VACCINE DELIVERY RESEARCH DIGEST

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

REPORT TO THE BILL & MELINDA GATES FOUNDATION

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1. Impact and Cost-Effectiveness of Alternative Human Papillomavirus Vaccines for Preadolescent Girls in Mozambique: A Modelling Study.

Guimarães E, Chissaque A, Pecenka C, Debellut F, Schuind A, Vaz B, et al.
Vaccines (Basel). 2023 Jul 01;11(6).
PubMed ID: 37376447

ABSTRACT

Mozambique has one of the highest rates of cervical cancer in the world. Human papillomavirus (HPV) vaccination was introduced in 2021. This study evaluated the health and economic impact of the current HPV vaccine (GARDASIL® hereafter referred to as GARDASIL-4) and two other vaccines (CECOLIN® and CERVARIX®) that could be used in the future. A static cohort model was used to estimate the costs and benefits of vaccinating girls in Mozambique over the period 2022-2031. The primary outcome measure was the incremental cost per disability-adjusted life-year averted from a government perspective. We conducted deterministic and probabilistic sensitivity analyses. Without cross-protection, all three vaccines averted approximately 54% cervical cancer cases and deaths. With cross-protection, CERVARIX averted 70% of cases and deaths. Without Gavi support, the discounted vaccine program costs ranged from 60 million to 81 million USD. Vaccine program costs were approximately 37 million USD for all vaccines with Gavi support. Without cross-protection, CECOLIN was dominant, being cost-effective with or without Gavi support. With cross-protection and Gavi support, CERVARIX was dominant and cost-saving. With cross-protection and no Gavi support, CECOLIN had the most favorable cost-effectiveness ratio. Conclusions: At a willingness-to-pay (WTP) threshold set at 35% of Gross Domestic Product (GDP) per capita, HPV vaccination is cost-effective in Mozambique. The optimal vaccine choice depends on cross-protection assumptions.

WEB: 10.3390/vaccines11061058
IMPACT FACTOR: 4.086
CITED HALF-LIFE: 3.4

START COMMENTARY

In this cost-effectiveness modelling study, *Guimaraes et al.* evaluated economic impact and health outcomes for the use of three human papillomavirus (HPV) vaccines in Mozambique. The three vaccines assessed were CECOLIN, CERVARIX, and GARDASIL, the currently used HPV vaccine. Each of the vaccines were evaluated against no vaccination with no change in screening practices, and against each other. The base case scenario evaluated the lifetime costs and benefits of vaccinating nine annual cohorts of 9-year-old girls (routine vaccination 2022–2031) and five cohorts of girls aged 10–14 years (catch-up campaign conducted in the year 2022) at the national level. Authors provided assumptions used for input parameters for cervical cancer disease burden (*Table 1)*, health service costs (*Table 2)*, health impact of HPV vaccination (*Table 3)*, and vaccination costs (*Table 4)*. *Figure 2* shows the cost-effectiveness acceptability curve under different scenarios; it was found that with Gavi support and cross-protection, there was an acceptable cost-saving result across all thresholds using CERVARIX. Authors also found that HPV vaccination could reduce the burden of cervical cancer cases and deaths by 53 – 70%, without and with cross-protection, respectively. Regardless, HPV vaccination is a cost-effective intervention in Mozambique and the specific vaccine utilized should be considered further as more data emerges about CECOLIN and CERVARIX.

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2. The societal cost of vaccine refusal: A modelling study using measles vaccination as a case study.

Olivera Mesa D, Winskill P, Ghani A, Hauck K.
Vaccine. 2023 Jun 21;41(28):4129-4137.
PubMed ID: 37263873

ABSTRACT

BACKGROUND: Increasing vaccine hesitancy and refusal poses a challenge to public health as even small reductions in vaccine uptake can result in large outbreaks of infectious diseases. Here we estimate the societal costs of vaccine refusal using measles as a case study.

METHODS: We developed a compartmental metapopulation model of measles transmission to explore how the changes in the size and level of social mixing between populations that are "pro-vaccination", and "anti-vaccination" impacts the burden of measles. Using the projected cases and deaths, we calculated the health, healthcare, direct medical costs, and productivity loss associated with vaccine refusal. Using measles in England as a case study, we quantified the societal costs that each vaccine refusal imposes on society.

