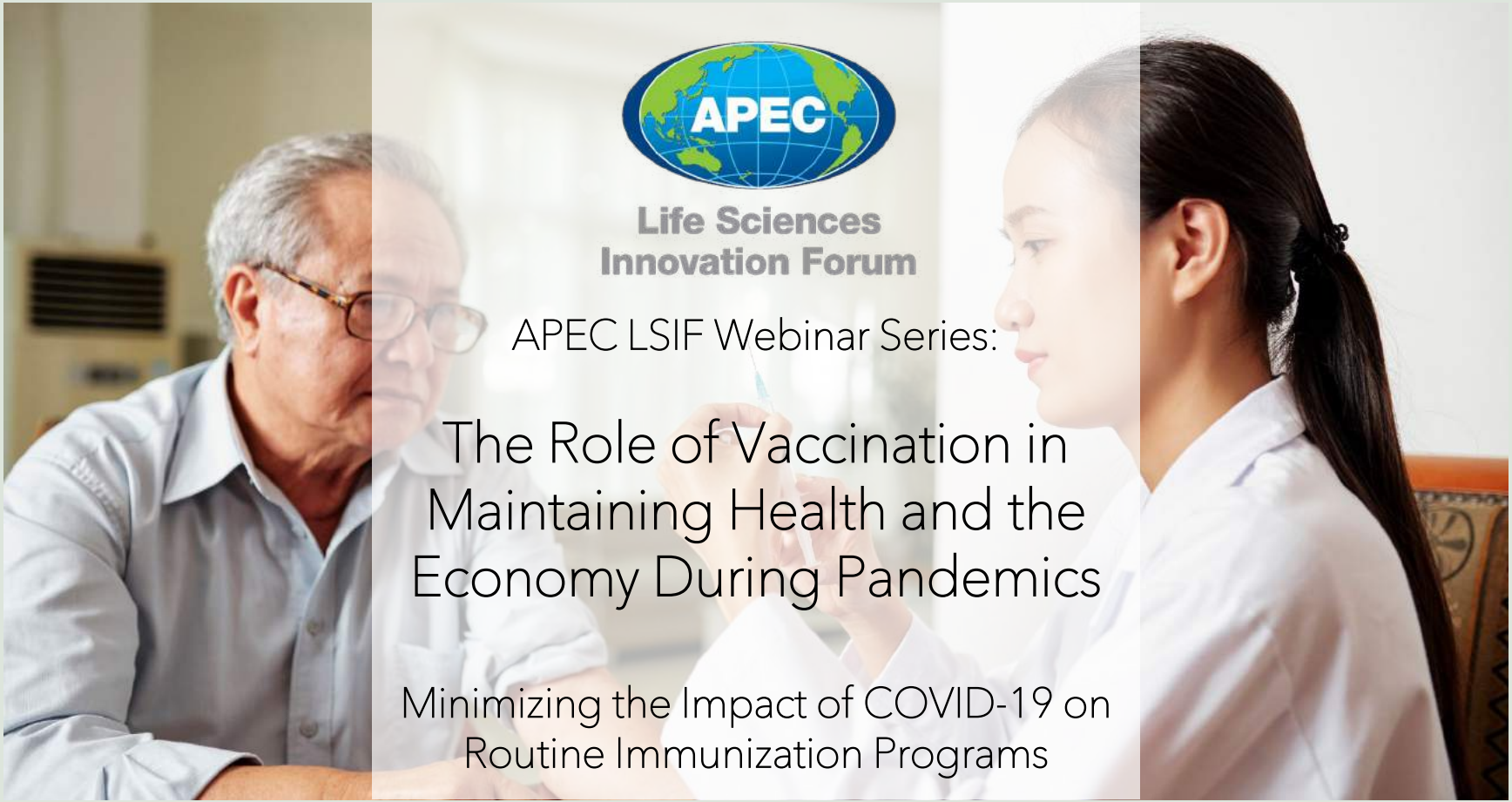
APEC
Life Sciences
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APEC LSIF Webinar Series:
The Role of Vaccination in Maintaining Health and the Economy During Pandemics
Minimizing the Impact of COVID-19 on Routine Immunization Programs

Minimizing the Impact on Routine Immunization Programs

Dr. Cuauhtémoc Ruiz Matus
Unit Chief of Comprehensive Family Immunization, Department of Family, Health Promotion and Life Course
Pan-American Health Organization (PAHO)

APEC, LIFE SCIENCES INNOVATION FORUM (LSIF
Minimizing the Impact on Routine Immunization Programs

The Immunization Program in the Context of the COVID-19 Pandemic

Cuauhtemoc Ruiz Matus
Immunization Program
15 December 2020

Disruption of the Immunization Program

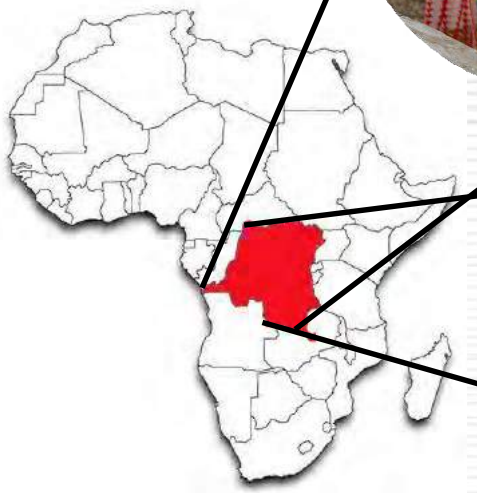
Causes

- War
- Social/political conflicts
- Natural disasters
- Epidemics

Impact

- Increased demand for health services
- Increase in morbidity and mortality from VPD

DRC: Measles Outbreak outstrips Ebola Deaths



3453
Total cases

2264
Total deaths

Ebola Outbreak

>310,000
Total cases

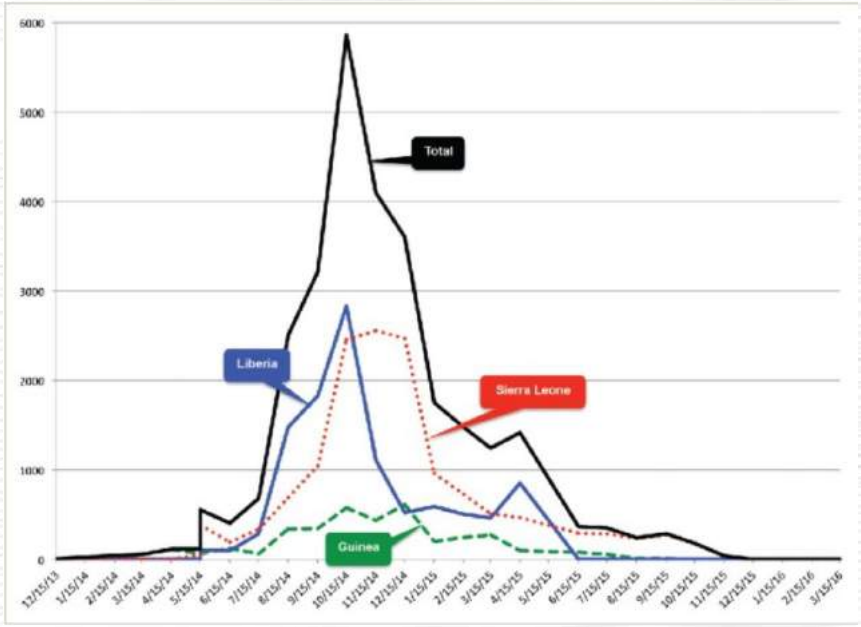
>6,000
Total deaths

Measles Outbreak

World Health Organization

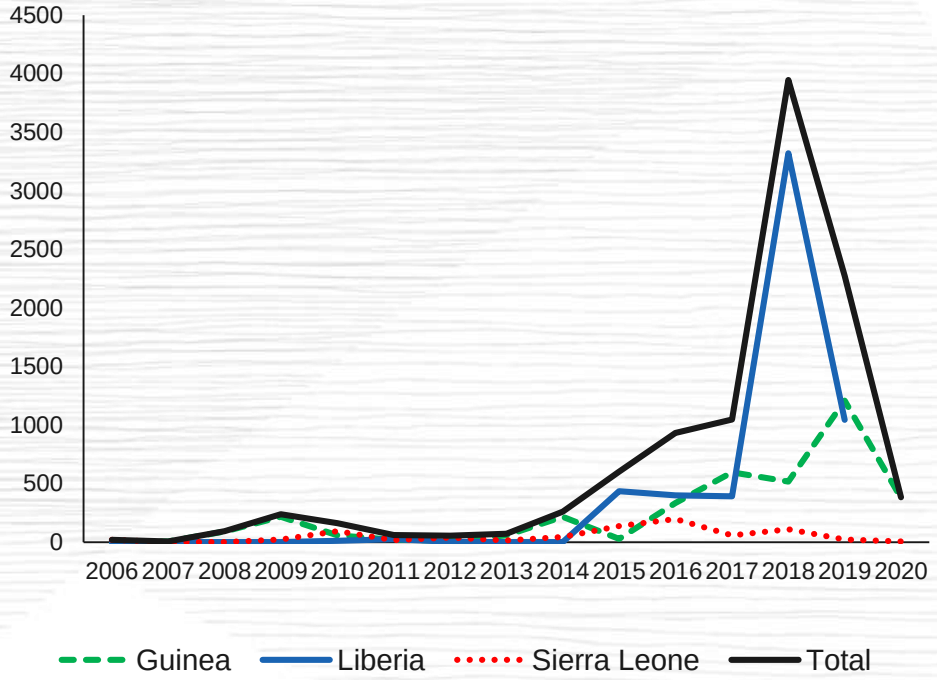
Measles cases after Ebola epidemic: Guinea, Liberia, Sierra Leone

Epidemic curve of Ebola virus disease cases: Guinea, Liberia, Sierra Leone, and 3-nation total by month, December 2013-March 2016.



Source: Shultz, J. M., Espinel, Z., Espinola, M., & Rechkemmer, A. (2016). Distinguishing epidemiological features of the 2013–2016 West Africa Ebola virus disease outbreak. *Disaster health*, *3*(3), 78-88.

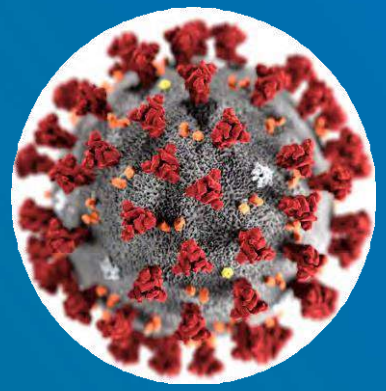
Measles Confirmed Cases. Guinea, Liberia, Sierra Leone. 2006-2020



Source: WHO UNICEF JRF

Immunization is an Essential Health Service

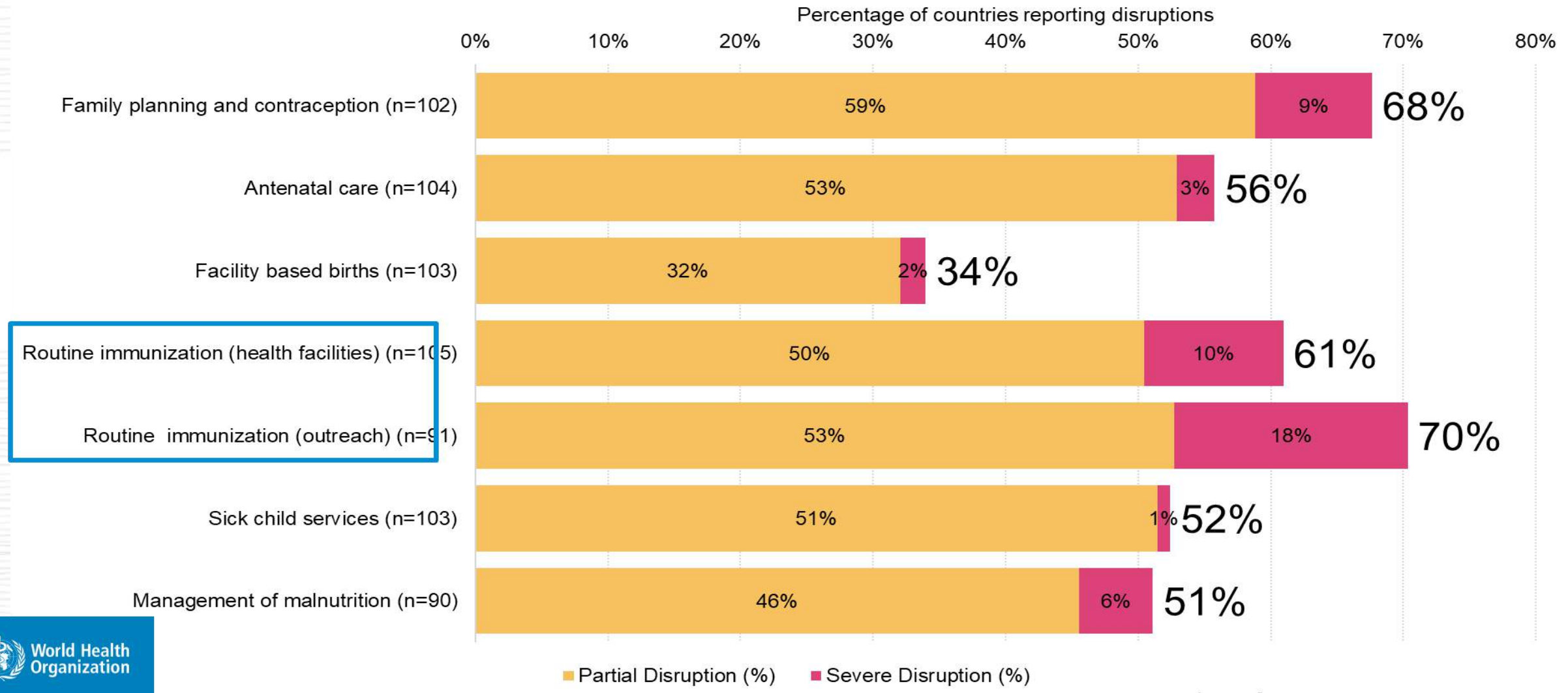
26 March 2020



- “Immunization is a core health service that should be prioritized for the prevention of communicable diseases and safeguarded for continuity during the COVID-19 pandemic……”

Source: WHO UNICEF JRF

Immunization outreach hard hit among essential RMNCH services in first months of COVID-19



Source: EHS key informant survey – May-June 2020

World Health Organization

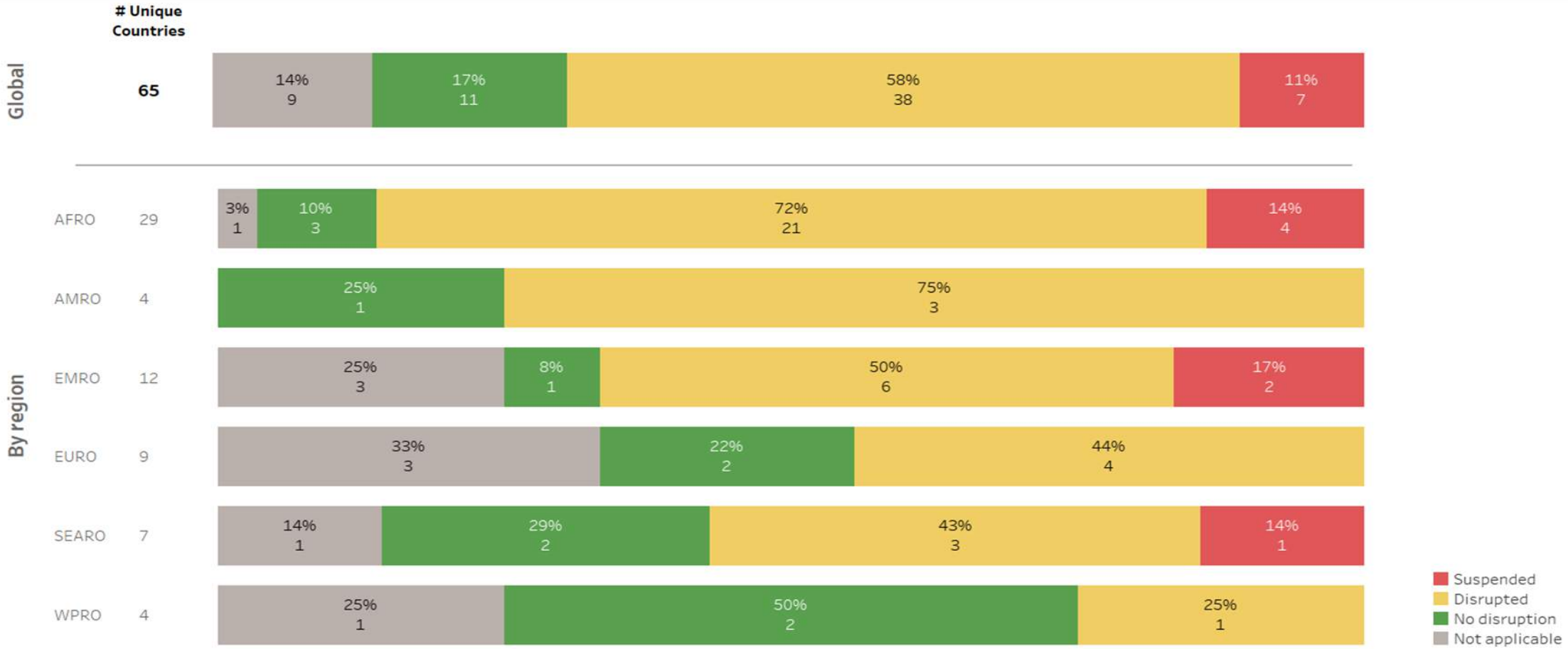
PAHO Pan American Health Organization World Health Organization Americas

Based on single calculated status per country
National respondents only

Outreach Disruption: Global

Reported level of disruption to outreach vaccination activities in May 2020 as a result of COVID-19

Percentage of countries reporting a given level of disruption. Includes national level respondents only, once 'Other' and 'Do not know' responses have been excluded.



