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VACCINE DELIVERY RESEARCH DIGEST

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

REPORT TO THE BILL & MELINDA GATES FOUNDATION

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- An analytical study to assess the cost-effectiveness of the Haemophilus influenza type b (Hib) vaccine and its impact on the prevention of childhood pneumonia, meningitis and other vaccine-preventable diseases in China.

7. Global Economic Evaluation of Oral Cholera Vaccine: A Systematic Review.
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- A review to assess economic evaluation (EE) studies for the oral cholera vaccine (OCV) globally.

8. Implementation of Rotavirus Surveillance and Vaccine Introduction - World Health Organization African Region, 2007-2016.
{Abstract & START Scientific Comment} {Full article}

- A report to evaluate rotavirus vaccine implementation and impact on pediatric diarrhea hospitalizations in the WHO African Region.

9. Understanding vaccine hesitancy in polio eradication in northern Nigeria.
{Abstract & START Scientific Comment} {Full article}

- An analytical study to evaluate influential factors for vaccination hesitancy in northern Nigeria.

10. Understanding threats to polio vaccine commitment among caregivers in high-priority areas of Afghanistan: a polling study.
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- A qualitative study to understand attitudes, knowledge, and experiences of pediatric caregivers' commitment to providing dosages of oral polio vaccine (OPV) in Afghanistan.

APPENDIX

DETAILS OF ARTICLES

1. Cost-effectiveness of maternal GBS immunization in low-income sub-Saharan Africa.
   Russell LB, Kim SY, Cosgriff B, Pentakota SR, Schrag SJ, Sobanjo-Ter Meulen A, et al.
   Vaccine. 2017 Dec 14;35(49 Pt B):6905-6914.
   PubMed ID: 29129451

ABSTRACT
BACKGROUND:
A maternal group B streptococcal (GBS) vaccine could prevent neonatal sepsis and meningitis. Its cost-effectiveness in low-income sub-Saharan Africa, a high burden region, is unknown.
METHODS:
We used a decision tree model, with Markov nodes to project infants' lifetimes, to compare maternal immunization delivered through routine antenatal care with no immunization. 37 countries were clustered on the basis of economic and health resources and past public health performance. Vaccine efficacy for covered serotypes was ranged from 50% to 90%. The model projected EOGBS (early-onset) and LOGBS (late-onset) cases and deaths, disability-adjusted life years (DALYs), healthcare costs (2014 US$), and cost-effectiveness for a representative country in each of the four clusters: Guinea-Bissau, Uganda, Nigeria, and Ghana. Maximum vaccination costs/dose were estimated to meet two cost-effectiveness benchmarks, 0.5 GDP and GDP per capita/DALY, for ranges of disease incidence (reported and adjusted for under-reporting) and vaccine efficacy.
RESULTS:
At coverage equal to the proportion of pregnant women with≥4 antenatal visits (ANC4) and serotype-specific vaccine efficacy of 70%, maternal GBS immunization would prevent one-third of GBS cases and deaths in Uganda and Nigeria, where ANC4 is 50%, 42-43% in Guinea-Bissau (ANC4=65%), and 55-57% in Ghana (ANC4=87%). At a vaccination cost of $7/dose, maternal immunization would cost $320-$350/DALY averted in Guinea-Bissau, Nigeria, and Ghana, less than half these countries' GDP per capita. In Uganda, which has the lowest case fatality ratios, the cost would be $573/DALY. If the vaccine prevents a small proportion of stillbirths, it would be even more cost-effective. Vaccination cost/dose, disease incidence, and case fatality were key drivers of cost/DALY in sensitivity analyses.
CONCLUSION:
Maternal GBS immunization could be a cost-effective intervention in low-income sub-Saharan Africa, with cost-effectiveness ratios similar to other recently introduced vaccines. The vaccination cost at which introduction is cost-effective depends on disease incidence and vaccine efficacy.

WEB: 10.1016/j.vaccine.2017.07.108
IMPACT FACTOR: 3.41
CITED HALF-LIFE: 5.90

START EDITORIAL COMMENT: The study produced estimates of cost-effectiveness of GBS immunization by country, vaccination cost, and GBS-associated still births. Maternal GBS was found to be cost-effective in Guinea-Bissau, Ghana, Nigeria, and Uganda with cost/DALY estimates ranging from $320/DALY averted and $573 per DALY averted. Some limitations of the study were: 1) only variable costs of vaccination were considered; 2) incidence, the driver of cost-effectiveness, was not differentiated among countries; and 3) researchers assumed that vaccination would not result in herd protection or serotype replacement.

