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)
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

<table>
<thead>
<tr>
<th>Causes</th>
<th>Impact</th>
</tr>
</thead>
<tbody>
<tr>
<td>War</td>
<td>Increased demand for health services</td>
</tr>
<tr>
<td>Social/political conflicts</td>
<td>Increase in morbidity and mortality from VPD</td>
</tr>
<tr>
<td>Natural disasters</td>
<td></td>
</tr>
<tr>
<td>Epidemics</td>
<td></td>
</tr>
</tbody>
</table>
DRC: Measles Outbreak outstrips Ebola Deaths

Measles Outbreak:
- Total cases: >310,000
- Total deaths: >6,000

Ebola Outbreak:
- Total cases: 3453
- Total deaths: 2264
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.

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

- Family planning and contraception (n=102) - 59% partial disruption, 9% severe disruption
- Antenatal care (n=104) - 53% partial disruption, 3% severe disruption
- Facility based births (n=103) - 32% partial disruption, 2% severe disruption
- Routine immunization (health facilities) (n=105) - 50% partial disruption, 10% severe disruption
- Routine immunization (outreach) (n=91) - 53% partial disruption, 18% severe disruption
- Sick child services (n=103) - 51% partial disruption, 1% severe disruption
- Management of malnutrition (n=90) - 46% partial disruption, 6% severe disruption

Source: EHS key informant survey – May-June 2020
### 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.

<table>
<thead>
<tr>
<th>Region</th>
<th># Unique Countries</th>
<th>Suspended</th>
<th>Disrupted</th>
<th>No Disruption</th>
<th>Not Applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Global</strong></td>
<td>65</td>
<td>14%</td>
<td>17%</td>
<td>58%</td>
<td>11%</td>
</tr>
<tr>
<td><strong>AFRO</strong></td>
<td>29</td>
<td>3%</td>
<td>10%</td>
<td>72%</td>
<td>14%</td>
</tr>
<tr>
<td><strong>AMRO</strong></td>
<td>4</td>
<td>25%</td>
<td>8%</td>
<td>75%</td>
<td>17%</td>
</tr>
<tr>
<td><strong>EMRO</strong></td>
<td>12</td>
<td>25%</td>
<td>22%</td>
<td>44%</td>
<td>17%</td>
</tr>
<tr>
<td><strong>EURO</strong></td>
<td>9</td>
<td>33%</td>
<td>22%</td>
<td>44%</td>
<td>14%</td>
</tr>
<tr>
<td><strong>SEARO</strong></td>
<td>7</td>
<td>14%</td>
<td>29%</td>
<td>43%</td>
<td>14%</td>
</tr>
<tr>
<td><strong>WPRO</strong></td>
<td>4</td>
<td>25%</td>
<td>50%</td>
<td>25%</td>
<td>1</td>
</tr>
</tbody>
</table>

**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 versus 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.
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

<table>
<thead>
<tr>
<th>Diseases/ Vaccines</th>
<th>No. of countries with postponed campaigns (fully or partially)</th>
<th>No. of campaigns postponed (fully or partially)</th>
<th>No. of campaigns postponed by regions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measles/ Measles Rubella/ Measles Mumps Rubella (M/ MR/MMR)</td>
<td>24</td>
<td>25</td>
<td>4 7 1 5 3 5</td>
</tr>
<tr>
<td>Polio (IPV)</td>
<td>8</td>
<td>8</td>
<td>7</td>
</tr>
<tr>
<td>Bivalent Oral Poliovirus (bOPV)</td>
<td>8</td>
<td>8</td>
<td>2 3 2 1</td>
</tr>
<tr>
<td>Monovalent Oral Poliovirus Type2 (mOPV2)</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
<tr>
<td>Meningitis A (Men A)</td>
<td>2</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Yellow Fever (YF)</td>
<td>3</td>
<td>4</td>
<td>2 2</td>
</tr>
<tr>
<td>Typhoid (TCV)</td>
<td>3</td>
<td>4</td>
<td>2 2</td>
</tr>
<tr>
<td>Cholera (OCV)</td>
<td>4</td>
<td>5</td>
<td>2 1 2</td>
</tr>
<tr>
<td>Tetanus (Td)</td>
<td>3</td>
<td>4</td>
<td>1 1 2</td>
</tr>
<tr>
<td><strong>Total postponed</strong></td>
<td><strong>46</strong></td>
<td><strong>64</strong></td>
<td><strong>26 9 8 5 7 9</strong></td>
</tr>
</tbody>
</table>

