



QUARTERLY Antimicrobial Resistance (AMR)

NewsLetter

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ISO 15189: 2012 Accreditation of NIH Microbiology Laboratory

The microbiology department of Public Health Laboratories Division, the National Institute of Health has been awarded accreditation to the ISO 15189: 2012 standard for Medical Laboratories requirements for quality and competence. This is a big achievement for the AMR National Reference Laboratory to meet the internationally recognised standard in providing quality services in Pakistan.

Preparation of the accreditation began in December 2019, with the support of the Fleming Fund Country Grant Pakistan. As the fight to combat AMR continues, the NIH Microbiology laboratory will continue to provide quality services as per the requirements of the ISO 15189 standard and continue to play its pivotal role in the healthcare system of Pakistan.



Optimisation of antimicrobial use in the human and veterinary sector

Objective 4 of the AMR National Action Plan (NAP) aims at, 'Optimisation of antimicrobial use in human and veterinary sector', for tackling the issue of Antimicrobial resistance. This engages multiple sectors, including human, animal and the environment; following the one health approach. Therefore, to address this particular objective, on 1st March 2022, all key stakeholders came together in the first-ever coordination meeting organised by the NIH, Islamabad. One of the important challenges regarding the regulation of antimicrobials sales was highlighted; i.e., Drug rules are not being revised. Islamabad capital territory Drugs Rules, 2013 are the latest ones, which fail to comply with today's emerging needs; as regulated sales of antimicrobials. The same goes for the provincial Drug rules. So a dire need to revise Drug Rules, particularly focusing on antimicrobials schedules and OTC sales of antimicrobials was the common consensus of meeting participants. Technical Working Group (TWG) for the said purpose of rules revision has been established.

Besides, the patterns of Antimicrobial

Resistance and Trend in antimicrobials Use in Regions of Asia was presented by the CAPTURA Grant. This highlighted the burden of Antimicrobial Consumption (AMC) in Pakistan by showcasing the Preliminary analysis of 2019-2020 IQVIA data.

Some other actions that need consideration were also discussed:

- Guidelines on antimicrobial use and consumption should be developed and implemented. This has been started for the animal health sector.
- Media awareness campaigns on the appropriate use of antimicrobials, alongside other related activities are conducted during AMR Awareness Week in November, each year.
- The Drug Regulatory Authority of Pakistan (DRAP) suggested that some other stakeholders need to be engaged for the Objective 4 of the National Action Plan (NAP), such as Health Care Commission/ Health Policy units for AMR and AMC.



Coordination Meeting of the NIH team with the Health Departments

Muzaffarabad, Azad Jammu & Kashmir (AJK)

6th September 2021

The meeting was chaired by the Secretary of Health with the aim to discuss the National Action Plan on AMR and Infection Prevention and Control (IPC). It focused on the implementation of the strategic framework in collaboration with the various sectors including hospitals, livestock department, pharmacy services and the environment. The secretary mentioned that "the assistance is required from the NIH in capacity building, sensitising the public, particularly awareness for persons working in critical areas and there is a need to engage all relevant stakeholders from all sectors for a positive outcome".



Gilgit Baltistan (GB) *26th November 2021*

The NIH team gave a briefing on National Action Plan for AMR & Infection Prevention and Control (IPC) to the Secretary, representatives from hospitals and the Drugs division. It was requested to nominate the focal person for AMR from GB for coordination on the AMR activities mentioned in the NAP.