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2. Potential impact and cost-effectiveness of rotavirus vaccination in Afghanistan.
Anwari P, Debellut F, Pecenka C, Parwiz SM, Clark A, Groman D, et al.
Vaccine. 2017 Oct 26. pii: S0264-410X(17)31466-4.
PubMed ID: 29107346

ABSTRACT
INTRODUCTION:
Despite progress made in child survival in the past 20 years, 5.9 million children under five years died in 2015, with 9% of these deaths due to diarrhea. Rotavirus is responsible for more than a third of diarrhea deaths. In 2013, rotavirus was estimated to cause 215,000 deaths among children under five years, including 89,000 in Asia. As of April 2017, 92 countries worldwide have introduced rotavirus vaccination in their national immunization program. Afghanistan has applied for Gavi support to introduce rotavirus vaccination nationally. This study estimates the potential impact and cost-effectiveness of a national rotavirus immunization program in Afghanistan.
METHODS:
This study examined the use of Rotarix® (RV1) administered using a two-dose schedule at 6 and 10 weeks of age. We used the ProVac Initiative's UNIVAC model (version 1.2.09) to evaluate the impact and cost-effectiveness of a rotavirus vaccine program compared with no vaccine over ten birth cohorts from 2017 to 2026 with a 3% annual discount rate. All monetary units are adjusted to 2017 US$.
RESULTS:
Rotavirus vaccination in Afghanistan has the potential to avert more than one million cases; 660,000 outpatient visits; approximately 50,000 hospital admissions; 650,000 DALYs; and 12,000 deaths, over 10 years. Not accounting for any Gavi subsidy, rotavirus vaccination can avert DALYs at US$82/DALY from the government perspective and US$80/DALY from the societal perspective. With Gavi support, DALYs can be averted at US$29/DALY and US$31/DALY from the societal and government perspective, respectively. The average yearly cost of a rotavirus vaccination program would represent 2.8% of the total immunization budget expected in 2017 and 0.1% of total health expenditure.
CONCLUSION:
The introduction of rotavirus vaccination would be highly cost-effective in Afghanistan, and even more so with a Gavi subsidy.

WEB: 10.1016/j.vaccine.2017.10.058
IMPACT FACTOR: 3.41
CITED HALF-LIFE: 5.90

START EDITORIAL COMMENT: The burden of rotavirus morbidity and mortality is high in Afghanistan. This study evaluated the impact and cost-effectiveness of a rotavirus vaccine program in Afghanistan compared with no vaccine, at the national level, over ten birth cohorts starting in 2017. A model was used to determine rotavirus disease events and treatment costs over the first 5 years of life, the average life expectancy of each birth cohort, and healthy future years of life gained. The primary outcome measure of the analysis was the discounted cost per disability adjusted life year (DALY) averted. Other outcomes included the incremental cost of the vaccine program, as well as the number of averted cases, visits, hospitalizations, treatment costs, and deaths.

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3. Impact of rotavirus vaccine on rotavirus diarrhoea in countries of East and Southern Africa.
Weldegebriel G, Mwenda JM, Chakauya J, Daniel F, Masresha B, Parashar UD, et al.
Vaccine. 2017 Oct 25. pii: S0264-410X(17)31458-5.
PubMed ID: 29102168

