World Health Organization

Analysis and Use of Routine Health Information Systems (RHIS) Data

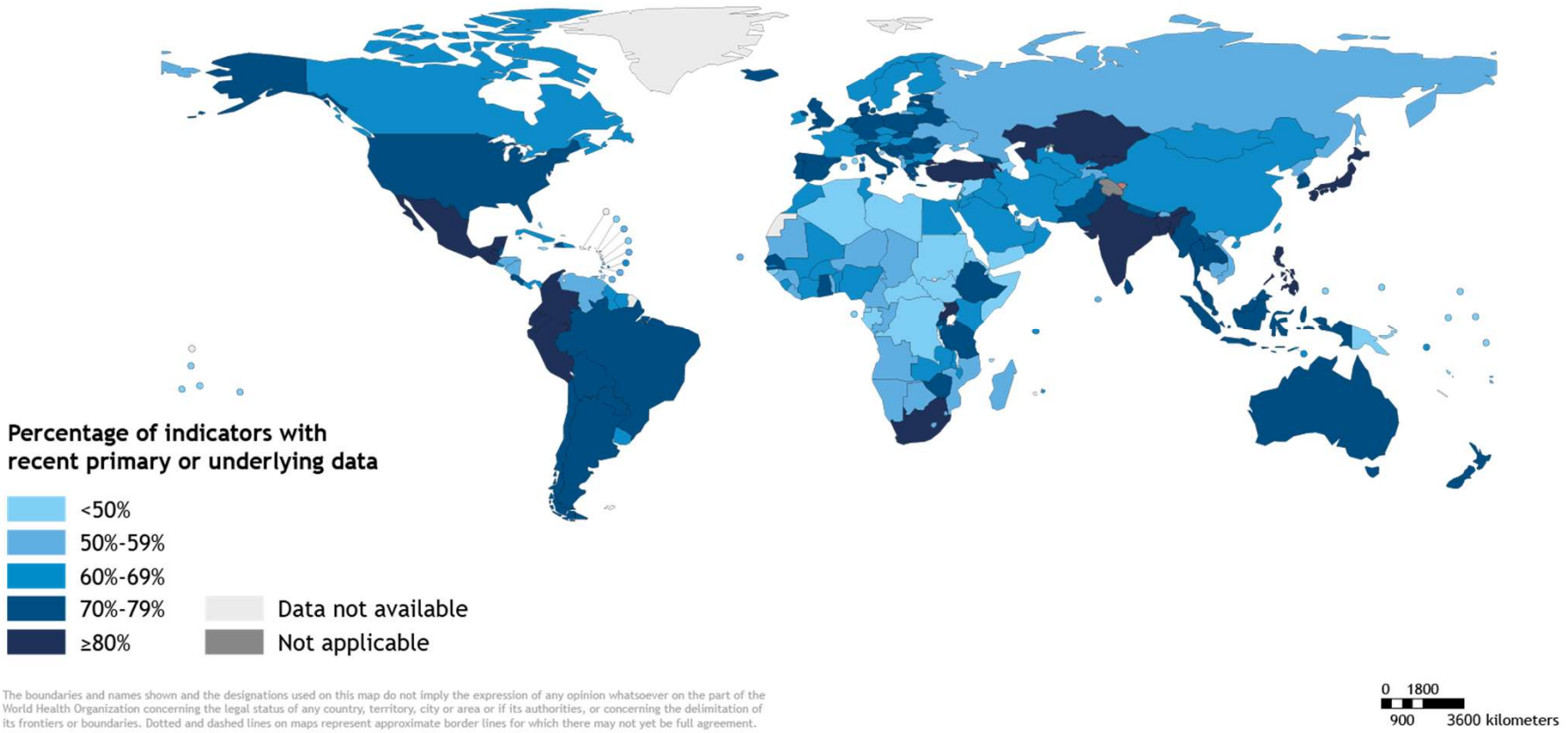
T O O L K I T

Key contents of this session

- Introduce the work of WHO/DDI in the areas of strengthening HIS/RHIS data systems in countries
- Introduce a collaborative cross WHO product: the WHO Toolkit for RHIS data analysis and use
- Share key features of the global implementation of these toolkit using DHIS2 – a health data collaborative approach to support integrated HIS/RHIS in countries

Part 1
Introduction

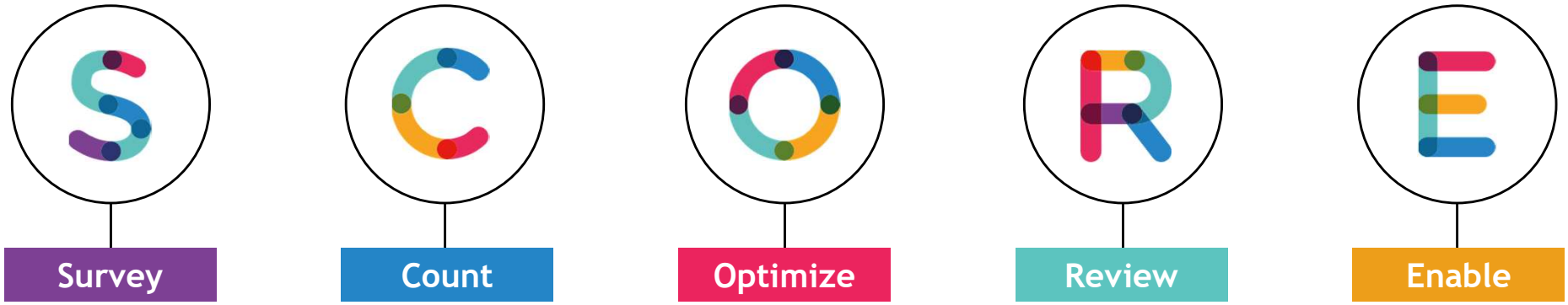
Mapping the world of missing data



Source: World Health Statistics 2020

SCORE for Health Data Technical Package

Represents the most effective strategies and interventions for strengthening country health data systems by encouraging stakeholders to invest in areas that have the greatest impact on the quality, availability, analysis, use and accessibility of data in countries



Populations and health risks

Births, deaths and causes of death

Health service data

Progress and performance

Data use for policy and action

Learn more: https://www.who.int/data/score

SCORE Results

S: There is much room for improvement for all six WHO regions in building capacity to survey populations and health risks, with the average score ranging from 2.9 to 3.6 out of a possible 5.

C: Overall, health information systems in the African and Southeast Asian regions face bigger challenges to accurately count births, deaths, and causes of death making this a priority area for investment.

O: All regions face the need to rapidly scale capacity to optimize routine health information systems to improve access to and quality of healthcare services.

R: All regions have good capacity to systematically review the progress and performance of their health sector. All countries need to invest in data and health information systems strengthening.

E: All regions need to take action to operationalize data governance and use disaggregated data for targeted policy action.

WHO Toolkit for RHIS Strengthening & DHIS2 Standard Package

UiO-WHO Collaboration

Learning Objectives

1. Become familiar with standards, guidance and tools of the WHO Toolkit for Analysis and Use of Routine Health Facility Data
2. Become aware of the rationales and potential roles of the toolkit in RHIS strengthening
3. Use visualization to inform programming, what is coming
4. Provide information on access to materials and technical support

Introduction

The RHIS provides frequent, up-to-date information on service performance at all levels of the health system, enabling regular analysis of progress and timely identification of problems.

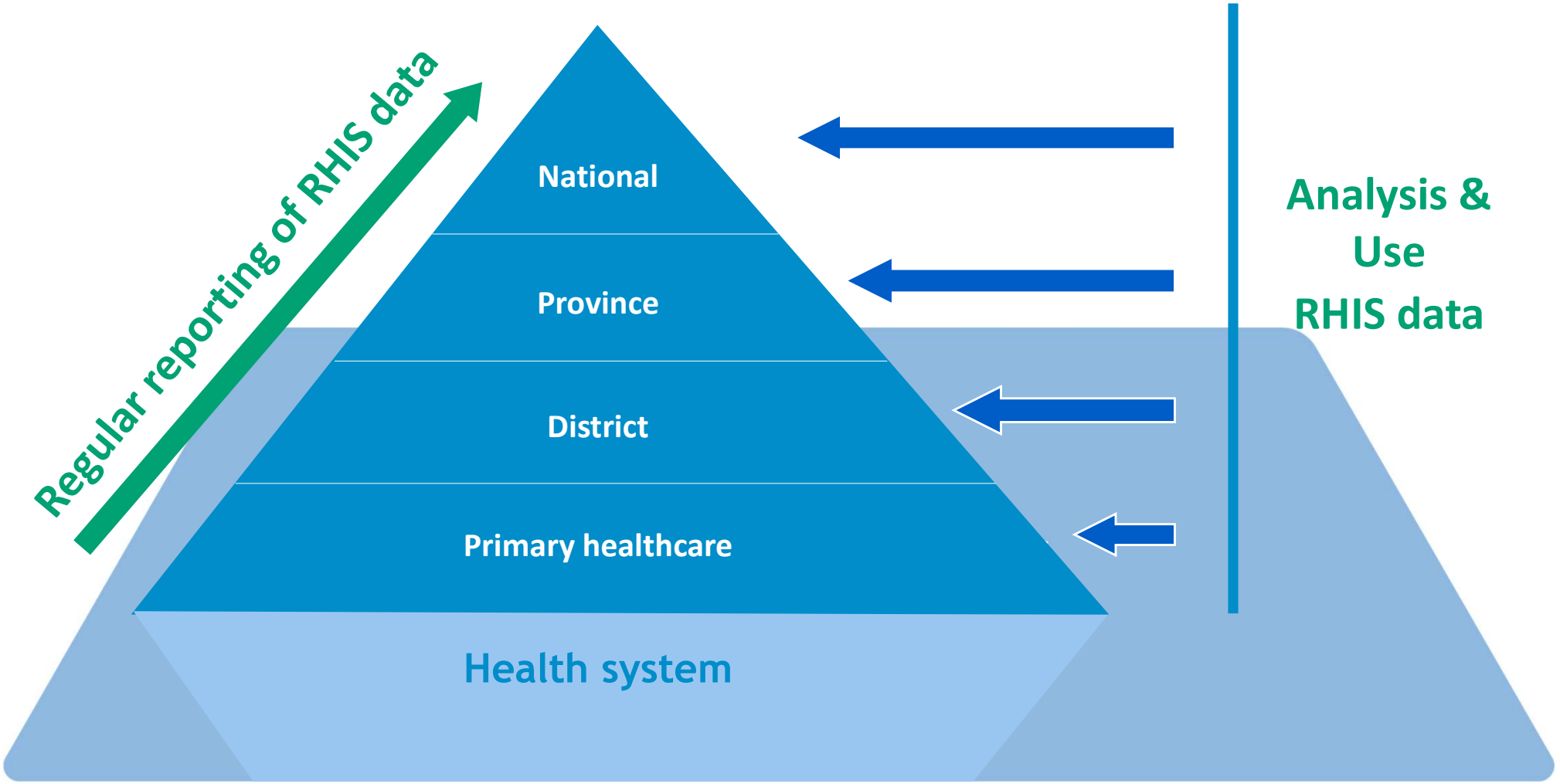
Health facilities submit regular reports on health service activities and the conditions for which people seek care through the RHIS.

The *Toolkit for Analysis and Use of RHIS Data* provides standards and guidance for analysis of RHIS data for individual health programmes as well as integrated analysis for general health service management.

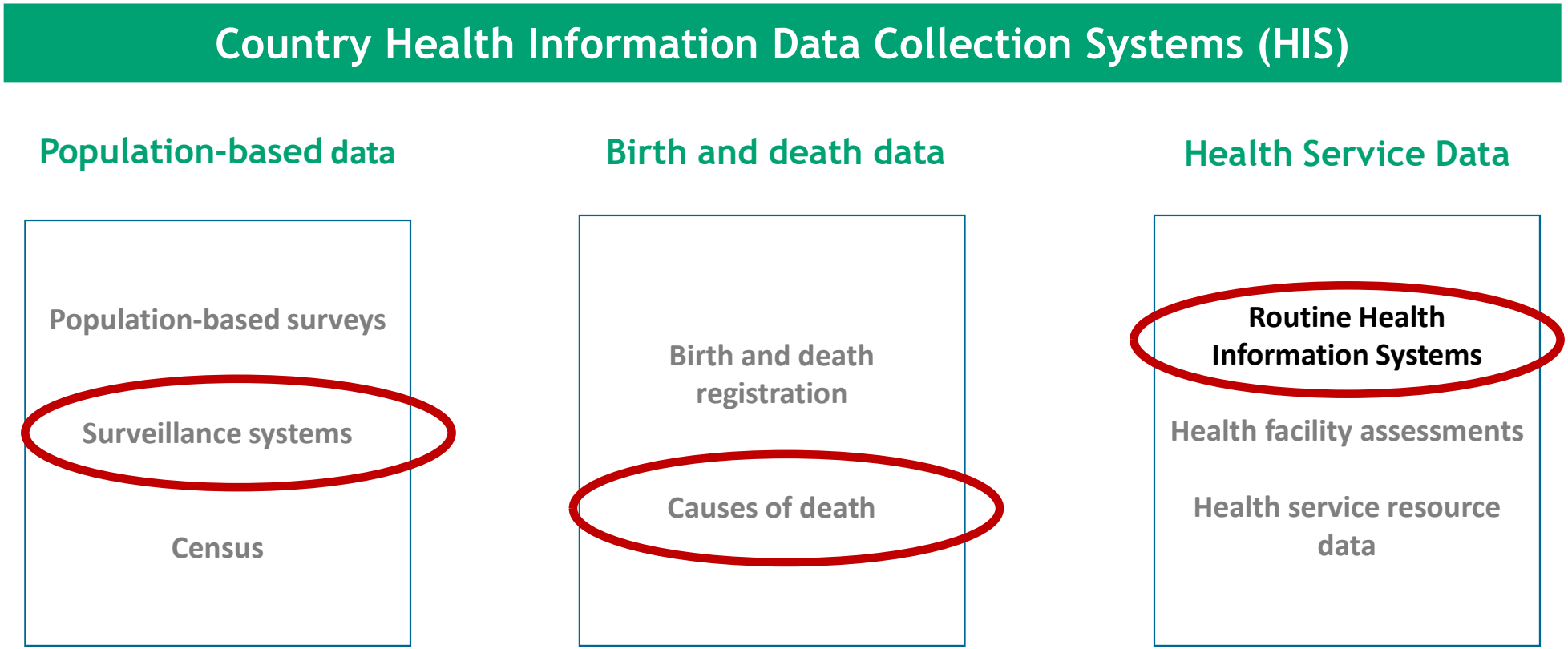
This effort is led by WHO and its Collaborating Centre on Innovation and Implementation Research for Health Information System Strengthening at the University of Oslo.

