What is implementation research and why should it be mainstreamed into immunization systems in the African Region?

How implementation data can strengthen practices

Abdu A Adamu, MBBS, PhD

Outline

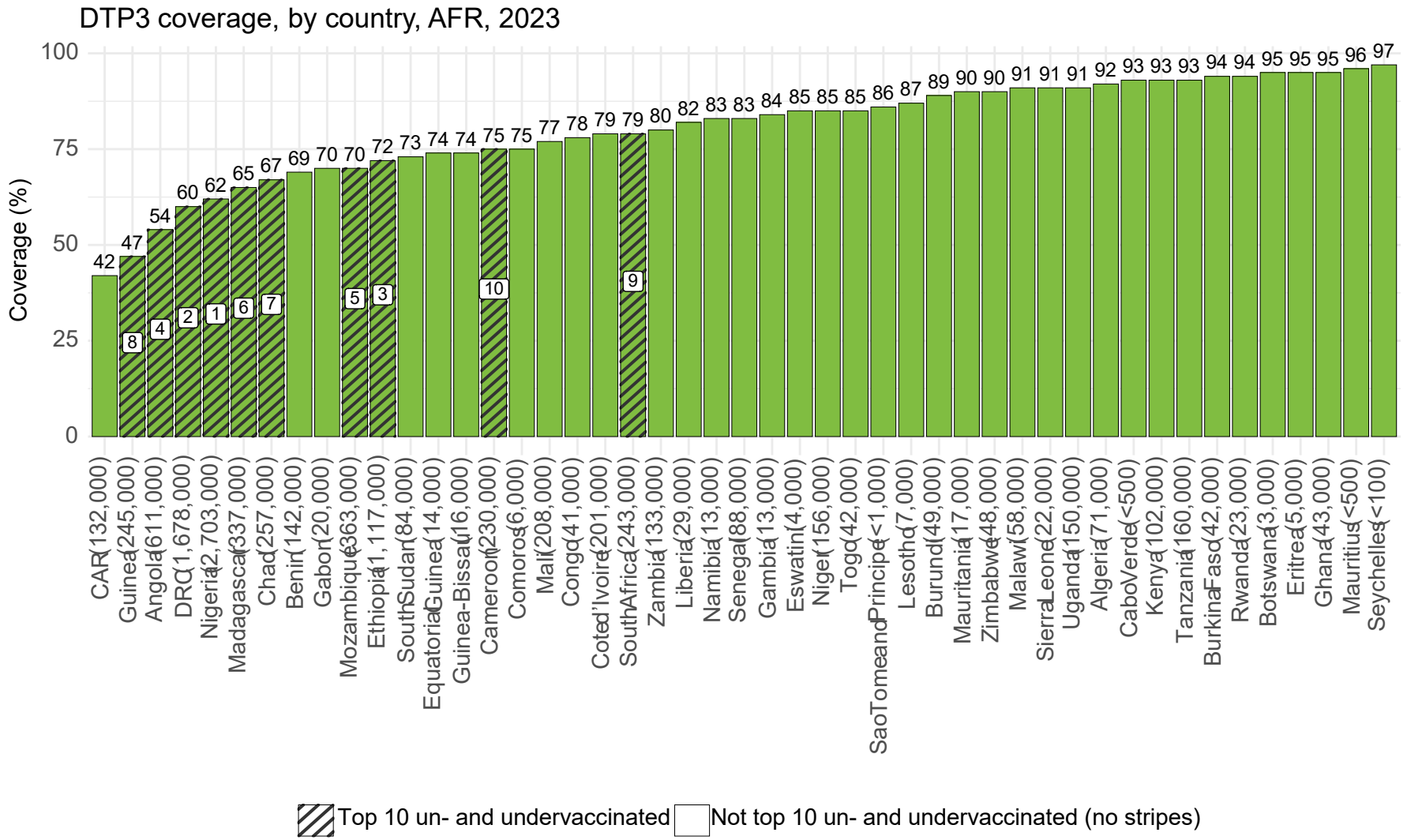
- Performance gaps in immunization systems in the WHO African Region
- Meaning of implementation research
- Prospects of implementation research in immunization systems
- Examples of implementation research activities in the African Region
- Future directions

Being reflexive

I am an implementation scientist with a clinical medicine and public health background. My area of interest/focus is addressing “know-do” gaps in immunization systems to improve access, demand, and uptake of new and existing vaccines.

The WHO African Region lags in immunization system performance with wide between-country differences in DTP3 coverage.

- According to the 2023 WUENIC, DTP3 coverage increased marginally from 73% in 2022 to 74% in 2023 in the WHO African Region.
- Only 16 of the 47 countries in the region had DTP3 coverage of at least 90%.
- Nigeria has the highest number of un- and under-vaccinated children in the region, followed by DRC and Ethiopia, among others.



