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Senior researcher of the laboratory of bacterial and viral infections of the Branch “Kh. Zhumatov Scientific Center of Hygiene and Epidemiology” of the national Center for Public Health of the Ministry of Health of the Republic of Kazakhstan.

Practical and scientific work experience in hospital epidemiology, clinical microbiology and infection control since 2002. Member of the interdepartmental working group of microbiologists on the implementation of the Roadmap for Containing AMR in Kazakhstan for 2019-2022, 2022-2027, facilitator of the WHO Global Laboratory Leadership Program in Kazakhstan.

Implementation of the antimicrobial resistance surveillance system in the Republic of Kazakhstan - achievements and plans for the future

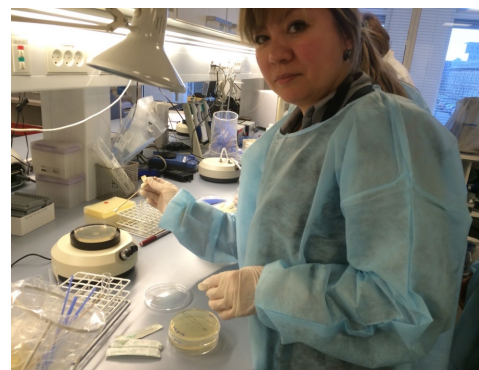


Previous AMR experience

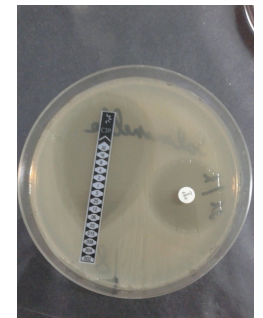
Intersectoral Training for the Central Asian Republics on Salmonellae Identification and Antibiotic Susceptibility Determination, Almaty, 2013



Antimicrobial Resistance Workshop (WHO Europe, Copenhagen, Denmark, 2015)



WHO Intersectoral Training for the Central Asian Republics on Antimicrobial Resistance, Tashkent, 2015





Beginning of the journey

2015 - WHO expert assessment of the existing situation and recommendations on implementation of national AMR surveillance in Kazakhstan

Implementation of WHO Recommendations



The National Center for Public Health addressed the Ministry of Health with the initiative to adopt the WHO Call to Action and develop antimicrobial resistance measures (2017-2018).



In 2018, the national reference center and reference laboratory for AMR (Scientific and Practical Center for Sanitary and Epidemiological Expertise and Monitoring of the NCPH of the Ministry of Health of the Republic of Kazakhstan) were identified



Development of The Roadmap for the Implementation of Activities to Contain Antimicrobial Resistance in the Republic of Kazakhstan for 2019-2022 and approval at the meeting of the National Coordination Council for Health Protection under the Government of the Republic of Kazakhstan (Minutes No. 3 of 27.12.2018)

Activities under the 1st Roadmap of the Ministry of Health of the RK



- **Local microbiological monitoring** started in Almaty with the support of the CDC/CAR office with the involvement of 4 medical organizations and AMR Reference Laboratory.
- Introduction of test quality external evaluation through participation in the NEQAS program (supported by CDC).
- Standardization of hemoculture blood and CSF sampling methods as part of the Global Networks for the Surveillance of Resistant Invasive Pathogens (CAESAR).
- Methodology for antimicrobial susceptibility testing in sentinel laboratories according to international standards (EUCAST) adopted.
- An electronic information system (WHONET) implemented in sentinel laboratories.