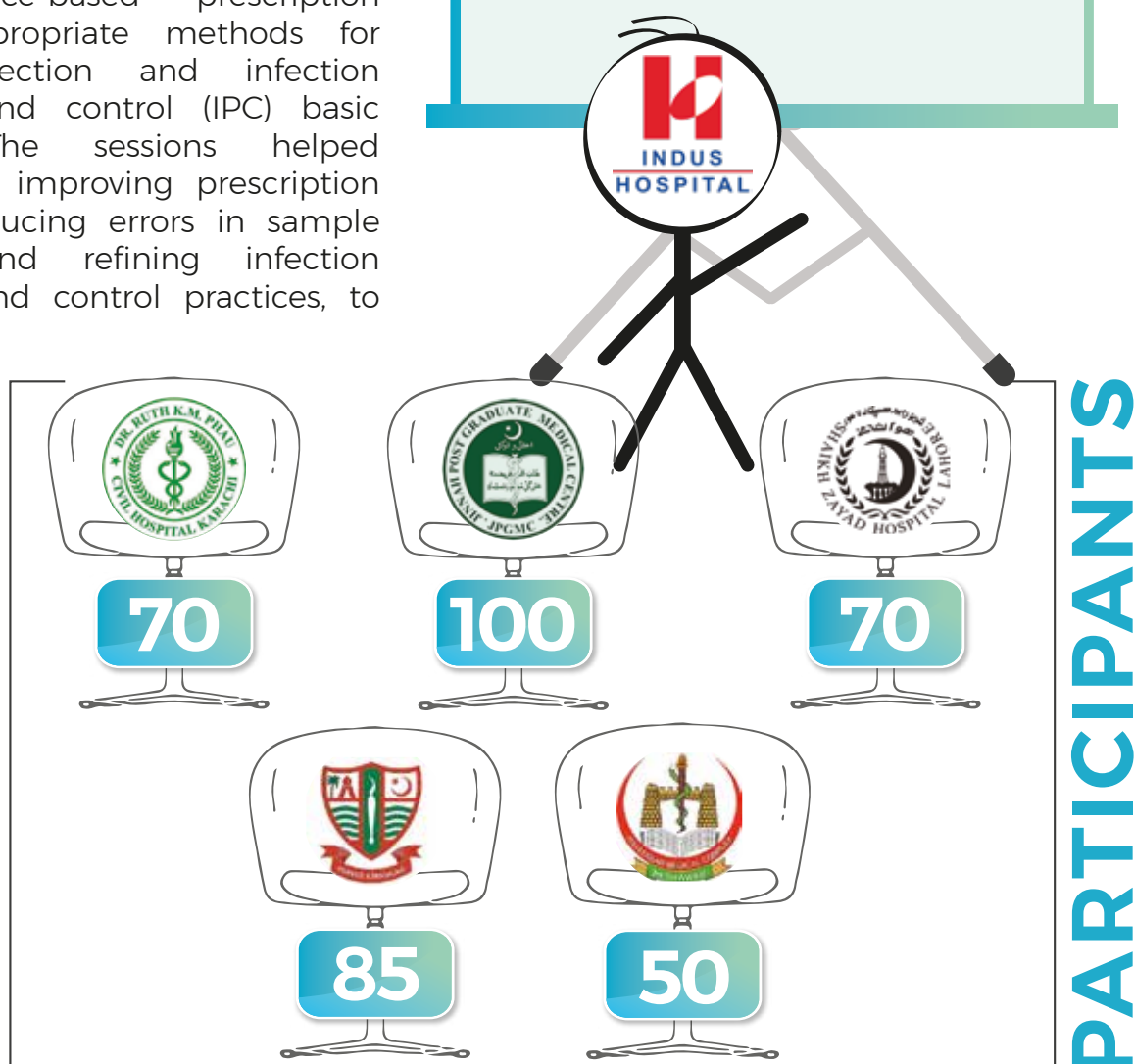
Strategies to Combat the Global Threat of Antimicrobial Resistance

A seminar was organised in collaboration with the Medical Microbiology and Infectious Diseases Society of Pakistan (MMIDSP) at five sentinel sites in December 2021. The distinguished guest speakers elaborated on the emerging burden of AMR globally and the way forward. The event is themed to strengthen the ongoing Clinical engagement activities for healthcare professionals to tackle AMR.

From July 2021 to February 2022, 7 teaching sessions for five clinical engagement sites were conducted, focusing on guidelines for antibiotic use, evidence-based prescription practice, appropriate methods for sample collection and infection prevention and control (IPC) basic concepts. The sessions helped physicians in improving prescription practices, reducing errors in sample collection and refining infection prevention and control practices, to reduce AMR.