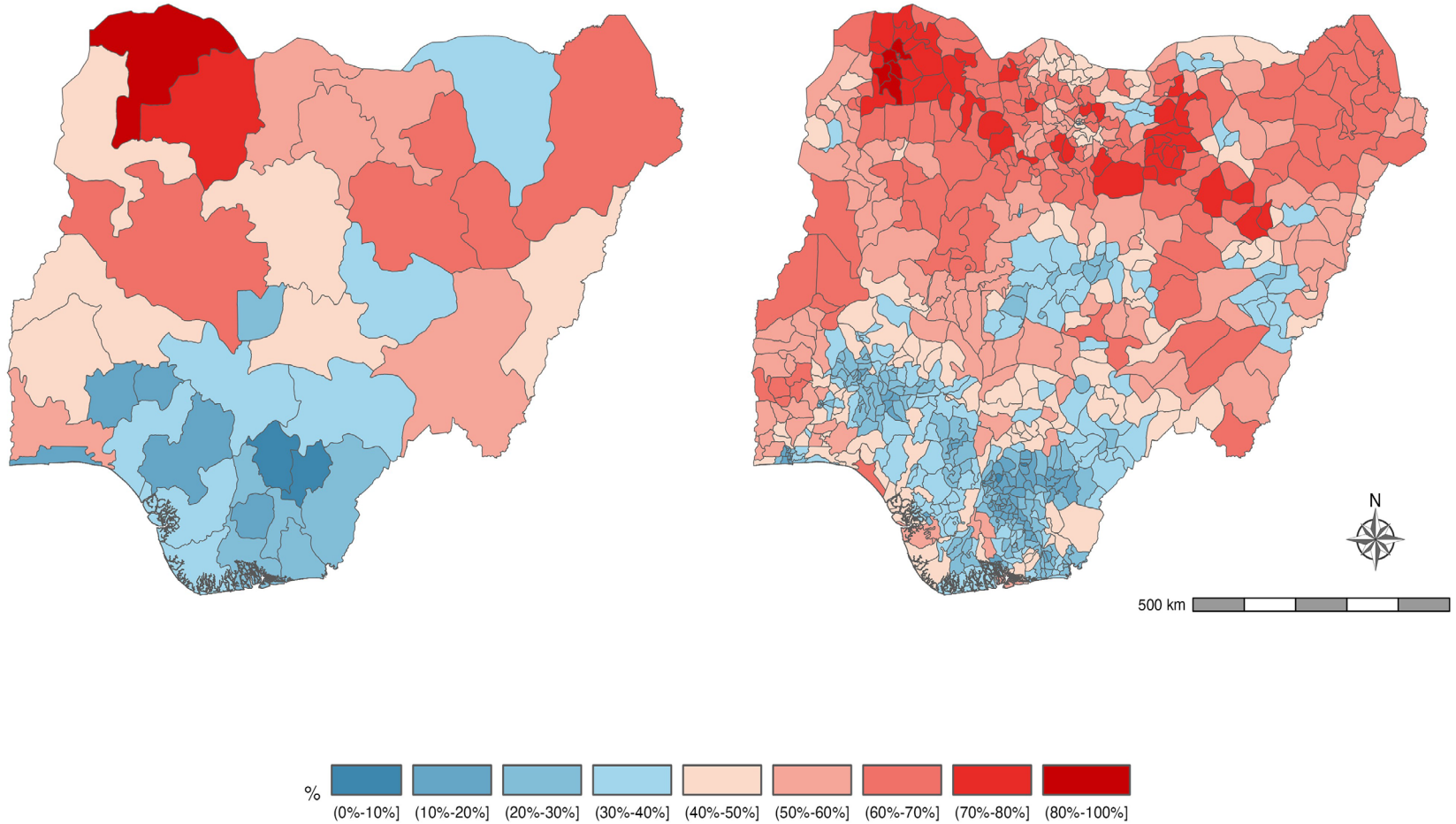
Source: WHO/UNICEF Estimates of National Immunization Coverage, 2023 revision
Note: Bars are ranked by ascending coverage.
Numbers in bubbles display top 10 rank based on absolute number of un- and undervaccinated children.Number in parentheses shows number of un- and undervaccinated children.

Even within countries, immunization system performance can vary widely from place to place

- There is significant heterogeneity in DTP3 coverage between states and local government areas in Nigeria.
- The northern geopolitical zones account for the highest number of under-vaccinated children in the country.
- Sokoto and Zamfara States in the North West geopolitical zones have the highest number of under-vaccinated children in the country.