Activities under the 1st Roadmap of the Ministry of Health of the RK



- Training for bacteriologists and health workers to raise awareness of AMR and the start of the state AMR program:
- **Antibiotic Resistance: Laboratory Diagnosis and Epidemiological Analysis Using the WHONET Software in collaboration with the L. Pasteur Institute, St. Petersburg, and Research Institute of Antimicrobial Chemotherapy, Smolensk (2019).**
- Section “**Problems of Antimicrobial Resistance in Modern Laboratory Diagnostics**” at the 7th International Congress of Kazakhstan Association of Medical Laboratory Diagnostics (2019).
- Section “**Organization of infection control in medical organizations and issues of surveillance of antimicrobial resistance**” within the 1st Kazakhstan Congress “Infectious Diseases in the Context of Globalization: Challenges and Solutions” (2019).
- Annual workshops and roundtables related to the World Antimicrobial Stewardship Week (from 2018)



Multidisciplinary and interagency cooperation

- According to the order of the Director of the National Center for Public Health, MOH RK №47-19-N-K of 29 May 2019 On the National Coordinating center for the Surveillance of Antimicrobial Resistance, the composition of the Interagency Coordination Group (ICG) of the health sector was approved.
- The ICG includes:
 - infectious disease doctors
 - pharmacologists
 - epidemiologists
 - microbiologists
 - representatives of the Ministry of Agriculture.



The National Reference Center for Veterinary Medicine (NRCVM) of the Veterinary Control and Supervision Committee of the Ministry of Agriculture of the Republic of Kazakhstan is determined as the MOA Coordinating Center.

Current situation in the Republic of Kazakhstan



Order of the Minister of Health of the Republic of Kazakhstan of 28 September 2022 No.842 on the approval of the Roadmap of Measures to Contain Antimicrobial Resistance in the Republic of Kazakhstan for 2023-2027.

1. Improvement of the National Antimicrobial Resistance Surveillance System;
2. Improvement of the system for microbiological monitoring of microorganism resistance at all levels of public health and agriculture;
3. Raising awareness and understanding of antimicrobial resistance through effective communication, education and training;
4. Decrease in infectious diseases by strengthening the infection control system and improving preventive measures;
5. Optimizing antimicrobial use in humans and animals;
6. Improvement of professional education and development of research programs;
7. Strengthening international cooperation in containing antimicrobial resistance of pathogens.

Organization of AMR sentinel surveillance by region in Kazakhstan





Sentinel sites

11 health organizations participate in SS: **Almaty** – City Clinical Hospital No.7, Scientific Center for Pediatrics and Pediatric Surgery; **Astana** – National Scientific Medical Center; **Karaganda** – Karaganda Medical University; **Shymkent** – City Infectious Disease Hospital, City Perinatal Center; **Mangistau** – Etalon MED LLP, MB Lab LLP; **North-Kazakhstan** – Regional Multidisciplinary Hospital, **Atyrau** – Atyrau Regional Children’s Hospital.

Assessment performed and ready to participate: **Aktobe** - Microlabservice LLP, **Kyzylorda** – Kyzylorda Regional Infectious Disease Hospital, Kyzylorda Regional Multidisciplinary Hospital, **Aktau** – Branch of the National Center of Expertise, CSEC MOH RK for Mangistau region.

A total of 24 organizations with bacteriology laboratories will be involved this year.