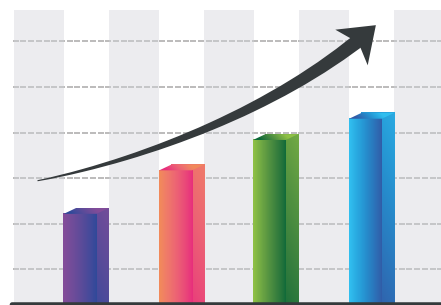
Areas covered during the sessions included:

- Understanding/ Interpretation of the Antibigram
- Antibiotic prophylaxis and treatment Guidelines for UTI
- Antibiotic prophylaxis and treatment Guidelines for Sepsis
- Appropriate sample collection techniques
- Protocols for ordering cultures and interpretation of culture results
- IPC: Standard and Transmission Based Precautions



Sharing preliminary results of Knowledge, Attitude & Practice (KAP) surveys on AMR, AMU in the Animal Health sector

The animal health team met with the Director General, Animal Health & Production Extension at Quetta on 15th February, 2022, with the Director Generals of Livestock and Research & Extension Sindh at Karachi on 17th February 2022 and Director General (Extension) & Director Animal Disease Diagnostics, Reporting and Surveillance (ADDRS) Lahore on 24th February, 2022 at Lahore. Dr Usman Zaheer (Surveillance Specialist, Health Security Partners (HSP) - Fleming Fund Country Grant) highlighted one of the major challenges in tackling AMR, is the lack of awareness among in-service field veterinarians and dairy farmers regarding AMR and AMU. Therefore, more work is required on awareness and advocacy.



Advocating the rational use of antimicrobials and control of transboundary animal diseases

The Fleming Fund Country Grant organised awareness seminars for field veterinarians and livestock farmers on the rational use of antimicrobials and control of transboundary animal diseases, at Veterinary Hospital Mekangi Road Quetta, Nagori Bhains Colony Superhighway Karachi,



Mushtaq Hajiano village District Mitiari. Dr Usman Zaheer (Surveillance Specialist, HSP - Fleming Fund Country Grant) and Dr Javaria Alam (Health Promotion Specialist, HSP - Fleming Fund Country Grant) stressed the importance of vaccination to minimise the need for antibiotics by preventing and controlling infectious diseases in dairy animals. Dr Alam advised dairy farmers to vaccinate and deworm their animals regularly.