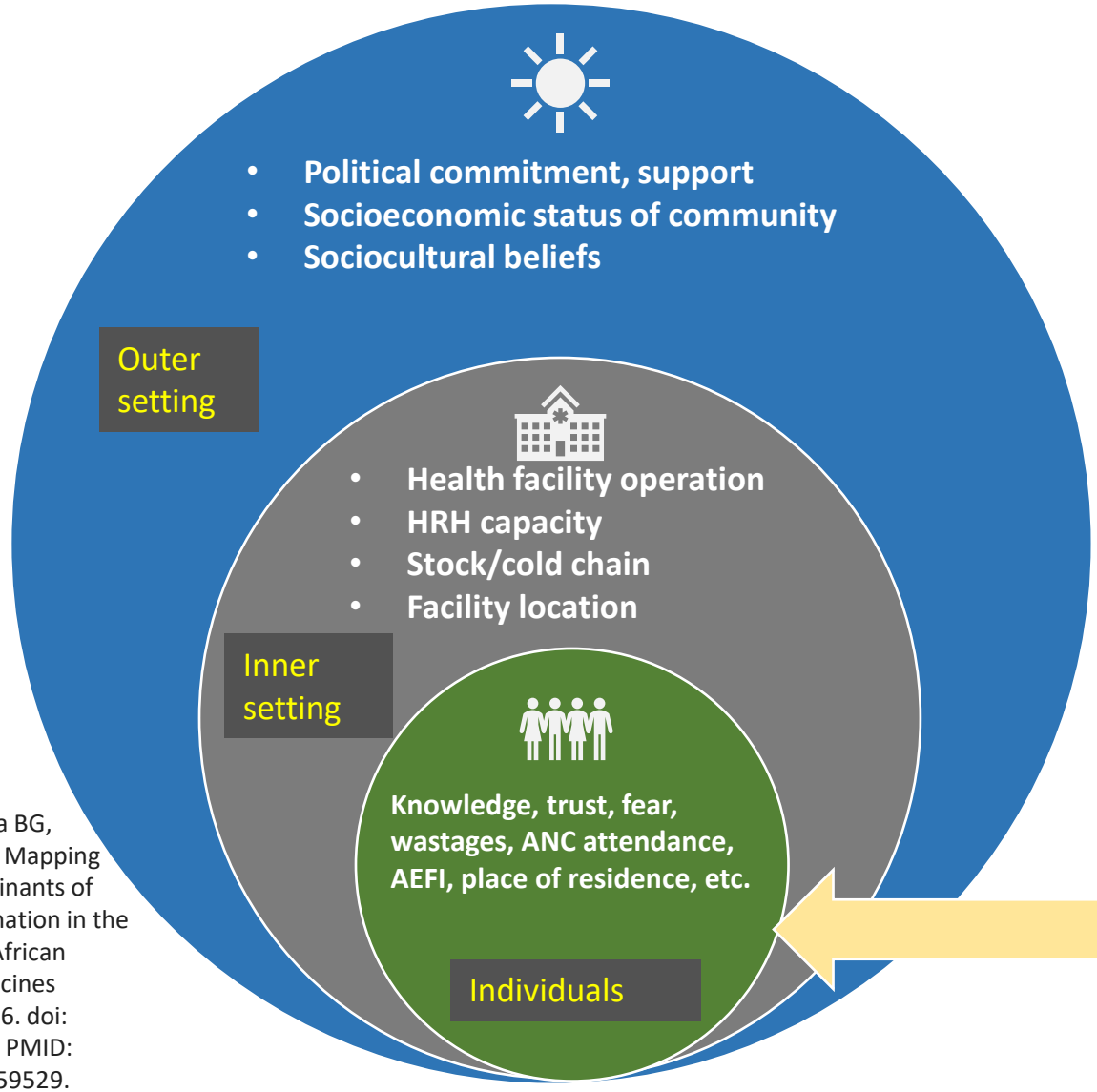
A The prevalence of under immunised children aged 12 to 23 months by state observed from the survey, Nigeria MICS-NICS 2021

B The prevalence of under immunised children aged 12 to 23 months by local government area (LGA) predicted from the survey, Nigeria MICS-NICS 2021



J Infect Dis, Volume 230, Issue 1, 15 July 2024, Pages e131–e138, https://doi.org/10.1093/infdis/jiad476

The factors that influence the success or failure of vaccination efforts in the WHO African Region are multi-level: an example of second dose measles vaccination using CFIR framework