ABSTRACT
BACKGROUND:
Established in 2006 with four countries conducting hospital-based rotavirus surveillance, the African rotavirus surveillance network has expanded over subsequent years. By 2015, 14 countries in the World Health Organization (WHO) East and Southern Africa sub-region (Eritrea, Ethiopia, Kenya, Lesotho, Madagascar, Mauritius, Namibia, Rwanda, Seychelles, Swaziland, Tanzania, Uganda, Zambia and Zimbabwe) were participating in the rotavirus surveillance network coordinated by WHO. We monitored the proportion of rotavirus diarrhoea among children under five years of age who were hospitalized for diarrhoea in the sentinel hospitals from 2010 to 2015 among countries that introduced rotavirus vaccine during or before 2013 (Rwanda, Tanzania, Zambia and Ethiopia) and compared with the other countries in the network.
METHODS:
Children under the age of five years hospitalized due to acute diarrhoea were enrolled into the sentinel surveillance system and had stool samples collected and tested for rotavirus antigens by enzyme immunoassay. We described trends in rotavirus positivity among tested stool samples before and after rotavirus vaccine introduction.
RESULTS:
In countries that introduced rotavirus vaccine by 2013 (Rwanda, Tanzania, Zambia and Ethiopia), average rotavirus vaccine coverage from 2010 to 2015 improved from 0% in 2010 and 2011, 13% in 2012, 46% in 2013, 83% in 2014 to 90% in 2015. Annual average rotavirus positivity from 2010 to 2015 was 35%, 33%, 38%, 28%, 27%, and 19%, respectively. In countries that introduced rotavirus vaccine after 2013 or had not introduced by 2015, average rotavirus vaccine coverage was 0% in 2010-2013, 13% in 2014 and 51% in 2015. In these countries, rotavirus positivity was 44% in 2010, 32% in 2011, 33% in 2012, 41% in 2013, 40% in 2014 and 25% in 2015.
CONCLUSION:
Countries that introduced rotavirus vaccine by 2013 had a lower proportion of rotavirus positive hospitalizations in 2013-2015 as compared to those that had not introduced rotavirus vaccine by 2013. The decrease in rotavirus positivity was inversely related to increase in rotavirus vaccine coverage showing impact of rotavirus vaccines.

WEB: 10.1016/j.vaccine.2017.10.050
IMPACT FACTOR: 3.41
CITED HALF-LIFE: 5.90

START EDITORIAL COMMENT: Rotavirus vaccine coverage was higher and rotavirus positive hospitalizations were lower in the countries that introduced the vaccine compared to countries that did not introduce the vaccine. These results provide a concrete argument to sustain vaccine use and could be used to inform decision making regarding vaccine use in countries that have not yet decided to introduce rotavirus vaccine into their immunizations programs.

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4. Health impact and cost-effectiveness of a domestically-produced rotavirus vaccine in India: A model based analysis.
   Rose J, Homa L, Meropol SB, Debanne SM, Bielefeld R, Hoyen C, et al.
   PLoS One. 2017 Nov 3;12(11):e0187446.
   PubMed ID: 29099848

ABSTRACT
BACKGROUND:
Currently, Indian officials are incorporating a domestically manufactured rotavirus vaccine (based on the 116E rotavirus strain) into the country's universal immunization program; this vaccine will cost significantly less than western rotavirus vaccines. Here, we examine the public health impact, cost, and cost-effectiveness of universal vaccination in India using the 116E vaccine. This work will allow comparison of universal 116E vaccination with other approaches to child mortality reduction, shed light on the future burden of rotavirus disease in India, and help stakeholders understand future resource needs.
METHODS:
Using information from published literature, we developed a dynamic simulation model of rotavirus transmission, natural history, and related utilization among Indian infants followed until age five. Infection risk depended on the degree of viral shedding in the population. Infection risk and severity were influenced by age, number of previous infections, and vaccination history. Probabilities of inpatient and outpatient health services utilization depended on symptom severity. With the model, we compared a strategy of nationwide 116E vaccination to one of no vaccination. Costs were considered from the perspective of all payers (including families) and from the societal perspective.
RESULTS:
We estimated that an established 116E vaccination program would reduce symptomatic rotavirus infection by 13.0%, while reducing population-wide rotavirus mortality by 34.6% (over 34,000 lives annually). Rotavirus outpatient visits would decline by 21.3%, and hospitalization would decline by 28.1%. The cost per disability-adjusted life year (DALY) averted was estimated at 3,429 Rupees (approximately $56). Predicted mortality reduction in children born during the first five years of vaccination implementation was nearly identical to that in children born in later years (34.4% versus 34.6%).
CONCLUSIONS:
116E vaccination of Indian infants would likely substantially reduce rotavirus-related morbidity, mortality, and utilization at a cost considered highly cost-effective by standard criteria. Nearly the entire mortality reduction benefit of vaccination was attributable to direct protection of those vaccinated, as opposed to indirect "herd immunity" effects.

WEB: 10.1371/journal.pone.0187446
IMPACT FACTOR: 3.23
CITED HALF-LIFE: 2.70

START EDITORIAL COMMENT: Researchers developed a rotavirus microsimulation model in India. Findings include a reduction of symptomatic rotavirus vaccination by 13%, reduction of rotavirus vaccine mortality by 37%, reduction of outpatient visits by 21%, and reduction of hospitalizations by 28%.