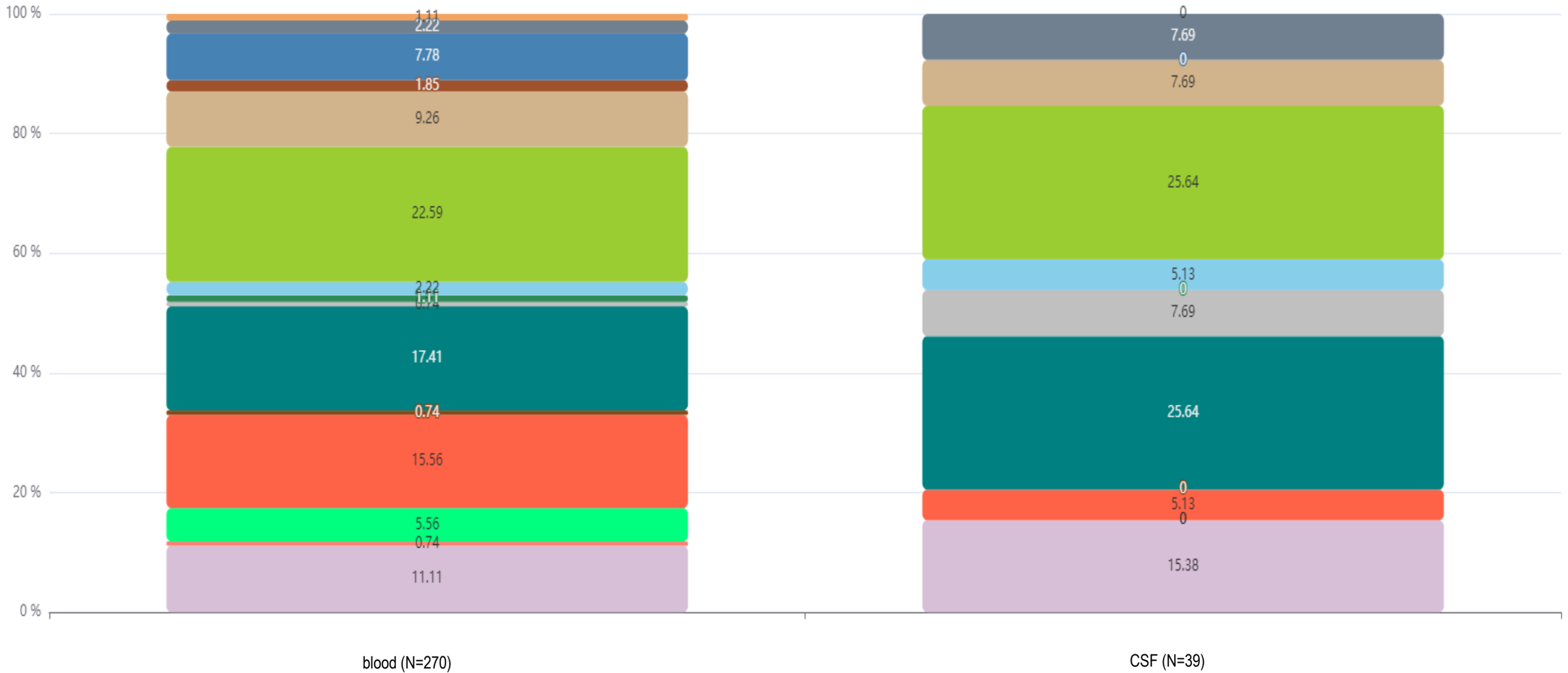
AMR sentinel surveillance data for Kazakhstan, 2023



Pathogens isolated from biological material

Microorganism by sample type (N=309)