Implementation process

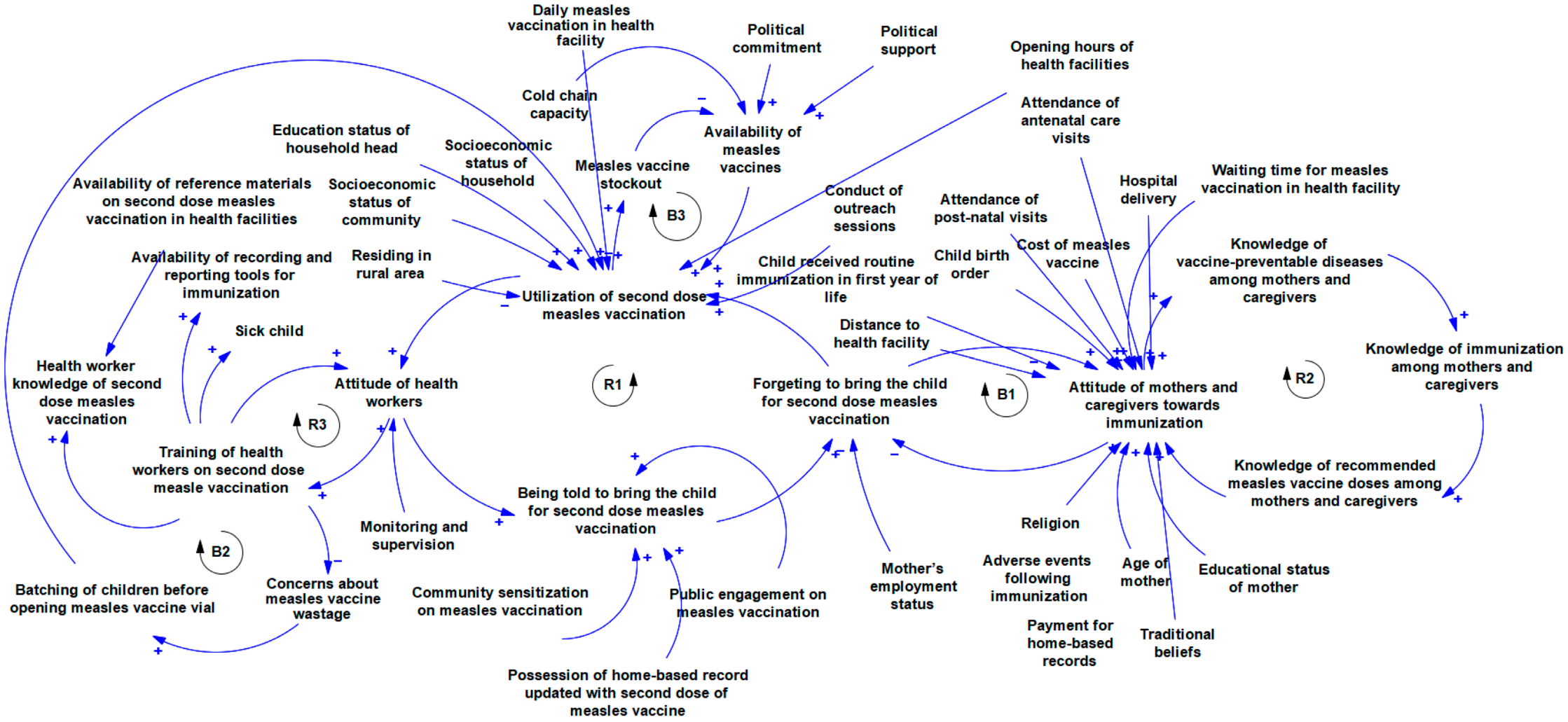
- Conducting outreach sessions
- Public engagement
- Community sensitization
- Monitoring and supervision

Innovation

- Cost of measles vaccine

Adamu AA, Jalo RI, Masresha BG, Ndwandwe D, Wiysonge CS. Mapping the Implementation Determinants of Second Dose Measles Vaccination in the World Health Organization African Region: A Rapid Review. Vaccines (Basel). 2024 Aug 8;12(8):896. doi: 10.3390/vaccines12080896. PMID: 39204023; PMCID: PMC11359529.

The implementation determinants of vaccination efforts are interconnected and interdependent, forming complex adaptive systems



Adamu AA, Jalo RI, Masresha BG, Ndwandwe D, Wiysonge CS. Mapping the Implementation Determinants of Second Dose Measles Vaccination in the World Health Organization African Region: A Rapid Review. Vaccines (Basel). 2024 Aug 8;12(8):896. doi: 10.3390/vaccines12080896. PMID: 39204023; PMCID: PMC11359529.

Despite suboptimal immunization programme performance in the WHO African Region, the global immunization landscape continue to evolve rapidly in terms of products, practices and policies

Examples of new/pipeline products include:

- Adolescent TB vaccines
- Group B streptococcus vaccines
- Respiratory syncytial virus vaccines

Examples of new/evolving practices include:

- Integrated service delivery
- Health campaign effectiveness
- Private sector engagement
- Digitalization
- Use of AI in immunization

Examples of new policies include:

- Switching from two doses to single dose HPV vaccine
- universal vaccination with rubella-containing vaccine (RCV)

Immunization systems in the WHO Africa Region must confront the multiple (context-specific) complex challenges that cause implementation failure of vaccination efforts while enhancing decision-making regarding new vaccine products, practices, and policies with practical evidence to advance equity.

