



Introduction to NVI-PST tool

Webinar 3, 19-20th October 2025



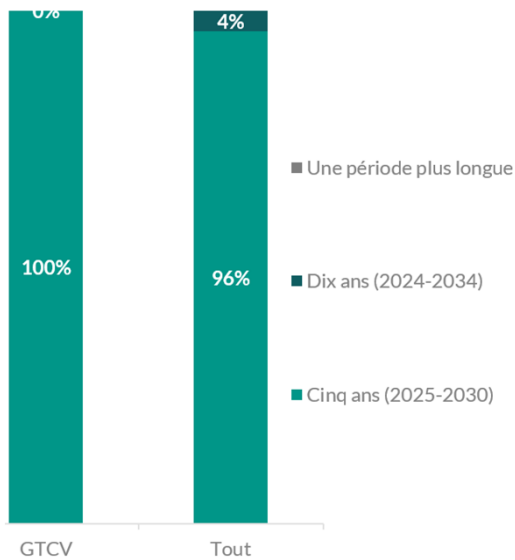
Agenda

- 1 **Reminder: key outputs of workshop 1**
- 2 NVI-PST: selecting vaccines and criteria
- 3 Ethiopia case study
- 4 NVI-PST: collecting & summarizing evidence for NITAG recommendations
- 5 Uganda case study

The first workshop aims at defining the parameters of the prioritization methodology, it could leverage results from an online survey

Timeline

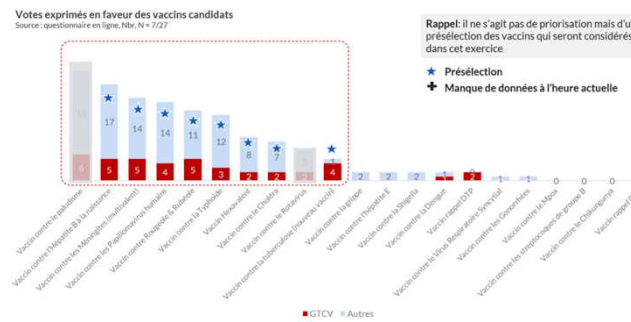
Defining the time horizon and target recurrence of the prioritization exercise



Example charts from the Niger workshop

Vaccines

Shortlisting vaccines to be further prioritized



Criteria

Selecting the final list of criteria used for prioritization



+ Plan for data collection

Agenda

1 Reminder: key outputs of workshop 1

2 **NVI-PST: selecting vaccines and criteria**


3 Ethiopia case study

4 NVI-PST: collecting & summarizing evidence for NITAG recommendations

5 Uganda case study

The process of selecting criteria and vaccines is done in three steps leading to the first workshop

1 Secretariat presents extended list of vaccines and criteria to NITAG

- Start from the 1.3 NVI-PST *Online session template*, including **presentation of the list of criteria**  *Focus of today*
- Prepare **high-level information on all proposed vaccines** (~20 vaccines)
- **Organize an online session** with NITAG members and present criteria and vaccines

2 Secretariat prepares, shares and analyses preference questionnaire

- **Prepare an online questionnaire**, using 1.2 *NVI PST Criteria & Vaccines questionnaire* (or GGform equivalent) as a base
- **Share the link** at the end or after the **Online session** with a deadline before workshop 1
- **Analyse** results from the questionnaire using the 1.4 *NVI PST workshop 1 template*

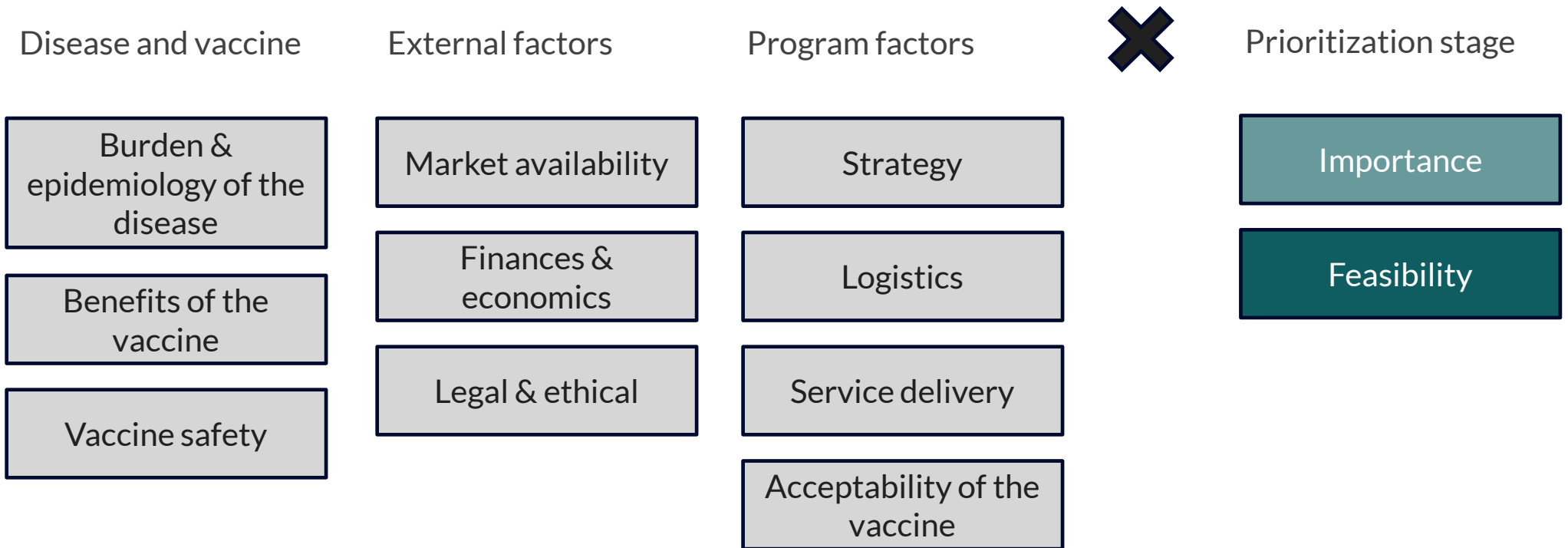
3 NITAG discusses the results during WS1 and select vaccines / criteria

- **During workshop 1:**
- **Discuss vaccines:** use survey results as a starting point and build consensus to select 5-7 vaccines
- **Discuss criteria:** use survey results as a starting point for each criteria category and build consensus to select max 16 criteria
- **Prepare data collection** for Vaccine X Criteria matrix

An extensive literature review was carried out to create a comprehensive list of criteria

Title	Year	Author(s)
An analytical framework for immunization programs in Canada	2004	L.J. Erickson, P. De Wals, L. Farand
National decision-making on adopting new vaccines: a systematic review	2011	Burchett et al.
New vaccine adoption: qualitative study of national decision-making processes in seven low- and middle-income countries	2012	Burchett et al.
Ranking Vaccines: A Prioritization Framework: Phase I: Demonstration of Concept and a Software Blueprint	2012	Guruprasad Madhavan, Kinpritma Sangha, Charles Phelps, Dennis Fryback, Tracy Lieu, Rose Marie Martinez, and Lonnie King
SAGE Guidance for the development of evidence-based vaccination- related recommendations	2017	WHO
National decision-making for the introduction of new vaccines: A systematic review, 2010–2020	2021	Morgane Donadel, Maria Susana Panero, Lynnette Ametewee, Abigail M. Shefer
Factors influencing the prioritization of vaccines by policymakers in low- and middle-income countries: a scoping review	2022	Guillaume et al.
The Use of Multicriteria Decision Analysis to Support Decision Making in Healthcare: An Updated Systematic Literature Review	2023	Pamela Gongora-Salazar, MSc, Stephen Rocks, MSc, Patrick Fahr, DPhil, Oliver Rivero-Arias, DPhil
CAPACITI Tool & Manual		WHO
Vaccine Investment Strategy (VIS) process		GAVI

These criteria relate to 10 topics and are categorized based on the prioritization stages



