Figure 2* includes the cost-effectiveness analysis for each of the modeled scenarios. Authors found three interventions to be strongly dominated: Pediatric vaccine at 6 & 7 months, Maternal vaccine plus pediatric vaccine at 6 & 7 months, and Extended half-life monoclonal antibody plus pediatric vaccine at 6 & 7 months. Though numerous RSV LTRI prevention strategies were found to be cost-effective and impactful, there are still major concerns around the feasibility of this intervention, including sufficient durability of protection, and if a product will be licensed and affordable for Mali using updated economic costs.

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3. Incidence and Spatial distribution of Human and Livestock Anthrax in Cao Bang Province, Vietnam (2004-2020).

Luong T, Be T, Hoang M, Hoang T, Pham Q, Tran T, et al.

Vector Borne Zoonotic Dis. 2023 May 15;23(5):306-309.

PubMed ID: 37140464

ABSTRACT

Specific knowledge on the distribution of anthrax, a zoonosis caused by Bacillus anthracis, in Southeast Asia, including Vietnam, remains limited. In this study, we describe disease incidence and spatial distribution of human and livestock anthrax using spatially smoothed cumulative incidence from 2004 to 2020 in Cao Bang province, Vietnam. We employed the zonal statistics routine a geographic information system (GIS) using QGIS, and spatial rate smoothing using spatial Bayes smoothing in GeoDa. Results showed higher incidence of livestock anthrax compared with human anthrax. We also identified co-occurrence of anthrax in humans and livestock in northwestern districts and the province center. Livestock anthrax vaccine coverage was <6% and not equally distributed among the districts of Cao Bang province. We provide implications for future studies and recommend improving disease surveillance and response through data sharing between human and animal health sectors.

WEB: 10.1089/vbz.2022.0072

IMPACT FACTOR: 2.523

CITED HALF-LIFE: 8.8

START COMMENTARY

In this geographic information system (GIS) analysis, *Luong et al.* map the cumulative incidence of livestock and human anthrax in Vietnam from 2004 to 2020. *Figure 1* shows the spatial distribution of anthrax in humans (C) and livestock (D) within the Cao Bang province at a subdistrict level; areas of human anthrax are shown to follow similar spatial patterns to livestock anthrax incidence. *Figure 1B* shows the temporal trends in incidence per 10,000 of human anthrax and mortality, livestock anthrax, and anthrax vaccine coverage in livestock. There is clear co-occurrence of anthrax in humans and livestock in 2004, 2005, 2011, and 2017; no human anthrax outbreaks have been reported since 2017. Authors utilized data from both human and animal health sectors, potentially introducing data quality limitations. However, these maps may be useful to help authorities identify high-risk areas and introduce targeted anthrax vaccination campaigns.

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4. The progressive control of foot-and-mouth disease (FMD) in the Republic of Kazakhstan: Successes and challenges.

Sultanov A, Tyulegenov S, Yessembekova G, Berdikulov M, Mukhanbetkaliyev Y, Akhmetzhanova A, et al.

Front Vet Sci. 2023 May 05;10:1036121.

PubMed ID: 37138919

ABSTRACT

Foot-and-mouth disease (FMD) has historically caused far-reaching economic losses to many regions worldwide. FMD control has been problematic, and the disease is still prevalent in many West and Central Asia countries. Here, we review the progress made by Kazakhstan in achieving freedom from FMD and discuss some of the challenges associated with maintaining the FMD-free status, as evidenced by the occurrence of an outbreak in 2022. A combination of zoning, movement control, vaccination, and surveillance strategies led to eliminating the disease in the country. However, the circulation of the FMD virus in the region still imposes a risk for Kazakhstan, and coordinated strategies are ultimately needed to support disease elimination. The results presented here may help design effective pathways to progressively eliminate the disease in West and Central Asia while promoting the design and implementation of regional actions to support FMD control.

