



**World Health  
Organization**

# **The Living Approach to WHO normative products and country implementation**

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**Member State Briefing**

**31 Oct 2022**

# Session outline

## Member State Briefing: The Living Approach to WHO normative products and country implementation

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### Introduction and overview

**Alain Labrique**

Living vs standard guideline development processes

Lisa Askie

Living adaptation and implementation at country-level

Kidist Bartolomeos

SMART guidelines and health system adoption

Garrett Mehl

Next steps, way forward

Alain Labrique

# Transformational Optimization



## The Living Approach to WHO normative products and country implementation

### Living Guidelines

Guideline recommendations that are updated as frequently as is necessary and feasible as evidence improves over time.

### Living Adaptation & Implementation

Guideline recommendations adapted to be usable and implementable, with uptake monitored and learnings used to inform innovation and better design.

### Evidence to Policy

Strategies to promote evidence use in national policies, and the development of evidence support systems use to support policy decision-making

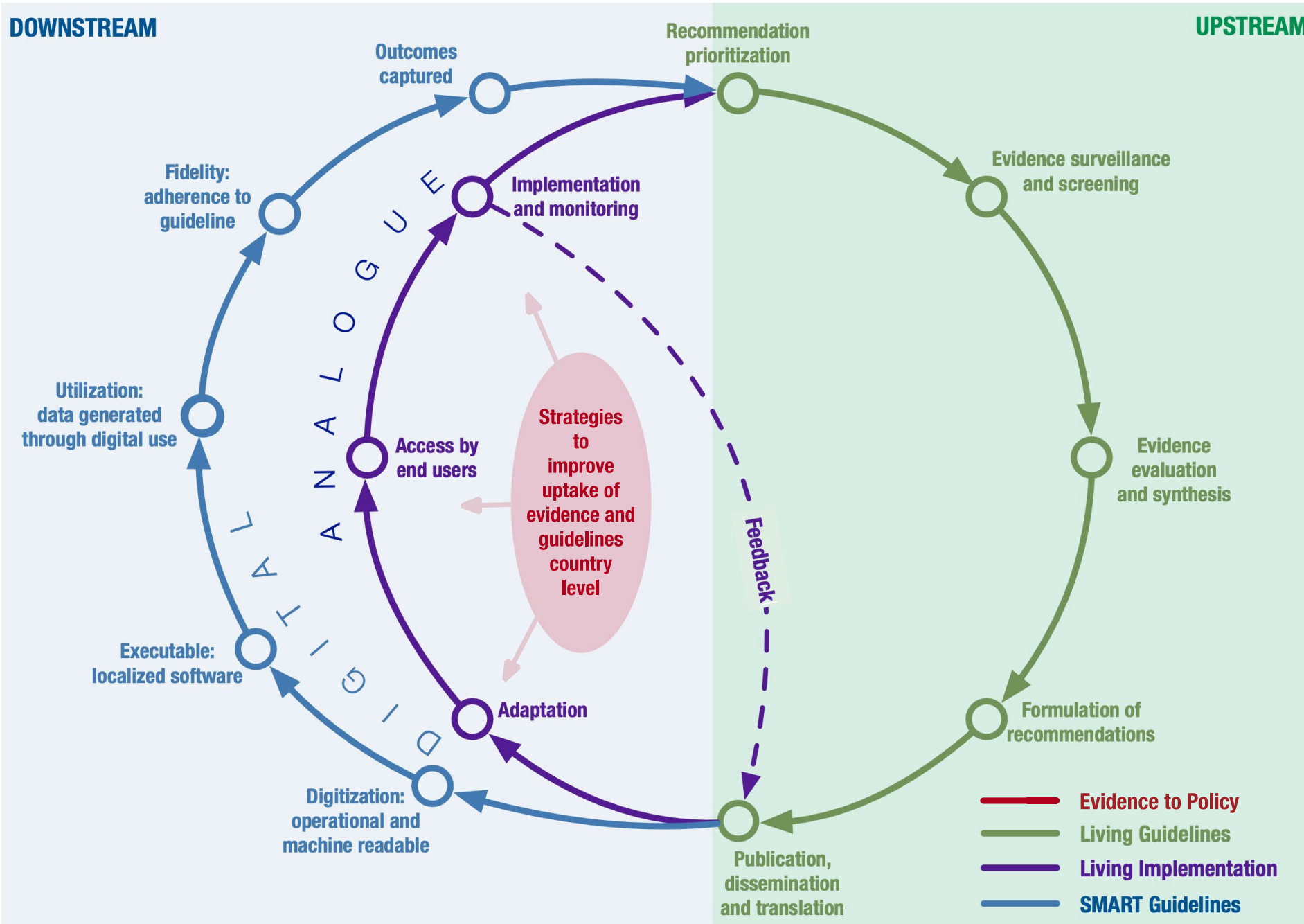
### SMART Guidelines

A stepwise process of translating guideline and data recommendations into specifications and reusable digital components which facilitate interoperability and accurate representation in digital systems, to reinforce recommended health and data practices.



Country Adoption, Effective Implementation, Refinement and Institutionalization

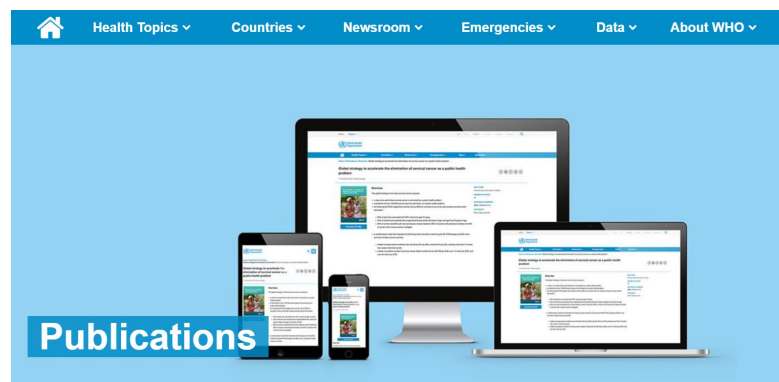
# The Living Approach to WHO normative products and country implementation



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What are we doing now?

# WHO GUIDELINES



تحضير مساحيق تركيبات الرضع،  
وتخزينها ومناولتها بأمانوية



مبادئ توجيهية



منظمة الصحة العالمية  
بالتعاون مع  
منظمة الأمم المتحدة للأغذية والزراعة




WHO guideline on self-care interventions for health and well-being, 2022 revision

WHO antenatal care recommendations for a positive pregnancy experience


Maternal and fetal assessment update: imaging ultrasound before 24 weeks of pregnancy



世界卫生组织

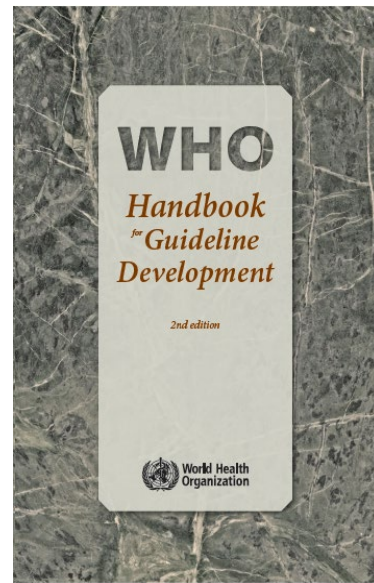
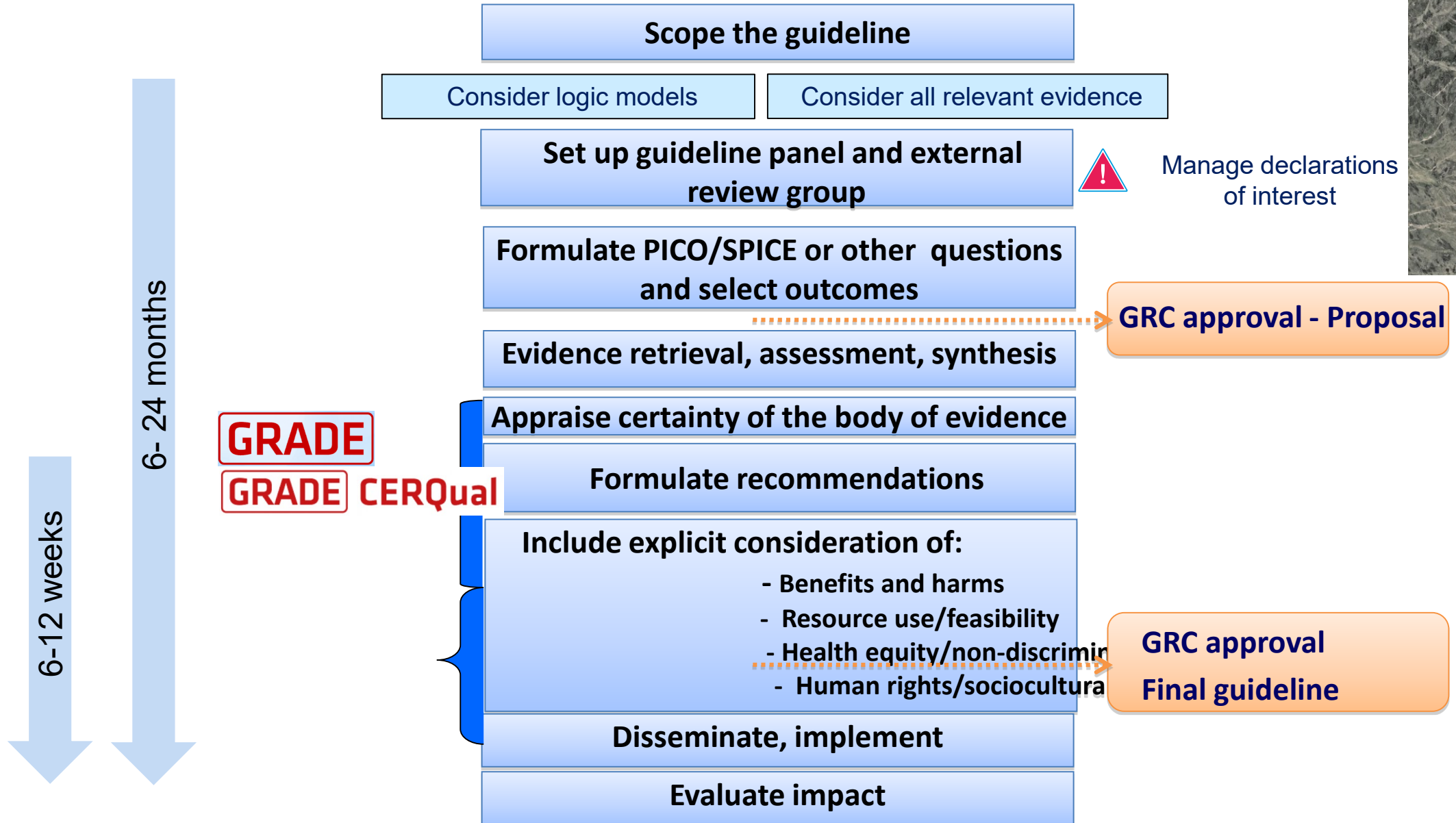
指南：  
学龄前和学龄儿童间断补充铁剂

