

# **Maternal and adolescents immunization - a global challenge -**

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**World Health  
Organization**

# Achieving universal health coverage - Sustainable Development Goal 3 targets

By 2030...

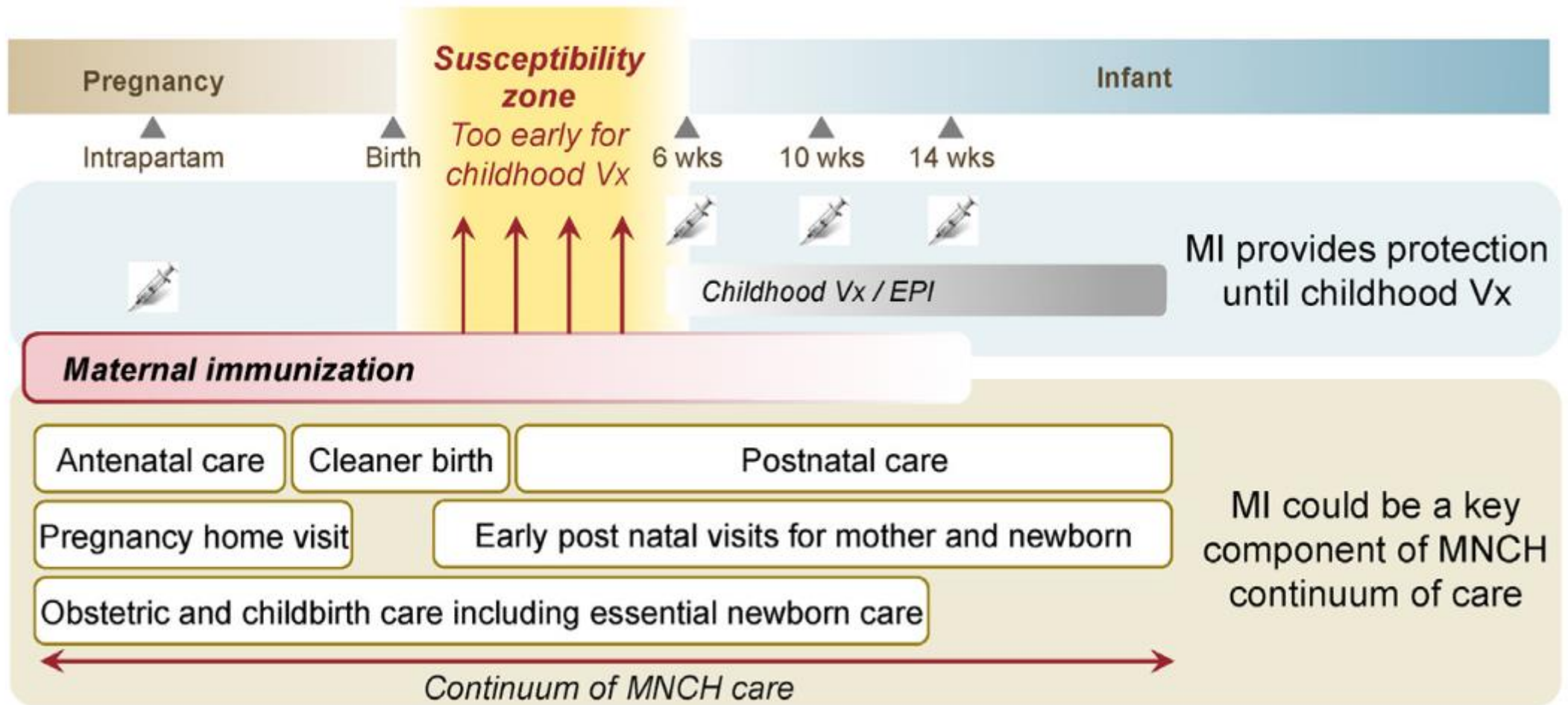
**Target 3.1** Reduce the global maternal mortality ratio to less than 70 per 100,000 live births

**Target 3.2** End preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce

- neonatal mortality to at least as low as 12 per 1,000 live births and
- under-5 mortality to at least as low as 25 per 1,000 live births

 To achieve these targets, interventions addressing the prominent causes of mortality in these target groups are required

# Targeted immunization through Antenatal Care services to mothers to increase coverage



Experts at a BMGF convening on mat. immunization in resource-limited settings (Berlin 2015) agreed that MI must be integrated within the ANC platform

A Sobanjo- Termeulen. Path to impact: A report from the Bill and Melinda Gates Foundation convening on maternal immunization in resource-limited settings; Berlin – January 29–30, 2015 Vaccine 2015

