GLOBAL ANTIMICROBIAL RESISTANCE AND USE SURVEILLANCE SYSTEM (GLASS)

Funded by the European Union

REGIONAL WORKSHOP ON INTEPRETATION AMR AMU / AMR DATA TO IMPROVE EVIDENCE-BASED DECISION MAKING IN ASIA AND THE PACIFIC

18 to 19 NOVEMBER 2025

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Global Commitments

- UNGA High-Level Meeting on AMR (2024)
- WHO Pandemic Agreement (2025)

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September 2024: 79th UNGA High-Level Meeting on Antimicrobial Resistance (AMR)

Global leaders pledged to reduce the estimated 4.95 million annual AMR-associated deaths by 10% by 2030.

Commitments:

98 - Strengthen national capacities for sustainable, sector-specific, integrated and interoperable surveillance systems for antimicrobial resistance and antimicrobial use, standards of diagnostics, laboratory information systems and networks, to support collection of nationally representative data on prevalence, antimicrobial resistance patterns, re-emerging disease surveillance, mortality and morbidity attributable to antimicrobial resistance, data on antimicrobial use across sectors and monitoring of WASH in healthcare facilities and community settings and the environment, and to share relevant information on emerging trends to inform decision-making at all levels

99 - Encourage **all countries** to report quality surveillance data on antimicrobial resistance and antimicrobial use by 2030, through existing global surveillance systems, including the **Global Antimicrobial Resistance and Use Surveillance System (GLASS)**, ...

100 - Improve access to diagnosis and care, so at least 80 per cent of countries can test resistance in all bacterial and fungal pathogens included in the **Global Antimicrobial Resistance and Use Surveillance System (GLASS)** by 2030

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Objectives of GLASS-AMR

GLASS is a global system for the standardized collection, analysis, and sharing of epidemiological, clinical, and microbiological AMR data

Aim: estimate antimicrobial resistance at national, regional and global levels, and monitor the global response.

Additionally, it aims to:

- guide national and global treatment guidelines on empirical treatment
- foster national AMR surveillance systems and harmonize global standards;
- detect emerging resistance and its international spread; and
- inform research and development of new tools for the prevention, diagnosis and treatment of human infections caused by common bacterial pathogens.

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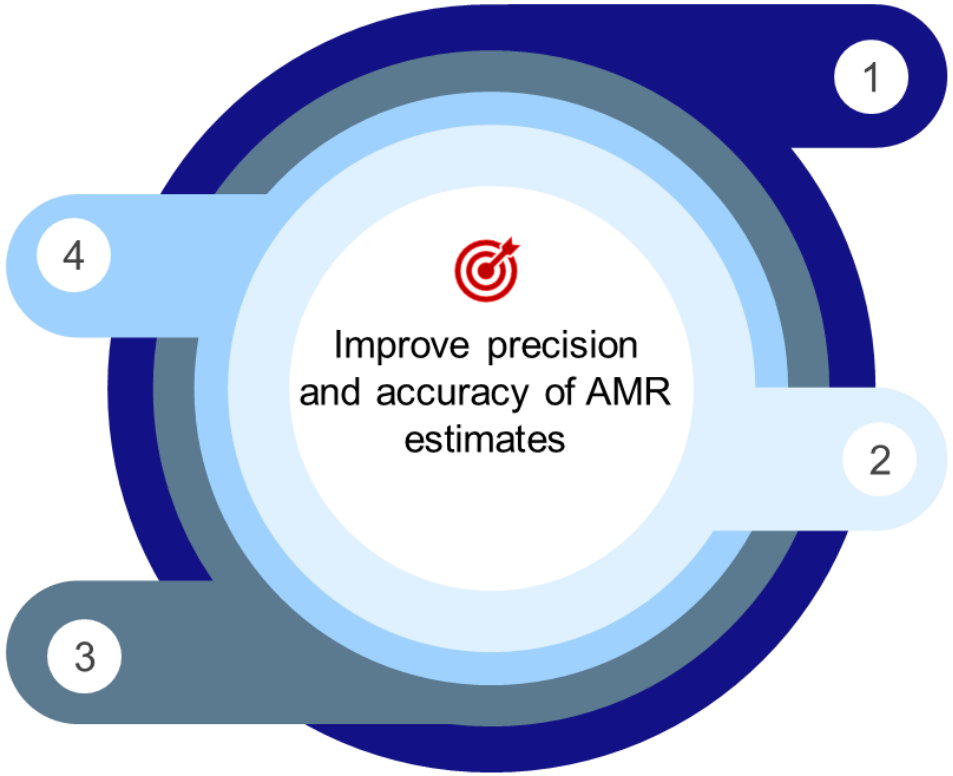
GLASS-AMR Strategy

