

Maternal-infant rotavirus-specific antibody kinetics to inform timing of vaccine boosting in Malawi: An observational study

15th International Rotavirus Symposium, Cape Town, 2025

Jonathan Mandolo, Leah Mulira, Martha Moyo, Memory Mvula, Fatima Mtonga, Marc Y. R. Henrion, Willy Wotcheni, Nigel A. Cunliffe, Kayla G. Barnes, Kondwani C. Jambo, **Khuzwayo C. Jere**

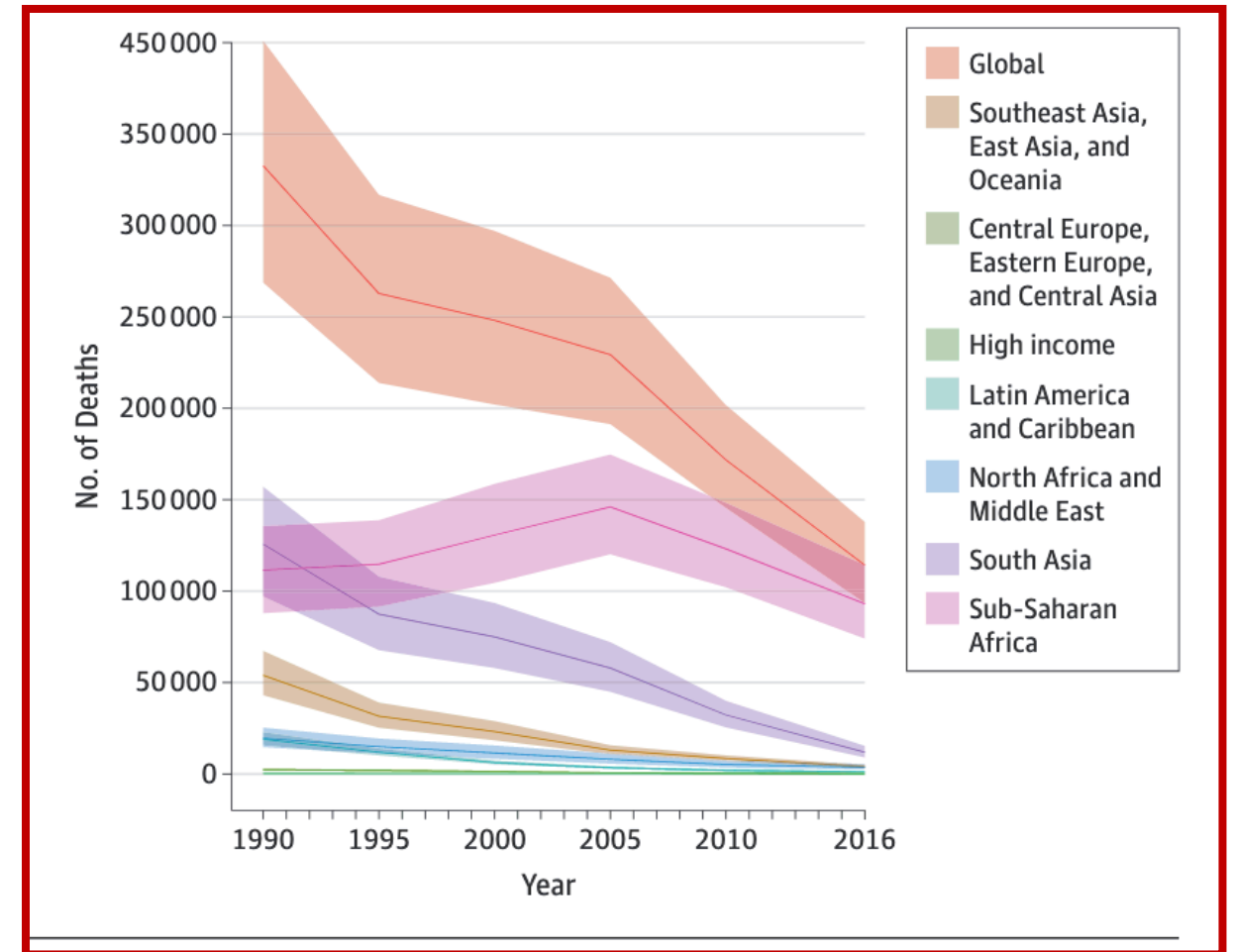
NIHR Global Health Professor: University of Liverpool & Kamuzu Health of Health Sciences
Virology Group Head: Malawi Liverpool Wellcome Research Programme

2nd October 2025

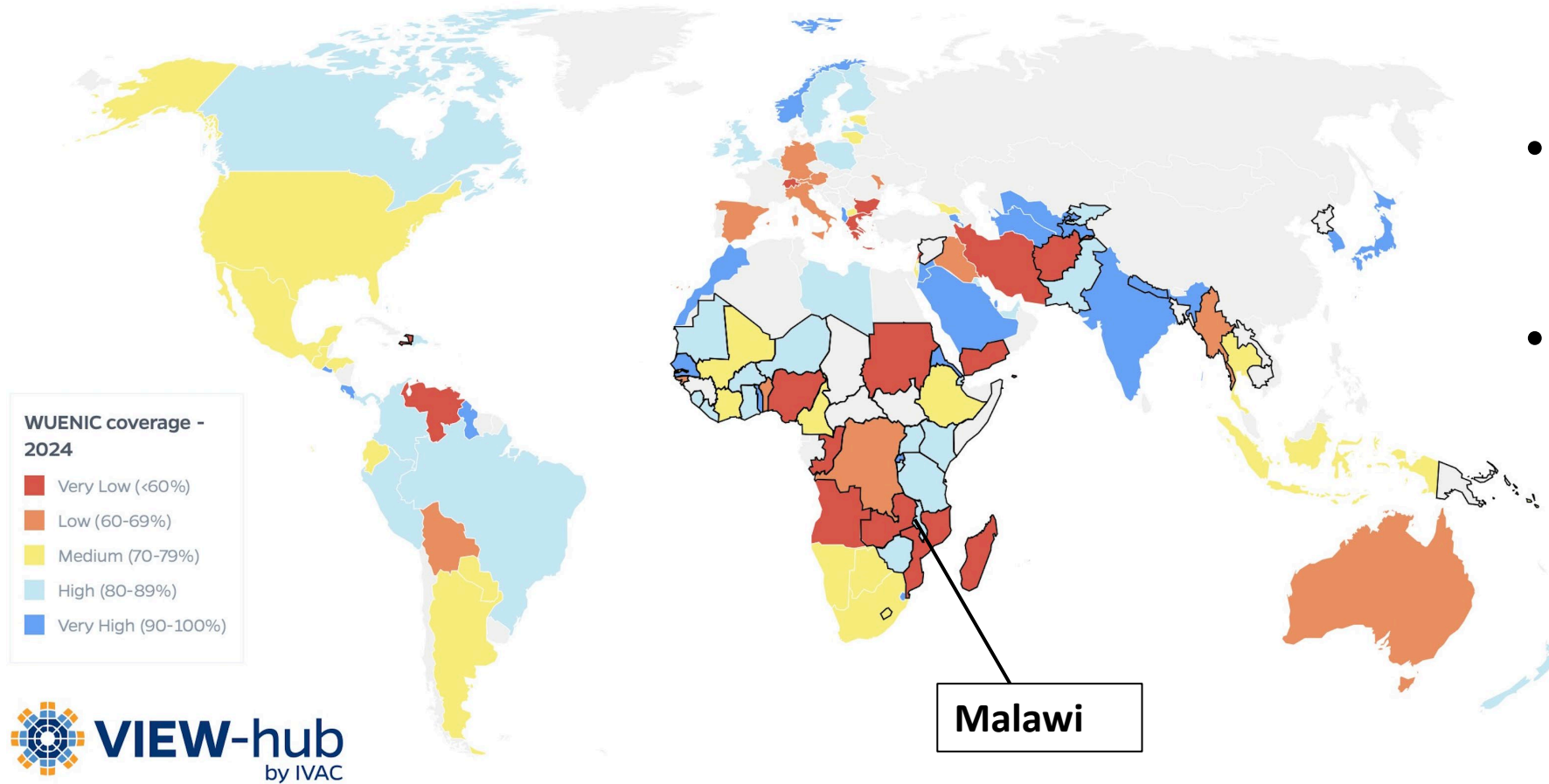
Global burden of rotavirus

Rotavirus Burden

- **Pre-vaccine:** >500,000 deaths annually in children <5 years.
- **Post-vaccine:**
 - ~128,500 deaths annually worldwide
 - ~104,700 deaths in **sub-Saharan Africa**
 - **Malawi:** ~1,000 child deaths annually



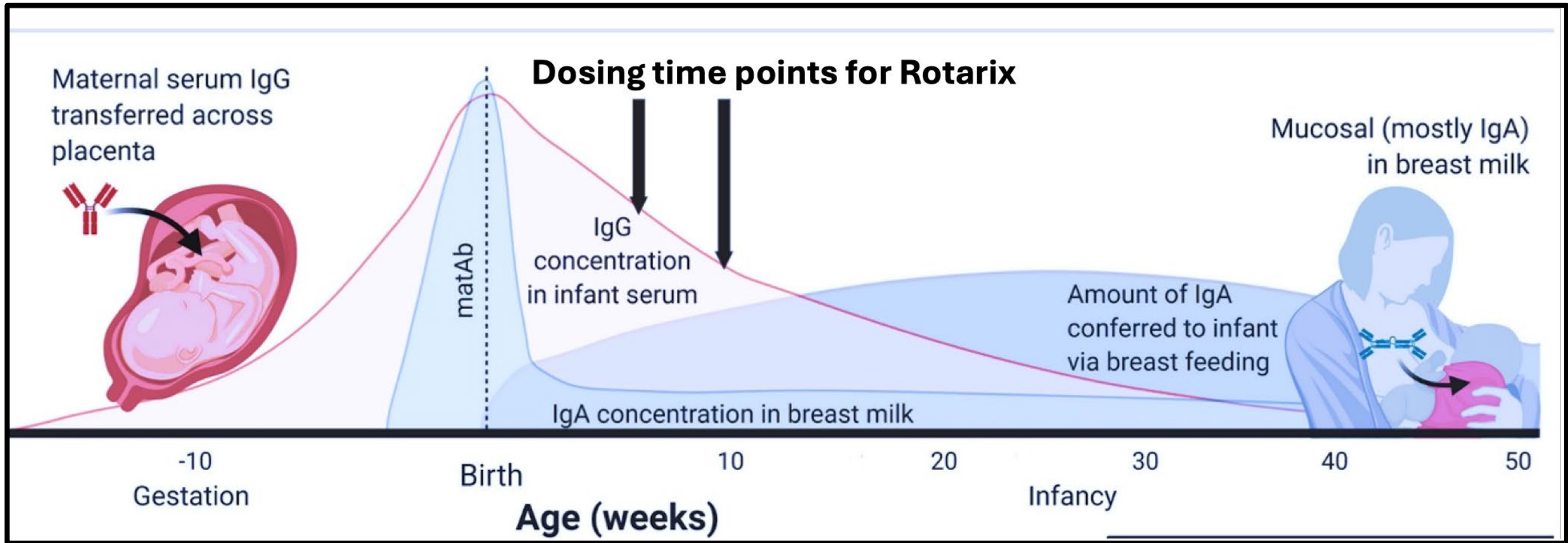
Rotavirus vaccine introduction coverage status



- Vaccines introduced in **142 countries**.
- **Malawi**: among highest coverage (>90%).
- **Challenge**: Vaccine effectiveness is **lowest in LMICs**, where rotavirus burden is highest.

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Maternal derived rotavirus-specific IgG antibodies and Rotavirus vaccines seroconversion



Hypothesis

Susceptibility to rotavirus infection is related to rotavirus-specific IgG, and better understanding of its kinetics would improve immunogenicity of live attenuated rotavirus vaccines

Study aim

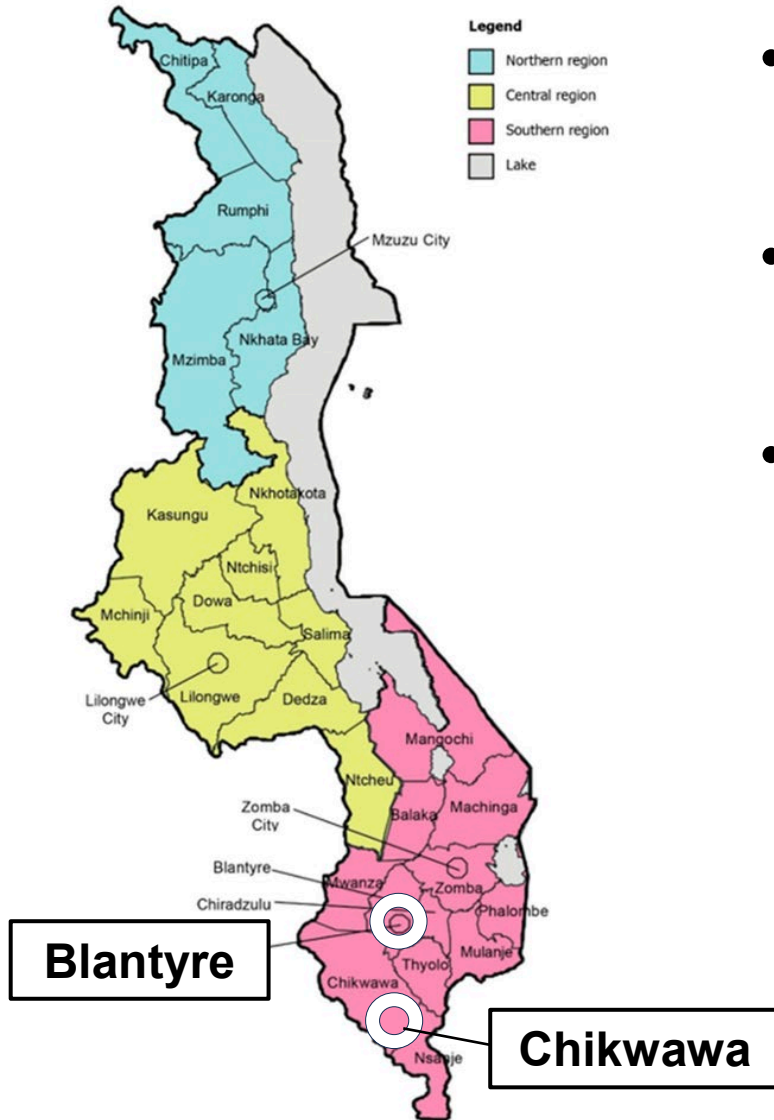
To identify **when** and at **what level of** maternal antibodies **threshold** would enhance strong infant vaccine responses.

Specific objectives

1. To determine **kinetics of rotavirus-specific IgA and IgG** antibodies at an individual and population levels.
2. To **identify a potential age window for an additional Rotarix dose** based on maternal antibody kinetics.
3. To determine an **association** between rotavirus-specific antibody **kinetics** and rotavirus-related **severe gastroenteritis**.