# Potential of maternal immunization

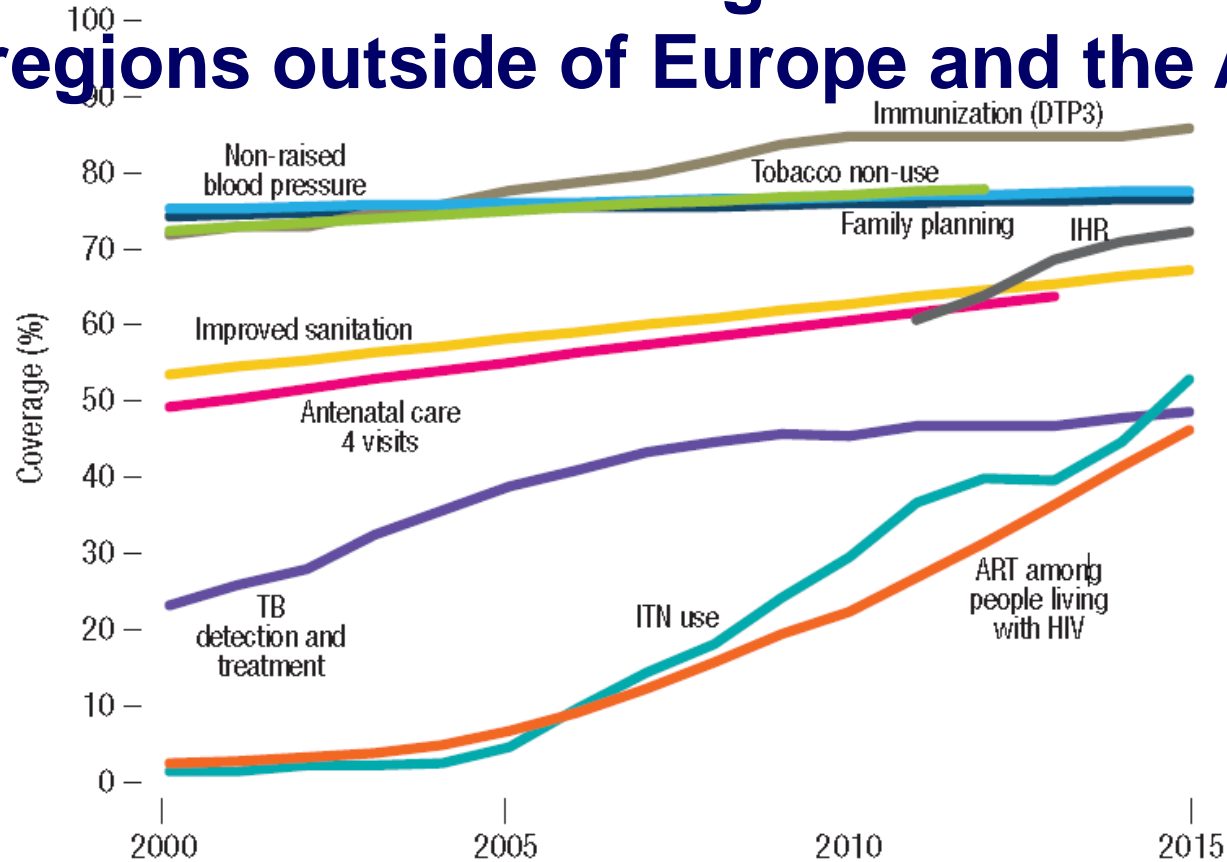
- High risk for exposure of pregnant woman and infants to disease, and potential to protect (depending on vaccine)
  - infants against infection-related deaths
  - against preterm birth and infection-related stillbirths
  - mothers (morbidity and mortality)
- Long history with Maternal Neonatal Tetanus Elimination Campaigns implies benefits in terms of dissemination and access to vulnerable target groups
- Increasing number of vaccines recommended for use during pregnancy and new vaccines in development (RSV, GBS)



# Universal Health Service Coverage SDG

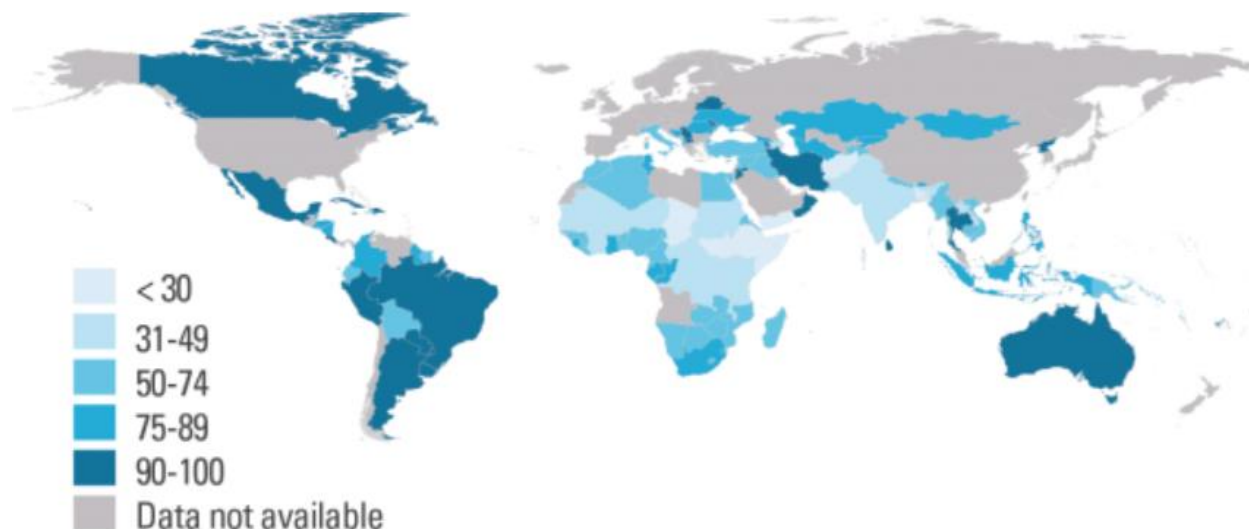
## Indicator: Coverage of essential health services

Since 2000 antenatal care coverage has increased by 30–60% across regions outside of Europe and the Americas