Additional support from Health Data Collaborative partners, including UNICEF, Global Fund, GAVI and PEPFAR.

What is RHIS data?



RHIS in the country HIS



Part 2
The Toolkit Modules

comprehensive integrated approach to

HEALTH SERVICES ANALYSIS

Electronic, automated packages for facility data e.g. DHIS2

Standards for Measurement and Analysis

Integrated Health Services Analysis

Programme specific Guidance

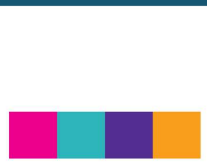
World Health Organization

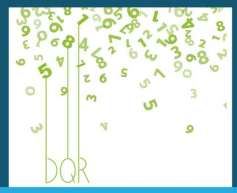
TOOLKIT FOR ROUTINE HEALTH FACILITY DATA

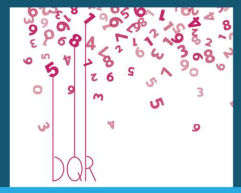
General principles

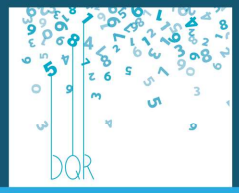
Core indicators

Data Quality Review









Guidance for planners and managers

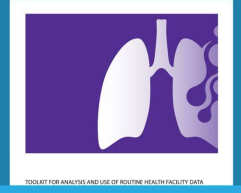
Mortality & Morbidity
Access, coverage & quality
Health service inputs

RMNCAH

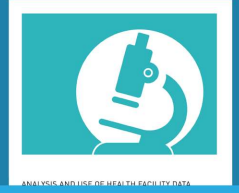
EPI

HIV

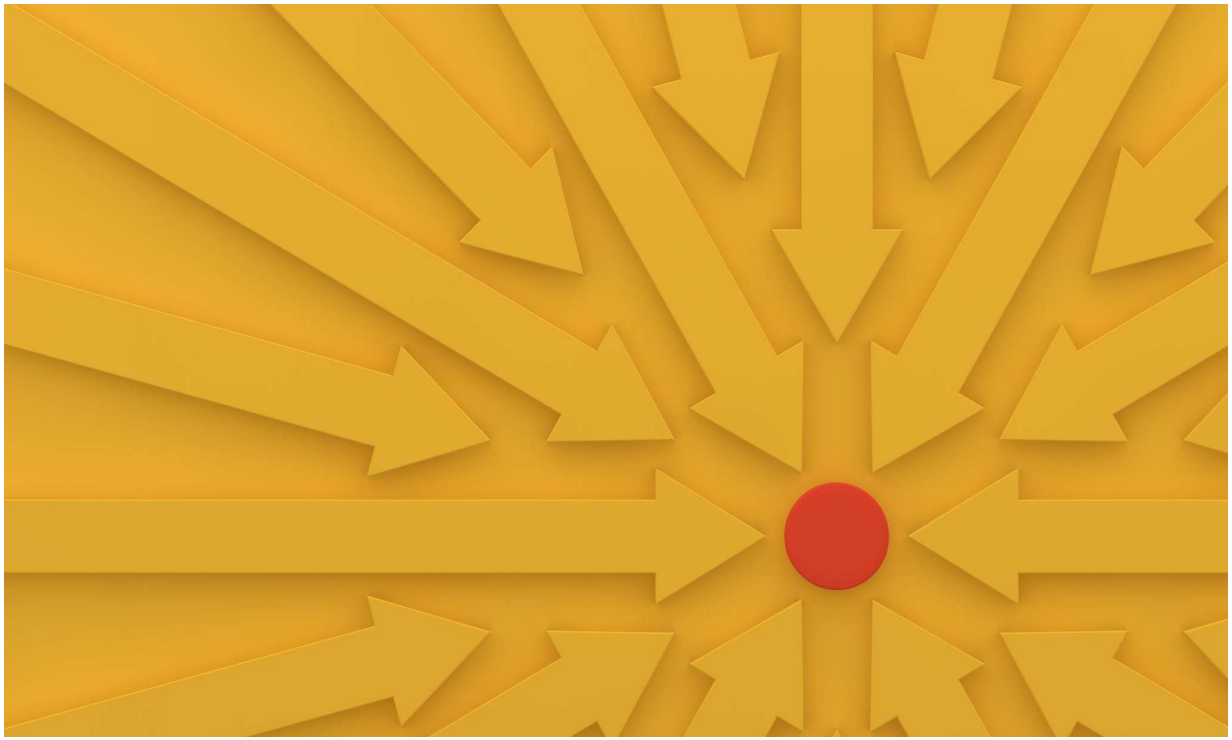
TB



Malaria



Training materials



the toolkit is critical

Countries need reliable facility data to:

- Assess and prioritise to strengthen their programme and health services
- Assess the performance of health services towards monitoring of UHC & SDG targets

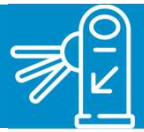
Why the Toolkit?

1. To ensure RHIS indicators meet global standards
2. To improve the way RHIS data is analyzed & displayed
3. To build capacity in analysing & interpreting RHIS data
4. To improve data quality
6. To build capacity at all level of the health data systems

RHIS

What kinds of data are reported?

Health services and programmes data



ACCESS

COVERAGE

NO. OF PEOPLE

DISEASES

DEATHS

PROGRAMMES

WHO Toolkit for RHIS Data

Comprehensive integrated approach to health services analysis

Standards for Measurement and Analysis

General principles

Core indicators

Data Quality Assurance

Integrated Health Services Analysis

National

Integrated Health Services Analysis

District & Facility

Programme specific Guidance

RMNCAH

TB

HIV

Malaria

EPI

AEFI

VPD IDSR

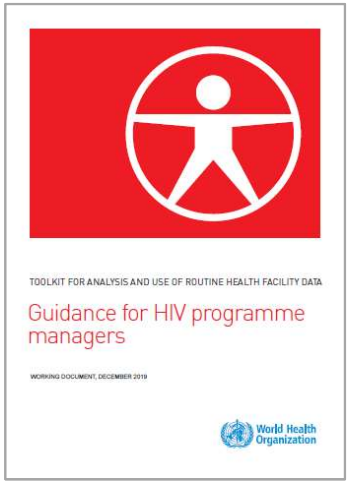
Training materials

Electronic, automated packages for facility data e.g.DHIS2

What is in a toolkit module?

Available in English and French

1. Guidance manual



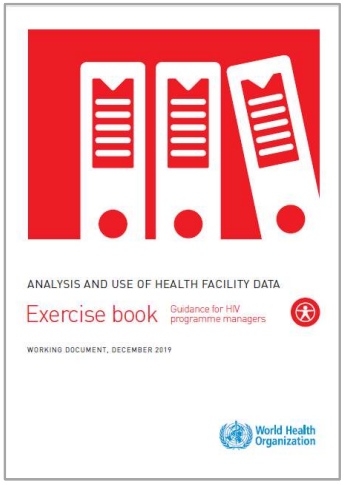
2. DHIS2 packages

HIV

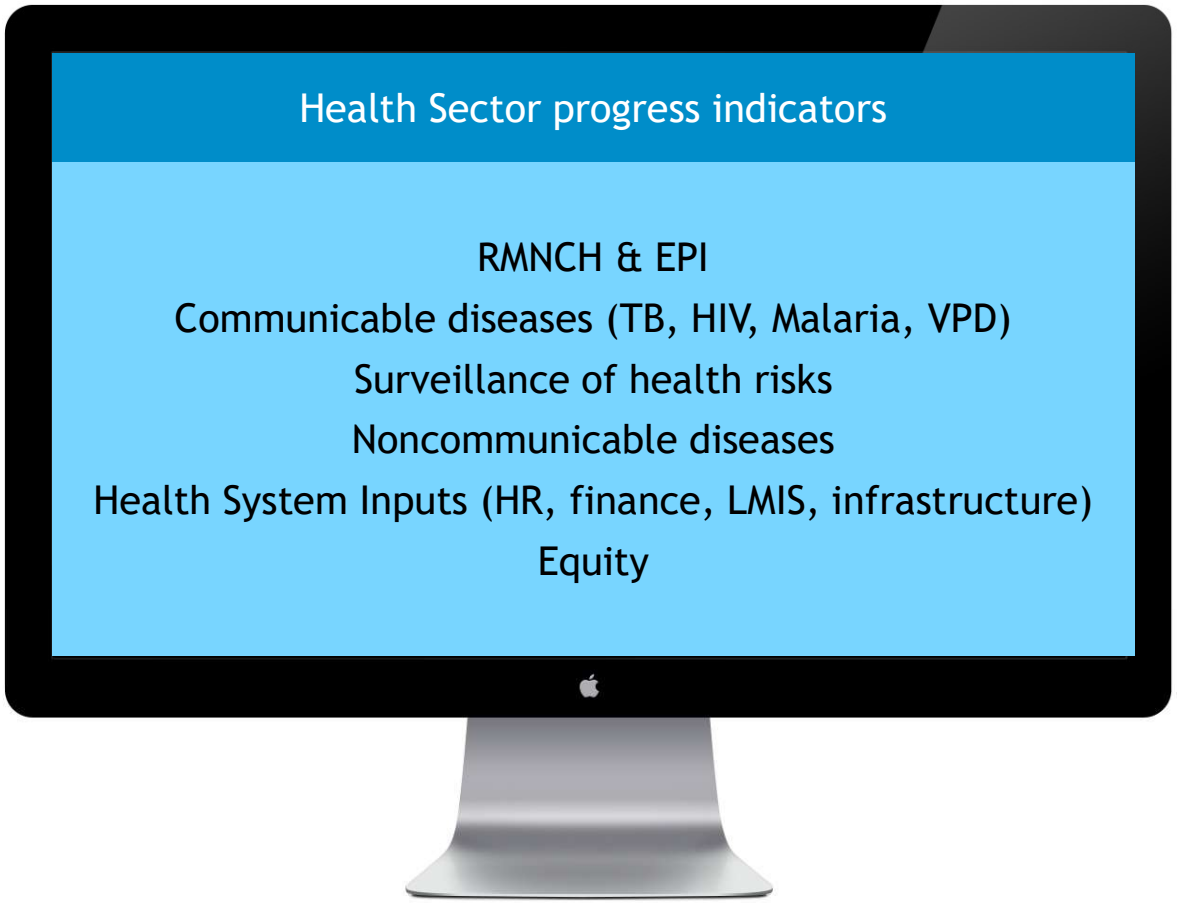
DHIS2 Packages and Tools:

- HIV Dashboard
- HIV Aggregate
- HIV Case Surveillance Tracker

3. Training materials



Country Level Effect - screen only



Country Level Effect

Routine Health
Facility Data (RHIS)

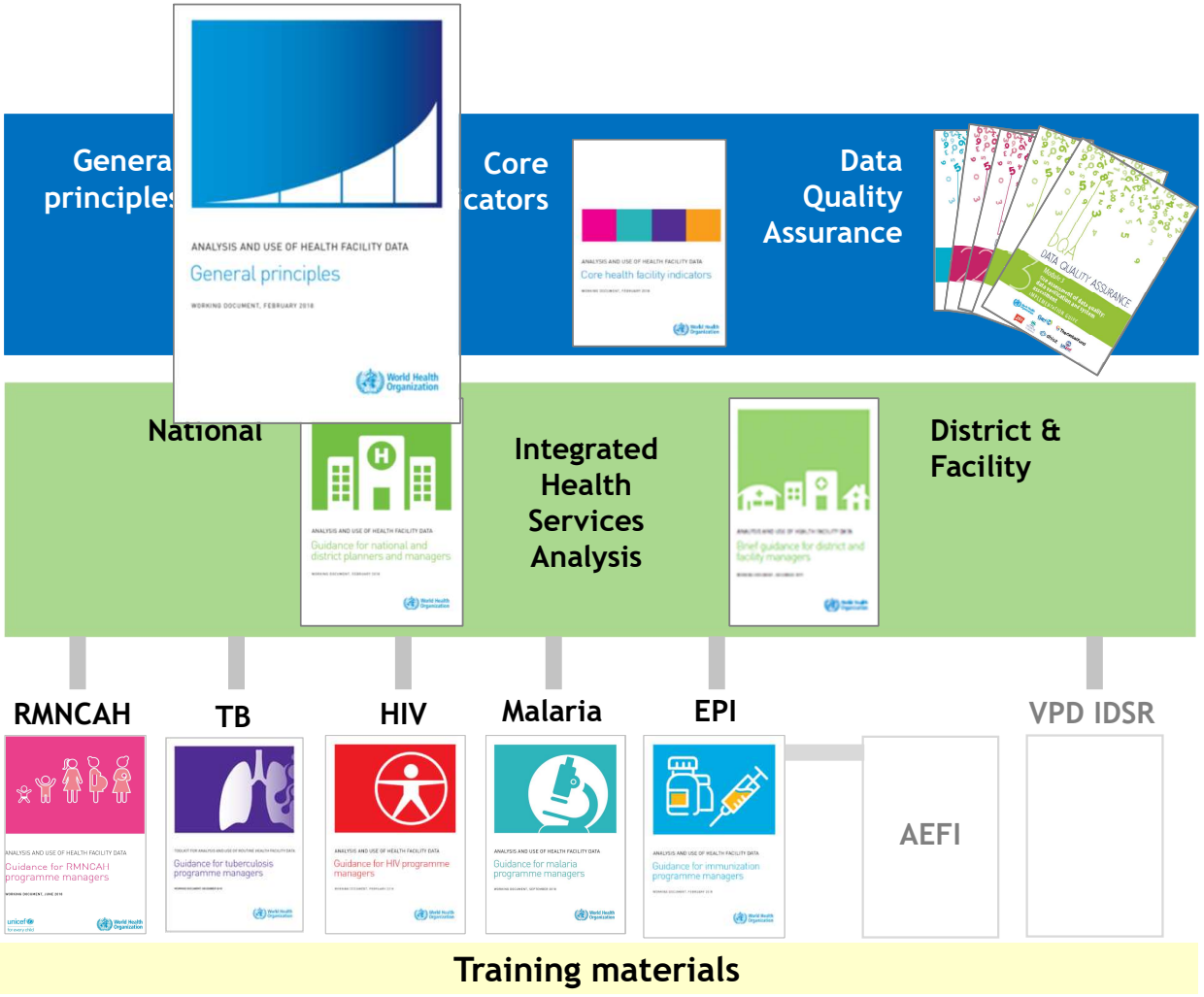
WHO RHIS standard Toolkit - what are currently available