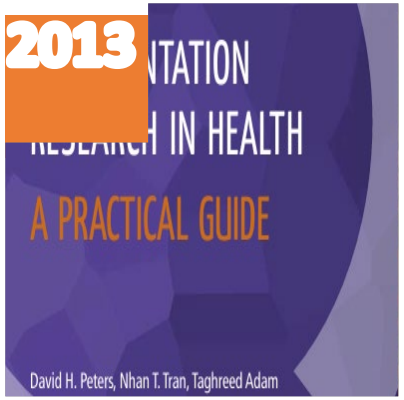
Implementation research in immunization systems is critical in a BANI (Brittle, Anxious, Nonlinear, Incomprehensible) world.

Implementation research can enhance the performance and impact of immunization programmes in the WHO African Region

- **Implementation research should be the compass of decision-making in immunization systems.**

ECCLES ET AL

Implementation research is the scientific study of methods to promote the systematic **uptake of research findings and other evidence-based practices into routine practice**, and, hence, to improve the quality and effectiveness of health services.

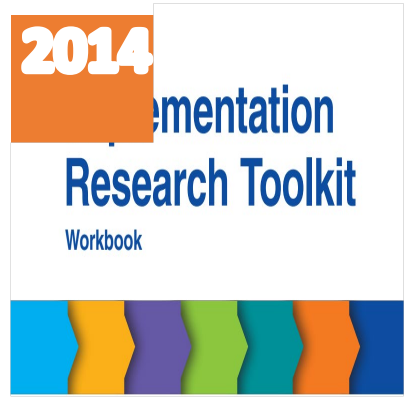


AHPSR

implementation research is the scientific study of the **processes used in implementing initiatives**, as well as the contextual factors that affect these processes.

PETERS ET AL

Implementation research is the scientific inquiry into questions concerning implementation—**the act of carrying an intention into effect**, which in health research can be **policies, programmes, or individual practices** (collectively called interventions).



TDR

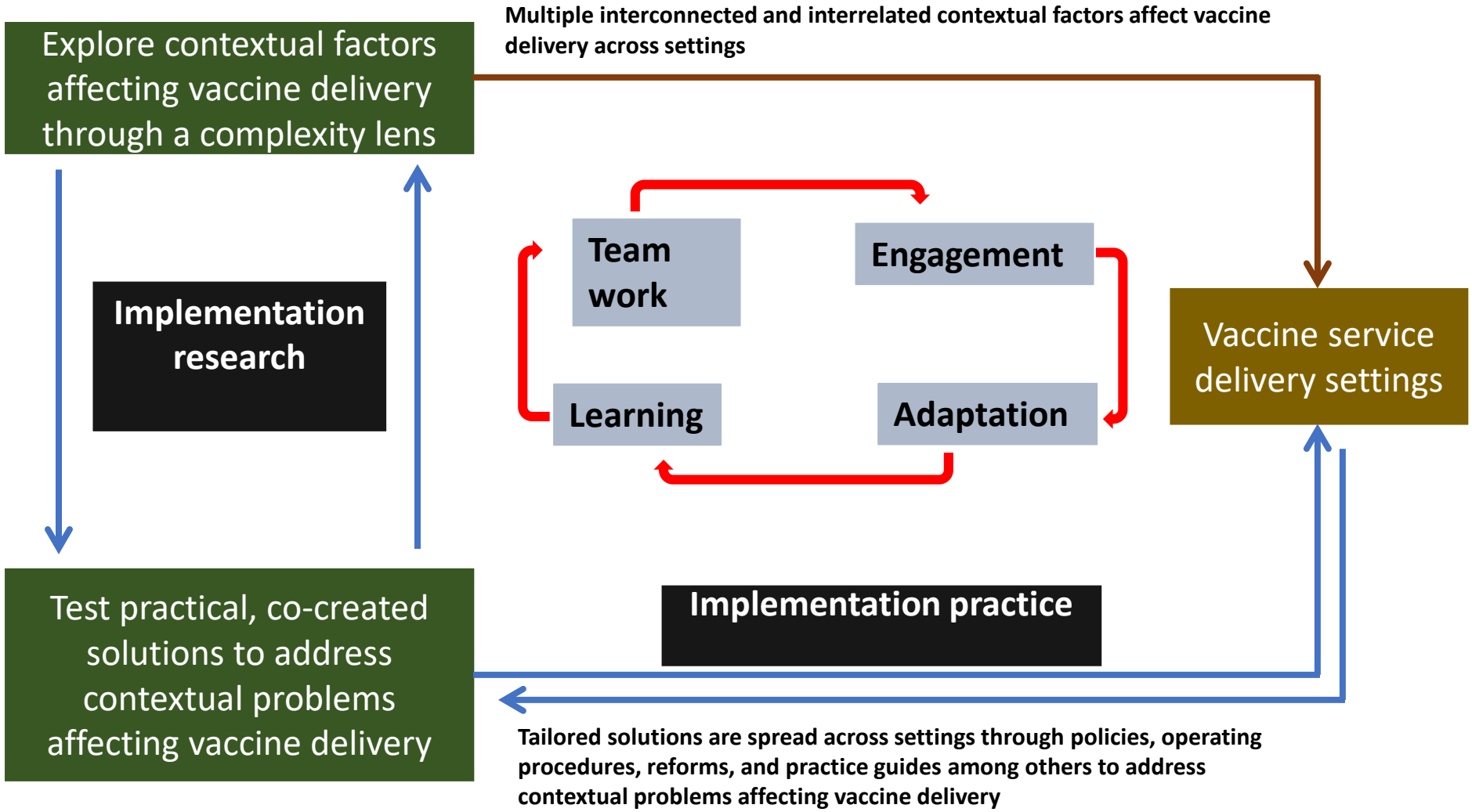
Implementation research is the systematic approach to **understanding and addressing barriers** to effective and quality implementation of **health interventions, strategies and policies**.

