សិក្ខាសាលាស្តីពី
ការពិនិត្យមើលការអនុវត្តន៍ផែនការសកម្មភាពជាតិ និងកិច្ចសហការ ពីការអេតែតាមជាន និងការចែករំលែកទិន្នន័យ AMR/AMU នៅកម្ពុជា

“The implementation of NAP and advancing collaborations in AMR/AMU surveillance/data sharing in Cambodia”

25-27 March 2025, Sweet Boutique Hotel, Kampot Province , Cambodia

With support from:

The Fleming Fund

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ANTIMICROBIAL RESISTANCE SURVEILLANCE

WORKSHOP ON REVIEWING THE IMPLEMENTATION OF NAP AND ADVANCING COLLABORATIONS IN AMR/AMU SURVEILLANCE/DATA SHARING
25-27 MARCH 2025, KAMPOT

Dr. Nay Touch

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Ministry of Health, Cambodia

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INTRODUCTION

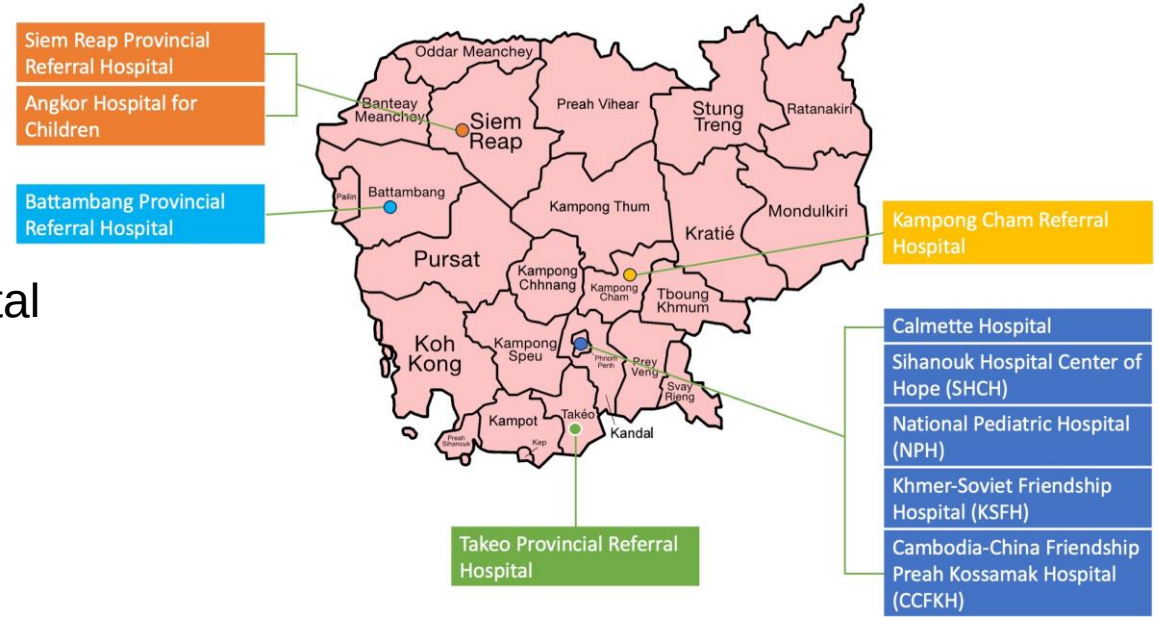
- Antimicrobial resistance (AMR) is a leading global public health and development threat. In 2019, bacterial AMR was directly responsible for 1.27 million deaths worldwide and contributed to 4.95 million deaths.
- AMR poses a significant public health risk, especially in low- and middle-income countries (LMICs).
- In Cambodia, 3,200 deaths in 2019 were caused by AMR, with 13,400 deaths linked to it.

OBJECTIVE

- Describe the burden of AMR in Cambodia by selected indicators and by available demographics.
- Detect emerging resistance patterns, outbreaks, and potential spread of pathogens.
- Enhance clinical care and appropriate antibiotic prescription.
- Improve clinical microbiology practice.
- Use the data to enhance infection prevention and control (IPC).
- Inform local surveillance sites and national policy and interventions for AMR and assess the impact of such measures.
- Contribute standardized AMR data to WHO (GLASS-AMR) for global AMR reporting.