General Principles

Standards for Measurement and Analysis

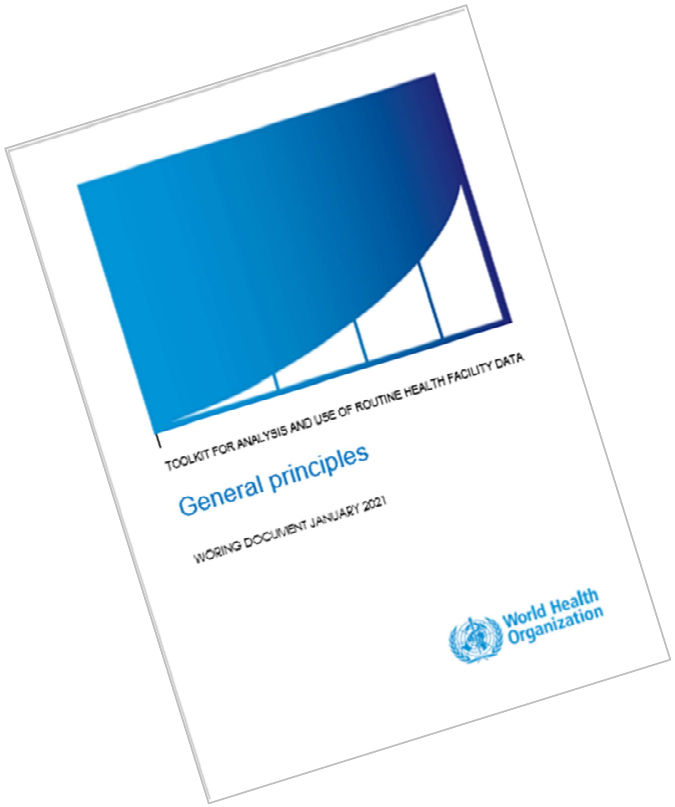
Integrated Health Services Analysis

Programme specific Guidance



Electronic, automated packages for facility data e.g.DHIS2

General Principles



Key concepts for RHIS data analysis

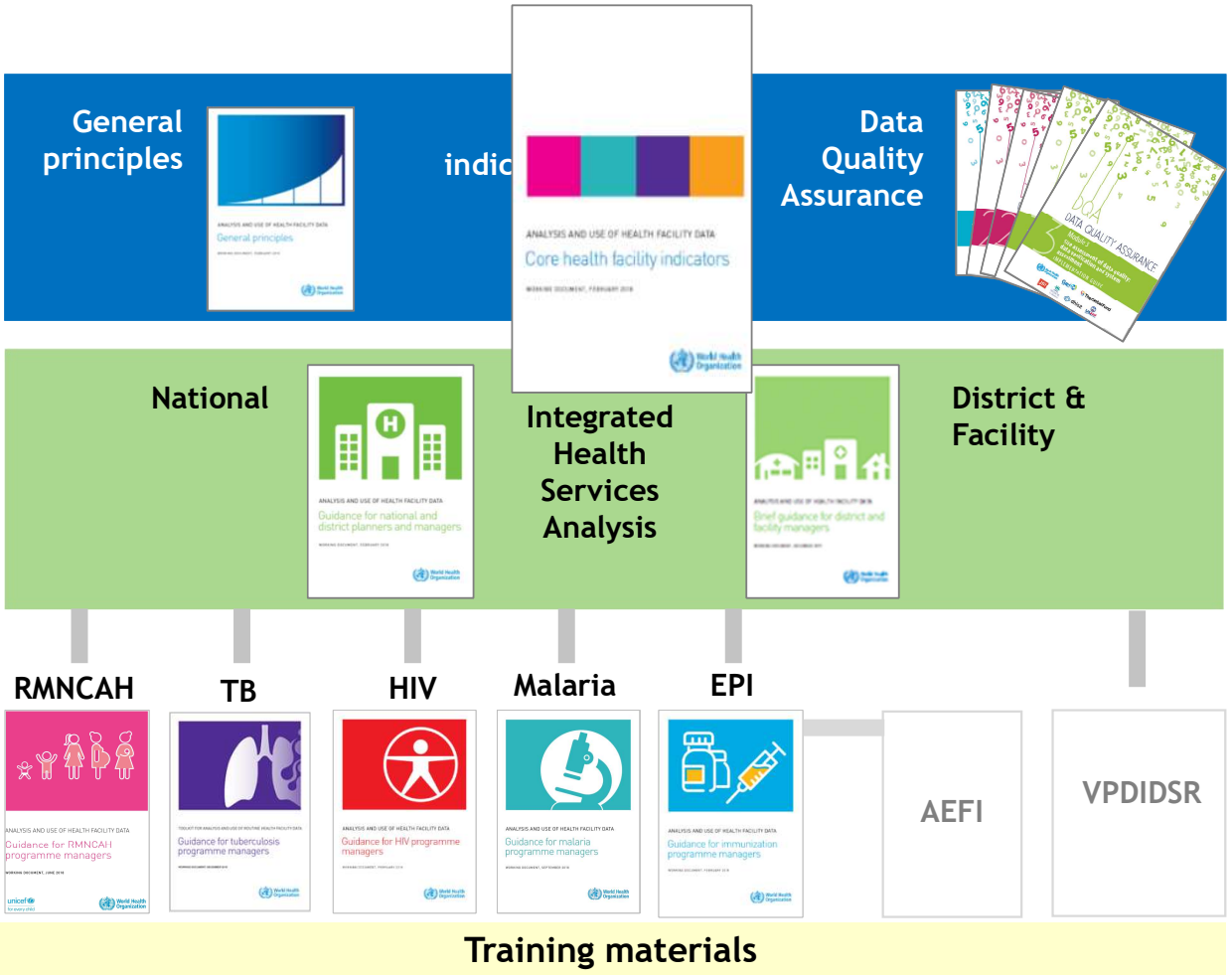
- Types of indicators
- Population estimates / denominators
- Overview of data quality
- Tips for presenting data
- Strengths and limitations of RHIS data

Core Indicators

Standards for Measurement and Analysis

Integrated Health Services Analysis

Programme specific Guidance



Electronic, automated packages for facility data e.g.DHIS2

Core Indicators

Offers a list of standardized health facility indicators that can be used/adapted as needed.

Recommended indicators

- Guide country selection
- Reflect program/service standards
- Promote alignment and reduce reporting

Core Indicators

List of standardized RHIS indicators that can be used or adapted by countries

Includes indicators from all the Toolkit modules

These recommended indicators:

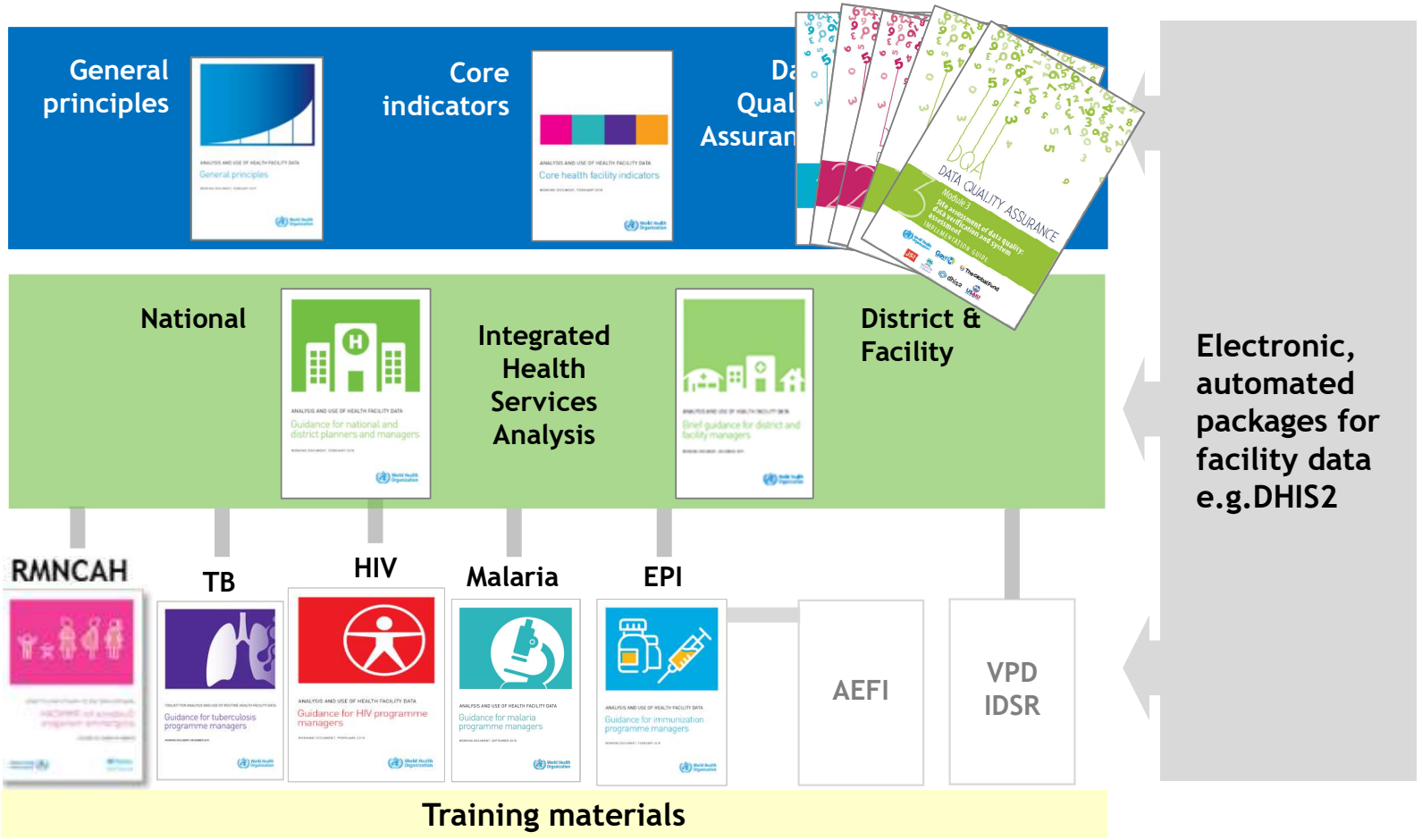
- Reflect programme /service standards
- Can guide country selection
- Can promote alignment and reduce reporting

Data Quality Assurance

Standards for Measurement and Analysis

Integrated Health Services Analysis

Programme specific Guidance



Electronic, automated packages for facility data e.g.DHIS2

Data Quality Assurance

Standard methodology for assessing data quality

Completeness/timeliness/consistency

Integrated into DHIS2

Scaling with support by GF, GAVI, USAID

Time-intensive but ensures quality

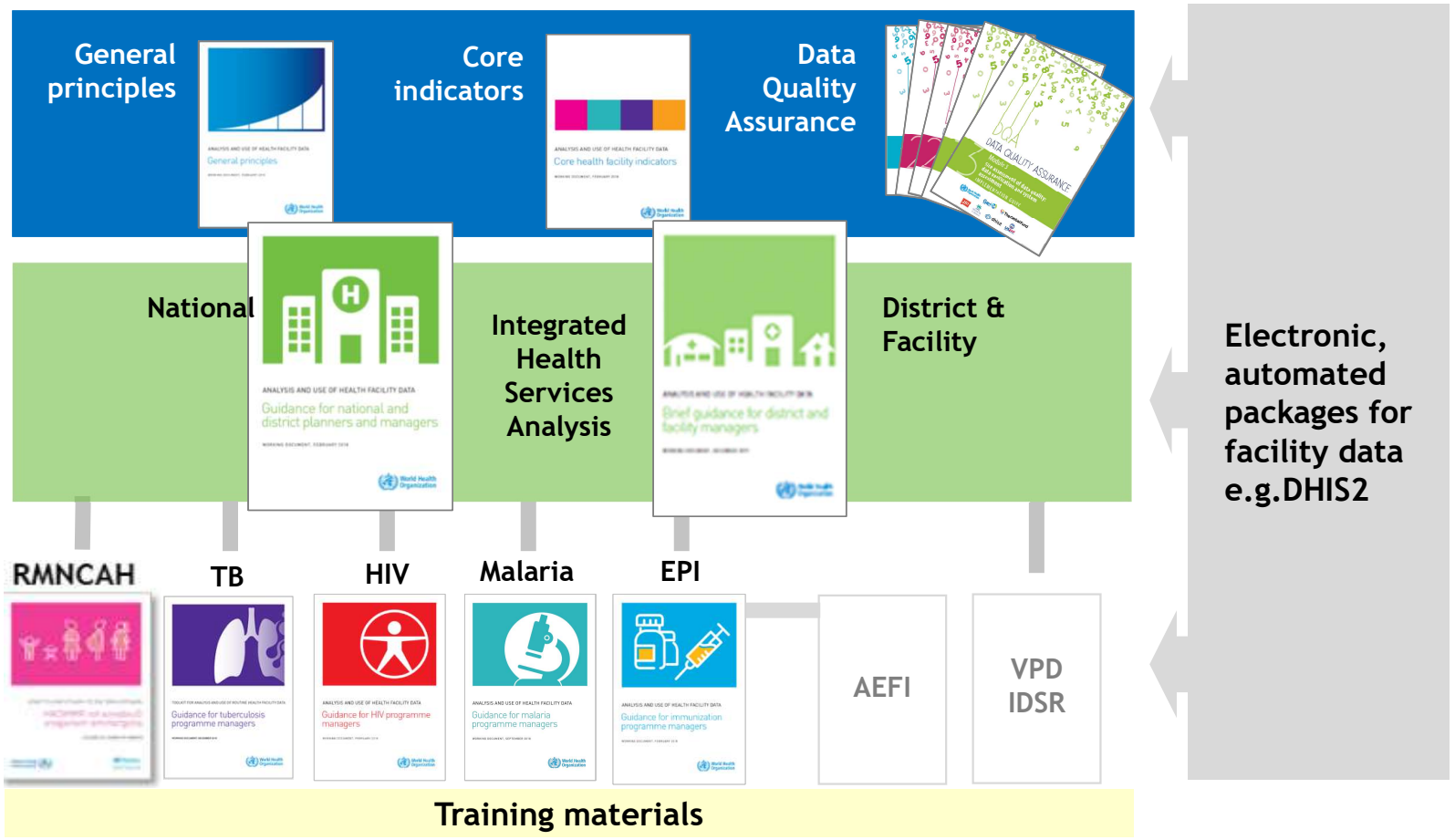
Adopt into annual SOPs and embed into quarterly review