Source: Immunization Pulse Poll 2, Question 5. Displayed percentages are of the calculated single status for disruption level in a country based on the majority response from that country

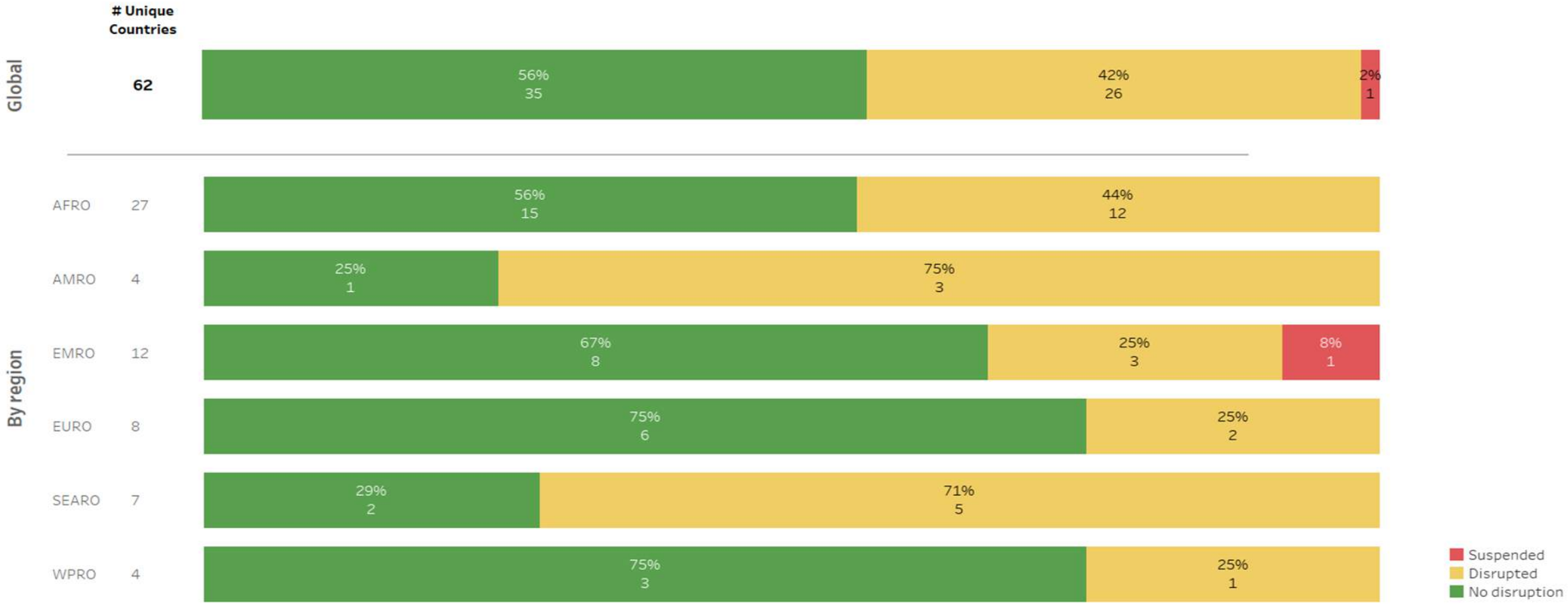
The data collected are subject to limitations inherent to voluntary self-reporting, self-selection bias, not all countries responded, countries with only one response vis-à-vis countries with many, possibility of fraudulent responses and not having a sampling frame to make inferences. Furthermore, the information about each country does not represent official reporting from Member States to WHO or UNICEF. Thus, the results presented here need to be interpreted with caution and do not represent in any way a WHO or UNICEF position regarding any country or territory for which one or more replies were received.

Based on single calculated status per country
National respondents only

Fixed Post Disruption: Global

Reported level of disruption to fixed post vaccination activities in May 2020 as a result of COVID-19

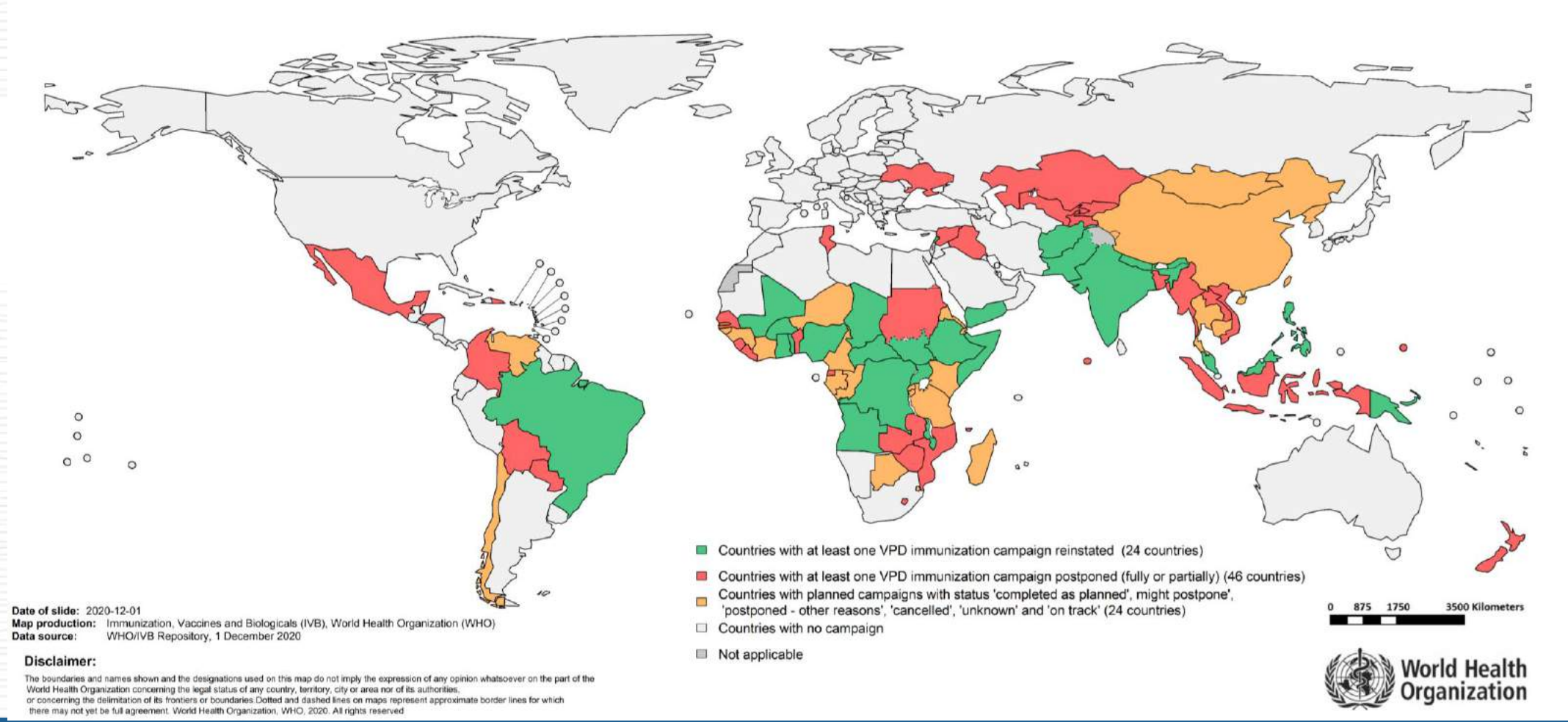
Percentage of countries reporting a given level of disruption. Includes national level respondents only, once 'Other' and 'Do not know' responses have been excluded.



Source: Immunization Pulse Poll 2, Question 7. Displayed percentages are of the calculated single status for disruption level in a country based on the majority response from that country

The data collected are subject to limitations inherent to voluntary self-reporting, self-selection bias, not all countries responded, countries with only one response vis-à-vis countries with many, possibility of fraudulent responses and not having a sampling frame to make inferences. Furthermore, the information about each country does not represent official reporting from Member States to WHO or UNICEF. Thus, the results presented here need to be interpreted with caution and do not represent in any way a WHO or UNICEF position regarding any country or territory for which one or more replies were received.

VPD campaigns postponed due to COVID-19: 46 countries with at least one VPD campaign postponed, 1 December 2020



VPD campaigns postponed due to COVID-19: 64 campaigns in 46 countries, 1 December 2020*

No. of countries with campaigns in 2020 that have been postponed because of COVID-19 *counting from March 2020 - current as of 2020-12-01

Diseases/ Vaccines	No. of countries with postponed campaigns (fully or partially)	No. of campaigns postponed (fully or partially)	No. of campaigns postponed by regions					
			AFR	AMR	EMR	EUR	SEAR	WPR
Measles/ Measles Rubella/ Measles Mumps Rubella (M/MR/MMR)	24	25	4	7	1	5	3	5
Polio (IPV)	8	8	7					1
Bivalent Oral Poliovirus (bOPV)	8	8	2		3		2	1
Monovalent Oral Poliovirus Type2 (mOPV2)	3	4	4					
Meningitis A (Men A)	2	2	2					
Yellow Fever (YF)	3	4	2	2				
Typhoid (TCV)	3	4	2		2			
Cholera (OCV)	4	5	2		1		2	
Tetanus (Td)	3	4	1		1			2
Total postponed	**46***	**64**	**26**	**9**	**8**	**5**	**7**	**9**

Total no. of countries with at least one VPD immunization campaign postponed (fully or partially)

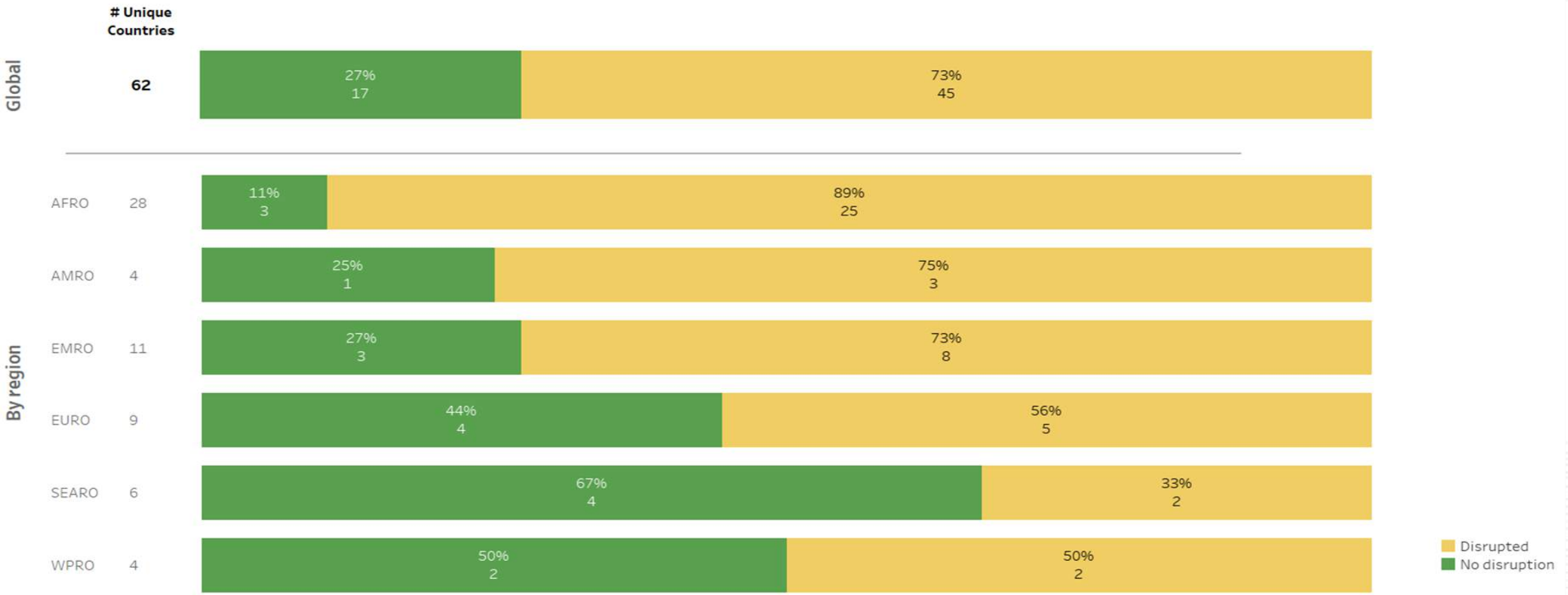
Data source: WHO/IVB Repository, as of 1 December 2020

Based on single calculated status per country
National respondents only

Demand Disruption: Global

Reported level of disruption to demand for vaccination services in May 2020 as a result of COVID-19

Percentage of countries reporting a given level of disruption. Includes national level respondents only, once 'Other' and 'Do not know' responses have been excluded.



Source: Immunization Pulse Poll 2, Question 10. Displayed percentages are of the calculated single status for disruption level in a country based on the majority response from that country

The data collected are subject to limitations inherent to voluntary self-reporting, self-selection bias, not all countries responded, countries with only one response vis-à-vis countries with many, possibility of fraudulent responses and not having a sampling frame to make inferences. Furthermore, the information about each country does not represent official reporting from Member States to WHO or UNICEF. Thus, the results presented here need to be interpreted with caution and do not represent in any way a WHO or UNICEF position regarding any country or territory for which one or more replies were received.

Impact of Covid-19 on routine immunization: Summary of demand-related issues

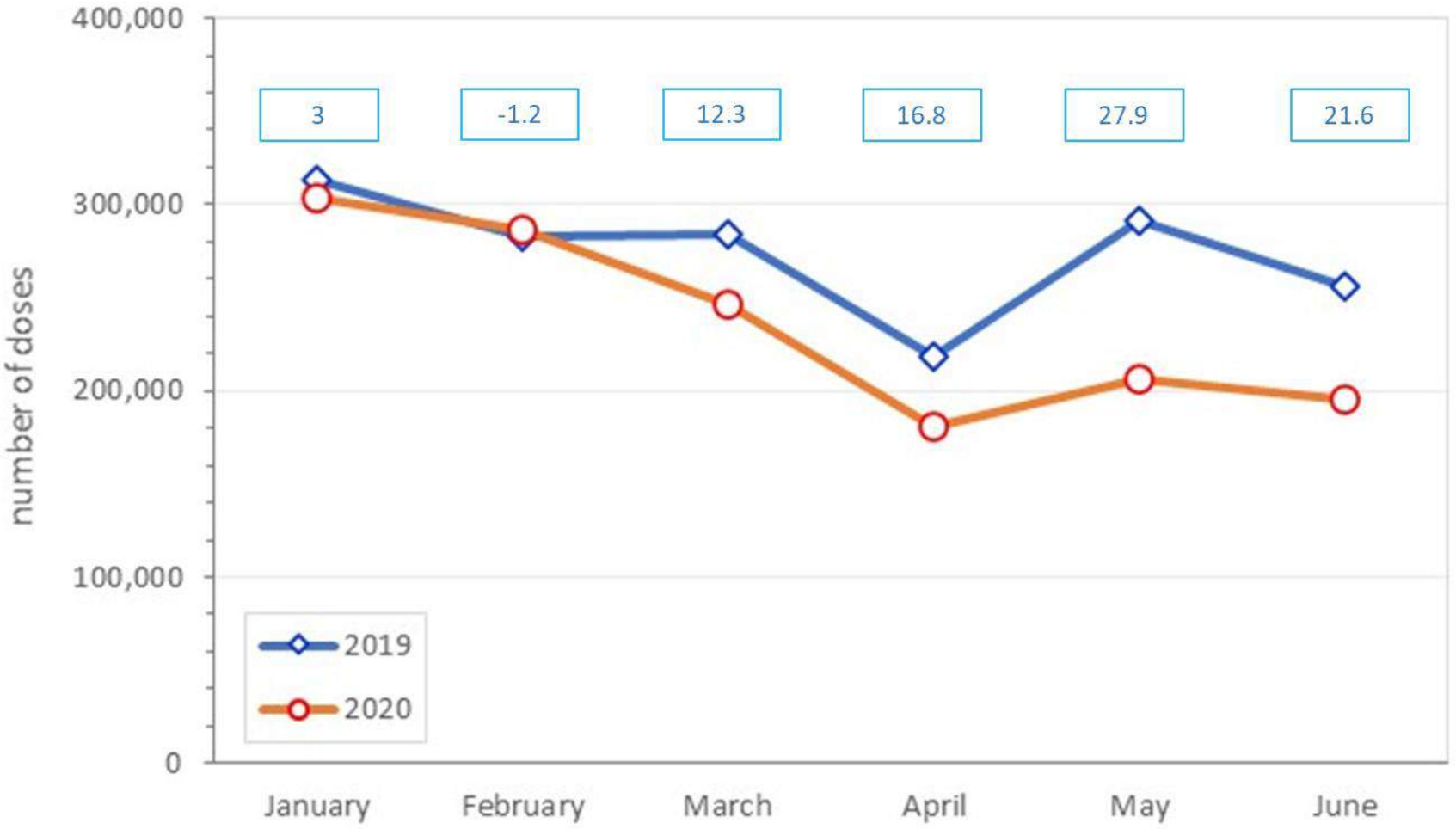
- Concerns about exposure to **COVID**
- Concerns about lockdowns, distancing policies, e.g. safety of public transport
- Lack of **awareness** of **continuity** of **vaccination services**
- Fears/concerns related to **misinformation, rumours, conspiracies**…

- Staff lacking motivation
- Safety fears/concerns related to **COVID**
- Fears/ concerns related to response / lockdowns

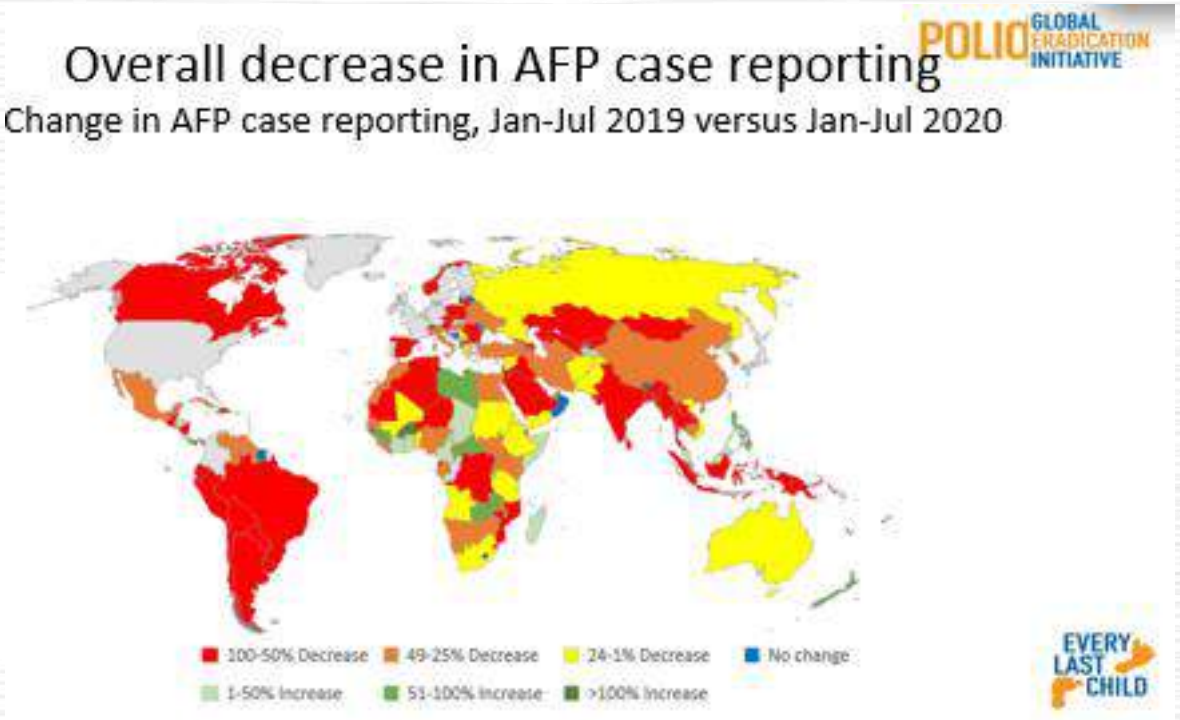
- Lack of PPE, training in IPC
- Lack of vaccines
- Lack of capacity
- Vaccination suspended due to response

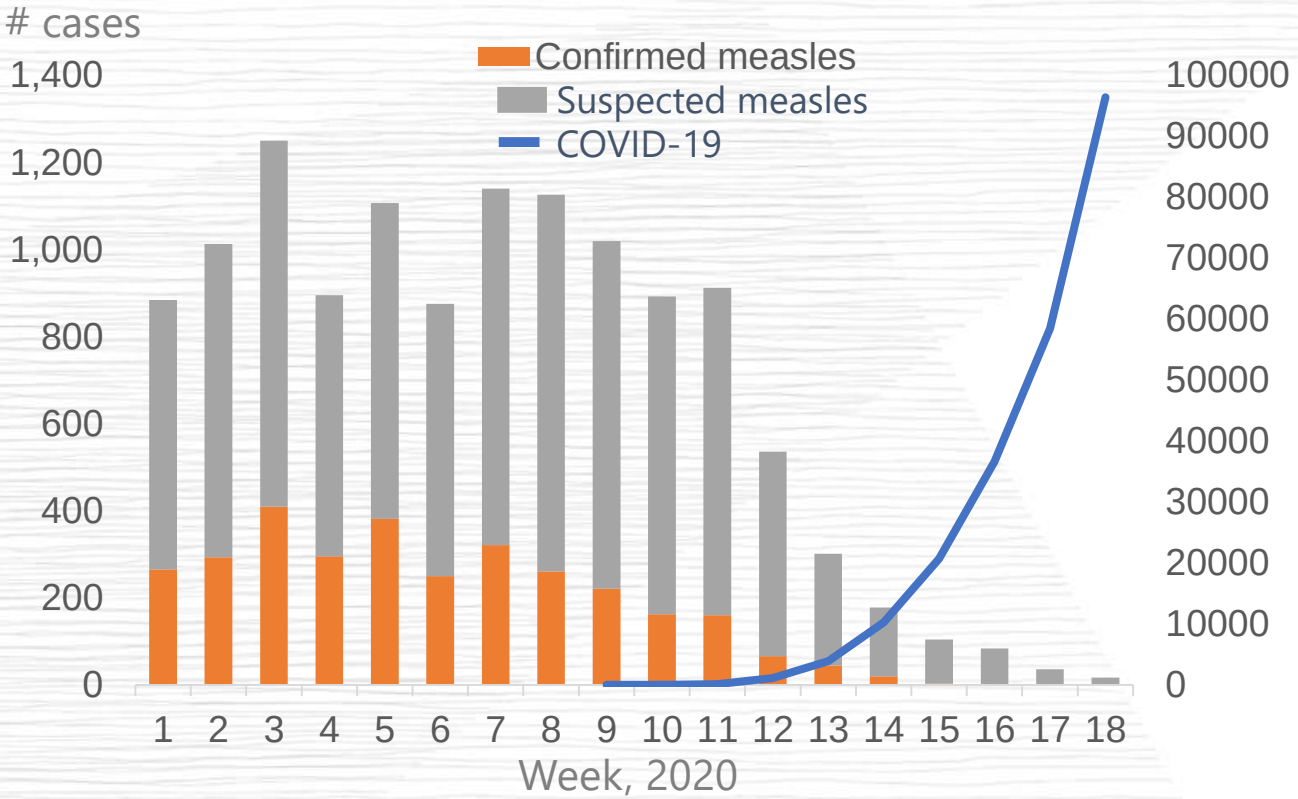
Sources: Immunization training needs assessment (April 20), Immunization Pulse Poll in the context of COVID-19 (April 14-24), BMGF COVID-19 response related to immunization (Updated April 28, 2020), EMPOL Operational overview (Week 17, 2020). Immunization Pulse Poll, June 2020.