Sampling Designs – Southern Malawi



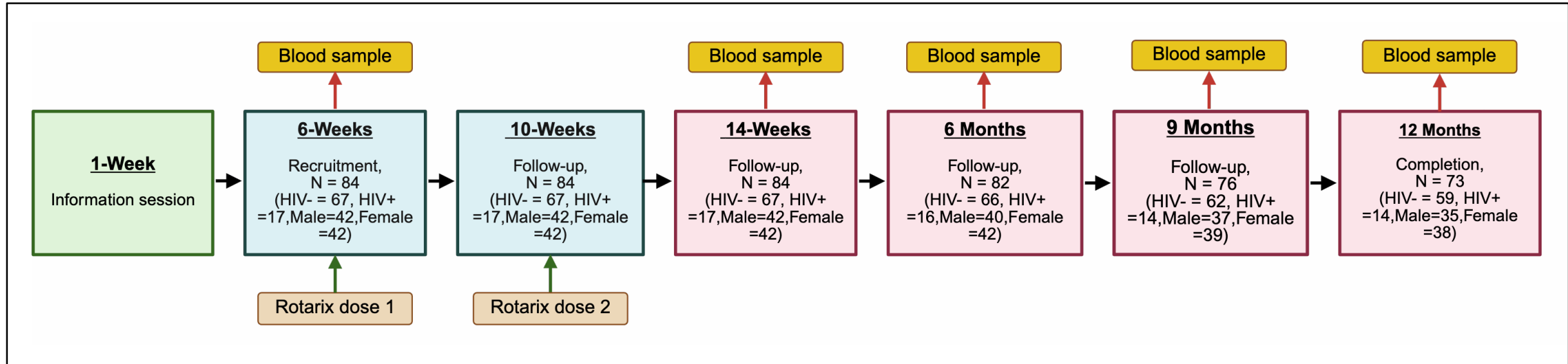
- **Designs:** Longitudinal cohort & cross-sectional studies (rural & urban).
- **Longitudinal cohort (ROTAHOST):** 84 infants (6 weeks) at routine EPI visits (Chilomoni Health Centre, Blantyre).
- **Cross-sectional cohort:**
 - **Urban cohort (SEROSURV):** 492 individuals (0–86 yrs), Ndirande, Blantyre.
 - **Rural cohort (SEROSURV):** 306 individuals (0–86 yrs), Chikwawa.
 - **Cases (DIARSURV):** 1,199 children <5 with rotavirus gastroenteritis (Nov 2012–Dec 2024, QECH, Blantyre).

Laboratory Methods

Antibody-sandwich enzyme-immunosorbent assays (ELISA) were utilised:

- **Rotavirus specific Immunoglobulin A (IgA)**
 - Indicator of seroconversion to rotavirus vaccination.
 - Recent infection and protection against disease.
- **Rotavirus specific Immunoglobulin G (IgG)**
 - Previous exposure to infection or vaccine.
 - Indicator of maternal delivered antibodies.

Recruitment and follow-up of participants in a longitudinal cohort study

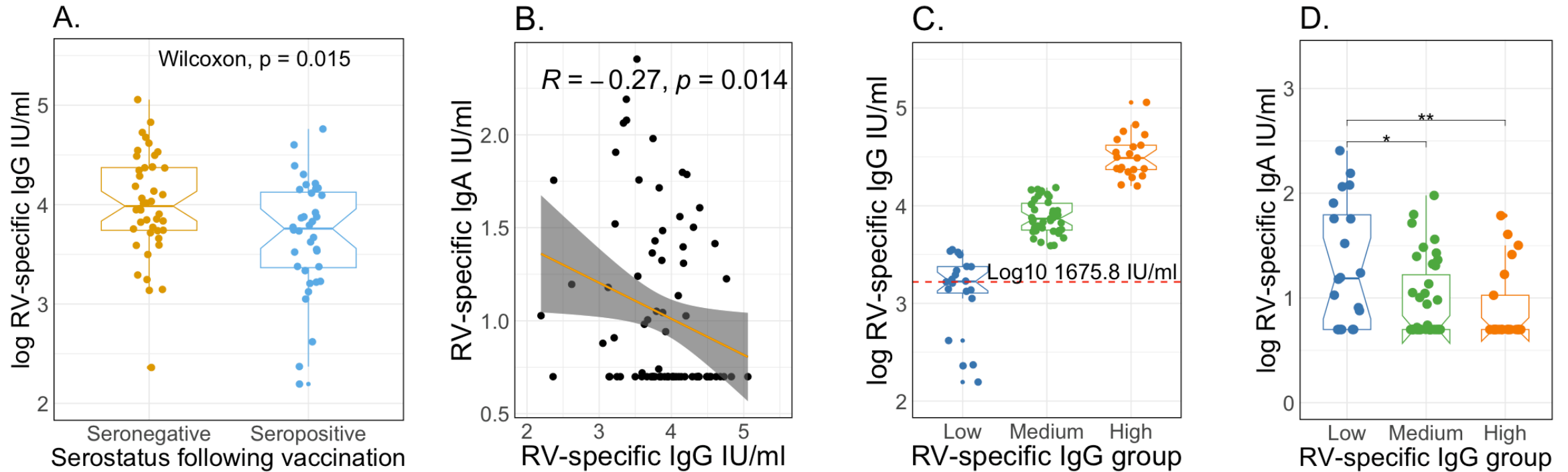


Participants were recruited at 6 weeks of age and followed at multiple timepoints corresponding to routine immunisation visits, in line with Malawi's Extended National Immunisation Programme.

Low levels of post Rotarix seroconversion in Malawi

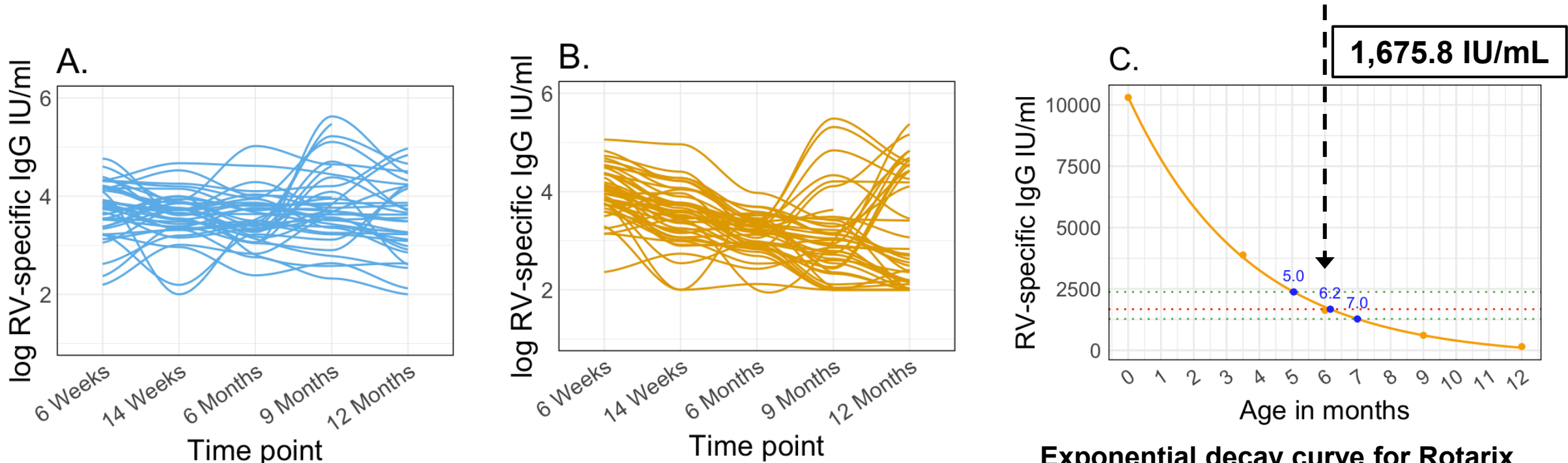
- **Seroconversion** ($\text{IgA} \geq 20 \text{ IU/ml}$ or 4-fold rise) was **26.19%** (22/84) (95% CI, 16.98–32.52).
- **Seropositivity** ($\text{IgA} \geq 7 \text{ IU/ml}$) was **46.43%** (39/84) (95% CI, 34.10–55.90).
- **Pre-exposure** ($\geq 20 \text{ IU/ml}$ of RV-Specific IgA at baseline) for longitudinal samples was **4.76%** (4/84) (95% CI, 1.3–11.61).

Maternal derived rotavirus-specific IgG negatively impact Rotarix seroconversion

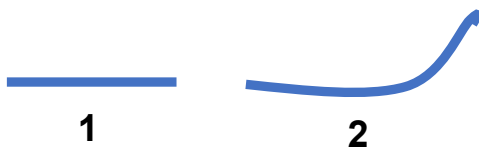


(A) Comparison of rotavirus-specific IgG antibody levels at baseline based on rotavirus-specific IgA serostatus post Rotarix. **(B)** Relationship between baseline rotavirus-specific IgG levels and post Rotarix rotavirus-specific IgA. **(C)** Week 6 rotavirus-specific IgG groups for children. **(D)** Rotavirus-specific IgA titres post Rotarix based on baseline rotavirus-specific IgG quartile

Rotarix dose at 6 months of age could improve its performance due to low population levels of RV-specific maternal IgG



Seropositive post second dose



Seronegative post second dose

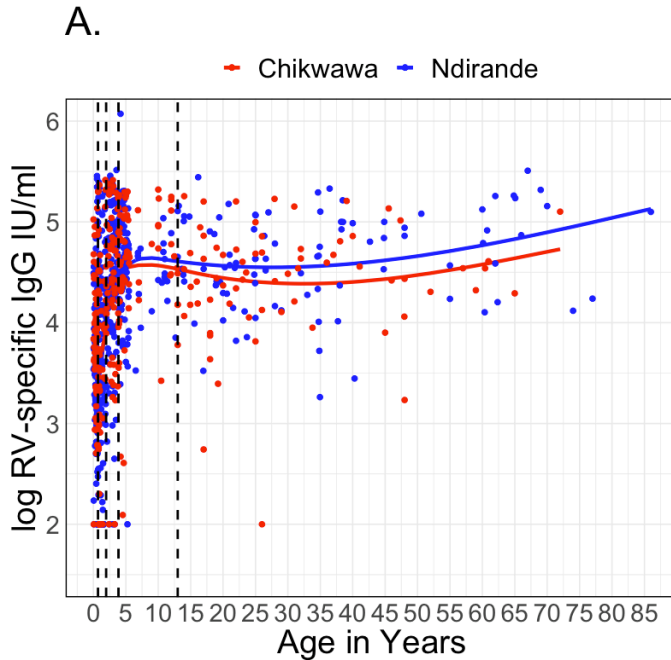


Exponential decay curve for Rotarix seronegative participants who were not serologically exposed after the second dose of Rotarix, defined by absence of ≥ 3 -fold increases in rotavirus-specific IgG titres between any two timepoints

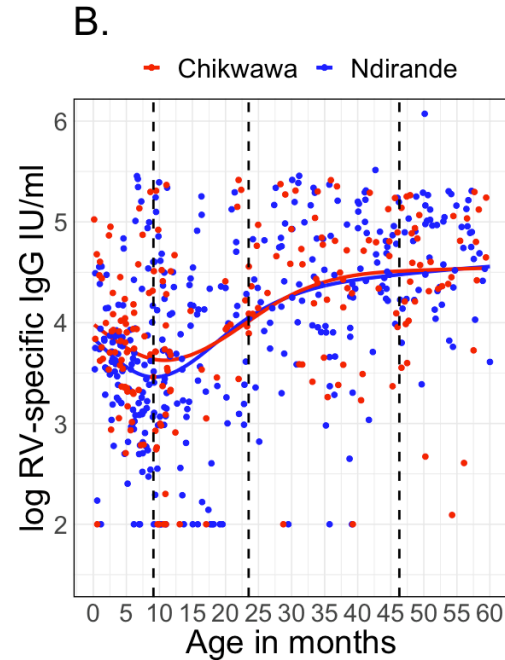
Cross-sectional study Participants characteristics

Characteristic	Category	Value, N = 798 (%)
Age group	<3m	46 (5.76)
	3 - 6m	87 (10.90)
	7 - 9m	63(7.89)
	10 - 12m	50 (6.27)
	13 - 23m	76 (9.52)
	2y	82 (10.28)
	3y	90 (11.28)
	4y	73 (9.15)
	5y - 9y	42 (5.26)
	10y -19y	69 (8.65)
	20y - 29y	48 (6.02)
	30y - 39y	29 (3.63)
	40y - above	43 (5.39)
RV1 (<5years)	Unknown	363 (64.02)
	1 dose	20 (3.35)
	2 doses	184 (32.45)
Sex	Female	394 (49.37)
	Male	404 (50.63)
Site	Chikwawa	306 (38.35)
	Ndirande	492 (61.65)

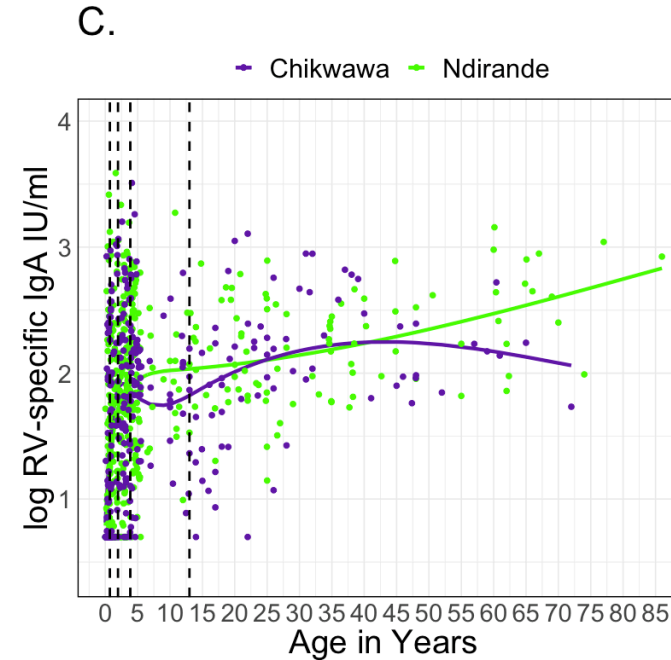
Population-level nonlinear trajectory of rotavirus-specific IgG and IgA levels across the lifespan



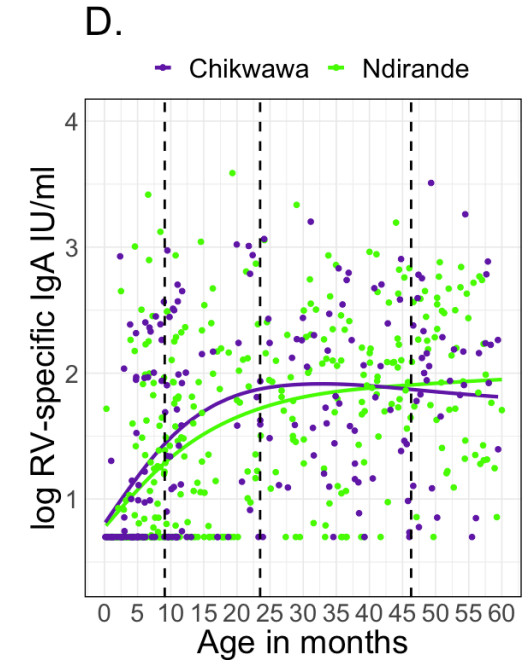
Rotavirus-specific IgG kinetics for all ages.