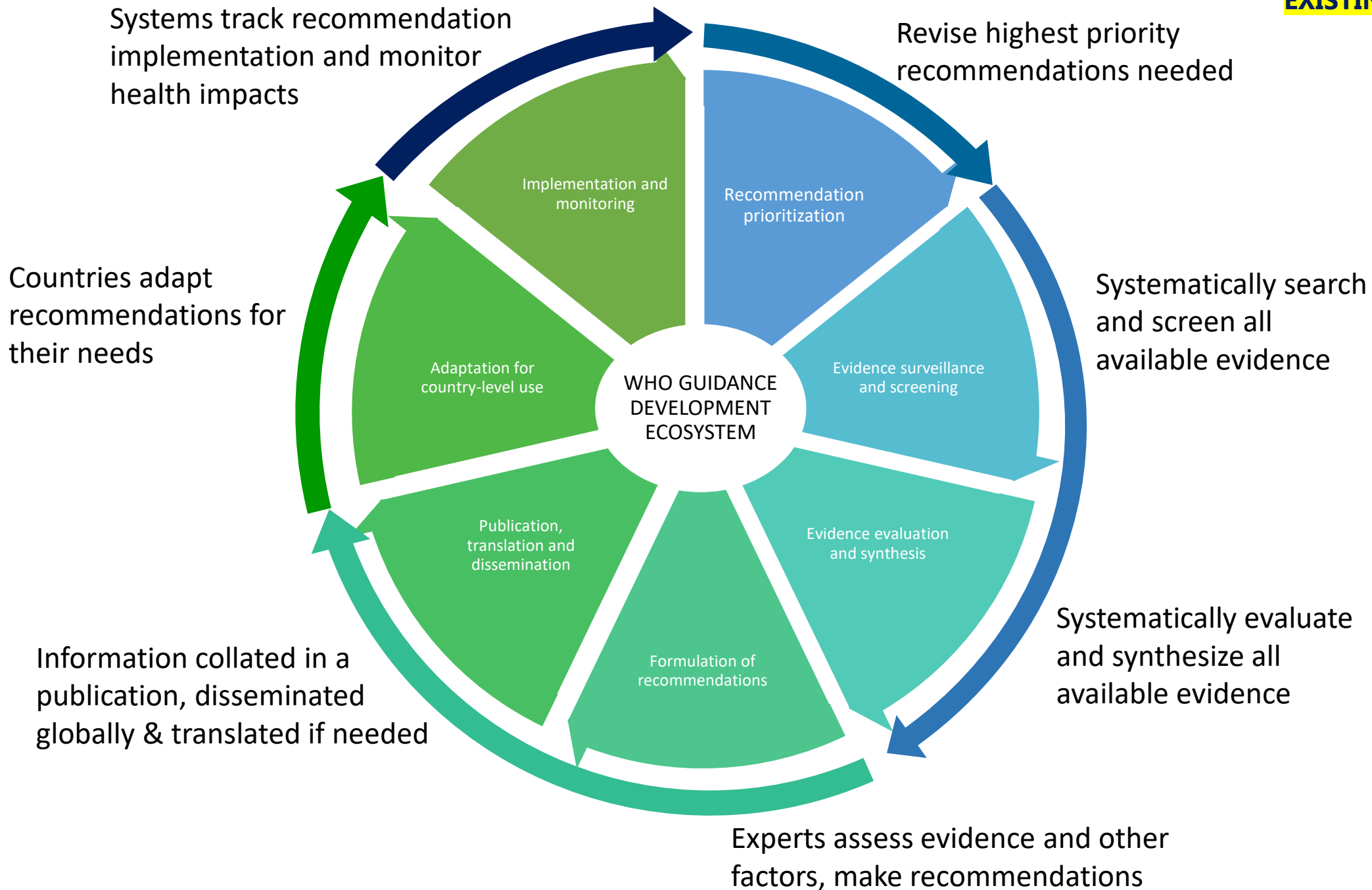
Antenatal care and COVID-19



... driving impact in countries

# Guideline development process

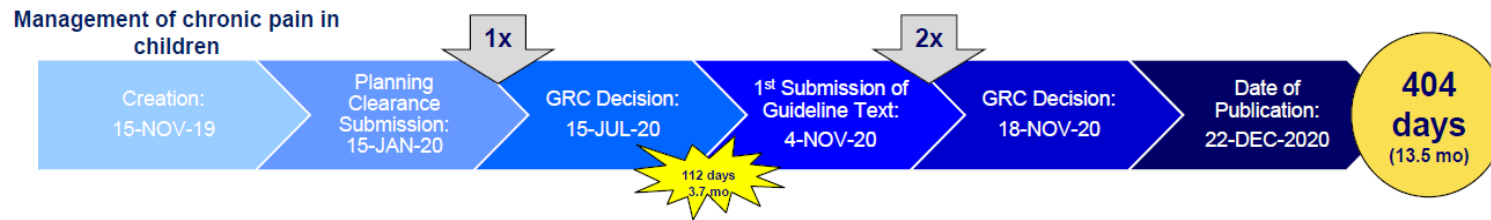




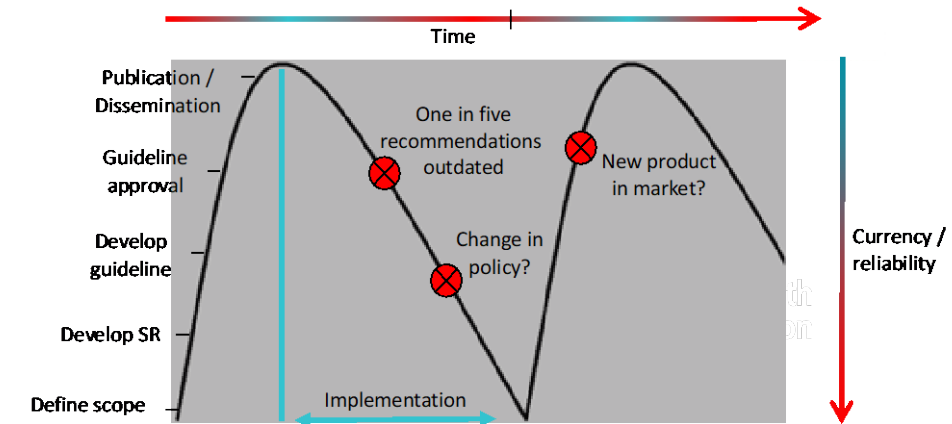


# Standard guidelines: trustworthy but (not always) up-to-date

## Standard WHO guidelines

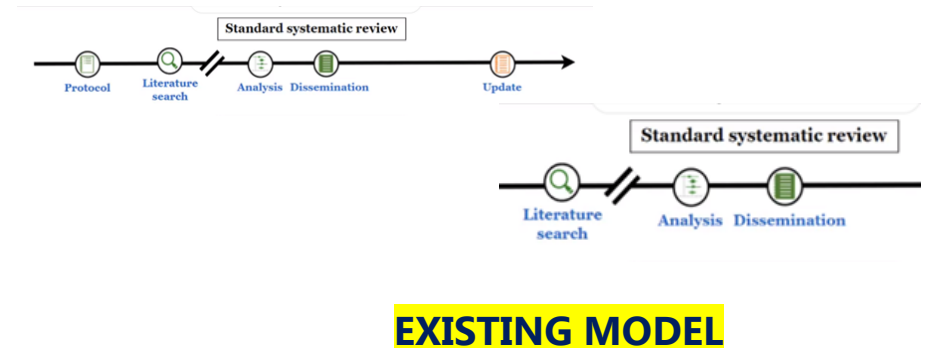


Current Model:  
Intermittently updated guidelines



## The usually

- take 1-2 yrs min to develop
- published only as static pdf, dense text, long
- not structured for in digital formats
- challenging to translate for interoperability and digital systems
- updated only every 3-5 years, so not always "informed by best available and up-to-date evidence"

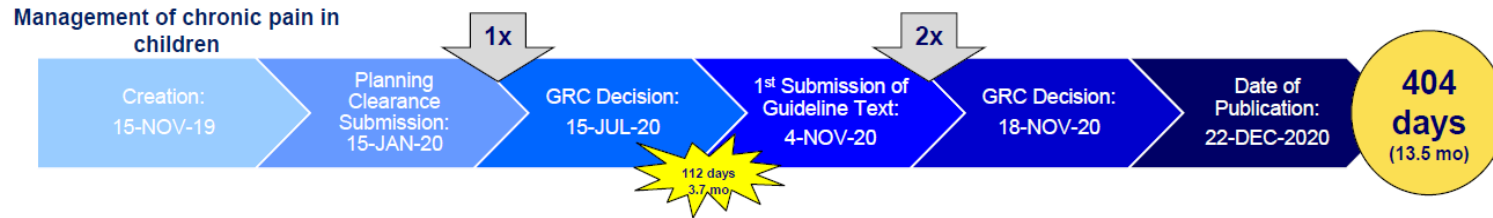


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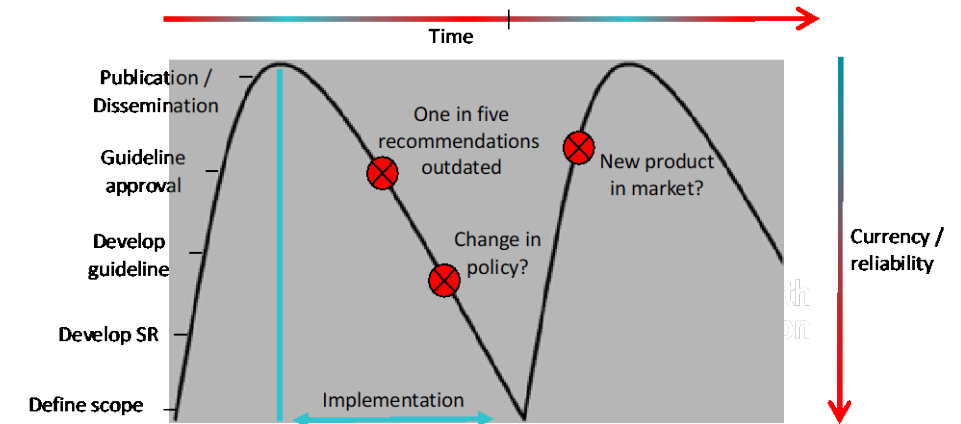
What needs to change?