WEB: 10.3389/fvets.2023.1036121

IMPACT FACTOR: 3.471

CITED HALF-LIFE: 2.3

START COMMENTARY

In this review, *Sultanov et al.* report on efforts made towards control of foot-and-mouth disease (FMD) outbreaks in Kazakhstan in recent history. Strategic plans used to control FMD were designed based on World Organization for Animal Health (WOAH) recommendations and include considerations over social, demographic, epidemiological characteristics of FMD and Kazakhstan itself. *Figure 1* illustrates the ten zones decision makers grouped the fourteen administrative units of Kazakhstan, based on FMD status (g: with vaccination, w: without vaccination). *Table 1* also shows the status of FMD outbreaks reported in each zone prior to 2022, with some zones showing a much higher number of outbreaks (V2: 14 in 2011 – 2013), compared to others (V4: no FMD reported since 1955; NV3: no FMD reported since 1955). Additional information is needed to demonstrate the full economic impact of these FMD outbreaks that authors mention. Regardless, the results do show there is potential to control and eliminate FMD outbreaks with national strategic plans.

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5. A Successful National and Multipartner Approach to Increase Immunization Coverage: The Democratic Republic of Congo Mashako Plan 2018-2020.

Lame P, Milabyo A, Tangney S, Mbaka G, Luhata C, Gargasson J, et al.

Glob Health Sci Pract. 2023 Jun 03;11(2).
PubMed ID: 37116931

ABSTRACT

BACKGROUND: The immunization system in the Democratic Republic of the Congo faces many challenges, including persistent large-scale outbreaks of polio, measles, and yellow fever; a large number of unvaccinated children for all antigens; minimal and delayed funding; and poor use of immunization data at all levels. In response, the Expanded Programme on Immunization within the Ministry of Health (MOH) collaborated with global partners to develop a revitalization strategy for the routine immunization (RI) system called the Mashako Plan.

MASHAKO PLAN DESIGN AND DEVELOPMENT: The Mashako Plan aimed to increase full immunization coverage in children aged 12-23 months by 15 percentage points overall in 9 of 26 provinces within 18 months of implementation. In 2018, we conducted a diagnostic review and identified gaps in coordination, service delivery, vaccine availability, real-time monitoring, and evaluation as key areas for intervention to improve the RI system. Five interventions were then implemented in the 9 identified provinces.

DISCUSSION: According to the 2020 vaccine coverage survey, full immunization coverage increased to 56.4%, and Penta3/DTP3 increased to 71.1% across the Mashako Plan provinces; the initial objective of the plan was reached and additional improvements in key service delivery indicators had been achieved. Increases in immunization sessions held per month, national stock of pentavalent vaccine, and supervision visits conducted demonstrate that simple, measurable changes at all levels can quickly improve immunization systems. Despite short-term improvements in all indicators tracked, challenges remain in vaccine availability, regular funding of immunization activities, systematic provision of immunization services, and ensuring long-term sustainability.

CONCLUSIONS: Strong commitment of MOH staff combined with partner involvement enabled the improvement of the entire system. A simple set of interventions and indicators focused the energy of managers on discrete actions to improve outcomes. Further exploration of the results is necessary to determine the long-term impact and generate all-level engagement for sustainable success in all provinces.

WEB: 10.9745/GHSP-D-22-00326
IMPACT FACTOR: 3.409
CITED HALF-LIFE: 4.7

START COMMENTARY

In this programmatic case study, *Lame et al.* reflect on the Mashako Plan to increase immunization coverage in the Democratic Republic of the Congo (DRC). Overall, the strategies used to strengthen routine immunization (RI) among children aged 12-23 month primarily focused on service delivery, management, real-time monitoring, evaluation, and vaccine availability. *Figure 1* shows the 2018 Diagnostic Review of the RI system in the DRC. Key focus areas identified for improving performance were: 1) Inequalities in immunization services availability, 2) Vaccine availability at the local level, 3) Management tools, 4) Monitoring and evaluation of the program, and 5) Workforce motivation. *Figure 2* illustrates the Mashako Plan Implementation Timeline, aimed at rapidly improving the RI system beginning in 2018, and supported by multiple partners (*Figure 3)*. Five key interventions were identified for sustainable immunization improvement in DRC (i.e., Coordination, Service delivery, Vaccine availability, Real-time monitoring, and Evaluation). The Mashako Plan succeeded in improving RI coverage and the specified service delivery indicators, contributing to almost 360,000 additional fully vaccinated children. Initially, plans were to upscale the Mashako Plan to all provinces within the country by the end of 2020, but some delays and additional challenges were encountered with the COVID-19 pandemic. However, I look forward to seeing how learnings from this first phase will be applied and adjustments will be made to achieve the goal of national implementation of this plan.