Key methodological challenge: Quality of antenatal services not captured

# Antenatal care coverage

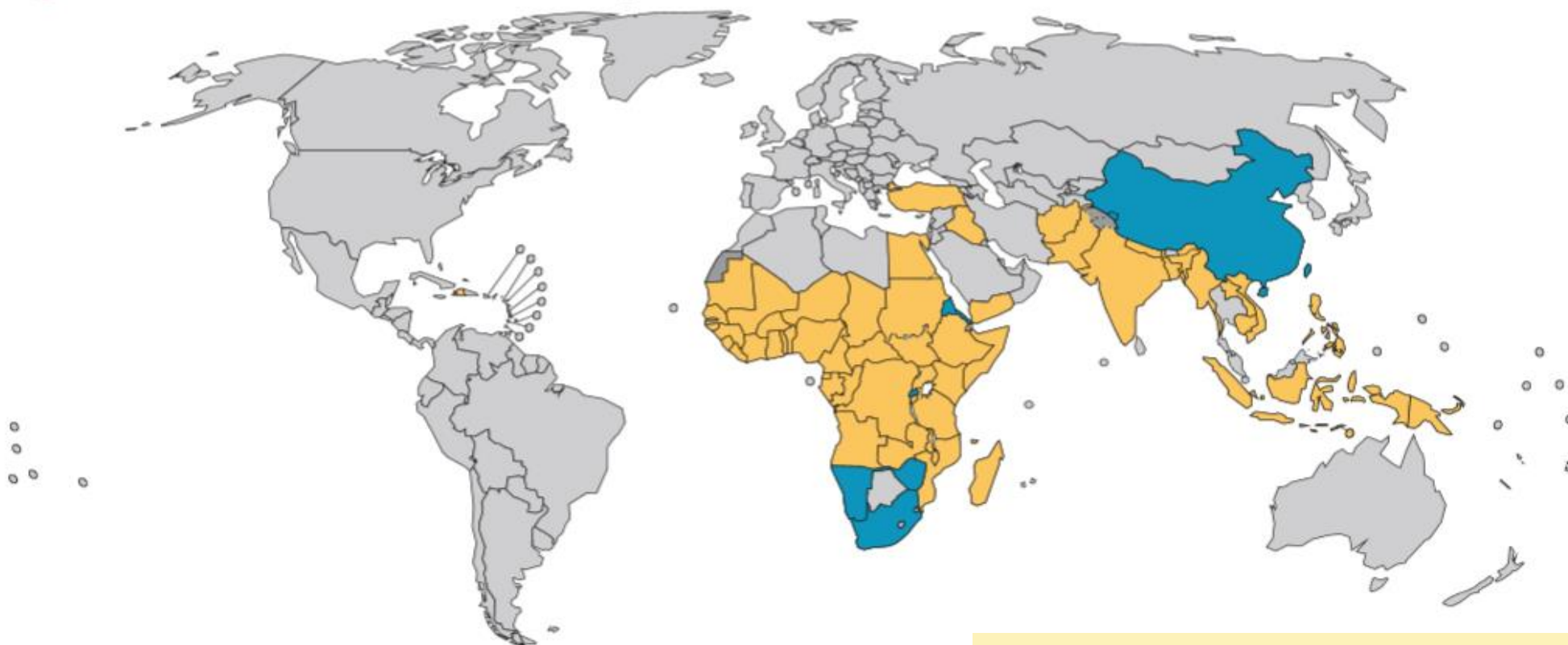


**MDG 5**  
Antenatal care coverage (%)  
2007 – 2014

Income group	At least 1 visit	At least 4 visits
Low income	75	40
Lower middle income	78	67
Upper middle income	94	-
High income	-	-
Global	83	64

# MNTE success has been often through efforts outside of routine immunization

52 member states implemented TT SIAs between 1999 and 2014

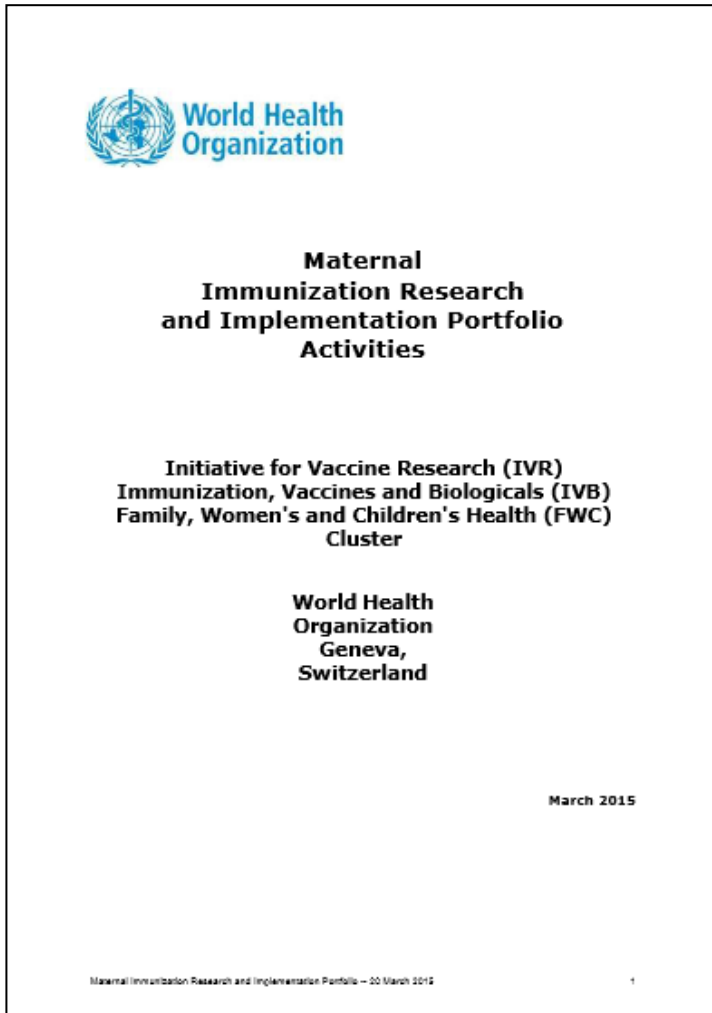


■ Countries achieved MNTE without TT SIAs between 1994 and 2015  
■ Countries having initiated or expanded SIAs between 1999 and 2015  
■ MNT eliminated before 2000

**Countries achieving elimination without SIAs :**  
**China, Eritrea, Namibia, Rwanda, South Africa, Zimbabwe**

Source:  
WHO/UNICEF database, July 2016.