# Living guidelines: trustworthy *and* up-to-date

Standard WHO guidelines are **updated every 3-5 years**



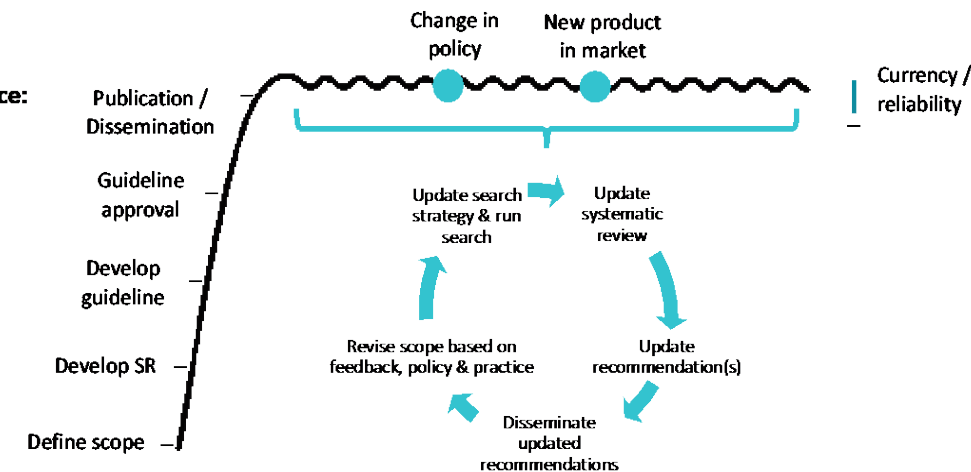
**Current Model:**  
Intermittently updated guidelines



'Living' guidelines are **updated every week / month / ?** and/or **triggered by rules or algorithms** that determine when emerging evidence would **change a recommendation**

**Living Evidence:**  
Continuously updated guidelines

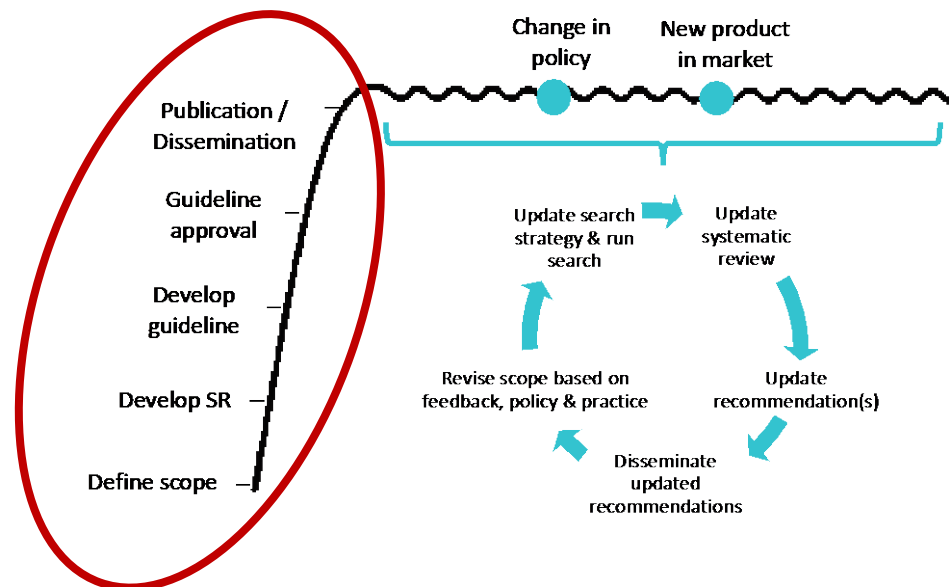
## REMDESIVIR GUIDELINE



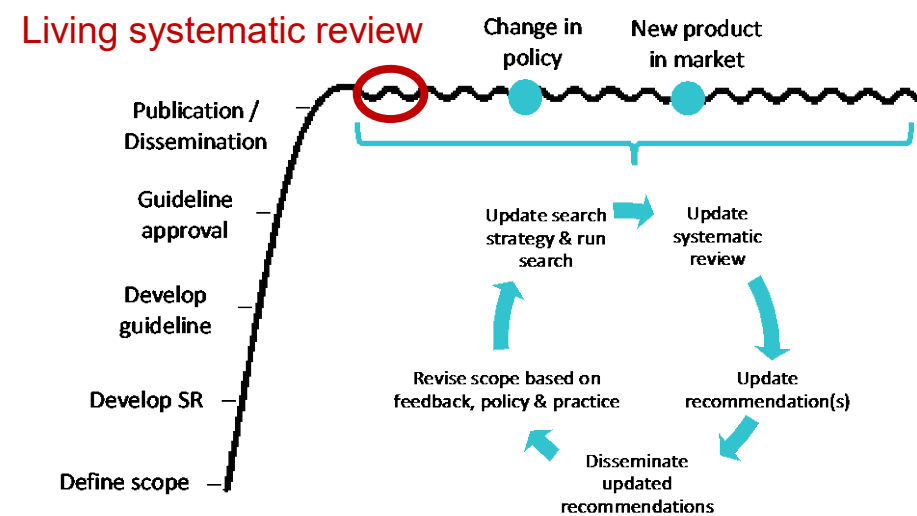
# What makes a guideline 'living' (vs static)

## Living guideline

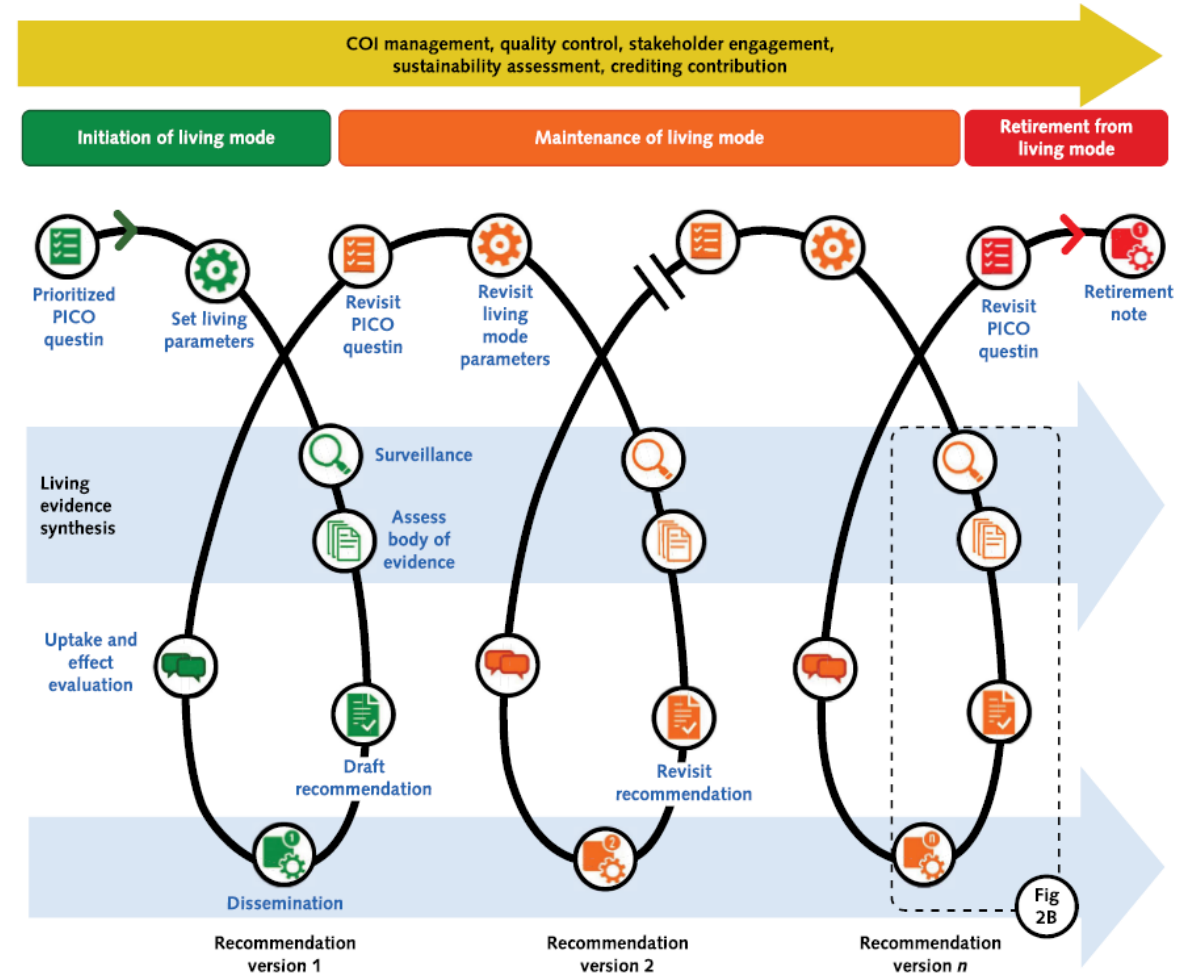
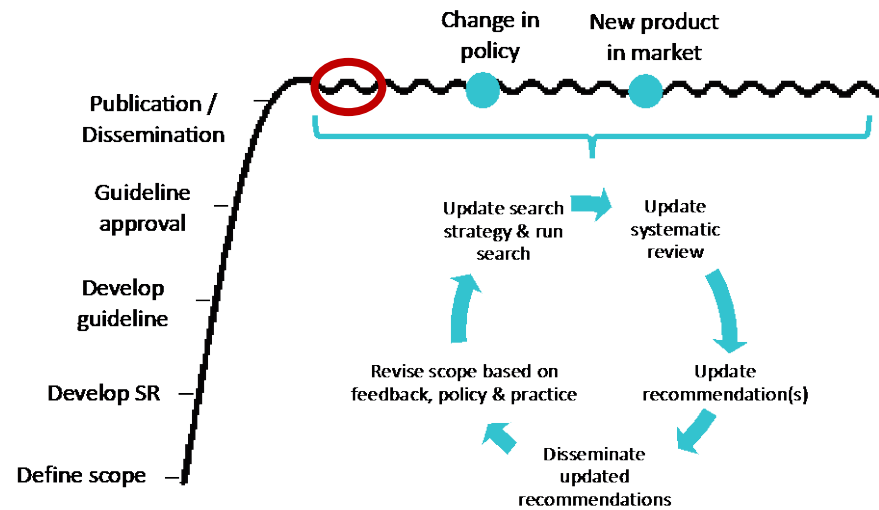
- starts with standard '**base**' systematic review
- then **prioritize** which recommendations need more frequent updating (due to expected new evidence)
- *definition*: a guideline with at least one recommendation is in 'living mode'
- *main feature*: underpinned by '**living systematic review**'