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5. The impact of antenatal care, iron-folic acid supplementation and tetanus toxoid vaccination during pregnancy on child mortality in Bangladesh.
   Abir T, Ogbo FA, Stevens GJ, Page AN, Milton AH, Agho KE.
   PLoS One. 2017 Nov 1;12(11):e0187090.
   PubMed ID: 29091923

ABSTRACT
BACKGROUND:
Appropriate antenatal care (ANC) is an important preventive public health intervention to ensure women's and newborn health outcomes. The study aimed to investigate the impact of ANC, iron-folic acid (IFA) supplementation and tetanus toxoid (TT) vaccination during pregnancy on child mortality in Bangladesh.
METHOD:
A cross-sectional study of three datasets from the Bangladesh Demographic and Health Surveys for the years 2004, 2007 and 2011 were pooled and used for the analyses. A total weighted sample of 16,721 maternal responses (5,364 for 2004; 4,872 for 2007 and 6,485 for 2011) was used. Multivariate logistic models that adjusted for cluster and sampling weights were used to examine the impact of ANC, IFA supplementation and TT vaccination during pregnancy on the death of a child aged 0-28 days (neonatal), 1-11 months (post-neonatal) and 12-59 months (child).
RESULTS:
Multivariable analyses revealed that the odds of postnatal and under-5 mortality was lower in mothers who had ANC [Odds Ratio (OR) = 0.60, 95% confidence interval (95% CI): 0.43-0.85], IFA supplementation [OR = 0.66, 95% CI: (0.45-0.98)] and ?2 TT vaccinations (OR = 0.43, 95% CI: 0.49-0.78) for post-natal mortality; and for under-5 mortality, any form of ANC (OR = 0.69, 95% CI: 0.51-0.93), IFA supplementation (OR = 0.67, 95% CI: 0.48-0.94) and ?2 TT vaccinations (OR = 0.50, 95% CI: 0.36-0.69). When combined, TT vaccination with IFA supplementation, and TT vaccination without IFA supplementation were protective across all groups.
CONCLUSION:
The study found that ANC, IFA supplementation, and TT vaccination during pregnancy reduced the likelihood of child mortality in Bangladesh. The findings suggest that considerable gains in improving child survival could be achieved through ensuring universal coverage of ANC, promoting TT vaccination during pregnancy and IFA supplementation among pregnant women in Bangladesh.

WEB: 10.1371/journal.pone.0187090
IMPACT FACTOR: 3.75
CITED HALF-LIFE: 4.40

START EDITORIAL COMMENT: Researchers used child mortality as the outcome variable for this study. Variables used in the current study were: community-level factors; socio-economic determinants; proximate determinants; usage of ANC services; location of delivery; and mode of delivery. Limitations of the study include non-validated reports from mothers, recall bias that could have led to under or over estimation of association between exposure variables and outcomes measures, and unavailable data on the cause of death data on the cause of death.

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6. Cost-effectiveness of the Haemophilus influenzae type b vaccine for infants in mainland China.
   Ning G, Yin Z, Li Y, Wang H, Yang W.
   Hum Vaccin Immunother. 2017 Oct 19:1-9.
   PubMed ID: 29049002