# WHO Maternal Immunization Research Portfolio 2015



- Global stakeholder survey of activities related to maternal immunization
- More than 60 projects included
- **Clear activity gap is evaluation and optimization of vaccine delivery strategies**



# Global recommendations to explore how to put the potential of Maternal Immunization into action

In 2013, the WHO Strategic Advisory Group of Experts on Immunization (SAGE) requested WHO to develop a process and a plan to move the maternal immunization agenda forward creating alignment between data safety evidence, public health needs and regulatory processes.

In 2015, SAGE encouraged WHO to promote more implementation research to generate generalizable data on the best ways to integrate maternal immunization into routine antenatal care in low resource settings.



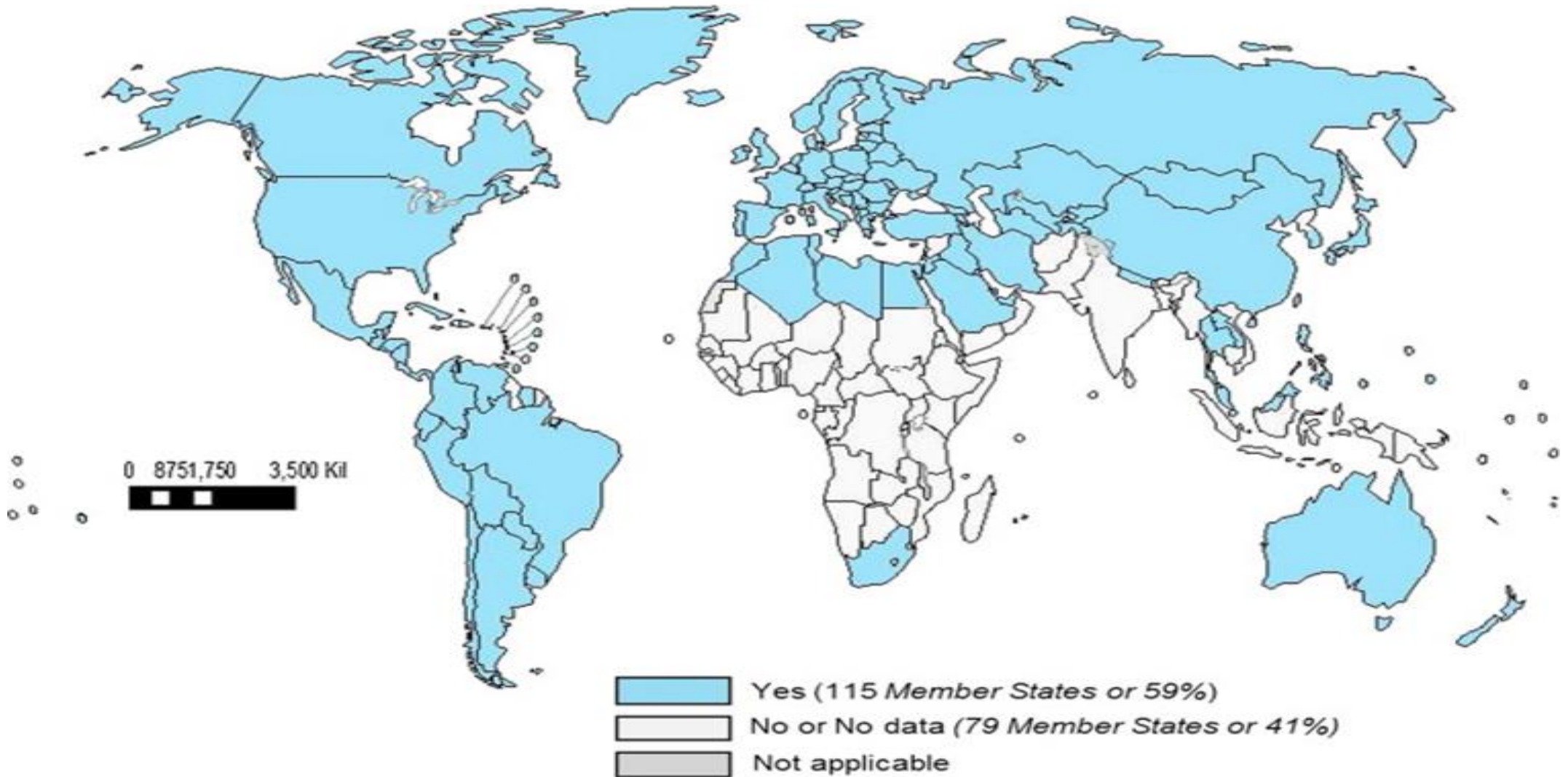
# Vaccines recommended for use in pregnant women by WHO

Generally recommended	Recommended for disease prevention in specific situations	Currently in development
Influenza Tetanus (TT, Td)	Cholera, Yellow Fever, Meningitis A, Hepatitis A, B, E, Japanese Encephalitis, Polio Pertussis	RSV GBS

# Service delivery – experiences with Maternal Tetanus Vaccination

- ANC clinics provide the opportunity to
  - assess the TTCV status of mothers and vaccinate these if required,
  - provide an immunization card as pregnant woman's home based record,
  - track pregnant women's records for defaulter tracing and planning of long duration protection
- Lessons learned from MNTE show operational challenges, e.g.
  - Reaching most vulnerable populations with regular services,
  - Campaigns and outreach services for delivery required
  - Service quality issues
  - Hesitancy issues
- MNTE experience shows different delivery models used in countries
- More information is needed to better understand
  - Factors affecting the implementation and uptake of maternal vaccination programmes
  - (Potential) impact of maternal immunization on capacity of ANC services