LOCATION OF SURVEILLANCE SITES

- ❑ National Paediatric Hospital (NPH)
- ❑ Calmette Hospital
- ❑ Sihanouk Hospital Center of Hope (SHCH)
- ❑ Khmer-Soviet Friendship Hospital (KSFH)
- ❑ Cambodia-China Friendship Preah Kossamak Hospital (CCFKH)
- ❑ Siem Reap Provincial Referral Hospital
- ❑ Battambang Provincial Referral Hospital
- ❑ Takeo Provincial Referral Hospital
- ❑ Kampong Cham Provincial Hospital
- ❑ Angkor Hospital for Children (AHC



CRITERIA FOR SURVEILLANCE SITE SELECTION

Surveillance sites are selected based on the following criteria:

- Commitment to contribute to the national AMR surveillance system from the hospital leadership and key staff (e.g., physicians and laboratory staff).
- Commitment to producing high quality AMR data.
- Availability of microbiology laboratory and laboratory information system in place.
- Geographically representative location.
- Ability to refer samples and/or isolates to the NRL.

SPECIMEN TYPES AND PRIORITY PATHOGENS

Priority pathogens*	Specimens			
	Blood	CSF	Urine	Aspirates from normally sterile sites[2]
Acinetobacter spp.	✓	✓		✓
E. coli	✓	✓	✓	✓
K. pneumoniae	✓	✓	✓	✓
P. aeruginosa	✓	✓		✓
S. aureus	✓	✓		✓
S. pneumoniae	✓	✓		✓
N. meningitidis	✓	✓		✓
H. influenzae	✓	✓		✓
Salmonella spp. (non-typhoidal)	✓	✓		✓
***S. enterica* serovar Typhi[3]**	✓			
***S. enterica* serovar Paratyphi A[3]**	✓			
B. pseudomallei	✓	✓	✓	✓

ROLE AND RESPONSIBILITY OF AMR-TWG

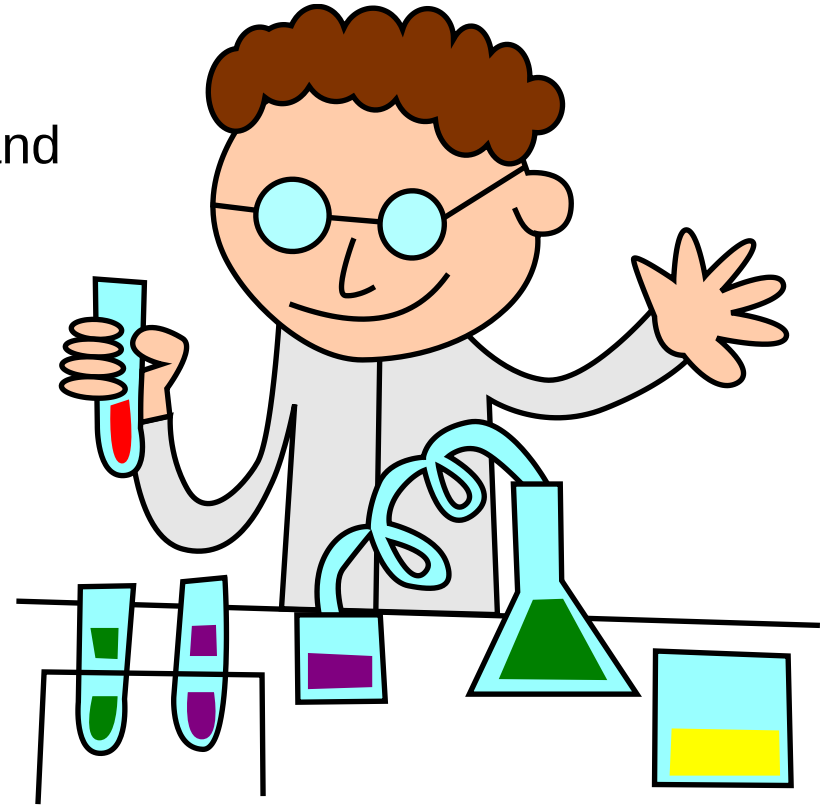
- Oversee the national AMR surveillance system;
- Mobilize resources;
- Review and endorse national AMR surveillance SOP and other related materials;
- Advise on regulatory matters;
- Advocate and communicate with relevant stakeholders.

ROLE AND RESPONSIBILITY OF COMMUNICABLE DISEASE CONTROL DEPARTMENT

- Define AMR surveillance strategy and national objectives with the AMR technical working group.
- Collaborate with NRL, AMR surveillance sites, clinical and laboratory facilities, and other stakeholders.
- Coordinate AMR data management: collection, analysis, reporting, storage, cleaning, deduplication, validation, and aggregation.
- Share information globally and nationally, including routine surveillance data, survey results, and outbreak identification.
- Oversee AMR surveillance training for clinical, laboratory, and surveillance staff.