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

By region:
- **AFRO**: 28 countries
  - 11% (3) Disrupted, 89% (25) No disruption
- **AMRO**: 4 countries
  - 25% (1) Disrupted, 75% (3) No disruption
- **EMRO**: 11 countries
  - 27% (3) Disrupted, 73% (8) No disruption
- **EURO**: 9 countries
  - 44% (4) Disrupted, 56% (5) No disruption
- **SEARO**: 6 countries
  - 67% (4) Disrupted, 33% (2) No disruption
- **WPRO**: 4 countries
  - 50% (2) Disrupted, 50% (2) No disruption

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 via a-v via 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

<table>
<thead>
<tr>
<th>Concerns</th>
<th>Staff lacking motivation</th>
<th>Staff lacking motivation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Concerns about exposure to <strong>COVID</strong></td>
<td>Safety fears/concerns related to <strong>COVID</strong></td>
<td>Fears/ concerns related to response / lockdowns</td>
</tr>
<tr>
<td>Concerns about lockdowns, distancing policies, e.g. safety of public transport</td>
<td>Lack of PPE, training in IPC</td>
<td></td>
</tr>
<tr>
<td>Lack of <strong>awareness</strong> of <strong>continuity</strong> of <strong>vaccination services</strong></td>
<td>Lack of vaccines</td>
<td></td>
</tr>
<tr>
<td>Fears/concerns related to <strong>misinformation</strong>, <strong>rumours</strong>, <strong>conspiracies</strong>...</td>
<td>Lack of capacity</td>
<td></td>
</tr>
<tr>
<td>Vaccination suspended due to response</td>
<td><strong>Vaccination suspended due to response</strong></td>
<td></td>
</tr>
</tbody>
</table>

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 decreased 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

Closing Immunization Gaps Caused by COVID-19
DRAFT – 11 August 2020

www.who.int/immunization/programmes_systems/policies_strategies/catch-up_vaccination/en/
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.
https://www.paho.org/en/topics/immunization
Utilized Strategies

- **Vaccination in strategic places**, like pharmacies, stadiums, day care centers, cultural centers, banks, schools, work areas, grocery stores
- Follow-up on vaccination and calling on absentees
- Work with community leaders
- Use of social media
- Changes in opening hours
- Vaccination in cars
- Vaccination at home
- Institutional vaccination
- Vaccination according to sex and ID number
- Integration with other health and government programs
- Health worker referrals
- Adaptation of vaccination centers and vaccination complying with security measures

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

DOI: 10.1016/S2214-109X(20)30308-9
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
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 =
  - $1 - (1 - \text{transmission probability per contact})^{\text{number of contacts}}$

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

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 1\textsuperscript{st}, 2\textsuperscript{nd}, 3\textsuperscript{rd}, 4\textsuperscript{th} & 5\textsuperscript{th} 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, aslogistically 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?

Some countries may stop their vaccination programs for a while to reduce the risk of spreading COVID-19. But which is better: fewer coronavirus infections or making sure children get all their usual vaccinations?

December 2020 – A series of science articles adapted for children’s education, in partnership with Science Journal for Kids

- [https://www.gavi.org/vaccineswork/routine-vaccinations-during-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](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.