The use of theories, models, and frameworks is sine qua non to implementation research

- There are over 100 TMFs that can be used in implementation research.
- They can be broadly classified into process models, determinants frameworks, classic theories, implementation theories, and evaluation frameworks.
- It is important to use TMFs for several reasons as follows:
  - **Uniformity**
  - **Comprehensiveness**
  - **Comparison**

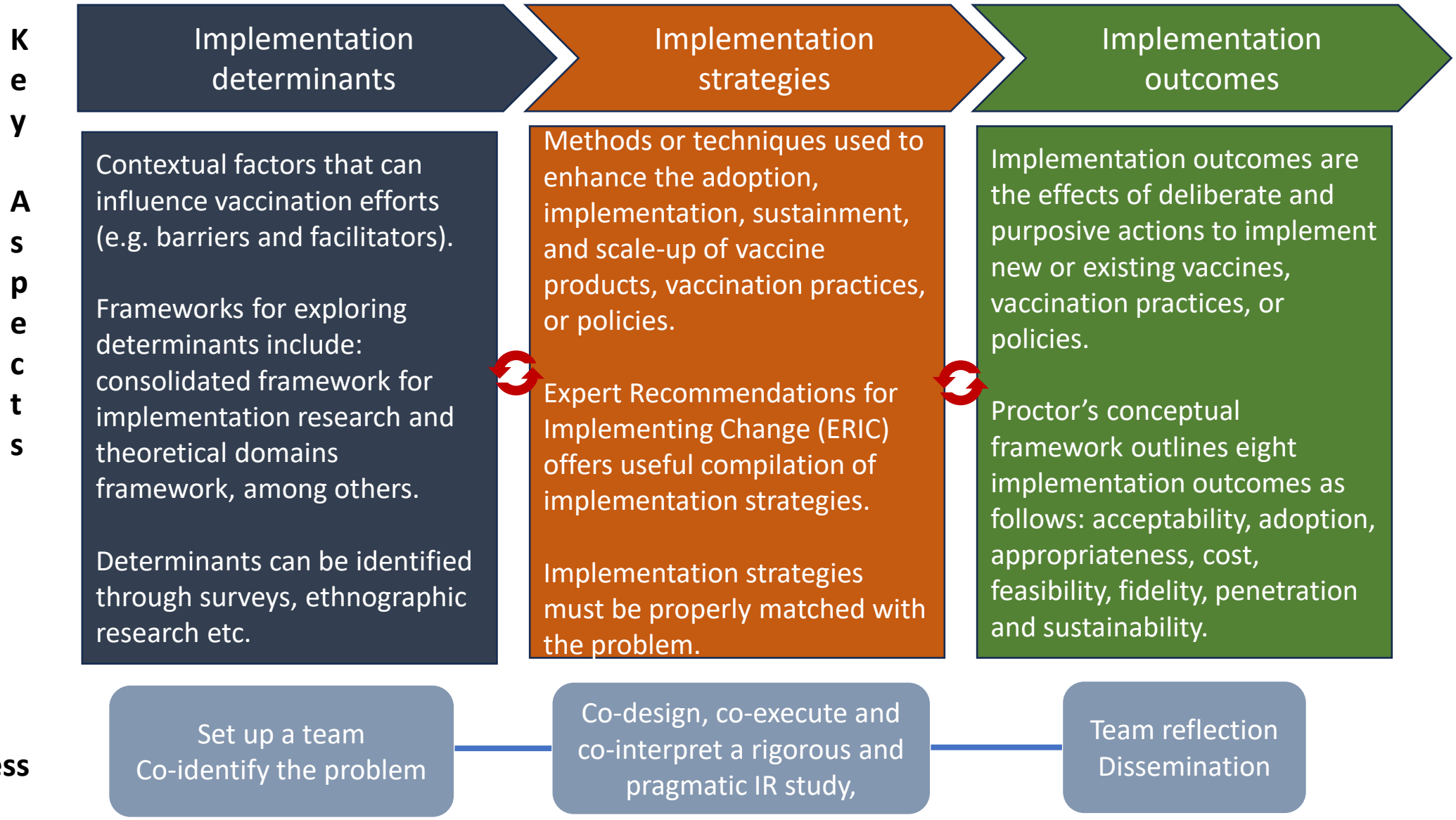
Nilsen, P. Making sense of implementation theories, models and frameworks. Implementation Sci 10, 53 (2015). https://doi.org/10.1186/s13012-015-0242-0