ROLE AND RESPONSIBILITY OF NATIONAL REFERENCE LABORATORY

- Conduct confirmatory testing for multi-drugs resistant organisms and carbapenemase producing organisms, and detect resistance mechanisms.
- Train laboratory personnel at surveillance sites.
- Provide ATCC strains and ensure quality assurance for data management and laboratory practices.
- Coordinate EQA programs with sentinel sites.
- Maintain a list of quality microbiology supplies and suppliers.
- Assist sentinel site laboratories in procuring reagents and supplies.
- Maintain a bio-repository for bacterial isolates.



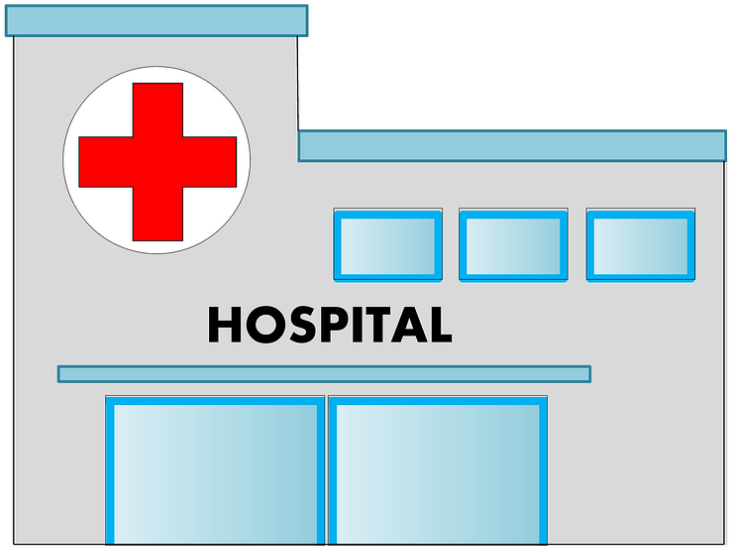
ROLE AND RESPONSIBILITY OF SURVEILLANCE SITE

- Follow the AMR Surveillance SOP.
- Conduct sample request and collection, microbiological testing of clinical specimens including pathogen identification (ID) and Antibiotic Susceptibility Testing (AST), packaging and transportation, in compliance with national SOPs.
- Coordinate data management: AMR data collection, analysis and reporting and data storage, cleaning, deduplication, validation, and aggregation.
- Ensure complete data are collected and entered or transferred into the national AMR reporting system. Ensure internal quality control monitoring.
- Establish or utilize existing AMR/AMS committee to oversee AMR surveillance activities including local policy development using AMR data, training, quality assurance, data management, reporting. Ensure the committee includes a representative with expertise in AMR surveillance.

AMR SURVEILLANCE DATA

Data submitted to the Cambodia AMR surveillance system include pathogen and antimicrobial susceptibility data obtained from routine clinical samples from patients with symptoms and signs suggestive of infection. Microbiology data is supplemented with clinical, demographic and epidemiological information.

SAMPLE FLOW PATHWAY



ត្រូវយកឈាមបណ្តុះមេរោគពីអ្នកជម្ងឺណាខ្លះ?

១)ការសង្ស័យ Bactériémie និងសញ្ញា១តាមបញ្ជីខាងក្រោម:

- កំដៅខ្លួន **>38.5°C ឬ <36°C** - ជីពចរ **>90/នាទី**
- ការដកដង្ហើម **>22/នាទី** - សម្ពាធឈាម (systole) **<90mmHg**

២)ក្តៅខ្លួនលើស២សប្តាហ៍:

- ក្តៅខ្លួនម្តងម្កាលឬ ក្តៅខ្លួនជាប់
- សញ្ញាផ្សេងៗទៀតអាចអវត្តមាន

៣)ករណីរោគវិនិច្ឆ័យ

រលាកស្រោមខួរក្បាល (សូមយកCSFដែរ)
រលាកសួតធ្ងន់ធ្ងរ (សូមយកកំហាកដែរ)
រលាកតម្រងនោម ធ្ងន់ធ្ងរ (e.g. pyelonephrite) (សូមយកទឹកនោមដែរ)
រលាកស្បែកនិងសាច់ដុំធ្ងន់ធ្ងរ (បញ្ចូលជំងឺORLផង) (សូមយកខ្ទុះដោយaspiration ឬ swab បើបូមអត់បាន)
រលាកសន្លាក់ ឬរលាកឆ្អឹង (យកខ្ទុះឬជុំឆ្អឹង)
រលាកស្រោមពោះឬ ventre chirurgical (បញ្ចូលជំងឺរោគស្ត្រីផង) (សូមយកខ្ទុះដែរ)
បូសសរីរាង្គ(ថ្លើម អណ្តើក តម្រងនោម ប្រុស្តាត សាច់ដុំ ។ល។) (សូមយកខ្ទុះដែរ)
ការសង្ស័យជំងឺរលាកប្រឹសបេះដូង (សូមយកឈាមបណ្តុះមេរោគ ច្រើនដង)

ជូតស្បែកជាមួយអាកុល៧0%(ទុក១នាទី)
បន្ទាប់មកជូតស្បែកជាមួយpovidone១0%(ទុក ២នាទី)
បន្ទាប់មក ជូតក្បាលដបឈាមបណ្តុះមេរោគ ជាមួយ povidone (ទុកអោយស្ងួត)

មនុស្សពេញវ័យ: យក១0មលក្នុង១ដប បូមសងខាង
កុមារ: ២-៦មល(១ដប)
ពេលបានប្រមូលឈាមរួច សូមមេត្តាយកដប ឈាមទៅមន្ទីរពិសោធន៍ឲ្យបានឆាប់។
សូមកុំដាក់ចូលក្នុងទូរទឹកកក។

Who should get blood cultures?

1) Suspected bacterial infection plus one of the following:

- Temperature **>38.5°Cor <36°C**
- Pulse rate **> 90/min**
- Respiratory rate **> 22/min**
- Systolic blood pressure **< 90mmHg**

2) Chronic fever >2 weeks

- intermittent or continuous
- may not have other symptoms or signs

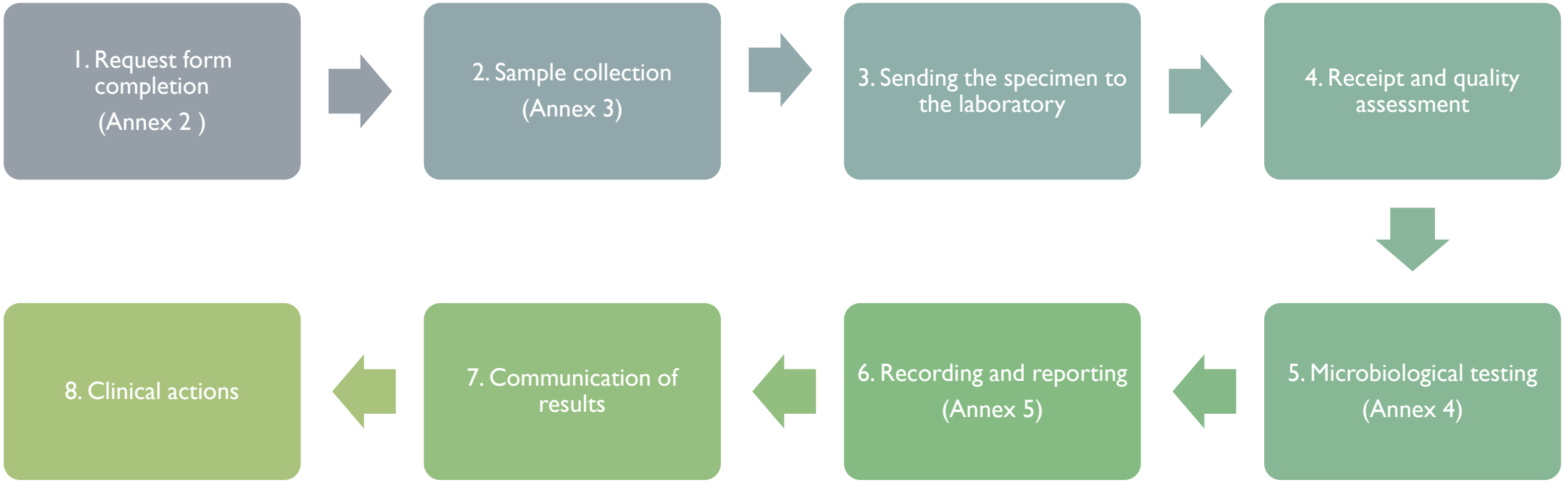
3) Clinical syndrome

- **meningitis** (order CSF also)
- **severe pneumonia** (order sputum also)
- **severe UTI** (e.g. pyelonephritis) (do midstream urine also)
- **severe skin or soft tissue infection** (including ENT pathology) (aspirate preferred -swab if not possible)
- **septic joint or osteomyelitis** (x-ray, pus/bone culture also)
- **acute abdomen/peritonitis** (including pelvic pathology) (pus also)
- **abscesses (deep organ)** (liver, spleen, kidney, prostate, muscle etc) (pus also)
- **suspected endocarditis** (multiple sets of BC)