ABSTRACT
OBJECTIVE:
The aims of this study were to estimate the cost-effectiveness of the Haemophilus influenzae type b (Hib) vaccine for the prevention of childhood pneumonia, meningitis and other vaccine-preventable diseases in mainland China from a societal perspective and to provide information about the addition of the Hib vaccine to Chinese immunization programs.
METHODS:
A decision tree and the Markov model were used to estimate the costs and effectiveness of the Hib vaccine versus no Hib vaccine for a birth cohort of 100,000 children in 2016. The disease burden was estimated from the literature, statistical yearbooks and field surveys. Vaccine costs were calculated from government reports and the United Nations International Children's Emergency Fund (UNICEF) website. The WHO cost-effectiveness thresholds were used to evaluate the Hib vaccine intervention. A one-way sensitivity analysis and probabilistic sensitivity analysis were performed to evaluate the parameter uncertainties.
RESULTS:
Within the hypothetical cohort, under a vaccination coverage of 90%, the Hib vaccine could reduce 91.4% of Hib pneumonia and 88.3% of Hib meningitis; the Hib vaccine could also prevent 25 deaths, 24 meningitis sequelae cases and 9 hearing loss cases caused by Hib infection. From a societal perspective, the incremental cost-effectiveness ratio (ICER) of the Hib vaccine compared with no vaccination was US$ 13,640.1 at the market price, which was less than 3 times the GDP per capita of China in 2016. The ICER of the Hib vaccine was US$ -59,122.9 at the UNICEF price, indicating a cost savings. The largest portion of the uncertainty in the result was caused by the annual incidence of all-cause pneumonia, proportion of pneumonia caused by Hi, vaccine costs per dose, annual incidence of Hib meningitis and costs per episode of meningitis. The models were robust considering parameter uncertainties.
CONCLUSION:
The Hib vaccine is a cost-effective intervention among children in mainland China. The cost of Hib vaccine should be reduced, and it should be introduced into Chinese immunization programs.

WEB: 10.1080/21645515.2017.1385687
IMPACT FACTOR: 2.15
CITED HALF-LIFE: 2.30

START EDITORIAL COMMENT: Approximately 1.11 million cases of serious illness and 19,000 deaths due to *Haemophilus influenzae* type b (Hib) occurred in children under 5 years of age in China. Projected health outcomes and costs for each vaccination strategy compared with those of no vaccination are shown in Table 2. The incremental cost-effectiveness ratio (ICER) of Hib vaccination compared with no vaccination was US$ 13,640.1 at the market price. The limitations of this review include a lack of local data for some parameters, underestimation of the cost-effectiveness of the Hib vaccine, and a wide margin of sensitivity surrounding the incidence of Hib pneumonia and meningitis.

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7. Global Economic Evaluation of Oral Cholera Vaccine: A Systematic Review.
   Teoh SL, Kotirum S, Hutubessy R, Chaiyakunapruk N.
   Hum Vaccin Immunother. 2017 Nov 3:0.
   PubMed ID: 29099647

ABSTRACT
World Health Organization recommends oral cholera vaccine (OCV) to prevent and control cholera, but requires cost-effectiveness evidence. This review aimed to provide a critical appraisal and summary of global economic evaluation (EE) studies involving OCV to guide future EE study. Full EE studies, published from inception to December 2015, evaluating OCV against cholera disease were included. The included studies were appraised using WHO guide for standardization of EE of immunization programs. Out of 14 included studies, almost all (13/14) were in low- and middle-income countries. Most studies (11/14) evaluated mass vaccination program. Most of the studies (9/14) incorporated herd protective effect. The most common influential parameters were cholera incidence, OCV coverage, herd protection and OCV price. OCV vaccination is likely to be cost-effective when targeted at the population with high-risk of cholera and poor access to health care facilities when herd protection effect is incorporated and OCV price is low.

WEB: 10.1080/21645515.2017.1392422
IMPACT FACTOR: 2.15
CITED HALF-LIFE: 2.30

START EDITORIAL COMMENT: Cholera persists as a significant but often overlooked disease in many low- and- middle income countries (LMICs). In 2014, the World Health Organization reported approximately 190,549 cholera cases with 2231 deaths—55% of cases originated from Africa, 30% from Asia and 15% from Hispaniola. This review found that almost all the studies on cholera were conducted in LMICs while only one study was conducted in a high-income country (HIC). Most studies (9/14) targeted a single country. A few studies (2/14) targeted a cluster of countries, some of which were focused in Africa (6/11), and South Asia (5/11) regions with Bangladesh (4/11), India (2/11) and Mozambique (2/11) being the most frequently studied countries. Three studies (3/14) were focused on no specified country. Non-governmental organizations funded more than half of the studies (8/14), with the Bill and Melinda Gates Foundation funding 6 of these studies. Of the 5 studies which compared oral cholera vaccination (OCV) to no vaccination, four (4/5) found OCV vaccination to be either cost-saving or with positive benefit-cost ratio. Methodological limitations of this study was finding appropriate comparators, addressing uncertainty of input parameters, and incorporating impacts of the herd effect.