Health Services Planning & Management

Standards for Measurement and Analysis

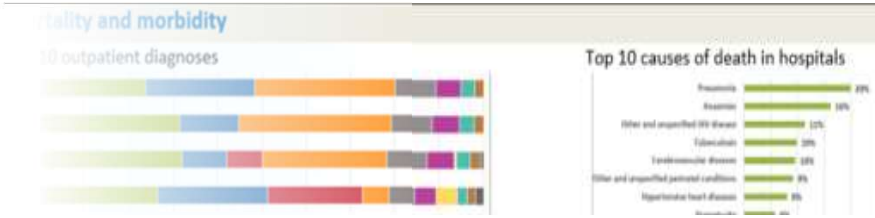
Integrated Health Services Analysis

Programme specific Guidance



Electronic, automated packages for facility data e.g.DHIS2

Integrated Health Services Analysis



Tracer indicators

- Institutional mortality
- Morbidity (outpatient & inpatient)
- Utilization and access
- Coverage & quality
- Health service resources

Integrated data platform

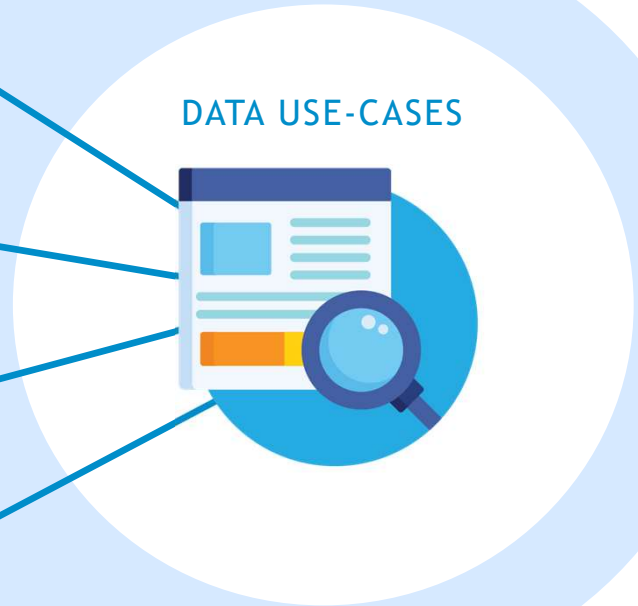
Programme Specific Modules

Global Reporting

National Reporting

Patient Care and Monitoring

Program Monitoring and Management

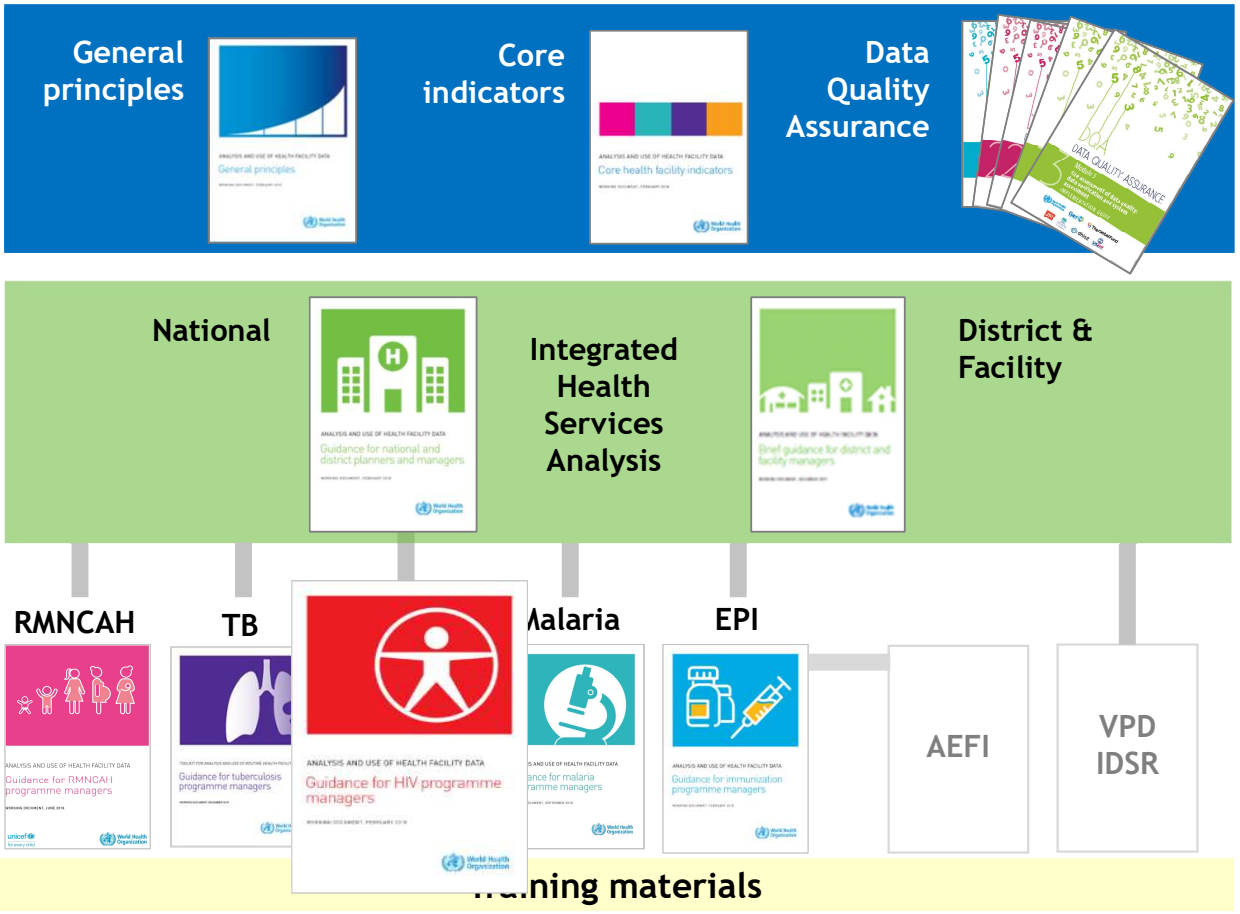


Programme Specific Modules: HIV

Standards for Measurement and Analysis

Integrated Health Services Analysis

Programme specific Guidance



Electronic, automated packages for facility data e.g.DHIS2

Programme Specific Modules: HIV

HIV 95-95-95 cascade
- 95% diagnosis of PLHIV
- 95% compliance on ART
- 95% viral load suppression

Strengthen individual level data
Improve data quality
Address programme data gaps
Align with partners

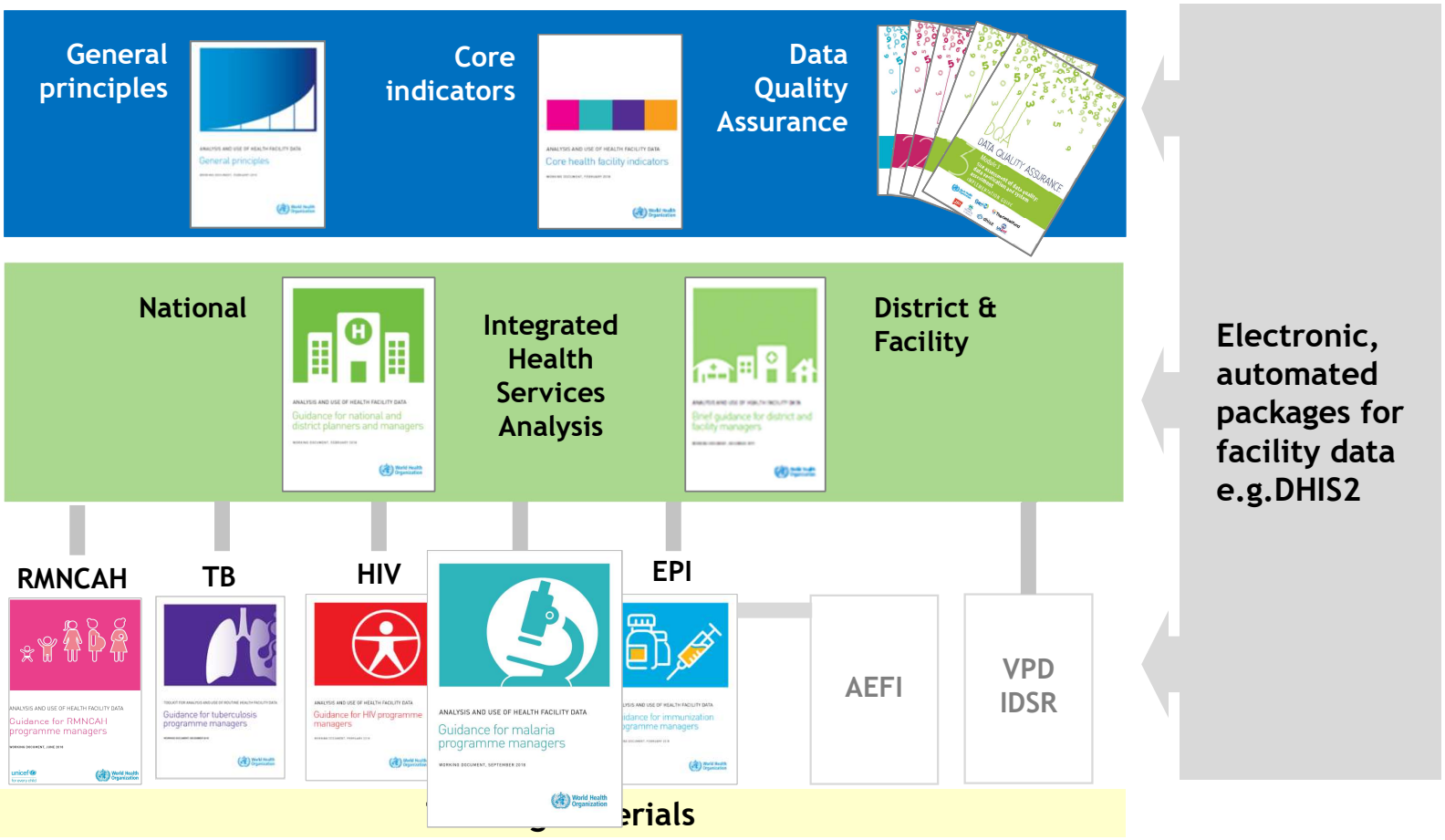
Meet global WHO reporting
Align national indicators and contextualize
Use HIV within DHIS2