# Countries with Influenza vaccine in the national immunization programme (2015)



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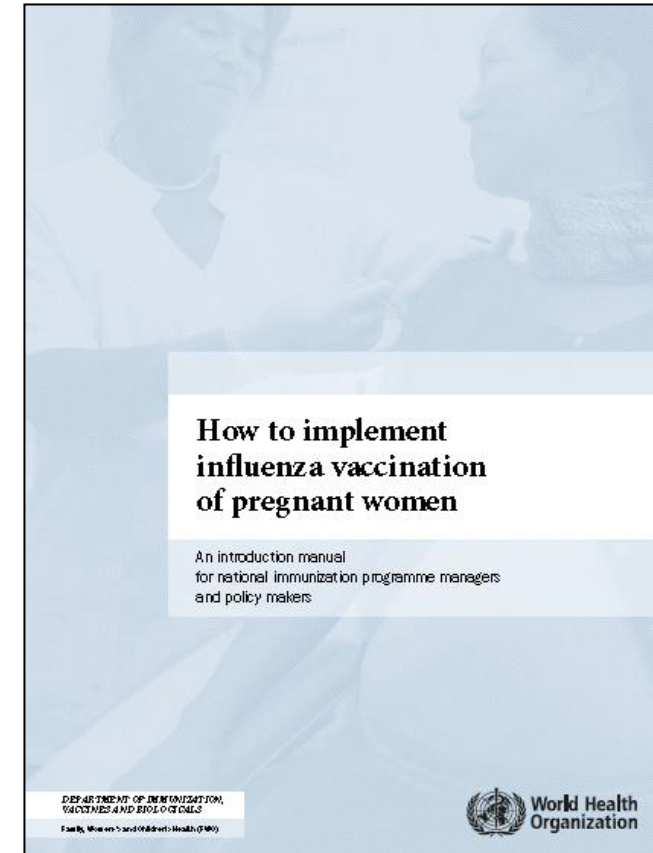
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# Maternal Influenza Immunization Project\*

## - addressing information needs of national decision making for maternal influenza vaccine introduction

- Desk reviews on burden of disease, pharmacovigilance systems, vaccine safety & performance
- Country case studies to identify best practices for routine immunization
- Economic evaluation tools
- Implementation guidance

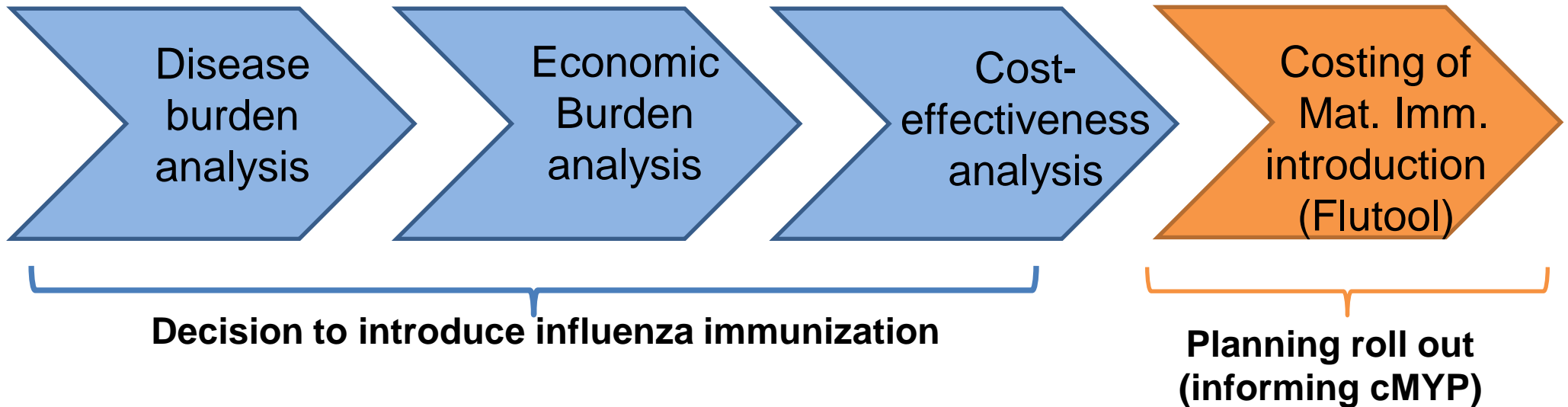
 **Generalizable evidence to support maternal vaccine introduction and service delivery**



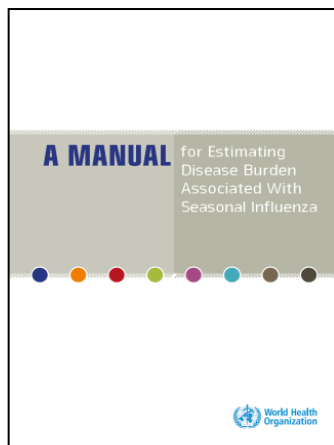
*\*BMGF funded, implemented in partnership with PATH*

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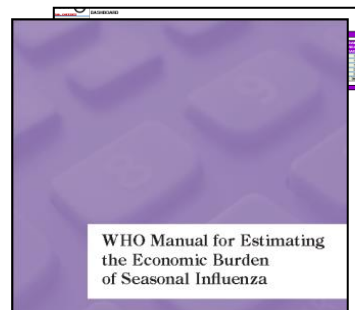
# WHO's Influenza Economic analysis value chain



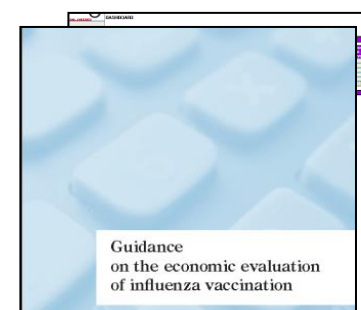
## Disease burden manual



## Economic burden manual & tool



## Cost-effectiveness guidance & tool



## Costing manual & tool



**Endorsed by IVIR-AC and published**

[http://www.who.int/immunization/research/committees/ivir\\_ac/en/](http://www.who.int/immunization/research/committees/ivir_ac/en/)

[http://www.who.int/immunization/research/development/influenza\\_maternal\\_immunization/en/index2.html](http://www.who.int/immunization/research/development/influenza_maternal_immunization/en/index2.html)

# Seasonal Influenza Immunization Costing Tool (SIICT) - objective

- Enables its user to estimate the value of additional resources required to add the influenza vaccine to an existing programme (targeting different risk groups)
- The provides estimates of several cost measures:
  - total costs of adding the influenza vaccine to specific regions/provinces or at the national level
  - cost per immunized person
  - recurrent (operational) and capital costs as well as financial and economic costs
  - expenditures of initial investments required for influenza vaccine introduction



# Piloting the costing tool using data from Malawi (1)

- First prospective costing for maternal immunization study using FluCosting in 2015
- Malawi as pilot study because of its success in MNTE and to leverage related maternal influenza immunization feasibility studies that were being undertaken in-country in 2015.