Rotavirus-specific IgG kinetics <5 years

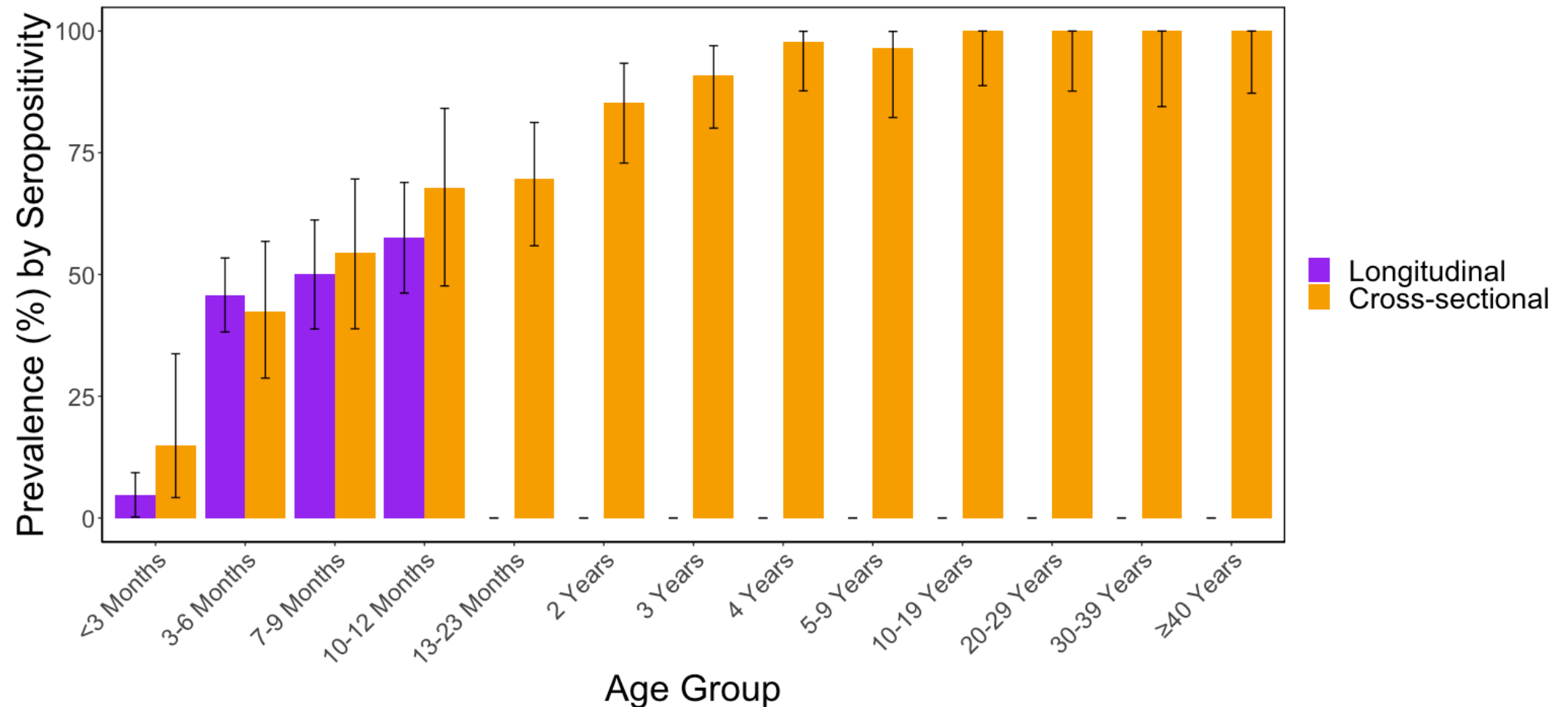


Rotavirus-specific IgA kinetics for all ages



Rotavirus-specific IgA kinetics <5 years

Comparable rotavirus-specific IgA seropositivity at individual and population-level

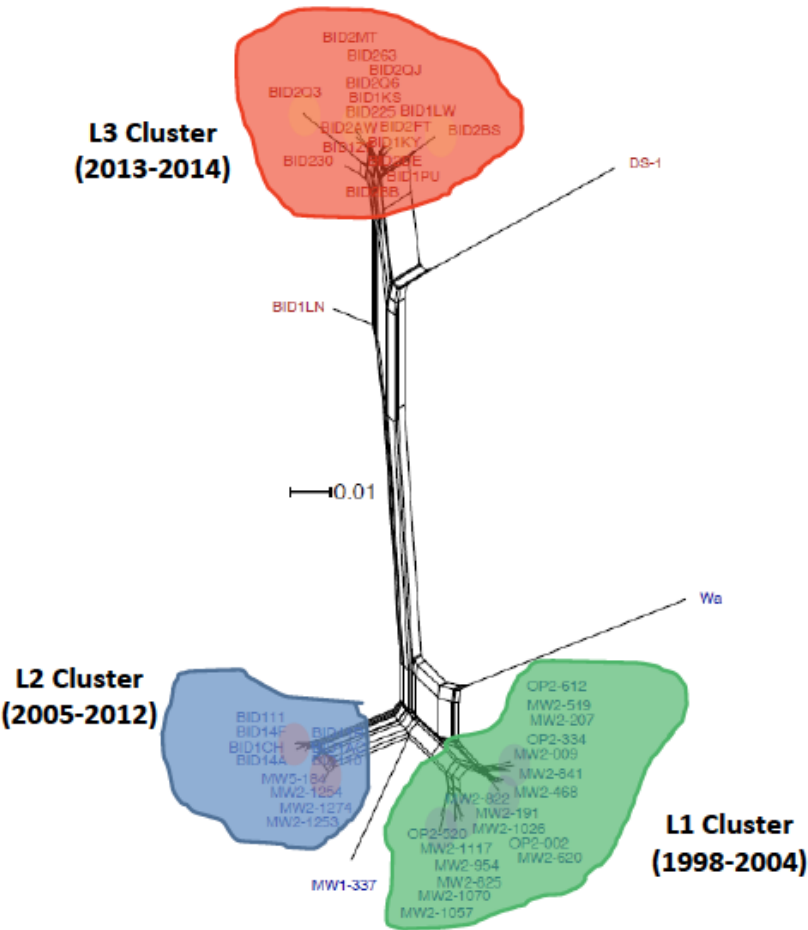


Rotavirus genotype diversity in Blantyre Malawi, 1997 - 2024

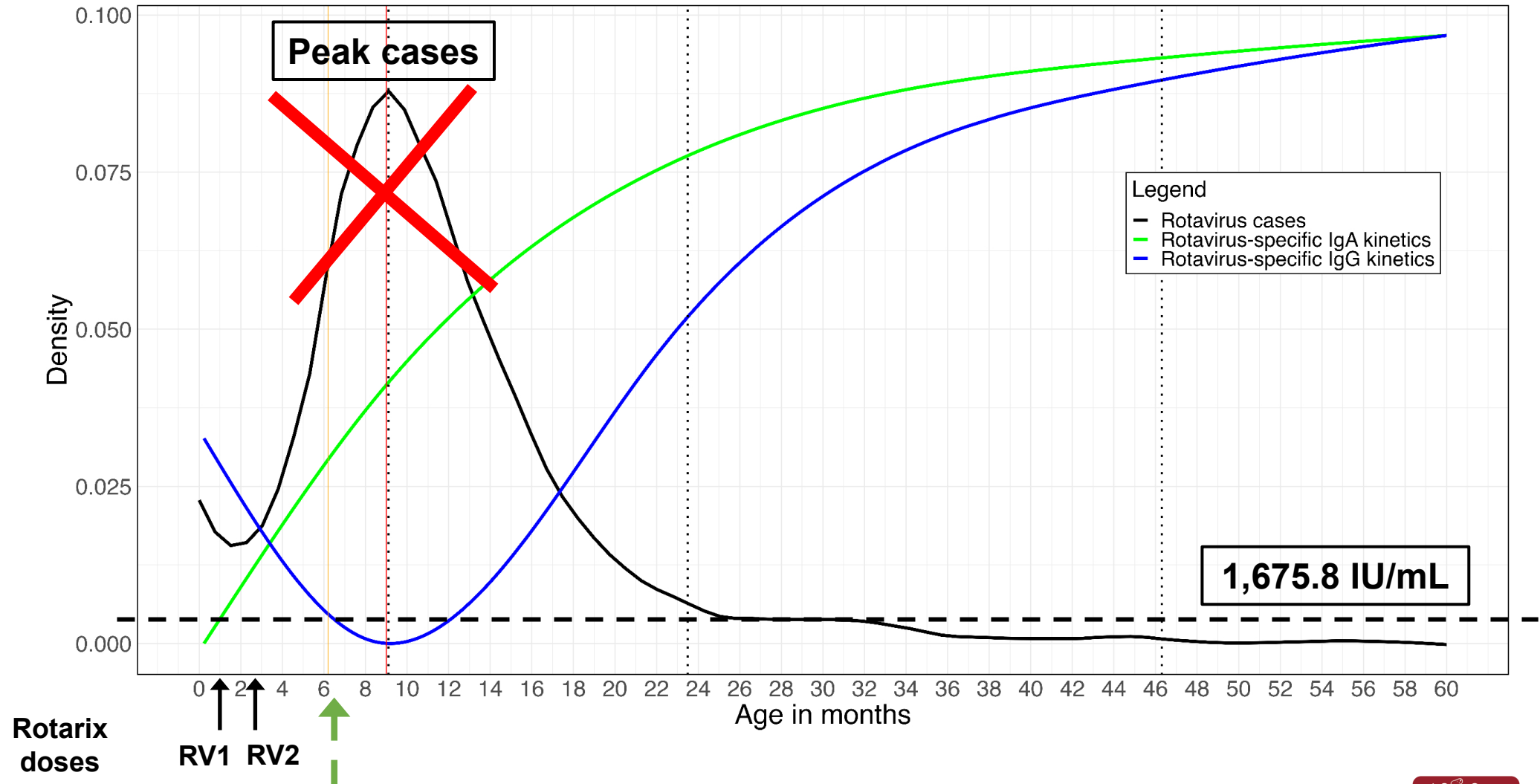
Rotavirus Strain Surveillance (1997 – Present)



Rotavirus Evolutionary Studies (1997 – Present)



Kinetics of rotavirus specific antibodies mirror with a pattern rotavirus-related severe gastroenteritis



Y-axis: Case density (cases per age group ÷ total). IgA/IgG: Scaled to density to show patterns, not absolute levels

Limitations

- Serum rotavirus-specific IgA correlates with protection, but absence $\neq$ no immunity.
- Optimal window estimate (6.2 months) based on only **27 non-seroconverters**.

Conclusions and recommendation

- **Rotavirus hyperendemicity in Malawi** likely reduces Rotarix immunogenicity.
- A **booster dose at 6–8 months**, when maternal antibodies are low and severe disease risk is high, may improve protection.
- A **clinical trial** is needed to confirm the effectiveness of this additional dose or dose 2 rescheduling.

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Post-launch Assessment of Rotavirus Vaccine Implementation in Indonesia: Key Findings from 11 Provinces

Fifteenth Internasional Rotavirus Symposium

30 September to 2 October 2025, Cape Town, South Africa

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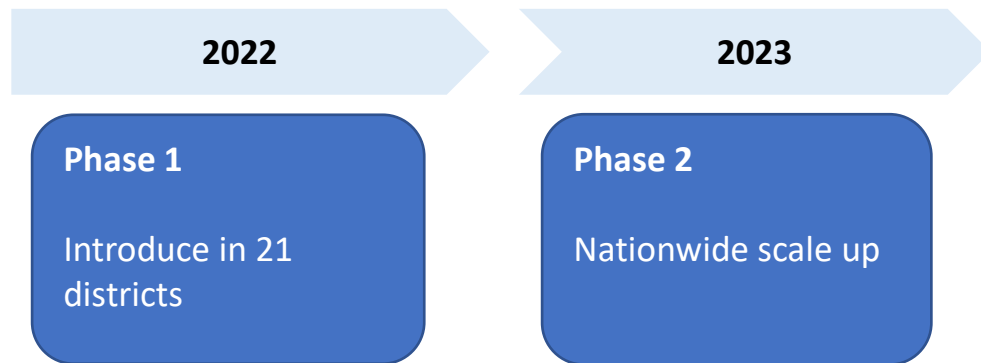
Background: Rotavirus Vaccine Introduction in Indonesia

Disease Burden



- **Diarrhea** is one of the top infectious causes of under-five mortality in Indonesia, causing an estimated 122,000 – 215,000 under-five deaths annually¹.
 - Diarrhea is the most common cause of death (10.7%) for the group of children under-5 (12-59 months), and the 2nd most common cause of post neonatal death (12.1%)².
- Rotavirus is the leading cause of severe acute gastroenteritis in children under-5, resulting in an **estimated 45-61% of all diarrhea cases** in Indonesia³.

Following 2019 NITAG recommendation, the MOH included Rotavirus Vaccine (RVV) into Indonesia's National Immunization Program, with nationwide introduction in August 2023.



Product used: *Rotavac*, frozen liquid (BBIL)

- 3 doses, oral administration with a **minimum interval of 4 weeks** between doses
- Administered alongside other routine antigens:
 - **2 months:** DTP-1, bOPV-2, PCV-1, **RV-1**
 - **3 months:** DTP-2, bOPV-3, PCV-2, **RV-2**
 - **4 months:** DTP-3, bOPV-4, IPV-1, **RV-3**

¹ Indonesia Basic Health Survey Data, 2018 (Data 2013 – 2017) ² Ministry of Health. Indonesia Health Profile 2019 ³Y. Soenarto, A.T. Aman, A. Bakri, H. Waluya, A. Firmansyah, M. Kadim, et al. Burden of severe rotavirus diarrhea in Indonesia, J Infect Dis, 200 (s1), 2009

Post-Launch Assessment (PLA): Purpose and Method



Purpose

1. Identify challenges in RV immunization rollout.
2. Determine support needs at subnational levels.
3. Document progress 7-8 months post-launch.