- 39 of 68 planned Gavi introductions for 2020 have been delayed (further 3 at risk of delay) in the 57 GAVI eligible countries.
- 73% (45/62) countries reported disruption in demand in WHO pulse survey, May 2020.
- Measles vaccine had the greatest drop in number of administered doses.
- 178 million people are at risk of missing measles shots in 2020.
- Of 29 countries which suspended measles campaigns due to COVID-19, 18 have reported outbreaks.
- Yellow fever outbreaks in Ethiopia, South Sudan, and Uganda.

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.

UNICEF vaccine survey, 2020

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 respondents mentioned no one in their household had been vaccinated due to COVID-19
  - 34% reported babies age 0-23 months 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;

Indonesia MOH Rapid Assessment in April, 2020:
Immunization services disrupted in 84% health facilities
- Inadequate understanding of MOH guide
- Insufficient funding (due to COVID response)
- Limited vaccinators (diverted to COVID-19)
- Travel restrictions, school closure
- Limited PPEs
Barriers to routine immunization during COVID-19 pandemic

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

Limited healthcare resources

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

Fear of COVID-19 infections

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

Low community demand

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

Lack of Transportation & Lock-downs
Restart vaccine services at full capacity as soon as possible - Catch-up vaccination need to be a gradual recovery.

**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

Control measures for immunization visit during the COVID-19 pandemic

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

Ener Cagri Dinleyici, etc (2020): Human Vaccines & Immunotherapeutics, DOI: 10.1080/21645515.2020.1804776
Ethiopia Moves Forward 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
“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.”

“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

“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.”

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

“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.”

“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.”

Immunization record system

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

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

- Limited healthcare resources
- Low community demand
- Fear of COVID-19 infections
- Lack of Transportation & Lock-downs
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

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 overstocking 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
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

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/
BASIC CHILDHOOD IMMUNIZATION COVERAGE IN ALL PROVINCES

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

Auliy A. Suwantika, Cornelis Boersma, and Maarten J. Postma

*Department of Pharmacology and Clinical Pharmacy, Faculty of Pharmacy, Universitas Padjadjaran, Bandung, Indonesia; Center for Excellence in Higher Education for Pharmaceutical Care Innovation, Universitas Padjadjaran, Bandung, Indonesia; Center for Health Technology Assessment, Universitas Padjadjaran, Bandung, Indonesia; *Unit of Global Health, Department of Health Sciences, University of Groningen, University Medical Center Groningen, Groningen, The Netherlands; *Unit of Pharmaco-Therapy, Epidemiology & -Economics, Department of Pharmacy, University of Groningen, Groningen, The Netherlands.

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

COSTS OF INTERVENTIONS TO INCREASE IMMUNIZATION COVERAGE

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

Sachiko Ozawa, Tatenda T. Yemeke, Kimberly M. Thompson

Abstract

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.

© 2018 Published by Elsevier Ltd.

Costs of interventions to increase immunization coverage

<table>
<thead>
<tr>
<th>Activity</th>
<th>0%</th>
<th>10%</th>
<th>20%</th>
<th>30%</th>
<th>40%</th>
<th>50%</th>
<th>60%</th>
<th>70%</th>
<th>80%</th>
<th>90%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routine immunization</td>
<td>$0.03</td>
<td>$0.04</td>
<td>$0.06</td>
<td>$0.09</td>
<td>$0.12</td>
<td>$0.18</td>
<td>$0.25</td>
<td>$0.36</td>
<td>$0.52</td>
<td>$0.74</td>
</tr>
<tr>
<td>Supplementary activity</td>
<td>$0.04</td>
<td>$0.06</td>
<td>$0.09</td>
<td>$0.13</td>
<td>$0.18</td>
<td>$0.26</td>
<td>$0.38</td>
<td>$0.54</td>
<td>$0.77</td>
<td>$1.10</td>
</tr>
<tr>
<td>Total</td>
<td>$0.07</td>
<td>$0.10</td>
<td>$0.15</td>
<td>$0.22</td>
<td>$0.30</td>
<td>$0.44</td>
<td>$0.63</td>
<td>$0.90</td>
<td>$1.29</td>
<td>$1.84</td>
</tr>
</tbody>
</table>

