



QUARTERLY Antimicrobial Resistance (AMR)

NewsLetter

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UK High Commission Visit & Inauguration of Reference Laboratories

The United Kingdom Department of Health and Social Care (DHSC) visited and attended the inauguration ceremony of the upgraded National Reference Lab at the NIH organised by the Fleming Fund Country Grant. The inauguration ceremony was conducted by the representatives of the UK Department of Health and Social Care (DHSC) and the Chief Public Health Laboratory Division of the NIH. The team members of the UKHSA, Fleming Fund Country Grant and senior staff members of the NIH attended the ceremony.



Third National AMR Steering Committee Meeting

The Ministry of National Health Services, Regulation and Coordination (MoNHSR&C) and the National Institute of Health (NIH), in collaboration with the Fleming Fund Country Grant, convened the third National Antimicrobial Resistance Steering Committee meeting on 07 June 2022 in Islamabad. The Director-General of Health, MoNHSR&C chaired the meeting. The national and provincial stakeholders from human health and animal health, including international partners and donor representatives, health professionals and members of academia attended the meeting.

The steering committee reviewed the progress on AMR National Action Plan to identify the resource needs and implementation challenges at the national and provincial levels within different sectors and discuss the way forward.



Recommendations:

- The development of provincial AMR committees and PC-1 in line with strategic objectives and priorities of the Global and National Action Plans.
- Strengthen AMR Surveillance in humans, animals & environment.
- Strengthen and sustain functionality of Operationalise National Reference Labs at the NIH and National Agriculture Research Centre (NARC).
- IPC system building at Health Care Facilities (HCF), national, provincial & district level
- Linking AMR surveillance with IPC & AMC to define stewardship policies at the national and institutional/hospital level
- Improved advocacy at the level of policy makers/decision makers



“Containment of AMR needs a multisectoral One-Health approach and requires stakeholders from the three sectors, i.e., Human Health, Animal Health and Environment sector to join hands. A holistic approach should be adopted including the public and private sectors and involving the pharmaceutical industry”.

Dr Rana Mohammad Safdar

*The Director-General of Health,
MoNHSR&C Islamabad*

“AMR is a global health challenge and all stakeholders need to join hands, trends need to be built through AMR Surveillance”.

Dr Nicholas John Adkin

*Head of Global Operation, UKHSA
UK Department of Health & Social Care*

“AMR has been identified as one of the top 10 public health threats. According to UK Department of Health by the year 2050, it is estimated that 10 million deaths may occur across the globe, with a reduction of 2 to 3.5 percent in GDP and costing up to \$100 trillion to the world”.

Dr Muhammad Salman

Chief Public Health Laboratories Division, NIH

Consultative meeting on AMR Surveillance Strategy for Human Health Sector

A Consultative Meeting was conducted on the “AMR Surveillance Strategy for Human Health Sector” with partners and stakeholders on 2nd June 2022 by the National Institute of Health. The purpose of the meeting was to highlight the main objectives of the strategy and get feedback from stakeholders. Pakistan AMR Surveillance System (PASS) is being established under the strategy and it aims to estimate the AMR burden in priority pathogens for uniformity decision-making and taking interventions to contain the AMR burden. It describes the procedures for establishing and enhancing AMR surveillance in Pakistan in the Human Health sector. The document will enable standardisation of data collection processes, methods and tools to ensure data comparability and enhanced understanding of the AMR burden in the country.

Goal of Pakistan AMR Surveillance System

The primary goal of the Pakistan AMR Surveillance System (PASS) is to estimate the AMR burden among priority pathogens for informed decision making and devising interventions to contain the AMR burden.

Pakistan AMR Surveillance System



National
Coordinating
Center



National
Reference
Laboratory



AMR
Surveillance
Sentinel Sites

Three Pillars of PASS

Coordination meeting with Drug Inspectors of Gilgit Baltistan (GB)

The NIH team visited the Drug control administration Health Department Gilgit Baltistan on 29th May 2022. The team had detailed meeting with the chief drug inspector and secretary of Quality Control Board, as well as field inspectors.

The team representatives briefed them on the AMR roadmap, the National action plan on AMR and its objectives. They were briefed about the technical working group constituted for the purpose of revision of drug rules and schedules and guided them to make an initial draft on AMR and AMC considering the challenges of antimicrobials optimization in GB.



Meeting with Promoting the Quality of Medicine (PQM+) USAID Officials

Mr. Khalid Saeed Bukhari (Principal advisor & Chief of Party, Promoting Quality of Medicine plus (PQM) United States Pharmacopoeia (USP) Mr Waqas Ahmed had a meeting with the National AMR focal person, Dr. Muhammad Salman at the NIH, Islamabad.

USP representatives briefed the AMR team about their activities, focusing on Laboratory assessments and accreditations, as it is a part of the National Action Plan. In coordination with PNAC, they have conducted "Lead Auditor" courses and training, all over Pakistan, with the aim to prepare labs for accreditation. They presented a list of laboratories that they have assisted in accreditation and WHO prequalification. They briefed about their expert team for lab assessments, working with Drug testing labs and extension to clinical diagnostic labs. Both parties identified the areas where they can work in coordination for lab strengthening and accreditations.