Method

- Self-assessment checklist (web-based, 20–30 min)
- Provincial workshops
- Monitoring visit to DHO and PHC

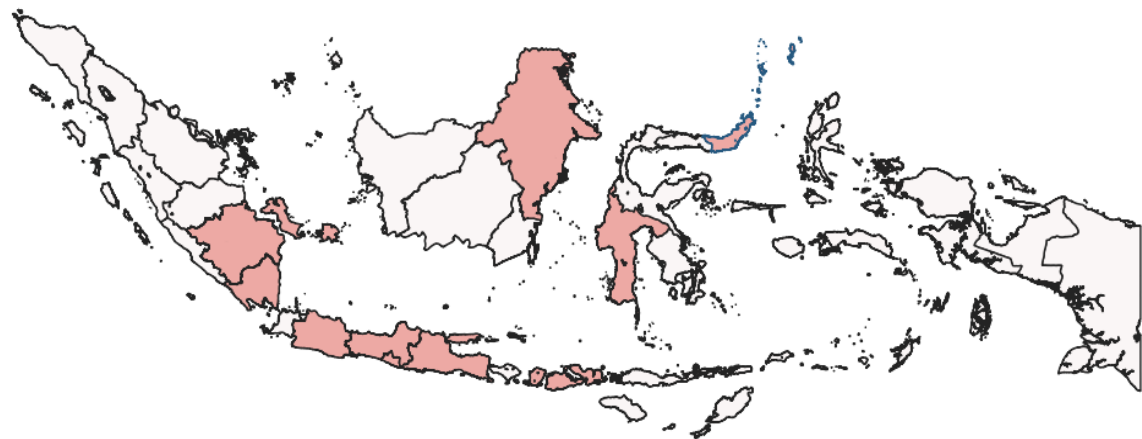
Dimensions Assessed by Level

Dimensions	Province	District	PHC
Policies and regulations	✓	✓	✓
Funding	✓	✓	✓
Microplanning	N/A	N/A	✓
Advocacy, socialization, and capacity building	✓	✓	✓
Logistics	✓	✓	✓
Cold-chain	✓	✓	✓
Waste management	N/A	N/A	✓
Data recording and reporting	✓	✓	✓
Monitoring and evaluation	✓	✓	N/A
AEFI Management	✓	✓	✓
Private sector involvement	N/A	✓	✓
Implementation challenges*	N/A	N/A	✓

** Implementation challenges were collected as descriptive responses and are presented separately, not included in scoring*

Post-Launch Assessment (PLA): Sampling, Data Collection and Analysis

Purposive sampling, 11 selected provinces



Sampling and Participation by Activity

Activity	Target sites	Participation
Self-assessment	11 provinces (all PHOs, DHOs, PHCs)	11 PHOs (100%), 174 DHOs (100%), 3,597 PHCs (92%)
Provincial workshop	11 provinces (all PHOs, DHOs)	11 PHOs (100%), 174 DHOs (100%)
Monitoring visits	1 DHO + 2 PHCs per province	11 DHOs, 22 PHCs

Data Collection and Analysis:



- Scores aggregated into dimensions and summarized in dashboards.
- Qualitative insights from workshops and visits used to interpret and validate results.

Asesmen Pasca Pencanangan Imunisasi Rotavirus (RV) Tingkat Provinsi

Lanjutkan nanti

* G03Q02 Dinas Kesehatan Provinsi telah mengeluarkan Surat Edaran untuk introduksi imunisasi antigen baru

Pilih jawaban yang sesuai

☐ Rotavirus (RV)

☐ Tidak mengeluarkan Surat Edaran

* G03Q03 Buku petunjuk teknis (baik cetak maupun elektronik) yang telah tersedia di wilayah kerja Anda

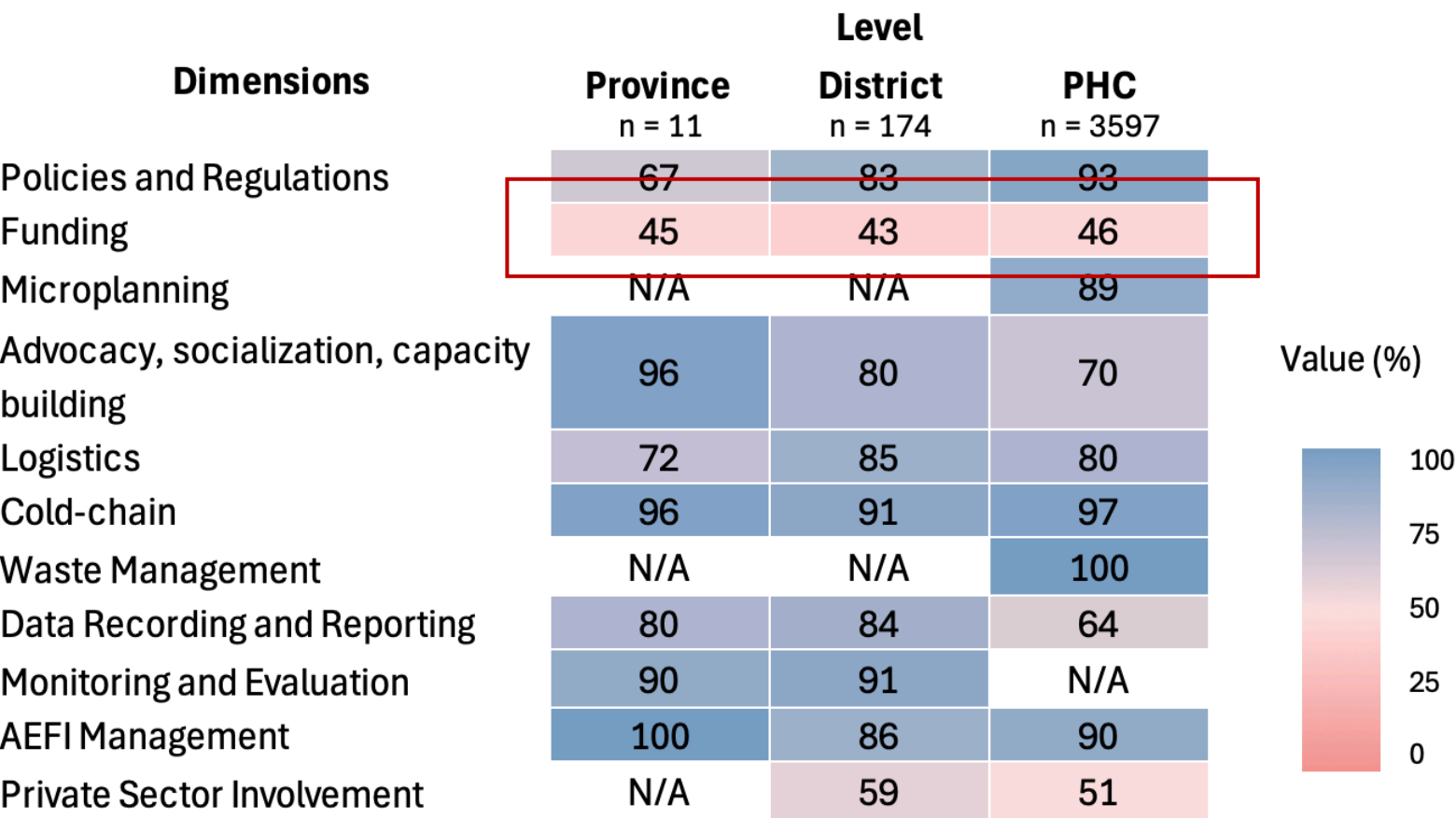
Pilih jawaban yang sesuai

☐ Rotavirus (RV)

☐ Tidak tersedia buku petunjuk teknis

Example of Web-Based Self-Assessment Form

Key Findings Summary: PLA Scores Across Level

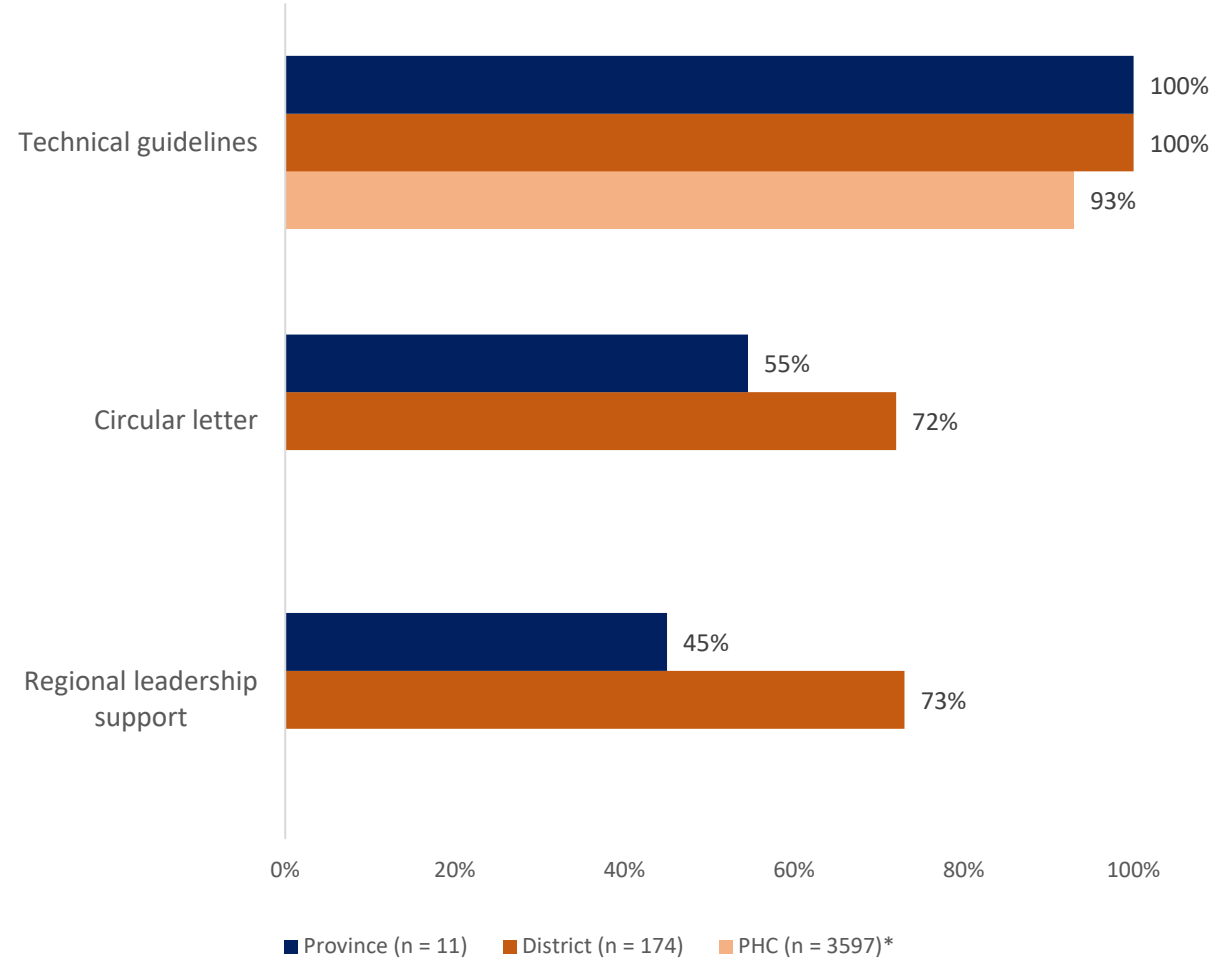


Highlights:

- Each level shows different scores, **reflecting Indonesia’s decentralized health system** and varying capacities across levels.
- **Funding was consistently low across levels** due to the mid-year rollout.
- Provinces, districts, and PHCs **adapted by leveraging routine immunization budgets** and pooling resources with other programs.

Data disclaimer: scores are self-reported; question scope differs by level.

Regulations and Policies

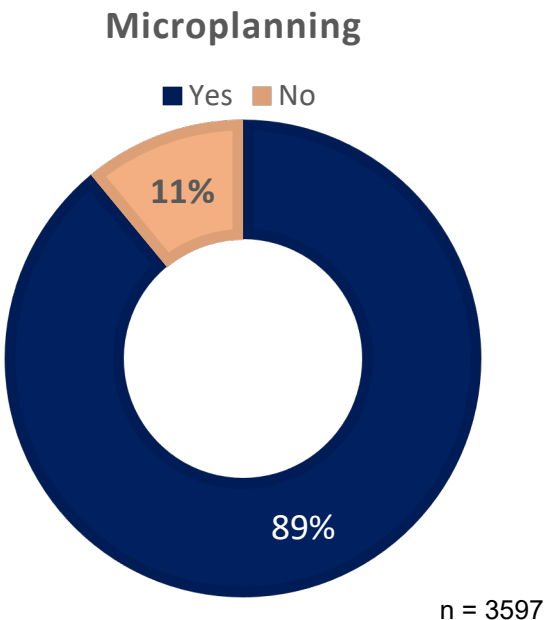


Technical guidelines were **available across all levels**, with almost all PHCs reporting access.

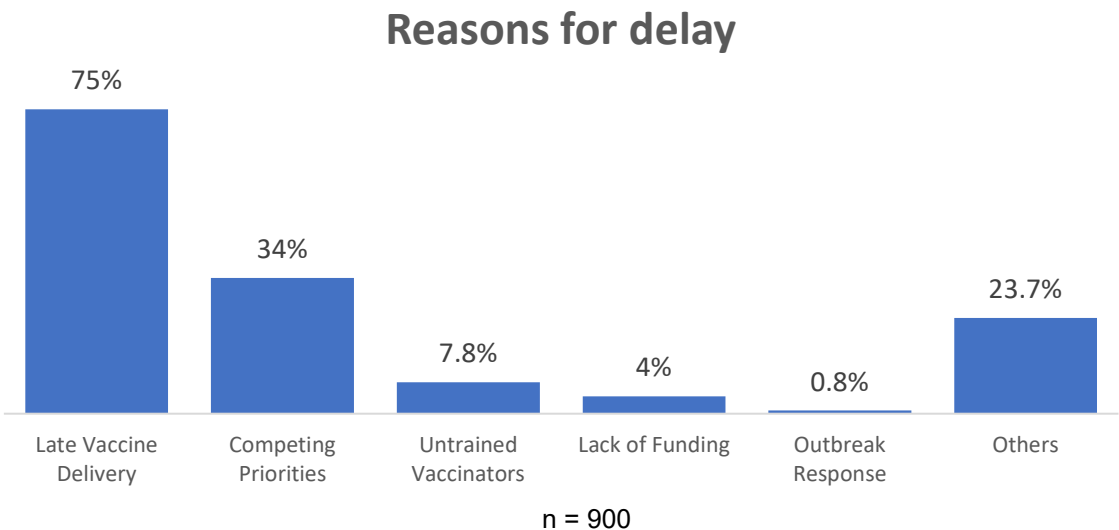
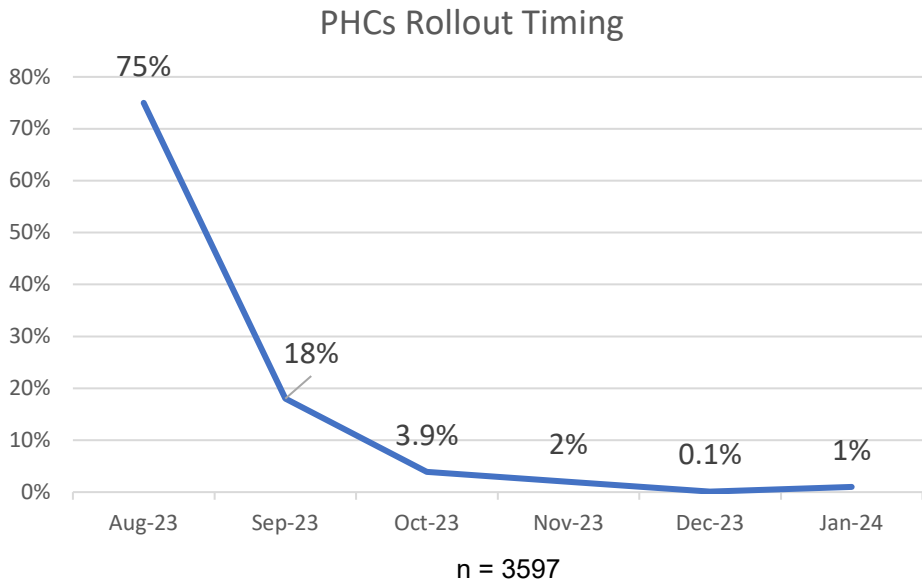
Circular letters and leadership support were more **frequently reported at district level**, consistent with Indonesia’s decentralized system where districts may issue local directives based on national or provincial guidance.