MMR applied doses and difference January - June 2019-2020



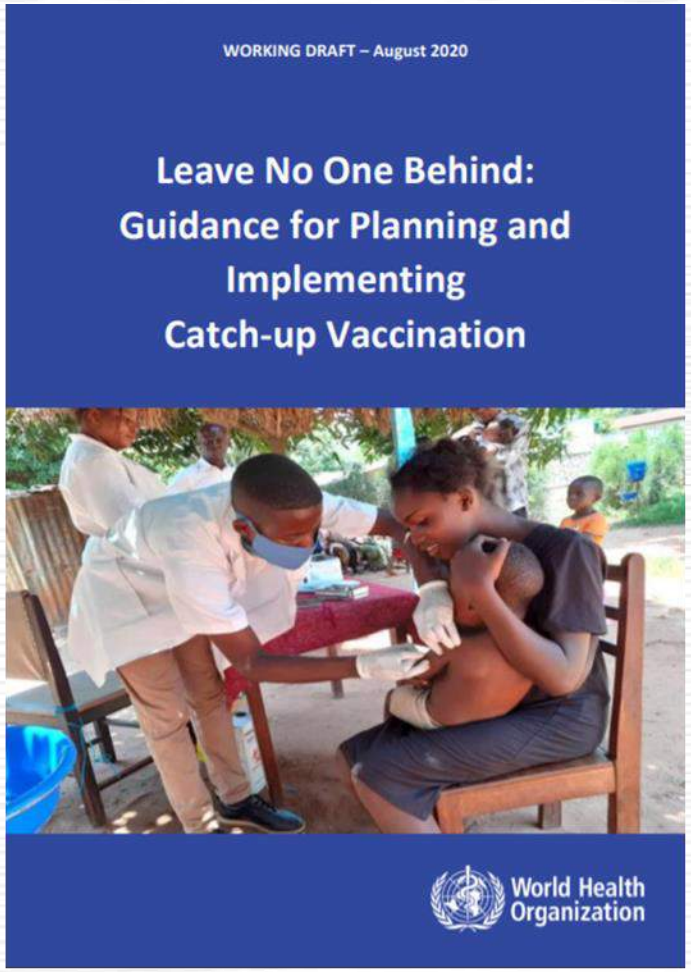
Data reported by 25 Member States to PAHO, 30 August 2020

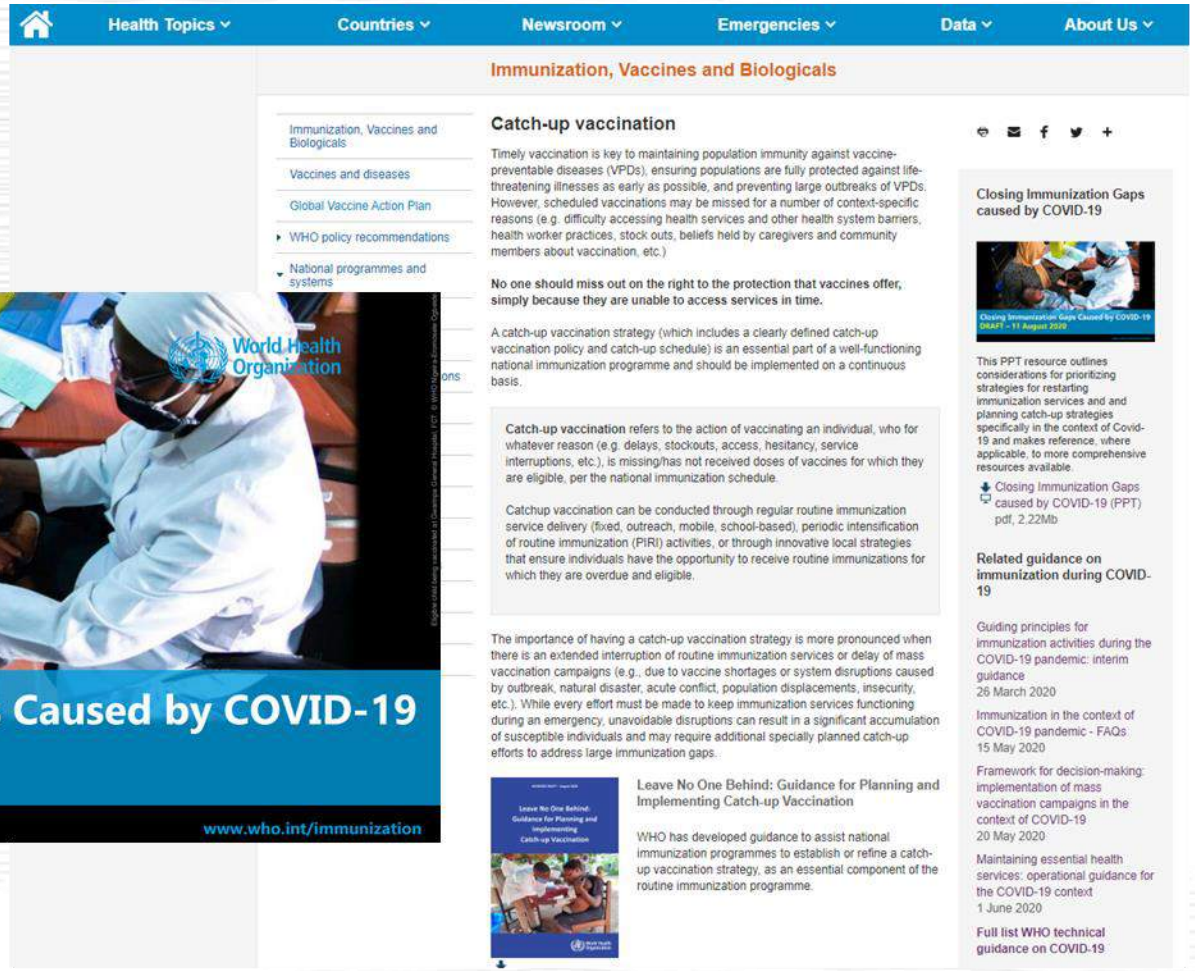




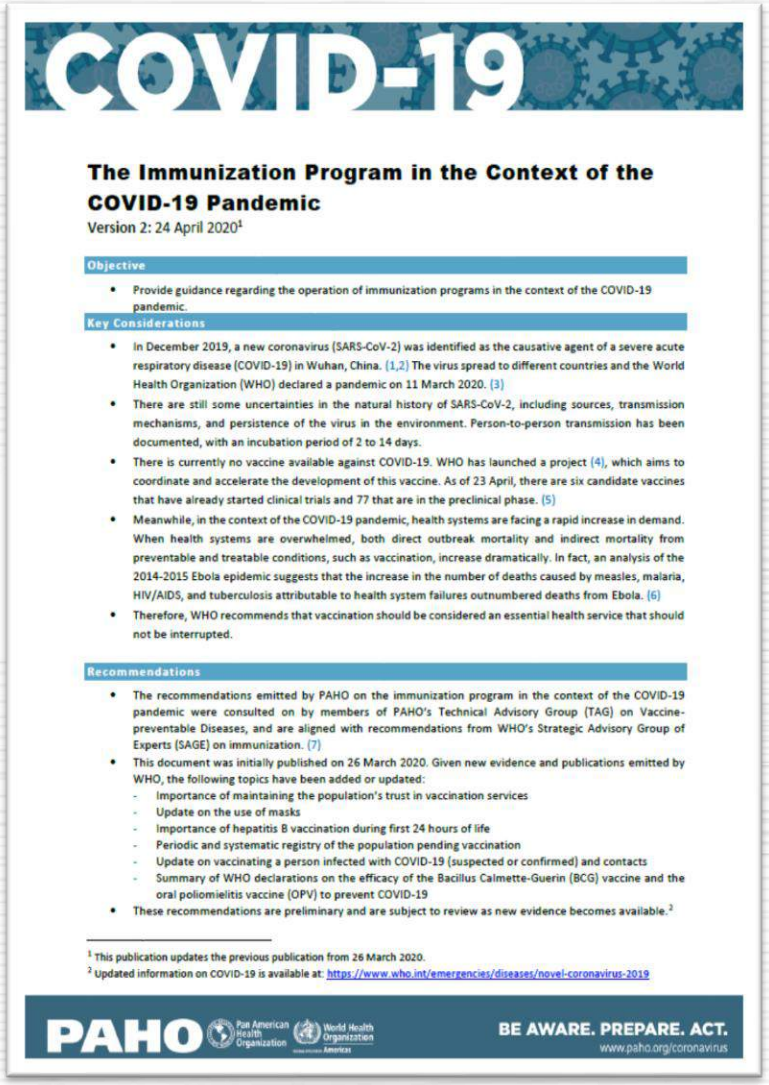
- **Impact on polio surveillance sensitivity**
- **All VPDs d**ecreased field surveillance
- **Global VPD laboratory networks providing critical support for COVID-19 testing, disrupting other surveillance activities**

WHO guidance for planning and implementing catch-up vaccination





www.who.int/immunization/programmes_systems/policies_strategies/catch-up_vaccination/en/



COVID-19

The Immunization Program in the Context of the COVID-19 Pandemic

Version 2: 24 April 2020[1]

Objective

- Provide guidance regarding the operation of immunization programs in the context of the COVID-19 pandemic.

Key Considerations

- In December 2019, a new coronavirus (SARS-CoV-2) was identified as the causative agent of a severe acute respiratory disease (COVID-19) in Wuhan, China. (1,2) The virus spread to different countries and the World Health Organization (WHO) declared a pandemic on 11 March 2020. (3)
- There are still some uncertainties in the natural history of SARS-CoV-2, including sources, transmission mechanisms, and persistence of the virus in the environment. Person-to-person transmission has been documented, with an incubation period of 2 to 14 days.
- There is currently no vaccine available against COVID-19. WHO has launched a project (4), which aims to coordinate and accelerate the development of this vaccine. As of 23 April, there are six candidate vaccines that have already started clinical trials and 77 that are in the preclinical phase. (5)
- Meanwhile, in the context of the COVID-19 pandemic, health systems are facing a rapid increase in demand. When health systems are overwhelmed, both direct outbreak mortality and indirect mortality from preventable and treatable conditions, such as vaccination, increase dramatically. In fact, an analysis of the 2014-2015 Ebola epidemic suggests that the increase in the number of deaths caused by measles, malaria, HIV/AIDS, and tuberculosis attributable to health system failures outnumbered deaths from Ebola. (6)
- Therefore, WHO recommends that vaccination should be considered an essential health service that should not be interrupted.

Recommendations

- The recommendations emitted by PAHO on the immunization program in the context of the COVID-19 pandemic were consulted on by members of PAHO's Technical Advisory Group (TAG) on Vaccine-preventable Diseases, and are aligned with recommendations from WHO's Strategic Advisory Group of Experts (SAGE) on immunization. (7)
- This document was initially published on 26 March 2020. Given new evidence and publications emitted by WHO, the following topics have been added or updated:
  - Importance of maintaining the population's trust in vaccination services
  - Update on the use of masks
  - Importance of hepatitis B vaccination during first 24 hours of life
  - Periodic and systematic registry of the population pending vaccination
  - Update on vaccinating a person infected with COVID-19 (suspected or confirmed) and contacts
  - Summary of WHO declarations on the efficacy of the Bacillus Calmette-Guerin (BCG) vaccine and the oral poliomielitis vaccine (OPV) to prevent COVID-19
- These recommendations are preliminary and are subject to review as new evidence becomes available.[2]

[1] This publication updates the previous publication from 26 March 2020.
[2] Updated information on COVID-19 is available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019

PAHO Pan American Health Organization World Health Organization Americas — BE AWARE. PREPARE. ACT. www.paho.org/coronavirus

Objective

Provide guidance regarding the operation of immunization programs in the context of the COVID-19 pandemic*

Recommendations by consensus:

- TAG for vaccine preventable diseases of PAHO
- CLAP
- PHE

In alignment with:

- SAGE
- WHO

*** Interim guidance: As the COVID-19 pandemic evolves, these documents will be revised, as necessary.**

Available on: https://www.paho.org/en/topics/coronavirus-infections/coronavirus-disease-covid-19/covid-19-health-topics
https://www.paho.org/en/topics/immunization

Utilized Strategies

Photos courtesy of Facebook: EPI-BENI

Institutional vaccination

Photos courtesy of Facebook: EPI-BENI

Vaccination in the community

Vaccination in strategic places, like pharmacies, stadiums, day care centers, cultural centers, banks, schools, work areas, grocery stores

Vaccination according to sex and ID number

Adaptation of vaccination centers and vaccination complying with security measures

Follow-up on vaccination and calling on absentees

Integration with other health and government programs

Health worker referrals

Work with community leaders

Use of social media

Changes in opening hours

Ex: Ministry of Health, Brazil

Vaccination in cars

Vaccination at home

Results from the Sixth Survey on the NIP Situation in the Region of the Americas, IM/PAHO Focal Points, August 2020

COVID-19

Vaccination of Newborns in the Context of the COVID-19 Pandemic

Version 1: 19 May 2020
Preliminary recommendations subject to revision as new evidence becomes available

Objective

- Provide guidance regarding vaccination of newborns with hepatitis B and BCG vaccines in the context of the COVID-19 pandemic, in order to maintain high vaccination coverage.

Key Considerations

- The COVID-19 pandemic is having a significant economic, social and health impact on the population, as well as placing a burden on health services. Based on currently available information, older adults and people of any age who have underlying medical conditions might be at higher risk for severe illness from COVID-19.
- Only few cases of COVID-19 have been reported among newborns. Currently, there is no evidence of vertical transmission of SARS-CoV-2 from infected pregnant women to their fetuses (1,2) and the virus has not been found in samples of breastmilk (2). However, screening studies of pregnant women who gave birth in two hospitals during the peak of the epidemic in New York City (United States), showed that between 15%-20% were

COVID-19

Immunization throughout the Life Course at the Primary Care Level in the Context of the COVID-19 Pandemic

Version 1: 21 May 2020

Objective

Provide recommendations regarding vaccination as an essential service at the primary care level in the context of the COVID-19 pandemic.

Key Considerations

- As a follow-up to the technical note on adapting the primary care level in the context of the COVID-19 pandemic *(1)* from 23 April on interventions, modalities and areas, which seeks to ensure the continuity of essential services like immunization, these practical guidelines have been developed for the primary care level, taking into account PAHO/WHO immunization technical documents in the context of the pandemic *(2)* and the framework of immunization through the life course, which offers vaccines for different population groups including children, adolescents, women, adults and older adults.
- Immunization activities that are offered to the population throughout the life course are detailed, taking into account the different transmission scenarios of COVID-19 as defined by the WHO *(3)*, and which may require adaptations and different approaches in the context of each country, to maintain immunization as an essential service in a safe way for health personnel and the community.
- Its implementation by primary care personnel implies considering recommendations on the provision, availability, and proper use of personal protective equipment (PPE), hygiene control measures, and the availability of devices, cold chain and logistics always required.
- These guidelines are aimed at primary care teams, those responsible for immunization programs at the national and sub-national levels, and managers of first-level care facilities.

COVID-19

Frequently Asked Questions (FAQs) about COVID-19 Candidate Vaccines and Access Mechanisms

Version 2[1]: 27 August 2020
Document subject to revision as new evidence and information become available

Progress in the Development of COVID-19 Vaccines

1. **Is there a vaccine against COVID-19?**
   At this moment, there are no SARS-CoV-2 vaccines licensed by the World Health Organization (WHO), the virus causing the COVID-19 pandemic. As of 25 August 2020, there are 31 candidate vaccines in clinical evaluation in humans and 142 candidate vaccines in the preclinical phase. The landscape of COVID-19 vaccines is updated on a regular basis by WHO at the following link: https://www.who.int/publications/m/item/draft-landscape-of-covid-19-candidate-vaccines

2. **Will all the COVID-19 candidate vaccines be successful?**
   Only a portion of candidate vaccines will be successful. A study about vaccines targeting human infectious diseases showed that candidate vaccines in preclinical evaluation have an estimated marked entry probability of 7%, and once they have entered clinical evaluation of 17%.[2] In coming years, it is likely that COVID-19 vaccines will gradually become available.

