



**SMART Guidelines: *Advancing Guideline Use in the Digital Age***

# WHO guidelines influence the health of billions around the world



The World Health Organization (WHO) delivers guidelines for clinical care and public health services in the country setting.

- WHO Guidelines are a critical resource for the majority of the world
- Hundreds of guidelines exist
- These guidelines shape behaviors across country health systems
- Guidelines comprise proven life-saving interventions

# When applied consistently, the recommendations within guidelines save lives



For example, WHO guidelines:

- **Protect millions of children from potentially life-threatening diseases** as a result of recommended immunization schedules
- **Reduce incidence and mortality within HIV programs** due to increased eligibility accelerating ART scale-up and coverage
- **Reduce maternal and perinatal mortality and morbidity** when ANC routine care and management of complications during pregnancy and childbirth recommendations are applied

# However, the potential benefits of guidelines are diluted and delayed...

## Current State

## Implications



Time delays



Patients are denied access



Diminished accuracy



Health services are compromised



Limited ability to evaluate and adapt



Delayed improvements to health practices



Passive dissemination mechanism



Lack of impact at scale

# Health system digitization stands to either help or further hinder guideline implementation



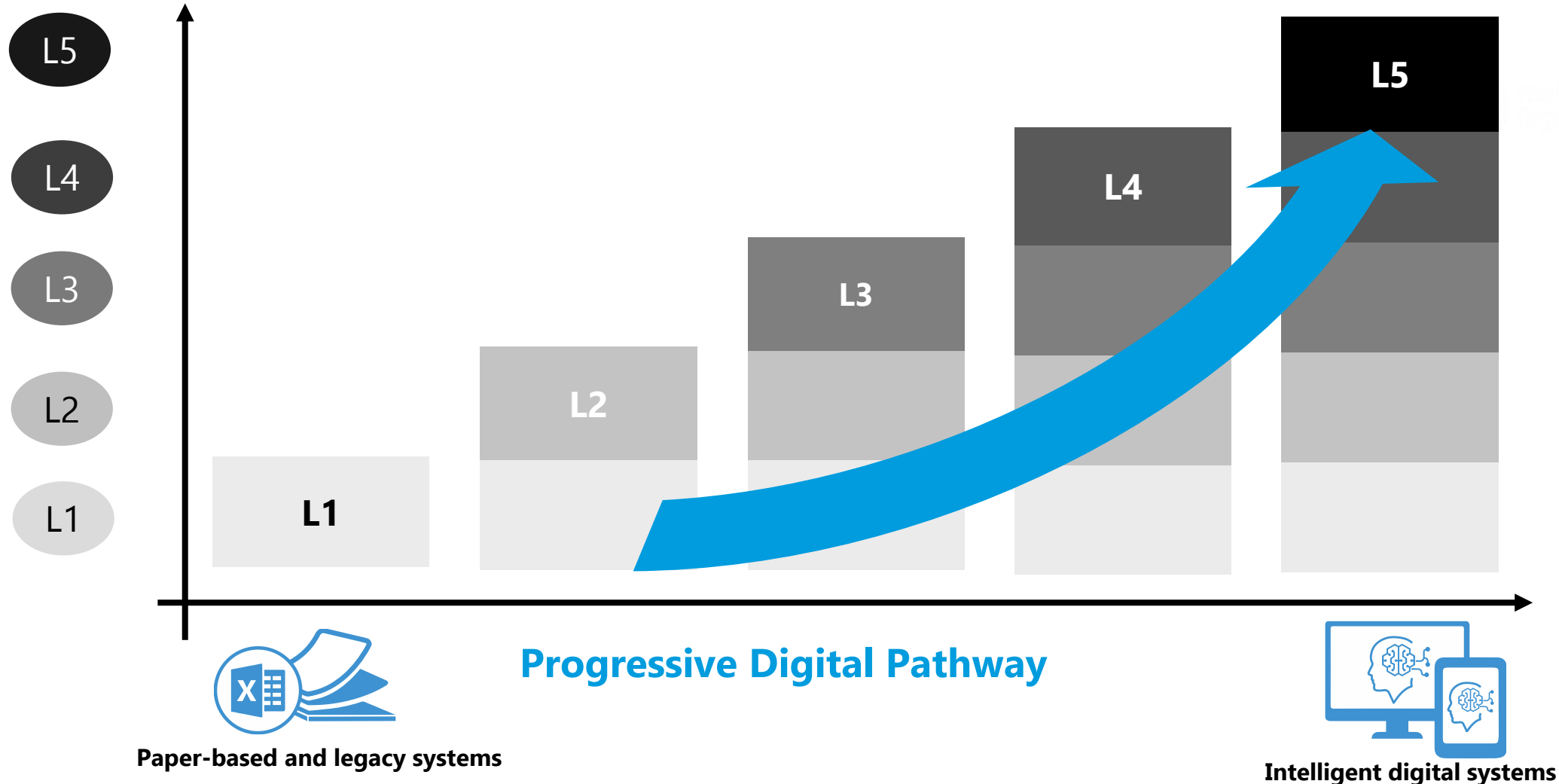
Countries are investing heavily in digital health systems. They directly impact the behavior of actors across healthcare delivery. However, without clear processes and tools, there is a risk these systems will not consistently guide users to the best healthcare practices. With appropriate support, digital health systems can save lives.