*At PHC level, only technical guidelines were assessed

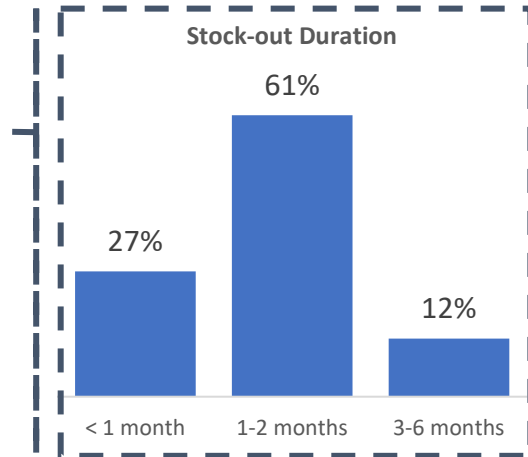
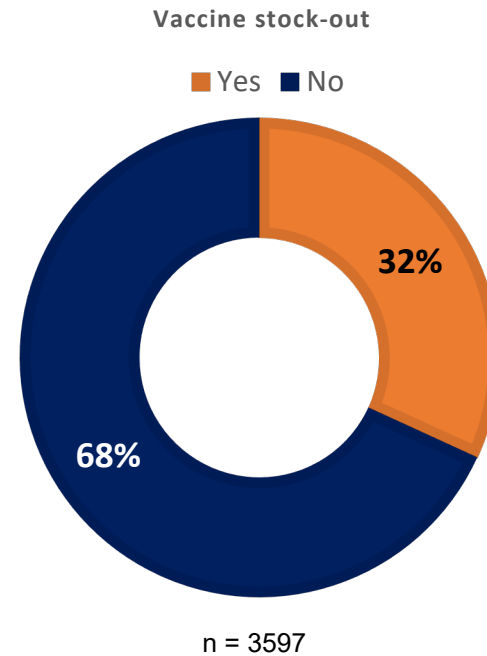
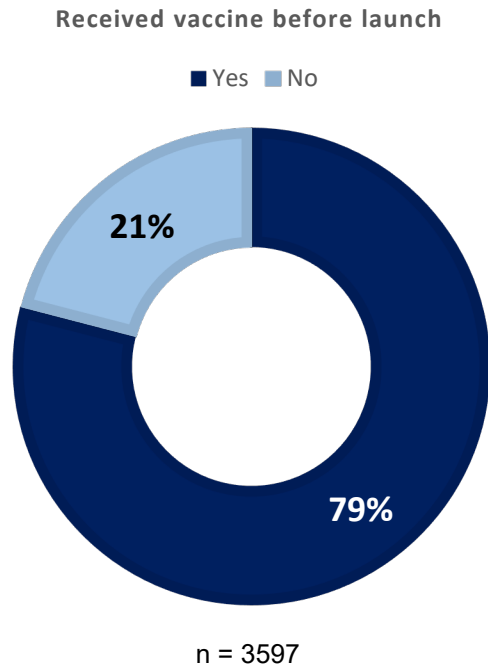
Microplanning and Rollout Timing at the PHC Level



- Most PHCs had microplans in place, reflecting pre-launch preparation.
- Rollout was not simultaneous: about 25% of PHCs started later.
- Delays were mainly due to late vaccine delivery, competing priorities, and alignment with annual plans.
- Some districts synchronized RVV rollout with routine outreach activities to optimize coverage and reduce missed opportunities.

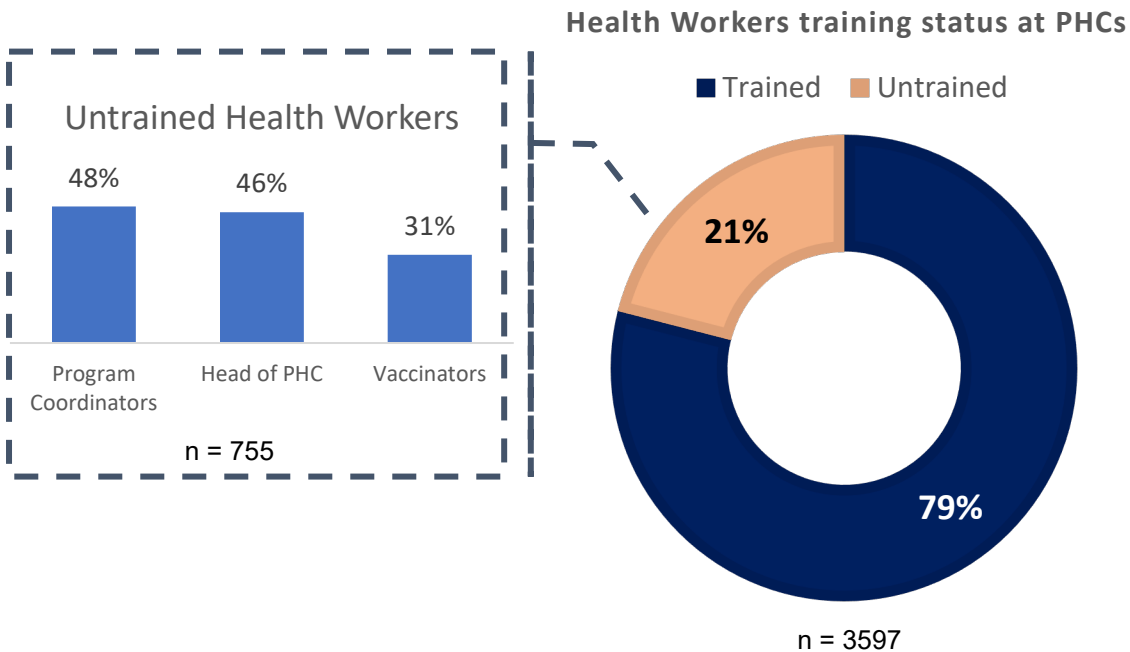


Vaccine Logistics and Supply Chain at the PHC Level



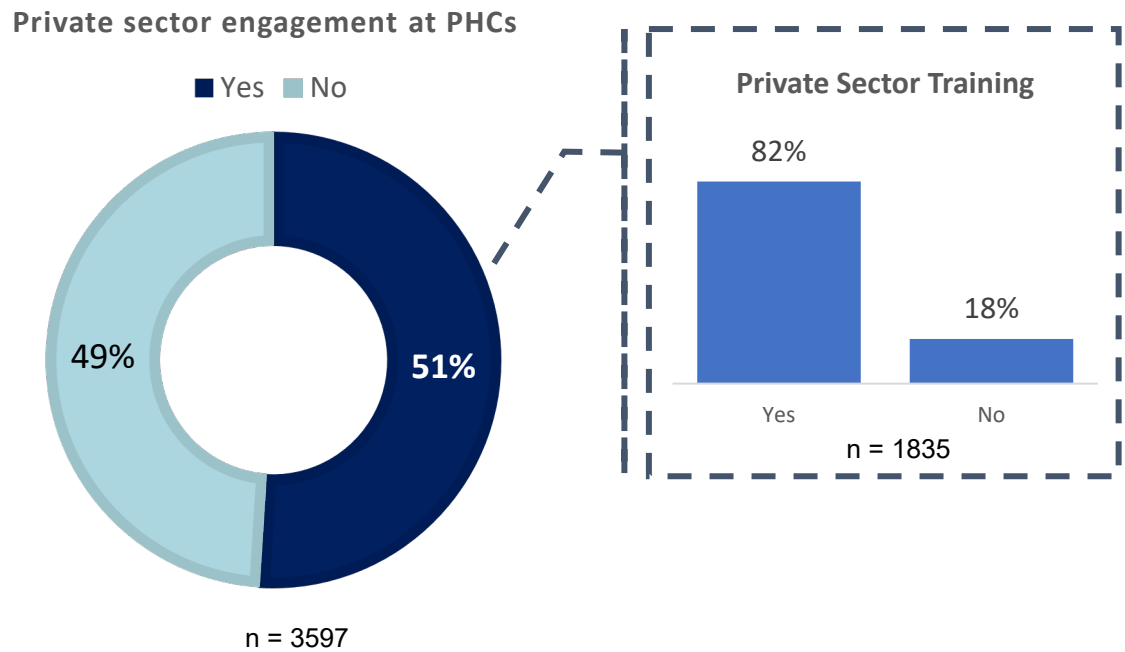
- **Most PHCs received vaccines prior to the national launch**, supporting timely rollout in many areas.
- Vaccine stock-outs occurred during implementation, with most lasting 1-2 months, reflecting challenges in planning and procurement.
- Indonesia uses eLMIS since 2022 as the national logistics system, which can enable reliable monitoring when updates are timely and accurate across all levels.

Health Workers Training and Private Sector Engagement



79% of PHC staff trained, but gaps remain among program coordinators, PHC heads, and vaccinators.

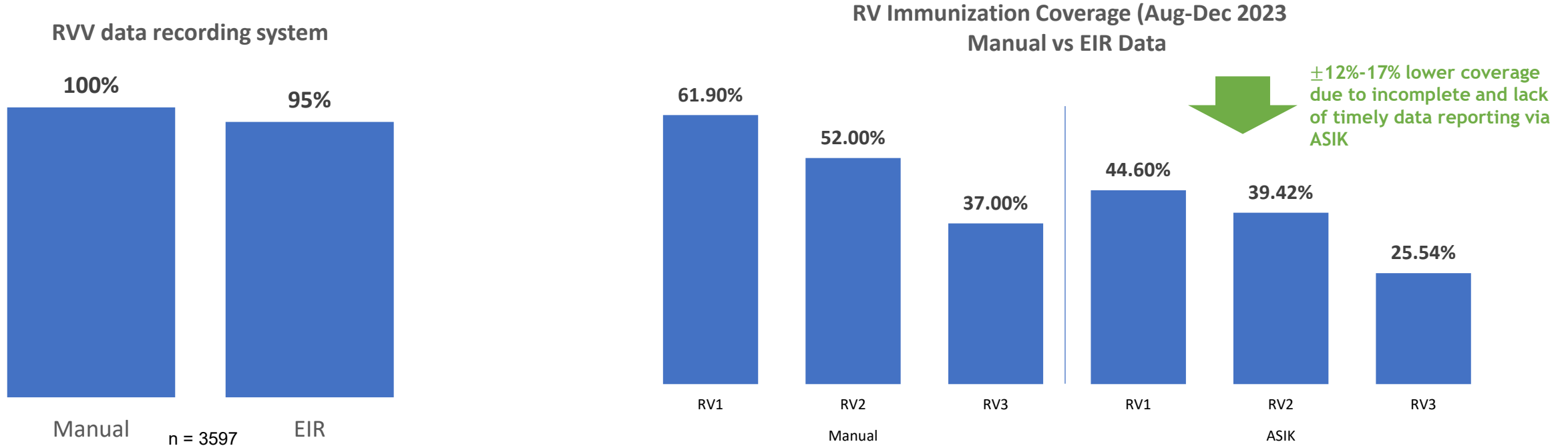
High turnover and competing duties contributed to untrained staff.



About half of PHCs reported collaboration with private facilities.

Most private facilities engaged received training, but coordination mechanisms remain limited.

Data Recording and Reporting

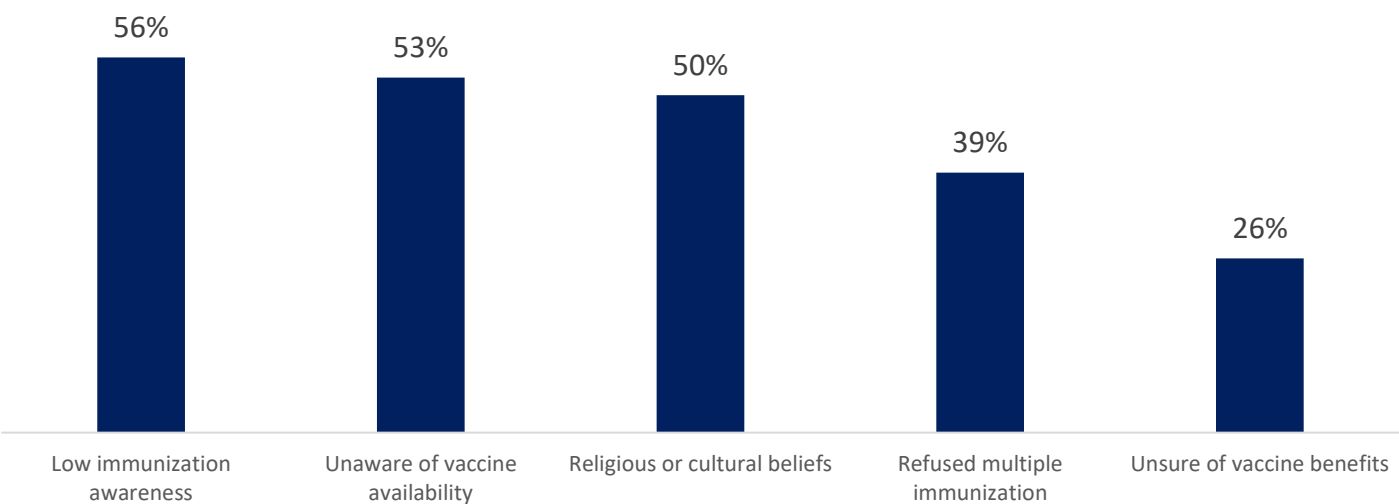


In 2023, Indonesia achieved a major step with **national use of ASIK (EIR)**, with 95% of PHCs transitioning from manual to electronic recording.

- Data entry delayed by 1–2 weeks → coverage gaps between manual and EIR.
- **Recording** forms at health facilities were not updated for new antigens, requiring staff to record RVV data separately.
- **Private sector reporting** remains limited, further contributing to under-reporting.