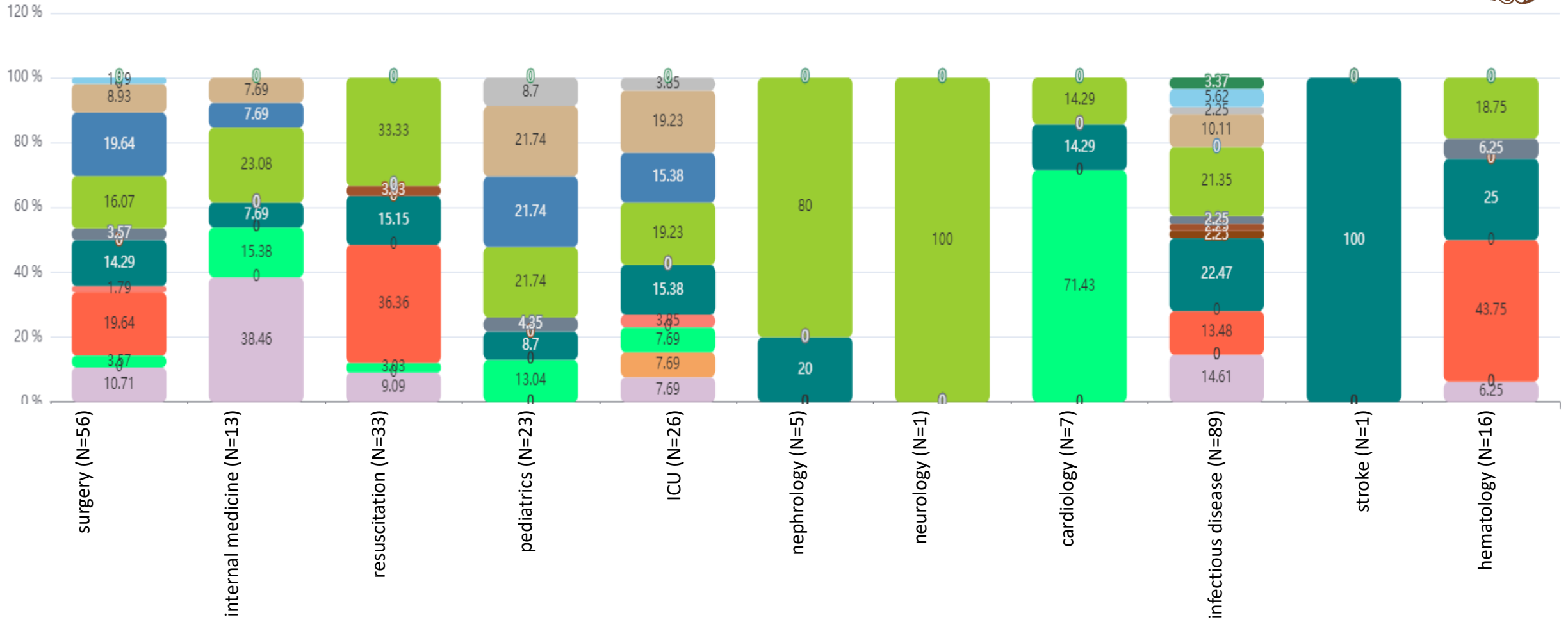
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Microorganisms isolated from blood by department

Microorganism by department (N=270)