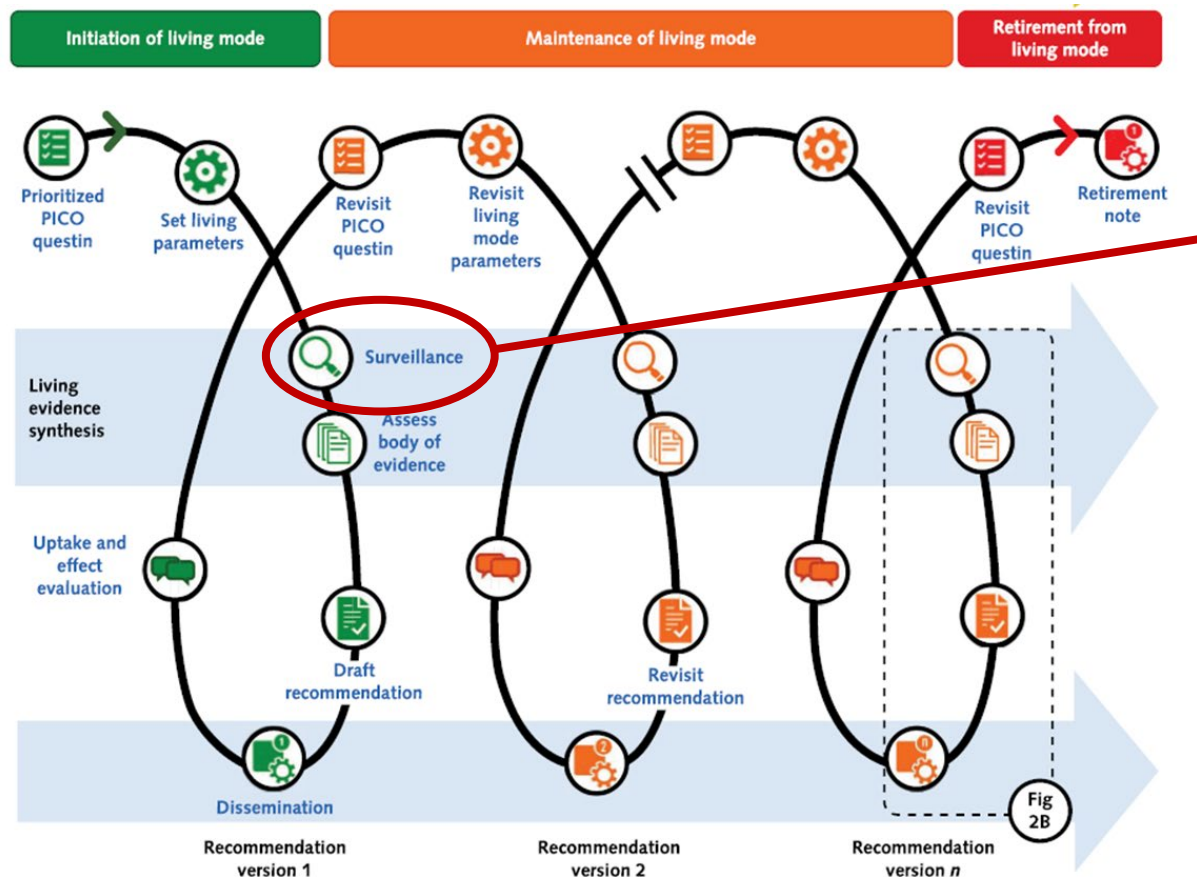
Base systematic review



# Living systematic reviews underpin living guidelines

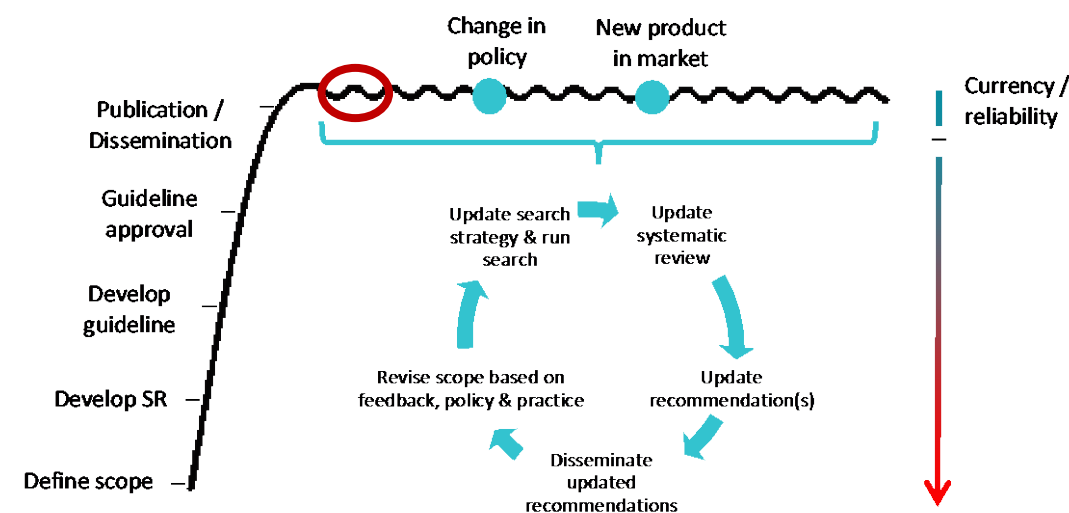


# Evidence surveillance frequency?

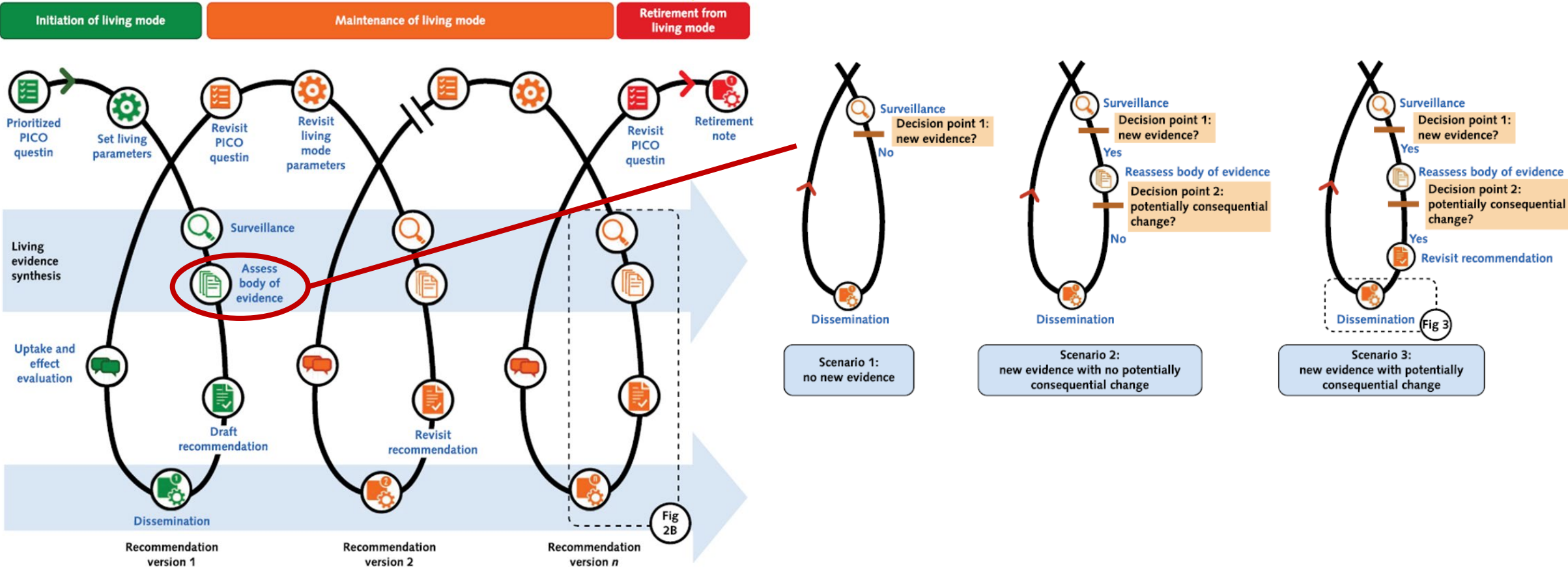


## How often to look for new, relevant evidence?

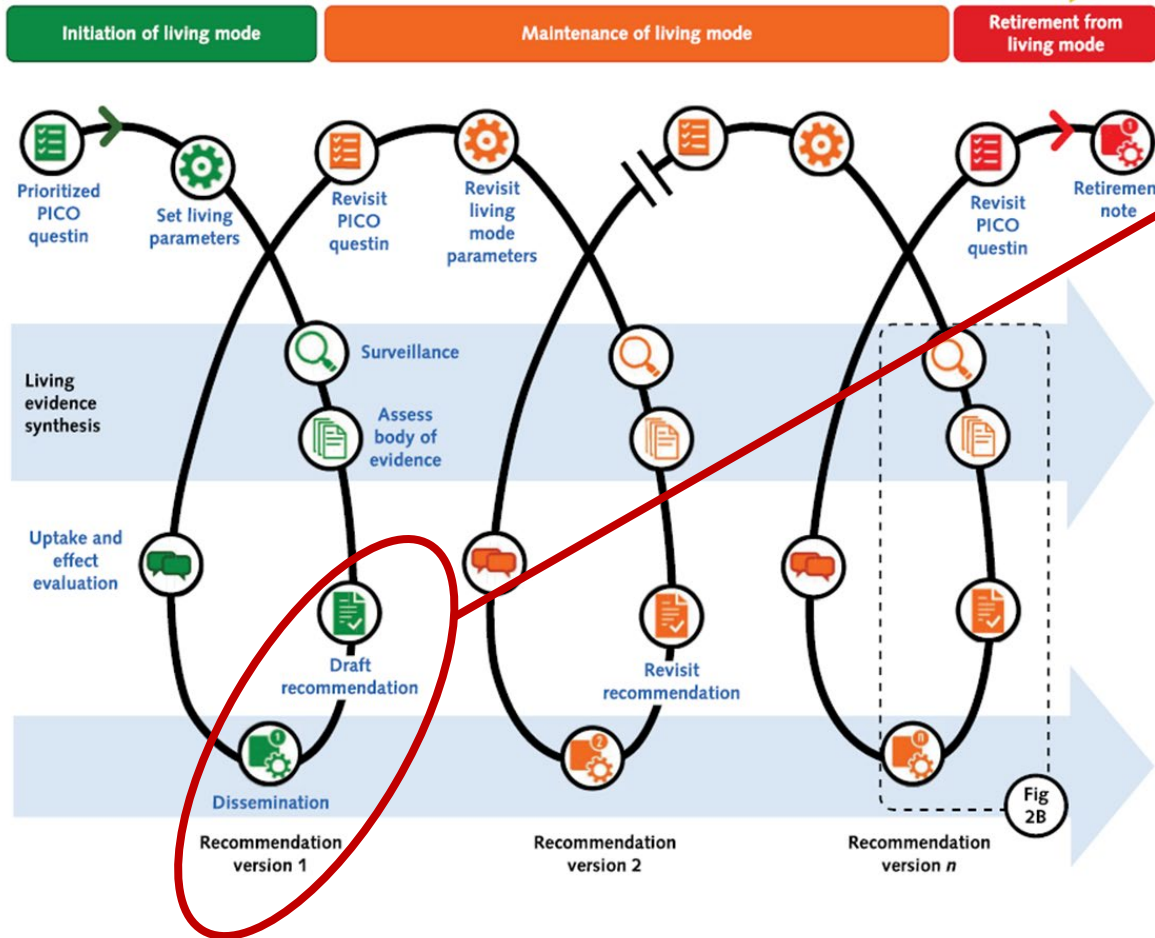
- usually at least every 3-6 months, for how long?
- could be 'continuous' 'real time' e.g. daily, weekly during COVID-19
- may need AI support tools
- can be triggered by off-cycle information e.g. new RCT published