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8. Implementation of Rotavirus Surveillance and Vaccine Introduction - World Health Organization African Region, 2007-2016.
Mwenda JM, Burke RM, Shaba K, Mihigo R, Tevi-Benissan MC, Mumba M, et al.
MMWR Morb Mortal Wkly Rep. 2017 Nov 3;66(43):1192-1196.
PubMed ID: 29095805

ABSTRACT
Rotavirus is a leading cause of severe pediatric diarrhea globally, estimated to have caused 120,000 deaths among children aged <5 years in sub-Saharan Africa in 2013 (1). In 2009, the World Health Organization (WHO) recommended rotavirus vaccination for all infants worldwide (2). Two rotavirus vaccines are currently licensed globally: the monovalent Rotarix vaccine (RV1, GlaxoSmithKline; 2-dose series) and the pentavalent RotaTeq vaccine (RV5, Merck; 3-dose series). This report describes progress of rotavirus vaccine introduction (3), coverage (using estimates from WHO and the United Nations Children's Fund [UNICEF]) (4), and impact on pediatric diarrhea hospitalizations in the WHO African Region. By December 2016, 31 (66%) of 47 countries in the WHO African Region had introduced rotavirus vaccine, including 26 that introduced RV1 and five that introduced RV5. Among these countries, rotavirus vaccination coverage (completed series) was 77%, according to WHO/UNICEF population-weighted estimates. In 12 countries with surveillance data available before and after vaccine introduction, the proportion of pediatric diarrhea hospitalizations that were rotavirus-positive declined 33%, from 39% preintroduction to 26% following rotavirus vaccine introduction. These results support introduction of rotavirus vaccine in the remaining countries in the region and continuation of rotavirus surveillance to monitor impact.

WEB: 10.15585/mmwr.mm6643a7
IMPACT FACTOR: 7.82
CITED HALF-LIFE: NA

START EDITORIAL COMMENT: Rotavirus surveillance data were collected from hospitals participating in the African Rotavirus Surveillance Network (ARSN). Enrolled children were aged <5 years who were hospitalized for acute diarrhea. Countries were included in this analysis if their sites collected and tested at least 80 stool specimens over ≥11 months in a given year. The average percentage of tested stool specimens that were positive for rotavirus during the vaccine pre-introduction period was 41%. During the vaccine post-introduction period, the average percentage of rotavirus-positive stool specimens was 24%. In 2016, the overall percentage of positive rotavirus stool specimens was 26% in countries that had introduced the vaccine in 2015 or earlier, and 43% in countries that had not yet introduced the vaccine ($p<0.001$). The findings in this report had the following limitations: over-reporting or under-reporting of UNICEF/WHO coverage estimates; limited number of surveillance sites in each country (these might not be representative of pediatric diarrheal illness across the country and might provide an incomplete picture of impact); immunization and surveillance data quality vary among countries; not all sites have been able to conduct continuous rotavirus disease surveillance, and data were not included in these results if analysis criteria were not met; and rotavirus surveillance data are not available for all countries before introduction, limiting the ability to assess vaccine impact in countries without vaccine pre-introduction data or those that are not part of the ARSN.

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9. Understanding vaccine hesitancy in polio eradication in northern Nigeria.
Taylor S, Khan M, Muhammad A, Akpala O, van Strien M, Morry C, et al.
Vaccine. 2017 Nov 7;35(47):6438-6443.
PubMed ID: 29031691

ABSTRACT
BACKGROUND:
Vaccine hesitancy constitutes a major threat to the Global Polio Eradication Initiative (GPEI), and to further expansion of routine immunisation. Understanding hesitancy, leading in some cases to refusal, is vital to the success of GPEI. Re-emergence of circulating wild poliovirus in northern Nigeria in mid-2016, after 24months polio-free, gives urgency to this. But it is equally important to protect and sustain the global gains available through routine immunisation in a time of rising scepticism and potential rejection of specific vaccines or immunisation more generally.
METHODS AND FINDINGS:
This study is based on a purposive sampling survey of 1653 households in high- and low-performing rural, semiurban and urban areas of three high-risk states of northern Nigeria in 2013-14 (Sokoto, Kano and Bauchi). The survey sought to understand factors at household and community level associated with propensity to refuse polio vaccine. Wealth, female education and knowledge of vaccines were associated with lower propensity to refuse oral polio vaccine (OPV) among rural households. But higher risk of refusal among wealthier, more literate urban household rendered these findings ambiguous. Ethnic and religious identity did not appear to be associated with risk of OPV refusal. Risk of vaccine refusal was highly clustered among households within a small sub-group of sampled settlements. Contrary to expectations, households in these settlements reported higher levels of expectation of government as service provider, but at the same time lesser confidence in the efficacy of their relations with government.
CONCLUSIONS:
Results suggest that strategies to address the micro-political dimension of vaccination - expanding community-level engagement, strengthening the role of local government in public health, and enhancing public participation of women - should be effective in reducing non-compliance, as an important set of strategies complementary to conventional didactic/educational approaches and working through religious and traditional 'influencers'.