GLASS: a global system for the standardized collection, analysis, and sharing of epidemiological, clinical, and microbiological AMR data

Aim: estimate antimicrobial resistance and monitor the global response



1. Strengthen routine AMR surveillance systems in all countries
2. Implement national AMR surveys to remedy paucity of data in LMICs
3. Periodically review methods to collect and translate surveillance and survey data into estimates of AMR
4. Establish and monitor milestones and targets for reductions in AMR and related deaths at global, regional, and country levels

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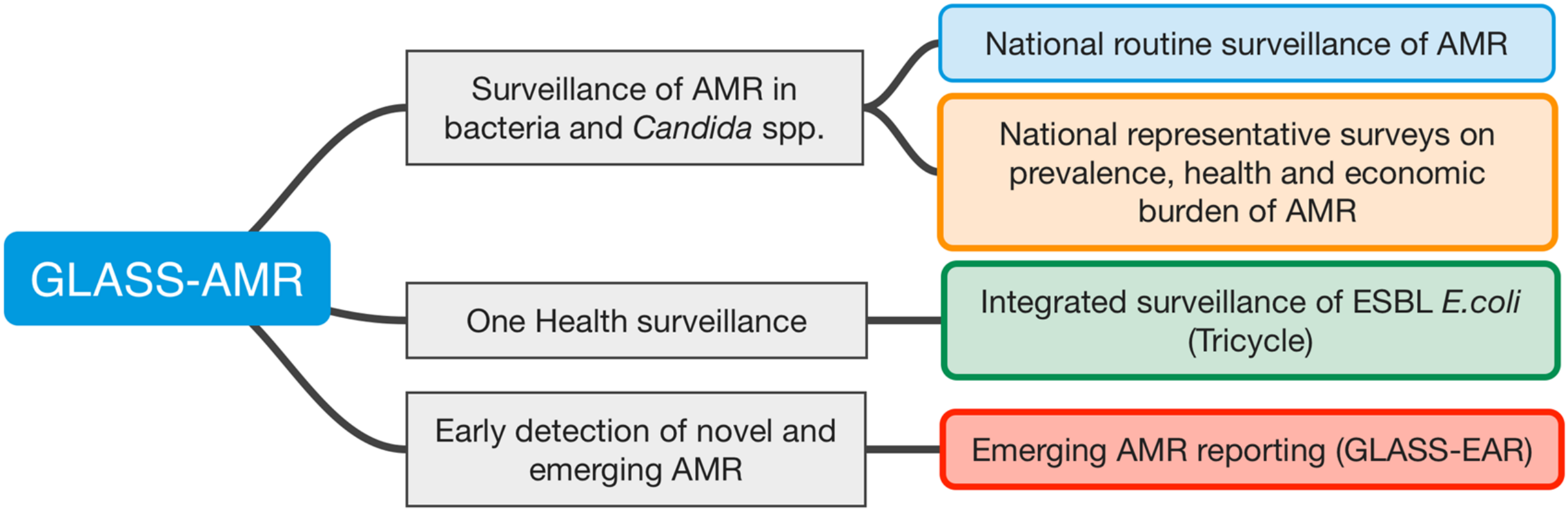
GLASS AMR in 2025



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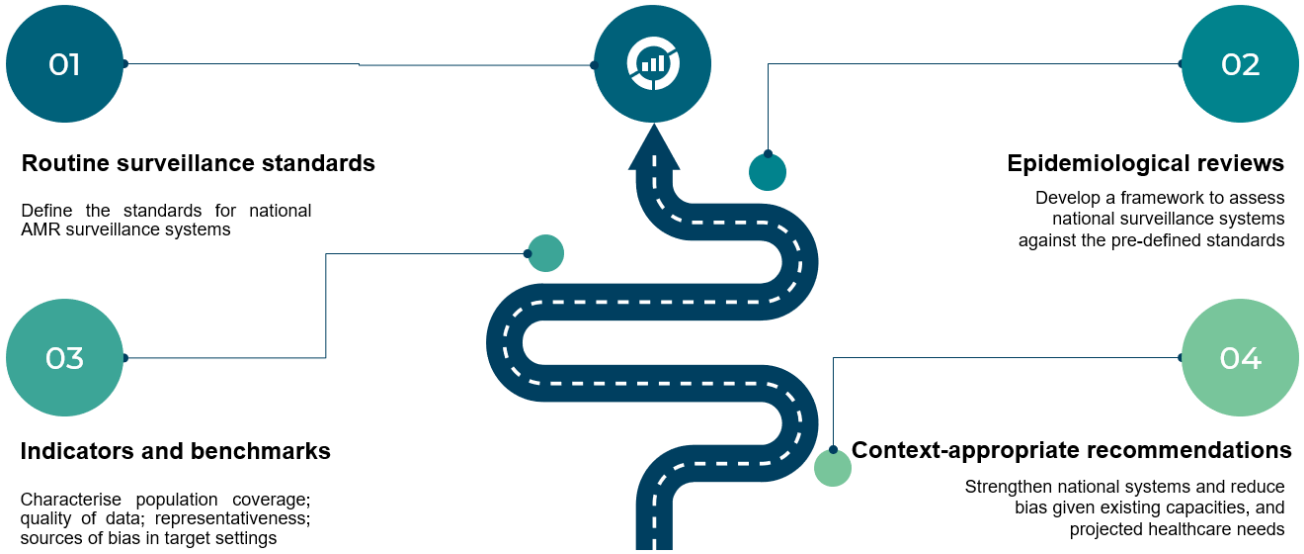
Two-Pronged Approach