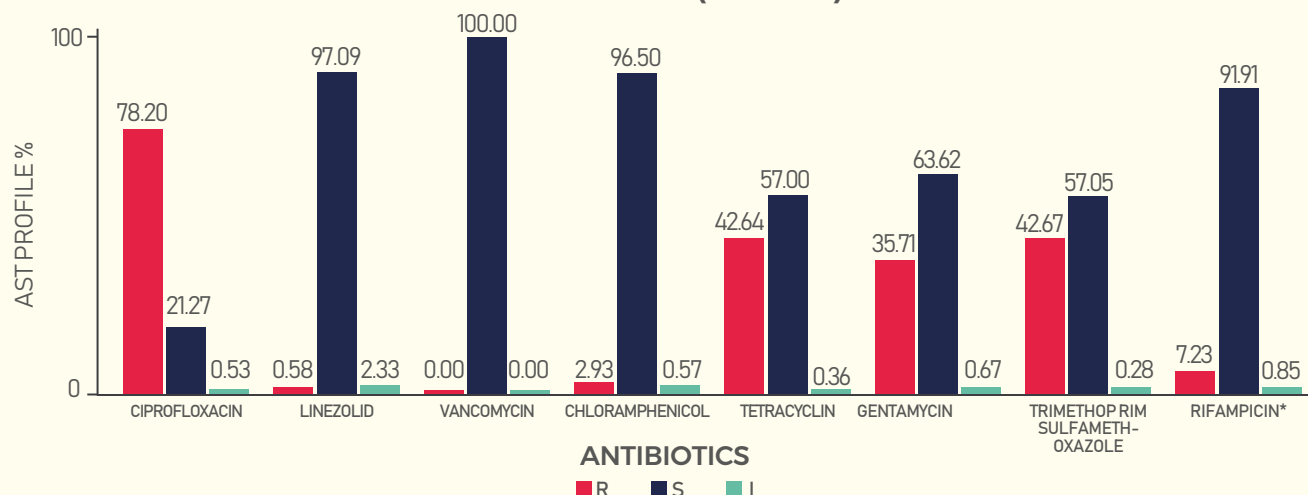
Surveillance Data

Human Health

Staphylococcus aureus (*S. aureus*) has long been known as a adaptive human pathogen which causes a variety of community and hospital-acquired infections, which range from local and harmless skin infections, such as furuncles and abscesses, to severe systemic infections, such as osteomyelitis, pneumonia, endocarditis, or sepsis.

Methicillin Resistance *S. aureus* (MRSA) has rapidly become the most frequently occurring antibiotic resistant pathogen globally.

Antimicrobial Susceptibility Testing (AST) Profile of MRSA Year 2020 - (n=7867)

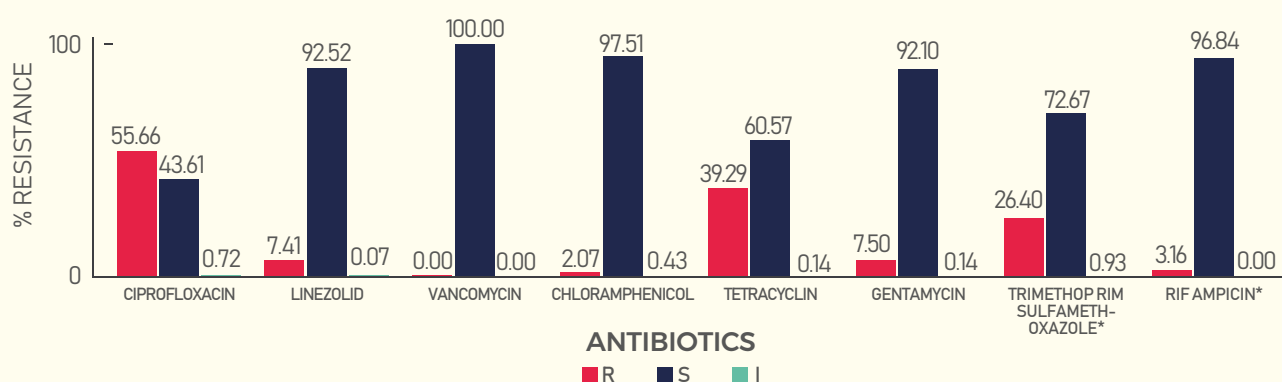


*Data from the three sentinel sites is available and reflected in the graph.

The findings suggest:

- From a total of 20,213 isolates of *Staphylococcus aureus*, a total of 7867 MRSA was reported from 15 sentinel laboratories during 2020. All the isolates were sensitive to vancomycin (100%).
- 97% of the isolates were sensitive to Linezolid.
- Rifampicin was found to be sensitive in 91.91% of isolates.
- Among conventional antibiotics used for the MRSA treatment, the resistance profile reveals resistance to Chloramphenicol remained low with 2.93%, Tetracycline is 42.6% and Gentamycin in 35.71% and Trimethoprim Sulfamethoxazole 42.67% respectively.

Antimicrobial Susceptibility Testing (AST) Profile of MSSA Year 2020 - (n=5019)



*Data from the three sentinel sites is available and reflected in the graph.