WEB: 10.1016/j.vaccine.2017.09.075
IMPACT FACTOR: 3.41
CITED HALF-LIFE: 5.90

START EDITORIAL COMMENT: Approval of polio vaccination reduced risk of OPV refusal across all households in the survey (OR 0.49, p = 0.001, CI 0.33–0.74). Fewer positive perceptions of vaccination raised the risk of OPV refusal (respectively, OR 4.00, p = 0.002, 95% CI 1.67–9.6 in urban and semi-urban areas; OR 3.76, p = 0.000, 95% CI 1.87–7.54 in rural areas). Negative perceptions of vaccination raised the risk of non-compliance, but more modestly (OR 1.33, p = 0.000, CI 1.23–1.43). The study demonstrates the potential value of expanding the category of determinants of vaccine behavior from the relatively heavy emphasis on cognitive factors to a wider scope of conditions, experiences and perspectives.

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10. Understanding threats to polio vaccine commitment among caregivers in high-priority areas of Afghanistan: a polling study.
SteelFisher GK[1], Blendon RJ[2], Guirguis S[3], Lodge W 2nd[4], Caporello H[4], Petit V[3], et al.
Lancet Infect Dis. 2017 Nov;17(11):1172-1179.
PubMed ID: 28818541

ABSTRACT
BACKGROUND:
Eradication of poliovirus from endemic countries relies on vaccination of children with oral polio vaccine (OPV) many times a year until the age of 5 years. We aimed to determine caregivers' commitment to OPV in districts of Afghanistan at high risk for polio transmission and to examine what knowledge, attitudes, or experiences could threaten commitment.
METHODS:
We designed and analysed a poll using face-to-face interviews among caregivers of children under 5 years of age. The sample was drawn via a stratified multistage cluster design with random route household selection. We calculated the percentage of committed and uncommitted caregivers. All percentages were weighted. We then compared percentages of uncommitted caregivers among those with varying knowledge, attitudes, and experiences, using logistic regression to control for possible demographic confounders.
FINDINGS:
Between Dec 19, 2014, and Jan 5, 2015, we interviewed 1980 caregivers, 21% of whom were "uncommitted" to accepting OPV. Multiple measures of knowledge, attitudes, and experiences are associated with lack of commitment. For example, compared with their relevant counterparts, caregivers are more likely to be uncommitted if they did not trust vaccinators "a great deal" (54% vs 9%), if they do not know that polio spreads through contaminated water (41% vs 14%), or if they believe rumours that OPV is not halal (50% vs 21%).
INTERPRETATION:
To enhance OPV commitment, it might be useful to consider a multifactorial approach that highlights building trust in vaccinators, providing facts about transmission, sharing positive messages to overcome key rumours, and strengthening community support for vaccination.

WEB: 10.1016/S1473-3099(17)30397-3
IMPACT FACTOR: 3.41
CITED HALF-LIFE: 5.90

START EDITORIAL COMMENT: Lack of commitment to accepting future OPV is associated with reporting that a child did not receive OPV in the previous campaign. Approximately 40% of families whose child did not receive OPV in the last campaign said they were uncommitted, compared with 19% of those whose child did receive OPV in the last campaign (Table 3). The study has the following limitations: the data are cross-sectional so none of the associated factors can be said to cause lack of commitment; findings might not be relevant to caregivers in low-performing districts that were inaccessible or to people who did not respond to the poll; commitment to accept OPV might differ from actual future behavior; data rely on random route sampling, which could be subject to exclusion biases or unequal selection biases.

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APPENDIX

(((((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]) ("2017/10/15"[PDAT] : "2017/11/14"[PDAT]))

* November 30, 2017, this search of English language articles published between October 15, 2017 and November 14, 2017 and indexed by the US National Library of Medicine resulted in 215 unique manuscripts.