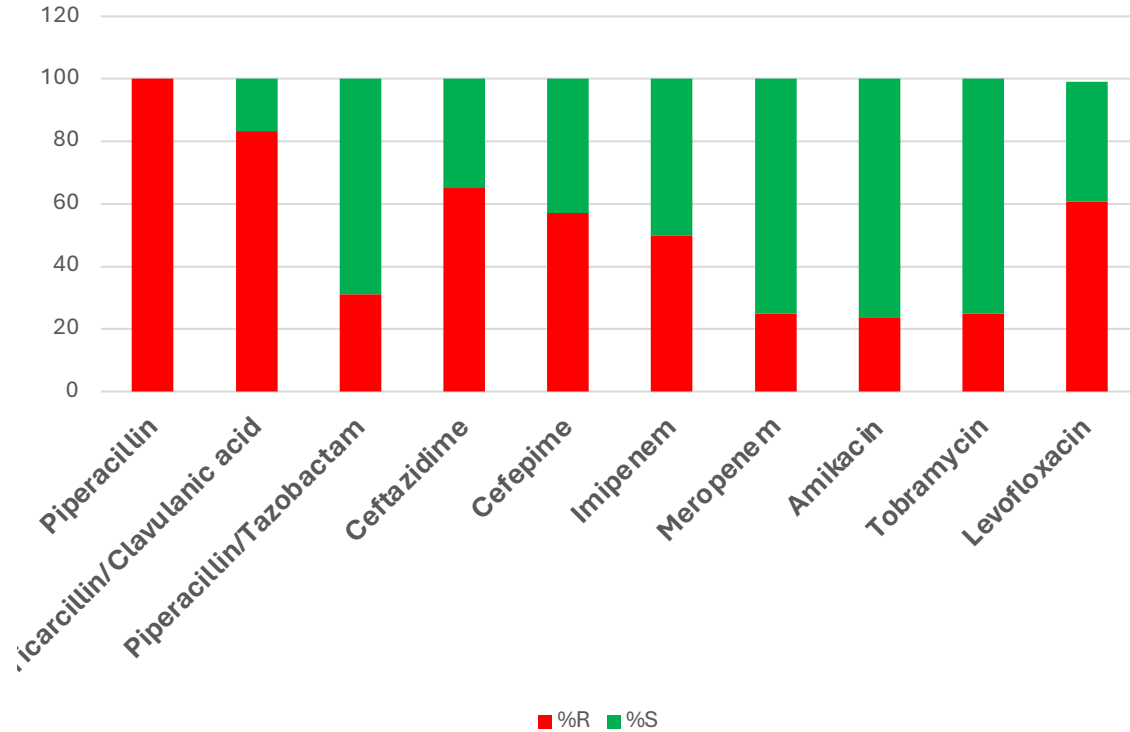
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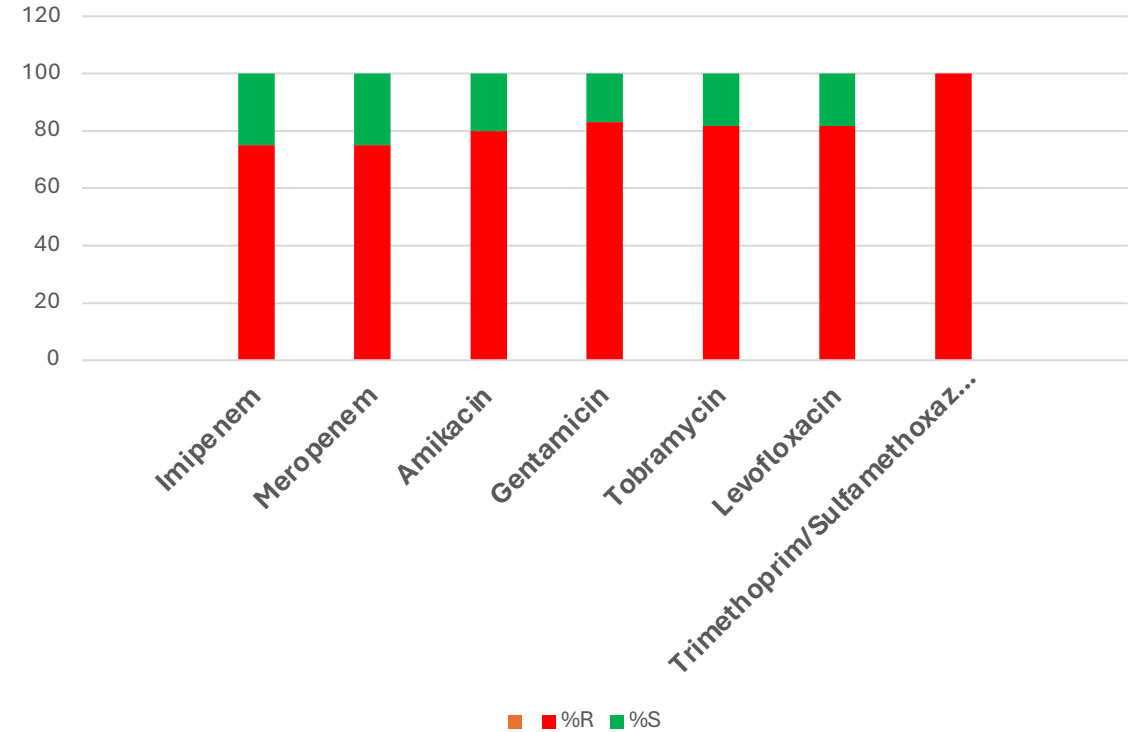