The findings suggest:

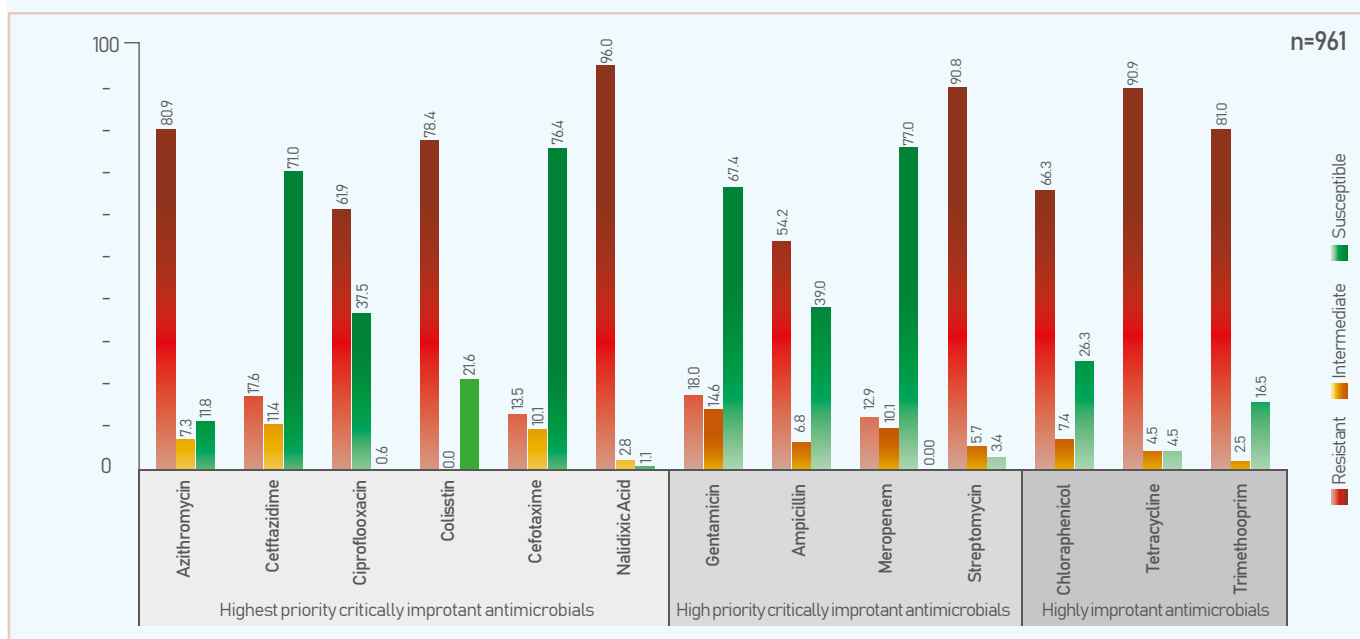
- A total of 5019 Methicillin Sensitive *S. aureus* (MSSA) was reported from 15 sentinel laboratories during 2020.
- All the isolates were sensitive to vancomycin (100%).
- Resistance profile for the reported antibiotics is considerably lower in MSSA isolates as compared to MRSA isolates.

National AMR Surveillance in Healthy Food Animals

The AMR surveillance pilot initiated in July 2020 to ascertain the pattern and trends of antimicrobial resistance in commensal and zoonotic foodborne pathogens isolated from healthy broilers and cattle/buffalo at slaughter points; significant progress has been made through support from the Fleming Fund Country Grant Pakistan. Followings are the resistance pattern trends for 961 isolates of *E. coli* and *Salmonella* spp., subjected to AST from 1469 caecal contents samples of in Poultry and 1165 isolates of *E. coli* and *Enterococcus* spp. from 1628 faecal samples of Livestock, collected from all sentinel sites working under national surveillance strategy for AMR in healthy food animals.