FINDINGS: When there is a high level of mixing between the pro- and anti-vaccination populations, those that refuse to be vaccinated benefit from the herd immunity afforded by the pro-vaccination population. At the same time, their refusal to be vaccinated increases the burden in those that are vaccinated due to imperfect vaccines, and in those that are not able to be vaccinated due to other underlying health conditions. Using England as a case study, we estimate that this translates to a societal loss of GBP 292 million and disease burden of 17 630 quality-adjusted-life-years (sensitivity range 10 594-50 379) over a 20-year time horizon. Of these costs, 26 % are attributable to healthcare costs and 74 % to productivity losses for patients and their carers. This translates to a societal loss per vaccine refusal of GBP 162.21 and 0.01 (0.006-0.03) quality-adjusted-life-years.

INTERPRETATION: Our findings demonstrate that even low levels of vaccine refusal can have a substantial and measurable societal burden on the population. These estimates can support the value of investment in interventions that address vaccine hesitancy and vaccine refusal, providing not only improved public health but also potential economic benefits to society.

WEB: 10.1016/j.vaccine.2023.05.039
IMPACT FACTOR: 3.143
CITED HALF-LIFE: 7.3

START COMMENTARY

In this disease modelling analysis, *Olivera Mesa et al* evaluate the impact of vaccine refusals on infectious disease transmission dynamics. Authors used measles as a case study and explored how changes in the size and level of mixing between vaccinated and unvaccinated populations impact the burden. *Figure 1* illustrates the measles metapopulation, showing mixing between the "pro-vaccination" and "anti-vaccination" populations; *Table 1* shows the parameters included in *Figure 1*, with values for vaccine coverage, vaccine efficacy, proportion of the population that are anti-vaccination, and a mixing parameter represented. *Figure 4* demonstrates the societal impact of an anti-vaccination population, as measured by a) direct healthcare and productivity costs, b) burden of disease due to death and illness, c) cumulative societal costs, and d) cumulative QALYs. These results show the burden of anti-vaccination is greater than just the cost of treating cases, underlining the need for continued and increased vaccination promotion.

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3. Estimating global changes in routine childhood vaccination coverage during the COVID-19 pandemic, 2020-2021.

Ghaznavi C, Eguchi A, Suu Lwin K, Yoneoka D, Tanoue Y, Kumar Rauniyar S, et al.
Vaccine. 2023 Jun 21;41(28):4151-4157.
PubMed ID: 37246068

ABSTRACT

OBJECTIVES: The COVID-19 pandemic has disrupted the distribution of routine immunizations globally. Multi-country studies assessing a wide spectrum of vaccines and their coverage rates are needed to determine global performance in achieving vaccination goals.

METHODS: Global vaccine coverage data for 16 antigens were obtained from WHO/UNICEF Estimates of National Immunization Coverage. Tobit regression was performed for all country-antigen pairs for which data were continuously available between 2015-2020 or 2015-2021 to predict vaccine coverage in 2020/2021. Vaccines for which multi-dose data were available were assessed to determine whether vaccine coverage for subsequent doses were lower than that of first doses.

RESULTS: Vaccine coverage was significantly lower-than-predicted for 13/16 antigens in 2020 and all assessed antigens in 2021. Lower-than-predicted vaccine coverage was typically observed in South America, Africa, Eastern Europe, and Southeast Asia. There was a statistically significant coverage drop for subsequent doses of the diphtheria-tetanus-pertussis, pneumococcus, and rotavirus vaccines compared to first doses in 2020 and 2021.

CONCLUSION: The COVID-19 pandemic exerted larger disruptions to routine vaccination services in 2021 than in 2020. Global efforts will be needed to recoup vaccine coverage losses sustained during the pandemic and broaden vaccine access in areas where coverage was previously inadequate.