# Introducing SMART Guidelines...

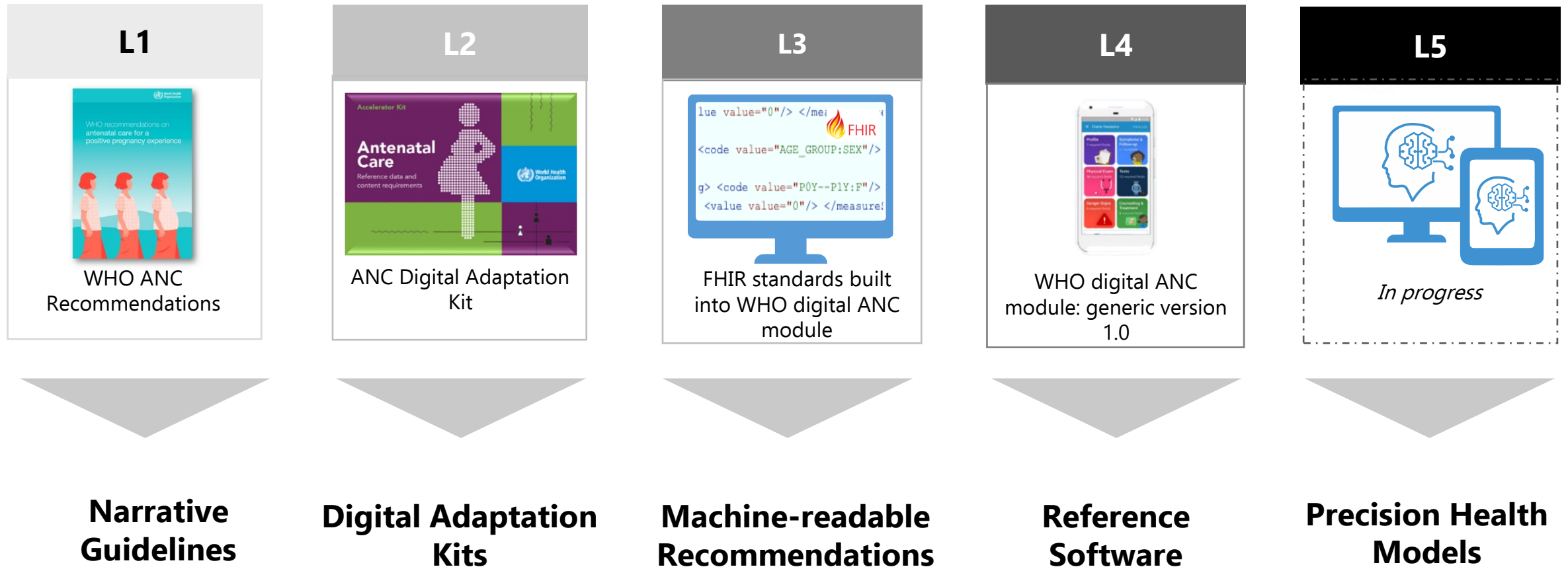
**SMART Guidelines are a new approach to using clinical, public health, and data recommendations in the digital age. At their heart, SMART Guidelines are a comprehensive set of documentation, reusable digital health components (e.g., interoperability standards, code libraries, recommended datasets, algorithms, technical and operational specifications) and procedures to steer guideline localization and translation into effective and interoperable digital systems, which preserves fidelity and accelerates uptake of recommendations within evolving digital health systems.**