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6. Perennial malaria chemoprevention with and without malaria vaccination to reduce malaria burden in young children: a modelling analysis.

Runge M, Stahlfeld A, Ambrose M, Toh K, Rahman S, Omoniwa O, et al.

Malar J. 2023 Apr 26;22(1):133.

PubMed ID: 37095480

ABSTRACT

BACKGROUND: A recent WHO recommendation for perennial malaria chemoprevention (PMC) encourages countries to adapt dose timing and number to local conditions. However, knowledge gaps on the epidemiological impact of PMC and possible combination with the malaria vaccine RTS,S hinder informed policy decisions in countries where malaria burden in young children remains high.

METHODS: The EMOD malaria model was used to predict the impact of PMC with and without RTS,S on clinical and severe malaria cases in children under the age of two years (U2). PMC and RTS,S effect sizes were fit to trial data. PMC was simulated with three to seven doses (PMC-3-7) before the age of eighteen months and RTS,S with three doses, shown to be effective at nine months. Simulations were run for transmission intensities of one to 128 infectious bites per person per year, corresponding to incidences of < 1 to 5500 cases per 1000 population U2. Intervention coverage was either set to 80% or based on 2018 household survey data for Southern Nigeria as a sample use case. The protective efficacy (PE) for clinical and severe cases in children U2 was calculated in comparison to no PMC and no RTS,S.

RESULTS: The projected impact of PMC or RTS,S was greater at moderate to high transmission than at low or very high transmission. Across the simulated transmission levels, PE estimates of PMC-3 at 80% coverage ranged from 5.7 to 8.8% for clinical, and from 6.1 to 13.6% for severe malaria (PE of RTS,S 10-32% and 24.6-27.5% for clinical and severe malaria, respectively. In children U2, PMC with seven doses nearly averted as many cases as RTS,S, while the combination of both was more impactful than either intervention alone. When operational coverage, as seen in Southern Nigeria, increased to a hypothetical target of 80%, cases were reduced beyond the relative increase in coverage.

CONCLUSIONS: PMC can substantially reduce clinical and severe cases in the first two years of life in areas with high malaria burden and perennial transmission. A better understanding of the malaria risk profile by age in early childhood and on feasible coverage by age, is needed for selecting an appropriate PMC schedule in a given setting.

WEB: 10.1186/s12936-023-04564-9
IMPACT FACTOR: 3.469
CITED HALF-LIFE: 6.4

START COMMENTARY

In this modelling analysis, Runge et al. assess the recent World Health Organization (WHO) recommendation for perennial malaria chemoprevention (PMC) with and without RTS,S vaccination on malaria cases in children under two years (U2). Authors utilized Phase 3 trial data for the parameterization of the RTS,S vaccine; Table 1 illustrates the model parameters and scenarios assessed. Additionally, Figure 1 shows the modelled intervention efficacies, schedules, and simulated cohort populations. These data were used to project the malaria cases and cases averted in Figure 2 without PMC or RTS,S, with PMC and no RTS,S, and PMC with RTS,S. Authors utilized an individual-based mathematical model, allowing for uncertainties around PMC scheduling to be addressed. It was found that across varying transmission levels, PMC and RTS,S in combination averted the most clinical cases under moderate to high transmission conditions and fewer at low or very high transmission levels.

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7. Vibrio cholerae in rural and urban Bangladesh, findings from hospital-based surveillance, 2000-2021.

Das R, Nasrin S, Palit P, Sobi R, Sultana A, Khan S, et al.

Sci Rep. 2023 Apr 21;13(1):6411.