WEB: 10.1016/j.vaccine.2023.05.034
IMPACT FACTOR: 3.143
CITED HALF-LIFE: 7.3

START COMMENTARY

In this global review, *Ghaznavi et al.* estimate the changes routine childhood vaccination coverage during 2020 and 2021. The following antigens were included in the analysis: DTPCV3, HEPB3, MCV1, and POL3, BCG, DTPCV1, HEPB_BD, HIB3, HPV_FEM, IPV1, MCV2, PCV1, PCV2, RCV1, ROTA1, and ROTAC. *Table 2* summarizes the observed and predicted coverage for multi-dose childhood vaccines, while *Figure 3* shows the difference between the observed and predicted vaccine coverage for DTP, HEPB, MCV, PCV, and ROTA. Authors found evidence of lower vaccine coverage than predicted globally for most antigens in 2020, and for all antigens in 2021, indicating a downward trend. Results also indicate that multi-dose vaccines performed worse than expected for subsequent doses when compared to predictions from first-doses, showing a significant dropout rate for many multi-dose vaccines. These results highlight the need for strengthening of routine immunization programs in general, and particularly for follow up doses.

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4. COVID-19 Vaccination in the WHO African Region: Progress Made in 2022 and Factors Associated.

Mboussou F, Farham B, Nsasiirwe S, Atagbaza A, Oyaole D, Atuhebwe P, et al.
Vaccines (Basel). 2023 May 30;11(5).
PubMed ID: 37243114

ABSTRACT

This study summarizes progress made in rolling out COVID-19 vaccinations in the African region in 2022, and analyzes factors associated with vaccination coverage. Data on vaccine uptake reported to the World Health Organization (WHO) Regional Office for Africa by Member States between January 2021 and December 2022, as well as publicly available health and socio-economic data, were used. A negative binomial regression was performed to analyze factors associated with vaccination coverage in 2022. As of the end of 2022, 308.1 million people had completed the primary vaccination series, representing 26.4% of the region's population, compared to 6.3% at the end of 2021. The percentage of health workers with complete primary series was 40.9%. Having carried out at least one high volume mass vaccination campaign in 2022 was associated with high vaccination coverage ($\beta = 0.91$, $p < 0.0001$), while higher WHO funding spent per person vaccinated in 2022 was correlated with lower vaccination coverage ($\beta = -0.26$, $p < 0.03$). All countries should expand efforts to integrate COVID-19 vaccinations into routine immunization and primary health care, and increase investment in vaccine demand generation during the transition period that follows the acute phase of the pandemic.

WEB: 10.3390/vaccines11051010
IMPACT FACTOR: 4.086
CITED HALF-LIFE: 3.4

START COMMENTARY

In this retrospective analysis, *Mboussou et al.* report on the coverage of COVID-19 vaccinations in 2022 within Africa. Authors focused on the following analyses: doses administered vs. received, doses expired vs received, complete primary vaccination series, and completion of primary series and receipt of at least one booster dose. *Table 1* includes the factors assessed for association with COVID-19 vaccination coverage across all 46 countries. *Figure 2* highlights the proportion of people with complete primary vaccination series at the end of 2021 and 2022, respectively. Importantly, only two countries had vaccinated at least 70% of their population by end of 2021 (Mauritius and Seychelles), and two additional countries reached 70% vaccination coverage by end of 2022 (Liberia

and Rwanda). By the end of 2022, four countries had yet to reach 10% coverage (Burundi, Democratic Republic of Congo, Madagascar, and Senegal). *Figures 3 & 4* show the percentage of people who had completed the vaccination primary series by the end of 2021 and 2022 among countries with more than 25% coverage and among countries with fewer than 25% coverage, respectively. Though progress was clearly made over the course of 2022, vaccination coverage remains low in Africa. This analysis further highlights the need to focus efforts on vaccinating high-priority groups, in addition to the general population.

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5. Adaptation and Validation of a French Version of the Vaccination Attitudes Examination (VAX) Scale.

Eisenblaetter M, Madiouni C, Laraki Y, Capdevielle D, Raffard S.
Vaccines (Basel). 2023 May 29;11(5).
PubMed ID: 37243105

ABSTRACT

Over the past decades, vaccination has proven to be largely beneficial to global health. Despite vaccine efficacy, the French population has been recently affected by more anti-vaccination attitudes and vaccine refusal, and it is therefore necessary to validate tools to study this health issue. The Vaccination Attitudes Examination scale (VAX) is a 12-item questionnaire targeting adults that assesses general attitudes towards vaccination. The aims of the study were to translate and adapt the original English version of the scale into French and to test the psychometric properties of the scale in a French-population-based sample of adults. We included 450 French speaking adults that completed the French VAX and other questionnaires to assess convergent and divergent validities. Exploratory and confirmatory factor analyses showed that the French version of the VAX replicated the factorial structure of the original scale. Moreover, it demonstrated high internal consistency, good convergent and divergent validities, and excellent temporal stability. Furthermore, scores on the scale differentiated vaccinees from non-vaccinee respondents. Results on the scale provide us with insight into factors involved in vaccine hesitancy in France, therefore allowing French authorities and policy makers to address these specific concerns and improve vaccine acceptance rates in this country.

