

Using Health Technology Assessment and vaccine economics for evidence-based decision-making for better choices and deployment of key vaccines in Nigeria

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Introduction

- **Health technology assessment (HTA) refers to the systematic evaluation of properties, effects, and/or impacts of health technology.**
- **It is a multidisciplinary process to evaluate the social, economic, organizational and ethical issues of a health intervention or health technology.**
- **The main purpose of conducting an assessment is to inform policy decision making (WHO).**

http://www.who.int/medical_devices/assessment/en/

Definition

- **HTA is the systematic evaluation of properties, effects and/or impacts of health technologies and interventions.**
- **It covers both the direct, intended consequences of technologies and interventions and their indirect, unintended consequences.**
- **HTA provides evidence to inform policy and decision-making in healthcare**
- **Impact on Public Health:** Improves resource allocation and health outcomes

Introduction

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Definition

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Elaborating

- It is the application of organized knowledge and skills in the form of medicines, medical devices, vaccines, procedures and systems developed to solve a health problem and improve quality of life.

http://www.who.int/medical_devices/assessment/en/

WHO Resolution on HTA at 67th World health assembly (2014)

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- http://apps.who.int/gb/ebwha/pdf_files/WHA67/A67_R23-en.pdf?ua=1

Rationale

Acknowledging the critical role of independent health intervention and technology assessment, as multidisciplinary policy research, in generating evidence to inform prioritization, selection, introduction, distribution, and management of interventions for health promotion, disease prevention, diagnosis and treatment, and rehabilitation and palliation;

URGES Member States:1 Resolution

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The main purpose

- To inform policymaking for technology in health care, where policymaking is used in the broad sense to include decisions made at, e.g., the individual or patient level, the level of the health care provider or institution, or at the regional, national and international levels.

Key issues with HTA

- HTA is a field of scientific research to inform policy and clinical decision making around the introduction and diffusion of health technologies
- It is a multidisciplinary field that addresses the health impacts of technology, considering its specific healthcare context as well as available alternatives. Contextual factors addressed by HTA include economic, organizational, social, and ethical impacts.
- The scope and methods of HTA may be adapted to respond to the policy needs of a particular health system (Health Technology Assessment International 2013).

Three basic HTA Orientations

1. Technology-oriented assessments are intended to determine the characteristics or impacts of particular technologies. For example, a government agency may want to determine the clinical, economic, social, professional, or other impacts of cochlear implants, new anti-diabetic drugs, cervical cancer screening, MRI, or widespread adoption of electronic health record systems.

2nd HTA orientation

Problem-oriented assessments focus on solutions or strategies for managing a particular disease, condition, or other problem for which alternative or complementary technologies might be used. For example, clinicians and other providers concerned with the problem of diagnosis of dementia may call for HTA to inform the development of clinical practice guidelines involving some combination or sequence of clinical history, neurological examination, and diagnostic imaging using various modalities.

3rd HTA orientation

Project-oriented assessments focus on a local placement or use of a technology in a particular institution, program, or other designated project. For example, this may arise when a hospital must decide whether or not to purchase a PET scanner, considering the facilities, personnel, and other resources needed to install and operate a PET scanner; the hospital's financial status; local market potential for PET services; competitive factors; etc.

Properties and Impacts Assessed in HTA

These include the following:

- Technical properties
- Safety
- Efficacy and/or effectiveness (health outcomes)
- Economic attributes or impacts
- Social, legal, ethical and/or political impacts

- HTA 101

Measuring Health Outcomes

Health outcome variables are used to measure the safety, efficacy and effectiveness of health care technologies. Main categories of health outcomes are:

- Mortality (death rate)
- Morbidity (disease rate)
- Adverse health events (e.g., harmful side effects)
- Quality of life
- Functional status
- Patient satisfaction
 - HTA 101

Timing of Assessment

- There is no single correct time to conduct an HTA. It is conducted to meet the needs of a variety of policymakers seeking assessment information throughout the lifecycles of technologies. Regulators, payers, clinicians, hospital managers, investors, and others tend to make decisions about technologies at particular junctures, and each may subsequently reassess technologies. Indeed, the determination of a technology's stage of diffusion may be the primary purpose of an assessment.