# Possible actions following surveillance time point?

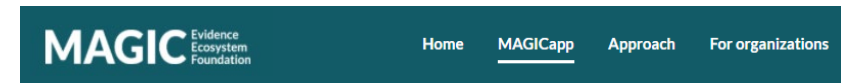


# Agile authoring and publication platforms

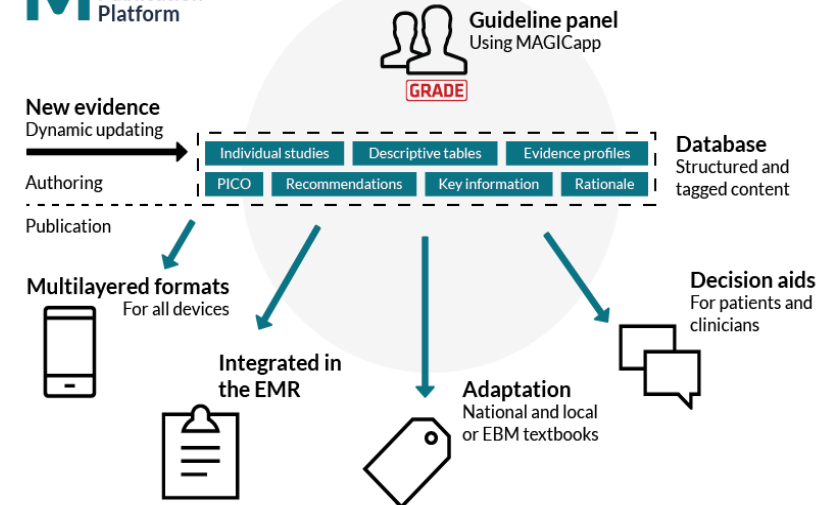


## Authoring, publishing & dissemination modes that are

- digital, flexible, agile, real-time
- can be embed elsewhere e.g dept webpages, create derivative products



### M Authoring & Publication Platform







The WHO *Therapeutics and COVID-19: living guideline* contains the Organization's most up-to-date recommendations for the use of therapeutics in the treatment of COVID-19. The latest version of this living guideline is available in [pdf](#) format (via the 'Download' button) and via an [online platform](#) and is updated regularly as new evidence emerges.

This tenth version of the WHO living guideline now contains 17 recommendations, including two new recommendations regarding nirmatrelvir-ritonavir. No further updates to the previous existing recommendations were made in this latest version.

The WHO *Therapeutics and COVID-19: living guideline* currently includes a:

- **\*\* NEW \*\*** [strong recommendation for the use of nirmatrelvir-ritonavir](#) in patients with non-severe illness at the highest risk of hospitalization (published 22 April 2022);
- **\*\* NEW \*\*** [conditional recommendation against the use of nirmatrelvir-ritonavir](#) in patients with non-severe illness at a low risk of hospitalization (published 22 April 2022);
- **\*\* UPDATED \*\*** [conditional recommendation for the use of remdesivir](#) in patients with non-severe COVID-19 at the highest risk of hospitalization (first published 20 November 2020, updated 22 April 2022);
- [conditional recommendation for the use of molnupiravir](#) in patients with non-severe COVID-19, at highest risk of hospitalization (excluding pregnant or breastfeeding women, and children) (published 03 March 2022);

# Online authoring & publication platforms

## 6.2 Nirmatrelvir-ritonavir (published 22 April 2022) <sup>2</sup>

For patients with non-severe COVID-19 at highest risk of hospitalization



### Strong recommendation for

Benefits outweigh harms for almost everyone. All or nearly all informed patients would likely want this option. [Learn more](#)

We recommend treatment with nirmatrelvir-ritonavir (*strong recommendation for*).

- See Section 6.1 for help to identify patients at highest risk.
- Several therapeutic options are available: see [decision support tool](#) that displays benefits and harms of nirmatrelvir-ritonavir, molnupiravir, remdesivir and monoclonal antibodies.
- The GDG concluded that nirmatrelvir-ritonavir represents a superior choice because it may have greater efficacy in preventing hospitalization than the alternatives, has fewer concerns with respect to harms than does molnupiravir; and is easier to administer than intravenous remdesivir and the antibodies.
- The strong recommendation in favour does not apply to pregnant women, children, or those with possible dangerous drug interactions (many drugs interact with nirmatrelvir-ritonavir, see mechanism of action).
- Nirmatrelvir-ritonavir should be administered as soon as possible after onset of symptoms, ideally within 5 days.

### Research evidence (3)

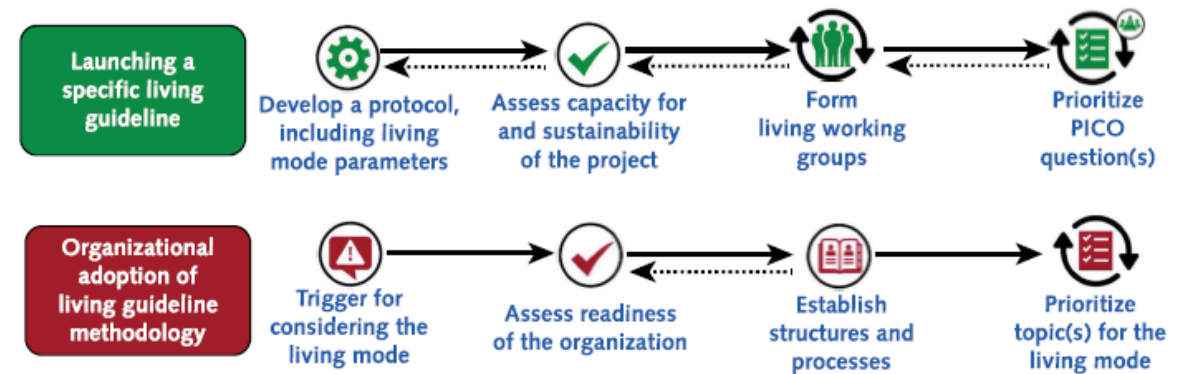
[Evidence to Decision](#) [Justification](#) [Practical info](#) [Decision Aids](#)

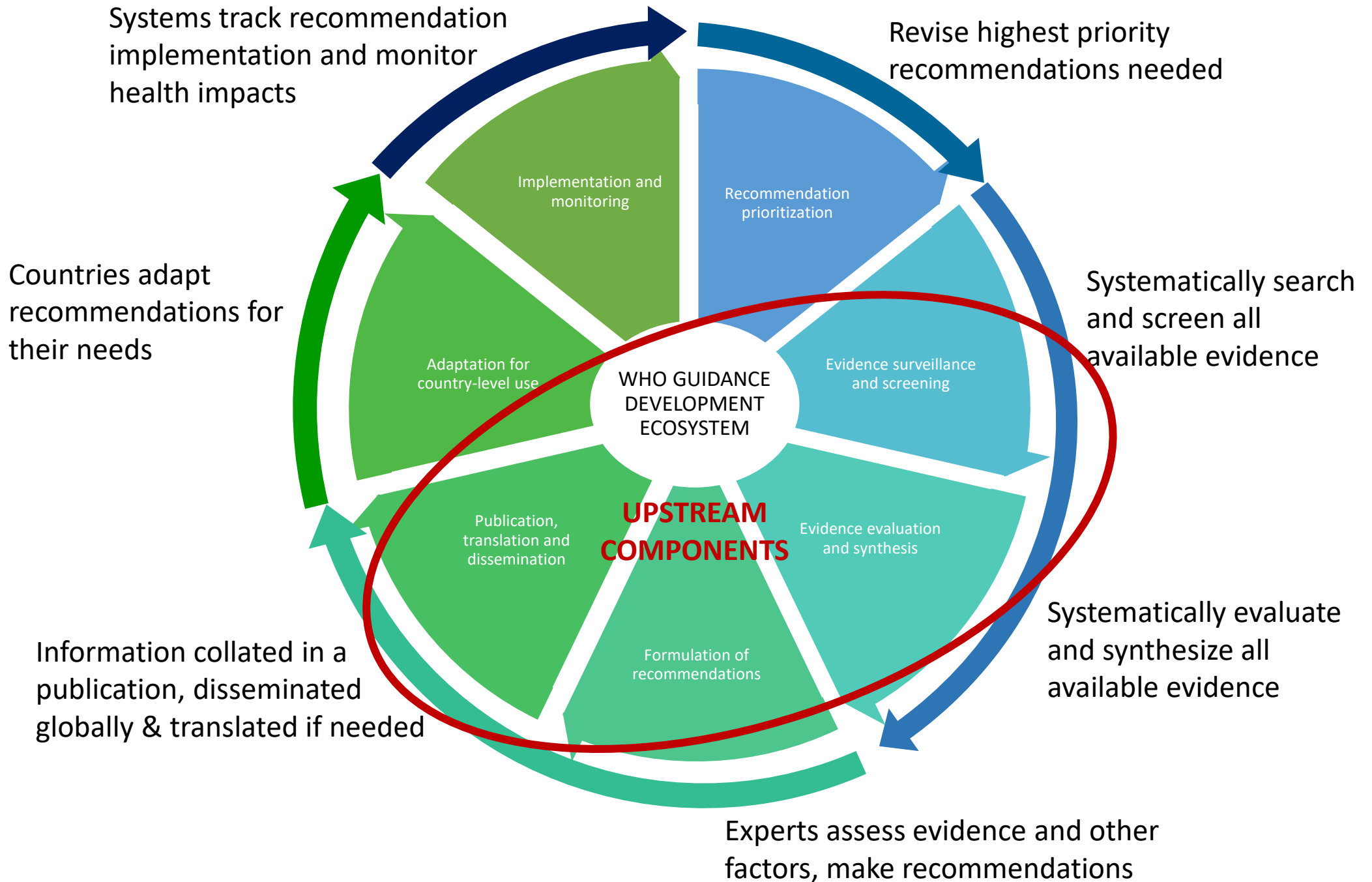
Nirmatrelvir-ritonavir vs No nirmatrelvir-ritonavir					
Patients with non-severe COVID-19					
7 Outcomes <a href="#">Graphical view</a> <a href="#">Summary</a>					
Outcome Timeframe	Study results and measurements	Absolute effect estimates		Certainty of the Evidence (Quality of evidence)	Plain language summary
		No nirmatrelvir-ritonavir	Nirmatrelvir-ritonavir		
Mortality 28 days	Odds ratio 0.04 (CI 95% 0.00 — 0.67) Based on data from 3100 participants in 2 studies	6 per 1000	0 per 1000	Low Due to serious imprecision and indirectness	Nirmatrelvir-ritonavir may have a small effect on mortality <small>No imp. diff.</small>
		Difference: 6 fewer per 1000 (CI 95% 6 fewer — 2 fewer)			