WEB: 10.3390/vaccines11051001
IMPACT FACTOR: 4.086
CITED HALF-LIFE: 3.4

START COMMENTARY

In this review, *Eisenblaetter et al*. aimed to translate and adapt the English Vaccination Attitudes Examination scale (VAX) into French, for a French population. The VAX scores are comprised of 12 items to assess general attitudes towards vaccination and is used to address concerns to improve vaccine acceptance rates within a population. *Table 3* shows the mean and standard deviation of questionnaires, and highlights specific areas of hesitancy, including conspiracy belief, perceived negative effects of treatment, and perceived necessity of treatment. Authors also included an exploratory factor analysis, showing 80.23% of the variance can be attributed to four factors:

“Mistrust of vaccine benefits”, “Worries about unforeseen future effects”, “Concerns about commercial profiteering”, and “Preference for natural immunity”. The French adaptation of the VAX scale demonstrated high internal consistency, reliability, and a strong temporal stability. Though this is a simple tool, the validation of the French VAX scale enables researchers to identify groups of particular concern with respect to vaccine hesitancy and determine specific concerns among these groups.

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6. Barriers and facilitators of HPV vaccination in sub-saharan Africa: a systematic review.

Kutz J, Rausche P, Gheit T, Puradiredja D, Fusco D.
BMC Public Health. 2023 May 29;23(1):974.
PubMed ID: 37237329

ABSTRACT

BACKGROUND: Human Papilloma Virus (HPV) is the most common sexually transmitted infection worldwide. Globally, both men and women have a 50% risk of being infected at least once in their life. HPV prevalence is among the highest in sub-Saharan Africa (SSA), at an average of 24%. HPV causes different types of cancers, including cervical cancer (CC), which is the leading cause of cancer deaths among women in SSA. HPV-vaccination has been proven to be effective in reducing HPV induced cancers. SSA countries are delayed in reaching the WHO's target of fully vaccinating 90% of girls within the age of 15 by 2030. Our systematic review aims to identify barriers and facilitators of HPV-vaccination in SSA to inform national implementation strategies in the region.

METHODS: This is a mixed method systematic review based on the PRISMA statement and The Joanna Briggs Institute Reviewers' Manual. Search strategies were adapted to each selected database: PubMed/MEDLINE, Livivo, Google Scholar, Science Direct, and African Journals Online for papers published in English, Italian, German, French and Spanish between 1 December 2011 and 31 December 2021. Zotero and Rayyan were the software used for data management. The appraisal was conducted by three independent reviewers.

RESULTS: A total of 20 articles were selected for appraisal from an initial 536 articles. Barriers included: limited health system capacities, socio-economic status, stigma, fear and costs of vaccines, negative experience with vaccinations, COVID-19 pandemic, lack of correct information, health education (HE) and consent. Additionally, we found that boys are scarcely considered for HPV-vaccination by parents and stakeholders. Facilitators included: information and knowledge, policy implementation, positive experience with vaccinations, HE, stakeholders' engagement, women's empowerment, community engagement, seasonality, and target-oriented vaccination campaigns.

CONCLUSIONS: This review synthesizes barriers and facilitators of HPV-vaccinations in SSA. Addressing these can contribute to the implementation of more effective HPV immunization programs targeted at eliminating CC in line with the WHO 90/70/90 strategy.

REGISTRATION AND FUNDING: Protocol ID: CRD42022338609 registered in the International Prospective Register of Systematic Reviews (PROSPERO). Partial funds: German Centre for Infection research (DZIF) project NAMASTE: 8,008,803,819.