71 criteria have been identified in total

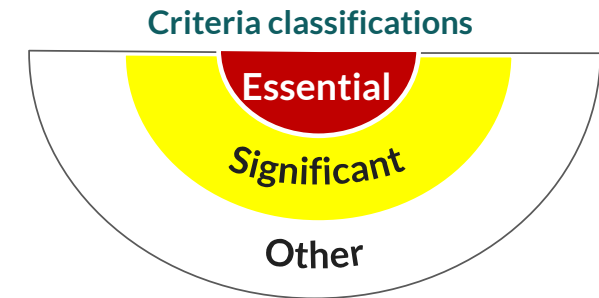
Criterion	Category	Sud-category
Ethical, programmatic, reputational or social issues that may affect acceptability of the vaccine to the target population (e.g. reputation of the country producer, halal)	Acceptability of the vaccine	Perception of target population of the vaccine
Level of use in HICs, thought-leader or neighbouring countries (e.g. related to safety)	Acceptability of the vaccine	Perception of target population of the vaccine
Perception of the target population of the disease risk, severity, fear and demand for disease control	Acceptability of the vaccine	Perception of target population of the disease
Perception of the target population on the desirable and undesirable effects of the vaccine	Acceptability of the vaccine	Perception of target population of the vaccine
Acceptability of schedule (e.g. multiple injections, additional visits)	Acceptability of the vaccine	Perception of target population of the vaccine
Availability of resources for marketing and communication	Acceptability of the vaccine	Demand generation
Coverage of active serogroups or serotypes in the country	Benefits of the vaccine	Direct impact
Effectiveness of the vaccine including in different populations/age groups/cohorts	Benefits of the vaccine	Direct impact
Efficacy and immunogenicity of the vaccine in target population	Benefits of the vaccine	Direct impact
Duration of protection and waning of immunity	Benefits of the vaccine	Direct impact
Number needed to vaccinate to prevent a case	Benefits of the vaccine	Direct impact
Impact on resistance to antibiotics & antivirals	Benefits of the vaccine	Indirect impact
Herd immunity / protection	Benefits of the vaccine	Indirect impact
Effect of the vaccine on transmission	Benefits of the vaccine	Indirect impact
Cost of the disease to the health system	Burden & epidemiology	Economic impact
Direct & indirect costs to patient & families	Burden & epidemiology	Economic impact
Short- and long-term use of health care (e.g. treatments, hospitalization)	Burden & epidemiology	Economic impact
Productivity losses e.g. linked to work & school absenteeism linked to the disease	Burden & epidemiology	Economic impact
Burden inequity	Burden & epidemiology	Epidemiology
Incidence including in different sociodemographic and age groups	Burden & epidemiology	Epidemiology
Prevalence including in different sociodemographic and age groups	Burden & epidemiology	Epidemiology
Outbreak potential incl. past occurrence of outbreaks and potential for international spread, and epidemic and pandemic risk	Burden & epidemiology	Epidemiology
Hospitalization rate	Burden & epidemiology	Health impact
Mortality and lethality incl. in different sociodemographic and age groups	Burden & epidemiology	Health impact
Intensity of suffering/severity of disease symptoms	Burden & epidemiology	Social impact
Long-term complications of disease	Burden & epidemiology	Social impact
Disability-adjusted life years (DALYs)	Burden & epidemiology	Social impact
Loss of quality-adjusted life years (QALYs)	Burden & epidemiology	Social impact
Absence of satisfactory alternatives to prevent/treat the disease	Burden & epidemiology	Alternatives
Social and economic benefits including reduction in health care costs, improvement in life expectancy, in quality of life for individuals, families, caregivers and communities, productivity gains	Finances & economics	Benefits
Indirect benefits (i.e. reduced antimicrobial resistance, reduced emergency room overcrowding)	Finances & economics	Benefits
Direct costs (cost of vaccine, materials, vaccinators, delivery)	Finances & economics	Cost
Indirect costs (e.g. training of health-care workers, supply chain expenses)	Finances & economics	Cost
Perspective on vaccine price	Finances & economics	Cost
Availability and sustainability of funding to cover the total cost of the program (incl. GAVI eligibility)	Finances & economics	Cost

Criterion	Category	Sub-category
Net present cost benefit ratios (from health care and societal perspectives) of vaccine vs. alternative strategies (per life saved, case prevented, life year gained, quality-adjusted life year gained)	Finances & economics	Ratio
Absence of legal constraints concerning use of vaccine (i.e. departure from manufacturers' recommendations/off license use of the vaccine, mandatory, recording, potential compensation for adverse events, incentives)	Legal & Ethical	Legal
Licensing by foreign NRA	Legal & Ethical	Legal
Prequalified by WHO	Legal & Ethical	Legal
Licensing by national RA	Legal & Ethical	Legal
Accessibility and equity of vaccination for the target population	Legal & Ethical	Ethical
Ethical, market and diplomatic issues that may affect acceptability of the vaccine to stakeholders	Legal & Ethical	Ethical
Compatibility of the presentation of the vaccines with the expected uses in the country (e.g. to population spread in the country)	Logistics	Product aspect
Ease of conservation (volume & cold chain requirements)	Logistics	Cold Chain
Shelf life of the vaccine	Logistics	Cold Chain
Availability of adequate cold chain equipment at all levels or ability to procure CCE required to store the vaccine	Logistics	Cold Chain
Readiness of the existing distribution channels in the country	Logistics	Distribution
Indicative wastage rate	Logistics	Wastage
Ability to maintain wastage at expected levels	Logistics	Wastage
Ability to manage waste	Logistics	Wastage
Adequacy of the labels to the local language	Logistics	Product aspect
Market availability of the vaccine and supplies over the selected time period	Market availability	Availability
Sustainability of the market availability of the vaccine and supplies in the longer term	Market availability	Availability
Ease of procurement of the vaccine	Market availability	Procurement
Safety issues related to the product being similar to an existing vaccines or drugs	Vaccine safety	Safety
Risk at population level (e.g. risk of displacement of average age of infection, potential impact of strain selection or emergence of non-vaccine serotypes)	Vaccine safety	Safety
Risk at individual level incl. Type, severity, consequences and frequency of AEFI, including reactogenicity profile & capacity to mitigate known adverse events	Vaccine safety	Safety
Contraindications and precautions for vaccination (e.g. requirement to check background especially factoring risk groups or risk factors)	Vaccine safety	Safety
Interference with other vaccines regarding immunity/protection	Vaccine safety	Safety
Ease of preparation, reconstitution & administration (open-vial policy, CTC)	Service delivery	Human Resources
Expected impact of the introduction on the human resources	Service delivery	Human Resources
Impact on existing immunization services or other health sectors - risk of overload	Service delivery	Human Resources
Availability of information systems to manage the vaccine supply chain and measure related performance metrics (i.e. coverage and vaccine utilization)	Service delivery	Systems
Interchangeability with alternative or future products/presentations	Strategy	Opportunities
Contribution to national/regional/global goals (e.g., eradication, control, elimination, reduction)	Strategy	Opportunities
Opportunity to pair introduction with other planned program (e.g. other vaccine introduction or switch with same target population)	Strategy	Opportunities
Existing recommendations / guidelines for use (e.g. SAGE, professional organizations)	Strategy	Opportunities
Accessibility of the target population (age, gender, special risk)	Strategy	Target
Ease of the considered immunization strategies - incl. geographic (stepwise or nationwide) and target populations (selective/stepwise or universal)	Strategy	Introduction
Administration strategy (single dose, routine primary series only, booster, campaigns)	Strategy	Administration
Feasibility of the program delivery strategy (physicians, CHW, nurses, pharmacists, school-based)	Strategy	Administration

Criteria have been pre-classified as essential, significant or other to ensure simplicity and readability of the framework - but the NITAG will finalize these classifications as relevant to their context and priorities

Criteria were pre-classified selected based on:

1	Relative importance of criteria	<ul style="list-style-type: none">Is this criteria more important for decision-making than other criteria?Is there potential for the data to singularly impact decision-making?
2	Expected availability of data	<ul style="list-style-type: none">Is there a reasonable expectation that country-specific data is available that is current, representative and credible?Is there regional or global data that exists and is made available?If no published evidence is expected to be available, are there experts that can provide advice and considerations?
3	Ability to easily differentiate among vaccines	<ul style="list-style-type: none">Will the data vary sufficiently to differentiate between vaccines, or are all vaccines expected to have similar results?



Essential criteria will have a higher weight and are globally relevant

Significant criteria will have a lower weight and should be chosen based on country-specific relevancy and priorities

Other criteria will have the lowest weight and are chosen based on country-specific relevancy and priorities.

The pre-classification presented in the following slides is only a starting point for discussion. The NITAG will have the final say on the criteria selected, including a 4th consideration for selection: applicability to the country's context.

Criteria review: Burden & epidemiology of the disease

Sub-category	Criteria	Group	Type	Source type
Epidemiology	Burden inequity (highest prevalence in poorer / at risk populations / gender inequity)	Importance	Qualitative	Direct source / Modeled
	Incidence including in different sociodemographic and age groups	Importance	Quantitative	Direct source
	Prevalence including in different sociodemographic and age groups	Importance	Quantitative	Direct source
	Outbreak potential incl. past occurrence of outbreaks and potential for international spread, and epidemic and pandemic risk	Importance	Quantitative	Direct source
Health impact	Hospitalization rate	Importance	Quantitative	Direct source
	Mortality and lethality including in different sociodemographic and age groups	Importance	Quantitative	Direct source
Social impact	Intensity of suffering/severity of disease symptoms	Importance	Quantitative	Modeled
	Long-term complications of disease	Importance	Quantitative	Direct source
	Disability-adjusted life years (DALYs)	Importance	Quantitative	Modeled
	Loss of quality-adjusted life years (QALYs)	Importance	Quantitative	Modeled
Economic impact of the disease	Cost of the disease to the health system	Importance	Quantitative	Direct source / Modeled
	Direct & indirect costs to patient & families	Importance	Quantitative	Modeled
	Short- and long-term use of health care	Importance	Quantitative	Direct source / Modeled
	Productivity losses	Importance	Quantitative	Modeled
Alternatives	Absence of satisfactory alternatives to prevent/treat the disease	Importance	Qualitative	Direct source

Essential

Significant

Criteria review: Benefits of the vaccine

Sub-category	Criteria	Group	Type	Source type
Direct impact	Coverage of active serogroups or serotypes in the country (for serogroup- or serotype-specific vaccines)	Importance	Quantitative	Direct source / Modeled
	Effectiveness of the vaccine including in different populations/age groups/cohorts	Importance	Quantitative	Direct source
	Efficacy and immunogenicity of the vaccine in target population	Importance	Quantitative	Direct source
	Duration of protection and waning of immunity	Importance	Quantitative	Direct source
	Number needed to vaccinate to prevent a case	Importance	Quantitative	Direct source
Indirect impact	Impact on resistance to antibiotics & antivirals	Importance	Quantitative / Qualitative	Direct source / Modeled
	Herd immunity / protection	Importance	Quantitative	Direct source
	Effect of the vaccine on transmission	Importance	Quantitative	Direct source