Table 1. Introduction, recurrent, and capitals costs and their components.

Introduction (Start-up) Costs	Recurrent (Operational) Costs	Capital Costs
<ul style="list-style-type: none"> <li>• Microplanning</li> <li>• Training</li> <li>• Social Mobilization and Information, Education, and Communication</li> </ul>	<ul style="list-style-type: none"> <li>• Vaccine and Injection Supplies</li> <li>• Service Delivery</li> <li>• Social Mobilization and Information, Education, and Communication</li> <li>• Supervision, Monitoring, and Evaluation</li> <li>• Other (e.g. waste management, items not included elsewhere)</li> </ul>	<ul style="list-style-type: none"> <li>• Cold chain equipment</li> <li>• Other equipment</li> </ul>

<https://doi.org/10.1371/journal.pone.0190006.t001>

Table 2. Key data inputs, base scenario.

Input	Value	Source
Target population (introduction year)	913,000 pregnant women	Malawi NSO, Population projections 2008 [20,21]
Doses per pregnant woman	1	WHO Position Paper [1]
ANC1 attendance	95%	Demographic Health Survey [22]
Vaccine coverage among ANC population	74%	Assumption based on Demographic Health Survey data on other ANC services
Vaccine price	\$0 financial cost due to assumed donation program; \$2.9 economic cost	WHO Vaccine Product, Price and Procurement Database [23]
Vaccine presentation	Single dose pre-filled syringe	Assumption based on presentation used in current donation program
Vaccine wastage	5%	Assumption
Vaccine buffer stock	10%	Assumption
Vaccine packaged volume	60 cc	Reference volume by presentation in Immunization Financing Toolkit [24]
Cold chain	\$7/liter for cold rooms; \$26/liter for refrigerators	Malawi Cold Chain Assessment, 2011 [25]; Manufacturer Websites [25–34]; Project Optimize Analysis [31]
Useful life years of cold chain equipment	10	Interviews/assumption
Vaccine transport	Integrated into existing transport	Interviews/assumption
Service delivery	Three minute vaccinator time per woman in ANC clinic or outreach	Interviews
Staff salaries	Various	Interviews
Microplanning, training, information, education, and communication	Various	Interviews
Supervision	Various	Interviews
Waste management	Excluded	Assumption
Disease surveillance	Excluded	Assumption