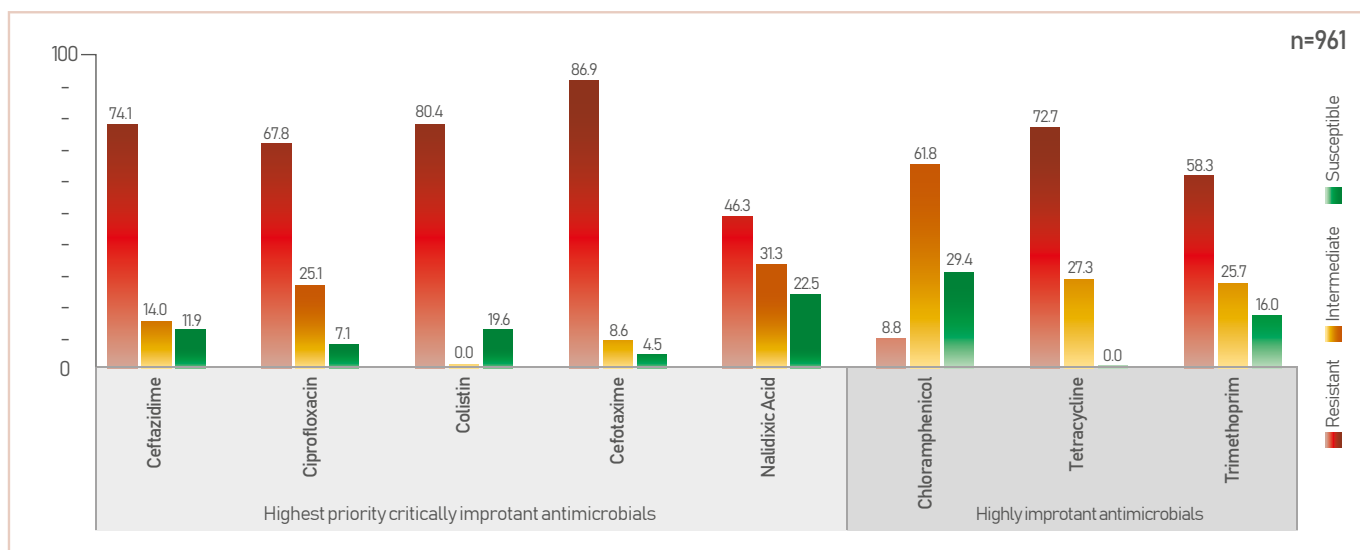
Resistance pattern of *E. coli* isolates from poultry caecal samples

- Nalidixic acid, Ciprofloxacin, and Azithromycin of highest priority critically important antibiotics have shown >60% resistance while Cefotaxime and Ceftazidime (Cephalosporins) have shown higher susceptibility.
- Of high priority critically important antibiotics, Streptomycin and Ampicillin shown high >80% resistance while gentamicin and meropenem are highly susceptible.
- All highly important antibiotics including chloramphenicol, Tetracycline and Trimethoprim have shown higher >65% resistance.



Resistance pattern of *Salmonella* spp. isolates from poultry caecal samples

- Azithromycin, Colistin and Nalidixic acid of highest priority critically important antibiotics have shown >70% resistance whereas Ciprofloxacin >60% while Cefotaxime and Ceftazidime have shown least <20% resistance
- Of high priority critically important antibiotics, gentamicin and meropenem are <20% resistant but ampicillin and streptomycin have shown higher resistance.
- All highly important antibiotics including chloramphenicol, Tetracycline and Trimethoprim have shown higher >65% resistance against *Salmonella* isolates of poultry.



Visit of Liverpool School of Tropical Medicine team to the NIH

The Liverpool School of Tropical Medicine (LSTM) team, including Russell Dacombe and Heather Galloway, visited the NIH during 1st to 5th March 2022. The LSTM team provides their technical expertise in Lab systems, capacity strengthening and ISO accreditation to the Fleming Fund Country Grants, worldwide. The LSTM, as part of the Fleming Fund Country Grant Pakistan, has been providing technical support to the National Reference Labs for their capacity building.