# SMART Guidelines provide a pathway to advance the adoption of best clinical and data practices, even if a country is not yet fully digital

## SMART GUIDELINE LAYER



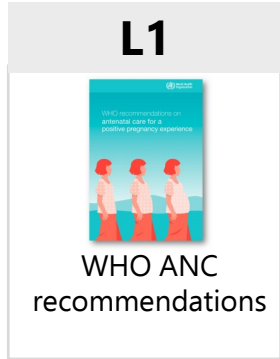
# When applied in the context of country health systems, the components within each layer can contribute to improved health services





# SMART Guidelines in practice for antenatal care (ANC)

L1: Traditional guidelines enhanced with unique identifiers to track recommendation updates

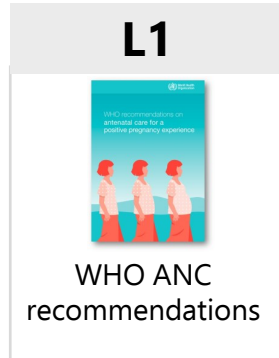


## L1: Text from guideline

Anaemia	<b>B.1.1:</b> Full blood count testing is the recommended method for diagnosing anaemia in pregnancy. In settings where full blood count testing is not available, <b>on-site haemoglobin testing with a haemoglobinometer is recommended</b> over the use of the haemoglobin colour scale as the method for diagnosing anaemia in pregnancy.	Context-specific recommendation
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# SMART Guidelines in practice for antenatal care (ANC)

L2: Translates narrative guidelines into structured components for operationalizing within country programs



- ### Components of a Digital Adaptation Kit
1. Health Interventions & Recommendations
  2. Generic Personas
  3. User Scenarios
  4. Business Processes & Workflows
  5. Core Data Elements
  6. Decision Support Logic
  7. Indicators & Monitoring
  8. Functional & Non- functional Requirements

### L2: Structured logic from Digital Adaptation Kit


Decision ID	ANC.DT.25 Anaemia, iron and folic acid supplementation						
Business Rule	Testing for anaemia is recommended for all pregnant women. Regardless of test results, iron and folic acid supplementation is recommended. The amount of						
Trigger	ANC.B9. Conduct laboratory tests and imaging						
Inputs	Output	Action				Annotations	
"Blood haemoglobin test result" < 110 g/L	"Gestational age" ≤ 12 weeks	"Anaemia diagnosis = "Positive for anaemia"	Conduct REQUIRED anaemia counselling	"Amount of iron prescribed" = 120 mg	"Type of iron supplement dosage provided" = "Daily"	"Amount of daily dose of folic acid prescribed" = 0.4 mg	Anaemia can be diagnosed if Hb level is less than 11 in first or third trimester or Hb level less than 10.5 in second trimester; OR there is no Hb test result recorded, but woman has pallor. If a woman is diagnosed with anaemia during pregnancy, conduct counselling for managing and treating anaemia. Her daily elemental iron should be increased to 120 mg until her haemoglobin (Hb) concentration rises to normal (Hb 110 g/L or higher). Thereafter, she can resume the standard daily antenatal iron dose to prevent recurrence of anaemia.
"Blood haemoglobin test result" < 110 g/L	"Gestational age" ≥ 28 weeks	"Anaemia diagnosis = "Positive for anaemia"	Conduct REQUIRED anaemia counselling	"Amount of iron prescribed" = 120 mg	"Type of iron supplement dosage provided" = "Daily"	"Amount of daily dose of folic acid prescribed" = 0.4 mg	The equivalent of 120 mg of elemental iron equals 600 mg of ferrous sulfate heptahydrate, 360 mg of ferrous fumarate or 1000 mg of ferrous gluconate. Please refer to iron sources listed below for additional guidance that can be provided.
"Blood haemoglobin test result" < 105 g/L	13 weeks ≤ "Gestational age" ≤ 27 weeks	"Anaemia diagnosis = "Positive for anaemia"	Conduct REQUIRED anaemia counselling	"Amount of iron prescribed" = 120 mg	"Type of iron supplement dosage provided" = "Daily"	"Amount of daily dose of folic acid prescribed" = 0.4 mg	
"Blood haemoglobin test conducted" = FALSE	"Pallor present" = TRUE	"Anaemia diagnosis = "Positive for anaemia"	Conduct REQUIRED anaemia counselling	"Amount of iron prescribed" = 120 mg	"Type of iron supplement dosage provided" = "Daily"	"Amount of daily dose of folic acid prescribed" = 0.4 mg	