Implementation research depends on strong collaboration

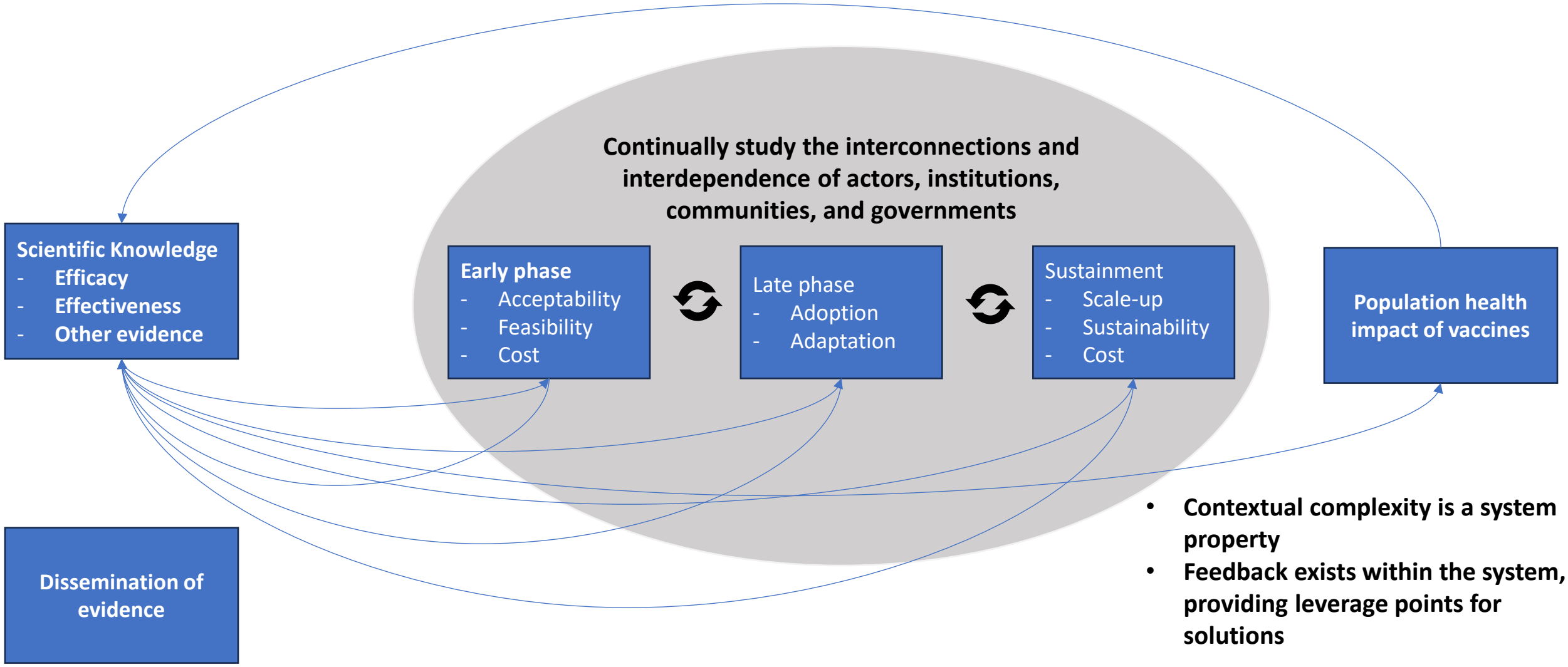


Adamu, A.A., Ndiaye, S., Jalo, R.I. et al. Enhancing vaccine delivery in Africa with implementation science. Discov Public Health 21, 190 (2024). https://doi.org/10.1186/s12982-024-00321-8

It is essential to strengthen participatory approaches



Implementation research in immunization systems must take cognizance of complexity and leverage systems thinking



- **Contextual complexity is a system property**
- **Feedback exists within the system, providing leverage points for solutions**

Luke, D. A., Powell, B. J., & Paniagua-Avila, A. (2024). Bridges and mechanisms: integrating systems science thinking into implementation research. Annual Review of Public Health, 45.

Differentiates roles for mainstreaming implementation research in immunization systems

Local level	• Understanding contextual determinants of vaccination efforts. • Identifying, designing, tailoring, and testing implementation strategies to improve vaccine access, demand, and uptake in specific settings. • Identifying and addressing implementation evidence needs regarding new vaccine products, policies and practices to facilitate optimal decision-making.
Regional level	• Developing guidance on the use of implementation research to strengthen immunization programmes • Strengthening implementation research capacity among immunization systems stakeholders • Using implementation evidence to guide vaccine prioritization
Global level	• Allocation of resources to implementation research through various Global Health Initiatives • New vaccine products and other immunization-related technologies are designed with consideration for diverse and dynamic local contexts.