Programme Specific Modules: Malaria

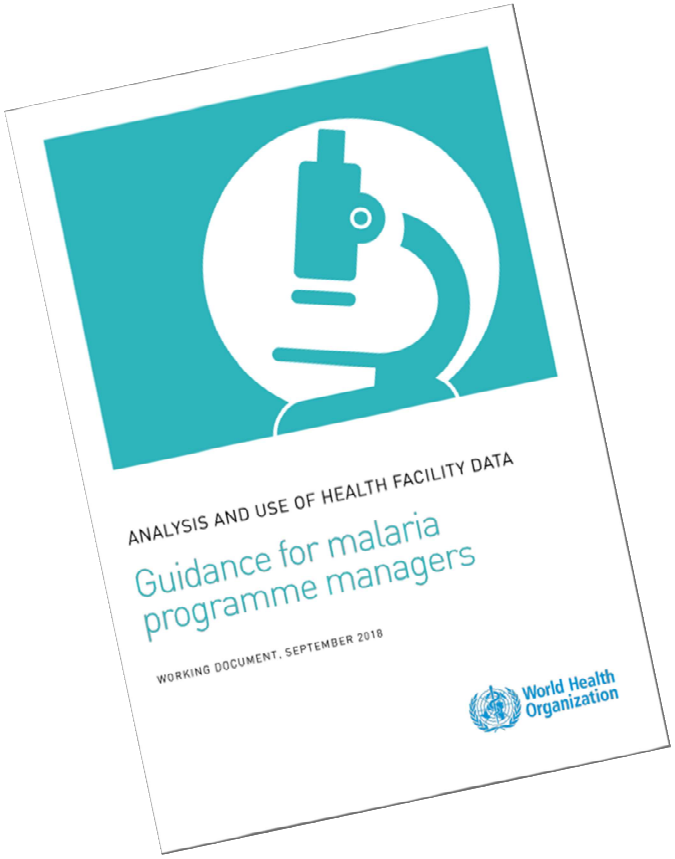
Standards for Measurement and Analysis

Integrated Health Services Analysis

Programme specific Guidance



Programme Specific Modules: Malaria



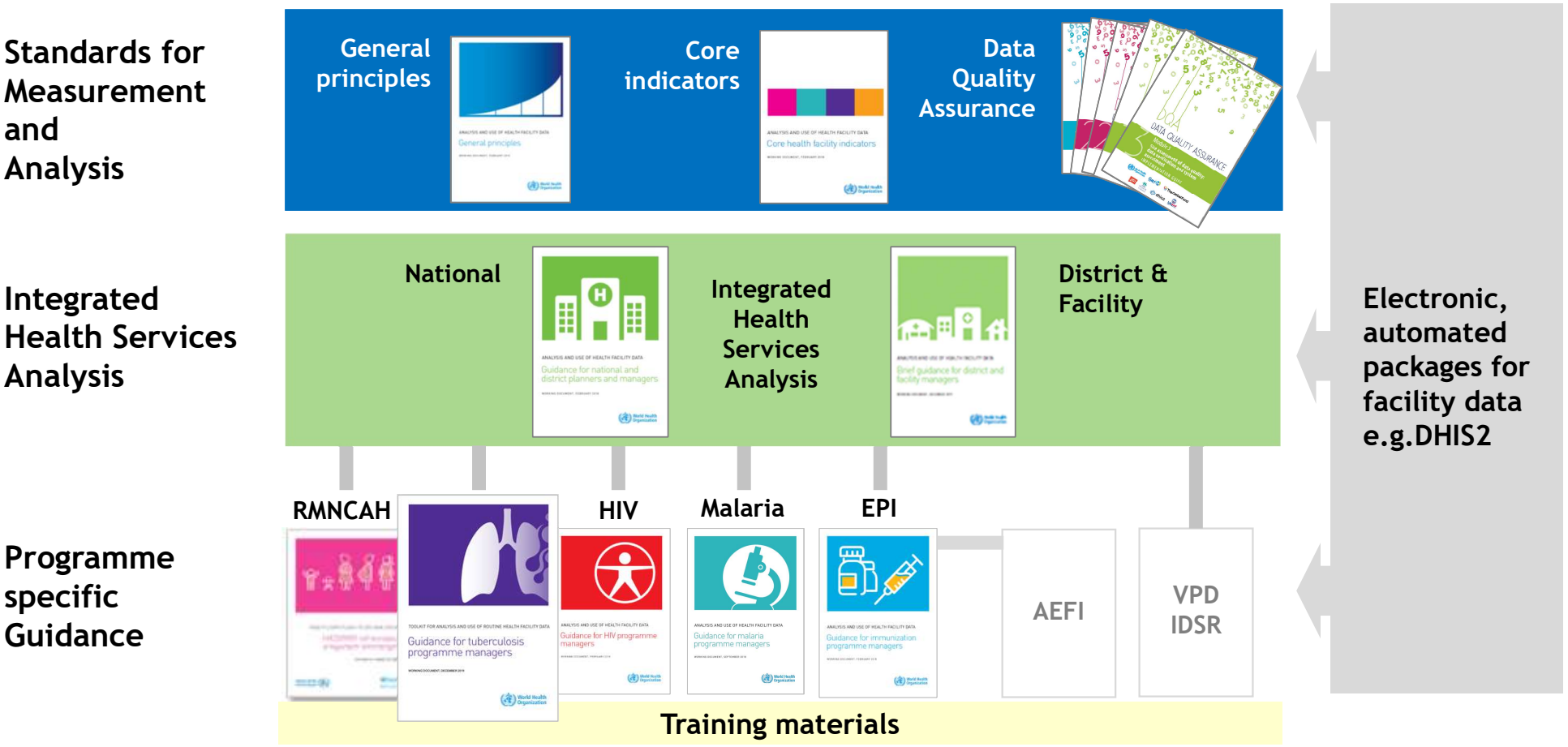
Surveillance
- During burden reduction (control)
- For elimination

Commodities monitoring

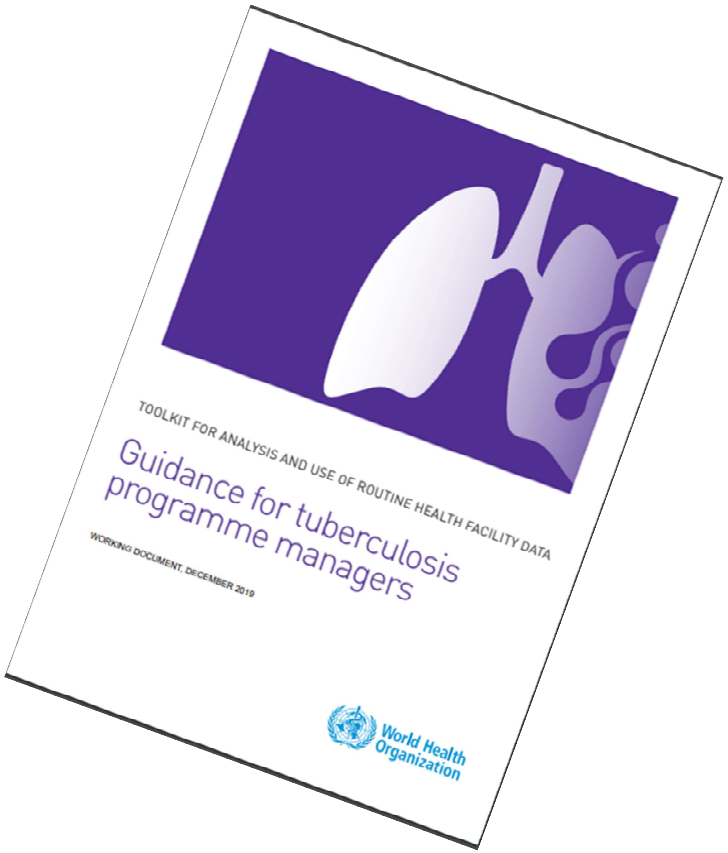
Aggregate → Individual case surveillance

Meet global WHO reporting
Align national indicators and contextualize
Use Malaria within DHIS2

Programme Specific Modules: Tuberculosis



Programme Specific Modules: Tuberculosis (aggregate and case-based)

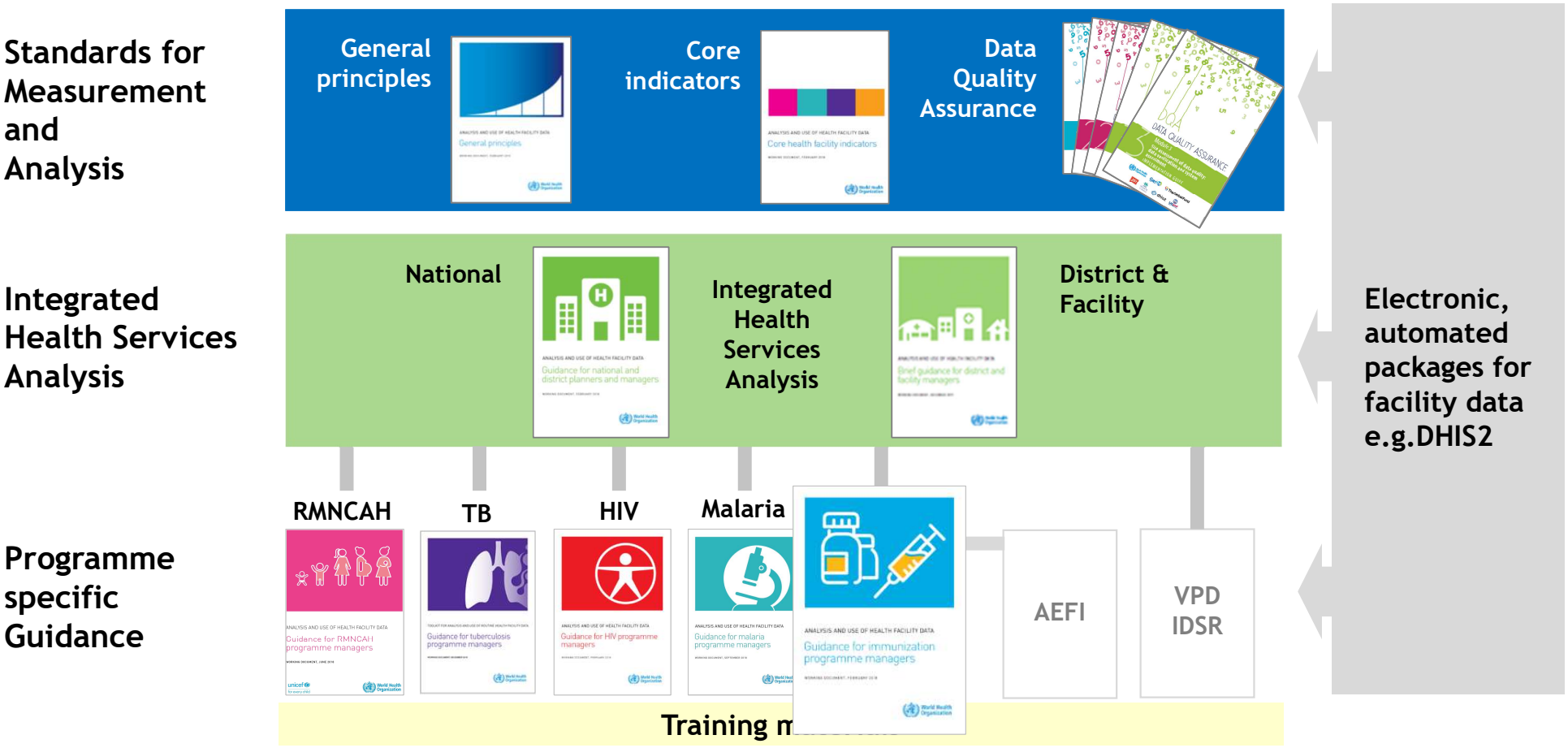


Dashboards (TB, Drug Resistant-TB, TB-HIV), trends, indicators

Standardized description and assessment (Historic) TB data
Support country implementation

Meet global WHO reporting
Align national indicators and contextualize
Use Tuberculosis Configuration within DHIS2

Programme Specific Modules: Immunization



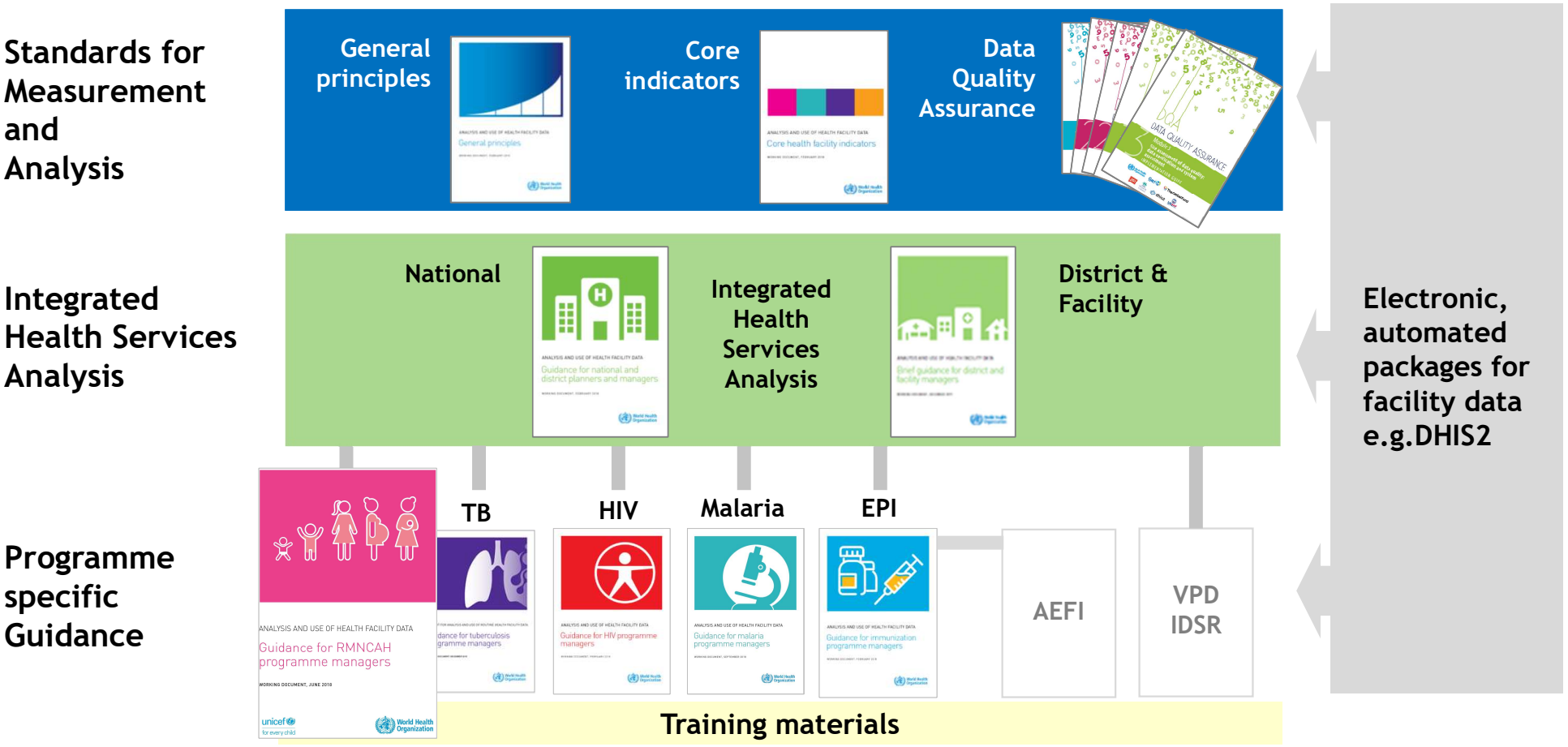
Programme Specific Modules: Immunization & AEFI

National coverage
Drop-out
Supply/cold chain

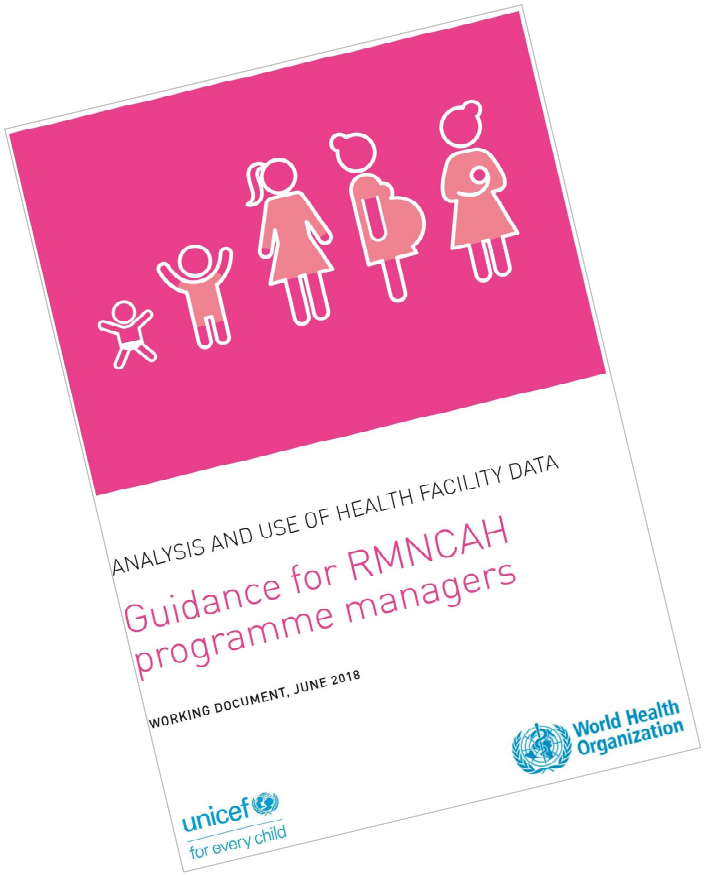
Links with other systems
Country support