Strengthening routine surveillance



GLASS enhancements: Shift from aggregated- to individual-level data including molecular AMR data; enhanced surveillance of fungal infections; new IT platform based on DHIS2; improved metadata to better interpret AMR findings.
https://www.who.int/publications/i/item/9789240076600

National surveys of prevalence, health and economic burden of AMR in human BSIs

Surveys are planned or ongoing in Kyrgyzstan, Indonesia, Malawi, with plans to scale-up.

https://www.who.int/publications/i/item/9789240067004
https://www.who.int/publications/i/item/9789240000650

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Pathogen targets

https://www.who.int/publications/i/item/9789240076600

Target pathogens	Blood	**CSF**	Urine	Stool	**Lower respiratory tract**	Urethral, cervical, **rectal, pharyngeal** swabs
Acinetobacter spp.	●	○			●	
E. coli	●	○	●		○	
K. pneumoniae	●	○	●		●	
P. aeruginosa	●	○			●	
S. aureus	●	○			●	
S. pneumoniae	●	●			●	
N. meningitidis	●	●				
H. influenzae	○	●			●	
Salmonella spp. (non-typhoidal)	●	○		●		
S. enterica serovar Typhi	●			○		
S. enterica serovar Paratyphi A	●			○		
Shigella spp.				●		
N. gonorrhoeae						●

13 bacterial pathogens. 9 specimen types. 32 antibiotics across 11 antimicrobial classes

The newest addition: AMR in ***Candida* spp.**

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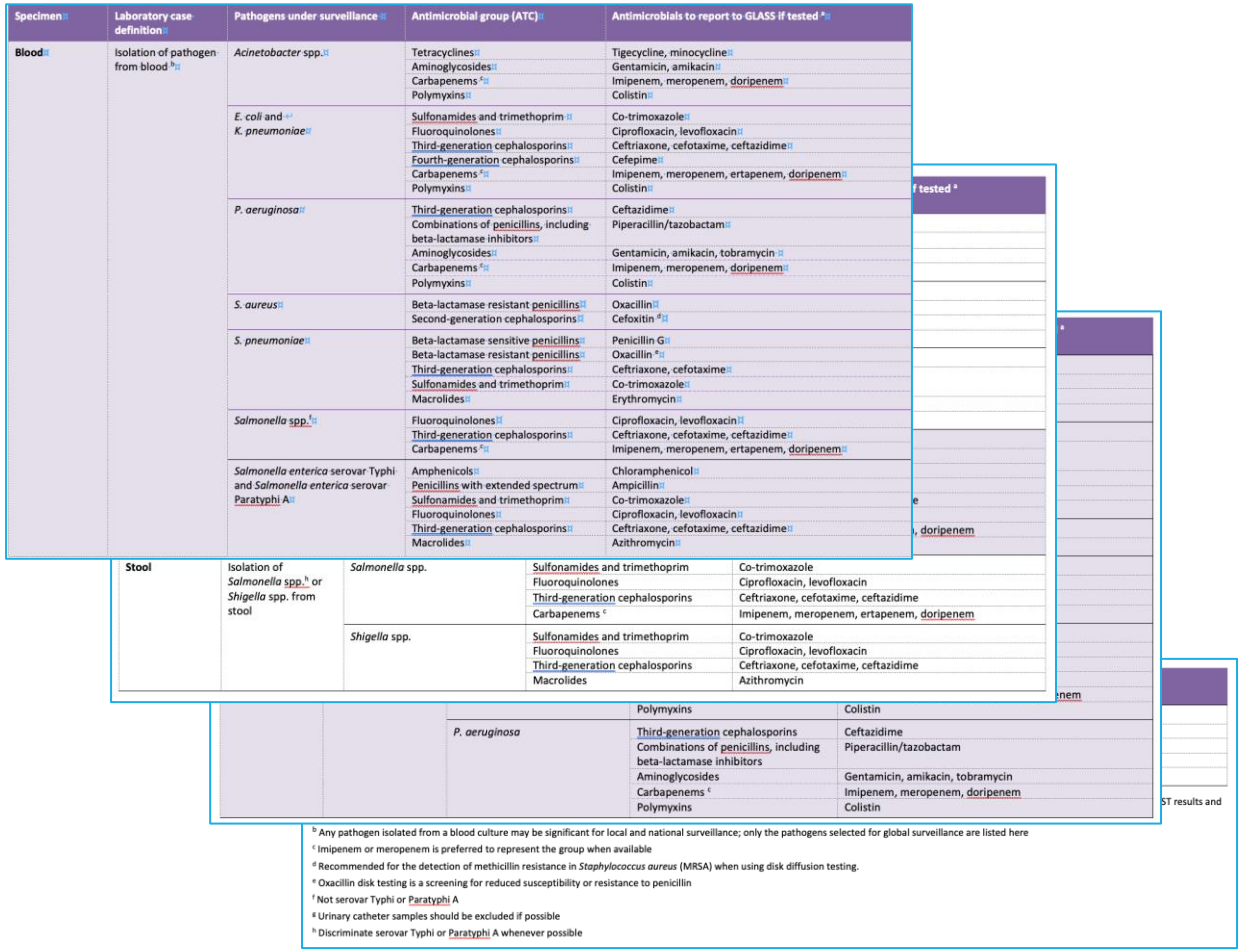
Specimens, pathogens, and antimicrobials selected for global surveillance