Cost of interventions to increase 1% coverage: $0.02
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

Total facilities assessed
N=5329 – 53% of total facilities in Indonesia

ACCESS
- Facility service disruptions (PHC, Village health post) 84%
- Facility suspension: Village health post 64%
- Facility suspension: PHC facility 32%
- School-based service suspension 26%

DEMAND
- COVID-19-related service hesitancy 76%

SUPPLY
- Limited protective equipment 67%
- Provider fear of COVID-19 50%
- Staff re-positioned 34%
- Commodity shortfalls 22%
- Funding re-directed 11%

“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

FACTORS CONTRIBUTING TO DECISION MAKING

Awareness of parents and caregivers on MoH guidelines

- Yes (78.44%) - 4519
- No (21.56%) - 1242

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

- 32.90% Yes
- 42.40% No
- 24.70% Don't know
- 72.60% Yes
- 17.20% No
- 10.20% Don't know

Key factors considered during the decision making

- Knowledge of the benefits of immunization: 94.96%
- Perceived quality of immunization services: 89.79%
- Experience of care (trust): 83.74%
- Service availability: 83.60%
- Fear of contracting COVID-19: 68.50%
- Accessibility: Schedule: 31.78%
- Accessibility: Distance: 22.38%
- Accessibility: Cost: 16.07%

EXPECTATIONS OF PARENTS AND CAREGIVERS ON IMMUNIZATION SERVICE DURING THE PANDEMIC

Source of information about safe immunization protocols

Key recommendations from parents and caregivers

Preferred channel of communication

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.
STRATEGIES FOR CATCH-UP VACCINATION IN INDONESIA

Routine immunization (RI) program
Integration with other health services
Periodic intensification of RI program
School-based immunization program
Supplementary immunization activities

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

<table>
<thead>
<tr>
<th>Region</th>
<th>Start-up cost</th>
<th>Recurrent cost</th>
<th>Total (1 year)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low intensity region</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>No PPE</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>IPC (hand sanitizer &amp; washing stations)</td>
<td>$24</td>
<td>$100</td>
<td>$1,224</td>
</tr>
<tr>
<td>Total cost</td>
<td>$24</td>
<td>$100</td>
<td>$1,224</td>
</tr>
<tr>
<td><strong>Medium intensity region</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PPE (masks)</td>
<td>$0</td>
<td>$141</td>
<td>$1,692</td>
</tr>
<tr>
<td>IPC (hand sanitizer &amp; washing stations)</td>
<td>$24</td>
<td>$100</td>
<td>$1,224</td>
</tr>
<tr>
<td>Total</td>
<td>$24</td>
<td>$241</td>
<td>$2,916</td>
</tr>
<tr>
<td><strong>High intensity region</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PPE (masks, gloves, goggles)</td>
<td>$11</td>
<td>$173</td>
<td>$2,087</td>
</tr>
<tr>
<td>IPC (hand sanitizer &amp; washing stations)</td>
<td>$150</td>
<td>$100</td>
<td>$1,350</td>
</tr>
<tr>
<td>Total</td>
<td>$161</td>
<td>$273</td>
<td>$3,437</td>
</tr>
</tbody>
</table>
PHYSICAL DISTANCING AND SCREENING