PubMed ID: 37076586

ABSTRACT

With more than 100,000 cases estimated each year, Bangladesh is one of the countries with the highest number of people at risk for cholera. Moreover, Bangladesh is formulating a countrywide cholera-control plan to satisfy the GTFCC (The Global Task Force on Cholera Control) Roadmap's goals. With a particular focus on cholera trends, variance in baseline and clinical characteristics of cholera cases, and trends in antibiotic susceptibility among clinical isolates of Vibrio cholerae, we used data from facility-based surveillance systems from icddr,b's Dhaka, and Matlab Hospitals from years 2000 to 2021. Female patients comprised 3,553 (43%) in urban and 1,099 (51.6%) in rural sites. Of the cases and most patients 5,236 (63.7%) in urban and 1,208 (56.7%) in the rural site were aged 15 years and more. More than 50% of the families belonged to the poor and lower-middle-class; in 2009 (24.4%) were in urban and in 1,791 (84.2%) were in rural sites. In the urban site, 2,446 (30%) of households used untreated drinking water, and 702 (9%) of families disposed of waste in their courtyard. In the multiple logistic regression analysis, the risk of cholera has significantly increased due to waste disposal in the courtyard and the boiling of water has a protective effect against cholera. Rotavirus (9.7%) was the most prevalent co-pathogen among the under-5 children in both sites. In urban sites, the percentage of V. cholerae along with co-existing ETEC and Campylobacter is changing in the last 20 years; Campylobacter (8.36%) and Enterotoxigenic Escherichia coli (ETEC) (7.15%) were the second and third most prevalent co-pathogens. Shigella (1.64%) was the second most common co-pathogen in the rural site. Azithromycin susceptibility increased slowly from 265 (8%) in 2006-2010 to 1485 (47.8%) in 2016-2021, and erythromycin susceptibility dropped substantially over 20 years period from 2,155 (98.4%) to 21 (0.9%). Tetracycline susceptibility decreased in the urban site from 2051 (45.9%) to 186 (4.2%) and ciprofloxacin susceptibility decreased from 2,581 (31.6%) to 1,360 (16.6%) until 2015, then increased 1,009 (22.6%) and 1,490 (18.2%) in 2016-2021, respectively. Since 2016, doxycycline showed 902 (100%) susceptibility. Clinicians need access to up-to-date information on antimicrobial susceptibility for treating hospitalized patients. To achieve the WHO-backed objective of eliminating cholera by 2030, the health systems need to be put under a proper surveillance system that may help to improve water and sanitation practices and deploy oral cholera vaccines strategically.

WEB: 10.1038/s41598-023-33576-3

IMPACT FACTOR: 4.997

CITED HALF-LIFE: 4.2

START COMMENTARY

In this longitudinal analysis, *Das et al.* analyze the distribution of *V. cholerae* infections among patients in urban and rural Bangladeshi hospitals. *Figure 1* illustrates the age-specific distribution of positive patients for both rural and urban sites, with the highest number of cases consistently attributed to the 15-60 year age band. This is also the broadest age band reported for patients; additional granularity in this reporting should be considered with future analysis. *Tables 2 & 3* reflect the antibiotic susceptibility trends of *V. cholerae* and co-pathogens (*Campylobacter* and ETEC), respectively. Antibiotics included were Azithromycin, Doxycycline, Tetracycline, Ciprofloxacin, and Erythromycin, and trends are shown from 2000 – 2021. Notably, over the course of this 20-year study period, prevalence of *Campylobacter* and ETEC increased by fourfold and fivefold, respectively. This paper highlights a growing concern over antimicrobial resistance and pathogen co-infection in areas with high incidence of cholera.

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8. Prevalence, Clinical Severity, and Seasonality of Adenovirus 40/41, Astrovirus, Sapovirus, and Rotavirus Among Young Children With Moderate-to-Severe Diarrhea: Results From the Vaccine Impact on Diarrhea in Africa (VIDA) Study.

Keita A, Doh S, Sow S, Powell H, Omore R, Jahangir Hossain M, et al.

Clin Infect Dis. 2023 Apr 21;76(76 Suppl1):S123-S131.

PubMed ID: 37074439

ABSTRACT

BACKGROUND: While rotavirus causes severe diarrheal disease in children aged <5 years, data on other viral causes in sub-Saharan Africa are limited.