WEB: 10.1186/s12889-023-15842-1
IMPACT FACTOR: 2.521
CITED HALF-LIFE: 6.0

START COMMENTARY

In this systematic review, *Kutz et al.* identify the barriers and facilitators of Human papillomavirus (HPV) vaccination in sub-Saharan Africa. *Figure 2* shows the countries in which the selected articles took place and the status of their HPV vaccination programs; a maximum of three articles included from a single country (Uganda and Kenya), and Nationwide and pilot programs were represented. *Figure 3* summarizes the barriers and facilitators for HPV vaccination. The most reported barriers were health system capacity, lack of information, lack of health education, and socio-economic status; the most reported facilitators were information and knowledge, policy implementation, positive experiences, and education. Authors identified three specific focus areas that would facilitate overcoming barriers and strengthening facilitators: health literacy, health system, and social & policy. Hopefully this information can be used to improve and implement effective HPV vaccination programs with sub-Saharan Africa.

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7. Monkeypox vaccination in the global south: Fighting a war without a weapon.

Ogunkola I, Abiodun O, Bale B, Elebesunu E, Ujam S, Umeh I, et al.

Clin Epidemiol Glob Health. 2023 Jun 13;22:101313.
PubMed ID: 37220529

ABSTRACT

BACKGROUND: The Mpox outbreak awakened countries worldwide to renew efforts in epidemiological surveillance and vaccination of susceptible populations. In terms of Mpox vaccination, various challenges exist in the global south, which impede adequate vaccine coverage, especially in Africa. This paper reviewed the situation of Mpox vaccination in the global south and potential ameliorative approaches.

METHODS: A review of online literature from PubMed and Google Scholar concerning Mpox vaccination in countries belonging to the 'global south' category was done between August and September, 2022. The major focus areas included inequity in global vaccine distribution, challenges impeding vaccine coverage in the global south, and potential strategies for bridging the gap in vaccine equity. The papers that met the inclusion criteria were collated and narratively discussed.

RESULTS: Our analysis revealed that, while the high-income countries secured large supplies of the Mpox vaccines, the low- and middle-income countries were unable to independently access substantial quantities of the vaccine and had to rely on vaccine donations from high-income countries, as was the case during the COVID-19 pandemic. The challenges in the global south particularly revolved around inadequate vaccine production capacity due to lack of qualified personnel and specialized infrastructure for full vaccine development and manufacturing, limited cold chain equipment for vaccine distribution, and consistent vaccine hesitancy.

CONCLUSION: To tackle the trend of vaccine inequity in the global south, African governments and international stakeholders must invest properly in adequate production and dissemination of Mpox vaccines in low- and middle-income countries.

WEB: 10.1016/j.cegh.2023.101313
IMPACT FACTOR: 2.6
CITED HALF-LIFE: 2.0

START COMMENTARY

In this review, *Ogunkola et al.* discuss the Monkeypox (Mpox) outbreak, and the challenges countries in the global south are facing in controlling the spread. Authors highlight the continued global vaccine distribution inequity and its contribution to low- and middle-income countries obtaining adequate doses. Unfortunately, Africa has not received any vaccine donation, creating a greater risk for worsening outbreak, especially among vulnerable populations. Additionally, inadequate vaccine production capacity in Africa is contributing to this disparity, with authors stating that Africa produces less than 1% of all vaccines used in the continent. Despite there being need for Mpox vaccination, most of the Global South is having challenges with acquiring vaccination doses, resulting in distribution inequity; one of the greatest solutions for this continued problem is to increase the vaccine production capacity within the Global South.

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8. Dengue vaccine acceptability before and after the availability of COVID-19 vaccines in Puerto Rico.