Sensitivity/resistance of cultures sent from sentinel laboratories, 2023 (RL data)

Pseudomonas aeruginosa (n=19)



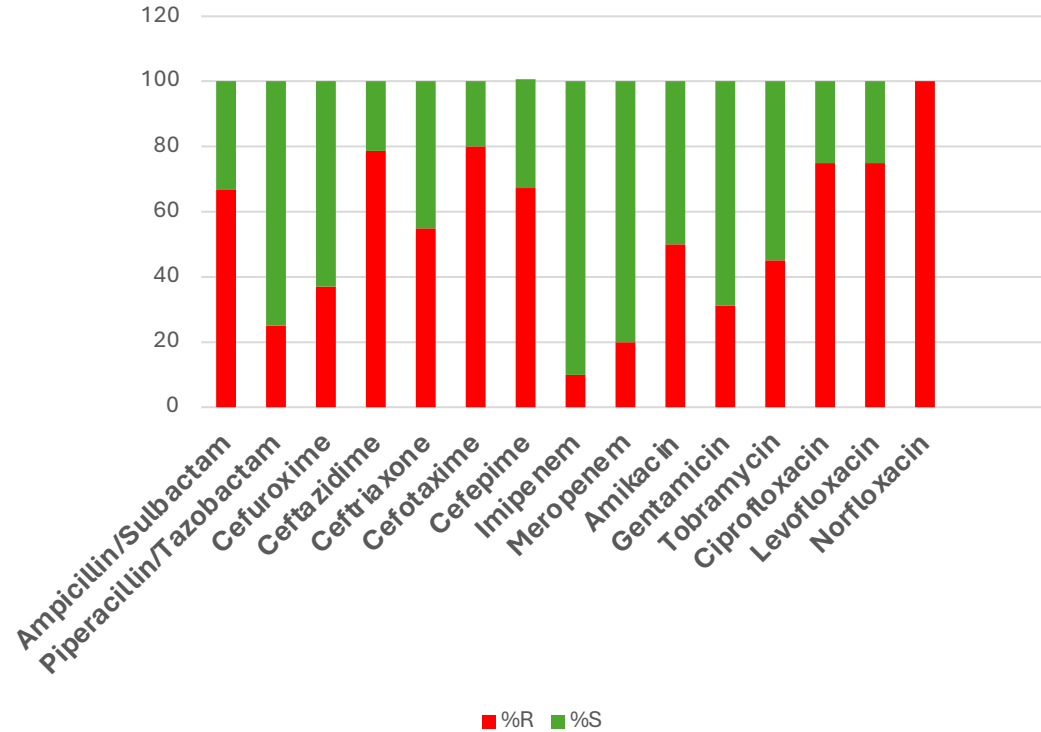
Acinetobacter baumannii (n=13)