3. **What are the different phases a vaccine must go through to be approved?**
   The evaluation of a vaccine candidate undergoes different phases (preclinical and clinical) until a vaccine receives regulatory approval[3]. The objective of this entire process is to ensure

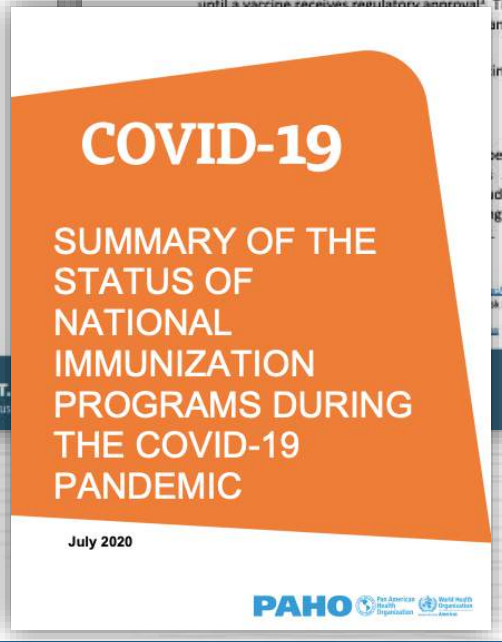
...nswer other questions like dose number and

...ine safety and its ability to produce an immune

...er of humans – usually under 100 adults – to ... ability to generate an immune response ...de studies to determine the number of doses ...g the vaccine. If the vaccine proves to be safe

...k in vaccine research and development quantified. PLoS One.

BE AWARE. PREPARE. ACT.
www.paho.org/coronavirus



Minimizing the Impact on Routine Immunization Programs

Dr. Kaja Abbas
Assistant Professor of Disease Modelling
London School of Hygiene & Tropical Medicine

Benefit-risk analysis of childhood immunisation during the COVID-19 pandemic

Kaja Abbas
Assistant Professor of Disease Modelling
London School of Hygiene & Tropical Medicine

Kaja Abbas, Simon Procter, Kevin van Zandvoort, Andrew Clark, Sebastian Funk, Tewodaj Mengistu, Dan Hogan, Emily Dansereau, Mark Jit, Stefan Flasche, LSHTM CMMID Covid-19 Working Group. **Routine childhood immunisation during the COVID-19 pandemic in Africa: a benefit–risk analysis of health benefits versus excess risk of SARS-CoV-2 infection**. The Lancet Global Health, 8 (10), e1264-e1272, 2020.
DOI: 10.1016/S2214-109X(20)30308-9

LONDON SCHOOL of HYGIENE &TROPICAL MEDICINE

Gavi The Vaccine Alliance

BILL & MELINDA GATES foundation

Background

- March 2020
  - National immunisation programmes globally are at risk of suspension due to the severe health system constraints and physical distancing measures in place to mitigate the ongoing COVID-19 pandemic.

- April and June 2020
  - Pulse polls conducted by WHO, UNICEF, Gavi and partners
    - Respondents from 82 countries
      - Widespread disruption to routine immunisation services
      - Suspension of mass vaccination campaigns

Aim

- To compare the health benefits of sustaining routine childhood immunisation in Africa against the risk of acquiring SARS-CoV-2 infections through visiting routine vaccination service delivery points.

- What if routine childhood immunisation in Africa was suspended for 6 months during the Covid-19 pandemic?

Benefits of sustained routine childhood immunisation

- Included vaccines
  - 6, 10 and 14 weeks of age for diphtheria, tetanus and pertussis (DTP), hepatitis B (HepB), *Haemophilus influenzae* type b (Hib), *Streptococcus pneumoniae*, rotavirus
  - 9 months for measles (MCV1), rubella (RCV1), *Neisseria meningitidis* serogroup A (MenA), yellow fever (YFV)
  - 15-18 months for the second dose of measles (MCV2)
- Excluded vaccines
  - Bacillus Calmette–Guérin (BCG)
  - Hepatitis B (HepB)
  - Polio
- Health benefits
  - from immunisation among the vaccinated children until five years of age

VACCINE IMPACT MODELLING CONSORTIUM

Excess risk of Covid-19 disease from sustained routine childhood immunisation

- SARS-CoV-2 exposure risk for the vaccinated child, their parents/adult carers, and household members as a result of contact with the vaccinator and other community members during travel to the vaccine clinic

- probability of SARS-CoV-2 infection during vaccination visit =
  - 1 - (1 - transmission probability per contact) number of contacts

Clinic | Community

$$P = 1 - (1 - p_v t_v)^{2\nu} (1 - p_o t_o)^{2\nu n}$$

Excess SARS-CoV-2 infections

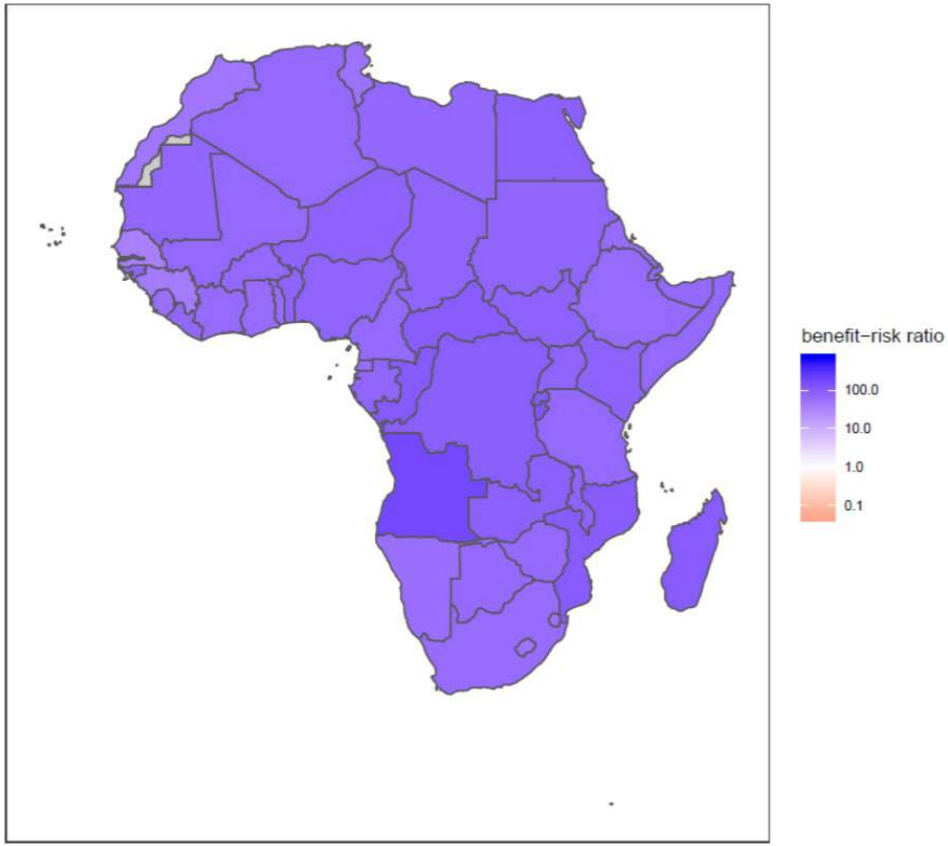
$$P_E = P\,(1 - \Theta)$$

Benefit-risk ratio

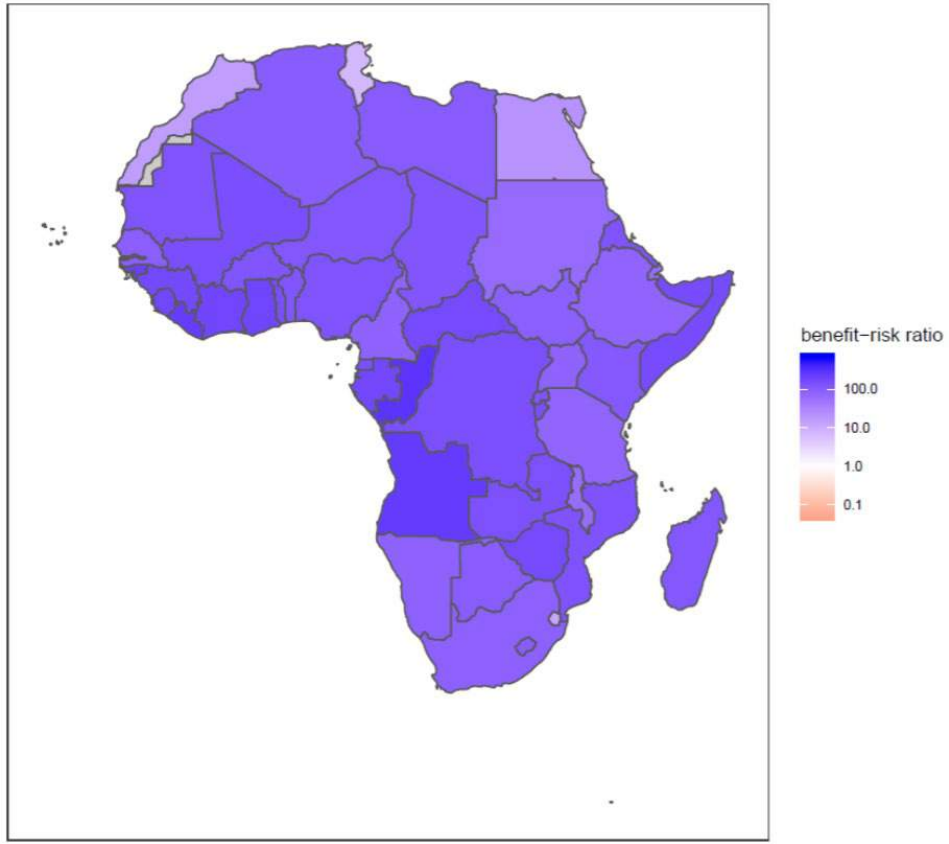
- Benefit-risk ratio
  - vaccine-preventable deaths averted by sustaining routine childhood immunisation in comparison to excess Covid-19 deaths from SARS-CoV-2 infections acquired by visiting routine vaccination service delivery points

- A benefit-risk ratio larger than 1 indicates in favour of sustaining the routine childhood immunisation programme during the Covid-19 pandemic.

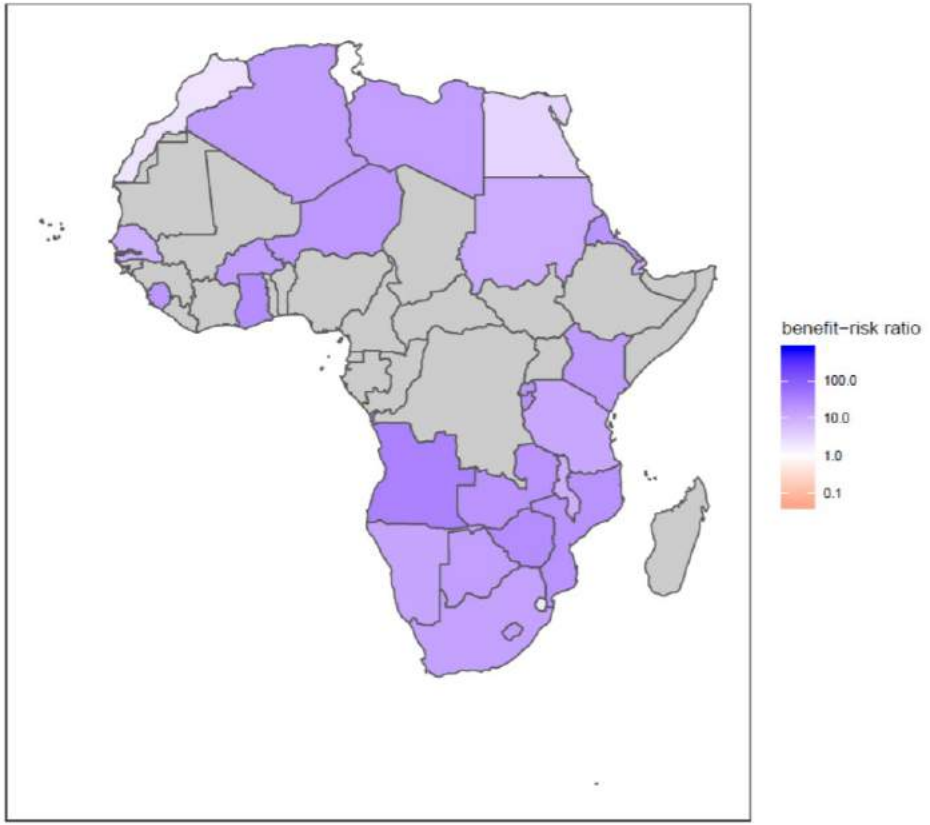
- Benefit-risk ratio of vaccines delivered in the 1st, 2nd & 3rd vaccination-related clinical visits
  - 3-dose DTP3, HepB3, Hib3, PCV3; 2-dose RotaC
    - children at 6, 10, 14 weeks of age
  - 82 (14 - 261) Household
  - 84,000 (5,000 - 543,000) Vaccinated children



- Benefit-risk ratio of vaccines delivered in the 4th vaccination-related clinical visit
  - 1-dose MCV1, RCV1, MenA, YFV
    - children at 9 months of age
  - 116 (18 - 374) Household
  - 117,000 (6,400 - 759,000) Vaccinated children



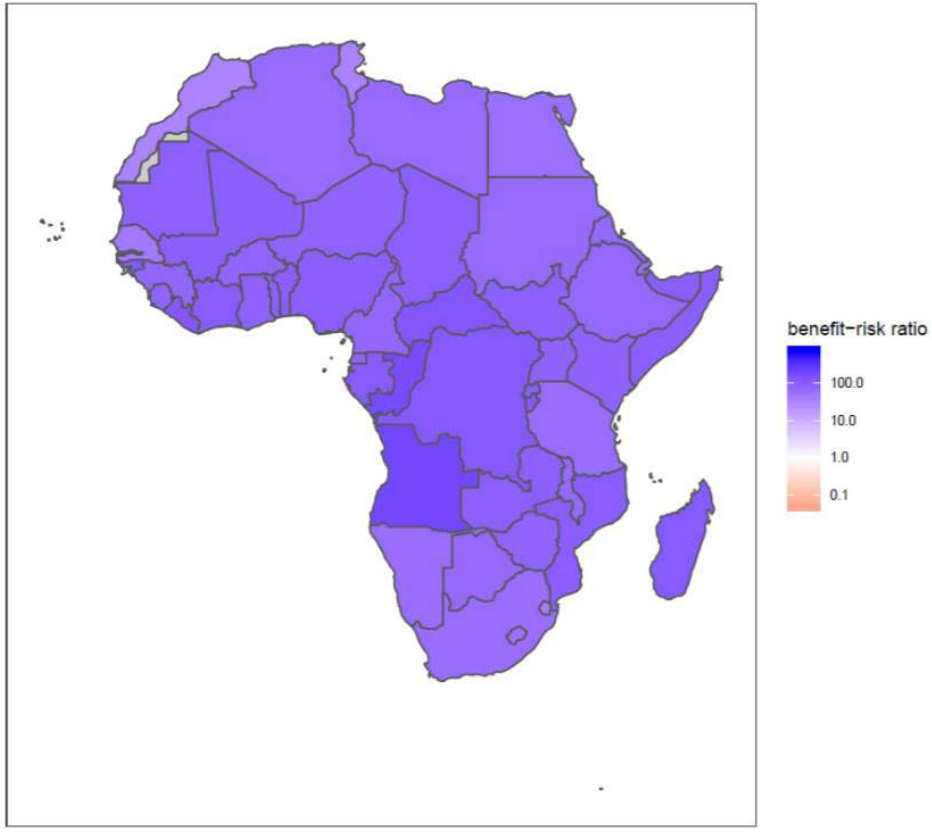
- Benefit-risk ratio of vaccines delivered in the 5th vaccination-related clinical visits
  - MCV2
    - children at 15-18 months of age
  - 14 (2 - 45) Household
  - 13,600 (708 - 88,000) Vaccinated children



- Benefit-risk ratio of vaccines delivered in the 1st, 2nd, 3rd, 4th & 5th vaccination-related clinical visits
  - 3-dose DTP3, HepB3, Hib3, PCV3; 2-dose RotaC
    - children at 6, 10, 14 weeks of age
  - 1-dose MCV1, RCV1, MenA, YFV
    - children at 9 months of age
  - MCV2
    - children at 15-18 months of age

- 84 (14 - 267) Household

- 85,000 (4,900 - 546,000) Vaccinated children

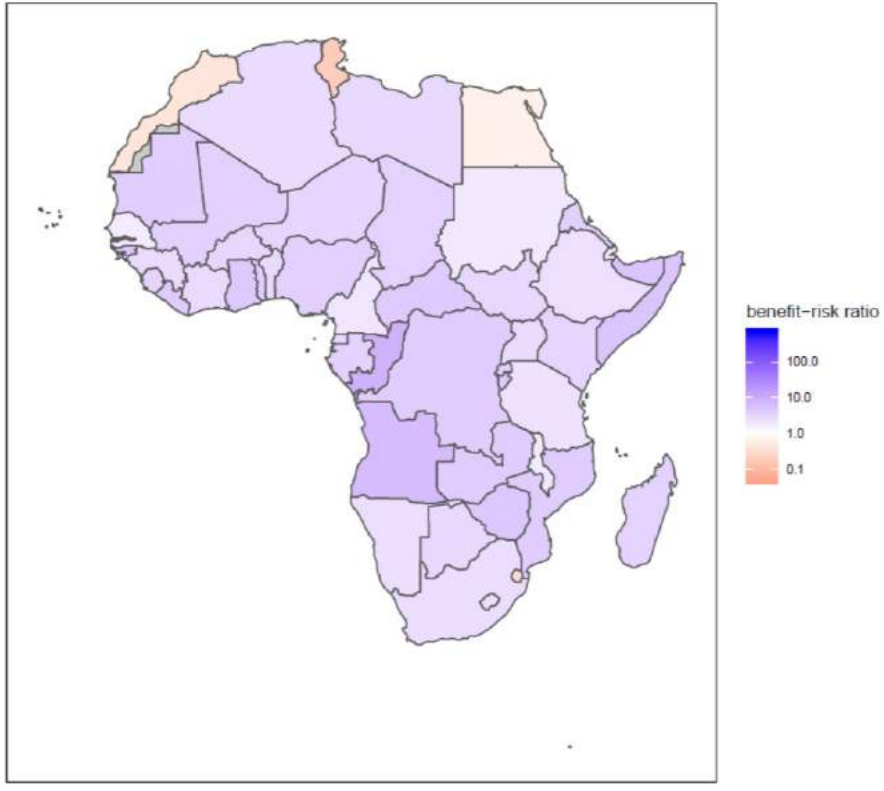


Conservative scenario of measles-only outbreak

- Benefit-risk ratio of vaccines delivered in the 1st, 2nd, 3rd, 4th & 5th vaccination-related clinical visits
  - ~~3-dose DTP3, HepB3, Hib3, PCV3; 2-dose RotaC~~
    - children at 6, 10, 14 weeks of age
  - 1-dose MCV1, ~~RCV1, MenA, YFV~~
    - children at 9 months of age
  - MCV2
    - children at 15-18 months of age

- 3 (0.5 - 10) Household

- 3,000 (182 - 21,000) Vaccinated children



Other factors influencing strategic decision making

- logistical constraints of vaccine supply chain problems caused by the Covid-19 pandemic
- reallocation of immunisation providers to Covid-19 and other prioritised health services
- healthcare staff shortages caused by SARS-CoV-2 infections among the staff
- infection risk to healthcare staff providing immunisation services and onward transmission to their households and into the wider community
- decreased demand for vaccination arising from community reluctance to visit vaccination clinics for fear of contracting SARS-CoV-2 infections

Opportunity risk

- Opportunity risk of SARS-CoV-2 infection for the healthcare staff
  - Similar to the concept of opportunity cost, what is the risk of SARS-CoV-2 infection to the healthcare staff engaged in alternative healthcare activities if not involved in immunisation activities?