The LSTM team:

- Audited and advised the lab staff on Biosafety Assessments and complying with the protocols of a BSL II level laboratory, of microbiology testing and lab results
- Assessed different components of the newly refurbished Microbiology laboratory, including the microbiology equipment, bench protocols, waste management, biosafety protocols and updated SOPs, using the LSTM Biosafety audit tool
- Advised on the National External Quality Assurance (NEQAS) program, which they are actively supporting the NIH team in. The team shared their expertise in how to fill the gaps to obtain ISO 17043
- Provided an introductory lecture on how to efficiently use the 2 state-of-the-art equipment – VITEK MS (MALDI-ToF) and VITEK 2 Compact in the NIH lab, and issues commonly faced in low – middle income countries (such as Pakistan)



The Executive Director of the NIH was updated on their findings and the following points were discussed:

- Post refurbishment follow-up of the biosafety assessments at the National Reference Laboratories (NRL) including the NIH.
- The LSTM with the help of Fleming Fund Country Grant, will continue to support NIH Proficiency Testing Program (Micro NEQAS NIH) for ISO17043 preparations.
- Progress review and way forward of ISO-17043 activities at the animal health sector NRLs.
- Strengthening of biorepository system at the NIH with the support of the Fleming Fund Country Grant

JOURNAL CLUB

Antimicrobial Use in Veterinary Sector in Pakistan

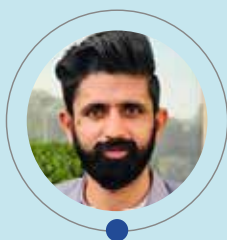
The 15th journal club was aimed to strengthen the understanding and knowledge of Antimicrobial Use (AMU) pattern in the Livestock and Poultry sector of Pakistan. This journal-based webinar helped future scientists and veterinarians to decipher the trends of AMU in the veterinary setting. Dr Taimoor Hamid Chaudhry (Senior Scientist, NIH) and Dr Farooq Tahir (Technical Advisor One Health, Fleming Fund Country Grant Pakistan) shared their expertise and briefed on the importance of AMU data for future interventions in the veterinary sector.

15th Virtual Journal Club

“Microbiology and Antimicrobial Resistance”

Topic: Antimicrobial Use in Veterinary Sector in Pakistan

SPEAKER



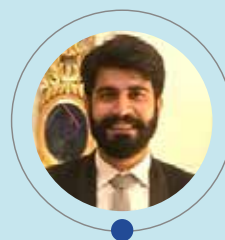
Dr Jabir Ali
M.Phil. Microbiology,
University of Agriculture
Faisalabad

SME



Dr Farooq Tahir
Technical Advisor,
One Health Fleming Fund
Country Grant Pakistan

MODERATOR



Dr Taimoor Hamid Chaudhry
Senior Scientist Veterinarian,
National Institutes of Health,
Islamabad



Date:
22 June, 2021



Time:
6:30pm - 8:00pm (PST)



Registration Link:

<http://echo.zoom.us/meeting/register/tJAsdoGgrDoiG9XGFZdGymMmO56cTQCdTVG>

Trainings

Hands-on Training on Basic Microbiology and Laboratory Biosafety

The National Veterinary Laboratories (NVL), Islamabad through the support of Fleming Fund Country Grant Pakistan conducted a 5 day hands-on training on “Basic Microbiology and Laboratory Biosafety” during 8 - 12th November, 2021. 12 laboratory veterinarians/technicians from Gilgit Baltistan Veterinary Lab, Disease Investigation Laboratory, Quetta, Central Veterinary Diagnostics Lab and Poultry Production and Research Institute Karachi were trained for basic microbiological techniques used in AMR surveillance, laboratory biosafety and AMR data management using WHONET. The objective was the strengthening of human resources of sentinel poultry and livestock labs of Gilgit Baltistan, Balochistan and Sindh.



Strengthening the National AMR Reference labs in the Animal Health Sector

The AMR reference laboratories continue to be strengthened for efficient automated identification and susceptibility testing of antibiotics in the animal health sector, parallel to human health support of the Fleming Fund Country Grant Pakistan. The Ministry of National Food Security and Research under the Fleming Fund Country Grant has provided a state of the art MALDI and BD Phoenix™ equipment to both the National Veterinary Laboratories (NVL) MoNFS&R and the National Reference Laboratory for Poultry Diseases, National Agriculture Research Centre (NARC) Islamabad.