Meet global WHO reporting
Align national indicators and contextualize
Use EPI Configuration package within DHIS2

Programme Specific Modules: RMNCAH



Programme Specific Modules: RMNCAH

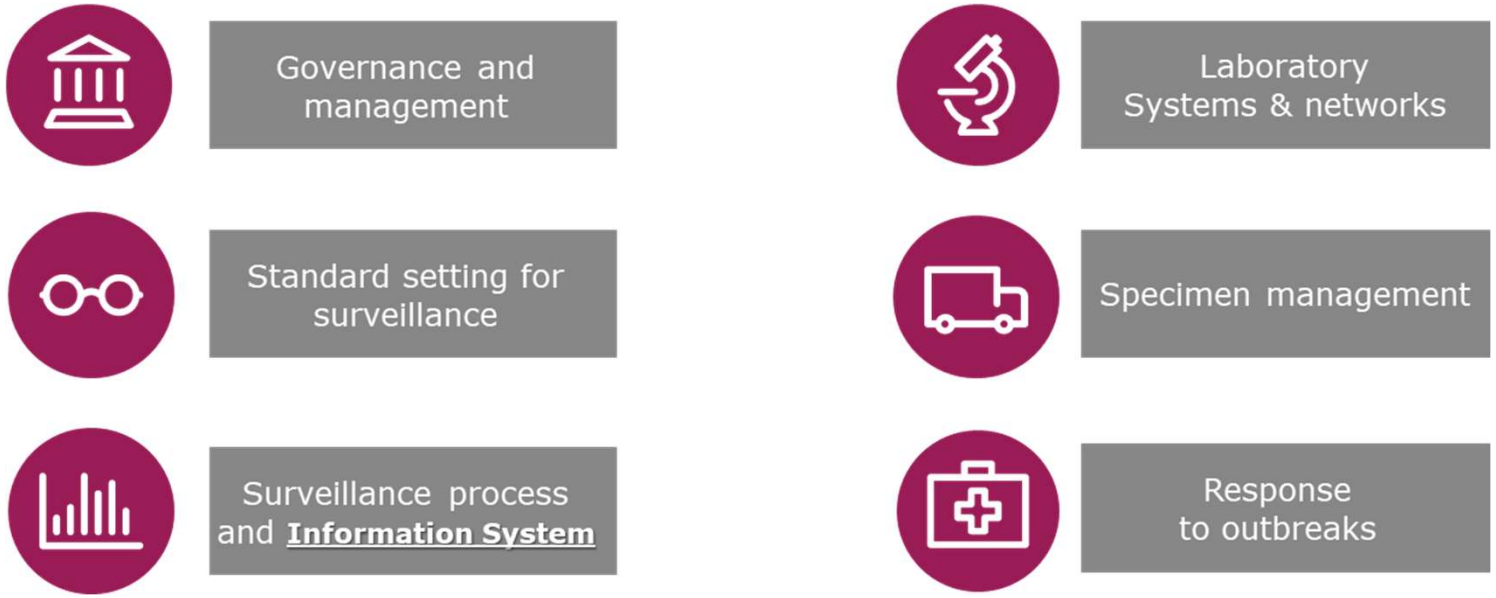


Joint module with UNICEF
Sexual and reproductive health, maternal health, postnatal, childhood health

Indicators and data elements
Joint module with UNICEF
Analyses and data dashboards

Meet global WHO reporting
Align national indicators and contextualize
Use RMNCAH within DHIS2

IDSR-VPD Surveillance



Ambition for 2030

*"By 2030… countries will **own, sustainably fund and maintain high-quality surveillance systems** and laboratory infrastructure… context of improved performance of their national immunization programmes to achieve their disease control objectives, leveraging reliable VPD surveillance data."*

IDSR - Diseases currently included

Aggregated surveillance (default list)		Case Based Surveillance	
Meningitis	Pertussis	Meningitis	IBVPD
Measles	Diphtheria	Yellow Fever	
Rubella	Diarrhoea with blood	Measles/rubella	
Yellow Fever	Rabies	Neonatal tetanus	Viral hemorrhagic fever (Ebola)
Cholera	Viral Hemorrhagic Fever	Polio (AFP)	
Acute watery diarrhoea	Dengue Fever	Rotavirus	Congenital Rubella Syndrome
Acute Flaccid Paralysis	Other diseases to be added		Cholera (when new standards will be defined)
Neonatal Tetanus			
Non Neonatal tetanus			

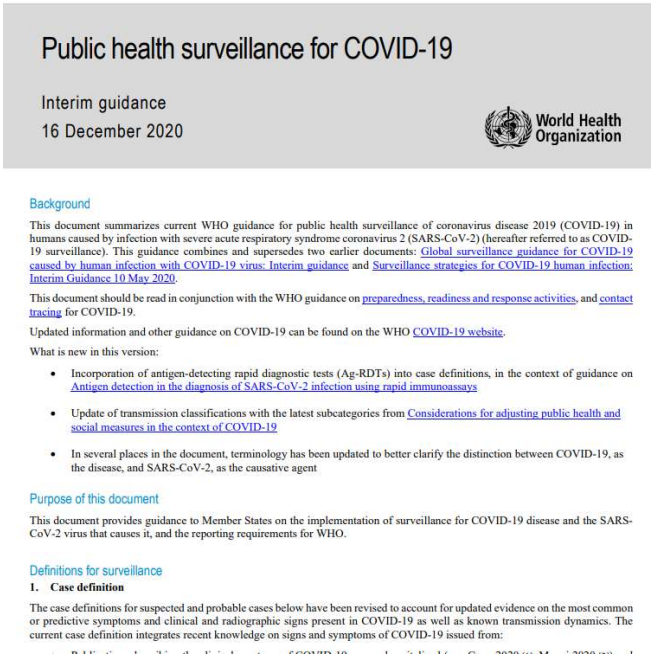
Development of a set of standard indicators and metadata for HMIS:

- serve as a global standard to guide Member States to capture information from health facilities that reflect the status of rehabilitation services in the country.
- facilitate the development of national priorities and a strategy for rehabilitation as part of overall integrated health services, to ensure UHC is reached.
- strengthen and standardize country facility data collection for rehabilitation.

COVID-19

Surveillance

Covid-19 Vaccine



Public health surveillance for COVID-19

Interim guidance
16 December 2020

World Health Organization

Background

This document summarizes current WHO guidance for public health surveillance of coronavirus disease 2019 (COVID-19) in humans caused by infection with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) (hereafter referred to as COVID-19 surveillance). This guidance combines and supersedes two earlier documents: Global surveillance guidance for COVID-19 caused by human infection with COVID-19 virus: Interim guidance and Surveillance strategies for COVID-19 human infection: Interim Guidance 10 May 2020.

This document should be read in conjunction with the WHO guidance on preparedness, readiness and response activities, and contact tracing for COVID-19.

Updated information and other guidance on COVID-19 can be found on the WHO COVID-19 website.

What is new in this version:

- Incorporation of antigen-detecting rapid diagnostic tests (Ag-RDTs) into case definitions, in the context of guidance on Antigen detection in the diagnosis of SARS-CoV-2 infection using rapid immunoassays
- Update of transmission classifications with the latest subcategories from Considerations for adjusting public health and social measures in the context of COVID-19
- In several places in the document, terminology has been updated to better clarify the distinction between COVID-19, as the disease, and SARS-CoV-2, as the causative agent

Purpose of this document

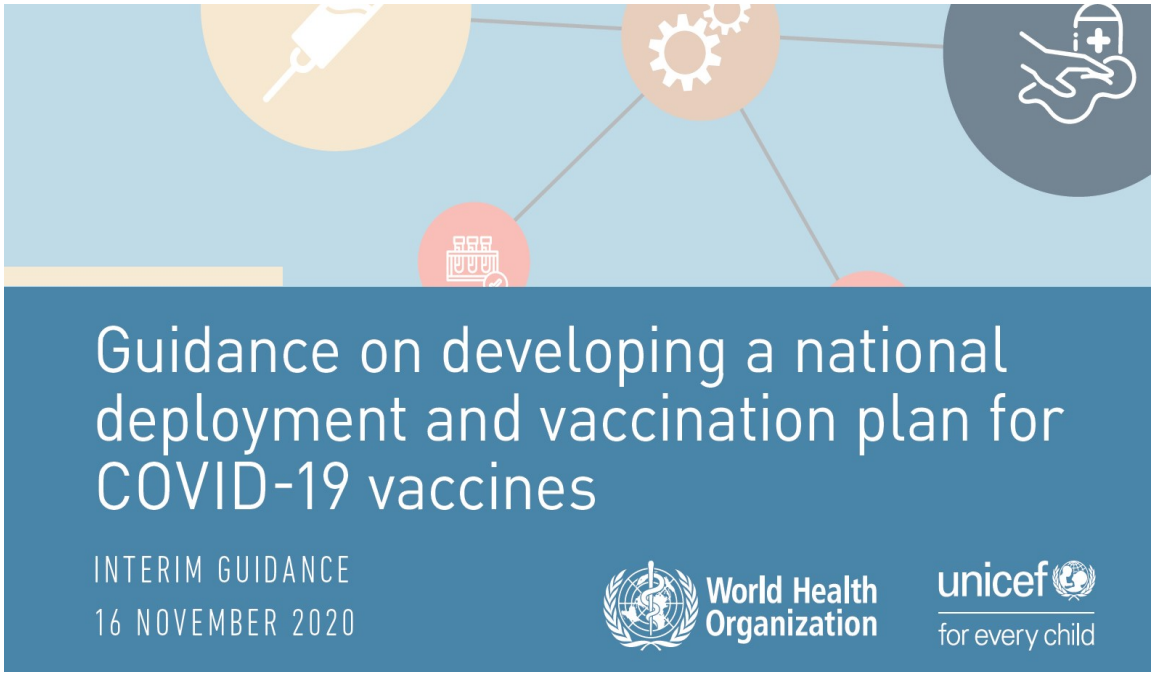
This document provides guidance to Member States on the implementation of surveillance for COVID-19 disease and the SARS-CoV-2 virus that causes it, and the reporting requirements for WHO.

Definitions for surveillance

1. **Case definition**

The case definitions for suspected and probable cases below have been revised to account for updated evidence on the most common or predictive symptoms and clinical and radiographic signs present in COVID-19 as well as known transmission dynamics. The current case definition integrates recent knowledge on signs and symptoms of COVID-19 issued from:

Covid-19 Vaccine



Guidance on developing a national deployment and vaccination plan for COVID-19 vaccines

INTERIM GUIDANCE
16 NOVEMBER 2020

World Health Organization

unicef
for every child

How to use these modules

1. Recommended approach (software agnostic)

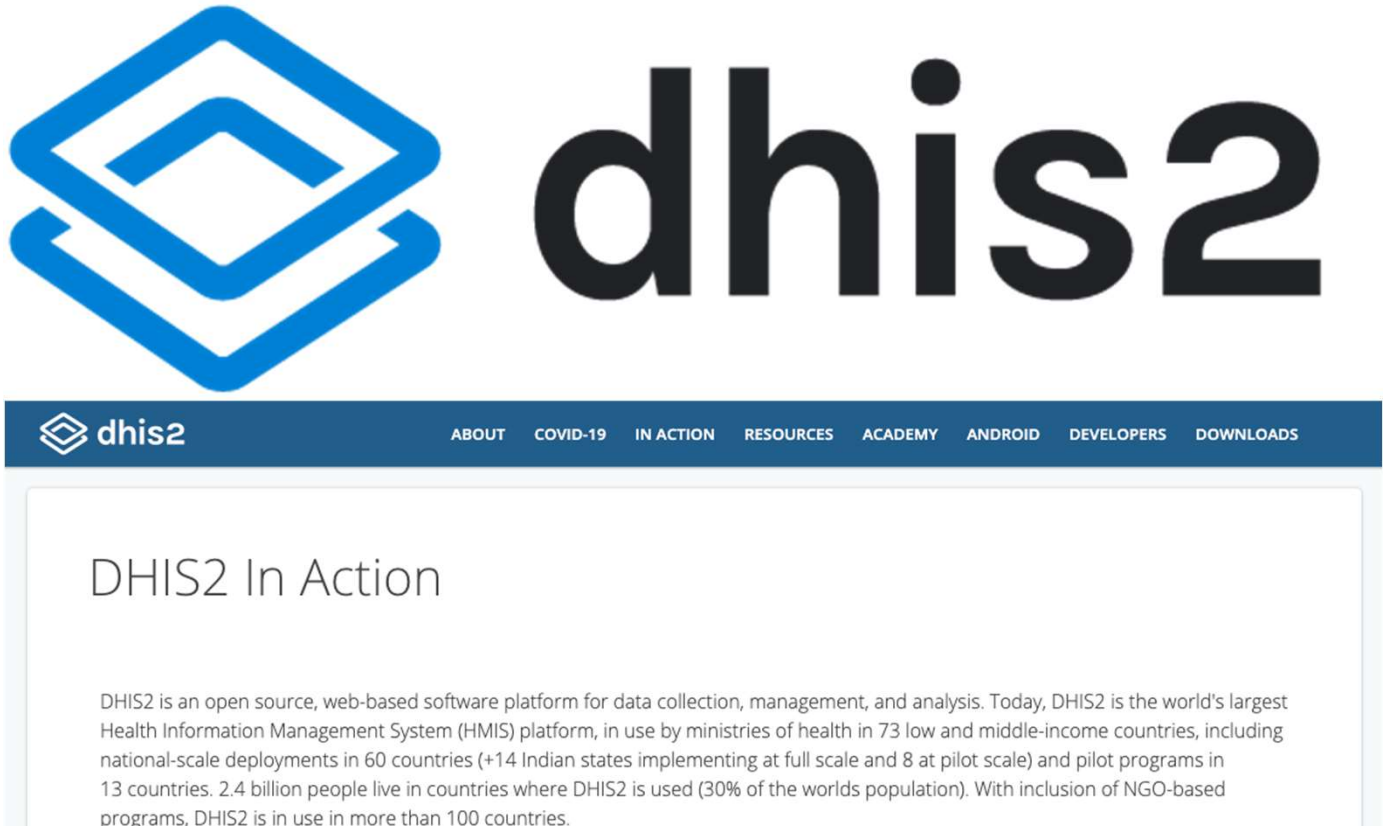
- Revise and adapt the indicators as recommended by the modules to the national RHIS data systems
- Provide training to build capacity for concerned staff and data managers

- Plan and implement data quality assurance and data quality review
- Adapt to national software where appropriate to promote the use of integrated approach.