Challenges Reported at the PHC Level: Community and Service Delivery

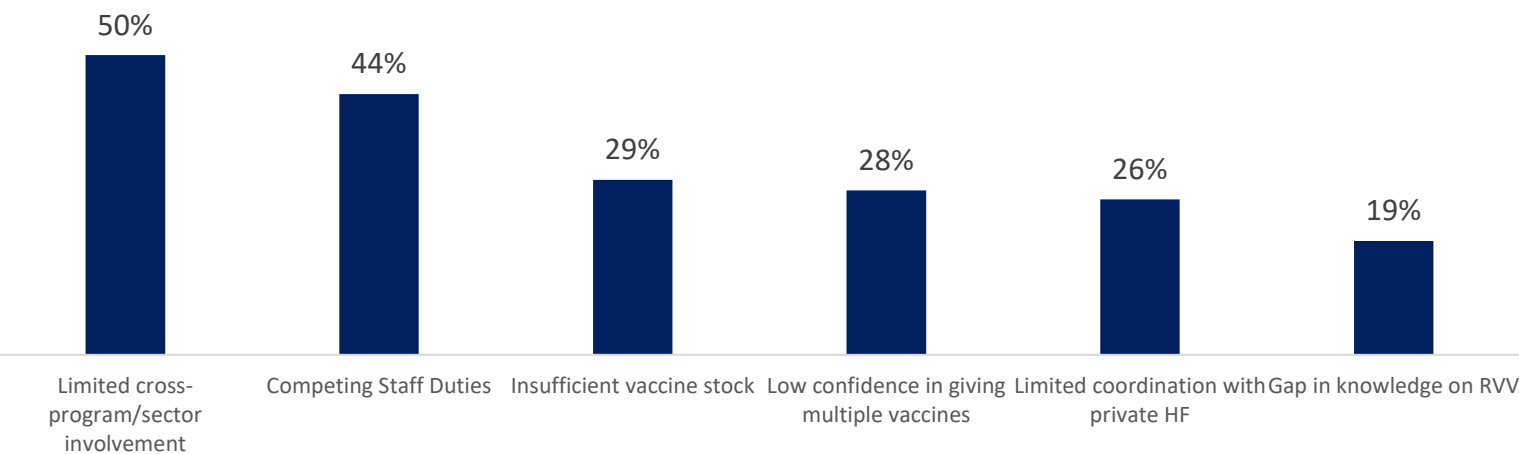
Community-related challenges



Community-related challenges:

Low immunization awareness, limited knowledge of vaccine availability, and socio-cultural or religious barriers, show that caregivers still lack clear and consistent information on RVV within the national immunization program

Service-delivery challenges



Service-delivery challenges:

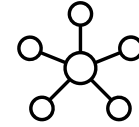
limited cross-program and cross-sector involvement affected mobilization and contributed to low awareness.

The least reported challenge was gaps in health worker knowledge (19%), though training gaps could reduce vaccinators' confidence.

Lessons-learned



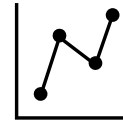
National policies exist but need reinforcement at subnational levels to align with decentralized governance. **Early announcement** of new vaccines are critical for **timely budget allocation within fiscal cycles**.



Clearer mechanisms and technical guidelines should be established to guide collaboration with private health facilities at district/PHC level.



Stronger planning and coordination before rollout, supported by real-time monitoring via eLMIS, are essential to avoid staggered starts and stock-outs.



Strengthening EIR use through timely data entry can reduce reporting delays and improve data quality for decision-making.



Regular OJT and supportive supervision play a key role in sustaining health worker confidence and skill.



Multi-sector involvement across programs and sectors are important to strengthen community mobilization and address gaps in caregiver awareness.

Key Recommendation to Strengthen RV Immunization Implementation and Future NVI



Policy & funding

Reinforce RV immunization policies at subnational levels and announce future NVIs early to allow local budgets to align with fiscal cycles.



Vaccine Availability

Strengthen procurement and forecasting, and ensure timely, accurate eLMIS updates to support responsive stock management.



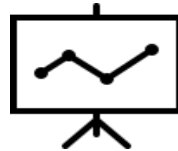
Capacity Building

Institutionalize regular OJT and supportive supervision, and provide job aids to help new staff adapt while awaiting formal training.



Private sector

Develop national and subnational guidelines for private sector coordination, and support DHOs to formalize collaboration through MOUs.



Data quality & use

Reinforce timely EIR entry and strengthen routine data review to improve data quality and support decision-making.



Community engagement:

Strengthen cross-program and cross-sector integration, leveraging media and community platforms to raise awareness, mobilize caregivers, and counter misinformation.



Thank You



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Early rotavirus outbreak response in a rural setting: a district-level health system case study from Ngamiland, Botswana

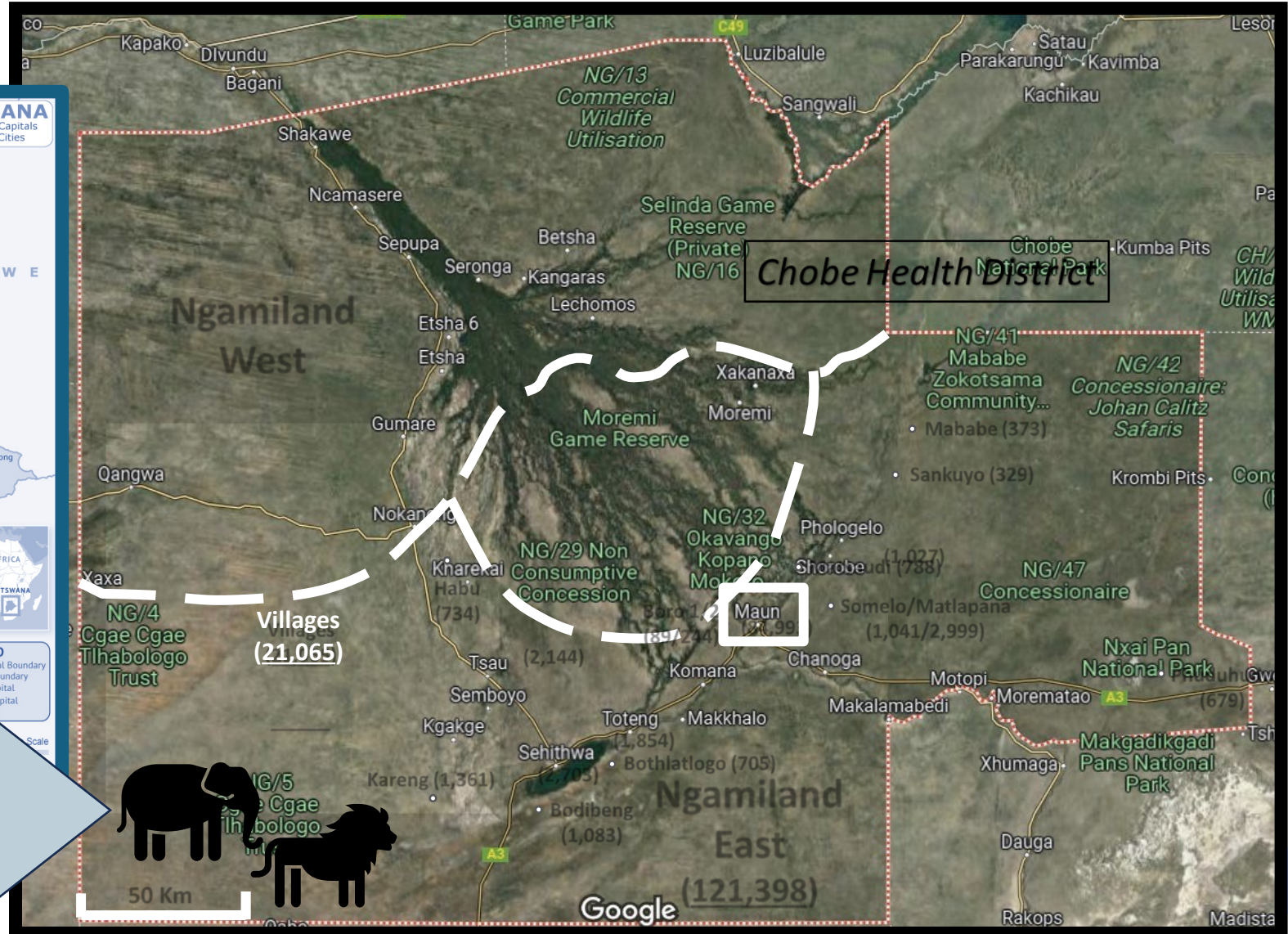
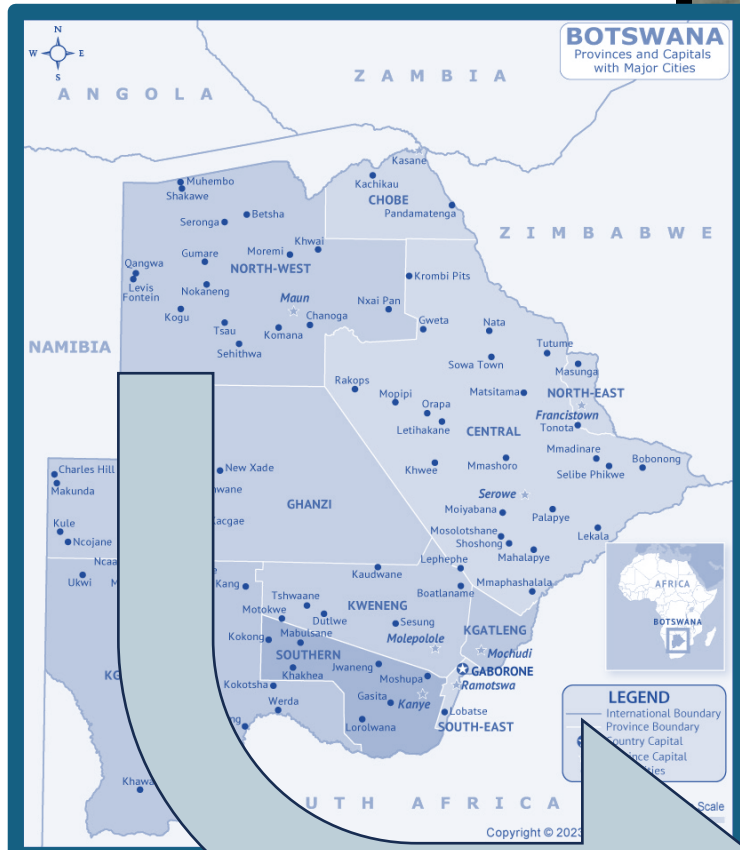
Dr. Sandra Maripe



02 October 2025



North-West Botswana



North-West

Area: 86,100km²

Population

2022

121,398

22 Villages

1 District Hospital

12 Clinics

17 Health Posts

92 Mobile Stops

Okavango Delta:

55 Safari Camps

17 private clinics

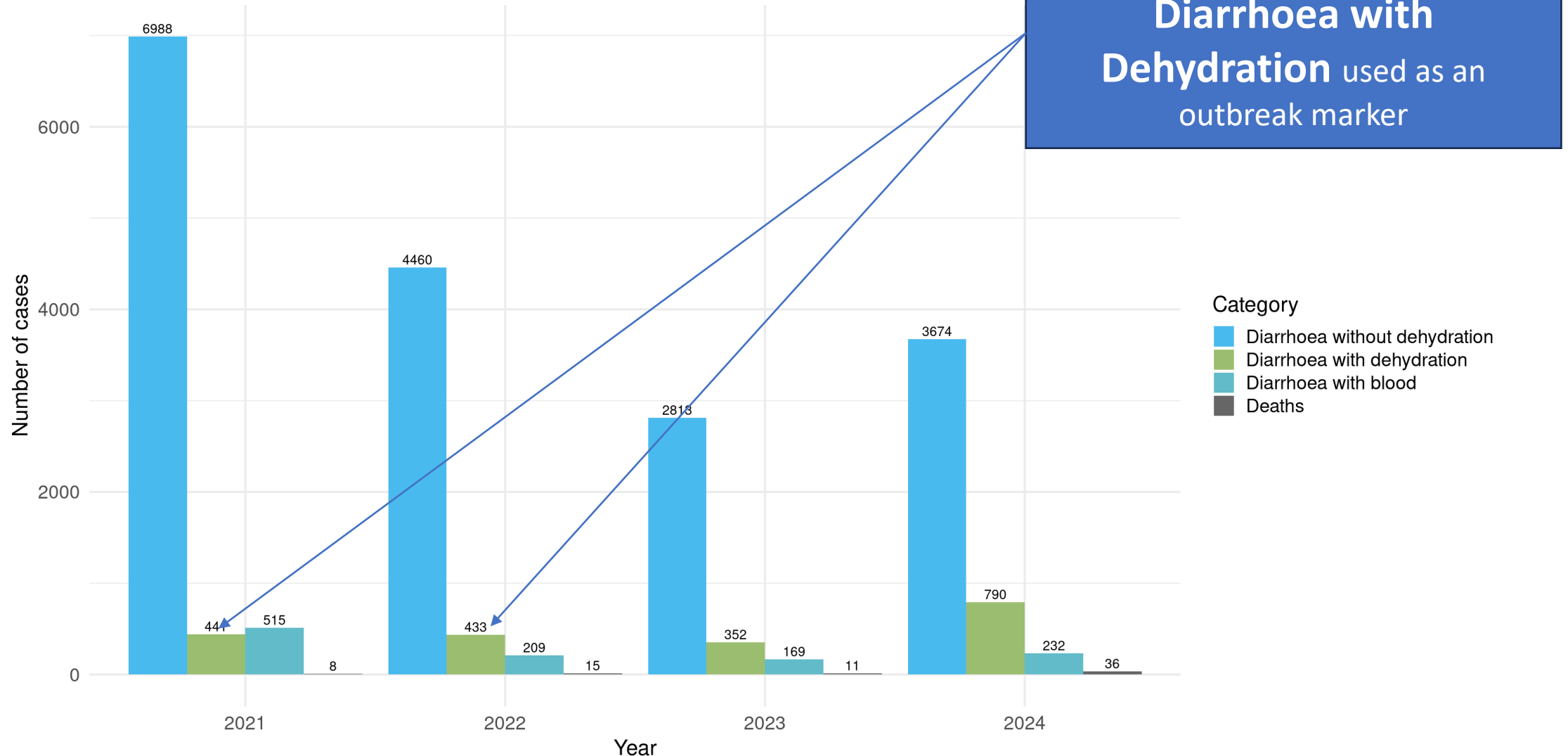
2 private Hospitals

1 Border-

MIA

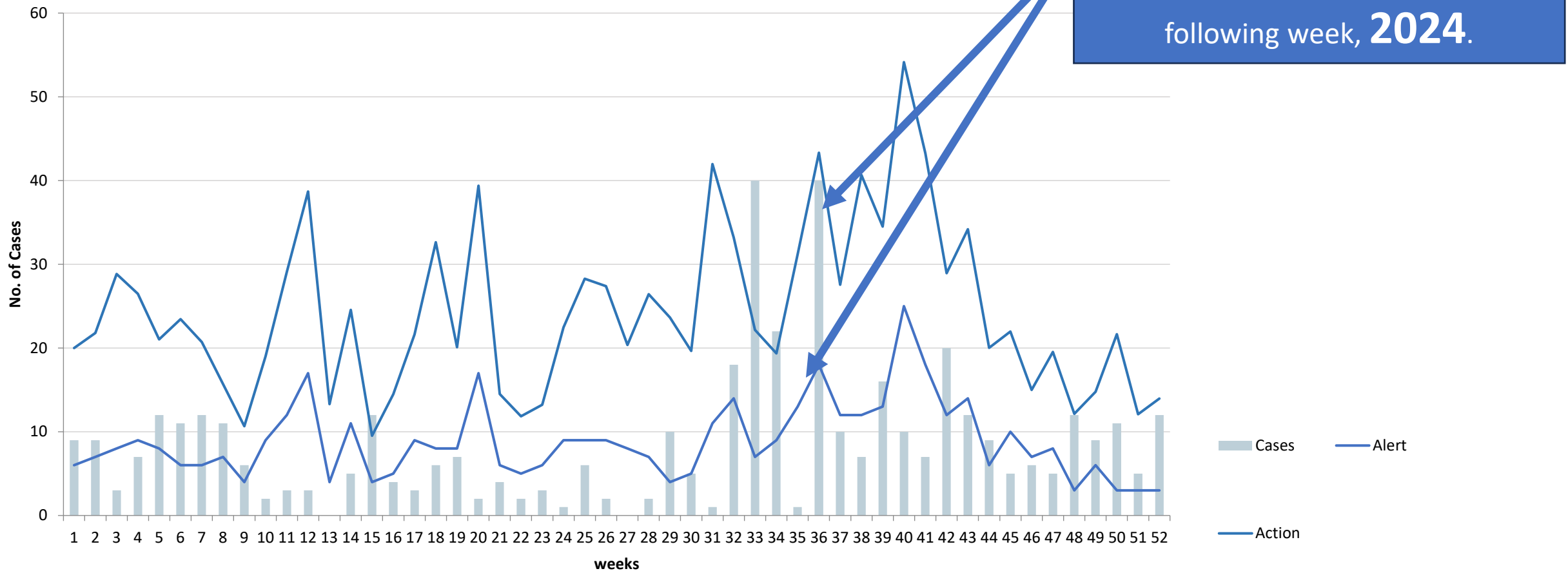
>10 Partners

Burden of diarrhoeal disease in Ngamiland, 2021–2024



Diarrhoea with Dehydration, 2024

Action and Alert Thresholds

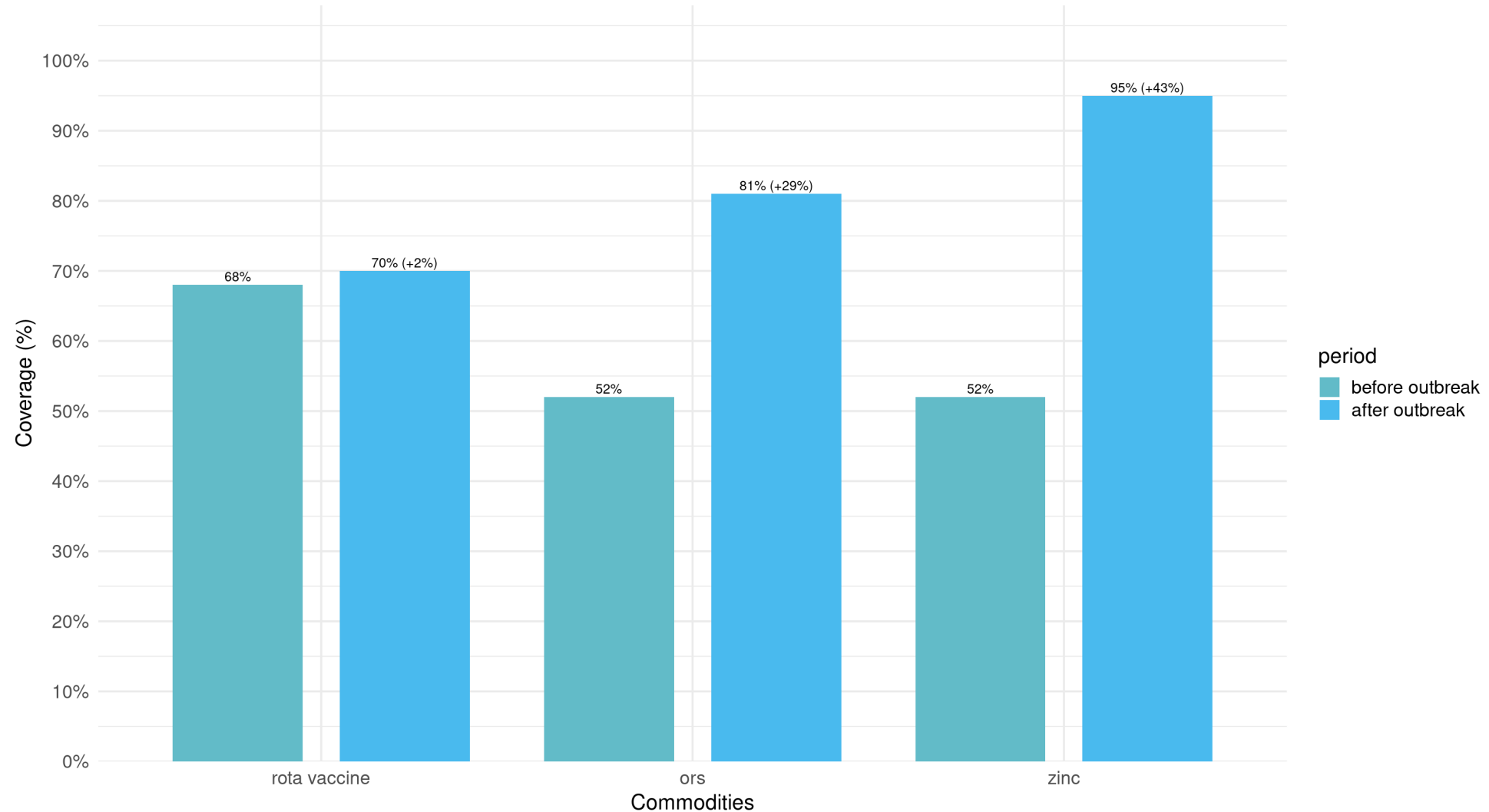


Surveillance thresholds built on annual averages



Seasonal peaks expected but
2024 far exceeded **Public Health
Emergency** thresholds

Commodity coverage before and after outbreak declaration, 2024



Mortalities, August 2024

Total mortalities (N=14)	Alive at presentation (n=6)	Brought in dead (n=8)
Age Group		
Less than 1 year old	4	8
One year and older	2	0
Gender*		
Female	3	4
Male	3	2

*Missing n=2

Almost all **mortalities**
where in infants **less**
than one years old

Majority of mortalities in
infants **brought in**
dead

Identifying rotavirus



In August, **56.2%** (18/32) of stool samples tested **positive for rotavirus**; by September, positivity fell to 4.2% (2/48).

5 samples showed *Taenia saginata*, *Giardia lamblia*, *Cryptosporidium*

No **point source** was identified for rotavirus against a backdrop of **poor water quality**



40.0% (4/10) samples from purification operators and **21.4%** (3/14) community sites tested positive for enteric pathogens such as *pseudomonas aeruginosa*, *E-Coli*, and *coliforms*

District level response

- Declaration of a Public Health Emergency
- Community mobilization, through NGOs, traditional leaders, faith-based actors, and healers, began in early September.
- Engaged district leadership
- Deployed Health promotion and IMCI teams for weekly commodity monitoring and supportive site visits for staff training in IMCI



Revealed systemic and structural challenges



Health System Capacity

- Staff Shortages (9 Doctors in District hospital), 5 in clinics, & 1 pediatrician
- No ICU in Ngamiland; nearest referral Hospital at least 500km away
- Pediatric ward overflowing
- Shortage of medical commodities



Treatment and Clinical Management

- Poor adherence to IMCI guidelines, under used De-CAM corners



Monitoring and Evaluation

- Late reporting to M&E including deaths – surveillance systems were not agile enough

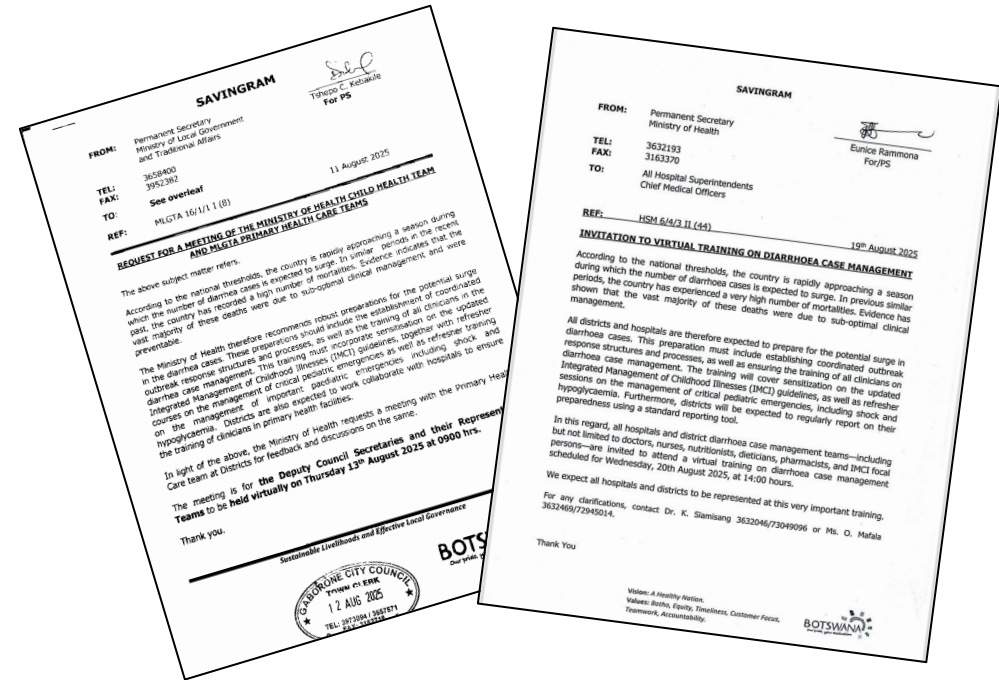


Community Care

- Late health seeking behaviors
- Access to clean water
- “Noka ya tshela”

Lessons learned

- **Readiness assessment** by CHN
- **Facility support visits** and mentorship
- **Refresher training** for clinicians
- **National IMCI guidelines** distributed to clinics
- **Risk Communication** to political leadership, community leaders, Traditional doctors and direct to communities to reduce number brought in dead



Private-public collaboration for top-up child-hood vaccinations

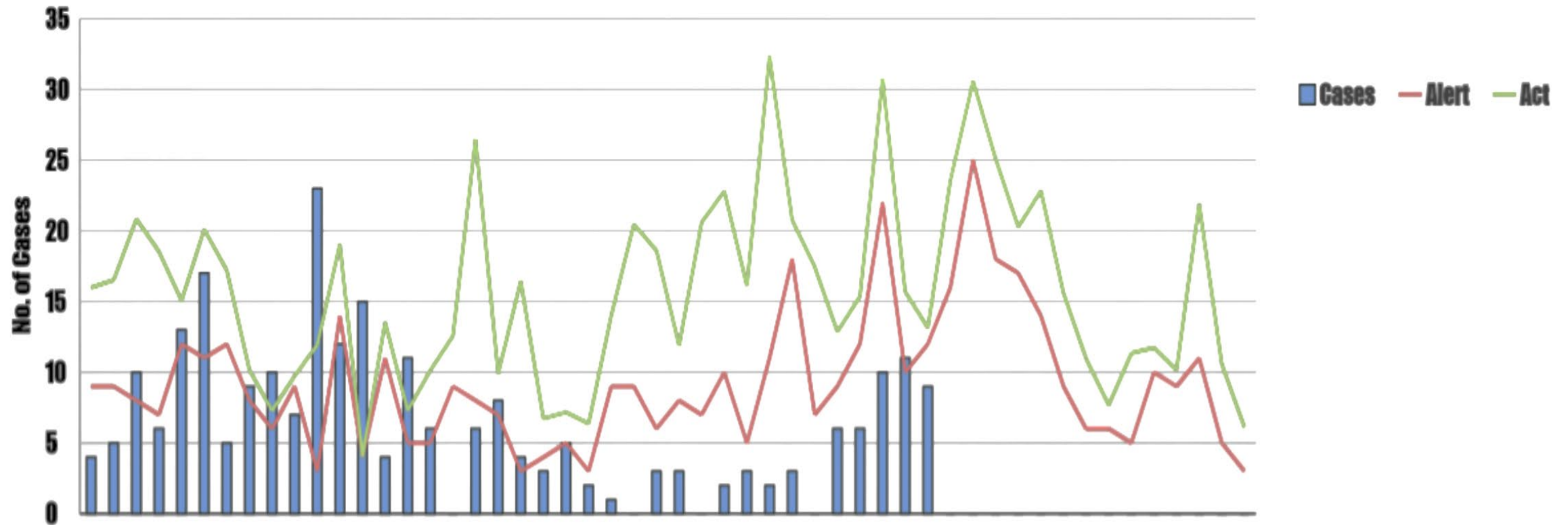


“Saving Lives and Livelihoods”

- Collaboration between CDC Africa, Mastercard foundation, and AMREF
- Provide top-up immunization for under 5s
- **Current Rota coverage is at 80%.**

A way forward

Ngamiland Diarrhoea with Dehydration 2025



An aerial photograph of a savanna landscape. A winding river flows through the center of the frame, surrounded by green grass and scattered trees. The horizon is visible in the distance under a clear blue sky.