METHODS: In the Vaccine Impact on Diarrhea in Africa study (2015-2018), we analyzed stool from children aged 0-59 months with moderate-to-severe diarrhea (MSD) and without diarrhea (controls) in Kenya, Mali, and The Gambia using quantitative polymerase chain reaction. We derived the attributable fraction (AFe) based on the association between MSD and the pathogen, accounting for other pathogens, site, and age. A pathogen was attributable if the AFe was ≥0.5.The severity of attributable MSD was defined by a modified Vesikari score (mVS). Monthly cases were plotted against temperature and rainfall to assess seasonality.

RESULTS: Among 4840 MSD cases, proportions attributed to rotavirus, adenovirus 40/41, astrovirus, and sapovirus were 12.6%, 2.7%, 2.9%, and 1.9%, respectively. Attributable rotavirus, adenovirus 40/41, and astrovirus MSD cases occurred at all sites, with mVS of 11, 10, and 7, respectively. MSD cases attributable to sapovirus occurred in Kenya, with mVS of 9. Astrovirus and adenovirus 40/41 peaked during the rainy season in The Gambia, while rotavirus peaked during the dry season in Mali and The Gambia.

CONCLUSIONS: In sub-Saharan Africa, rotavirus was the most common cause of MSD; adenovirus 40/41, astrovirus, and sapovirus contributed to a lesser extent among children aged <5 years. Rotavirus- and adenovirus 40/41-attributable MSD were most severe. Seasonality varied by pathogen and location. Efforts to increase the coverage of rotavirus vaccines and to improve prevention and treatment for childhood diarrhea should continue.

WEB: 10.1093/cid/ciad060

IMPACT FACTOR: 8.313

CITED HALF-LIFE: 8.3

START COMMENTARY

In this article, *Keita et al.* analyze the Vaccine Impact on Diarrhea in Africa study (VIDA), examining trends in moderate-to-severe diarrhea (MSD) in Kenya, Mali, and The Gambia from 2015 - 2018. MSD cases were attributed to infection of Adenovirus 40/41 (n=127), Astrovirus (n=141), Sapovirus (n=90), and Rotavirus (n=609), and were reported by age and sex in *Table 1. Figure 1* illustrates the seasonality of adenovirus 40/41, astrovirus, sapovirus, and rotavirus at each study site where participants received vaccines; MSD cases were typed using qPCR. Authors found that the proportion of cases among the 4 viral pathogens included in this analysis varied by site and age. Additionally, authors did report on norovirus infections in this cohort in a separate article, but it would be beneficial to have included norovirus infection to a give a more comprehensive view of the VIDA study's impact on MSD, even after rotavirus vaccine introduction.

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9. Use of an adapted participatory learning and action cycle to increase knowledge and uptake of child vaccination in internally displaced persons camps (IVACS): A cluster-randomised controlled trial.

Seal A, Mohamed H, Stokes-Walter R, Mohamed S, Abdille A, Yakowenko E, et al.
Vaccine. 2023 May 01;41(19):3038-3046.
PubMed ID: 36906409

ABSTRACT

BACKGROUND: Vaccination is a key public health intervention that can reduce excess mortality in humanitarian contexts. Vaccine hesitancy is thought to be a significant problem requiring demand side interventions. Participatory Learning and Action (PLA) approaches have proven effective in reducing perinatal mortality in low income settings and we aimed to apply an adapted approach in Somalia.

METHODS: A randomised cluster trial was implemented in camps for internally displaced people near Mogadishu, from June to October 2021. An adapted PLA approach (hPLA) was used in partnership with indigenous 'Abaay-Abaay' women's social groups. Trained facilitators ran 6 meeting cycles that addressed topics of child health and vaccination, analysed challenges, and planned and implemented potential solutions. Solutions included a stakeholder exchange meeting involving Abaay-Abaay group members and services providers from humanitarian organisations. Data was collected at baseline and after completion of the 3 month intervention cycle.