Essential

Significant

Criteria review: Vaccine safety

Sub-category	Criteria	Group	Type	Source type
Safety	Safety issues related to the product being similar to an existing vaccines or drugs	Feasibility	Qualitative	Direct source
	Risk at population level (e.g. risk of displacement of average age of infection, potential impact of strain selection or emergence of non-vaccine serotypes)	Feasibility	Qualitative	Modeled
	Risk at individual level incl. Type, severity, consequences and frequency of AEFI, including reactogenicity profile & capacity to mitigate known adverse events	Feasibility	Quantitative	Direct source
	Contraindications and precautions for vaccination (e.g. requirement to check background especially factoring risk groups or risk factors)	Feasibility	Qualitative	Direct source
	Interference with other vaccines regarding immunity/protection	Feasibility	Qualitative	Direct source

Essential

Significant

Criteria review: Market availability

Sub-category	Criteria	Group	Type	Source type
Availability	Market availability of the vaccine and supplies over the selected time period	Feasibility	Quantitative	Direct source
	Sustainability of the market availability of the vaccine and supplies in the longer term	Feasibility	Quantitative	Direct source
Procurement	Ease of procurement of the vaccine (e.g. ability to procure through UNICEF, procurement timeline, delivery speed)	Feasibility	Qualitative	Direct source

Essential

Significant

Criteria review: Finances and economics

Sub-category	Criteria	Group	Type	Source type
Benefits	Social and economic benefits including reduction in health care costs, improvement in life expectancy, in quality of life for individuals, families, caregivers and communities, productivity gains	Importance	Quantitative	Modeled
	Indirect benefits (i.e. reduced antimicrobial resistance, reduced emergency room overcrowding)	Importance	Qualitative	Modeled
Cost	Direct costs (cost of vaccine, materials, vaccinators, delivery)	Feasibility	Quantitative	Modeled
	Indirect costs (e.g. training of health-care workers, supply chain expenses)	Feasibility	Quantitative	Modeled
	Perspective on vaccine price	Feasibility	Quantitative	Expert opinion
	Availability and sustainability of funding to cover the total cost of the program (incl. GAVI eligibility)	Feasibility	Quantitative	Direct source
Ratio	Net present cost benefit ratios (from health care and societal perspectives) of vaccine vs. alternative strategies (per life saved, case prevented, life year gained, quality-adjusted life year gained)	Importance	Quantitative	Modeled

Essential

Significant

Criteria review: Legal and ethics

Sub-category	Criteria	Group	Type	Source type
Legal	Absence of legal constraints concerning use of vaccine (i.e. departure from manufacturers' recommendations/off license use of the vaccine, mandatory, recording, potential compensation for adverse events, incentives)	Preselection	Yes/no	Direct source
	Licensing by foreign NRA	Preselection	Yes/no	Direct source
	Prequalified by WHO	Preselection	Yes/no	Direct source
	Licensing by national RA	Preselection	Yes/no	Direct source
Ethical	Accessibility and equity of vaccination for the target population	Feasibility	Qualitative	Expert opinion
	Ethical, market and diplomatic issues that may affect acceptability of the vaccine to stakeholders	Feasibility	Yes/no	Direct source

Essential

Significant

Criteria review: Strategy

Sub-category	Criteria	Group	Type	Source type
Opportunities	Interchangeability with alternative or future products/presentations	Feasibility	Qualitative	Direct source
	Contribution to national/regional/global goals (e.g., eradication, control, elimination, reduction)	Importance	Quantitative/ qualitative	Direct source
	Opportunity to pair introduction with other planned program (e.g. other vaccine introduction or switch with same target population)	Feasibility	Yes/no	Direct source
	Existing recommendations / guidelines for use (e.g. SAGE, professional organizations)	Importance	Yes/no	Direct source
Target	Accessibility of the target population (age, gender, special risk)	Feasibility	Qualitative	Direct source / Modeled
Introduction	Ease of the considered immunization strategies - incl. geographic (stepwise or nationwide) and target populations (selective/stepwise or universal)	Feasibility	Qualitative	Direct source
Administration	Administration strategy (single dose, routine primary series only, booster, campaigns)	Feasibility	Qualitative	Direct source
	Feasibility of the program delivery strategy (physicians, CHW, nurses, pharmacists, school-based)	Feasibility	Qualitative	Expert opinion

Essential

Significant

Criteria review: Logistics

Sub-category	Criteria	Group	Type	Source type
Cold chain	Ease of conservation (volume & cold chain requirements)	Feasibility	Qualitative	Direct source
	Shelf life of the vaccine	Feasibility	Qualitative	Direct source
	Availability of adequate cold chain equipment at all levels or ability to procure CCE required to store the vaccine	Feasibility	Quantitative	Direct source
Distribution	Readiness of the existing distribution channels in the country	Feasibility	Qualitative	Modeled / expert opinion
Wastage	Indicative wastage rate	Feasibility	Quantitative	Direct source
	Ability to maintain wastage at expected levels	Feasibility	Qualitative	Expert opinion
	Ability to manage waste	Feasibility	Qualitative	Direct source
Product aspect	Compatibility of the presentation of the vaccines with the expected uses in the country (e.g. to population spread in the country)	Feasibility	Qualitative	Direct source
	Adequacy of the labels to the local language	Feasibility	Yes/no	Direct source

Essential

Significant

Criteria review: Service delivery

Sub-category	Criteria	Group	Type	Source type
Human resources	Ease of preparation, reconstitution & administration (open-vial policy, CTC)	Feasibility	Qualitative	Modeled / expert opinion
	Expected impact of the introduction on the human resources (e.g. additional workload due to the schedule, complexity of the administration, flexibility of the schedule, level of training requirements for human resources)	Feasibility	Qualitative	Modeled / expert opinion
	Impact on existing immunization services or other health sectors - risk of overload	Feasibility	Qualitative	Expert opinion
Systems	Availability of information systems to manage the vaccine supply chain and measure related performance metrics (i.e. coverage and vaccine utilization)	Feasibility	Yes/no	Direct source

Essential

Significant

Criteria review: Acceptability of the vaccine

Sub-category	Criteria	Group	Type	Source type
Perception of target population of the vaccine	Ethical, reputational or social issues that may affect acceptability of the vaccine to the target population (e.g. reputation of the country producer, halal)	Feasibility	Yes/no	Direct source
	Level of use in HICs, thought-leader or neighbouring countries (e.g. related to safety)	Feasibility	Quantitative	Direct source / Modeled
	Perception of the target population of the disease risk, severity, fear and demand for disease control	Importance	Qualitative	Expert opinion
	Perception of the target population on the desirable and undesirable effects of the vaccine	Feasibility	Qualitative	Direct source
	Acceptability of schedule (e.g. multiple injections, additional visits)	Feasibility	Qualitative	Direct source / Modeled
Demand generation	Availability of resources for marketing and communication	Feasibility	Qualitative	Direct source

Essential

Significant

Summary – Essential and Significant criteria

IMPORTANCE: Which vaccines are the most important to introduce?

Burden & epidemiology of the disease

- Cost of the disease to the health system
- Direct & indirect costs to patient & families
- Burden inequity
- Incidence
- Prevalence
- Outbreak potential
- Hospitalization rate
- Mortality and lethality
- Disability-adjusted life years (DALYs)
- Absence of satisfactory alternatives to prevent/treat the disease

Benefits of the vaccine

- Effectiveness of the vaccine including in different populations/age groups/cohorts
- Efficacy and immunogenicity of the vaccine in target population
- Duration of protection and waning of immunity
- Herd immunity / protection
- Coverage of active serogroups or serotypes in the country

Acceptability of the vaccine

- Perception of the target population of the disease

Strategy

- Contribution to national/regional/global goals

Essential criteria

Significant criteria

FEASIBILITY: Which vaccines are the easiest to introduce?

Market Availability

- Market availability of the vaccine and supplies over the selected time period
- Sustainability of the market availability of the vaccine and supplies in the longer term

Finances and Economics

- Direct costs
- Availability and sustainability of funding

Acceptability of the vaccine

- Ethical, reputational or social issues that may affect acceptability of the vaccine to the target population
- Acceptability of schedule

Vaccine Safety

- Vaccine safety

Service Delivery

- Ease of preparation, reconstitution & administration
- Expected impact of the introduction on the human resources
- Impact on existing immunization services or other health sectors

Logistics

- Availability of adequate cold chain equipment at all levels
- Readiness of the existing distribution channels in the country

Strategy

- Accessibility of the target population

Reminder: This pre-classification was completed at a global level and is only a starting point for discussion. The NITAG will review, discuss and amend this list as appropriate for country context and needs.

Indicators are used to translate criteria into easily comparable measures

Criteria need to be broken down into indicators

- Criteria are broad standards representing one aspect of the vaccine prioritization decision-making.
- To effectively evaluate these criteria, they need to be broken down into specific, measurable indicators.
- Indicators provide concrete data that reflect how well the criteria are being met, making the decision-making process clearer and more precise.
- Indicators therefore need to be:
 - **Specific** (e.g. vaccine effectiveness is not specific enough, vaccine effectiveness in preventing cervical cancer among women aged 18 or more is specific)
 - **Measurable** (e.g. vaccine hesitancy is not measurable, while % of the population expressing doubts about the vaccine is measurable) – for qualitative criteria, scales (e.g. high/medium/low) can be defined to mitigate the absence of measurable values
 - **Consistent with the criteria** (e.g. Number of new cases per year cannot be used for the Prevalence criteria)
 - **Consistent with the vaccine** (e.g. availability of cold chain must be limited to either positive or negative cold chain depending on the vaccine)

Some practical examples

DRC and Niger both selected **Market availability of the vaccine and supplies** as a criteria for their prioritization. To assess this criteria, it was broken down into several indicators each representing one aspect of the criteria, such as : number of available suppliers, Volumes secured by UNICEF in Long Term Agreements, Total global demand for the vaccine per year (millions of doses), Estimated Available Supply for Commercialization (ASC) (millions of doses)

For **vaccine effectiveness**, specificity regarding the population and prevented disease is key. One example arose from the comparison of HPV and Cholera vaccine. For HPV, vaccine effectiveness can be measured by the % of cervical cancer avoided, but also % of CIN3 avoided, and depends on the number of doses received and the age of immunization. For Cholera, vaccine effectiveness in endemic contexts should be separated from vaccine effectiveness in epidemic contexts

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1 Reminder: key outputs of workshop 1

2 NVI-PST: selecting vaccines and criteria

3 Ethiopia case study

4 NVI-PST: collecting & summarizing evidence for NITAG recommendations

5 Uganda case study

In the first workshop, the NITAG defined the methodological scope of prioritization, selecting 6 vaccines and 13 criteria over a 5-year timeframe.