- Detection of the most important antibiotic resistance mechanisms
- Consideration given to antimicrobials that are commonly used and available locally and nationally
- **32 antimicrobial drugs monitored**
- According to WHO AWaRe categorization of antibiotics
  - 11 in “Access” group
  - 18 in “Watch” group
  - 3 in “Reserve” group
- 18 antibiotics included in the current WHO EMLs



Specimen	Laboratory case definition	Pathogens under surveillance	Antimicrobial group (ATC)	Antimicrobials to report to GLASS if tested [a]
Blood	Isolation of pathogen from blood [b]	*Acinetobacter* spp.	Tetracyclines	Tigecycline, minocycline
			Aminoglycosides	Gentamicin, amikacin
			Carbapenems [c]	Imipenem, meropenem, doripenem
			Polymyxins	Colistin
		E. coli and *K. pneumoniae*	Sulfonamides and trimethoprim	Co-trimoxazole
			Fluoroquinolones	Ciprofloxacin, levofloxacin
			Third-generation cephalosporins	Ceftriaxone, cefotaxime, ceftazidime
			Fourth-generation cephalosporins	Cefepime
			Carbapenems [c]	Imipenem, meropenem, ertapenem, doripenem
			Polymyxins	Colistin
		P. aeruginosa	Third-generation cephalosporins	Ceftazidime
			Combinations of penicillins, including beta-lactamase inhibitors	Piperacillin/tazobactam
			Aminoglycosides	Gentamicin, amikacin, tobramycin
			Carbapenems [c]	Imipenem, meropenem, doripenem
			Polymyxins	Colistin
		S. aureus	Beta-lactamase resistant penicillins	Oxacillin
			Second-generation cephalosporins	Cefoxitin [d]
		S. pneumoniae	Beta-lactamase sensitive penicillins	Penicillin G
			Beta-lactamase resistant penicillins	Oxacillin [e]
			Third-generation cephalosporins	Ceftriaxone, cefotaxime
			Sulfonamides and trimethoprim	Co-trimoxazole
			Macrolides	Erythromycin
		Salmonella spp. [f]	Fluoroquinolones	Ciprofloxacin, levofloxacin
			Third-generation cephalosporins	Ceftriaxone, cefotaxime, ceftazidime
			Carbapenems [c]	Imipenem, meropenem, ertapenem, doripenem
		Salmonella enterica serovar Typhi and *Salmonella enterica* serovar Paratyphi A	Amphenicols	Chloramphenicol
			Penicillins with extended spectrum	Ampicillin
			Sulfonamides and trimethoprim	Co-trimoxazole
			Fluoroquinolones	Ciprofloxacin, levofloxacin
			Third-generation cephalosporins	Ceftriaxone, cefotaxime, ceftazidime
			Macrolides	Azithromycin
Stool	Isolation of *Salmonella* spp. [h] or *Shigella* spp. from stool	*Salmonella* spp.	Sulfonamides and trimethoprim	Co-trimoxazole
			Fluoroquinolones	Ciprofloxacin, levofloxacin
			Third-generation cephalosporins	Ceftriaxone, cefotaxime, ceftazidime
			Carbapenems [c]	Imipenem, meropenem, ertapenem, doripenem
		Shigella spp.	Sulfonamides and trimethoprim	Co-trimoxazole
			Fluoroquinolones	Ciprofloxacin, levofloxacin
			Third-generation cephalosporins	Ceftriaxone, cefotaxime, ceftazidime
			Macrolides	Azithromycin