2. Countries that use DHIS2:
See more details below.

Part 3 - DHIS2 Health Data Toolkit

Collaborative work between WHO and UiO / WHO CC for HIS Strengthening and to promote WHO's guidelines & standards



What is DHIS2?

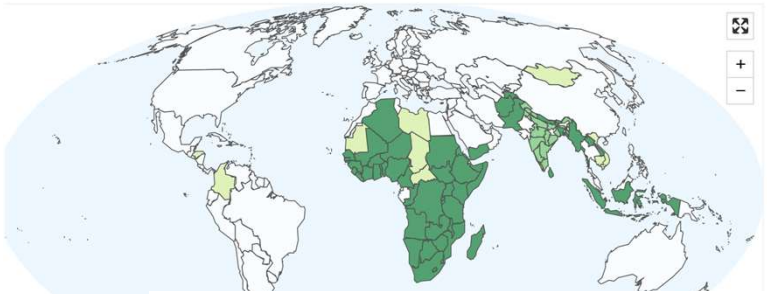
- Web-based, open source software platform, first developed in South Africa for district health data use strengthening in
- Used to collect, analyze and display health **data** (from facilities, community, and other points) in 73 countries
- Developed & governed by University of Oslo

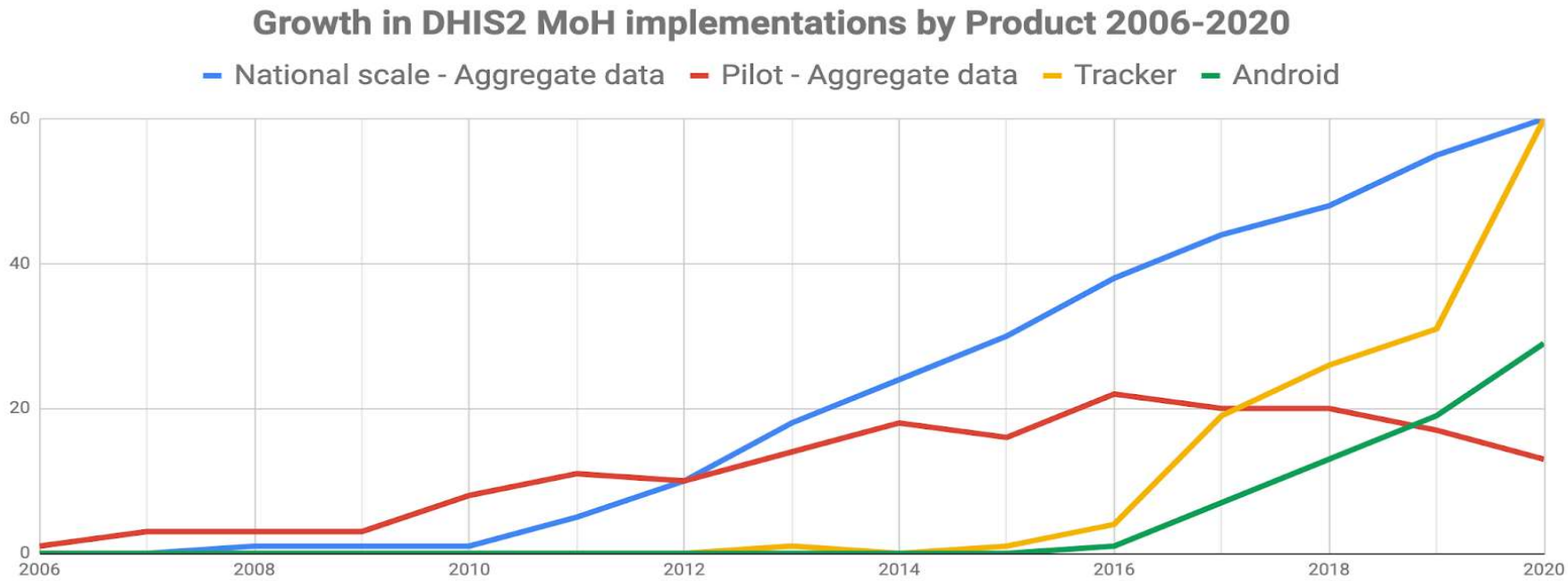
dhis2.org/about

Guiding principles

- Governed open source
- Dynamic embrace of technology
- Designed for integration & interoperability
- In-country ownership
- Capacity building
- Collaboration with global health institutions (WHO Collaborating Centre)
- Active community of practice and community-driven software roadmap
- Global guidance and local innovation
- Benefits of scale (national scale)
- Flexible across sectors
- Sustainability

Dynamic embrace of technology: Global adoption of DHIS2 products





Why DHIS2?

dhis2

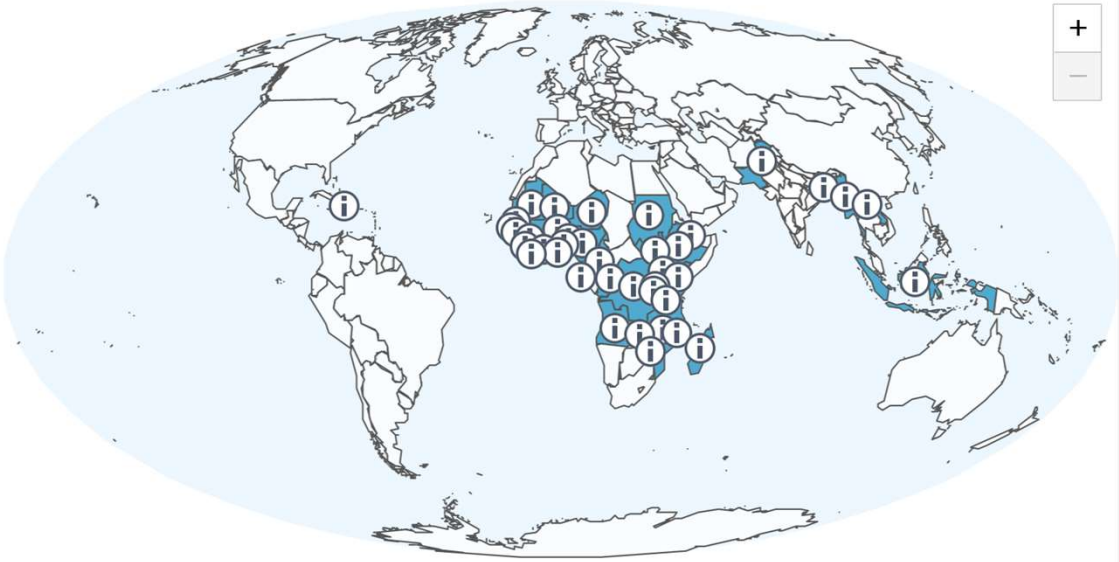
Overview features

- Free, Open source
- Data ownership by countries
- Database in countries
- Sustained country system support
- 70+ countries implementing
- 14 programme data collection systems
- Joint technical support to countries by UiO, WHO, partners
- UiO a WHO collaborating centre for HIS strengthening

Operational Features

- A to Z of HIS from data collection to use
- Integrated systems approach
- Country led, country focused for system strengthening
- National and sub national
- Dissemination of standards and data quality practices
- Monitoring programme performance at facility/community
- Key indicators and disaggregations for health sector and programme specific
- Harmonized analysis

Global adoption of WHO standard packages in national DHIS2



WHO Packages: 40

Angola	Djibouti	Kenya	Myanmar	Senegal	Zambia
Bangladesh	Ethiopia	Laos	Niger	Sierra Leone	Zimbabwe
Benin	Ghana	Liberia	Nigeria	South Sudan	
Burkina Faso	Guinea	Madagascar	Pakistan	Sudan	
Burundi	Guinea Bissau	Malawi	Republic of the	Tanzania	
Cameroon	Haiti	Mali	Congo	The Gambia	
Dem. Rep. Congo	Indonesia	Mauritania	Rwanda	Togo	

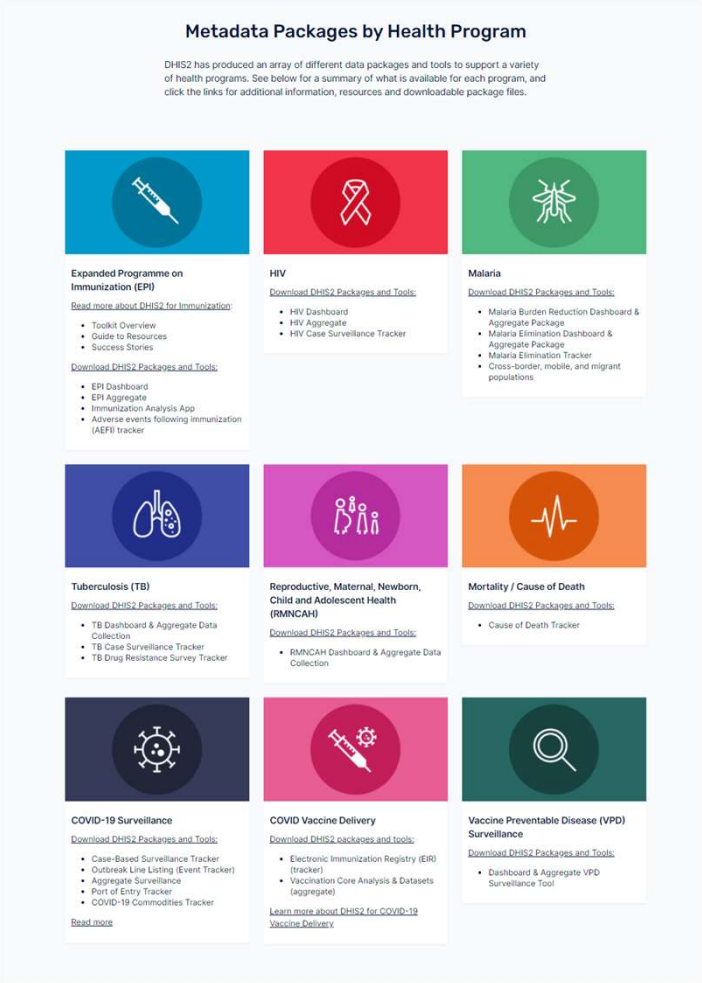
40 countries & counting

Packages adopted

- HIV
- TB
- Malaria
- EPI
- Cause of Death/Mortality
- COVID-19 Surveillance
- IDSR & VPD case-based surveillance

https://dhis2.org/in-action

WHO-approved DHIS2 metadata packages



Analytics Package: Dashboards, data visualizations, standard indicators, and data use & analysis guidance; be installed and mapped to inputs in a country's existing routine program or HMIS; or used in combination with an aggregate full package.

Aggregate data collection package
Data input forms, standard data elements and disaggregation to support the collection of aggregate data. Aggregate data input packages are assured to produce the indicators and dashboards included in the analytics package.

Tracker (individual-level) data packages
Individual-level data capture modules to enhance a patient-centered approach for program management. Tracker is used to uniquely identify and track a person or entity over time. These packages can be used to support clinical-level decision-making and generate highly granular data for enhanced analysis, while mapping to standard outputs in the analytics packages

What's in the DHIS2 toolkit?

1. Metadata package(s)

- Installable .json files containing complete configuration
- Dashboards, indicators, tracker programs/data sets, data elements
- Coded to WHO data dictionary where available, opportunities for integration of data standards like SNOMED, ICD-11, FHIR, LOINC
- Modular:for eaxample, case-based surveillance, POE, contact tracing, aggregate reporting
- Translated into multiple languages

2. Documentation (technical & programmatic)

- Installation guides
- Metadata reference files
- System design guides (linking information system design decisions with WHO technical guidance)
- Implementation & customization guidance
- Programmatic guidance developed by partners, software agnostic materials like WHO Health Facility Data Analysis Guides

3. Training materials

- End user training templates: for data entry (web & Android), analytics; Templates based on standard metadata can be easily adapted for countries
- Training and demo database

DHIS2: Capacity in countries & regions

The key elements of the HISP/DHIS2 approach

Build on established approaches and partnerships

Strengthen existing systems, tools and capacity

Leverage local expertise and innovation

Regional and local technical support

Network of 13 HISP groups with regional hubs:

- Eastern Africa
- West & Central Africa
- Southern Africa
- Asia & the Pacific
- Latin America & Carribbean