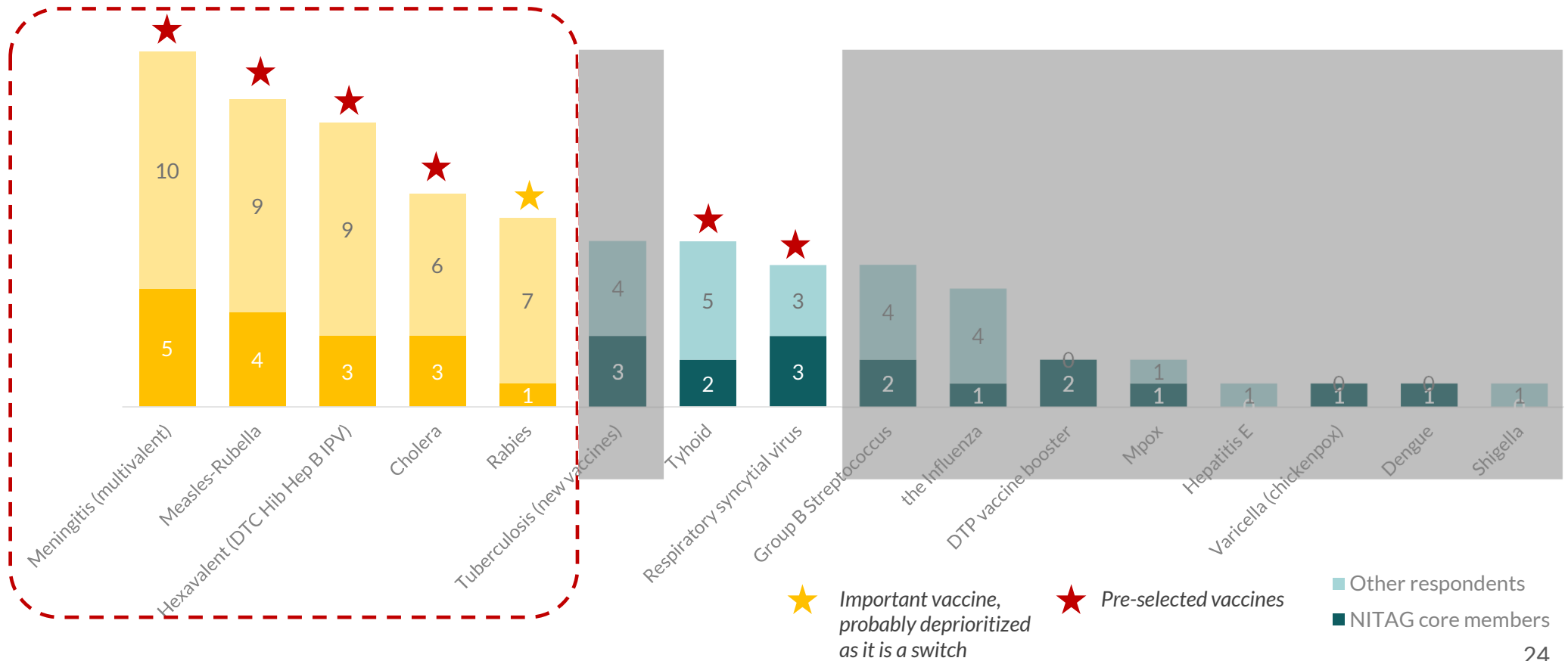
	Timeframe	Vaccines	Criteria
Results	<ul style="list-style-type: none"> The ENITAG recommended a period of 5 years No decision was taken regarding the periodicity of the NVI PST exercise 	<ul style="list-style-type: none"> 6 vaccines were selected for the NVI-PST exercise : <ul style="list-style-type: none"> Meningitis Multivalent Measles-Rubella Hexavalent Cholera (preventive campaigns) TCV RSV 	<ul style="list-style-type: none"> 13 criteria were selected: <ul style="list-style-type: none"> 4 absolutely critical criteria (weight: 3): <ul style="list-style-type: none"> Effectiveness of the vaccine, Incidence Mortality & lethality Coverage of serogroups 6 essential criteria (weight: 2): <ul style="list-style-type: none"> Absence of alternatives Risk at individual level Availability of funding Prevalence Market availability Contribution to goals 3 important criteria (weight: 1) <ul style="list-style-type: none"> Duration of protection Availability of cold chain Impact on human resources
Notes	<ul style="list-style-type: none"> Periodicity can be discussed at the end of the second workshop 	<ul style="list-style-type: none"> 1 additional vaccine (Rabies) was selected, to be discussed separately from NVI-PST to ensure re-introduction of a Rabies stockpile Reminder: Meningitis Multivalent funding by GAVI is accessible to country having introduced MenACV 	<ul style="list-style-type: none"> ENITAG decided to add a “Absolutely critical” category to highlight the importance of criteria in this category, with a higher weight

6 vaccines have been pre-selected for this prioritization exercise ; 1 vaccine to be discussed separately from this NVI PST exercise

Votes cast in favor of vaccine candidates

Source : online questionnaire, Nbr, N = 17

Reminder: this step is not addressing prioritization, but simply consists in pre-selecting vaccines to be considered in this exercise



Source: Second online questionnaire administered to workshop audience

Summary – 13 criteria retained (4 critical, 5 essential, 4 important)

ABSOLUTELY CRITICAL (4)

Effectiveness of the vaccine

Mortality and lethality

Coverage of active serogroups or serotypes in the country

Incidence

WEIGHT: 3

ESSENTIAL (6)

Absence of satisfactory alternatives

Risk at individual level

Availability and sustainability of funding

Prevalence

Market availability of the vaccine

Contribution to national/regional/global goals

WEIGHT: 2

IMPORTANT (3)

Duration of protection and waning of immunity

Availability of adequate cold chain equipment

Expected impact on human resources

WEIGHT: 1

Essential criteria

Important criteria

Other criteria



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4 **NVI-PST: collecting & summarizing evidence for NITAG recommendations**

5 Uganda case study

Data collection is a key step of the process - it enables the NITAG to later make evidence-based recommendations

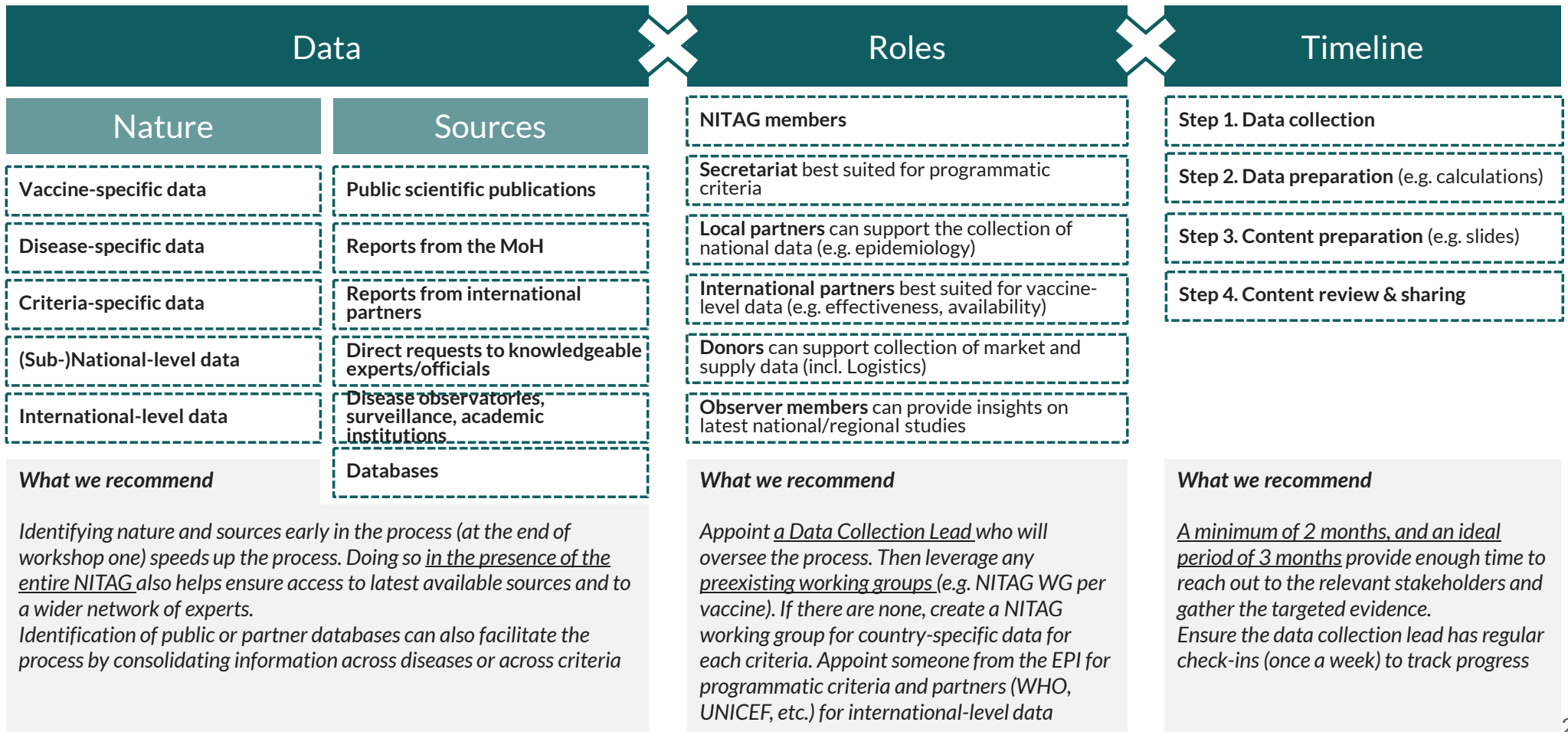
Data collection is the most important part of the new vaccine introduction prioritization process