- Opportunity risk of SARS-CoV-2 infection to the vaccinated children
  - If the alternative activity that the children and their carers would be involved in had a higher risk of SARS-CoV-2 infection in comparison to the risk involved with the immunisation visits,
    - then it is beneficial for the children and their carers to undertake the immunisation visits for the children to get vaccinated.

Implications for policy and practice

- Routine childhood immunisation programmes should be safeguarded for continued service delivery and prioritised for the prevention of infectious diseases, as logistically possible, as part of delivering essential health services during the Covid-19 pandemic.

- The current immunisation service models will require adaptation, including physical distancing measures, personal protective equipment, and good hygiene practices for infection control at the vaccination clinics, and have to be complemented by new immunisation service models for sustaining routine childhood immunisation during the Covid-19 risk period.

- Routine vaccinations during a pandemic – benefit or risk?
  - https://www.gavi.org/vaccineswork/routine-vaccinations-during-pandemic-benefit-or-risk
  - https://sciencejournalforkids.org/articles/routine-vaccinations-during-a-pandemic-benefit-or-risk

Thank you

kaja.abbas@lshtm.ac.uk

Restarting Vaccination Services

Dr. Jennifer Bouey
Senior Policy Analyst, Professor
RAND Corporation

Strategies to restart immunization post COVID-19

Jennifer Bouey, MD, PhD

RAND Corporation

December 15, 2020

Goals for South-East Asia Immunization and Vaccine Development

Routine Immunization systems strengthening

Measles and Rubella Elimination

Maintaining polio-free status

Sustaining maternal and neonatal tetanus elimination

Accelerated control of Japanese encephalitis

Hepatitis B Control

Accelerating introduction of new vaccines and related technologies

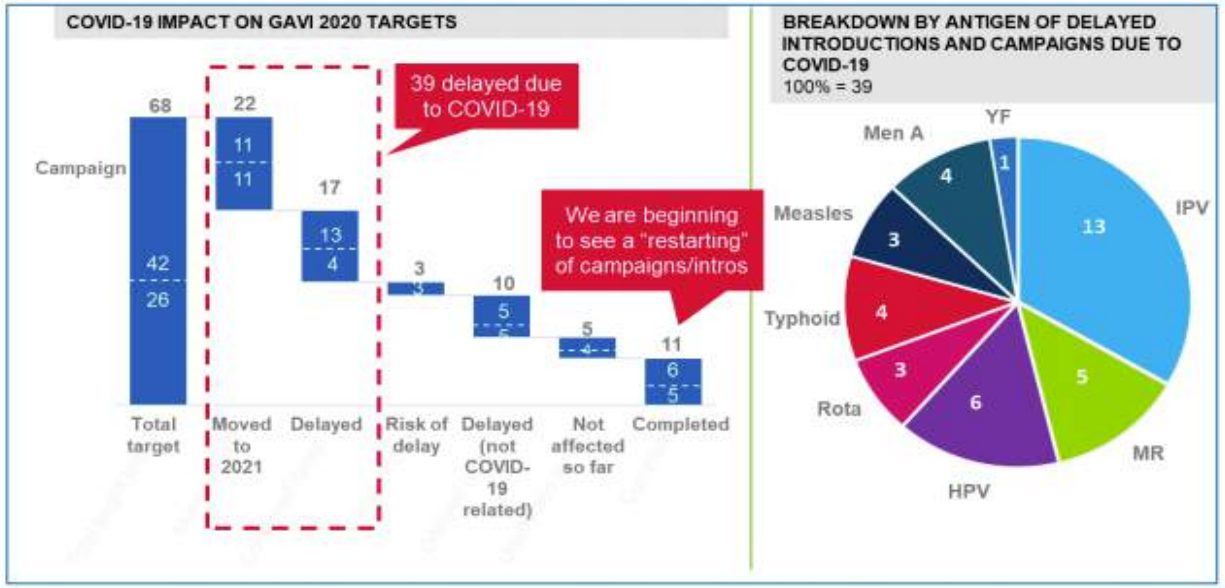
Access to high quality vaccines

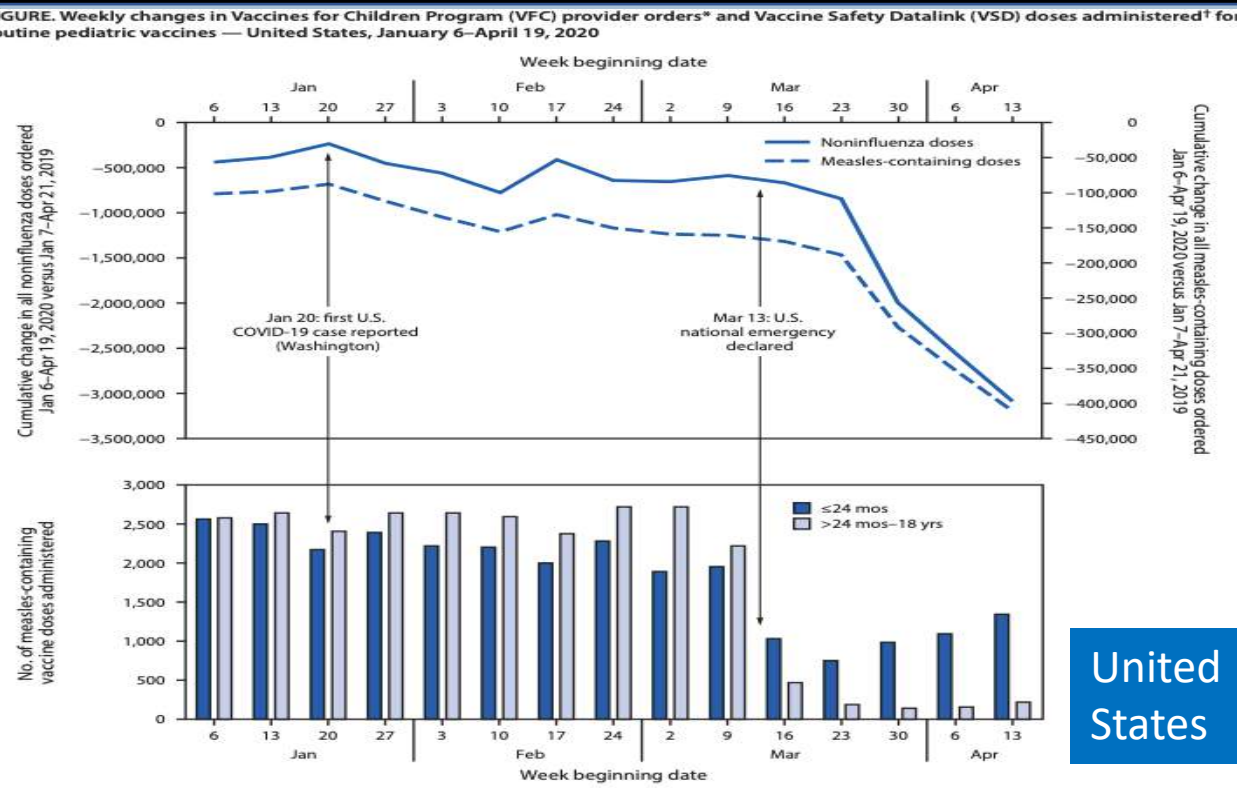
Status of Immunization Campaigns September 2020

- Measles immunization campaigns have been delayed or may be delayed in 41 countries in 2020.
- As of 8 Sept 2020, only 5 countries have resumed immunization campaigns after initial delays.
- 16 of the 36 countries facing continued campaign delays have ongoing measles outbreaks.

COVID-19 has had a significant impact on **vaccination programs** globally-Reduction in Demand/Coverage particularly where outbreaks have occurred

Demand





United States

Supply

- Indian suppliers have not yet been adjusting supply in response to this lower level of demand
- COVID-19 vaccine candidates have not been disrupting supply of current vaccines
- 18 Gavi-eligible countries currently reporting shipment delays
  - 6 countries reporting stockouts at central or subnational level due to COVID-19
  - UNICEF now reporting weekly shipments within pre-COVID-19 levels, stabilizing to 45-50 vaccine shipments per week
  - Some delays in cold chain equipment optimization platform (CCEOP) implementation. Situation improving.

Data source: COVID-19 Situation Report #20, November 18, 2020. GAVI the vaccine alliance.

UNICEF vaccine survey, 2020

Indonesia MOH Rapid Assessment in April,2020: Immunization services disrupted in 84% health facilities

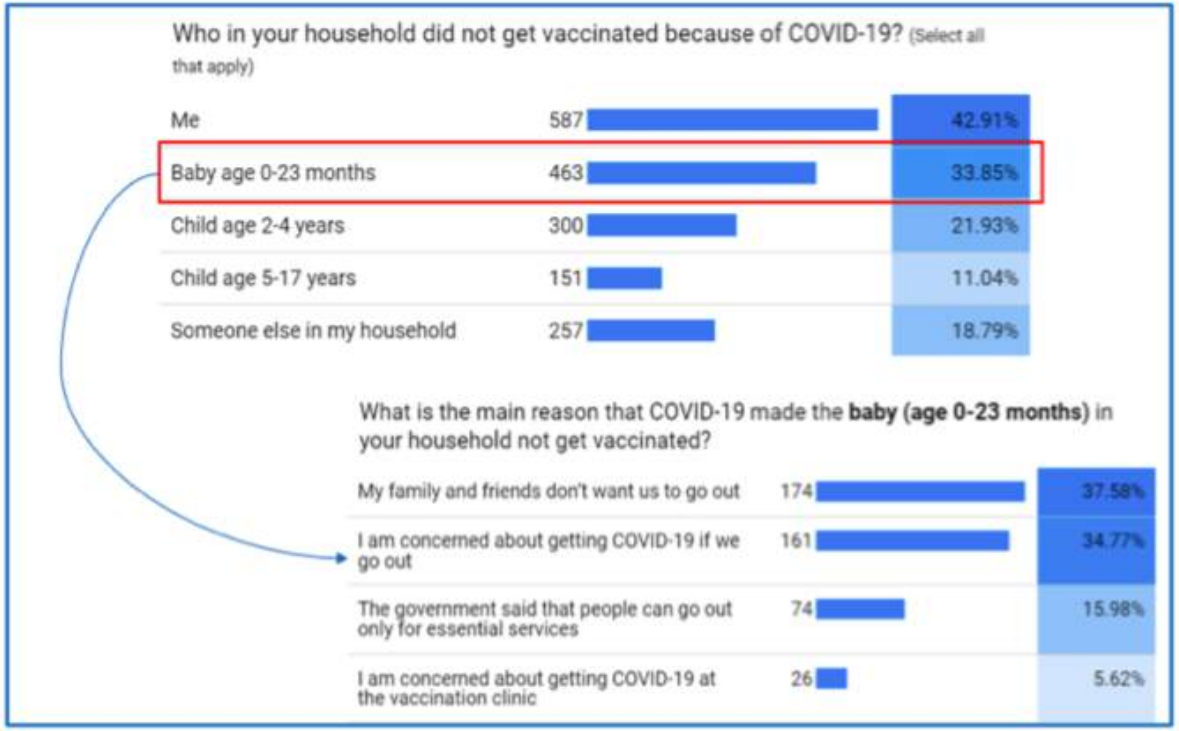
Healthcare

- Inadequate understanding of MOH guide
- Insufficient funding (due to COVID response)
- Limited vaccinators(diverted to COVID-19)
- Travel restrictions, school closure
- Limited PPEs

Premise survey (n=4,033, 9 countries) on perceptions about immunization:

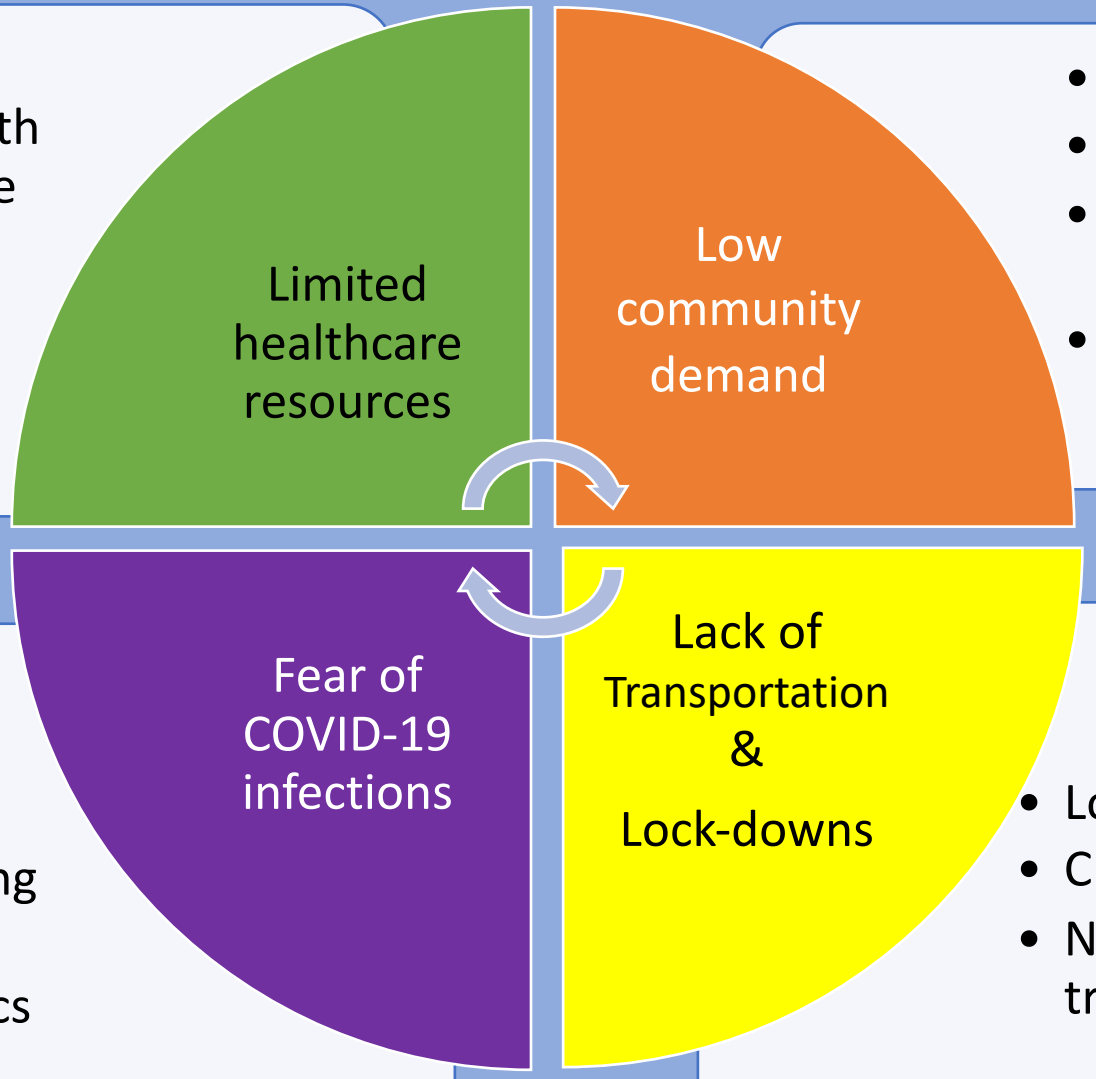
- Over 65% of respondents said that distance to the vaccination clinic is the main barrier
- 33% of respondence mentioned no one in their household had been vaccinated due to COVID-19
  - 34% reported babies age 0-23 m not vaccinated due to COVID-19
  - Main reason for not vaccinating 0-23 months old are :
    a. don't want to go out;
    b. fear of COVID-19 infection;
    c. gov lock down;

PREMISE™



Barriers to routine immunization during COVID-19 pandemic

- Closure of facilities
- Conflicting need in health care resources (shortage of doc/nurses, space)
- Confusing policies



- Conflicting priorities
- Confusing policies
- Limited knowledge of immunization
- Disrupted community engagement

- Not enough PPEs
- Difficulties in maintaining social distance
- Not get infected in clinics

- Lock-downs
- Clinics closed
- No safe public transportation

Restart vaccine services at full capacity as soon as possible

- Catch-up vaccination need to be a gradual recovery.

World Health Organization
Western Pacific Region

COVID Safety

Protect health workers

- PPEs
- social distancing
- handwashing

Avoid mass campaign

Surveillance

Add routine vaccine survey to COVID-19 survey

Assess immunization gap: Track and follow-up with those missed vaccination

Prioritize epidemic prone diseases (polio, measles, rubella, diphtheria, and pertussis) & vulnerable communities

Innovation

Re-establish community demands through campaigns and media

Disseminate immunization schedule widely

Design separate time/location for immunization

Prioritize pneumococcal & influenza vaccines

WHO guide on routine immunization services during COVID-19 pandemic. December 11, 2020

Routine immunization strategies during COVID-19 pandemic

Ener Cagri Dinleyici , etc (2020): Human Vaccines & Immunotherapeutics, DOI: 10.1080/21645515.2020.1804776

ure 1. Control measures for immunization visit during the COVID-19 Pandemic: luding appointment, wearing a mask, hand hygiene, social distancing and munization room.

Control measures for immunization visit during the COVID-19 pandemic

- Telemedicine/Appointment
- Immunization room
- Universal mask wearing
- Hand hygiene
- Social distancing

Ethiopia Moves Froward with Mass Measles Vaccination Campaign during COVID-19 Pandemic, Protecting 14.9 Million Children- Mitigation measures minimize the risk of COVID-19 spread, June 30-July 24, 2020

PVD surveillance : CGH/CDC Measles Incident Management System (MIMS) responders review and analyze measles vaccination and surveillance data and generate age-specific immunity profiles for countries. For Ethiopia, a large immunity gap among children 1-5 years of age were found.

Successful Features

- Availability of PPEs
- Pre- and intra- campaign social mobilization activities
- Proximity of vaccination sites to the communities, mobile team
- Extended campaign implementation days
- School closures

Unexpected

- Political protests (not related to vaccination)
- Four adverse events following immunizations- prompts national review

6-member team include COVID-19 screening.

Outdoors, or in large, well ventilated buildings, with handwashing stations, hand sanitizers

Uganda

GAVI COVID-19 Situation report, 2020

"In Uganda, April and October are months dedicated to reaching every child and woman with critical health care services like catch-up vaccinations, deworming and vitamin A supplementation – in addition to family planning services and general health education. These special days are commonly known as Integrated Child Health Days. "- GAVI country case studies

"UNICEF, through the Ministry of Health, provides the vaccines and ensures the cold chain equipment is available to keep the vaccines safe, thanks to funding from Gavi."

"Sister Allen wears gloves and a mask before she begins her work. All health workers have been provided with the necessary personal protective equipment to protect themselves and their clients from COVID-19 as they continue to deliver critical health services."

Well-known MCH event: months or days designated to catch up vaccinations and other MCH services. These days doesn't replace regular immunization routing services.

Well-coordinated supply chain

Sufficient COVID- Related PPEs and practice: masks, gloves, washing hands, keep social distance for healthcare workers and parents

GAVI COVID-19 Situation report, 2020

GAVI COVID-19 Situation report, 2020

"It's immunization time. Sister Allen and Sister Ebenezer review immunization cards shared by the mothers. During routine immunization days and Integrated Child Health Days, mothers and caregivers are encouraged to come for services with their children's immunization cards. This helps the health workers know which vaccine the children will need and what they have received at the last immunization visit. However, those without cards are also immunized."

Immunization record system

"A mother who has brought her child for immunization also gets an HIV test and she receives her results in a few minutes. HIV testing and early infant diagnosis for children from 6 weeks to 18 months are among the services provided during Integrated Child Health Days."