<https://doi.org/10.1371/journal.pone.0190006.t002>



# Piloting the costing tool using data from Malawi (2)

- Goal: Increase maternal immunization coverage

## ● Scenarios

### Scenario

Base case: Donate vaccines to women over five years

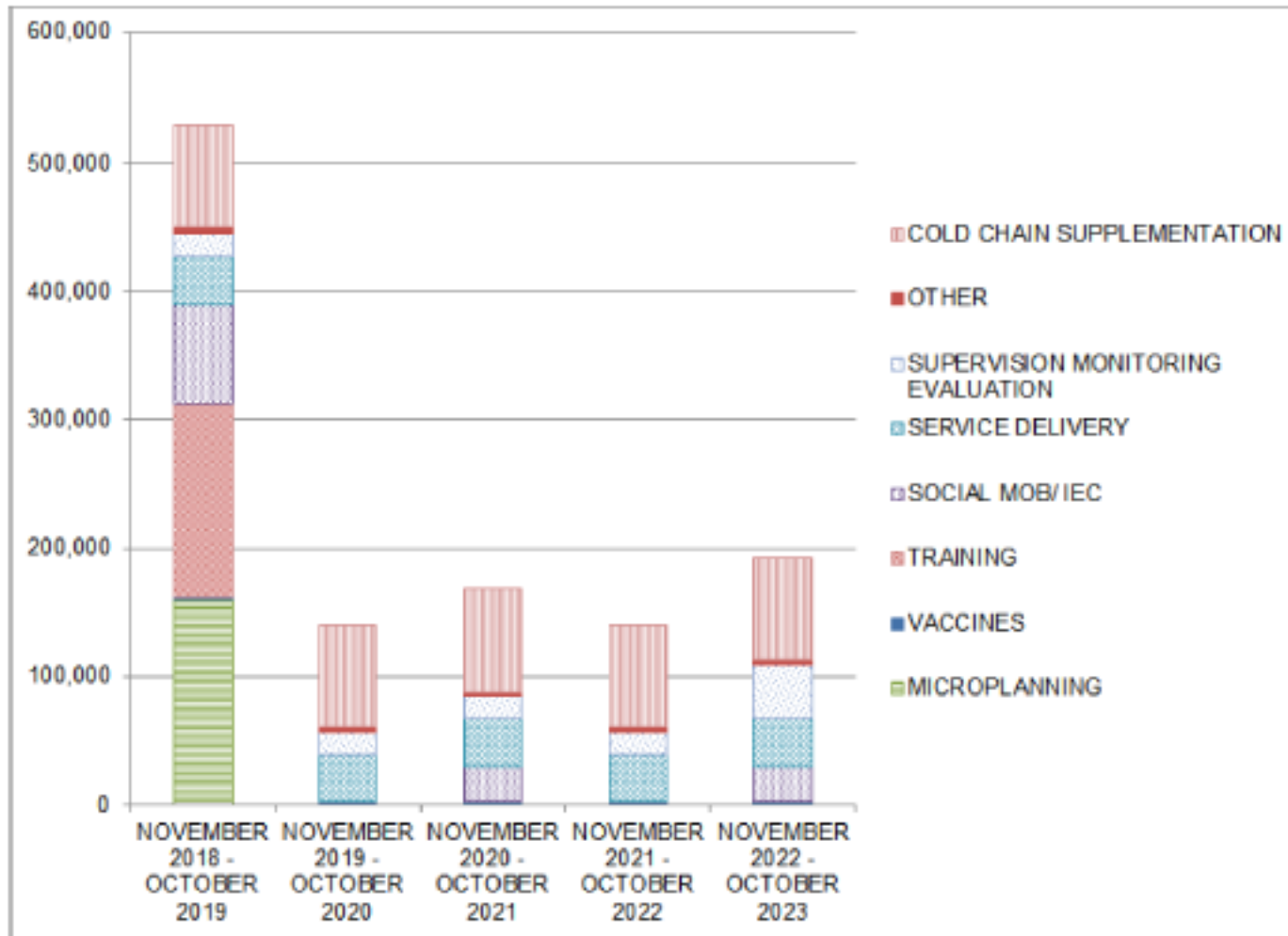
Base case with low coverage

Low coverage: Purchase vaccines

High coverage: Purchase vaccines

## ● Conclusions

- Increased maternal immunization coverage
- Purchasing vaccines is more cost-effective than donating



ion and

### Economic costs (per preg. woman)

\$4.58

\$5.06

\$6.73

\$6.24

and vaccination

Fig 1. Financial costs of maternal influenza immunization program by year, (US\$).

<https://doi.org/10.1371/journal.pone.0190006.g001>

# **Economic value chain for HPV vaccination**

# WHO Cervical Cancer Prevention and Control Costing Tool (C4P)

Tool for costing and planning to support government decisions

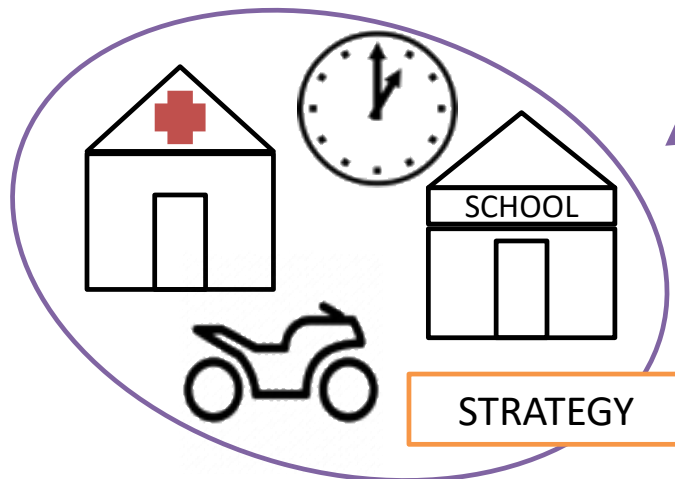
## HPV Vaccination Module

Demonstration project

Five-year scale-up

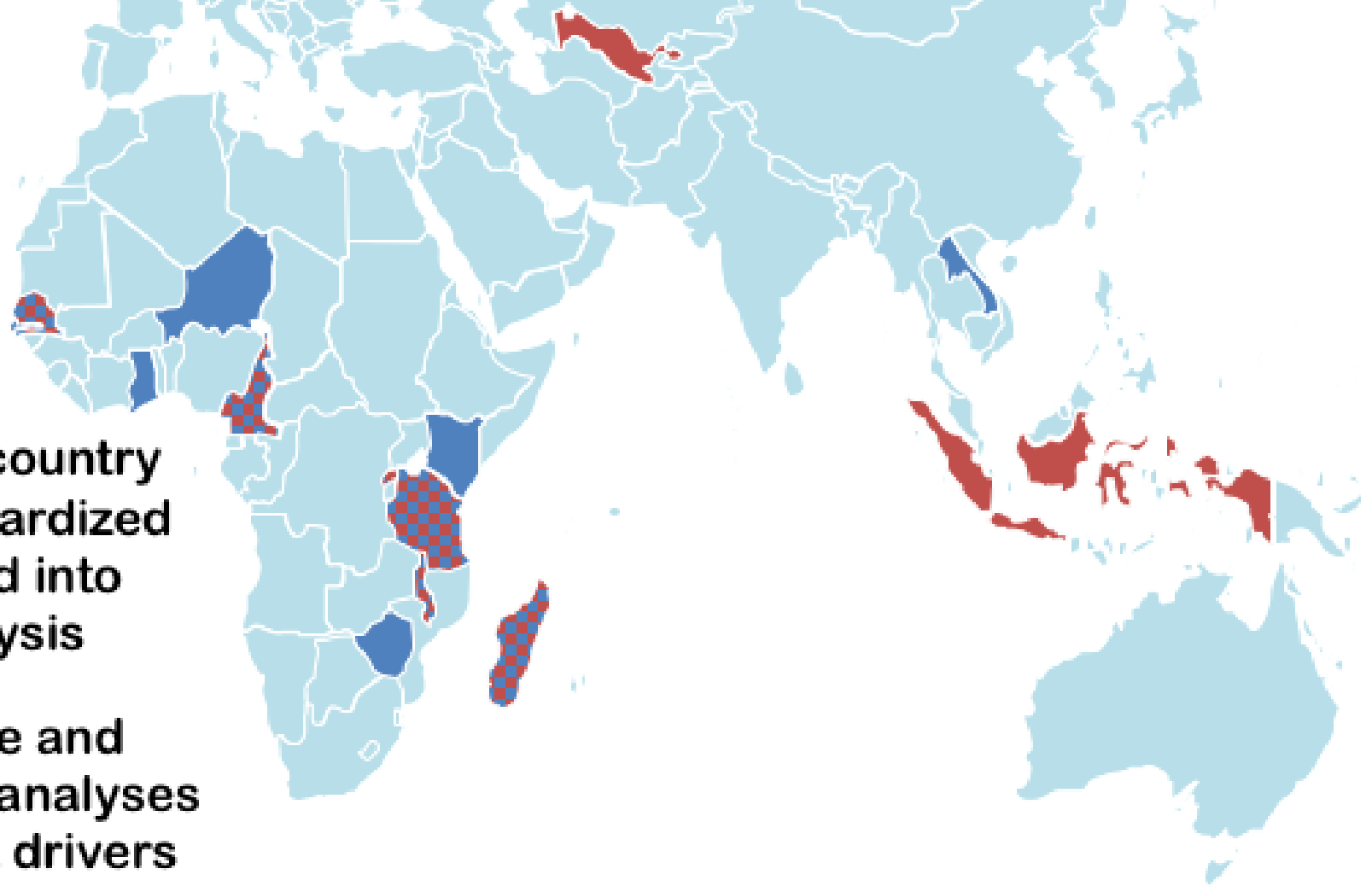
## Cervical Cancer Screening and Treatment Module