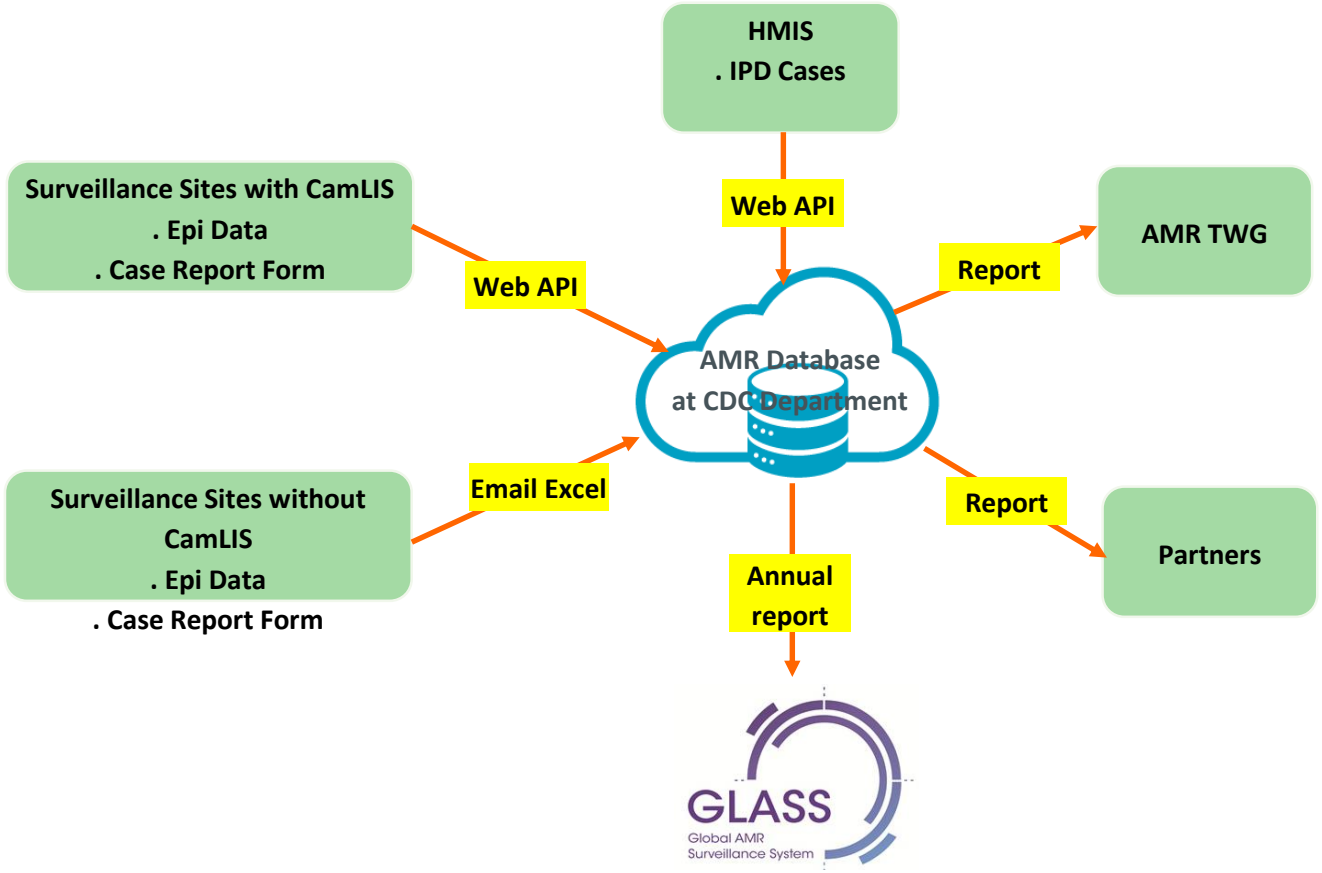
Clean skin with 70% alcohol (leave 1 min)
then wipe with povidone 10% (leave 2 mins)
then wipe top of bottle with povidone (let dry)