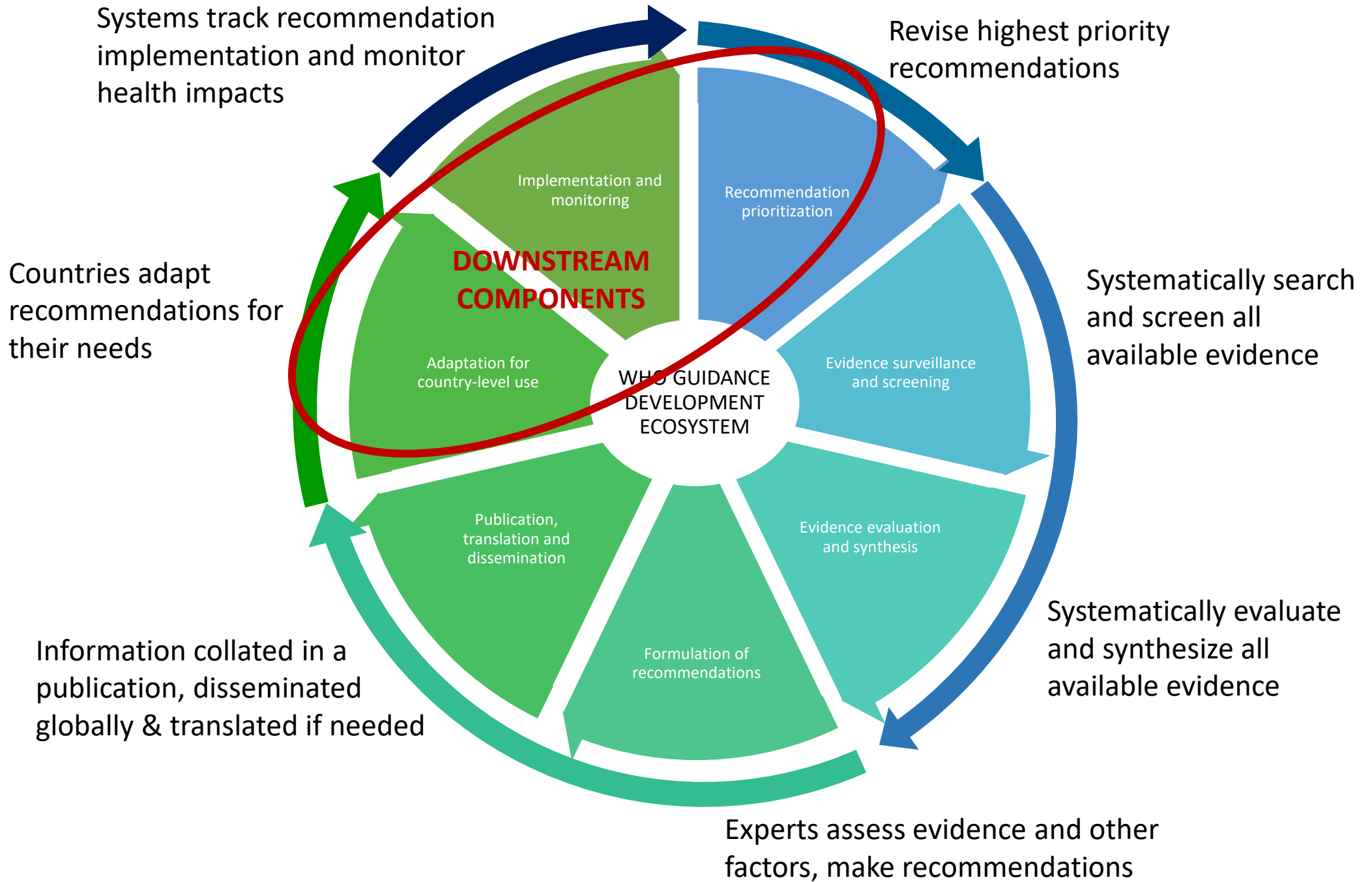
- Clearly flags new / updated recommendations
- Jumps directly to specific recommendation
- Can click through multiple layers of info, including evidence underpinning the recommendation

# To achieve truly 'living approach' for all NSPs, we need:

- **Fewer** (most impactful, only *truly* prioritized recommendations)
- **Faster** (rapid, shorter, current/up-to-date)
- **Fit-for-purpose** (user-friendly, implementable, permits monitoring & evaluation)
- **Findable** (digital, interoperable, derivative products)
- **Fairer** (accessible, adaptable, easily-translatable)







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# Living adaptation and implementation at country-level

# Main barriers to WHO guidelines' uptake & use

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- Leadership and governance, lack of policy coherence
- Information/ intelligence/data/evidence/
- Health workforce capacity
- Inadequate health care infrastructure and resources
- Funding limitations



Saluja et al.  
*Health Research Policy and Systems* (2022) 20:98  
<https://doi.org/10.1186/s12961-022-00899-y>


Health Research Policy  
and Systems

REVIEW

Open Access

Improving WHO's understanding of WHO  
guideline uptake and use in Member States:  
a scoping review



Kiran Saluja<sup>1,8†</sup>, K. Srikanth Reddy<sup>1,2,7,8†</sup> , Qi Wang<sup>3</sup>, Ying Zhu<sup>3</sup>, Yanfei Li<sup>4</sup>, Xiajing Chu<sup>5</sup>, Rui Li<sup>5</sup>, Liangying Hou<sup>4</sup>, Tanya Horsley<sup>6</sup>, Fred Carden<sup>7</sup>, Kidist Bartolomeos<sup>8</sup> and Janet Hatcher Roberts<sup>9</sup>

# Priorities for investment to optimize uptake at country level

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- Leadership and ownership at country level
- Awareness raising and investment to enhance capacity of countries to develop/adapt/implement guidelines
- System level investments (beyond capacity development)
  - institutionalizing systematic guideline development and adaptation at regional and country level
    - HQ level (Optimization of content development for improved accessibility, including translation into all official languages)
    - Regional level (within WHO): For technical and strategic leadership
    - Country level (WHO and national partners): to put in place systems, structure and resources (human, financial, regulatory, data/evidence/intelligence, etc)
- Engaging implementing partners, including NGOs
- Need for accountability, feedback from country level discussion to technical programmes



Maximize **country impact** is our utmost priority



To have demonstrable country impact, guideline recommendations need to be usable/implementable, with uptake monitored and learnings used to inform innovation/better design.

# WHO-GUIDES: Technical package for countries

## Governance

Verifying availability and applicability of the guideline establishing governance for the issue(s) being addressed



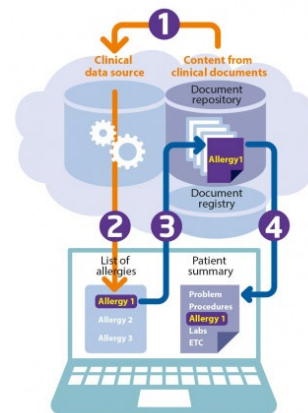
## Users

Tailoring for users' needs, context and priorities



## Information

Identifying appropriate & quality information for planning, decision making, execution, monitoring & evaluation



## Decisions & decision makers

Involving relevant implementing partners at all levels for effective decision making



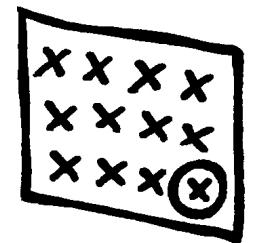
## Enabling environment

Creating enabling environment for effective delivery



## Steps

Having a clear plan for step-wise execution



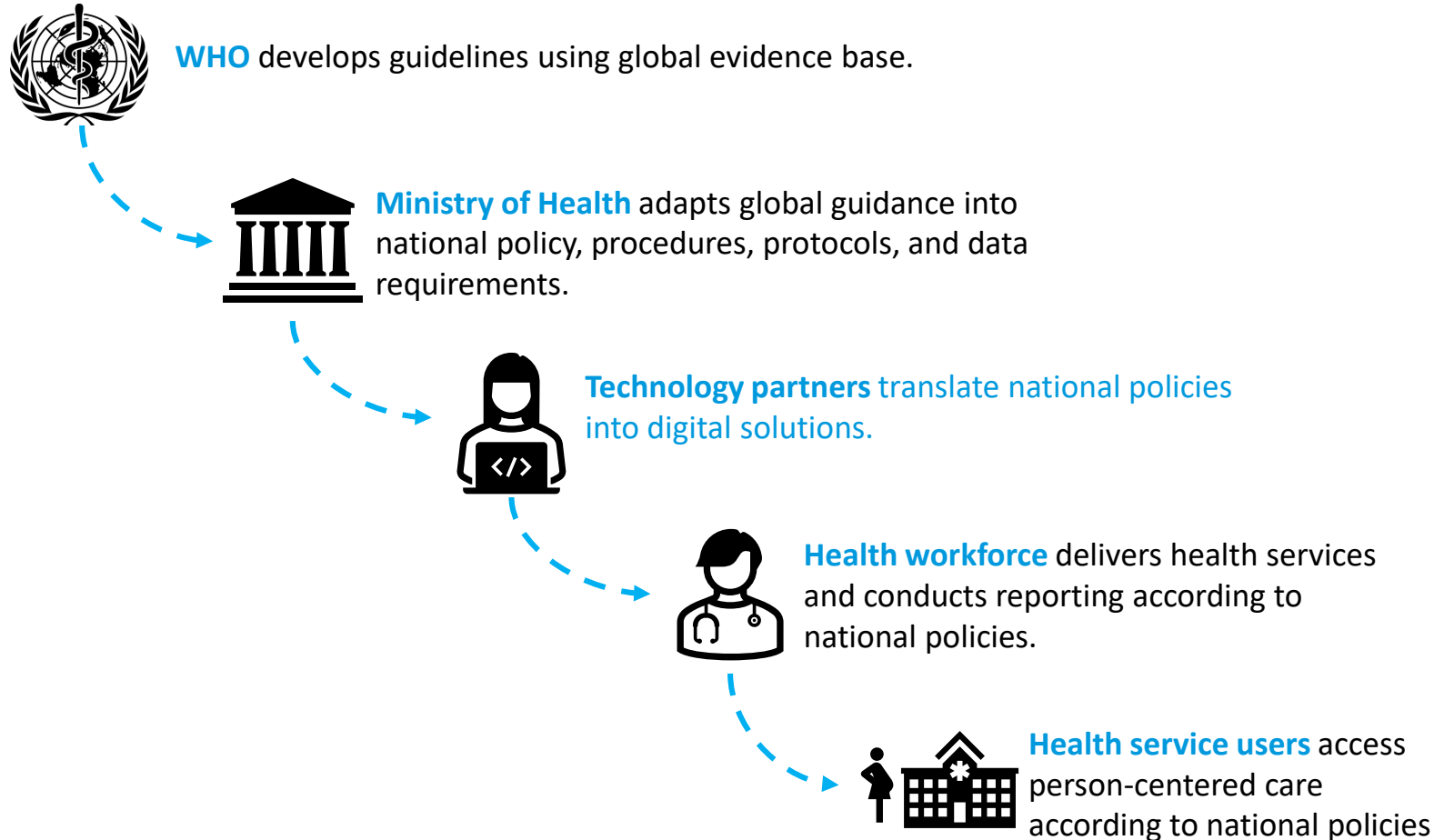
## Working towards mutual accountability of delivering on living guidelines