[b] Any pathogen isolated from a blood culture may be significant for local and national surveillance; only the pathogens selected for global surveillance are listed here
[c] Imipenem or meropenem is preferred to represent the group when available
[d] Recommended for the detection of methicillin resistance in *Staphylococcus aureus* (MRSA) when using disk diffusion testing.
[e] Oxacillin disk testing is a screening for reduced susceptibility or resistance to penicillin
[f] Not serovar Typhi or Paratyphi A
[g] Urinary catheter samples should be excluded if possible
[h] Discriminate serovar Typhi or Paratyphi A whenever possible

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Key Enhancements to GLASS

- Shift from aggregated- to individual-level data
- More infectious syndromes, bacterial pathogens and antibiotics
- New IT platform based on DHIS2
- Metadata to facilitate the interpretation of AMR rates at population level
- Complementary methods to address global data scarcity
- Enhanced surveillance of fungal infections

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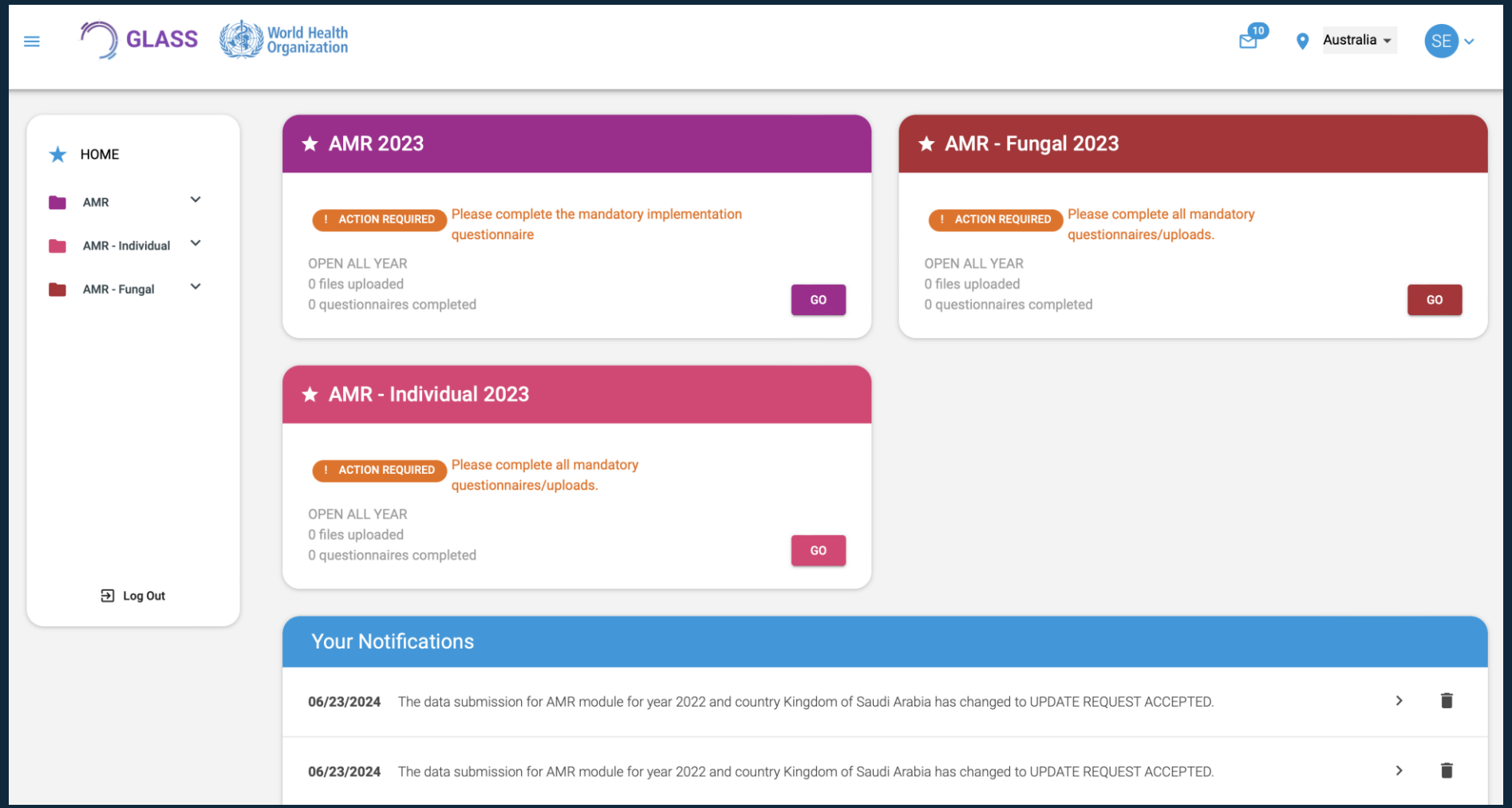
GLASS IT platform updated with new modules
individual data on AMR in bacteria and fungi