It provides a robust basis for comparison and recommendations by the NITAG

A 5-step process

1. **Prepare and finalize the data collection plan** during workshop #1, assigning responsibilities and defining timelines
2. **Collect evidence and data** through various sources
3. **Clean and prepare data** to ensure consistency across vaccines and adequacy of data to the selected criteria
4. **Prepare content**, especially using visualization to facilitate comparison between vaccines
5. **Review and share content** ahead of workshop #2 so that everyone is on the same information level

Building an adequate data collection plan is key – it involves defining the nature of data to collect and potential sources, the roles of each stakeholder and the timeline



The NVI-PST toolkit equips NITAGs with a template for data collection

1.5 NVI PST - Phase 1 - Data collection planning matrix

Extract

NVI Prioritization and Sequencing Framework: Evidence Collection Planning Matrix										
This worksheet has been designed to support comprehensive planning for evidence collection. The Evidence Collection Lead can further use this worksheet to track status of data collected.										
Instructions:										
1. For each criteria, insert criteria into column B and identify indicators of interest in column C. Add extra rows for additional criteria/indicators, as needed.		2. Identify the appropriate data collection method (by vaccine or by indicator) in column D and whether this indicator is country-specific or global in column E. If the data collection method is "by indicator," assign an Indicator		3. Add a column for each vaccine selected and input the vaccine name into row 6. Add extra columns as needed. For each vaccine, assign a Vaccine Lead (row 7) that will be responsible for leading evidence collection for any indicators identified as "by vaccine" for collection			4. Complete the evidence collection planning matrix by identifying - for each indicator and each vaccine - who the assigned lead is (as determined by either the Indicator Lead or Vaccine Lead), who will support the assigned lead, and what		5. As data is collected and submitted to the Evidence Collection Lead, easily track status by changing cell color to	
Criteria	Indicators	Collection method (by vaccine/indicator)	Collection level (country/global)	Indicator Lead (if by indicator only)	Malaria	Typhoid	Meningitis	Measles	Tuberculosis	
					Vaccine Lead:	Vaccine Lead:	Vaccine Lead:	Vaccine Lead:	Vaccine Lead:	
Mortality	Number of deaths in 2023	By vaccine	Country	Country	Lead: Dr. John Johnson Support: Sources: Notifiable Disease Surveillance report 2023 Notes:	Lead: Dr. Jack Jackson Support: Sources: Notifiable Disease Surveillance report 2023 Notes:	Lead: Dr. Ali Abdulrazzaq Support: Sources: Notifiable Disease Surveillance report 2023 Notes:	Lead: EPI director (Dr. XX) Support: Sources: EPI Surveillance report, EPI Notes:	Lead: EPI director (Dr. XX) Support: Sources: EPI Surveillance report, EPI Notes:	
Criteria 1	Indicator 2				Lead: Support: Sources: Notes:	Lead: Support: Sources: Notes:	Lead: Support: Sources: Notes:	Lead: Support: Sources: Notes:	Lead: Support: Sources: Notes:	
Criteria 2	Indicator 1				Lead: Support: Sources: Notes:	Lead: Support: Sources: Notes:	Lead: Support: Sources: Notes:	Lead: Support: Sources: Notes:	Lead: Support: Sources: Notes:	
Criteria 2	Indicator 2									
Criteria 2	Indicator 3									

Data can be of various nature and be available at various levels – identifying the potential sources early helps speeding up the process

Type of evidence	Key stakeholders	Key sources
All	<ul style="list-style-type: none"> GNN 	<ul style="list-style-type: none"> WHO compendium Global NITAG Network Resource Center SYSVAC registry Scientific publications on pivotal trials
Burden of disease, epidemiology	<ul style="list-style-type: none"> MoH directions (surveillance, VPD) Disease-specific observatories or initiatives WHO 	<ul style="list-style-type: none"> DHIS2 or other national disease databases MoH annual disease reports WHO Country profiles (e.g. cervical cancer country profile)
Finances & economics	<ul style="list-style-type: none"> UNICEF 	<ul style="list-style-type: none"> UNICEF NIS Material or here UNICEF NIS Costing tool
Market and supply	<ul style="list-style-type: none"> International partners (UNICEF, WHO, GAVI) 	<ul style="list-style-type: none"> WHO MI4A UNICEF Market and Supply Updates GAVI Market shaping roadmaps
Vaccine specifications, safety profiles, etc.	<ul style="list-style-type: none"> WHO GAVI (Peer-reviewed) Studies databases Manufacturers 	<ul style="list-style-type: none"> WHO List of prequalified vaccines GAVI Detailed Products NIH Studies Database <i>Secondary: Manufacturers' websites</i>
Vaccine effectiveness, duration of protection, etc.	<ul style="list-style-type: none"> WHO SAGE (Peer-reviewed) Studies databases 	<ul style="list-style-type: none"> WHO SAGE position papers and annexes (GRADE, ETR tables) NIH Studies Database
Service delivery	<ul style="list-style-type: none"> WHO 	<ul style="list-style-type: none"> WHO recommendations for routine immunization
Logistics and cold chain	<ul style="list-style-type: none"> EPI Logistics section UNICEF 	<ul style="list-style-type: none"> National Stock Management Tool (SMT) eLMIS
Acceptability and demand	<ul style="list-style-type: none"> EPI Demand generation section Demand generation partners National studies UNICEF 	<ul style="list-style-type: none"> National Vaccination Coverage Surveys (VCS) UNICEF Knowledge, Attitude and Practices studies

Data should be collected in a consistent and detailed way to ensure traceability and readability

1.5 NVI PST - Phase 1 - Data collection templates

Extracts

Long version

NVI Prioritization and Sequencing Framework: Evidence Collection Template							
This optional template is provided to streamline evidence collection and synthesize key information into a consistent format that can be used to assess evidence quality and compare across							
Criterion:							
Indicator:							
Vaccine:							
Assigned to:							
Data Sources							
Reference							
Date							
Research team							
Funder							
Study type							
Study design and methodology							
Population and/or country/setting							
Key outcomes and findings							
Evidence reliability (bias, completeness, and transferability)							
Summary of evidence:							
Notes							

Short version (recommended)

NVI Prioritization and Sequencing Framework: Evidence Collection Template	
This optional template is provided to streamline evidence collection and synthesize key information into a consistent format that can be used to assess evidence	
Criterion:	
Indicator:	
Vaccine:	
Summary of evidence:	
Source	
Notes	

Evidence quality can be considered when conducting NVI prioritization, although it does not have to be as structured/comprehensive as for EtR

Evidence quality should be considered, whether formally or informally (e.g. as a discussion during workshop)

- As relevant evidence is identified, the quality and reliability of this evidence is assessed by those conducting data collection
- For NVI-PST, **evidence grading is not always necessary** as it represents a strong additional workload. Shortcuts (such as identifying whether quality has been assessed by other organizations) can be useful
- The [WHO Development of WHO immunization policy and strategic guidance](#) provides several tools to consider for assessing evidence quality.
- **Caveat: The optional evidence quality assessment conducted during the prioritization process should not replace the full evidence quality assessment conducted by NITAGs when considering and developing vaccine recommendations**

The following **can be used** for assessing evidence quality, accuracy and reliability



Bias of the study or data

- *Are there any methodological limitations in the study design or execution that may have influenced the outcomes?*
- *Are these clearly described and are mitigation measures explained?*
- *More broadly, is the person evaluating the data able to discern the quality of the data?*



Conflicts of interest

- *Are there any potential vested interest that the authors, publishers or funders may have?*
- *Are any potential interests disclosed or acknowledged clearly? In that, case, these should be recognized, acknowledged and discussed, while not necessarily leading to automatically downgrading these studies*



Completeness

- *Is the study based on complete datasets (i.e., limited dropout or exclusion) or are there structural limitations that impact the results (i.e., in to lack of health care access or incomplete reporting)?*
- *Do studies report similar and homogenous effects of the vaccines?*
- *Are there concerns about underlying data quality?*



Transferability

- *Is the evidence representative of the target population and/or country context?*
- *Is the context in which the study was conducted relevant or comparable to the potential introducing country, or is there adequate information about the study population to allow for transferability to other settings?*

NITAGs should also decide on the course of action in the case of missing / partial / inaccessible evidence

NITAGs can encounter the following issues regarding data...