Adults: 10 mls each from 2 sites
Children : 2-6 mls (1 bottle)
Send to laboratory immediately after collection. **Do not refrigerate**

SAMPLE FLOW PATHWAY



SAMPLE FLOW PATHWAY



ACHIEVEMENT ON DATA AMR SURVEILLANCE

About this data

The dashboard with a colour-coded system shows the extent of AMR data submission, and the below table gives an overview of the submitted number of tested patients per specimen, and number of infected patients, per specimen-pathogen combination, by infection origin

GLASS
Global Antimicrobial Resistance and Use Surveillance System

Cambodia

Population 16,486,542 (2019)

Data Visualization

Select Country

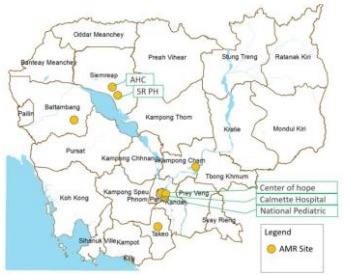
Cambodia

Data submission

specimen	Pathogen name	Number of tested patient	AST results	Age	Gender	Infection origin
BLOOD	Acinetobacter spp.	🔴	🟢	🟢	🟢	🟡
	E. coli	🔴	🟢	🟢	🟢	🟡
	K. pneumoniae	🔴	🟢	🟢	🟢	🟡
	S. aureus	🔴	🟢	🟢	🟢	🟡
	S. pneumoniae	🔴	🟢	🟢	🟢	🟡
	Salmonella spp.	🔴	🟢	🟢	🟢	🟡
GENITAL	N. gonorrhoeae	🔴	🔴	🔴	🔴	🔴
STOOL	Salmonella spp.	🔴	🔴	🔴	🔴	🔴
	Shigella spp.	🔴	🔴	🔴	🔴	🔴
URINE	E. coli	🔴	🔴	🔴	🔴	🔴
	K. pneumoniae	🔴	🔴	🔴	🔴	🔴

70-100% data reported 🟢
<70% data reported 🟡
No data reported 🔴

1. Introduction



The Ministry of Health, Royal Government of Cambodia endorsed and launched National Laboratory-Based Antimicrobial (AMR) Sentinel Surveillance system in January 2018 in eight sites: three sites in Phnom Penh and five in four other provinces. All laboratories at these sites perform AST (antimicrobial susceptibility testing) and participate in external quality assurance (EQA) schemes. National Institute of Public Health is the national reference laboratory (NRL) and receives EQA from the Pacific Pathology Training Center (PPTC), New Zealand and The Royal College of Pathologists of Australasia Quality Assurance Programs (RCPAQAP), Australia.

All sites contribute data to Global Antimicrobial Resistance and Use Surveillance System (GLASS) including six high priority pathogens from blood specimens*: Escherichia coli, Klebsiella pneumoniae, Acinetobacter* spp, *Staphylococcus aureus*, *Streptococcus pneumoniae* and *Salmonella* spp. and another pathogen of importance in Cambodia: *Bukholderia pseudomallei*.

In Cambodia, two sets of blood cultures are collected for adults and one bottle for children. For AST, Cambodia uses CSLI guidelines. The final dataset used for analyses includes only the first positive culture for a particular pathogen for the one clinical course for the patient. If there is more than one pathogen detected from the same patient throughout the same clinical courses those pathogens are included.

This Cambodia AMR surveillance report is aimed at sharing the AMR data with policy-makers, physicians, infection control teams and antimicrobial stewardship (AMS)/ Medical Therapeutic Committee (MTC) to take appropriate interventions to address the current AMR situation at national, sub-national and facility levels. This second report covers AMR surveillance data from 2019 through 2022; future reports will be annual.

2. Results

Between 2019 and 2022, 697,429 in-patients were admitted to the eight surveillance sites. Of these, on average 15.6% had blood samples taken.

The proportion of blood taken varies across sites in 2022 from 942 (4.8%) at Kampong Cham to 3363 (73.2%) at Angkor Children's Hospital (Table 1). Among the blood samples from 2019 to 2022, on average, 10% were positive for any pathogen and this positivity has remained stable over time. Higher positivity was detected at Calmette (14.4%-18.0%) and Siem Reap (8.9%-11.0%) compared to other sites (Table 1).

THANK YOU