Expertise for Conducting HTA- Depending upon the topic and scope of assessment, these include a selection of the following

- Physicians, nurses, other clinicians
- Managers of hospitals, clinics, nursing homes, and other health care institutions
- Pharmacists and pharmacologists
- Laboratory technicians, radiology technicians, and other allied health professionals
- Biomedical and clinical engineers
- Patients and community representatives
- Epidemiologists
- Biostatisticians
- Economists
- Social scientists
- Decision scientists
- Ethicists
- Lawyers
- Computer scientists/programmers
- Librarians/information specialists

Basic steps in HTA

1. Identify assessment topics
2. Specify the assessment problem or questions
3. Determine organizational locus or responsibility for assessment
4. Retrieve available relevant evidence
5. Generate or collect new evidence (as appropriate)
6. Appraise/interpret quality of the evidence
7. Integrate/synthesize evidence
8. Formulate findings and recommendations
9. Disseminate findings and recommendations
10. Monitor impact

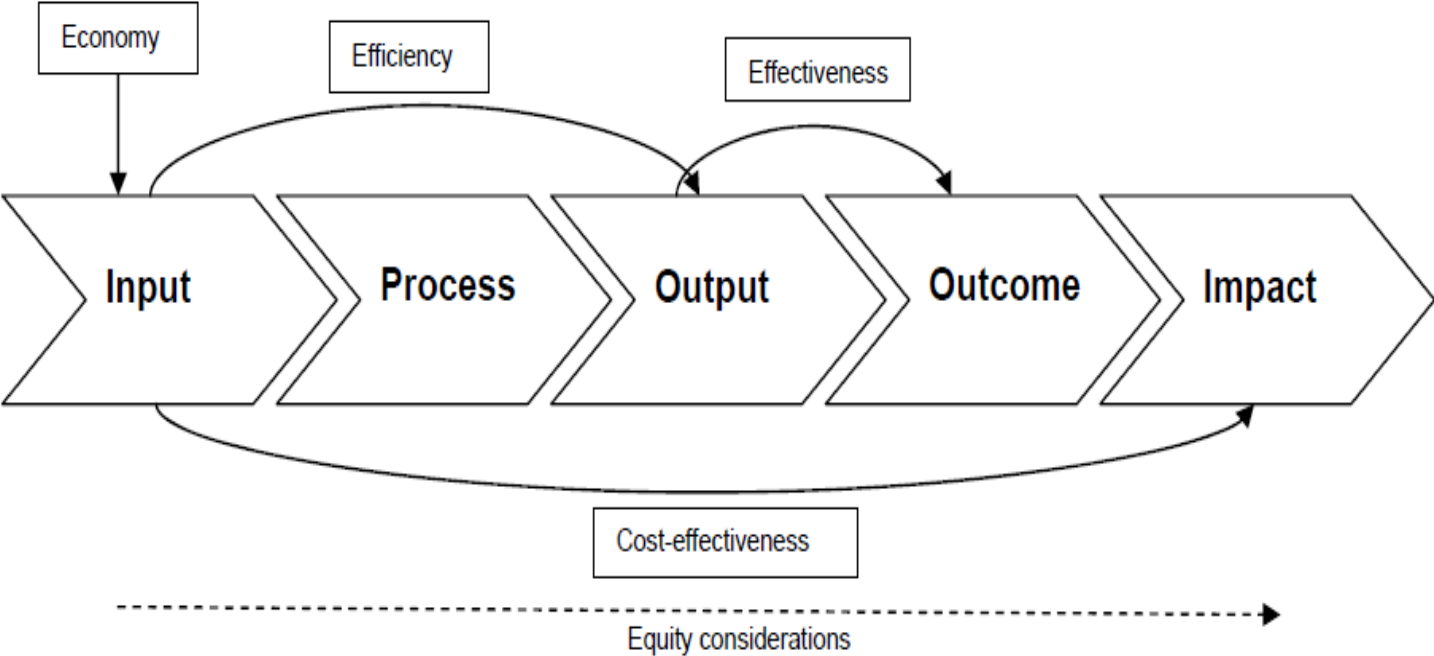
**A major output of many HTA
assessments**

Determining Value for Money
of health technologies

Value for Money (VfM)

- Value-based healthcare weighs the costs and benefits of programmes (what is put in and what is achieved), to make a case for why a chosen alternative is the best use of resources and delivers most value to the patient
- The central goal in health care must be **value for patients, not** access, volume, convenience, or cost containment
- Efficient utilisation of healthcare resources to achieve the desired goals defines value in healthcare