Rodriguez D, Major C, Sánchez-González L, Jones E, Delorey M, Alonso C, et al.
Vaccine. 2023 Jun 05;41(24):3627-3635.
PubMed ID: 37173267

ABSTRACT

Dengue is a growing public health threat, causing approximately 400 million infections annually. In June 2021, the Advisory Committee on Immunization Practices recommended the first dengue vaccine (CYD-TDV) for children aged 9-16 years with a previous dengue infection, living in endemic areas, such as Puerto Rico (PR). As the COVID-19 pandemic affected vaccine intention worldwide, we assessed dengue vaccine intention before (pre-COVID) and after (post-COVID) COVID-19 vaccine availability among participants enrolled in the Communities Organized to Prevent Arboviruses (COPA) cohort to prepare for dengue vaccine implementation in PR. We used logistic regression models to evaluate changes in dengue vaccine intention by interview timing and participant characteristics. Among 2,513 participants pre-COVID, 2,512 answered the dengue vaccine intention question for themselves, and 1,564 answered relative to their children. Post-COVID, dengue vaccine intention in adults increased for themselves from 73.4% to 84.5% (adjusted odds ratio (aOR) = 2.27, 95%CI: 1.90-2.71) and relative to their children from 75.6% to 85.5% (aOR = 2.21, 95%CI: 1.75-2.78). Among all participants, groups with higher dengue vaccine intention included those who reported previous year influenza vaccine uptake and those who reported being frequently bitten by mosquitos, compared to those who did not. Adult males were also more likely to intend to vaccinate themselves than females. Respondents who were employed or in school were less likely to intend to vaccinate compared to those who were not working. The primary reasons for vaccine hesitancy were concerns with side effects and not believing in vaccines, which should be considered during educational strategies prior to dengue vaccine implementation. In general, dengue vaccine intention is high in PR and has increased after COVID-19 vaccine availability, potentially due to increased awareness of vaccine importance during the COVID-19 pandemic.

WEB: 10.1016/j.vaccine.2023.04.081
IMPACT FACTOR: 3.143
CITED HALF-LIFE: 7.3

START COMMENTARY

Within Puerto Rico, *Rodriguez et al.* assess the acceptability of the dengue vaccine before and after the availability of the COVID-19 vaccine. For the purposes of this analysis, the time periods are defined as: Pre-COVID (May 2019 to December 14, 2020) and Post-COVID (December 15, 2020 to December 30, 2021) vaccine availability. Authors also chose to ask parents about vaccinating their children; *Figure 2* shows the prevalence of dengue vaccine intention pre- and post- COVID vaccine availability for adults and parents, demonstrating an increase in intention for both groups. Vaccine hesitancy was still an issue, with the most frequently reported reasons for hesitancy being: 1) concerns about side effects, 2) not believing in vaccines in general, and 3) needing more information about the vaccine. *Figure 3* includes reasons for hesitancy for both adults and parents, pre- and post- COVID vaccine availability. Overall, it appears COVID-19 vaccine rollout improved intention to vaccinate against dengue, suggesting educational campaigns, and conversations around vaccine safety and effectiveness be continued to improve coverage.

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9. The shared ethical framework to allocate scarce medical resources: a lesson from COVID-19.

Emanuel E, Persad G.
Lancet. 2023 Jun 05;401(10391):1892-1902.
PubMed ID: 37172603

ABSTRACT

The COVID-19 pandemic has helped to clarify the fair and equitable allocation of scarce medical resources, both within and among countries. The ethical allocation of such resources entails a three-step process: (1) elucidating the fundamental ethical values for allocation, (2) using these values to delineate priority tiers for scarce resources, and (3) implementing the prioritisation to faithfully realise the fundamental values. Myriad reports and assessments have elucidated five core substantive values for ethical allocation: maximising benefits and minimising harms, mitigating unfair disadvantage, equal moral concern, reciprocity, and instrumental value. These values are universal. None of the values are sufficient alone, and their relative weight and application will vary by context. In addition, there are procedural principles such as transparency, engagement, and evidence-responsiveness. Prioritising instrumental value and minimising harms during the COVID-19 pandemic led to widespread agreement on priority tiers to include health-care workers, first responders, people living in congregate housing, and people with an increased risk of death, such as older adults and individuals with medical conditions. However, the pandemic also revealed problems with the implementation of these values and priority tiers, such as allocation on the basis of population rather than COVID-19 burden, and passive allocation that exacerbated disparities by requiring recipients to spend time booking and travelling to appointments. This ethical framework should be the starting point for the allocation of scarce medical resources in future pandemics and other public health conditions. For instance, allocation of the new malaria vaccine among sub-Saharan African countries should be based not on reciprocity to countries that participated in research, but on maximally reducing serious illness and deaths, especially among infants and children.