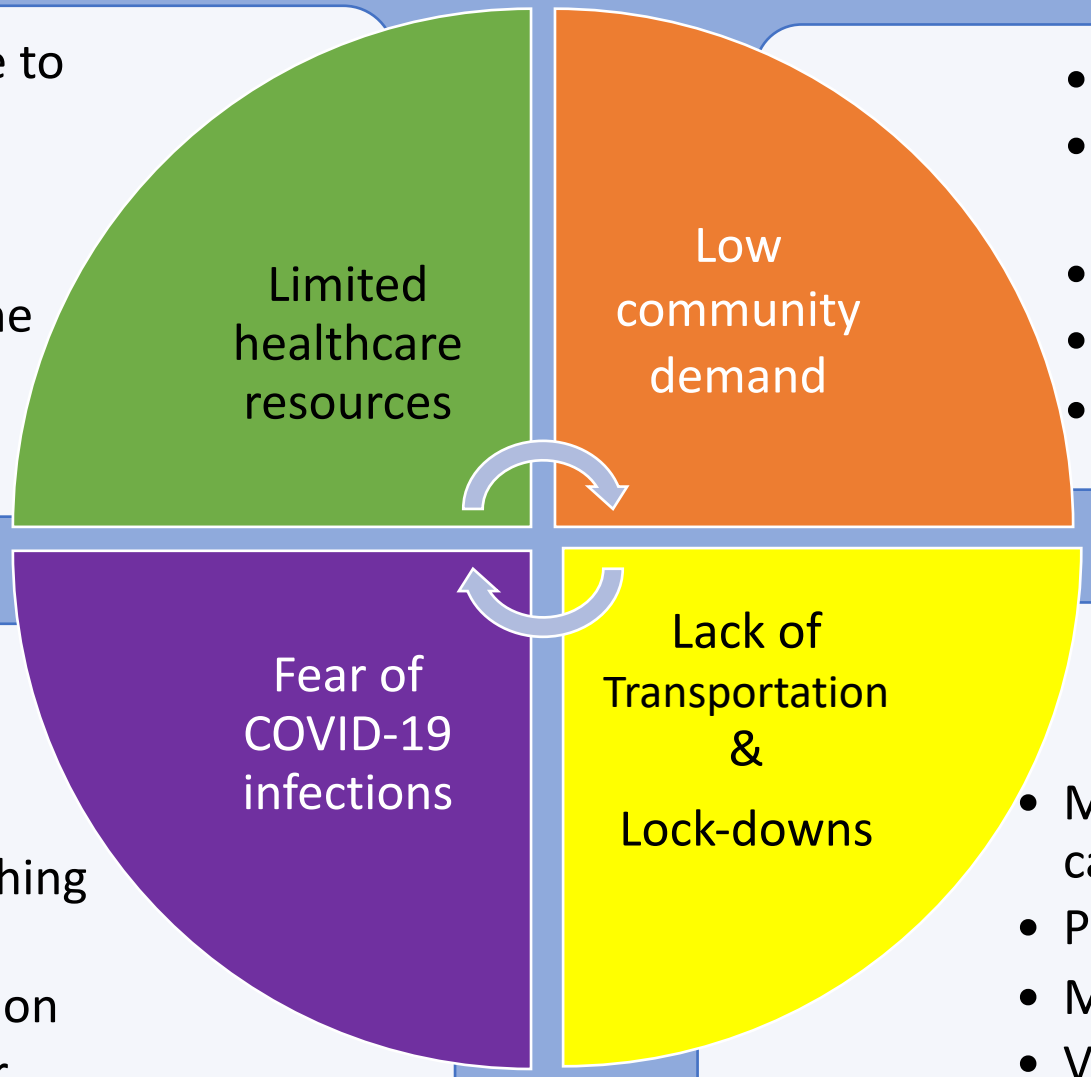
Combine immunization service with other critical maternal and child health services, e.g. HIV testing, mental health symptoms screening, nutrition supplement console, etc.

"In addition to immunizing the children and attending to mothers at the health facility, they go out to under-served communities with vaccines and services. "Just last week, we were in one of the most populated zones to make sure that those children too are reached."

Reach out to under-served communities

Strategies to routine immunization during COVID-19 pandemic

- Vaccination surveillance to identify gaps
- Immunization catch up events
- Prioritize epidemic prone diseases
- Prioritize newborns



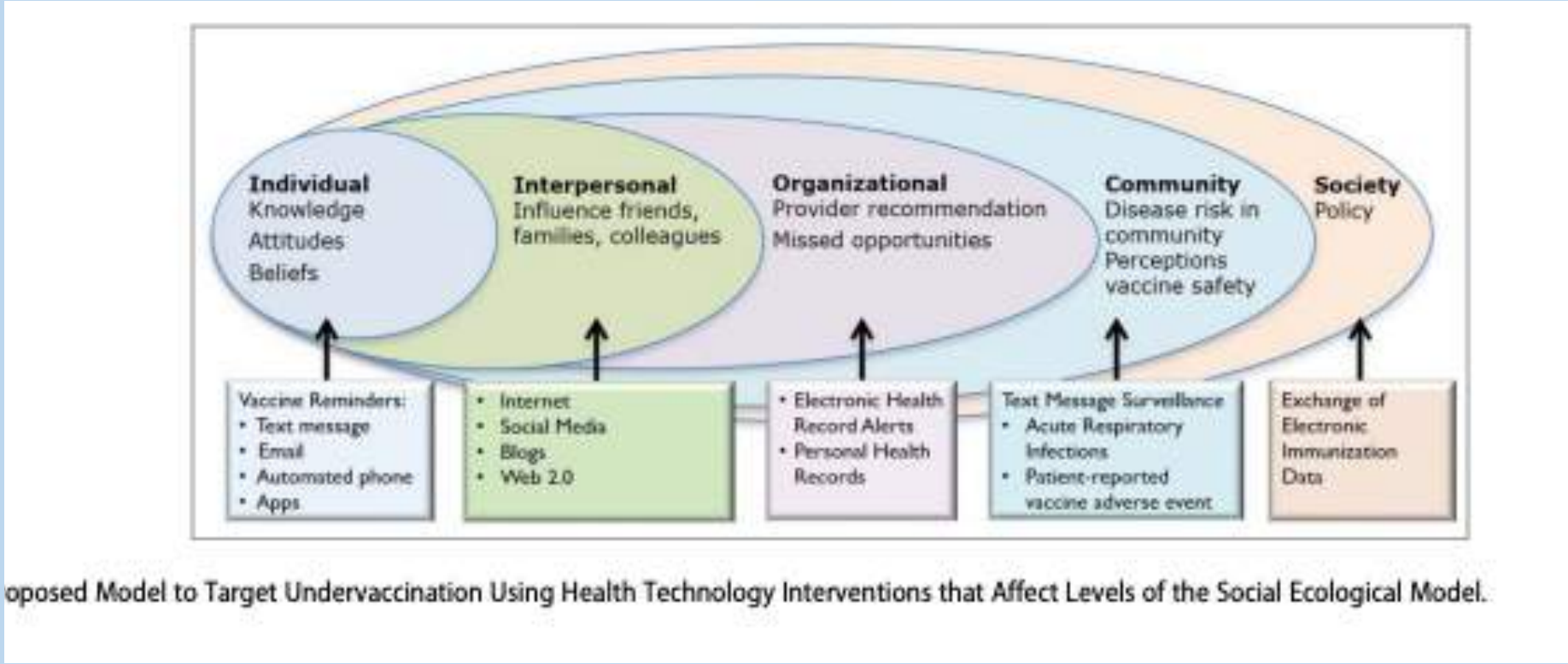
- Child health day
- Social media/media campaigns
- Bundle care (MCH, HIV)
- Recall system/reminder
- Community mobilization

- Covid-19 screening
- provide PPEs/hand washing stations/no toys
- Crowd control/ ventilation
- Separate time/space for immunization

- Medical home/primary care
- Proximity
- Mobile unit
- Vaccine transportation with cold chain protocol

Can technology help improve access and uptake of vaccine ?

- Personalized text message/ email/app reminder
- Information disseminations on internet, social media
- EHR (electronic key, digital necklace, etc)
- Community report of outbreaks, crowd sourcing to provide transportation, medicine delivery
- Big-data to inform health services coverage and policy changes
- Drones for vaccine delivery
- Digital vaccine cold chain



oposed Model to Target Undervaccination Using Health Technology Interventions that Affect Levels of the Social Ecological Model.

Kolff CA, etc. *Human vaccines and immunotherapeutics* 2018

Digitizing vaccine cold chain, key to post-pandemic immunization in Indonesia

SMILE consists of a mobile app for cold chain handlers, a web interface for data storage, and a temperature logger that monitors storage temperature of vaccines to ensure that quality vaccines are delivered as required in a timely manner.

Following its implementation in 2018, SMILE has focused on expanding reach to 600 Public Health Centers by 2021.

- Vaccine inventory digitized at 58 cold chain points in West Java and Banten, linking 2,723 Integrated Health Centers and private practices.

- 16,000 transactions per month on SMILE, showing that the app is well used by healthcare staff. Data entry errors have also been reduced by 74 percent.

- Vaccine stockout levels have been reduced by 70 percent and over-stocking by 47 percent.

- Vaccine stock waste has been reduced by more than 90 percent.

Thank you!

The Role of Catch-Up Vaccination Programs

Dr. Auliya Abdurrohim Suwantika
Researcher, Center of Excellence in Higher Education for Pharmaceutical Care Innovation
Universitas Padjadjaran, Indonesia

THE ROLE OF CATCH-UP VACCINATION PROGRAMS:
LESSONS LEARNED FROM INDONESIA

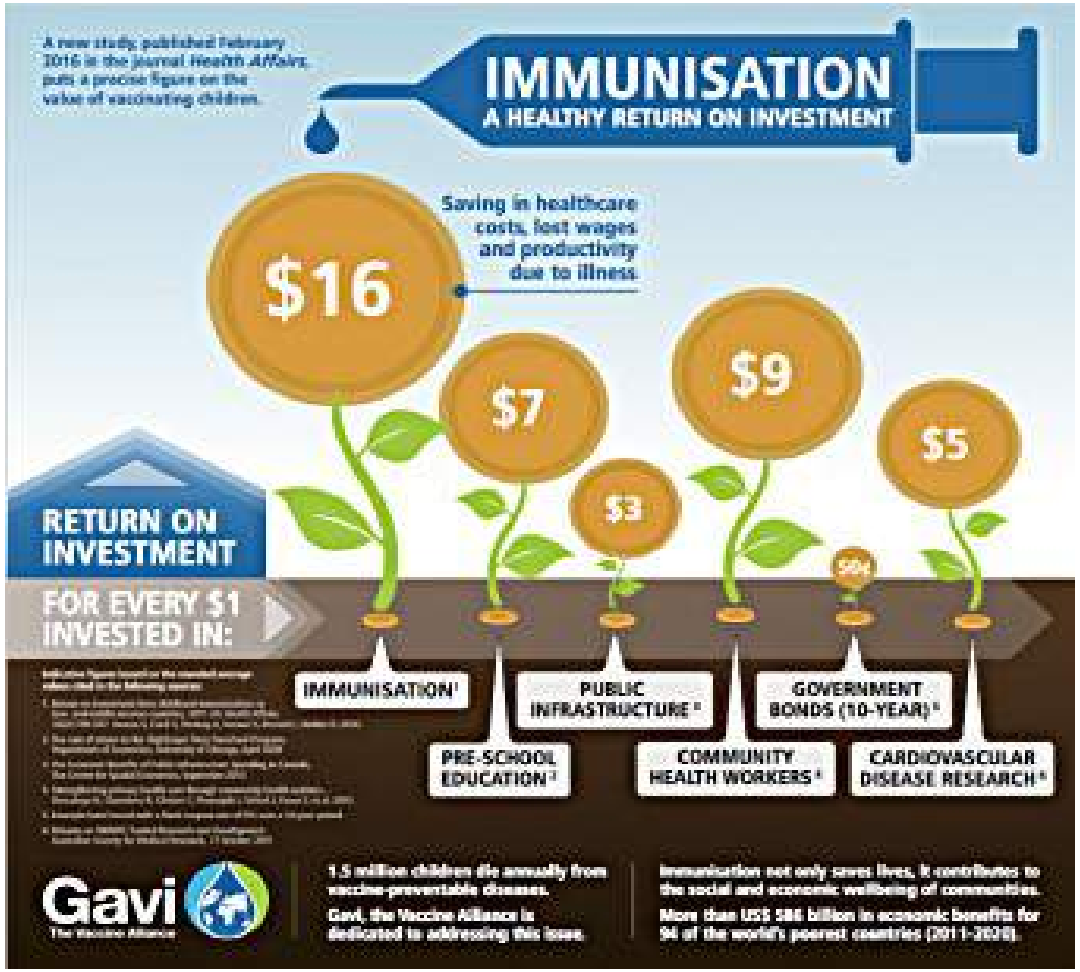
Auliya A. Suwantika, Ph.D.

Department of Pharmacology and Clinical Pharmacy, Universitas Padjadjaran

DISCLAIMER

- I have no potential conflicts of interest to report.
- The expressed opinions in the following slides are those of the individual presenter.

IMMUNIZATION IS THE PUBLIC HEALTH'S BEST BUY



World Health Organization

Health Topics | Countries | Newsroom | Emergencies

Home / Newsroom / Detail / WHO and UNICEF warn of a decline in vaccinations during COVID-19

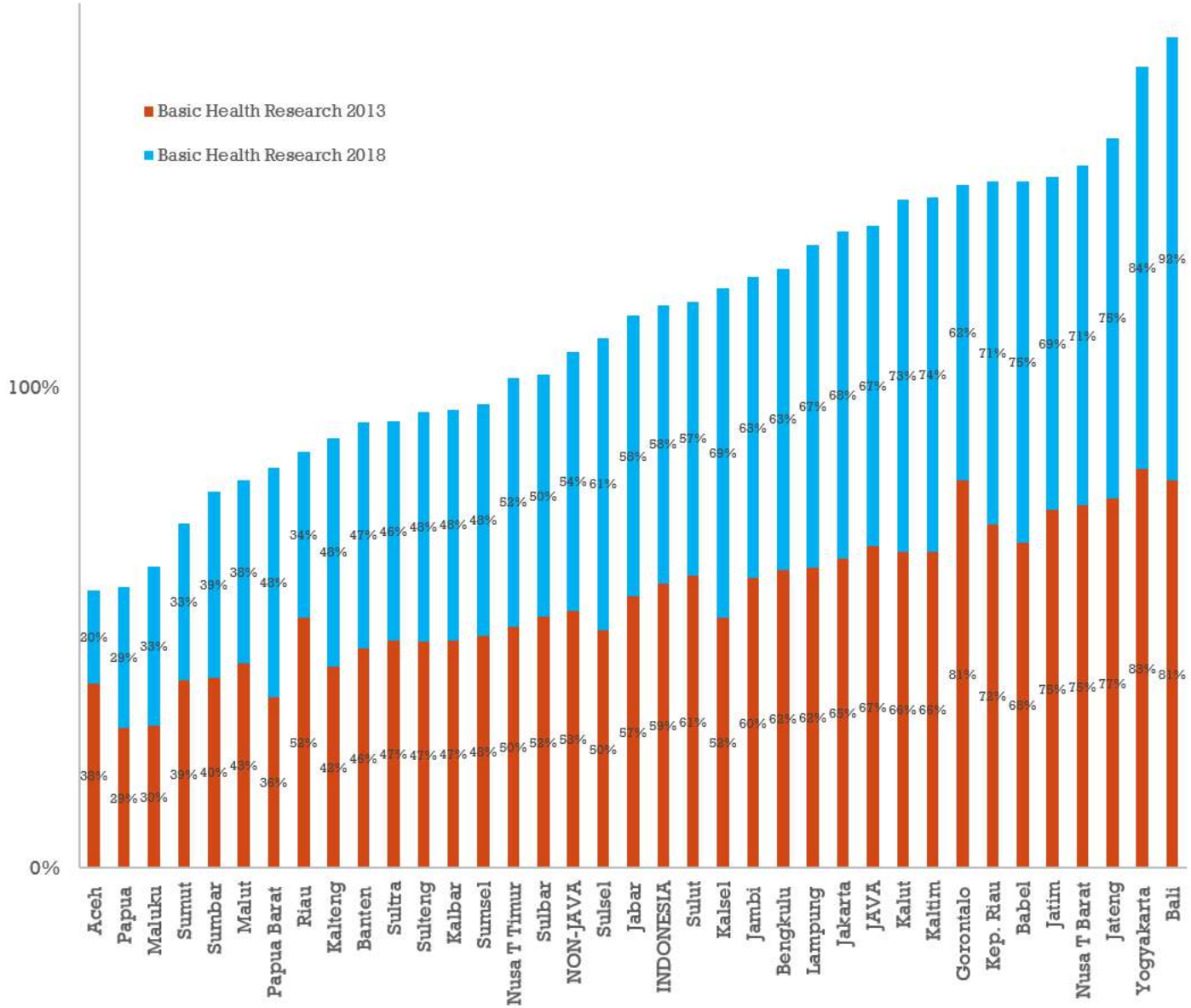
WHO and UNICEF warn of a decline in vaccinations during COVID-19

15 July 2020 | News release | Geneva/New York

GENEVA/NEW YORK, 15 July 2020 – The World Health Organization and UNICEF warned today of an alarming decline in the number of children receiving life-saving vaccines around the world. This is due to disruptions in the delivery and uptake of immunization services caused by the COVID-19 pandemic. According to new data by WHO and UNICEF, these disruptions threaten to reverse hard-won progress to reach more children and adolescents with a wider range of vaccines, which has already been hampered by a decade of stalling coverage.

https://www.gavi.org/about/value/cost-effective/
https://www.who.int/news-room/detail/15-07-2020-who-and-unicef-warn-of-a-decline-in-vaccinations-during-covid-19

BASIC CHILDHOOD IMMUNIZATION COVERAGE IN ALL PROVINCES



Suwantika AA, Boersma C, Postma MJ. The potential impact of COVID-19 pandemic on the immunization performance in Indonesia. *Expert Rev Vaccines*. 2020, 19:8,687-690.

EXPERT REVIEW OF VACCINES
2020, VOL. 19, NO. 8, 687–690
https://doi.org/10.1080/14760584.2020.1800461

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EDITORIAL

The potential impact of COVID-19 pandemic on the immunization performance in Indonesia

Auliya A. Suwantika [a,b,c], Cornelis Boersma [d] and Maarten J. Postma [d,e]

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KEYWORDS Vaccine; coverage; health crisis; mitigation; immunization program

Despite the economic growth and the escalated number of investments in the health-care sector, Indonesia remains one of the countries with relevant but declining numbers of under-vaccinated children [5]. In the recent years, national immunization coverage had been steadily increasing, but currently appears to be declining [6]. The latest Indonesian Basic Health Survey reported that the proportion of fully immunized children in the age of 12–23 months old was only 58%, which was lower than the targeted national coverage by the government (93%) [6]. As the most populous island, the proportion of fully immunized children in Java was reported to be 67% (see Figure 1) [6].