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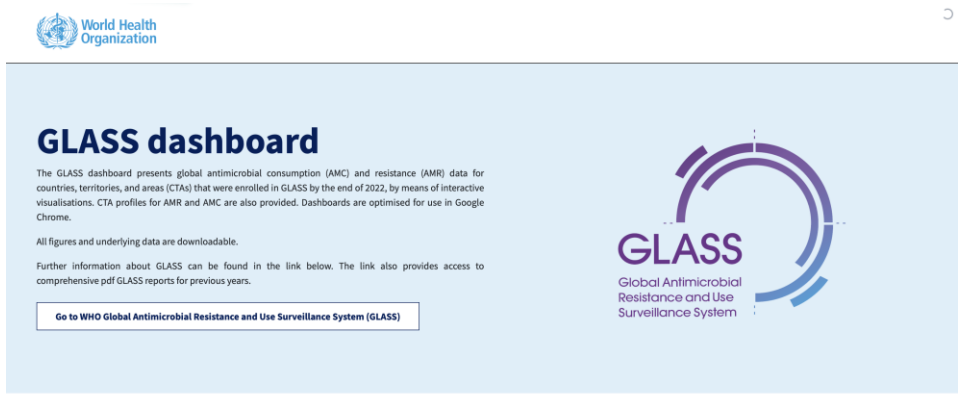
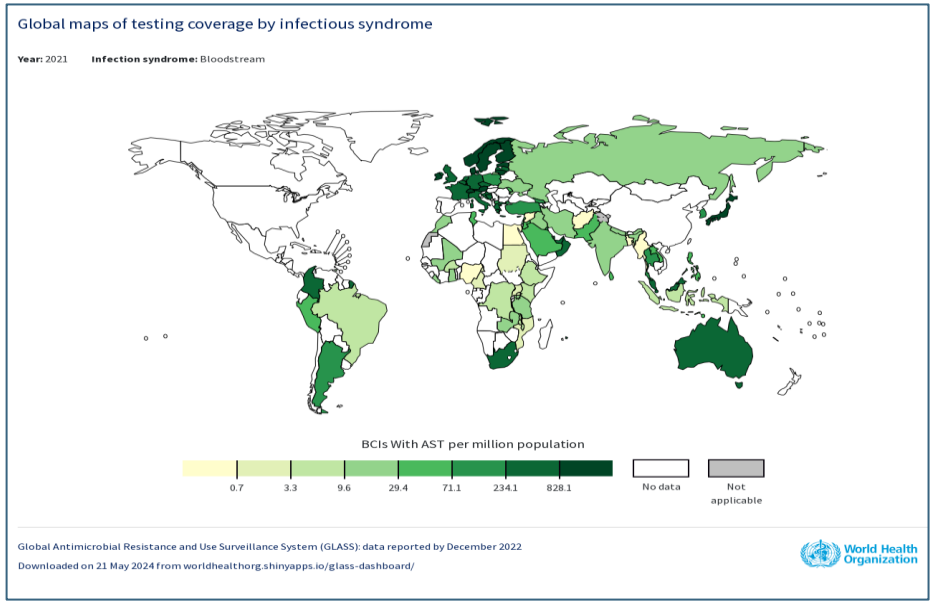
GLASS Dashboard

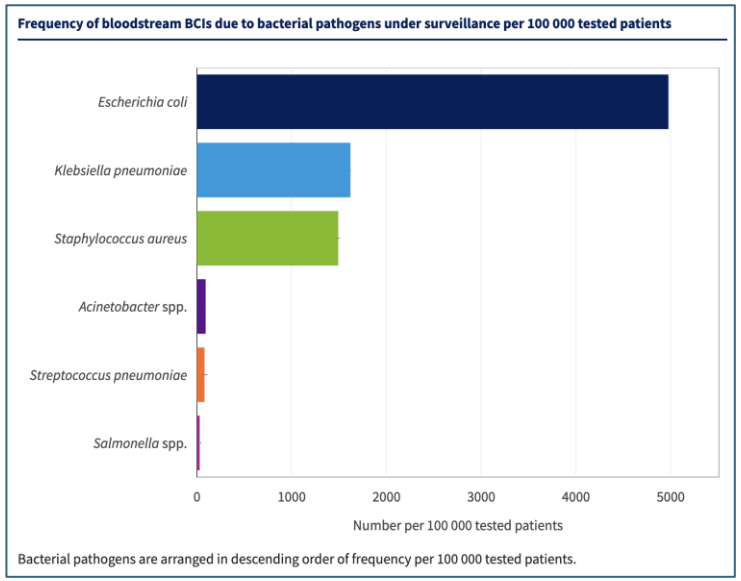
Online fully interactive and flexible data visualization portal of **crude data** submitted by MoH