Strengths, weakness, opportunities and threats to mainstreaming implementation research in immunization systems

STRENGTHS

- There is a strong inclination toward evidence-based decision-making in immunization programmes.
- Immunization Technical Advisory Groups at regional and national level have strong research and programmatic skills.

WEAKNESSES

- Implementation research capacities and capabilities are weak among immunization programme implementers.
- Inadequate engagement of implementation scientists in immunization programmes.
- Weak consideration of implementation research as integral to immunization programme theory of change.

OPPORTUNITIES

- Recognition of the value of implementation research in global health agendas (e.g. Lusaka Agenda)
- Several implementation science training institutions in Africa
- Multiple vaccinology trainings programmes in Africa

THREATS

- Inadequate domestic allocation to health research.
- Dwindling donor funds

Target: Immunization stakeholders such as NITAGs, EPI teams at national and subnational levels, partners, health workers, and public health researchers focused on immunization.
Current opportunities to leverage: Integrate implementation science training into all immunization-related trainings and vaccinology short courses.
Opportunities to explore: Develop a tailored implementation science training course for immunization stakeholders.

Pathway 1

Methodology: Transformational learning and coaching

Immediate expected outcome: Use of implementation science frameworks, models, and tools to improve vaccine uptake across diverse settings.

Continuous mentorship

Implementation science capacity building and capability development

Improved application of implementation science in immunization systems

Methodology: Interactive teaching

Immediate expected outcome: Academic qualification in vaccinology with competencies in implementation science and vice versa.

Continuous mentorship

Pathway 2

Target: Postgraduate students in vaccinology or implementation science, and research fellows.
Current opportunities to leverage: Specify implementation science as a core courses for vaccinology masters programmes. And include vaccinology as one of the elective courses for implementation science masters programmes.
Opportunities to explore: Develop a specialized academic programme on vaccine implementation research in countries that do not have any existing programme on vaccinology or implementation science.

Adamu, A. A., Ndwandwe, D., Jalo, R. I., Ndiaye, S., Ahmed, J., & Wiysonge, C. S. (2025). Implementation science capacity building for immunization stakeholders in Africa: benefits and way forward. The Pan African Medical Journal, 50(38).

Example 1: Mapping implementation strategies for immunization in the WHO African Region

During the COVID-19 pandemic, distinct patterns of immunization programme resilience were identified in the African Region between 2019 and 2022.

Countries that sustained DTP3 coverage at ≥ 90% between 2019 and 2022 and they include Burkina Faso, Burundi, Cabo Verde, Eritrea, Ghana, Kenya, Mauritius, Sao Tome and Principe, Senegal, Seychelles and Sierra Leone.

Countries that experienced a decline but recovered their DTP3 coverage back to ≥ 90% during the pandemic and they include Eswatini, Rwanda, Tanzania and Zimbabwe.

Countries with DTP3 coverage of < 90% but recorded consistent positive improvement between 2019 and 2022 and they include Chad, Equatorial Guinea and South Sudan.

- Developed the Documenting and Reporting Implementation Strategies of Vaccination Efforts (DRIVE) framework to fostering systems learning and enhance cross-context replication in immunization programmes.

Example 2: SP7 Exemplar pilot project: 3 proposed phases across a 5yr timeframe, aligned with IA2030's Strategic Priority (SP) 7 on Research & Innovation

PHASE 1:
Scoping phase to examine & characterize the vaccine and immunization research ecosystem, with particular focus on implementation research: highlighting strengths & weaknesses, identifying evidence and capacity gaps in context of a specific innovative intervention test cases

- 1st phase = approved/funded by Wellcome Trust and expected to define scope for subsequent phases

SP7.1

PHASE 2:
Infrastructure phase to develop regional vaccine IR prioritization and agenda setting process + capacity building

SP7.3

PHASE 3:
Impact phase to demonstrate evidence generation, dissemination, and translation into impactful policies, practices, and products

SP7.2

Key take-home messages

- **Embrace the complexity of context that influences vaccine products, practices, and policies:**

❖ Dynamic contextual factors can influence vaccine access, demand, and uptake.

- **A "one-size-fits-all" approach is not likely to equitably improve vaccination coverage across diverse communities:**

❖ It is important to contextualize factors (including their dynamics) to tailor efforts to improve vaccination coverage in specific communities.

❖ Transform immunization programmes into learning systems and strengthen cross-context knowledge exchange.

- **Country immunization programme implementers need to be capacitated in implementation science:**

❖ Local programme implementers should drive implementation research within countries with equity-focused action.

❖ Support implementation research training at all levels.


TEGURA NONE EJO HEZA H'UMWANA WAWE
UMUKINGIZA INKINGO ZOSE
NYAMPINGA

THANK YOU