Thank You

Dr Sandra Maripe,
smaripe@yahoo.com



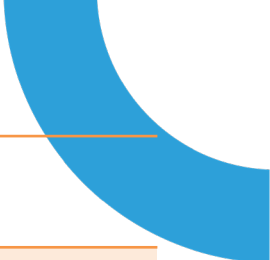
**Thank You
Abstract
Authors!**





**Thank You
Abstract
Reviewers!**





Ali Carter	Arindam Ray	Asad Ali
Baoming Jiang	Benjamin Lee	Carl Kirkwood
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Nicci Page	Rashi Gautam	Richard Omore
Roger Glass	Sasirekha Ramani	Tintu Varghese
Tony Nelson	Umesh Parashar	Vanessa Harris

Top 10 Posters (alphabetically)

#	First Name	Last Name	Title
1323	Mamta	Chawla Sarkar	Endo-metabolomics profiling reveals indispensability of aspartate-glutamate metabolic pathway for effective rotavirus replication in host cells
1567	Edy	Chissaque	Rotavirus Vaccine Coverage and Associated Factors Among Children Aged 12–23 Months in Mozambique: A National-Level Analysis
1468	Zinabu	Melsebo	Case Study: Managing an Unplanned Rotavirus Vaccine Switch- lessons from Ethiopia
1517	Sandrama	Nadan	Setting up rotavirus immunogenicity testing in South Africa
1587	Latif	Ndeketa	The 7 year impact of rotavirus vaccine and the effect of the polio vaccine: an interrupted time-series and case-control analysis for Blantyre, Malawi
1374	Xaira Jimena	Rivera Gutierrez	Exploring Viral Interactions in the Gut using Human Intestinal Enteroids: Co-infections Between Oral Rotavirus Vaccines and Enteroviruses
1476	Sarosh	Sher Ali	Global Seasonal Trends of Rotavirus Cases in the Post-Vaccine Era: A Systematic Review and Meta-Analysis
1390	Beckie	Tagbo	Evaluating the Impact of Rotavac Vaccine on Rotavirus Gastroenteritis in Enugu State, Nigeria: A Retrospective Analysis
1403	Muhumuza	Umar	Solar-Powered Vaccine Caravans and Refugee Storytellers: A Rotavirus Triumph in Uganda's Camps.
1529	Kipkiruri	Zadock	Early Rotavac® Vaccine Effectiveness Estimate from Coastal Kenya following Switch from Rotarix™, January 2023-April 2025



FIFTEENTH INTERNATIONAL ROTAVIRUS SYMPOSIUM

30 SEPTEMBER to 2 OCTOBER 2025 CAPE TOWN SOUTH AFRICA







**Dick Ward
&
David
Bernstein**

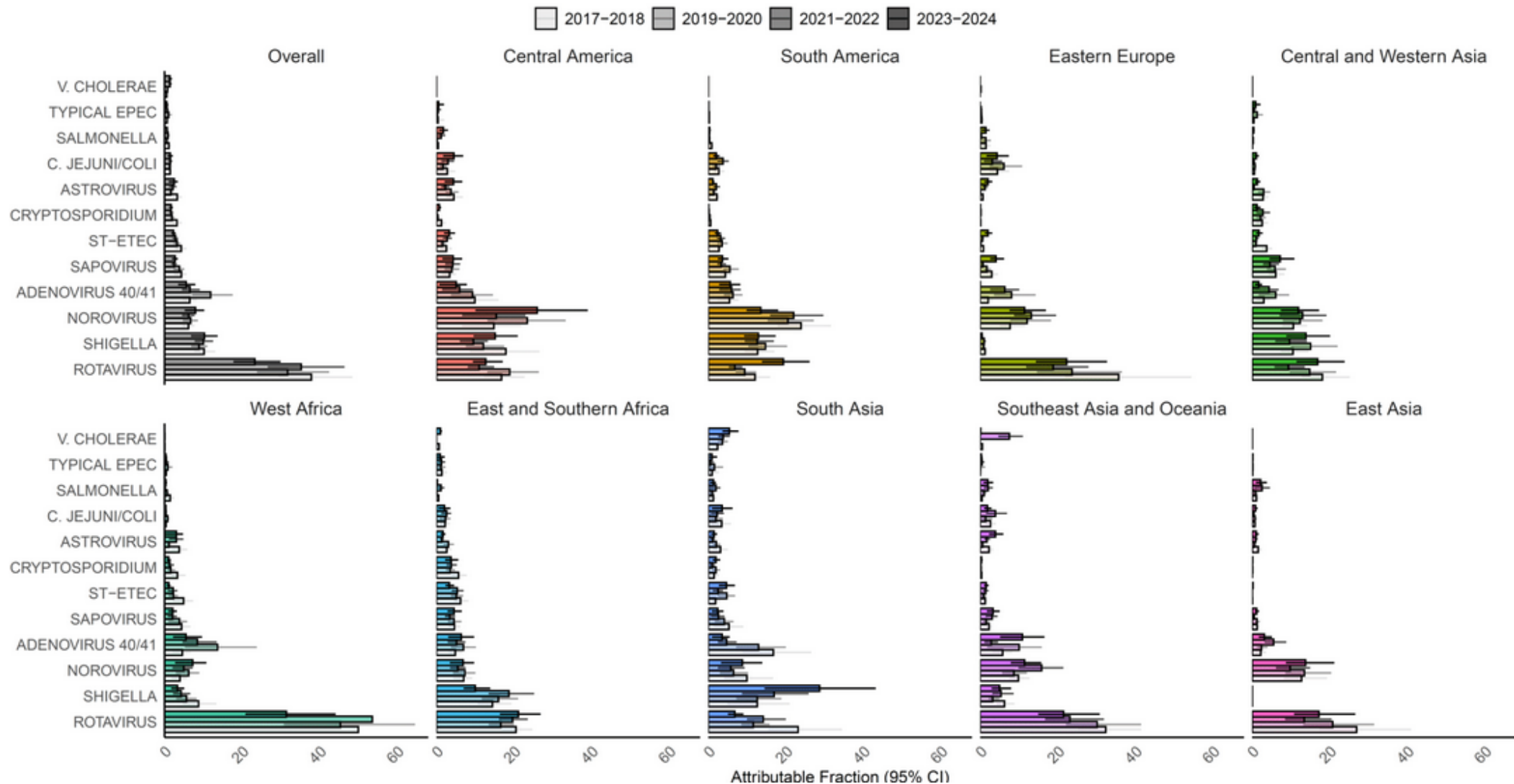


Timo Vesikari



James Platts-Mills and GPDS Consortium

Attributable Fractions: overall and by geographic grouping





2025

Roger Glass Lecture

Professor George Armah



Dr. Temprana C. Facundo

ROTAVIRUS SYMPOSIUM

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FIFTEEN ROTAVIRUS

BER to 2 00

Rotavirus shedding (%)

~ 33 % reduction in rotavirus shedding

Dose dependant

Immunization strategy

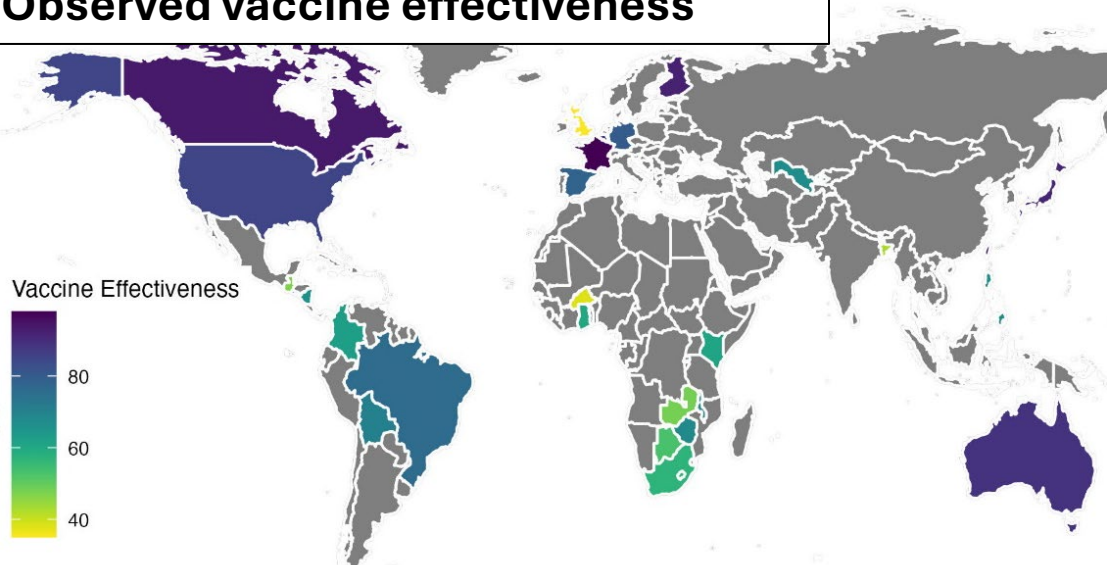
Optimal doses

Immunization schemes

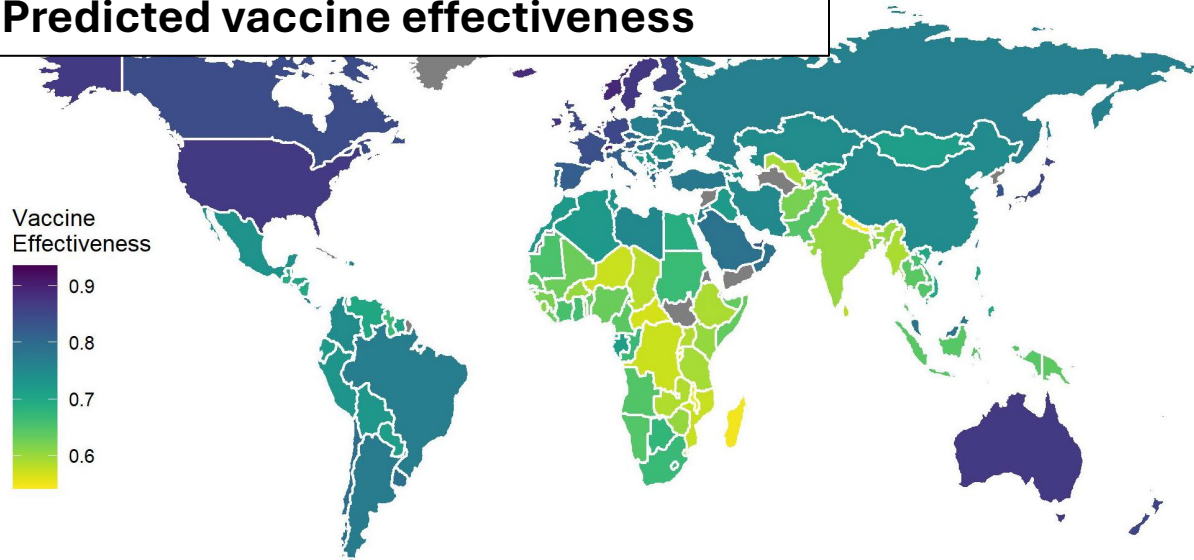
Immunization Strategy	Rotavirus Shedding (%)
OV	~100
DNZ	~100
CF	~90
CV	~85
CFCV	~85
CFCV9	~75
SCFV	~85

From Ginny Pitzer & Ernest Asare

Observed vaccine effectiveness



Predicted vaccine effectiveness



Lower vaccine effectiveness

- VE for HICs = 63-100%
- VE for LMICs = 38-92%

Options:

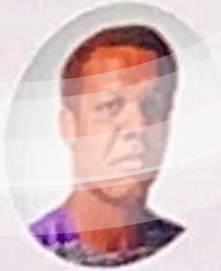
- Switching to more affordable vaccines?
- Alternative schedules: ie. add 3rd dose to Rotarix, neonatal schedule?
- Next-generation parenteral vaccines?

Let's connect!

Team Rotavirus @ Pitzer Lab



Virginia Pitzer, ScD



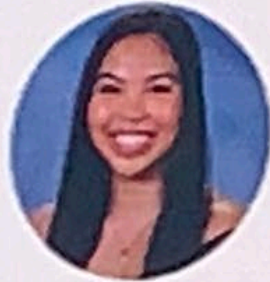
Ernest Asare, PhD



Jiye Kwon, MPH



Xiao Li, PhD



Charlene Jamie Miciano

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Edson Mwiniwa (MLW/Kamuzu Univ)

Miren Iturriza-Gomara (U Liverpool)
Naor Bar-Zeev (WHO)
Ben Lopman (Emory Univ)
Umesh Parashar (CDC)

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National Institute of
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Prototype demo



Feedback form



*An app for you.
Create with us!*

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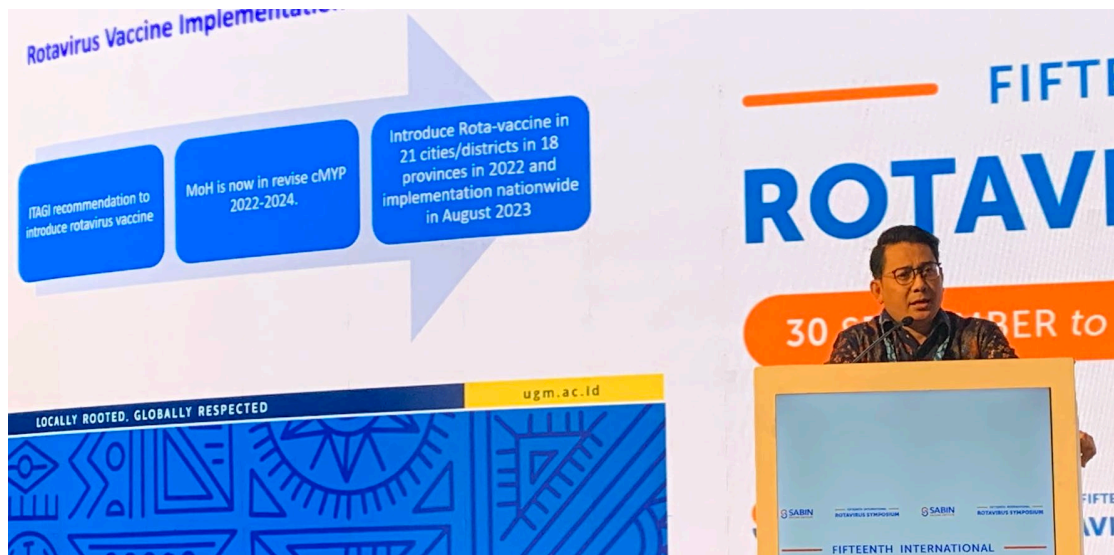


2025

Ruth Bishop Lecture

Professor Harry
Greenberg





Global RV supply shortages Vs Rotavirus Vaccine Switch

Country	Current Product	Date of initial introduction	Switch Date	Switch Product	Reasons for switch
Burkina Faso	Rotarix	20-Aug-12	Sept-12	Rotavac	Vaccine supply shortage
Burkina Faso	Rotarix	31-Oct-13	Jan-14	Rotavac	Supply & cold chain
Cote d'Ivoire	Rotarix	21-Mar-17	May-18	Rotarix	Supply & cold chain
Chad	Rotarix	26-Apr-12	Jan-20	Rotavac	Cost & GAVI graduation
Ghana	Rotarix	14-Feb-14	Nov-22	Rotavac	Supply & cold chain
India	Rotarix	14-Jan-14	Jan-20	Rotavac	Supply & cold chain
Kenya	Rotarix	11-Nov-14	Feb-22	Rotavac	High cost of Rotarix
Kenya	Rotarix	25-May-12	Apr-17	Rotarix	Supply & cold chain
Kenya	Rotarix	05-Dec-12	Oct-22	Rotavac	Supply shortage
Kenya	Rotarix	14-Oct-13	Feb-17	Rotarix	Supply & cold chain
Kenya	Rotarix	26-Nov-16	Apr-23	Rotavac	Cost & GAVI graduation
Kenya	Rotarix	01-May-14	Feb-22	Rotavac	Supply & cold chain
Kenya	Rotavac	Aug-2019	17		

- > 13 countries switched rotavirus vaccine due to supply shortage, cold chain or high cost of vaccine
- > Complex RV products & presentation affect

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Thank you