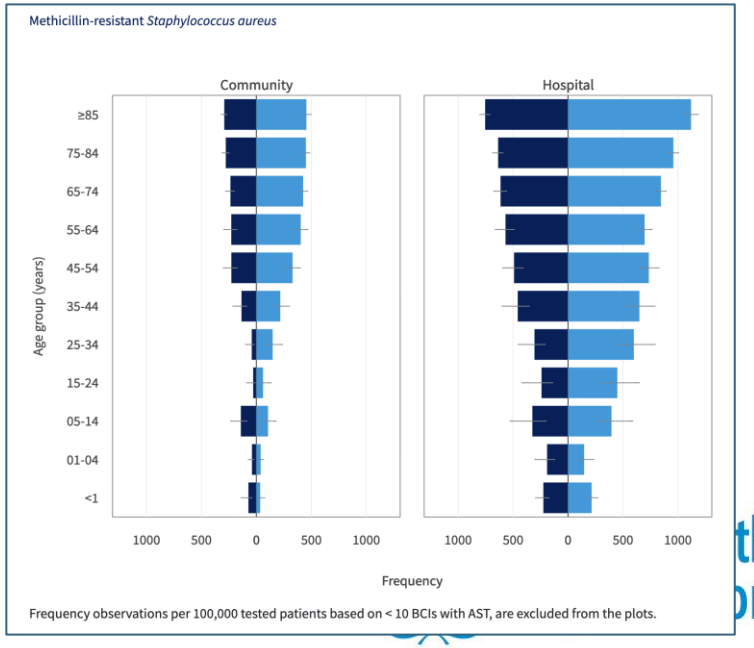
- Data
- Graphs
- Maps
- GLASS indicators

GLASS dashboard









Anonymised individual-level data submission

- monitor the occurrence of multidrug resistance, critical for informing research and development of new therapeutic and diagnostic tools;
- better manage and validate data
- explore additional data analyses and stratifications;
- generate state/province or regional statistics by including facility identifiers to support an analysis of data by national surveillance systems
- analyse drivers and risk factors linked to resistance
- enhance the ability to study the evolution of resistance during the year
- improve capacity for outbreak detection
- generate transmission trends, using both spatial and genetic information
- provide several additional ways to assess data quality

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Individual level variables

GLASS-Bacteria

#	Variable name	Type of variable
1	COUNTRY	Coded value
2	YEAR	Numeric
3	HCF_ID	Text
4	HCF_TYPE	Coded value
5	HOSPITALUNITTYPE	Coded value
6	PATIENT_ID	String
7	AGE	Numeric (integer)
8	GENDER	Coded value
9	PATIENTTYPE	Coded value
10	DATEOFHOSPITALISATION_VISIT	Date
11	PATIENTCOUNTER	Numeric (integer)
12	LABORATORYCODE	Coded value
13	SAMPLE_DATE	Date
13	ISOLATEID	Text
14	SPECIMEN	Coded value
16	PATHOGEN	Coded value
17	ANTIBIOTIC	Coded value
18	SIR	Coded value
19	REFERENCEGUIDELINESSIR	Coded value
20	DISKLOAD	Text
21	RESULTETESTSIGN	Coded value
22	RESULTETESTVALUE	Numeric
23	RESULTETESTSIR	Coded value
24	RESULTZONEVALUE	Numeric
25	RESULTZONESIGN	Coded value
26	RESULTZONESIR	Coded value
27	RESULTMICSIGN	Coded value
28	RESULTMICVALUE	Numeric
29	RESULTMICSIR	Coded value