Missing data

Incomplete data (e.g. for some vaccines/diseases only)

Inaccessible evidence

Lack of clarity

Scattered data

Inconsistent data

Incomparable data (extrapolation not possible)

... and should therefore define the course of action

Remove criteria or vaccine from comparison

Model data

Use proxy data (e.g. regional)

Use qualitative source (expert opinion) or scale

Reduce criteria weight

Mandate complementary study

Add caveat / disclaimer to content / visualization

Finally, data and content preparation is a critical step that enables easy comparison between vaccines

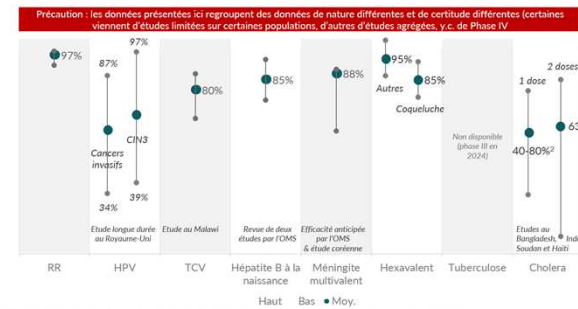
Data needs to be cleaned and processed to ensure robustness and readability...

... and translated into visual content to facilitate efficient discussions during workshop 2

Ex: cold chain volume calculations

Type de CDD	Cible	Population	Part de la population	Cible	Doses par cibles	Facteur de perte	Couverture	Doses Réserve (stock)	Volume par dose	Volume min	Volume max	Volume total nécessaire (m3)	Volume min nécessaire	Volume max nécessaire	Volume antérieur r par dose	Volume net		
RR	Positive	Enfants < 2 ans	126 707 550	4%	5 068 302	2	1.43	92%	25%	16 652 992	4.22	2.6	5.2	70	43	87	4.22	
HPV	Positive	Jeunes filles 10-14 ans	126 707 550	8.0%	10 136 604	1	1.05	70%	25%	9 277 904	15	4.8	15	139	80	250	139.11	
Typhoïde routine	Positive	Enfants < 2 ans	126 707 550	4%	5 068 302	1	1.11	92%	25%	6 476 164	2.89	2.8	14.2	19	47	206	18.72	
Typhoïde entrapasse	Positive	Enfants de 9 à 15 ans	126 707 550	23%	29 141 737	1	1.11	92%	25%	33 456 715	2.89	2.8	14.2	97	47	206	96.64	
Hépatite B	Positive	Naissances	126 707 550	4%	5 068 302	1*	1.09	90%	25%	6 541 966	2.76	2.199	16.8	18	35	280	18.04	
Méningites	Positive	Enfants < 2 ans	126 707 550	4%	5 068 302	2	1.11	92%	25%	12 952 327	9.68	12.3	125	-	205	125.38		
Hexavalent	Positive	Enfants < 2 ans	126 707 550	4%	5 068 302	3	1.06	90%	25%	19 208 325	9.91	2.11	21.8	41	35	30	4.77667	
Tuberculose	Positive	Naissances	126 707 550	4%	5 068 302	1	1.25	90%	25%	7 523 261	0.54	-	-	4	-	-	4.04	
Volume par dose (actuel)																		
VAR																	5.2	
Penta																	2.6	
VPI																	4.4	
BCG																	1.2	
Capacité dispo (m3)																		
Niveau central																		400
Taux d'utilisation																		10%
Niveau antennes (tota)																		400
Taux d'utilisation																		10%

Efficacité réelle contre les maladies couvertes par les vaccins candidats



Commentaires

- HPV: l'efficacité réelle dépend de la population concernée, de la pathologie considérée et du nombre de doses.
- TCV: les données d'efficacité issues de la phase IV sont en ligne avec les données de l'étude au Malawi (79%-88%).
- Hépb: est ici considérée: l'efficacité de la dose du vaccin à prévenir la transmission du VHB de la mère à l'enfant à la naissance.
- Méningites: peu de recul sur l'utilisation du vaccin pentavalent, mais une efficacité au moins égale à celle du tétravalent.
- Hexavalent: protection similaire au pentavalent; protection à 85% contre la coqueluche, 95% pour les autres maladies.
- Choléra: efficacité dépend du vaccin, du nombre de doses et diminue rapidement dans le temps; les études présentent des résultats hétérogènes.

Ex: vaccine effectiveness

1. Pour le HPV, les données varient en fonction de l'âge d'administration du vaccin; 2. Dans un contexte de réponse à une épidémie; Sources: OMS Position Paper sur la Rubéole 2020; OMS Position Paper sur le HPV 2022; OMS Position Paper Typhoïde 2018; OMS Position Paper Méningites 2024; OMS Position Paper sur les vaccins contre la diphtérie, 2017; Infocovid sur les Méningocoques, Paicaro & Al. 2021; UK, Liang et al. 2023; Malawi: HepB-BD Guide for NITAGs, 2022; Carr JP et al. 2022; Jee Myoung et al. 2020; OMS position paper sur le Choléra; Thomas, Carabali et al., 2015; Forbush Qasri et al., 2015; Louise C Ivers et al., 2015; Andrew S Azman et al., 2016; Moly P Franke et al., 2018

Ex: market weight calculations

	Rougeole-Rubéole	HPV	TCV	Hépatite B	Méningites	Hexavalent	Tuberculose
Nombre de fournisseurs (UNICEF)	2	2	2		3 tetra 1 penta	1 (2023)	
Nombre de pays demandeurs (UNICEF)	35 (2021)	20 (2020)	5 (2022)			0	
Demande sécurisée par UNICEF (LTAs)	154 M (2021-2023)	21M (2021-2025)	13M (2022-2024)			0	
Capacité de production estimée	800M (2020)	80M (2022)	60-120M (2021)	environ 1/3 au marché pour le tétravalent soit 65M-70M doses			
Demande estimée 2025 routine via UNICEF	80	35	59.9			27	
Demande RDC 2025	16.7	9.3	6.5	6.5		19.2	
%	21%	27%	11%	37%	#DIV/0!	71%	#DIV/0!
Demande estimée 2025 AVS via UNICEF	120		59.9				
Demande RDC 2025 AVS	24.3		33.4				
%	20%	#DIV/0!	56%	#DIV/0!	#DIV/0!	#DIV/0!	#DIV/0!
Evaluation des capacités de production par UNICEF et GAVI	Le marché a la capacité d'accueillir une introduction de masse		Disponibilité limitée en 2024-2025	Disponibilité suffisante avec anticipation (12-15 mois)		Disponibilité limitée du pentavalent et du tétravalent	
Autres éléments							Vaccin non disponible

Ex: disease inequity

Existence d'inégalité dans les maladies couvertes par les vaccins candidats

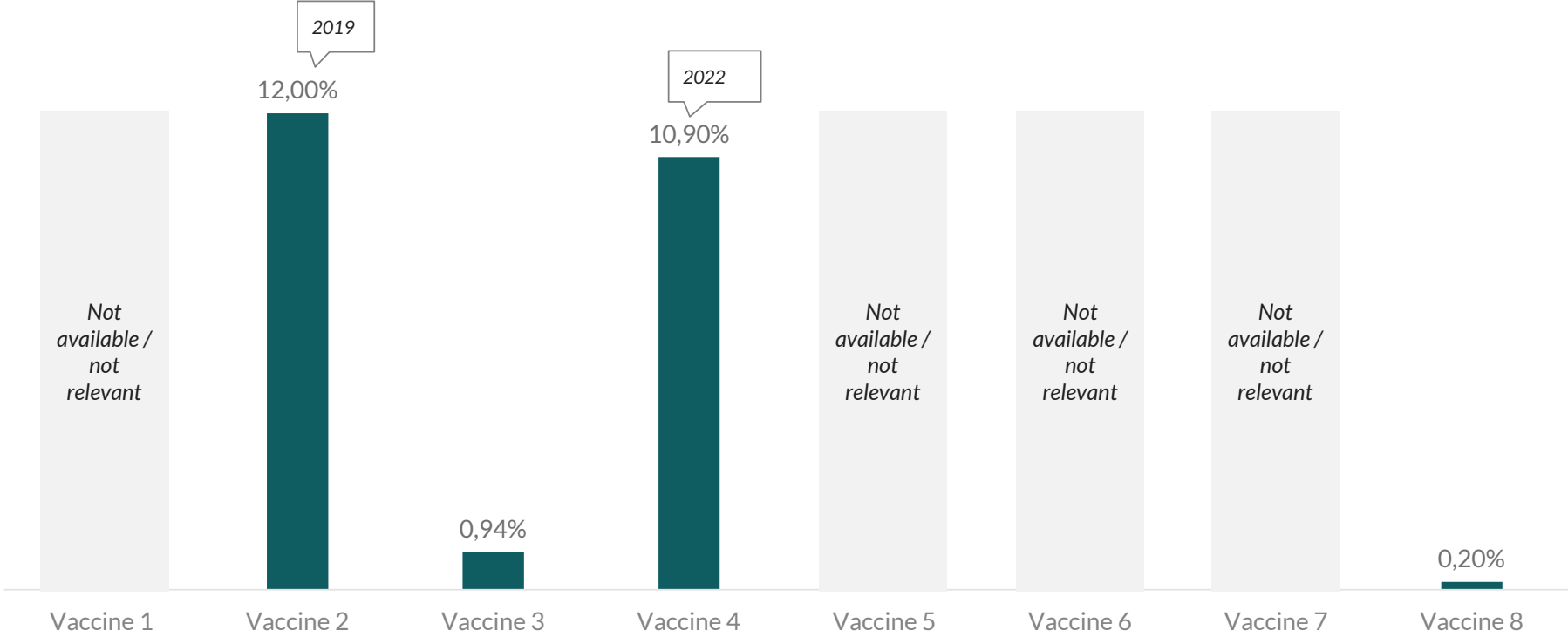
Type d'inégalité	Rougeole-Rubéole	HPV	TCV	Hépatite B	Méningites	Hexavalent	Tuberculose
Inégalité de sexe	Pas d'inégalité significative	Inégalité très forte: les femmes représentent 90% des cancers liés au HPV	Pas d'inégalité significative	Prévalence plus forte de la maladie chez les hommes que chez les femmes	Pas d'inégalité significative	Pas d'inégalité significative	Prévalence plus forte de la maladie chez les hommes
Inégalités socioéconomiques	Existence d'une inégalité faible liée à la sous-nutrition	Existence d'une inégalité faible liée à la probabilité supérieure de comportements sexuels à risque dans les populations plus pauvres et une connaissance moindre des risques	Existence d'une inégalité liée à l'accès à des installations modernes d'eau, sanitaire et d'hygiène	Existence d'une inégalité faible liée à un accès plus limité à des soins obstétricaux ou migrants (plus de risque de propagation du virus)	Existence d'une inégalité faible, notamment chez les populations déplacées ou migrantes (plus de risque de propagation du virus)	Pas d'inégalité significative	Existence d'une inégalité liée à la sous-nutrition, pauvreté, à la prévalence du VIH et la fréquentation de lieux peu aérés
Inégalité géographique	Quelques provinces présentent une incidence bien supérieure à la moyenne; Sankuru (incidence 7 fois supérieure à la moyenne), Tanganyika, Haut-Lomami	Pas d'inégalité significative	Quelques provinces, notamment urbaines, présentent une incidence légèrement supérieure à la moyenne; Kinshasa (incidence 2.8 fois supérieure à la moyenne), Luabala, Haut Katanga & grandes agglomérations	Pas d'inégalité significative	Assez peu d'inégalité malgré l'existence de la ceinture méningitique liée aux caractéristiques épidémiologiques des méningites - l'Equateur a une incidence 3.4 fois supérieure à la moyenne	Pas d'inégalité significative	Existence d'une charge plus forte pour les provinces avec une forte prévalence du VIH