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# SMART Guidelines for Consistent and Interoperable Digitization of Health Systems

# Digital tools can help facilitate the adoption and integration process, but if done inappropriately, can lead to questionable results

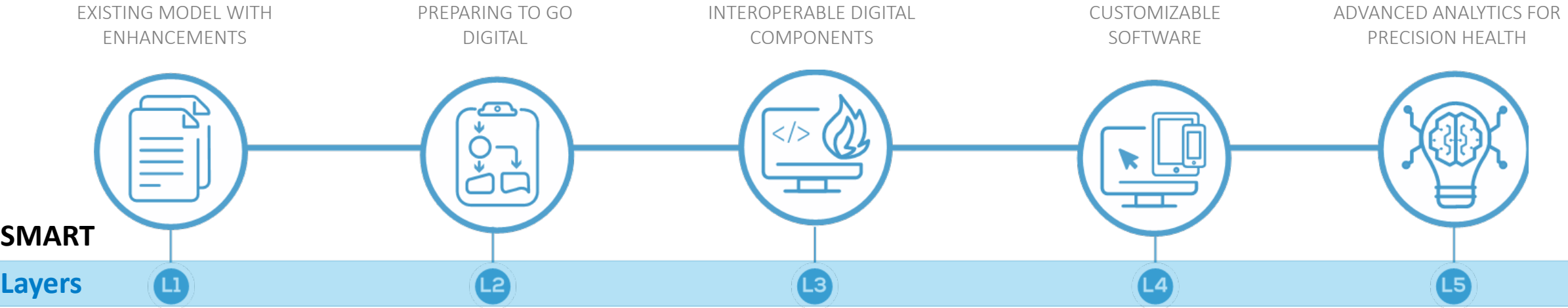


- **Difficult to operationalize** intentionally vague guideline content into digital systems with fidelity
- Infrequently digitized with **interoperability standards, and architectural good practice**, leading to siloed systems
- **“Black box”** digital systems become **difficult to maintain** sustainably in the long-term

**In order to deliver greater reach of WHO's evidence-based content, we need to invest more time in providing our content in digital-ready packages, bringing our core mandate of public health, data, and clinical normative content into the digital age – rather than building more siloed software apps.**

# SMART Guidelines are Content Digital Public Goods for Digitization

Standards-based, Machine Readable, Adaptive, Requirements-based, Testable



Types	Narrative	Operational	Machine Readable	Executable	Dynamic
	<ul style="list-style-type: none"> <li>Reinforce operational specificity in existing guidelines</li> <li>Digital curation of recommendations</li> <li>Panels include informatics and standards experts</li> </ul>	<ul style="list-style-type: none"> <li>Digital Adaptation Kit (DAK) – requirements document</li> <li>Human-readable components</li> <li>Describes how a digital tool should function</li> <li>Data dictionaries mapped to ICD, LOINC</li> </ul>	<ul style="list-style-type: none"> <li>FHIR Implementation Guide (IG) documentation</li> <li>Based on Clinical Practice Guidelines IG</li> <li>Consistent execution across systems - software as a function</li> <li>Decision support services (CQL)</li> </ul>	<ul style="list-style-type: none"> <li>Fully executable software tools</li> <li>Mechanism for real-time updates</li> <li>Interoperate with national systems</li> </ul>	<ul style="list-style-type: none"> <li>Advanced analytics for greater local relevance and precision</li> <li>AI-based decision support</li> <li>Mechanisms in support of learning systems</li> </ul>



# WHO SMART Antenatal Care Guidelines Examples

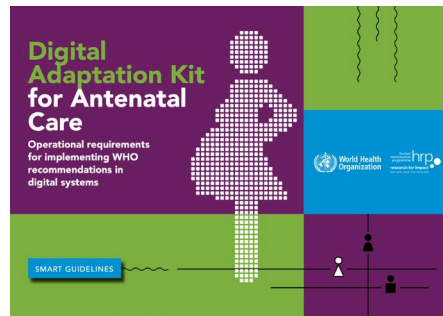
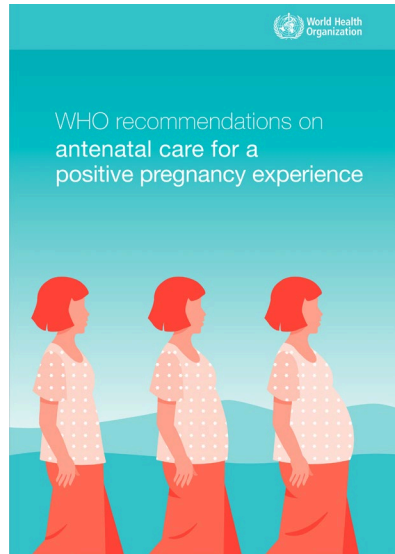
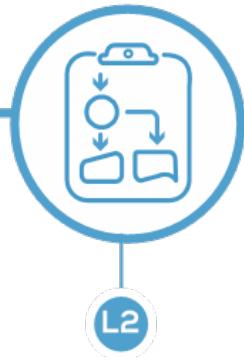
EXISTING MODEL WITH ENHANCEMENTS

PREPARING TO GO DIGITAL

INTEROPERABLE DIGITAL COMPONENTS

CUSTOMIZABLE SOFTWARE

ADVANCED ANALYTICS FOR PRECISION HEALTH



WHO Antenatal Care Guideline Implementation Guide  
0.2.0 - CI Build

Table of Contents Quick Start

2 Quick Start

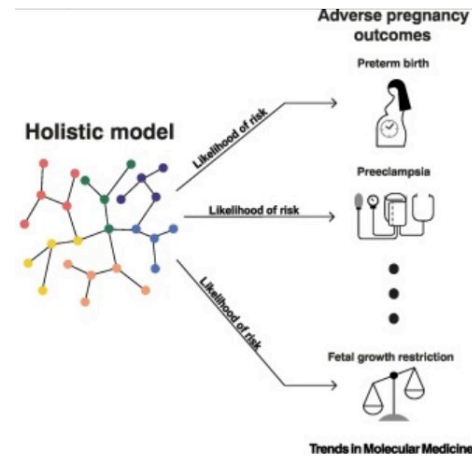
2.1 WHO Antenatal Care Guideline - Quick Start

2.2 Overall Approach

2.3 API Requests/Responses Via HTTP Client

2.4 FHIR Clinical Reasoning Service

ICD-11 Common standards for a connected world





# What does this digitized future look like for WHO, countries, technologists and health providers?



## WHO

- ✓ Increased **precision** of global guidelines through digitization process
- ✓ Increased **fidelity and uptake** of guidelines
- ✓ Increased access to country level data, with potential to **increase ability for localization** of clinical and public health guidelines and guidance to countries

## Ministries of Health & Technology partners

- ✓ **Reduced costs and time** of software development cycle by reusing common requirements and computable assets
- ✓ **Consistent representation of standardized datasets, calculations, and metadata** for consistent functionality, and interoperability between systems
- ✓ Countries can confidently **evolve legacy paper systems into digital connected solutions**
- ✓ **Availability** of digital solutions consistent with recommendations, and technical specifications
- ✓ **Decreased reliance** on foreign firms for technology development & opportunity to grow capacity of health tech sector

## Health care providers

- ✓ Longitudinal records and patient access to their personal health record for **continuity of care**
- ✓ **Greater trust** in digital tools used for decision support following clinical best practice
- ✓ **Optimized data collection** – collect once for clinical care, and use many times for aggregate reporting & performance management

## Individuals

- ✓ **Access** to their health data anytime, anywhere, for whatever purpose they need it for

WHO recommendations on  
antenatal care for a  
positive pregnancy experience

## Illustrative example: Anaemia & Iron Folic Acid Supplementation

*Recommendations from the WHO  
recommendations on antenatal care for a  
positive pregnancy experience*



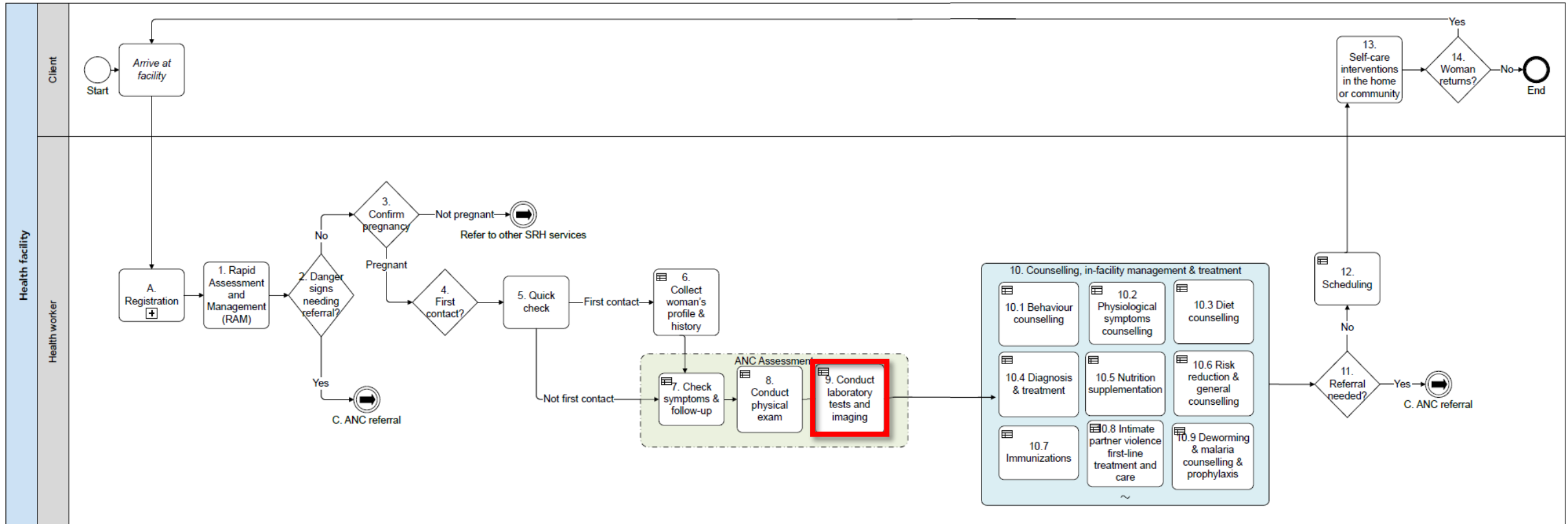
# L1: Narrative | Existing model with enhancements