# SMART Guidelines in practice for antenatal care (ANC)

L3: Transforms L2 components into standards-based software code that accurately reflects guideline decision logic and data requirements



**L1**




WHO ANC recommendations

**L2**



ANC Digital Adaptation Kit

**L3**



FHIR standards built into WHO digital ANC module

## L3: Guideline in software code

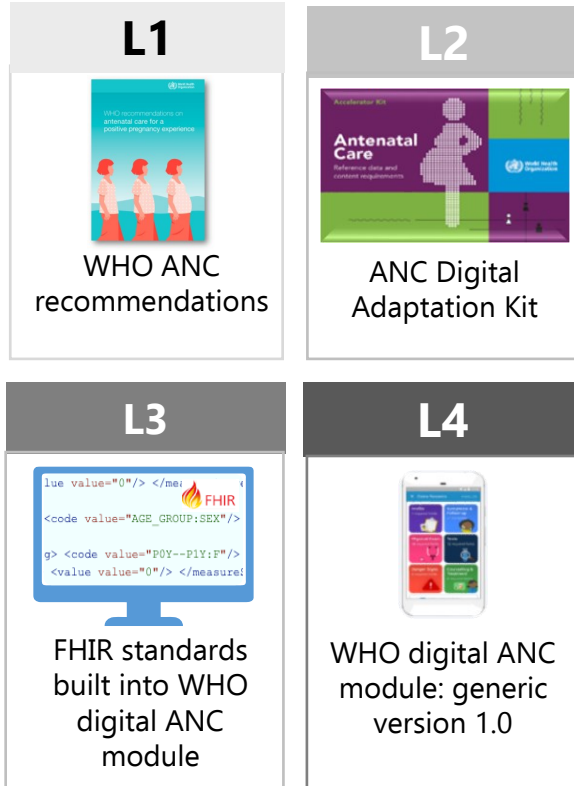
```
/* codesystem "LOINC": 'http://loinc.org'
code "Hb": '718-7' from "LOINC" display 'Haemoglobin measured from haemoglobinometer (g/dL)' */
code "Hb": '165395AAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA' from Common.OpenMRSEntity display 'Haemoglobin
measured from haemoglobinometer (g/dL)'

// if anaemia detected
define "Has Anaemia":
  if Common.gest_age between 13 weeks and 27 weeks then
    "Hb Concentration" < 10.5 'g/dL'
  else
    "Hb Concentration" < 11 'g/dL'

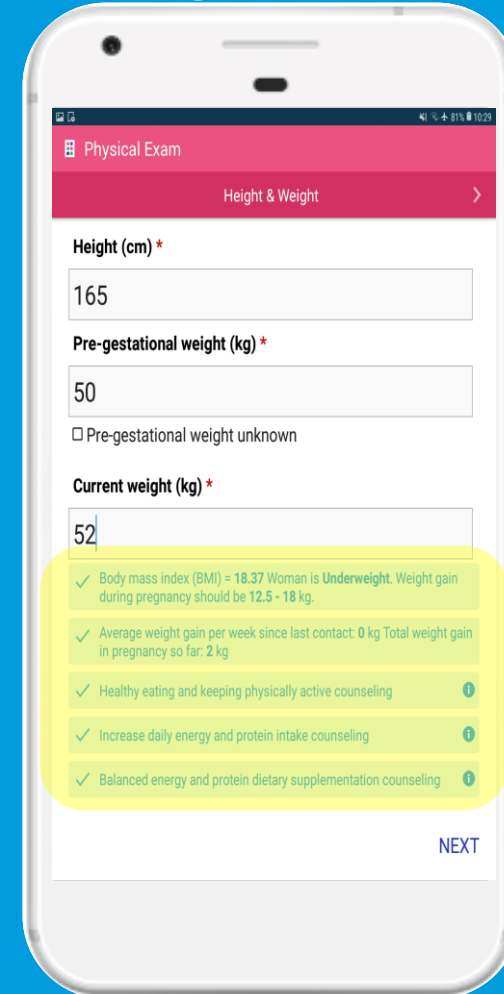
define "Hb Concentration":
  First(
    ["Observation": "Hb"] 0
    where 0.status = 'final'
      and (0.effective as FHIR.Period) after start of Common.pregnancy.period
    sort by FHIRHelpers.ToDateTime(effective as FHIR.dateTime) descending
  ).value as Quantity
```