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

<table>
<thead>
<tr>
<th>Region</th>
<th>Start-up cost</th>
<th>Recurrent cost</th>
<th>Total (1 year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low intensity region</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Crowd controller (per diem, no PPE)</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Infrared thermometer</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Total cost</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Medium intensity region</td>
<td>$0</td>
<td>$41</td>
<td>$492</td>
</tr>
<tr>
<td>Crowd controller (per diem, masks)</td>
<td>$0</td>
<td>$41</td>
<td>$492</td>
</tr>
<tr>
<td>Infrared thermometer</td>
<td>$0</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Total</td>
<td>$0</td>
<td>$41</td>
<td>$492</td>
</tr>
<tr>
<td>High intensity region</td>
<td>$0</td>
<td>$104</td>
<td>$1,248</td>
</tr>
<tr>
<td>Crowd controller (per diem, masks, gloves)</td>
<td>$0</td>
<td>$104</td>
<td>$1,248</td>
</tr>
<tr>
<td>Infrared thermometer</td>
<td>$70</td>
<td>$0</td>
<td>$70</td>
</tr>
<tr>
<td>Total</td>
<td>$0</td>
<td>$273</td>
<td>$1,318</td>
</tr>
</tbody>
</table>
## 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

<table>
<thead>
<tr>
<th>Region</th>
<th>Recurrent cost</th>
<th>Total (1 year)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low intensity region</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport</td>
<td>-$16</td>
<td>-$192</td>
</tr>
<tr>
<td>Per diem</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Total cost</td>
<td>-$16</td>
<td>-$192</td>
</tr>
<tr>
<td><strong>Medium intensity region</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport</td>
<td>$85</td>
<td>$1,020</td>
</tr>
<tr>
<td>Per diem</td>
<td>$5</td>
<td>$60</td>
</tr>
<tr>
<td>Total</td>
<td>$90</td>
<td>$1,080</td>
</tr>
<tr>
<td><strong>High intensity region</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport</td>
<td>$256</td>
<td>$3,072</td>
</tr>
<tr>
<td>Per diem</td>
<td>$55</td>
<td>$660</td>
</tr>
<tr>
<td>Total</td>
<td>$311</td>
<td>$3,732</td>
</tr>
</tbody>
</table>
### INCREASED OUTREACH VOLUMES

Recurrent cost for increased outreach volumes for an average health facility

<table>
<thead>
<tr>
<th>Region</th>
<th>Recurrent cost</th>
<th>Total (1 year)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low intensity region</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport</td>
<td>$1</td>
<td>$12</td>
</tr>
<tr>
<td>Per diem</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Total cost</td>
<td>$1</td>
<td>$12</td>
</tr>
<tr>
<td><strong>Medium intensity region</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport</td>
<td>$2</td>
<td>$24</td>
</tr>
<tr>
<td>Per diem</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Total</td>
<td>$2</td>
<td>$24</td>
</tr>
<tr>
<td><strong>High intensity region</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport</td>
<td>$5</td>
<td>$60</td>
</tr>
<tr>
<td>Per diem</td>
<td>$3</td>
<td>$36</td>
</tr>
<tr>
<td>Total</td>
<td>$8</td>
<td>$96</td>
</tr>
</tbody>
</table>
# Increased Outreach Volumes

Recurrent cost for increased outreach volumes for an average health facility

<table>
<thead>
<tr>
<th>Region</th>
<th>Recurrent cost</th>
<th>Total (1 year)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Low intensity region</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport</td>
<td>$1</td>
<td>$12</td>
</tr>
<tr>
<td>Per diem</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Total cost</td>
<td>$1</td>
<td>$12</td>
</tr>
<tr>
<td><strong>Medium intensity region</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport</td>
<td>$2</td>
<td>$24</td>
</tr>
<tr>
<td>Per diem</td>
<td>$0</td>
<td>$0</td>
</tr>
<tr>
<td>Total</td>
<td>$2</td>
<td>$24</td>
</tr>
<tr>
<td><strong>High intensity region</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Transport</td>
<td>$5</td>
<td>$60</td>
</tr>
<tr>
<td>Per diem</td>
<td>$3</td>
<td>$36</td>
</tr>
<tr>
<td>Total</td>
<td>$8</td>
<td>$96</td>
</tr>
</tbody>
</table>
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

- All these studies were funded by the Ministry of Education and Culture, Republic of Indonesia.