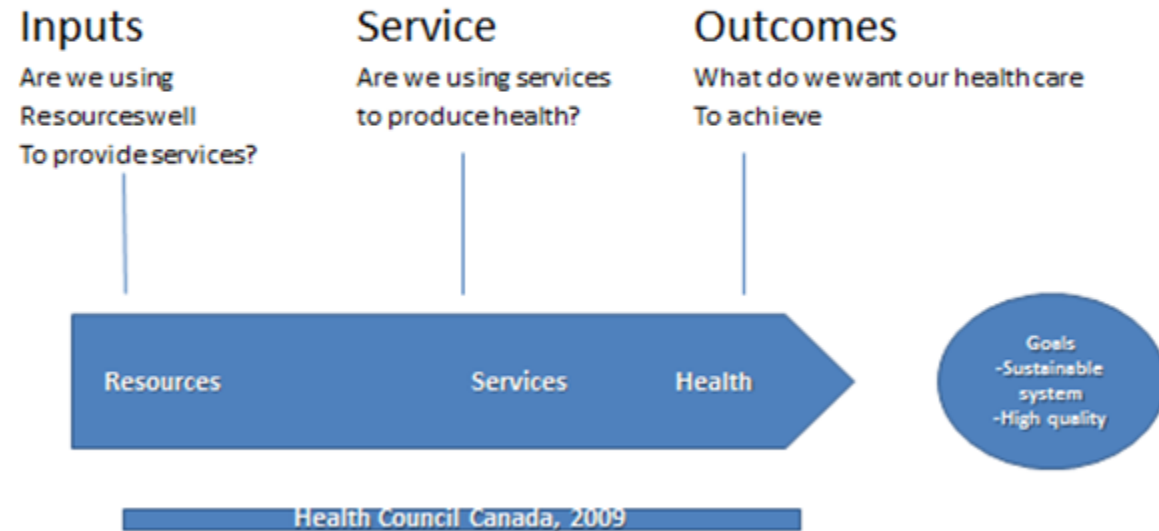
VFM CHAIN



DFID APPROACH

VfM relationship

Value for Money



Role in choices of vaccines and how they are deployed

- **Identifies the most efficient, equitable, ethical and effective vaccines**
- **Identifies the most efficient, equitable, ethical and effective vaccination strategies or vaccine deployment strategies or immunisation mechanisms**

Components:

- **Economic evaluation**
 - **Cost-effectiveness analysis (CEA)**
 - **Cost-benefit analysis (CBA)**
 - **Cost Utility analysis (CUA)**
 - **Cost minimization analysis (CMA)**

- **Costs (Medical and non-medical/ direct and indirect)**
- **Clinical effectiveness**
- **Benefits**
- **Quality of Life**

- **Ethical implications**
- **Social implications**
- **Legal implications**

Vaccine economics

- Also known as Immunisation Economics
- A component of Health Technology Assessment
- **Definition:** The study of economic aspects related to the development, deployment, and impact of vaccines.

Vaccine Economics: Key Concepts

CEA, CBA, CUA (CEA): Compares the relative costs and outcomes (benefits) of different courses of action.

Budget Impact Analysis (BIA): Estimates the financial impact of adopting a new health intervention (vaccine or deployment method) within a specific budget context.

Economic Evaluation:
CEA, CBA, CUA, CMA

Importance: Ensures efficient use of limited resources.

Common outcome measures

- Quality-Adjusted Life Years (QALY)
- Disability-Adjusted Life Years (DALY)

The Importance of Evidence-Based Decision Making

Definition: Decision-making based on systematically collected evidence.

Principles:

- Use the best available evidence
- Consider patient values and preferences
- Leverage clinical expertise

Benefits: Improves patient outcomes, enhances efficiency, and reduces costs.

Challenges: Data quality, resource limitations, and resistance to change.

Role in Vaccine Deployment: Optimizes vaccine selection and distribution.

Case Studies: Successful implementation examples.

Utilizing HTA in Vaccine Decision Making

- **Steps in Conducting HTA:**
 - Define the scope and objectives
 - Collect and review evidence
 - Analyze data
 - Develop recommendations
- **Prioritizing Vaccines:** Criteria for selection based on burden of disease, population needs, and cost-effectiveness.
- **Evidence Gathering:** Systematic reviews, meta-analyses, and real-world data.
- **Stakeholder Engagement:** Inclusion of policymakers, healthcare providers, and the public.
- **Decision-Making Process:** Integrating HTA findings into policy formulation.



Economic Evaluation of Vaccines: Case Studies

Case Study 1: Measles Vaccination in Nigeria:

- Cost-effectiveness analysis
- Impact on measles incidence and mortality

Case Study 2: Malaria Vaccine Deployment:

- Budget impact analysis
- Reduction in malaria burden

Economic Evaluation Results:

- QALYs gained
- DALYs averted

Health Outcomes: Improvement in public health metrics.

Lessons Learned: Best practices and strategies for future implementations.