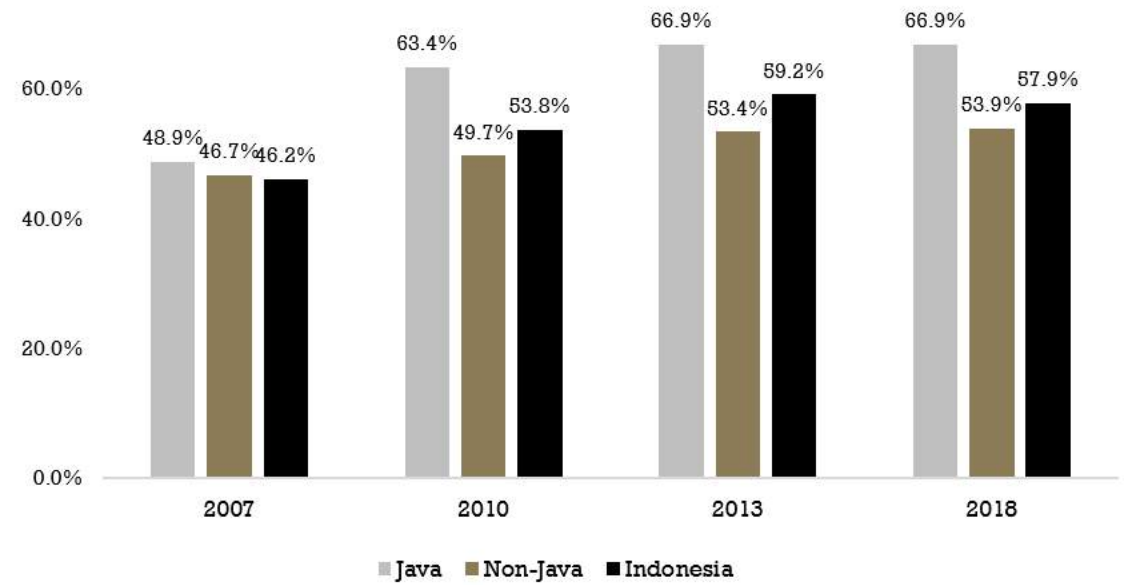
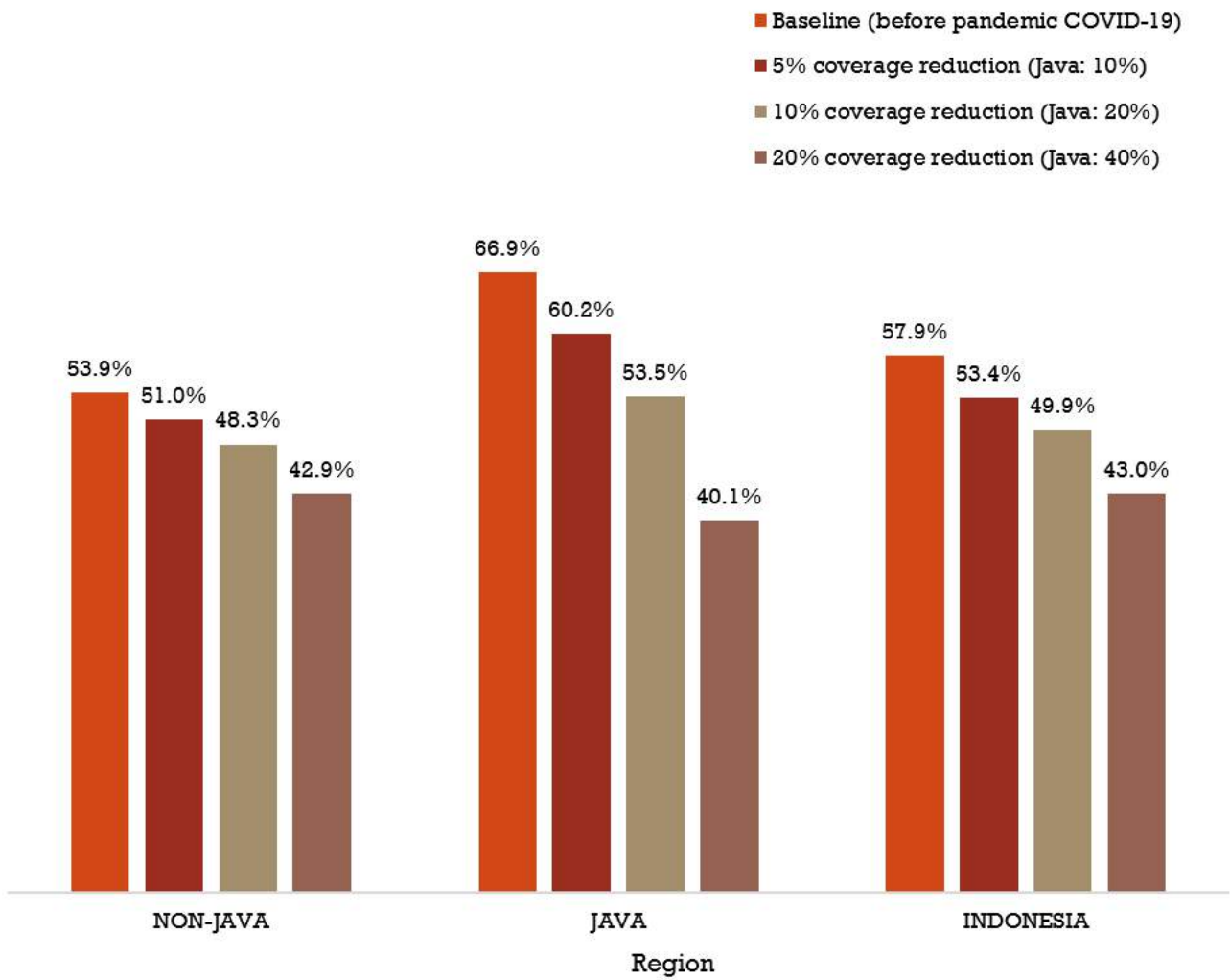


Figure 1. Basic childhood immunization coverage (12-23 months of age)

IMPACT OF COVID-19 PANDEMIC ON THE IMMUNIZATION PERFORMANCE



Impact of COVID-19 pandemic on basic childhood immunization coverage

Suwantika AA, Boersma C, Postma MJ. The potential impact of COVID-19 pandemic on the immunization performance in Indonesia. *Expert Rev Vaccines*. 2020, 19:8,687-690.

COSTS OF INTERVENTIONS TO INCREASE IMMUNIZATION COVERAGE

Contents lists available at ScienceDirect

Vaccine

journal homepage: www.elsevier.com/locate/vaccine

Systematic review of the incremental costs of interventions that increase immunization coverage

Sachiko Ozawa [a,b,*], Tatenda T. Yemeke [a], Kimberly M. Thompson [c]

[a] Division of Practice Advancement and Clinical Education, UNC Eshelman School of Pharmacy, University of North Carolina, Chapel Hill, NC, USA
[b] Department of Maternal and Child Health, UNC Gillings School of Global Public Health, University of North Carolina, Chapel Hill, NC, USA
[c] Kid Risk, Inc., Columbus, OH, USA

A B S T R A C T

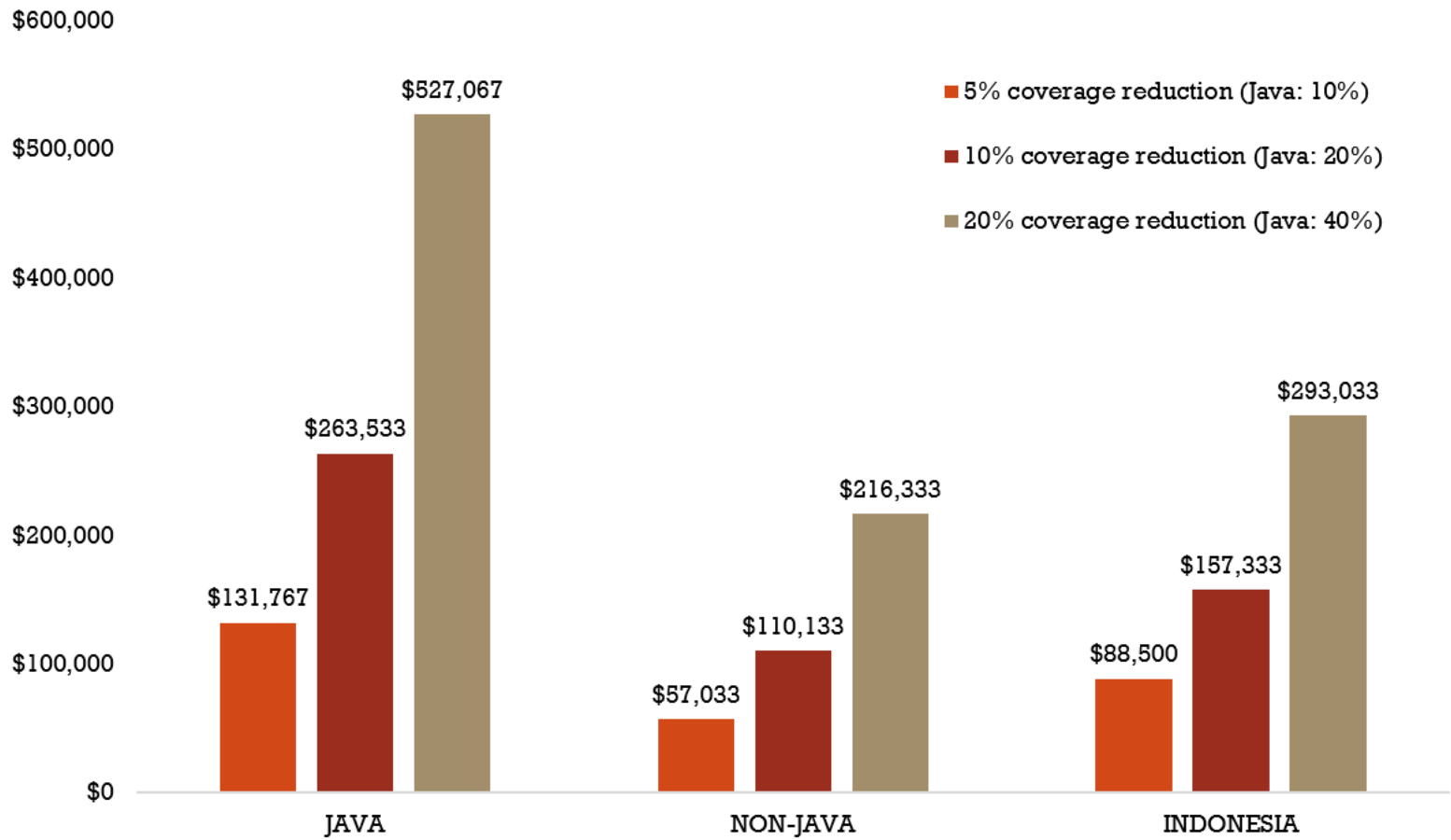
Achieving and maintaining high vaccination coverage requires investments, but the costs and effectiveness of interventions to increase coverage remain poorly characterized. We conducted a systematic review of the literature to identify peer-reviewed studies published in English that reported interventions aimed at increasing immunization coverage and the associated costs and effectiveness of the interventions. We found limited information in the literature, with many studies reporting effectiveness estimates, but not providing cost information. Using the available data, we developed a cost function to support future programmatic decisions about investments in interventions to increase immunization coverage for relatively low and high-income countries. The cost function estimates the non-vaccine cost per dose of interventions to increase absolute immunization coverage by one percent, through either campaigns or routine immunization. The cost per dose per percent increase in absolute coverage increased with higher baseline coverage, demonstrating increasing incremental costs required to reach higher coverage levels. Future studies should evaluate the performance of the cost function and add to the database of available evidence to better characterize heterogeneity in costs and generalizability of the cost function.

Costs of interventions to increase immunization coverage

Activity	0%	10%	20%	30%	40%	50%	60%	70%	80%	90%
Routine immunization	$0.03	$0.04	$0.06	$0.09	$0.12	$0.18	$0.25	$0.36	$0.52	$0.74
Supplementary activity	$0.04	$0.06	$0.09	$0.13	$0.18	$0.26	$0.38	$0.54	$0.77	$1.10
Total	$0.07	$0.10	$0.15	$0.22	$0.30	$0.44	$0.63	$0.90	$1.29	$1.84
Cost of interventions to increase 1% coverage										$0.02

Ozawa S, Yemeke TT, Thompson KM. Systematic review of the incremental costs of interventions that increase immunization coverage. Vaccine. 2018 Jun 14;36(25):3641-3649.

COST TO INCREASE IMMUNIZATION COVERAGE AS THE IMPACT OF COVID-19 PANDEMIC



Cost to increase immunization coverage as the impact of COVID-19 pandemic per 1,000,000 targeted children

VACCINATION IN HUMANITARIAN EMERGENCIES

- STEP 1

  Determine and grade risk of the vaccine-preventable diseases (VPD)

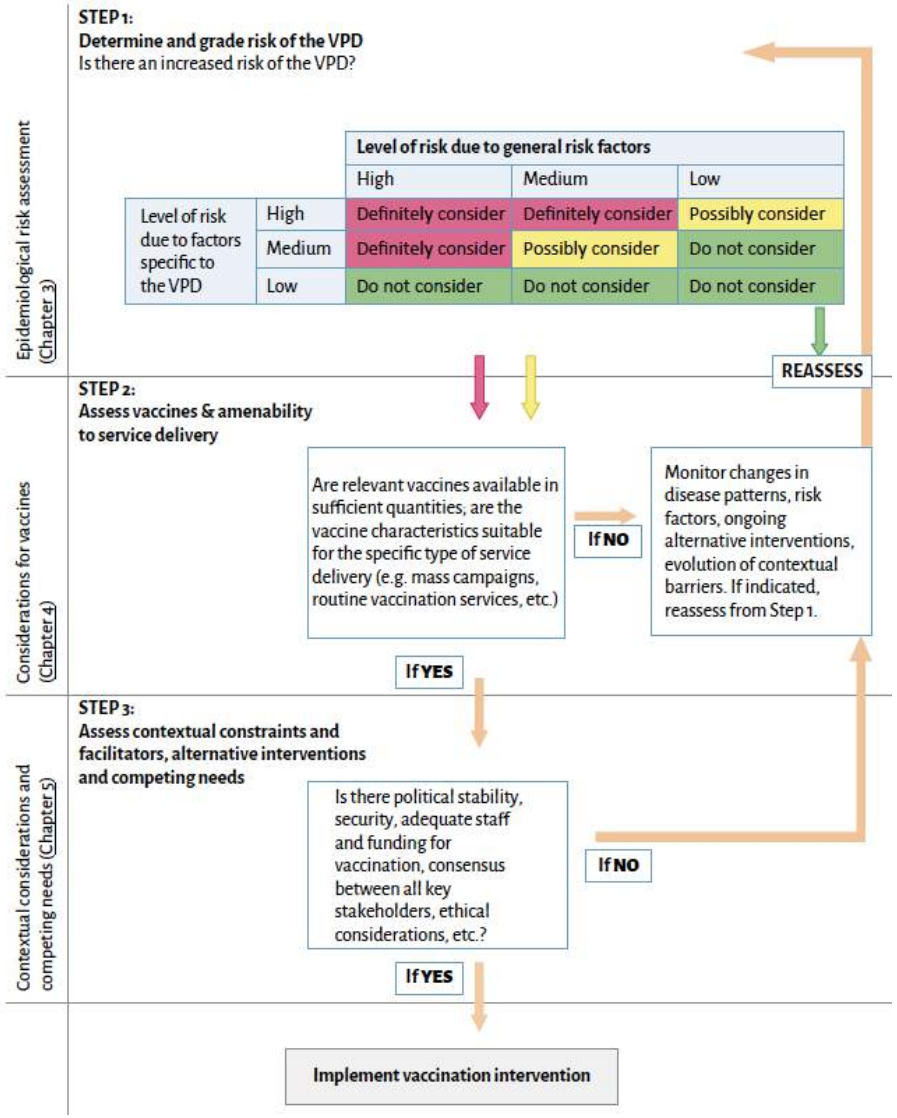
- STEP 2

  Assess vaccines and amenability to service delivery

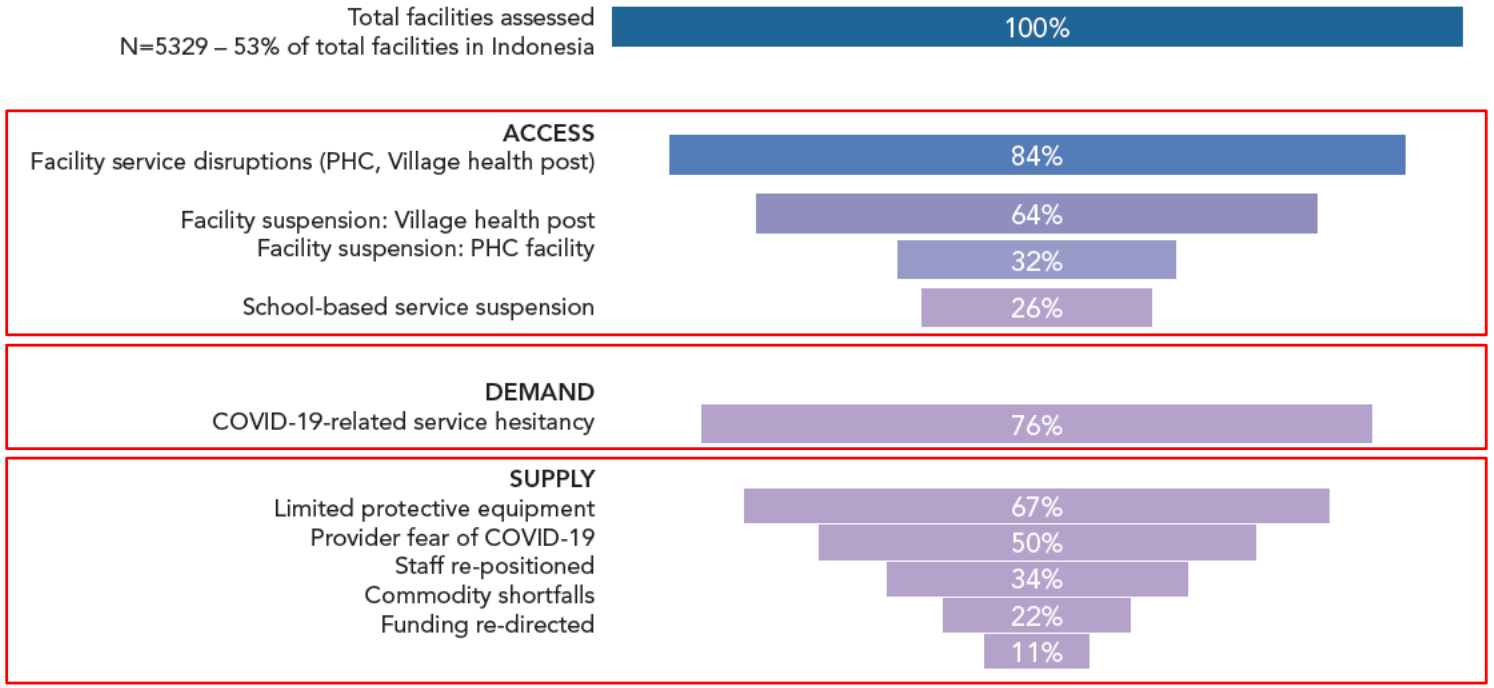
- STEP 3

  Assess contextual constraints and facilitators, alternative interventions and competing needs

https://apps.who.int/iris/bitstream/handle/10665/255575/WHO-IVB-17.03-eng.pdf



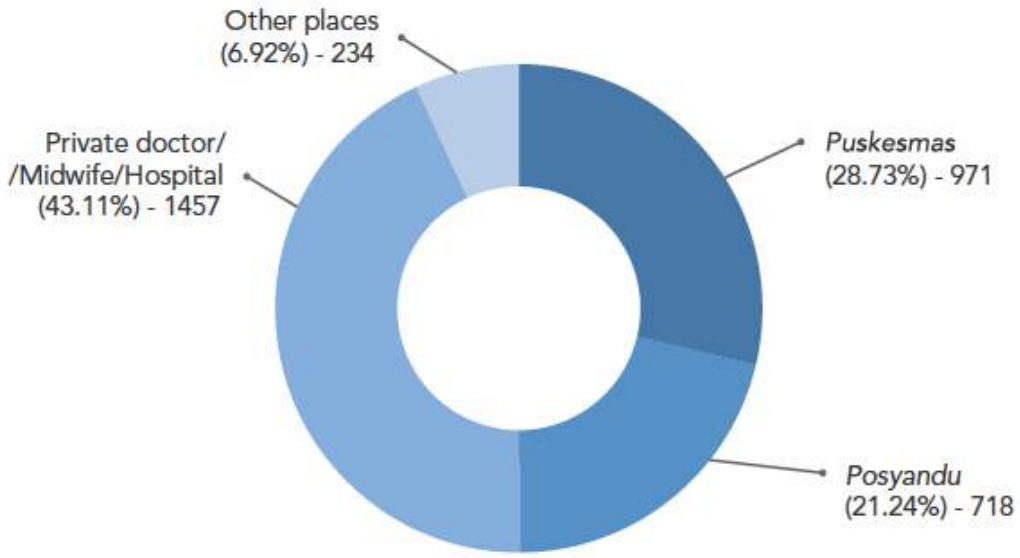
COVID-19-RELATED BOTTLENECKS IN IMMUNIZATION SERVICE DELIVERY IN INDONESIA



https://covid19.go.id/storage/app/media/Materi%20Edukasi/community-perception-survey-en-01-09-2020.pdf