🔴 Inégalité très forte 🟡 Inégalité moyenne 🟢 Faible inégalité

Sources: "Worldwide burden of cancer attributable to HPV by site, country and HPV type"; Gender disparity in infections of Hepatitis B virus, Rapport annuel DSE 2022

Example 1: Prevalence: summary of evidence

Share of the population affected with each disease covered by vaccine candidates
%,

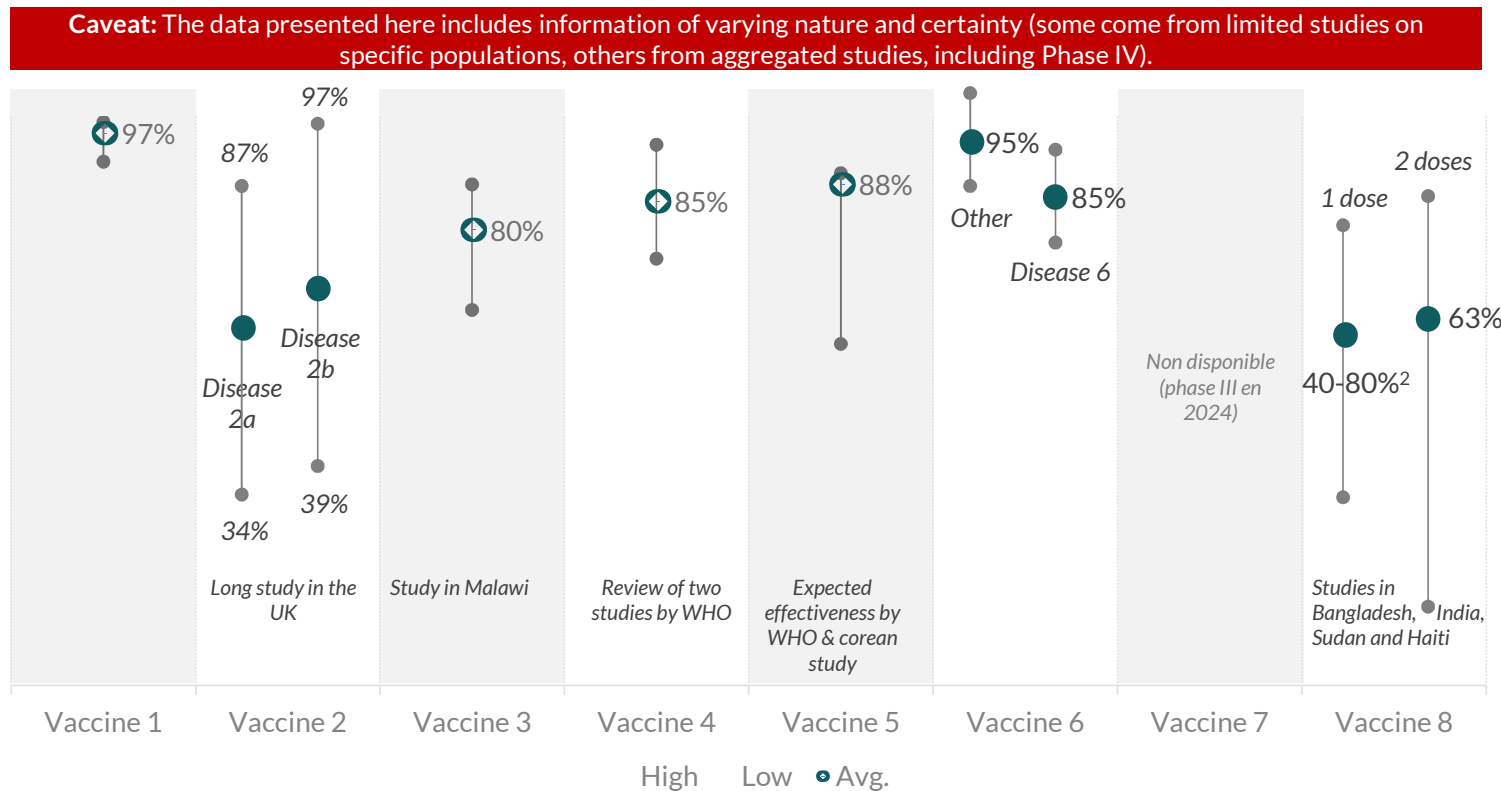


Sources: yyy

Example 2: Effectiveness of the vaccine: summary of evidence

Effectiveness against diseases covered by candidate vaccines

In %













1. For Disease 1, the data varies depending on the age at which the vaccine is administered. 2. In the context of responding to an epidemic.
Sources: WHO Position Paper on XXX.

Comments

- Vaccine 1: The actual effectiveness depends on the target population, the specific pathology considered, and the number of doses.
- Vaccine 2: Effectiveness data from phase IV is consistent with the data from the study in Malawi (79%-88%).
- Vaccine 3: Here, the effectiveness of the vaccine dose in preventing the transmission of Disease 3 from mother to child at birth is considered.
- Vaccine 5: Limited data on the use of the pentavalent vaccine, but its effectiveness is at least equal to that of the tetravalent vaccine.
- Vaccine 6: Offers similar protection to the pentavalent vaccine: 85% protection against whooping cough and 95% for other diseases.
- Vaccine 8: Effectiveness depends on the vaccine, the number of doses, and declines rapidly over time; studies show heterogeneous results.

Example 3: Current availability of the vaccine: summary of evidence

Market information for each vaccine

Caution: The data presented are estimates made from modeled elements based on publicly available data.								
	Vaccine 1	Vaccine 2	Vaccine 3	Vaccine 4	Vaccine 5	Vaccine 6	Vaccine 7	Vaccine 8
No of suppliers (UNICEF)	2	2	2	2 (/4 PQ OMS)	3 (Tetravalent) 1 (Pentavalent) not yet with UNICEF	1	0	2
No of countries supply by UNICEF	35 (2021)	20 (2020)	5 (2022)	Unknown	Unknown	0 (2023)	0	20 (2021)
Secured volumes through UNICEF (LTAs)	 154 M (2021-23)	 21M (2021-25)	 13M (2022-24)	 ~15M	1-2M?	0M	0M	 37M
Weight of XX's demand on overall demand	~4%	~6%	~3%	~8%	Unknown	~15%	Unknown	~5%
Available supply for consumption	 800M (2020)	 80M (2022)	 60M-120M (2021)	Unknown	 ~65M (2019)	Unknown	0M	 35-40M
UNICEF/GAVI summarized assessment on availability	The market has the capacity to accommodate a mass introduction.	Limited availability in 2024-2025	Sufficient availability with anticipation (12-15 months).	Availability is sufficient (greater than demand)	Very limited availability of the pentavalent and tetravalent.	Availability expected from Q2 2024 for Gavi	Not available	Limited availability , increasing demand, decreasing supply
Other elements	Simultaneous transition in [Country], ETH, and NIG represents a risk to availability.			One country is responsible for the majority of UNICEF purchases to date.				Demand is expected to increase significantly starting in 2024 (supported by GAVI).