Considers costs incurred by the provider (no out-of-pocket expenses)



**LEVIN &  
MORGAN**

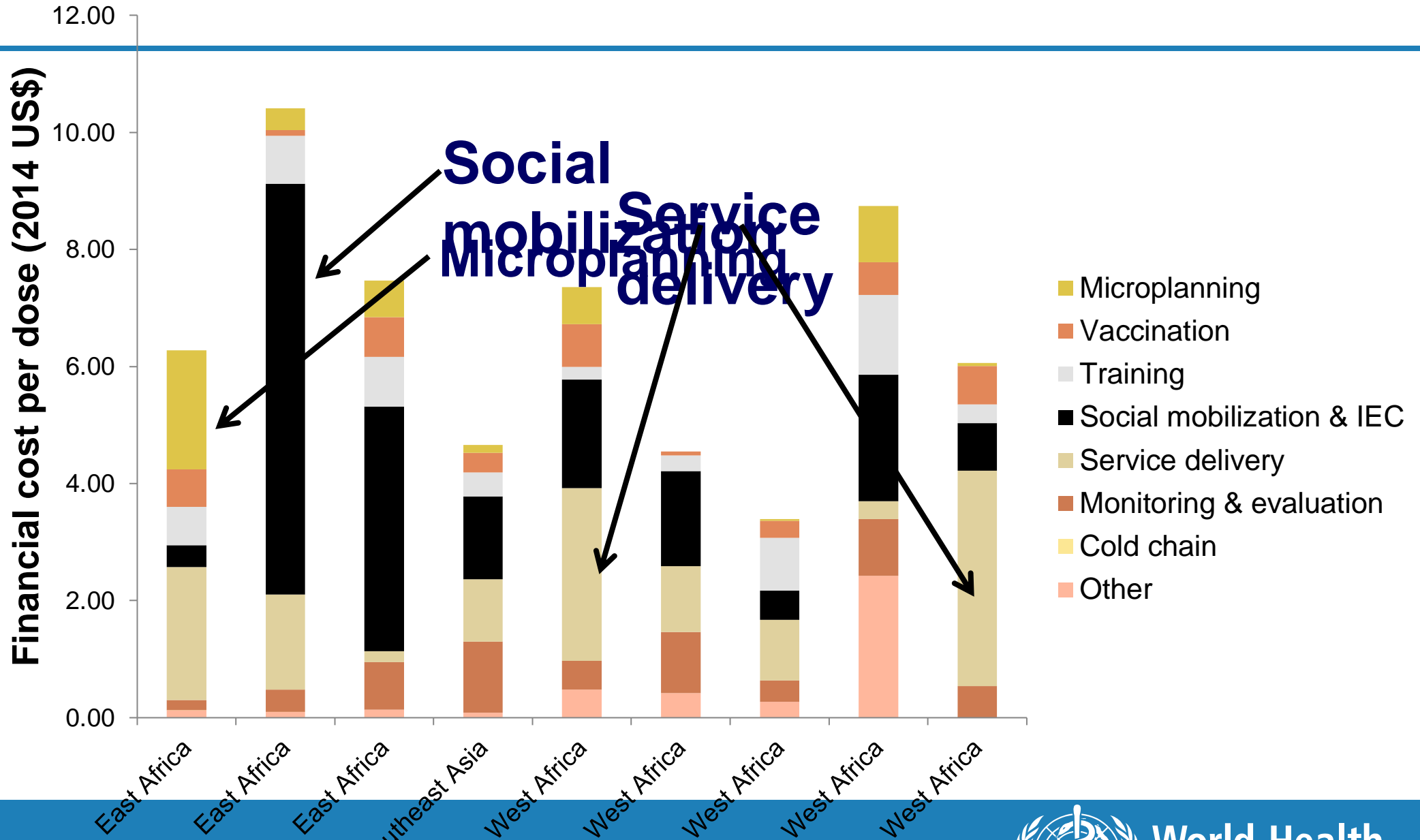
# HPV vaccine costing Database and country characteristics



- Data from country tools standardized and entered into global analysis
- Quantitative and qualitative analyses to find cost drivers

■ 12 demo countries (1 year)  
■ 9 national scale-up countries (5 years)

# Financial cost per dose



# Summary

- Opportunities for immunizing adolescents and pregnant women
- However, information gaps for future vaccine introduction need to be closed, including disease burden, vaccine efficacy and safety, economic aspects and how to best operationalize vaccination
- Careful identification and global coordination of ongoing efforts is essential to inform development, and ultimately the launch and uptake of future maternal vaccines
- WHO provides Guidance and Tools including economic value considerations