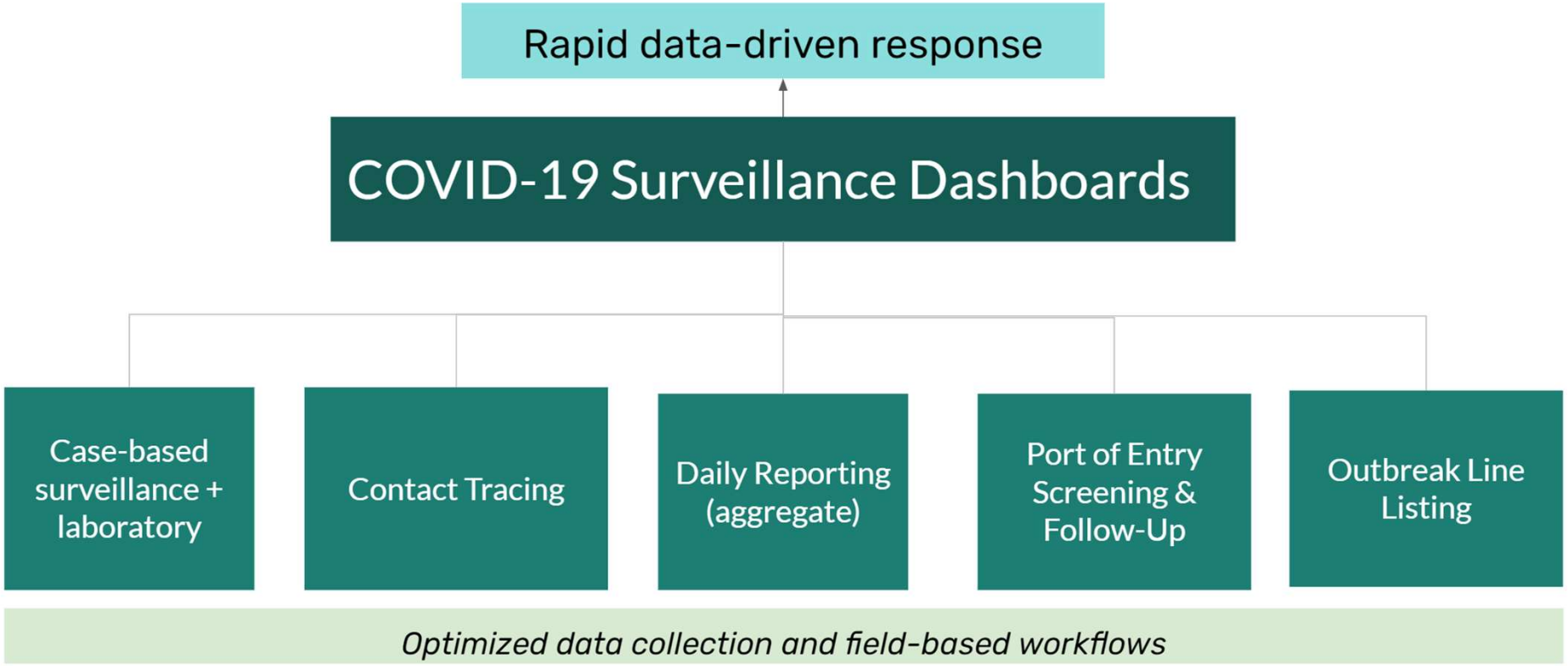
DHIS2 Capacity

Functions

Collect data from lowest levels, integrate data across systems, analyse and use information products at all levels to inform programmatic and national health decisions

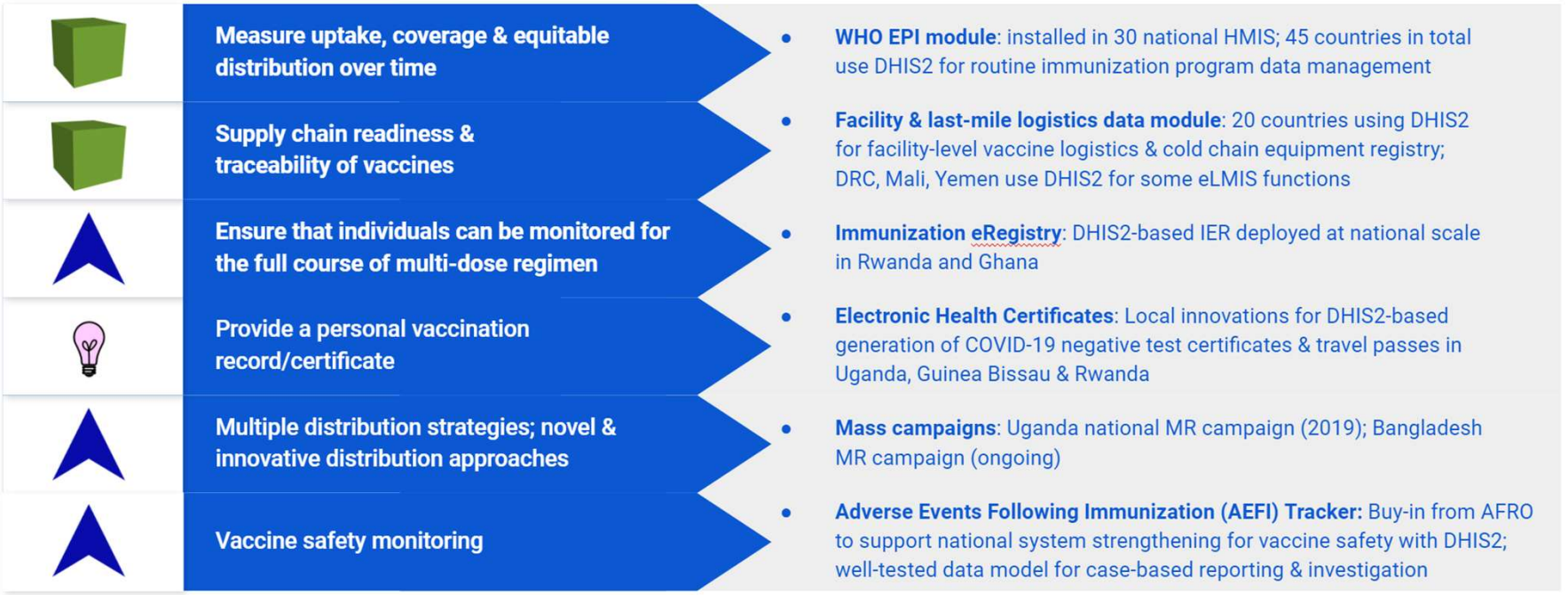
- Aggregate; individual data capture for disaggregation
- Connect with Lab
- Connect with infrastructure and logistics
- Community data package
- Score cards; bottle neck analysis
- SMS and mobile app
- Data quality
- Communication

Rapid deployment of DHIS2 Toolkit to support COVID-19 surveillance (using WHO case-based designs & package approach)



DHIS2 Toolkit to support COVID-19 NDVPs based on WHO EPI package development efforts since 2017

Optimized	Developing	Defined
WHO-approved DHIS2 solution that has been replicated at national scale in many countries and optimized to become fit-for-purpose	DHIS2 solutions that are WHO-approved, meet global standards, but are still in the process of being rolled out or scaled up in countries	DHIS2 solutions applied with success in some contexts, but not enough information about replicability & scale. These include novel uses and local innovations.



DHIS2 Standard Package

As routinely as any HIS

Standardize national core indicators

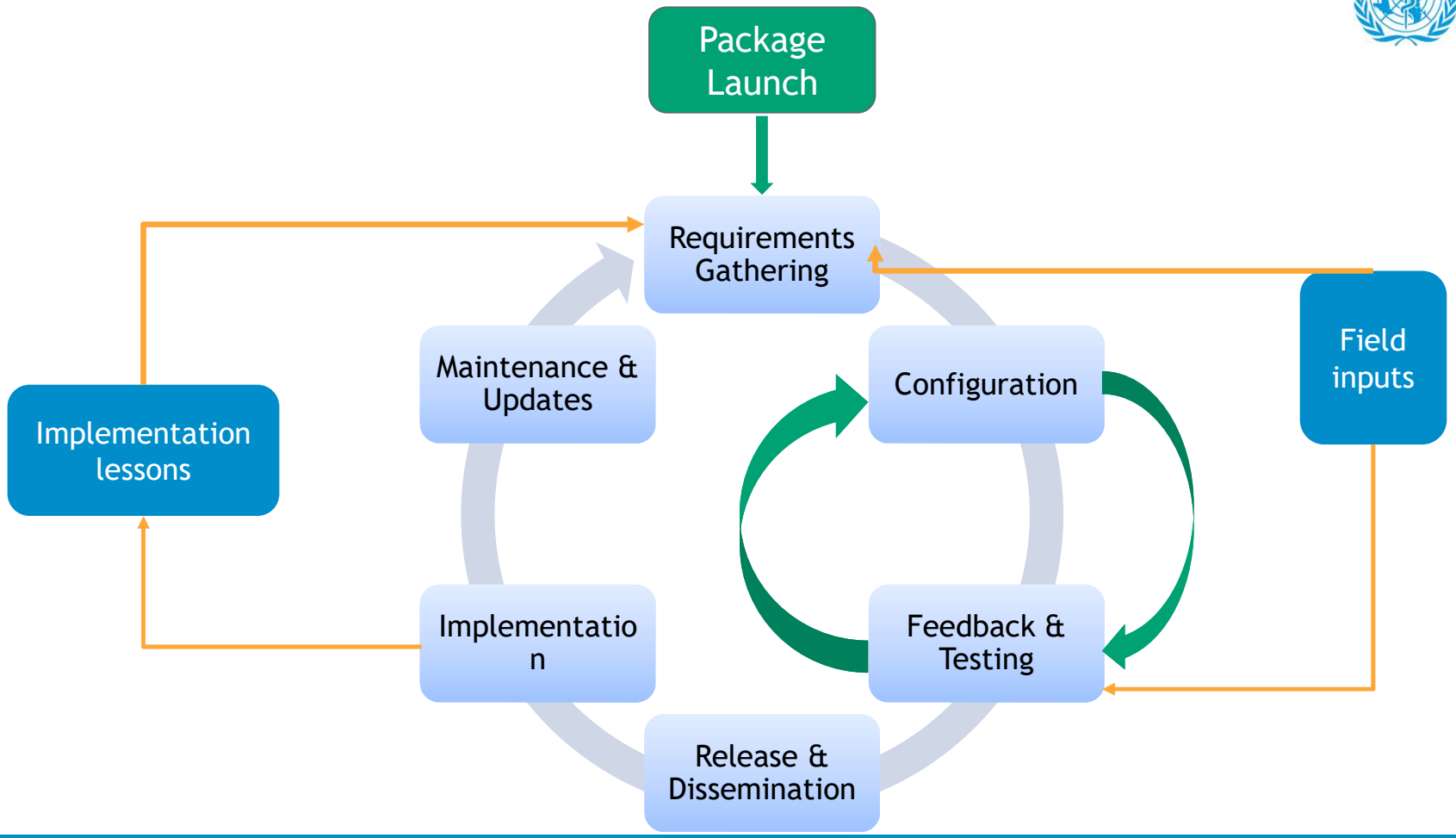
Generic standards for countries

How to use

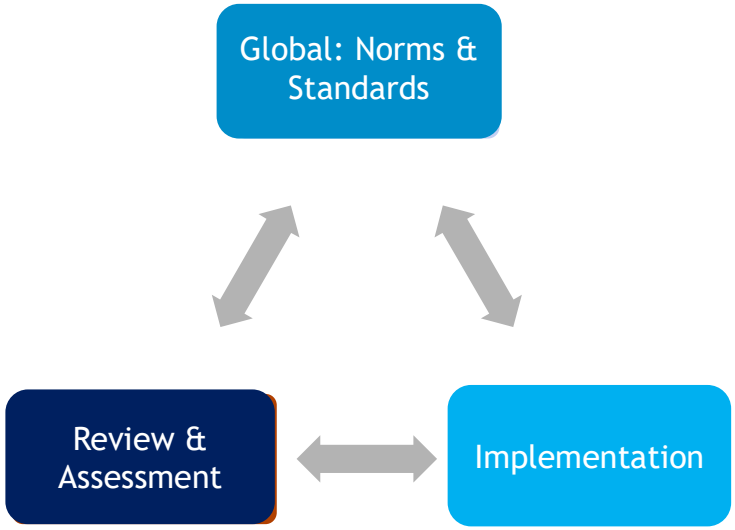
1. To ensure RHIS indicators meet global standards
2. To improve the way RHIS data is analyzed & displayed
3. To build capacity in analysing & interpreting RHIS data
4. To improve data quality
5. To use the DHIS2 packages
6. To build capacity in use of DHIS2

What have we learnt from the implementation so far?

- More agile development with much shorter cycles (e.g. COVID19) and stronger field implementation feedback loops
- Underestimation of the time and complexity of generating and translating health requirements into information system designs; opportunities to make these requirements & designs even more software agnostic for broader applicability
- WHO Dashboard Installations (35+ countries): improved access and analysis of data, but 'mapping the gap' reveals limitations in country data collection tools that need to be systematically addressed
- Country coordination and leadership amongst programs and partners to support integration; need to strengthen linkages from global, regional to country offices & MOH & partners
- Need for standardized and improved requirements gathering processes with content and subject matters experts to translate global health guidance into information system design
- Need for more robust implementation guidance, tailored to use cases covered by the toolkit; no "one size fits all"
- Need to learn more about country adoption, customization & localization: what should remain standard vs. what components are most critical to country adaptation?
- Integrated HMIS architecture: how to connect HMIS with other in-country systems, mapping data flows, linking individual level data to aggregated analysis


Package Launch
Requirements Gathering
Configuration
Feedback & Testing
Release & Dissemination
Implementation
Maintenance & Updates
Implementation lessons
Field inputs

- **Partnership WHO/HISP: Key channel for dissemination and application of the standards**
- The structure is flexible with a strong system as base which enable extension and inclusion of new programme (exp. COVID surveillance package)
- Feedback loops “Global→ country→ implementation→ global” to improve the tools and implementation
- Allow information exchange and sharing experience amongst countries and regions and with partners




QUESTIONS?

In the upcoming series on RHIS standard & DHIS2 packages

1. Aggregated programmes and integrated RHIS system for analysis and data use at national and sub-national level
2. Data Quality Assurance and DHIS2 –WHO DQ apps for data quality review
3. Surveillance and the use of DHIS2 for case-based surveillance

   Covid-19 surveillance with DHIS2: lessons learnt
4. Immunization and use of DHIS2
5. Use of DHIS2 as a digital tool to support country RHIS strengthening and monitoring of GPW1/UHC targets

Where to find the toolkit and support

Where to get materials:
https://www.who.int/healthinfo/tools_data_analysis_routine_facility/en/
Modules (who.int)

To get DHIS2 Configuration & User Guide: https://www.dhis2.org/who

Extended training for implementers, support staff
DHIS2: https://academy.dhis2.org/courses/course-v1

The toolkit remains working versions as data requirements evolve;
For questions or comments, please contact chuh@who.int

Acknowledgement

The following teams in WHO for technical inputs and country implementation support:
- DDI/DNA/Health Service Data team for inputs in RHIS, Mortality/Cause of Death
- UHL: HIV, Malaria, Immunization, RMNCAH, TB, WHE/Surveillance, NCD/Rehabilitation

Partners:
- The Global Funds to fight against TB, HIV, Malaria
- The Gavi Alliance
- University of Oslo/HISP Programme
- Other HDC partners