Provincial updates on AMR

Provincial Headquarters Hospital, Gilgit Baltistan (PHQ-GB)

The microbiology lab located in the Provincial Headquarters Hospital, Gilgit Baltistan (PHQ-GB) due to limited resources, including technical capacities was not able to conduct microbiological culture and sensitivity testing for the last seven years. The patients were referred to a private sector lab to get their cultures done which was very costly and only a few patients were able to afford it.

The Fleming Fund Country Grant's support for the improvement of the basic infrastructure, including the provision of consumables and equipment has led to the initiation of a functional microbiology lab with the ability to run standardised microbiology diagnostic testing. A

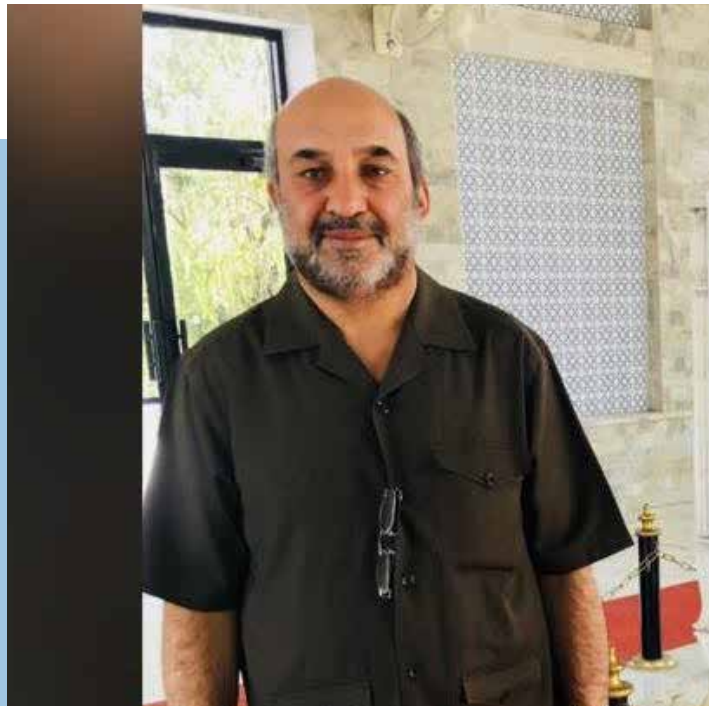
technical expert from Indus Hospital & Health Network (IHHN) is also working on the validation of the processes and mentoring the lab staff regarding maintenance and quality assurance.

The microbiology lab based at the Provincial Headquarters Hospital, Gilgit Baltistan (PHQ-GB) has become functional and has started processing blood cultures, including other basic microbiology testing. The lab operationalisation will reduce out-of-pocket expenditures of patients visiting PHQ-GB. The Secretary of Health, Gilgit Baltistan inaugurated the upgraded microbiology lab located at the PHQ.



MESSAGE

AMR FOCAL PERSON DRUG REGULATORY AUTHORITY, PAKISTAN



AMR has become a health challenge owing to more irresponsible attitudes of healthcare professionals, patients, entrepreneurs and policy makers than due to the mutation abilities of pathogens.

However, this challenge has highlighted many flaws in our healthcare system, we need to fill the gaps for building a healthier community and coexisting with the pathogens.

AMR has brought many stakeholders together to coordinate and benefit from each other, not only in sole objectives, activities but also in our national interest.

Optimising the use of antibiotics is critical to effectively treat infections, protect patients from harm caused by unnecessary antimicrobial use and combat antimicrobial resistance. To start with multi-pronged strategies and as a first step Antimicrobial Stewardship Programs (ASPs) can help clinicians improve clinical outcomes and minimize harm by improving antibiotic prescribing. Sustainable policy decisions on changing aspects of the AMR phenomenon are vital on multiple levels.

Dr Masud-ur-Rehman

Director,
Division of Pharmacy Services,
Drug Regulatory Authority of Pakistan



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