Strategies for Better Deployment of Key Vaccines

Integrating

Integrating HTA and Economic Evaluations:

- Use HTA to inform vaccine policy
- Align economic evaluations with health priorities

Strengthening

Strengthening Health System Infrastructure:

- Improve cold chain logistics
- Expand healthcare workforce

Enhancing

Enhancing Supply Chain and Logistics:

- Ensure reliable vaccine supply
- Implement robust distribution systems

Increasing

Increasing Public Awareness and Education:

- Conduct awareness campaigns
- Address vaccine hesitancy

Leveraging

Leveraging International Partnerships:

- Collaborate with global health organizations
- Secure funding and technical support

Recommendations for Policy Makers

Prioritize Evidence-Based Decision Making:

- Use HTA and economic evaluations
- Base decisions on robust data

Invest in HTA Capacity Building:

- Train healthcare professionals
- Develop local expertise

Ensure Sustainable Funding:

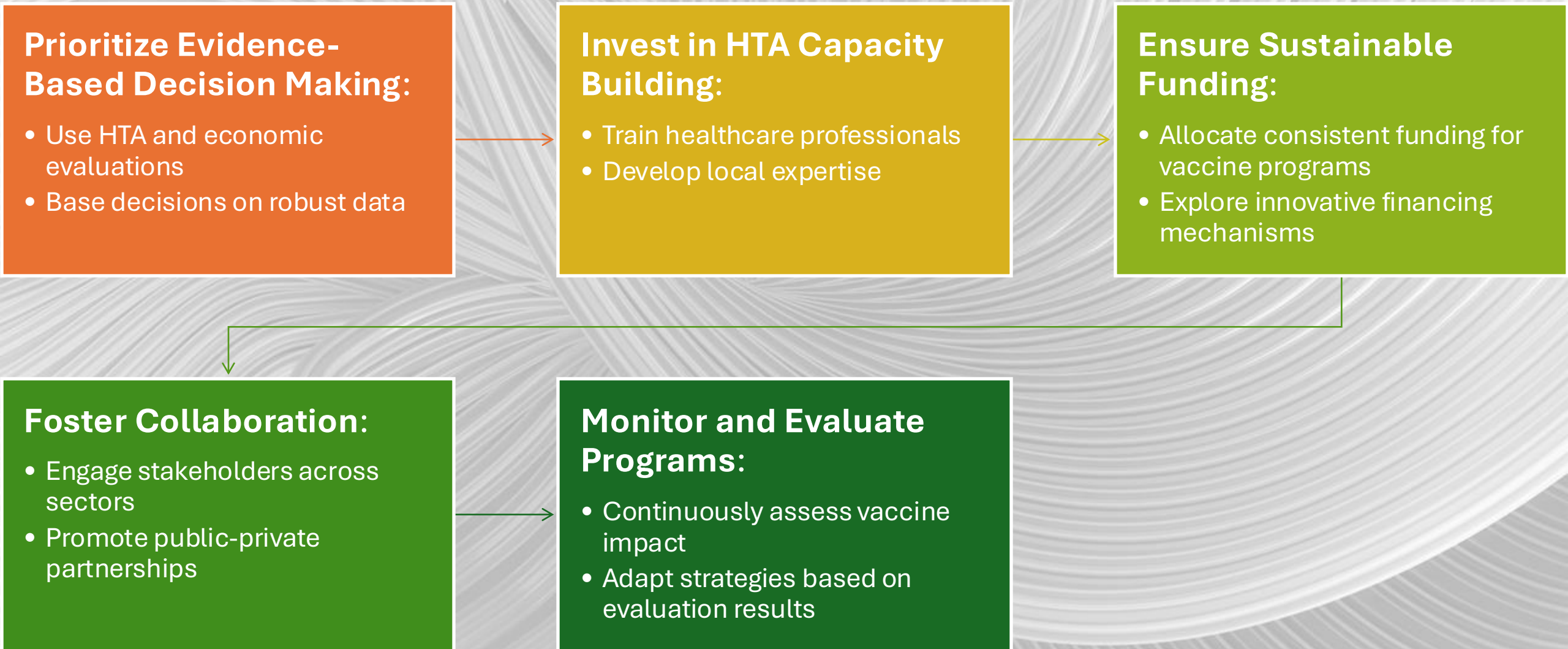
- Allocate consistent funding for vaccine programs
- Explore innovative financing mechanisms

Foster Collaboration:

- Engage stakeholders across sectors
- Promote public-private partnerships

Monitor and Evaluate Programs:

- Continuously assess vaccine impact
- Adapt strategies based on evaluation results





Conclusion

- **Summary of Key Points:**
 - Importance of HTA and vaccine economics
 - Benefits of evidence-based decision making
 - Strategies for improving vaccine deployment