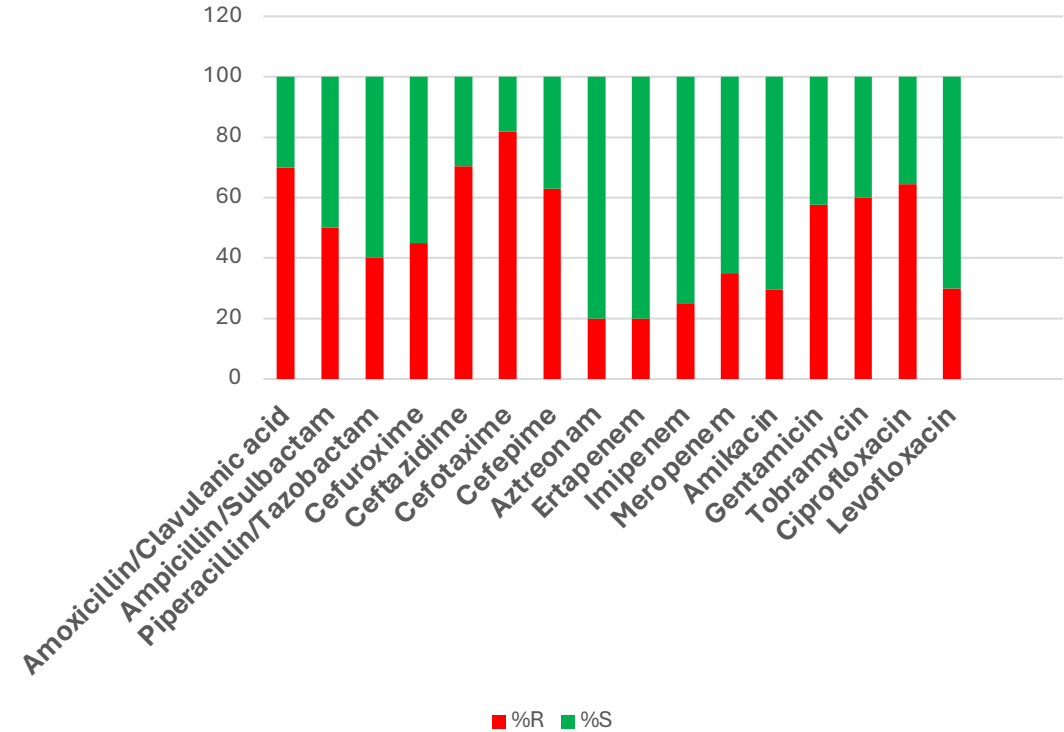


Sensitivity/resistance of cultures sent from sentinel laboratories (RL data)

E.coli (n=43)



K. pneumoniae (n=28)





Reference laboratory work with sentinel sites

Assessment of readiness of a health organization bacteriology laboratory to participate in AMR sentinel surveillance the with further involvement in participation.

Retesting of cultures sent from sentinel laboratories and antibiotic susceptibility testing

Maintaining a bank of cryostatted cultures for subsequent genomic studies (600 strains)

Retesting is performed using MALDI-TOF mass spectrometry, sensitivity test is performed on VITEK2 Compact

Data from sentinel sites are collected using the WHONET software

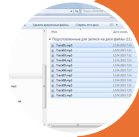
Participation in CAEZAR external quality assessment jointly with sentinel laboratories

- ESBL detection in Gram-negative bacteria ranged from 15% to 32.1%
- Methicillin-resistant *S.aureus* accounted for 88.5%(n=43)

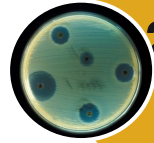
AMR sentinel surveillance and IPC



Based on the assessment of sentinel laboratories' readiness to participate in SS, RL specialists made recommendations that directly impact the success of AMR sentinel surveillance



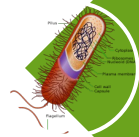
1. Reporting on microbial landscape and antibiotic sensitivity of microorganisms isolated from patient clinical specimens.



2. Monitoring microbiological landscape, antibiotic resistance and hospital strains circulation



3. Submission of information to the infection control commission



4. Collection of data on the circulation of predominant microflora in the hospital, resistance factors of circulating microorganisms, their species and genus affiliation



5. Increasing communication with the hospital epidemiologist, clinical pharmacologist and clinicians.



6. Involvement of sentinel laboratory bacteriologists in the work of the infection control commission.

Raising awareness and understanding of antimicrobial resistance



- **1. Basic microbiology in the context of IPC.**
- **2. Antibiotic resistance and antibiotic prophylaxis in infection control**