WEB: 10.1016/S0140-6736(23)00812-7
IMPACT FACTOR: 60.390
CITED HALF-LIFE: 8.6

START COMMENTARY

In this report, *Emanuel et al.* discuss how the lessons learned from the COVID-19 pandemic can be used to create an ethical framework around the allocation of scarce medical resources. *Table 2* highlights the fundamental values for allocating scarce medical resources: 1) maximizing benefits and preventing harm, 2) mitigating disadvantage, 3) equal moral concern, 4) reciprocity, and 5) instrumental value. During initial stages of COVID-19 vaccine rollout, these values led to priority tiers for vaccines and antiviral treatments within countries. Additionally, we saw inconsistent use of characteristics associated with higher risk (group housing, occupation, geography, race, and sex) used to prioritize vaccine doses. *Table 3* includes the challenges with operationalizing priority tiers and suggests mitigation tactics for each dilemma: 1) distributing vaccines on the basis of population size, 2) overbroad and underinclusive priority tiers, 3) rigid age cutoffs, 4) using passive allocation, 5) accepting personal attestation of eligibility criteria, and 5) rigidly excluding people not in a priority tier. These lessons gleaned from the COVID-19 vaccine rollout underscores the need for careful consideration during the implementation and distribution of scare resources, and will hopefully improve the distribution in future health emergencies.

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10. Equity in Economic Evaluations of Early Childhood Development Interventions in Low-and Middle-Income Countries: Scoping Review.

Baek Y, Ademi Z, Fisher J, Tran T, Owen A.
Matern Child Health J. 2023 May 08;27(6):1009-1029.
PubMed ID: 37036566

ABSTRACT

OBJECTIVES: This study aimed to examine how equity is integrated into economic evaluations of early childhood development interventions in low-and middle-income countries (LMICs), and to narratively synthesize the study characteristics and findings.

METHODS: We conducted a scoping review by searching three electronic databases with terms including equity, early childhood development intervention, economic evaluation, and LMICs. Interventions that aimed to improve child cognitive, physical, language, motor, or social and emotional development through health, nutrition, security and safety, responsive caregiving, and early learning interventions between conception and age 8 years were considered. Studies published in English peer-reviewed journals in the year 2000 and later were included.

RESULTS: The review included 24 cost-effectiveness studies out of 1460 identified articles based on eligibility criteria. The included studies addressed health, nutrition, social protection, and water, sanitation and hygiene interventions for child development. The common type of intervention was immunization. Mostly, equity was measured using household wealth or geographic areas, and the study findings were presented through subgroup analyses. The study settings were LMICs, but most studies were conducted by research teams from high-income countries. Overall, 63% of included studies reported that early childhood development interventions improved equity with greater intervention benefits observed in disadvantaged groups.

CONCLUSIONS: Consideration of equity in evaluations of early childhood interventions provides a more complete picture of cost-effectiveness, and can improve equity. Greater focus on promoting equity consideration, multi-sectoral interventions, and researchers in LMICs would support evidence-based interventions and policies to achieve equity in child development.

WEB: 10.1007/s10995-023-03650-3
IMPACT FACTOR: 1.890
CITED HALF-LIFE: 6.0

START COMMENTARY

In this economic evaluation, *Baek et al.* assess how equity is included in the evaluation of interventions aimed at children in low- and middle- income countries (LMICs). Authors found that existing studies mostly measured equity by wealth groups or geographic areas (*Figure 2).* The most common type of intervention was childhood immunization. *Table 4* shows the equity impact found in the included studies, characterizing papers into pro-disadvantaged (37.5%), mixed (29.2%), not pro-disadvantaged, not cost-effective (4.2%), and no conclusion (4.2%). A small number of relevant studies in the review highlights that more emphasis on equity integration into economic evaluation, coordinated work across multiple sectors, and strong involvement of researchers based in LMICs, are necessary to improve child development. Including equity as a key consideration of future childhood-focused interventions is an essential part for future work to improve child development in LMICs.

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Appendix

The literature search for the July 2023 Vaccine Delivery Research Digest was conducted on June 29, 2023. We searched English language articles indexed by the US National Library of Medicine and published between May 15, 2023 and June 14, 2023. The search resulted in 460 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]) (“2023/15/5”[PDAT] : “2023/14/6”[PDAT]))