Current guideline format from the guideline document

Iron and folic acid supplements	<b>A.2.1:</b> Daily oral iron and folic acid supplementation with 30 mg to 60 mg of elemental iron <sup>b</sup> and 400 µg (0.4 mg) of folic acid <sup>c</sup> is recommended for pregnant women to prevent maternal anaemia, puerperal sepsis, low birth weight, and preterm birth. <sup>d</sup>	Recommended
	<b>A.2.2:</b> Intermittent oral iron and folic acid supplementation with 120 mg of elemental iron <sup>e</sup> and 2800 µg (2.8 mg) of folic acid once weekly is recommended for pregnant women to improve maternal and neonatal outcomes if daily iron is not acceptable due to side-effects, and in populations with an anaemia prevalence among pregnant women of less than 20%. <sup>f</sup>	Context-specific recommendation
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, on-site haemoglobin testing with a haemoglobinometer is recommended over the use of the haemoglobin colour scale as the method for diagnosing anaemia in pregnancy.	Context-specific recommendation

# L2: Operational | Preparing to go digital

## ANC Consultation workflow



# L2: Operational | Preparing to go digital

## Decision support logic table for Anaemia, iron, and folic acid supplementation

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 iron and folic acid supplementation will vary depending on anaemia diagnosis, population prevalence of anaemia, and whether the woman has side-effects due to
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.	
"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		
"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	If a woman is diagnosed with anaemia during pregnancy, conduct counselling for managing and treating anaemia.	
"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	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.  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.	
"Blood haemoglobin test result" ≥ 110 g/L	"Gestational age" ≤ 12 weeks	"Population prevalence of anaemia" ≥ 40%		"Anaemia diagnosis = "Negative for anaemia"	"Anaemia counselling conducted" IS OPTIONAL	"Amount of iron prescribed" = 60 mg	"Type of iron supplement dosage provided" = "Daily"	"Amount of daily dose of folic acid prescribed" = 0.4 mg	If a woman is not diagnosed for anaemia, iron and folic acid supplementation is still recommended.	
"Blood haemoglobin test result" ≥ 110 g/L	"Gestational age" ≥ 28 weeks	"Population prevalence of anaemia" ≥ 40%		"Anaemia diagnosis = "Negative for anaemia"	"Anaemia counselling conducted" IS OPTIONAL	"Amount of iron prescribed" = 60 mg	"Type of iron supplement dosage provided" = "Daily"	"Amount of daily dose of folic acid prescribed" = 0.4 mg	Due to the population's high anaemia prevalence, a daily dose of 60 mg of elemental iron is preferred over a lower dose. A daily dose of 400 micrograms (0.4 mg) folic acid is also recommended.	
"Blood haemoglobin test result" ≥ 105 g/L	13 weeks ≤ "Gestational age" ≤ 27 weeks	"Population prevalence of anaemia" ≥ 40%		"Anaemia diagnosis = "Negative for anaemia"	"Anaemia counselling conducted" IS OPTIONAL	"Amount of iron prescribed" = 60 mg	"Type of iron supplement dosage provided" = "Daily"	"Amount of daily dose of folic acid prescribed" = 0.4 mg	The equivalent of 60 mg of elemental iron is 300 mg of ferrous sulfate heptahydrate, 180 mg of ferrous fumarate or 500 mg of ferrous gluconate.	
"Blood haemoglobin test conducted" = FALSE	"Pallor present" = FALSE	"Population prevalence of anaemia" ≥ 40%		"Anaemia diagnosis = "Negative for anaemia"	"Anaemia counselling conducted" IS OPTIONAL	"Amount of iron prescribed" = 60 mg	"Type of iron supplement dosage provided" = "Daily"	"Amount of daily dose of folic acid prescribed" = 0.4 mg	Please refer to iron sources listed below for additional guidance that can be provided.	
"Blood haemoglobin test result" ≥ 110 g/L	"Gestational age" ≤ 12 weeks	"Population prevalence of anaemia" ≤ 20%	"Has side-effects from iron and folic acid supplements" = TRUE	"Anaemia diagnosis = "Negative for anaemia"	"Anaemia counselling conducted" IS OPTIONAL	30 mg ≤ "Amount of iron prescribed" ≤ 60 mg	"Type of iron supplement dosage provided" = "Daily"	"Amount of daily dose of folic acid prescribed" = 0.4 mg	If a woman is not diagnosed for anaemia, iron and folic acid supplementation is still recommended.	
"Blood haemoglobin test result" ≥ 110 g/L	"Gestational age" ≥ 28 weeks	"Population prevalence of anaemia" ≤ 20%	"Has side-effects from iron and folic acid supplements" = TRUE	"Anaemia diagnosis = "Negative for anaemia"	"Anaemia counselling conducted" IS OPTIONAL	30 mg ≤ "Amount of iron prescribed" ≤ 60 mg	"Type of iron supplement dosage provided" = "Daily"	"Amount of daily dose of folic acid prescribed" = 0.4 mg	Daily oral iron and folic acid supplementation with 30–60 mg of elemental iron and 400 micrograms (0.4 mg) of folic acid to prevent maternal anaemia, puerperal sepsis, low birth weight and preterm birth.	
"Blood haemoglobin test result" ≥ 105 g/L	13 weeks ≤ "Gestational age" ≤ 27 weeks	"Population prevalence of anaemia" ≤ 20%	"Has side-effects from iron and folic acid supplements" = TRUE	"Anaemia diagnosis = "Negative for anaemia"	"Anaemia counselling conducted" IS OPTIONAL	30 mg ≤ "Amount of iron prescribed" ≤ 60 mg	"Type of iron supplement dosage provided" = "Daily"	"Amount of daily dose of folic acid prescribed" = 0.4 mg	The equivalent of 60 mg of elemental iron is 300 mg of ferrous sulfate heptahydrate, 180 mg of ferrous fumarate or 500 mg of ferrous gluconate.	
"Blood haemoglobin test conducted" = FALSE	"Pallor present" = FALSE	"Population prevalence of anaemia" ≤ 20%	"Has side-effects from iron and folic acid supplements" = TRUE	"Anaemia diagnosis = "Negative for anaemia"	"Anaemia counselling conducted" IS OPTIONAL	30 mg ≤ "Amount of iron prescribed" ≤ 60 mg	"Type of iron supplement dosage provided" = "Daily"	"Amount of daily dose of folic acid prescribed" = 0.4 mg	Please refer to iron sources listed below for additional guidance that can be provided.	

## L2: Operational | Preparing to go digital

Indicator calculation for % of women who have received iron and folic acid supplements

Indicator code	Indicator name	Numerator		Denominator		Disaggregation	Reference
		Definition	Computation	Definition	Computation		
ANC.IND.2	Percentage of pregnant women who received iron and folic acid (IFA) supplements for 90+ days	Number of pregnant women who received the recommended number of IFA tablets during all previous contacts	COUNT of number of women who were prescribed IFA tablets at each ANC contact they have had	Total number of antenatal clients with a first contact	COUNT of all women whose records were closed (ANC close form) in the last reporting period due to any of the reasons below: <ul style="list-style-type: none"> <li>» live birth</li> <li>» stillbirth</li> <li>» miscarriage</li> <li>» abortion</li> <li>» woman died</li> <li>» lost to follow-up</li> <li>» moved away</li> </ul>	Age (10–14, 15–19, 20+)  Education level (none, don't know, primary, secondary, higher)	WHO ANC monitoring framework (43)

- Indicators can be aggregated from individual level data rather than a separate reporting system
- Each 'variable' must be encoded to a standard terminology (ICD, ICHI, ICF, LOINC)
- Data dictionary, decision support logic, indicator tables, functional and non-functional requirements are in spreadsheet formats

# L3: Machine-readable | Interoperable digital components

Same recommendations in standards-based software code format

## ANC.DT.25 Anaemia, iron and folic acid supplementation:

**When:** *named-event:* ANC.B9. Conduct laboratory tests and imaging

### Then:

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. 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.

**If:** *applicability:* (((("Blood haemoglobin test result" < 110 g/L) AND ("Gestational age" ≤ 12 weeks)) OR (("Blood haemoglobin test result" < 110 g/L) AND ("Gestational age" ≥ 28 weeks))) OR ((("Blood haemoglobin test result" < 105 g/L) AND (13 weeks ≤ "Gestational age" ≤ 27 weeks))) OR ((("Blood haemoglobin test conducted" = FALSE) AND ("Pallor present" = TRUE))) (*Should Conduct REQUIRED anaemia counselling*)

### Then:

**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:

If a woman is not diagnosed for anaemia, iron and folic acid supplementation is still recommended. Due to the population's high anaemia prevalence, a daily dose of 60 mg of elemental iron is preferred over a lower dose. A daily dose of 400 micrograms (0.4 mg) folic acid is also recommended. The equivalent of 60 mg of elemental iron is 300 mg of ferrous sulfate heptahydrate, 180 mg of ferrous fumarate or 500 mg of ferrous gluconate. Please refer to iron sources listed below for additional guidance that can be provided.

**If:** *applicability:* (((("Blood haemoglobin test result" ≥ 110 g/L) AND ("Gestational age" ≤ 12 weeks) AND ("Population prevalence of anaemia" ≥ 40%)) OR ((("Blood haemoglobin test result" ≥ 110 g/L) AND ("Gestational age" ≥ 28 weeks) AND ("Population prevalence of anaemia" ≥ 40%))) OR ((("Blood haemoglobin test result" ≥ 105 g/L) AND (13 weeks ≤ "Gestational age" ≤ 27 weeks) AND ("Population prevalence of anaemia" ≥ 40%))) OR ((("Blood haemoglobin test conducted" = FALSE) AND ("Pallor present" = FALSE) AND ("Population prevalence of anaemia" ≥ 40%))) (*Should "Anaemia counselling conducted" IS OPTIONAL*)

### Then:

"Anaemia counselling conducted" IS OPTIONAL:

"Amount of iron prescribed" = 60 mg:

"Type of iron supplement dosage provided" = "Daily":

"Amount of daily dose of folic acid prescribed" = 0.4 mg:

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# L4: Executable Forms | Customizable software

Same recommendations manifested in reference software applications that can be adapted and deployed in countries

**Blood Haemoglobin test** [SAVE]

**Blood haemoglobin test \***

- Done today
- Done earlier
- Ordered
- Not done

**Blood haemoglobin test type \***

- Complete blood count test (recommended)
- Hb test (haemoglobinometer)
- Hb test (haemoglobin colour scale)

Complete blood count test result (g/dl) (recommended)

9

1 / 100

**Anaemia diagnosis!**

Hematocrit (Ht)

White blood cell (WBC) count

Platelet count

**Anaemia diagnosis!**

Anaemia - Hb level of < 11 in first or third trimester or Hb level < 10.5 in second trimester.

OR

No Hb test results recorded, but woman has pallor.

OK



# SMART Guidelines: Scenarios of use



Digital system does not exist or is yet to be identified



Kick start the requirements gathering process to design the system



Digital system established



Update and align content to WHO standards and guidance



Update existing paper registers and decision support



Update content within existing digital system to align WHO standards, guidance

**WHO will develop SMART guidelines for all primary health care domains to facilitate evidence-based digital transformation globally.**

**Partnership is sought to accelerate this work.**

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Next steps

## Expanding the Living Approach

- Transformational moment for WHO
- Member State have considerable experience and technical expertise to assist with this process
- Aim to leverage such experience, and ensure member-state engagement to ensure value and impact at country-level