1. Hospital epidemiologists

2. Doctors in the general treatment network

3. Healthcare managers

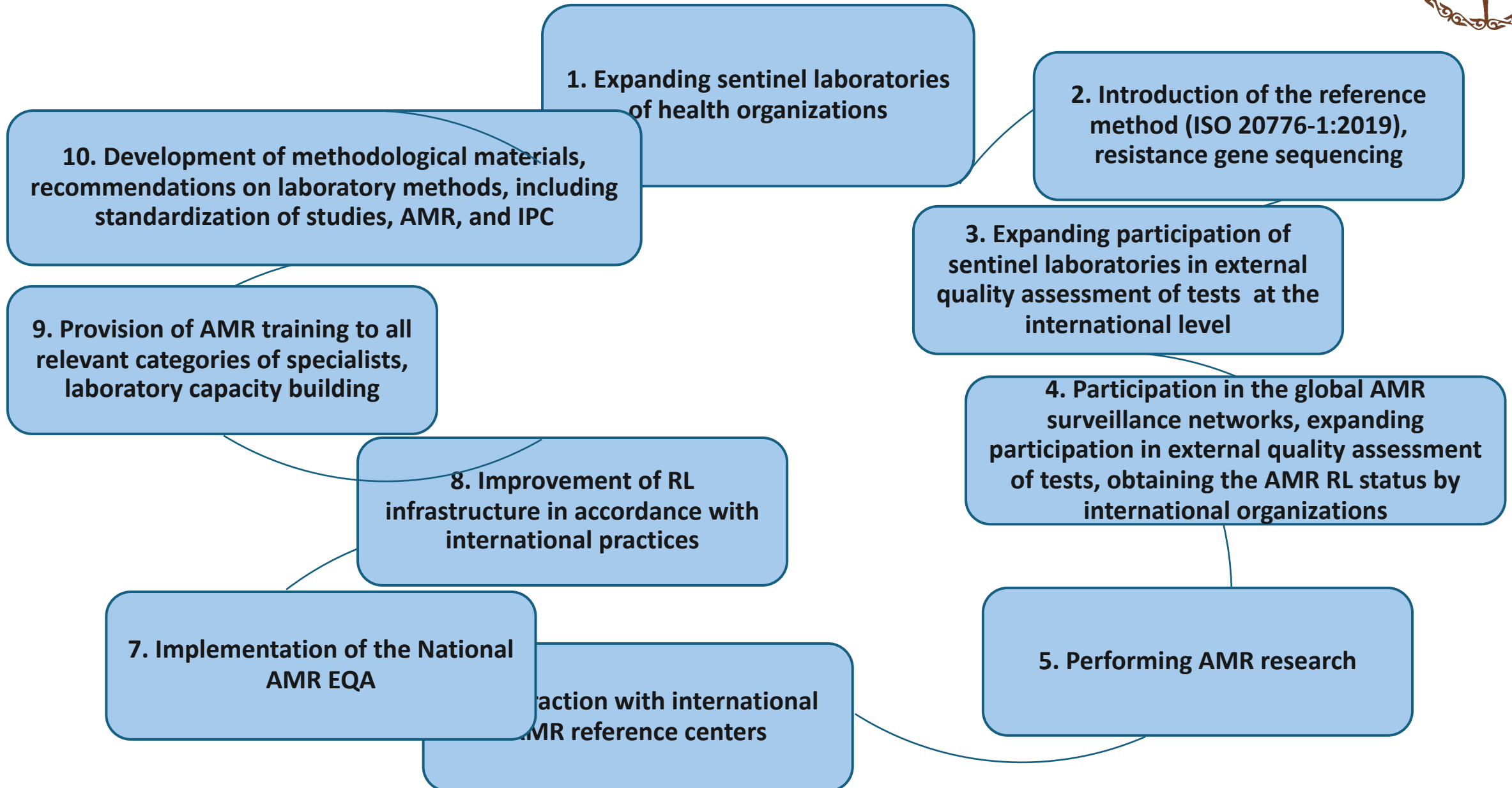
4. Nursing staff

5. Epidemiologists of the sanitary and epidemiological service

6. Faculty of higher and secondary educational institutions



Plans for the future





Thank you for your attention!