Sources: Measles & Rubella Supply & Demand update 2022, [Vaccine 2] Supply & Demand update 2020, Typhoid Supply & Demand update 2022, WHO MI4A Global Market Study Typhoid, WHO MI4A Global Market Study [Vaccine 2], WHO MI4A Global Market Study Measles containing vaccines, Diphtheria-Tetanus-Pertussis-Vaccine-Containing Market supply & demand 2023, Meningococcal Vaccines Supply & Demand update 2019, HepB Market & supply update, OCV Market & Supply Update by UNICEF, Gavi Alliance MS Roadmap for Oral Cholera Vaccines,

Agenda

- 1 Reminder: key outputs of workshop 1
- 2 NVI-PST: selecting vaccines and criteria
- 3 Ethiopia case study
- 4 NVI-PST: collecting & summarizing evidence for NITAG recommendations
- 5 **Uganda case study**

Uganda – Extract of Plan for Evidence Collection.....1/2

- 6 vaccines (*Hexavalent, DTP booster, Cholera, Meningitis Multivalent, Typhoid, Influenza*)
- 18 criteria that further need to be specified into indicators
 - 7 essential criteria (weight: 2):
 - Incidence
 - Mortality & lethality
 - Effectiveness of the vaccine,
 - Availability of funding
 - Risk at individual level
 - Direct costs
 - Availability of cold chain
 - 6 important criteria (weight: 1.5):
 - Impact on human resources
 - Contribution to goals
 - Ethical, reputation, social issues
 - Market availability
 - DALYs
 - Cost of disease to health system
 - 5 other criteria (weight: 1)
 - Impact on AMR
 - Accessibility of population
 - Social and economic benefits
 - Existing recommendations
 - Equity of vaccination

Uganda – Extract of Plan for Evidence Collection.....2/2

- 6 vaccines (Hexavalent, DTP booster, Cholera, Meningitis Multivalent, Typhoid, Influenza)

Working groups:

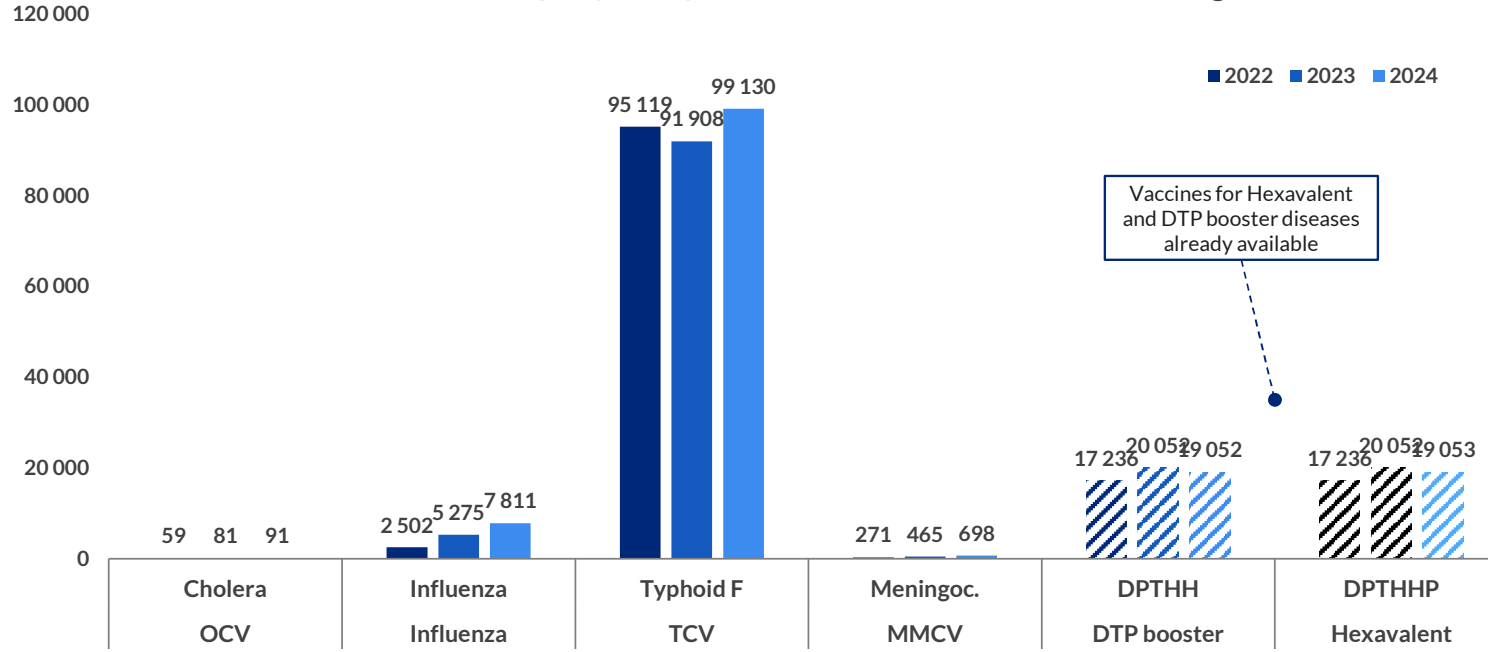
- **Burden of disease group** : Mortality
- **Impact of the vaccine group** : Effectiveness, Safety, Impact on resistance to antibiotics, Existing recommendations
- **Economics group** : Availability of Cold chain, Availability of Funding, Sustainability of Market availability, Direct costs, Impact on human resources,
- **Ethical, legal and social group** : Contribution to national goals, Ethical, reputation and social issues, Accessibility and equity of vaccination, Social and Economic benefits
- **Data collection lead: Irene Atime & Celia Nalwadda (UNITAG Secretariat)**
- **Criteria was split into indicators in the next two weeks during working group sessions**

Uganda data collection matrix

Criteria	Indicator	Study	Findings	Notes
Criteria 1: Effectiveness of the Vaccine	Indicator 1:1: Reduction in disease incidence in general population (in %)(data can be considered given a less score)	P. M., Hutchins, C., Xu, H., Hulse, J. D., Demby, M. N., ... & Azman, A. S. (2024). Effectiveness of one dose of killed oral cholera vaccine in an endemic community in the Democratic Republic of the Congo: a matched case-control study. <i>The Lancet Infectious Diseases</i> , 24(5).	Euvichol-Plus vaccine provided an adjusted effectiveness of 52.7% at 12–17 months post-vaccination, which decreased to 44.7% at 24–36 months. This suggests that while the vaccine offers substantial protection, its effectiveness wanes over time (Malembaka et al 2024)	vaccination in pregnant women: A single centre randomised, double-blind placebo-controlled trial including HIV-uninfected and HIV-infected pregnant women (60% with a median CD4 count 393.5 cells/mm ³ was conducted in South Africa. The influenza attack rate in HIV-infected placebo recipients was higher than in HIV-uninfected placebo recipients (17.0% vs to 3.5%). The results showed the per-protocol vaccine efficacy against all RT-PCR-confirmed symptomatic influenza was 54.4% (95% CI 19.5, 74.2, P=0.005) for HIV-uninfected women and 70.6% (95% CI 23.0, 88.8, P=0.02) for HIV-infected women. Infants born to HIV-uninfected women had a per-protocol vaccine efficacy against RT-PCR-confirmed symptomatic infection of 45.6% (95% CI 2.469-7, P = 0.04) at six months of age compared to 42.3% (95% CI -96.9, 83.1, P=0.52) in HIV-exposed uninfected infants. No impact of vaccination on birthweight, clinical
	Indicator 1:2: Reduction in disease incidence in risk population (in %)	Essen, G. A., de Bakker, D. H., Grobbee, D. E., Tacken, M. A., ... & Verheij, T. J. (2005). Clinical effectiveness of influenza vaccination in persons younger than 65 years with high-risk medical conditions: the PRISMA study. <i>Archives of internal medicine</i> , 165(3), 274-280; Quinn, M. K., Edmond,	outbreak in Cameroon found that after OCV intervention, cholera cases dropped from about 10.5 to 9.3 cases per week at the regional level while at the district level, they dropped from 5.3 to 2.1, 2.2 to 1.7, 0.6 to 0 and 1.7 to 1.5 cases per week respectively for Garoua, Garoua II, Tchollire and Pitoa. (Amani et al., 2021) A study by Khan et al. (2018) evaluating the cost effectiveness of controlling Cholera through the use of oral cholera vaccine in Dhaka Bangladesh targeting 3 age groups: 1-4 year olds, 1-14 year olds, and all persons 1+ using cholera incidence data found that vaccinating 1–14 year olds every three years, combined	1. Results from a systematic review study in the US during the the 2017-2018 influenza season vaccination prevented 7.1 million illnesses (95% CrI, 5.4 million–9.3 million), 3.7 million medical visits (95% CrI, 2.8 million–4.9 million) 109,000 hospitalisations (95% CrI, 39 000–231 000), and 8000 deaths (95% credible interval [CrI], 1100–21 000). Vaccination prevented 10% of expected hospitalizations, and 41% among young children (6 months–4 years). The study used national age-specific estimates of 2017-2018 influenza vaccine coverage and disease burden (Rolfes et al., 2019) 2. Pregnant women: Results from a systematic review and meta-analysis by Quach et al., 2020

Example: Incidence

Number of new cases per year by vaccine candidate, 2022-2024 in Uganda



Hexavalent & DTP booster data:

- Diphtheria: 78 in 2022; 71 in 2023; 40 in 2024
- Polio: 1 case in 2024
- Tetanus: 4044 in 2022; 1914 in 2023; 2485 in 2024
- Hepatitis B: 13114 in 2022; 18067 in 2023; 16527 in 2024

No cases of Haemophilus Influenza B and Pertussis from 2022; however the WHO/UNICEF Joint reporting form indicated 382 pertussis cases in Uganda in 2021

Comments

- **Cholera:** MoH data in line with WHO reports, but underestimated compared to 2013 article (11 000 cases per year). Majority of cases occur within fishing communities and on the DRC/South Sudan/Kenya borders + Kampala slums
- **Influenza:** during peak flu season, prevalence estimated to be between 10% and 13% of the population, much higher than estimated here
- **Typhoid:** MoH data in line with WHO-UNICEF JRF; many cases reported in the capital city. **Caveat: testing is not systematic to confirm S. Typhi**
- **Meningitis:** Karamoja region most affected; incidence higher for children < 5yo; most recent data show prevalence of Serogroups C and A

Sources: Ugandan Ministry of Health, Bwire et.al, (2013), WHO External Situation Report, Uganda Virus Research Institute National Influenza Centre (UVRI-NIC), WHO UNICEF Joint reporting form on Immunization