RESULTS: Overall, 64.6% of mothers were group members at baseline and this increased in both arms during the intervention (p = 0.016). Maternal preference for getting young children vaccinated was >95% at baseline and did not change. The hPLA intervention improved the adjusted maternal/caregiver knowledge score by 7.9 points (maximum possible score 21) compared to the control (95% CI 6.93, 8.85; p < 0.0001). Coverage of both measles vaccination (MCV1) (aOR 2.43 95% CI 1.96, 3.01; p < 0.001) and completion of the pentavalent vaccination series (aOR 2.45 95% CI 1.27, 4.74; p = 0.008) also improved. However, adherence to timely vaccination did not (aOR 1.12 95% CI 0.39, 3.26; p = 0.828). Possession of a home-based, child health record card increased in the intervention arm from 18 to 35% (aOR 2.86 95% CI 1.35, 6.06; p = 0.006).

CONCLUSION: A hPLA approach, run in partnership with indigenous social groups, can achieve important changes in public health knowledge and practice in a humanitarian context. Further work to scale up the approach and address other vaccines and population groups is warranted.

WEB: 10.1016/j.vaccine.2023.02.016
IMPACT FACTOR: 3.143
CITED HALF-LIFE: 7.3

START COMMENTARY

In this cluster-randomized controlled trial, *Seal et al.* examine the impact of participatory learning on uptake of childhood vaccination among internally displaced persons camps (IVACS). *Figure 1* reports the flow chart for households utilized by the study, and *Figure 2* includes information on caregivers and children included in this study. Overall, the study had an impressive follow up of households (99%) and caregivers (92%). *Table 3* reports on the intervention effects, showing a significant and positive association with caregiver knowledge, measles vaccination, penta series completion, and child health record cards. This is the first study to report a significant impact on vaccination coverage while utilizing a Participatory Learning and Action (PLA) approach, indicating there is the potential for future applications and a need for additional research.

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10. Advancing detection and response capacities for emerging and re-emerging pathogens in Africa.

Nachega J, Nsanzimana S, Rawat A, Wilson L, Rosenthal P, Siedner M, et al.

Lancet Infect Dis. 2023 Apr 25;23(5):e185-e189.

PubMed ID: 36563700

ABSTRACT

Recurrent disease outbreaks caused by a range of emerging and resurging pathogens over the past decade reveal major gaps in public health preparedness, detection, and response systems in Africa. Underlying causes of recurrent disease outbreaks include inadequacies in the detection of new infectious disease outbreaks in the community, in rapid pathogen identification, and in proactive surveillance systems. In sub-Saharan Africa, where 70% of zoonotic outbreaks occur, there remains the perennial risk of outbreaks of new or re-emerging pathogens for which no vaccines or treatments are available. As the Ebola virus disease, COVID-19, and mpox (formerly known as monkeypox) outbreaks highlight, a major paradigm shift is required to establish an effective infrastructure and common frameworks for preparedness and to prompt national and regional public health responses to mitigate the effects of future pandemics in Africa.

WEB: 10.1016/S1473-3099(22)00723-X

IMPACT FACTOR: 24.446

CITED HALF-LIFE: 4.7

START COMMENTARY

In this editorial commentary, *Nachega et al.* discuss the state of detection systems and response capabilities in Africa for disease outbreaks caused by emerging and re-emerging pathogens. In a panel insert, authors highlight six areas of focus for response to emerging pathogens. These areas of focus are: 1) strengthening public health preparedness and coordination of response, 2) building local supply chains, 3) establishing integrated surveillance systems and data sharing hubs, 4) strengthening diagnostic laboratory capacity and pathogen genomics, 5) developing clinical trial capacity vaccine infrastructure, and 6) promoting community engagement. Across Africa, there are real-world examples for each of these focus areas, working as proof of concept. The COVID-19 pandemic response highlighted cracks in health systems globally, but the hope is that by targeting time and financing to the outlined focus areas, African governments can address new health threats as they emerge.

Return to List of Articles

Appendix

The literature search for the June 2023 Vaccine Delivery Research Digest was conducted on May 29, 2023. We searched English language articles indexed by the US National Library of Medicine and published between April 15, 2023 and May 14, 2023. The search resulted in 478 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]) (“2023/15/4”[PDAT] : “2023/14/5”[PDAT]))