# SMART Guidelines in practice for antenatal care (ANC)

L4: Manifests guidelines in software applications that are ready to be deployed in the field




## L4: WHO digital ANC module



# The SMART Guidelines Layers

**L1**



Enhanced Guidelines

**Traditional guidelines enhanced with unique identifiers to track recommendation updates**

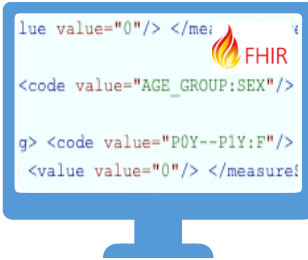
**L2**



Digital Adaptation Kits

**Translates narrative guidelines into structured components (e.g., decision trees, flow diagrams) for operationalizing within country programs**

**L3**

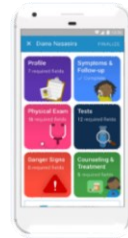


```
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```

Machine-Readable Recommendations

**Transforms L2 components into standards-based software code that accurately reflects guideline decision logic and data requirements**

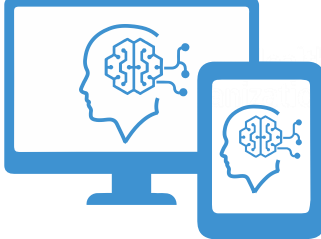
**L4**



Reference Software

**Manifests guidelines in software applications that are ready to be deployed in the field**

**L5**



Precision Models

**Provides advanced analytics to support continuous improvement of health services**



**The SMART Guidelines support a paradigm shift:  
they systematize and accelerate the consistent application of  
life-saving interventions globally**

# SMART Guidelines transform the way WHO's evidence base is applied for health service delivery globally. They...

## Accelerate guideline use

Accelerate the adoption of clinical, public health, and data interventions in member states by leveraging evolving digital technologies

## Ensure guideline fidelity

Systematically encourage the consistent and accurate interpretation of guidelines as digitization takes place

## Improve analytics and M&E

Strengthen data quality, metrics, and reporting - across geographies and different levels of digital system maturity - to accurately monitor, course correct, and attribute health gains

## Strengthen the evidence base

Create feedback loops to continuously track how guidelines are used, enriching and speeding up the evidence base, and enabling more rigorous evaluation of guideline impact

**...for better clinical care & stronger health systems**

# Call to Action: opportunities for engagement for actors at all levels



## Donor Community

Support the development and maintenance of Smart Guidelines, invest in products that adopt Smart Guidelines, and require use of Smart Guidelines in country implementations



## Guideline Developers

Engage with business analysts and other experts to ensure guidance is accurately translated to digital tools



## Program Managers

Request digital products that implement Smart Guidelines



## Technologists

Adopt Smart Guidelines as the primary mechanism to improve the functionality and interoperability of tools



## Health System Actors

Advocate for the adoption of Smart Guideline tools in the context of health service delivery



**Thank you!**

*For more information:*

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Department of Digital Health and Innovations, Science Division,  
WHO**

**<https://www.who.int/teams/digital-health-and-innovation/smart-guidelines/>**

**For more information on WHO ANC SMART Guideline:  
[www.srhr.org/antenatalcare](http://www.srhr.org/antenatalcare)**



# SMART Guidelines

**S** = Standards-based

**M** = Machine-readable

**A** = Adaptive

**R** = Requirements-based

**T** = Testable

SMART Guidelines are an operationalization of this vision for a new WHO-supported approach to facilitate rapid, effective, global implementation of WHO guideline recommendations in the digital age

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**WHO SMART guidelines: optimising country-level use of guideline recommendations in the digital age**