IMMUNIZATION-SEEKING BEHAVIOURS AND PRACTICES IN PANDEMIC

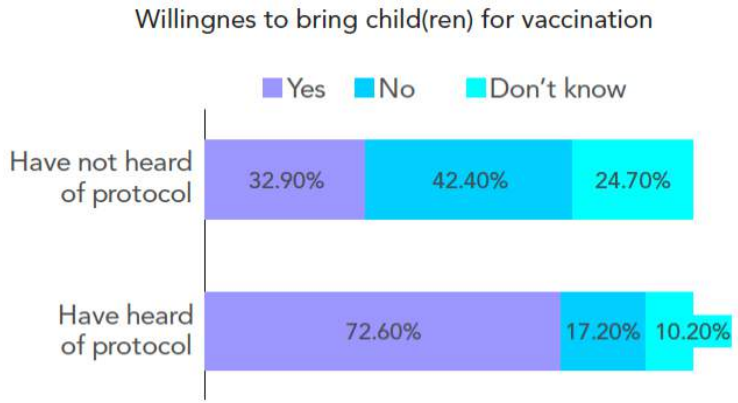
- "I have not brought my child for vaccination in the past two months as my child has completed the DPT3 vaccination. The next immunization schedule is when he is 9 months, and it is this month. I want to vaccinate my child even in the midst of this pandemic, but the Posyandu is closed" - Respondent
- During a pandemic like this, I have been vaccinating my children at a midwife's clinic which is less crowded compared to the hospital or Puskesmas" – Respondent
- "I still visit a private clinic because the schedule is more flexible, but I have to pay expensive fees. Public health facilities should be more flexible, so that those who don't have money can vaccinate easily." - Respondent



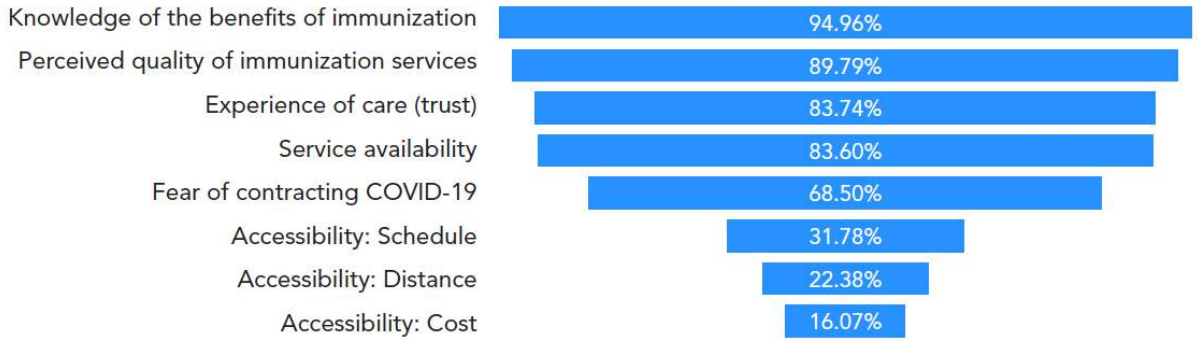
Source of immunization services in pandemic

https://covid19.go.id/storage/app/media/Materi%20Edukasi/community-perception-survey-en-01-09-2020.pdf

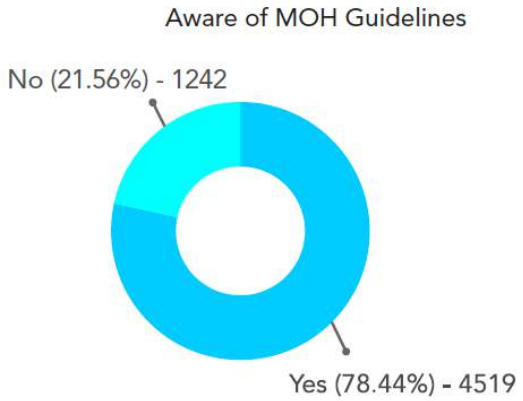
FACTORS CONTRIBUTING TO DECISION MAKING



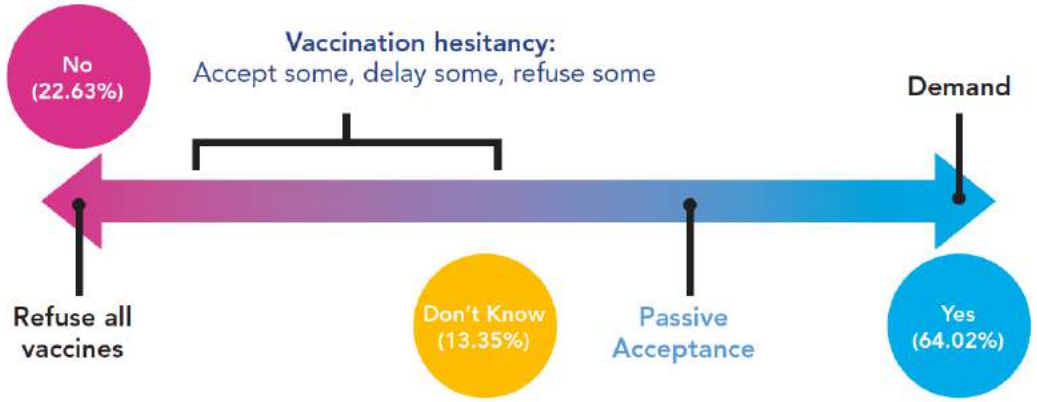
Willingness to bring child(ren) for vaccination



Key factors considered during the decision making



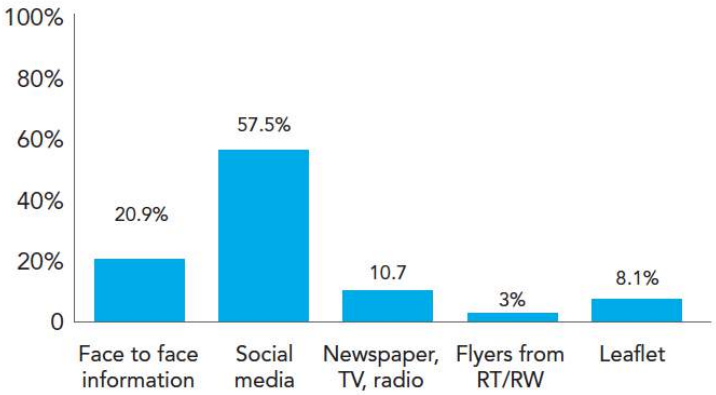
Awareness of parents and caregivers on MoH guidelines



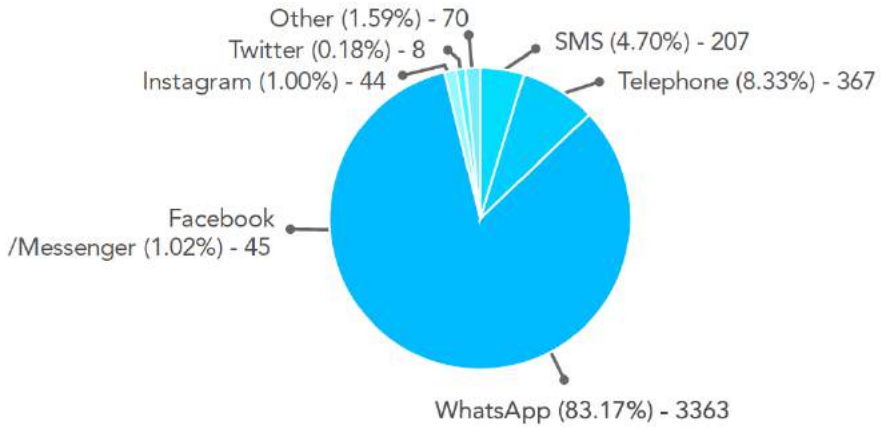
Willingness to bring child(ren) for vaccination during the pandemic

https://covid19.go.id/storage/app/media/Materi%20Edukasi/community-perception-survey-en-01-09-2020.pdf

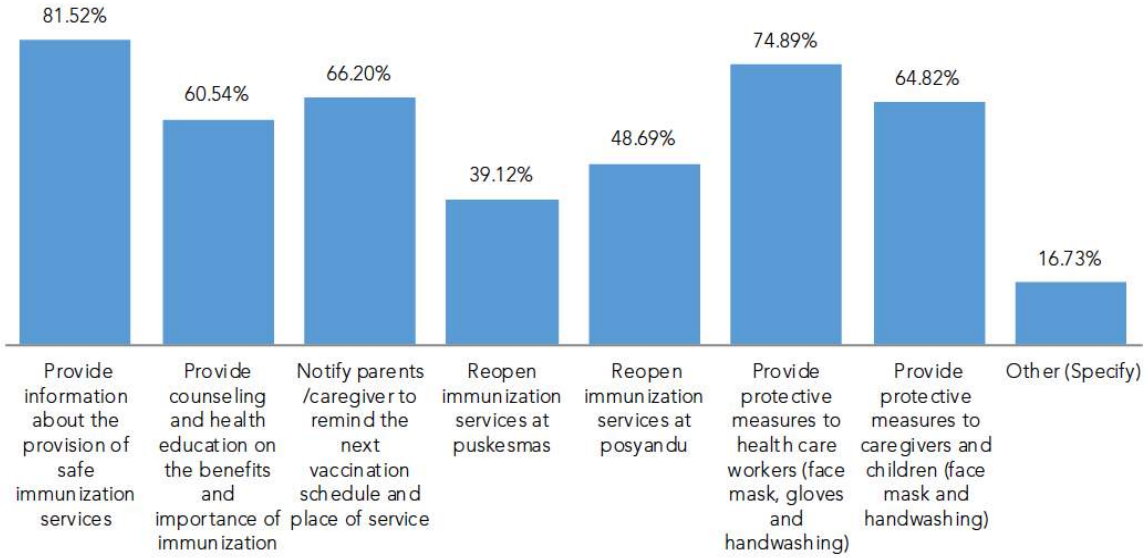
EXPECTATIONS OF PARENTS AND CAREGIVERS ON IMMUNIZATION SERVICE DURING THE PANDEMIC



Source of information about safe immunization protocols



Preferred channel of communication

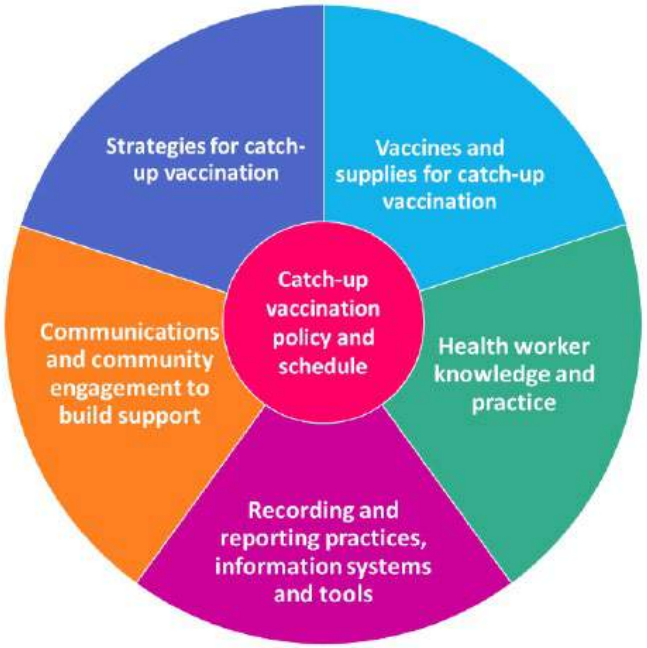


Key recommendations from parents and caregivers

https://covid19.go.id/storage/app/media/Materi%20Edukasi/community-perception-survey-en-01-09-2020.pdf

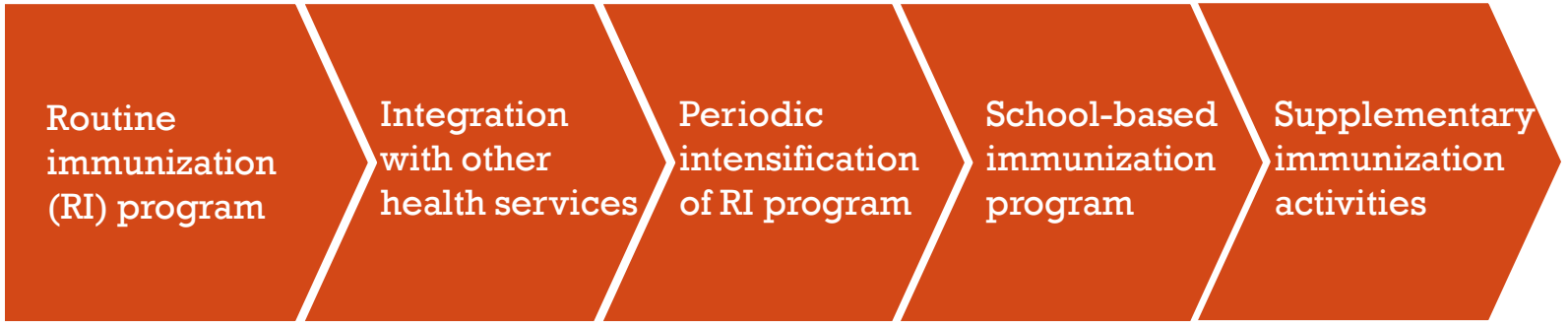
PRINCIPLES OF CATCH-UP VACCINATION

- It is important to ensure that all relevant stakeholders are consulted and the implications across all components of the immunization programme are considered.
- Planning to introduce a catch-up policy requires an assessment of the vaccine stock management and overall immunization supply chain system performance to identify and address any gaps.
- For catch-up vaccination to be viewed as a priority, health workers' interpersonal skills, motivations and attitudes need to be addressed in training, supervision, and the feedback they are given.
- A major challenge for identifying eligibility, administering and monitoring catch-up vaccination is lack of reliable written record of vaccination history.
- Local community and civil society groups, non-government organizations, faith-based groups and other stakeholders should be considered partners in the design and delivery of services.



https://www.who.int/immunization/programmes_systems/policies_strategies/WHO_Catch-up_guidance_working_draft_11.08.20.pdf?ua=1

STRATEGIES FOR CATCH-UP VACCINATION IN INDONESIA



https://www.who.int/immunization/programmes_systems/policies_strategies/WHO_Catch-up_guidance_working_draft_11.08.20.pdf?ua=1

INCREMENTAL COSTS OF CATCH-UP VACCINATION

- Personal protective equipment (PPE) & infection prevention and control (IPC) measures
- Physical distancing and screening
- Changes in the frequency and size of outreach immunization sessions
- Increased outreach volumes to compensate for a reduction in facility-based routine coverage

PPE AND IPC MEASURES

Start-up and recurrent costs for PPE and IPC measures for an average health facility

Region	Start-up cost	Recurrent cost	Total (1 year)
Low intensity region			
No PPE	$0	$0	$0
IPC (hand sanitizer & washing stations)	$24	$100	$1,224
Total cost	$24	$100	$1,224
Medium intensity region			
PPE (masks)	$0	$141	$1,692
IPC (hand sanitizer & washing stations)	$24	$100	$1,224
Total	$24	$241	$2,916
High intensity region			
PPE (masks, gloves, goggles)	$11	$173	$2,087
IPC (hand sanitizer & washing stations)	$150	$100	$1,350
Total	$161	$273	$3,437

PHYSICAL DISTANCING AND SCREENING

Start-up and recurrent costs for physical distancing and screening measures for an average health facility

Region	Start-up cost	Recurrent cost	Total (1 year)
Low intensity region			
Crowd controller (per diem, no PPE)	$0	$0	$0
Infrared thermometer	$0	$0	$0
Total cost	$0	$0	$0
Medium intensity region			
Crowd controller (per diem, masks)	$0	$41	$492
Infrared thermometer	$0	$0	$0
Total	$0	$41	$492
High intensity region			
Crowd controller (per diem, masks, gloves)	$0	$104	$1,248
Infrared thermometer	$70	$0	$70
Total	$0	$273	$1,318

CHANGES IN THE FREQUENCY AND SIZE OF OUTREACH SESSIONS

Recurrent costs for changes in the frequency and size of outreach immunization sessions for an average health facility

Region	Recurrent cost	Total (1 year)
Low intensity region		
Transport	-$16	-$192
Per diem	$0	$0
Total cost	-$16	-$192
Medium intensity region		
Transport	$85	$1,020
Per diem	$5	$60
Total	$90	$1,080
High intensity region		
Transport	$256	$3,072
Per diem	$55	$660
Total	$311	$3,732

INCREASED OUTREACH VOLUMES

Recurrent cost for increased outreach volumes for an average health facility

Region	Recurrent cost	Total (1 year)
Low intensity region		
Transport	$1	$12
Per diem	$0	$0
Total cost	$1	$12
Medium intensity region		
Transport	$2	$24
Per diem	$0	$0
Total	$2	$24
High intensity region		
Transport	$5	$60
Per diem	$3	$36
Total	$8	$96

INCREASED OUTREACH VOLUMES

Recurrent cost for increased outreach volumes for an average health facility

Region	Recurrent cost	Total (1 year)
Low intensity region		
Transport	$1	$12
Per diem	$0	$0
Total cost	$1	$12
Medium intensity region		
Transport	$2	$24
Per diem	$0	$0
Total	$2	$24
High intensity region		
Transport	$5	$60
Per diem	$3	$36
Total	$8	$96

CONCLUSION

- COVID-19 pandemic might decrease the coverage of routine immunizations and economic impacts of COVID-19 pandemic on the immunization performance are evident.
- Catch-up vaccination programs are required to maintain the performance of routine immunization programs and to prevent the outbreak of VPD.

ACKNOWLEDGMENT

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