GLASS-FUNGI

#	Variable name	Type of variable
1	COUNTRY	Coded value
2	YEAR	Numeric
3	HCF_ID	Text
4	HCF_TYPE	Coded value
5	HOSPITALUNITTYPE	Coded value
6	PATIENT_ID	String
7	AGE	Numeric (integer)
8	GENDER	Coded value
9	PATIENTTYPE	Coded value
10	DATEOFHOSPITALISATION_VISIT	Date
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13	ISOLATEID	Text
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17	ANTIBIOTIC	Coded value
18	SIR	Coded value
19	REFERENCEGUIDELINESSIR	Coded value
21	RESULTETESTSIGN	Coded value
22	RESULTETESTVALUE	Numeric
23	RESULTETESTSIR	Coded value
24	RESULTZONEVALUE	Numeric
25	RESULTZONESIGN	Coded value
26	RESULTZONESIR	Coded value
27	RESULTMICSIGN	Coded value
28	RESULTMICVALUE	Numeric
29	RESULTMICSIR	Coded value
30	AST_METHOD	Coded value
31	IDENT_METHOD	Coded value
32	PERFORMED_TEST	Coded value

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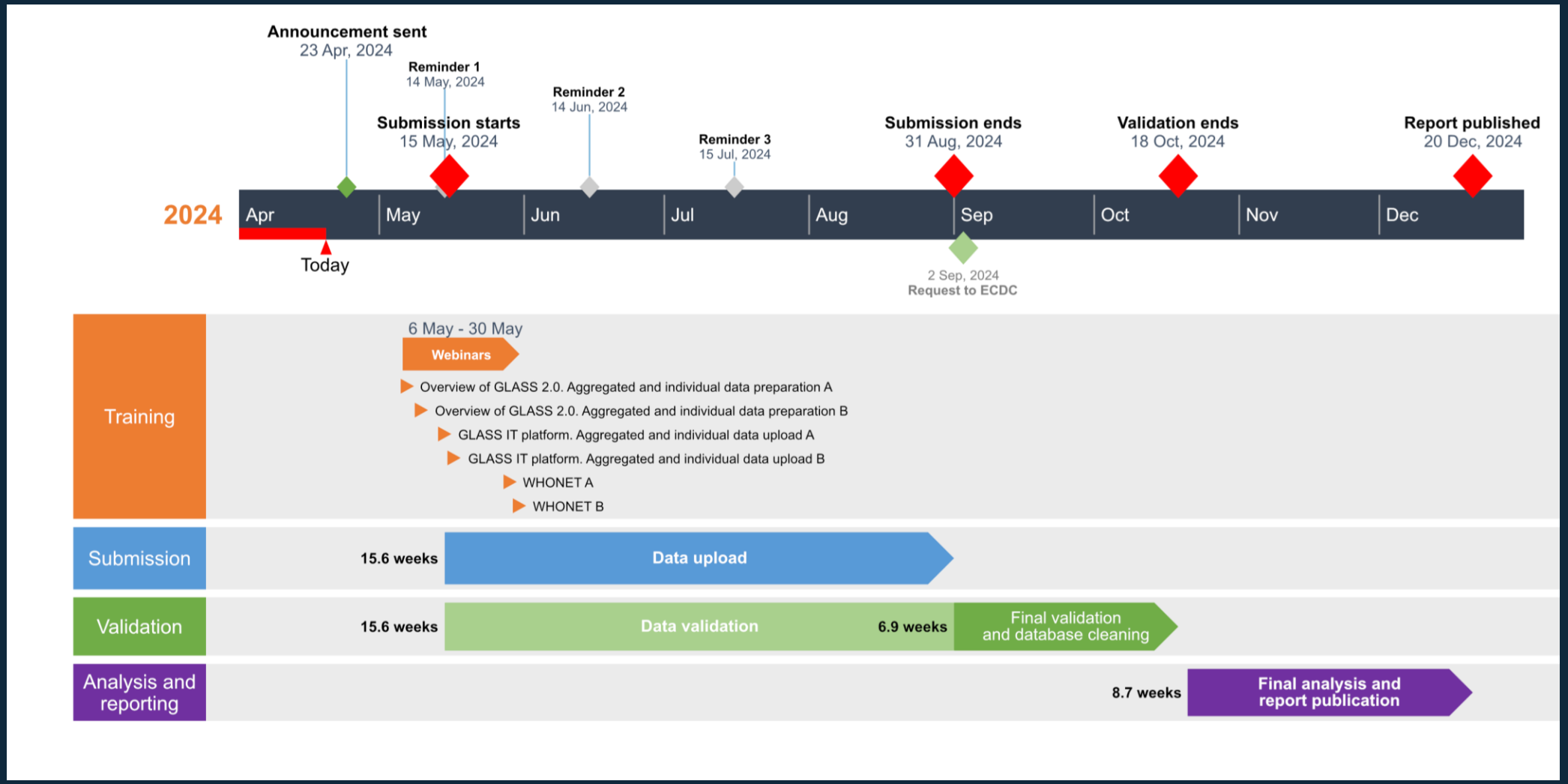
GLASS call for AMR data

shortening the reporting cycle



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Thank you