The team also visited the Drug testing laboratory in GB, used for water testing, food testing and drugs testing. The funds for a separate food testing laboratory have been approved. The Lab is well established in terms of infrastructure, building and desired equipment. Clean rooms are maintained according to the number and size of particles permitted per volume of air, through installation of HEPA filters and have advanced HPLC for drugs testing. Gaps were identified and discussed for further improvements. The NIH offered to provide technical assistance for the accreditation process of the lab after conducting the preliminary assessment.



Progress Review Meeting for AMR Surveillance Pilot in Healthy Food Animals

There is on-going AMR surveillance which was piloted in healthy food animals. This is being followed by a national surveillance strategy for AMR in healthy food animals developed by Ministry of National Food Security and Research (MoNFS&R) and the Fleming Fund Country Grant Pakistan. The progress of AMR surveillance pilot at National AMR Laboratory and allied gaps were also identified to improve procedure for bacterial isolation. A progress review meeting for antimicrobial resistance

surveillance pilot in healthy food animals was organized on 28th February 2022. Laboratories personnel from the National Reference Lab for Poultry Diseases, NARC and the National Veterinary Laboratories and the Fleming Fund Country Grant team members participated and progress of both NRLs was shared. It was decided to have quarterly meetings on AMR surveillance results with national AMR reference labs before sharing with provinces.

Consultative Meeting to Deliberate Key Elements of Veterinary Drug Prescription

Fleming Fund Country Grant Pakistan, in collaboration with the Ministry of National Food Security and Research (MoNFS&R) organised one day "Consultative Meeting to Deliberate on Key Elements of Veterinary Drug Prescription Guidelines" on 3rd March 2022. The Knowledge, Attitudes and Practices (KAP) surveys of field veterinarians highlighted the unavailability of drug prescription guidelines for veterinarians, to follow when dealing with diseases, specifically priority infectious diseases in food animals. Based on this need, the Fleming Fund Country Grant and MoNFS&R are developing drug prescription guidelines for diseases in food animals.

Participants from Livestock Departments of Punjab, South Punjab, Sindh, Balochistan, Khyber Pakhtunkhwa, Gilgit Baltistan, AJK, University of Agriculture Faisalabad, University of Veterinary and Animal Sciences Lahore,

Cholistan University of Veterinary and Animal Sciences Bahawalpur, PMAS Arid Agriculture University Rawalpindi, Poultry Research Institute Rawalpindi, National Veterinary Laboratory Islamabad, NRLPD Islamabad, Animal Health Program NARC, FAO Pakistan, National Institute of Health (NIH) and private stakeholders joined the session. Current practices of veterinary practitioners of diagnosis and treatment of different diseases, and possibilities to improve the current practices were discussed. All participants prioritized items related to veterinary drug prescription guidelines. Dr Muhammad Akram (Animal Husbandry Commissioner) indicated that such guidelines for judicious use of antibiotics are of prime importance for the livestock sector. He appreciated the efforts of the Fleming Fund Country Grant to take this initiative.



Farmers Day with the ARID Agriculture University Rawalpindi

Animal health team of Fleming Fund Country Grant collaborated with the Department of Clinical Sciences, Faculty of Veterinary and Animal Sciences, PMAS Arid Agriculture University Rawalpindi to conduct a farmers' day at village Mian Ahmed on 16th March 2022. At this session, a free medical camp was arranged for farmers and the Fleming Fund Country Grant team conducted awareness of more than 50 DVM students and dairy farmers on antibiotic resistance, biosecurity, herd health management and transboundary animal disease control to minimise the use of antibiotics. Awareness material in Urdu was provided to all farmers and in English to veterinary students. Dr Arif Zafar (Chairman, Clinical Sciences, PMAS Arid Agriculture University Rawalpindi) demonstrated how to avoid antibiotics, by using antibiotic alternatives.



Awareness Session on AMR, AMU, Transboundary Animal Diseases (TADs) and Herd Health Management at the University of Veterinary and Animal Sciences Lahore

The Fleming Fund Country Grant and the Ministry of National Food Security and Research in collaboration with the University of Veterinary and Animal Sciences (UVAS) Lahore conducted an awareness webinar on antimicrobial resistance (AMR), antimicrobial use (AMU), transboundary animal diseases (TADs) and herd health management" with UVAS final year DVM students on 7th April 2022. The session was chaired by the honourable vice-chancellor, UVAS. The students were assessed, pre-session and post-session, for their knowledge on AMR/AMU. Significant improvement about the knowledge of AMR/AMU among students was observed. The speakers briefed on the importance of antimicrobial resistance/use and how Pakistan is tackling this issue. Prof. Dr Naseem Ahmad appraised the organisers and advised the students on the prudent use of antibiotics in the field.



Mentoring Session on Basic Microbiology (Sample Collection, Transportation, Bacterial Isolation and Antimicrobial Susceptibility Testing)

To extend the AMR surveillance activities in aquaculture, a laboratory at Aquaculture & Fisheries Program (AFP, NARC) has been assessed. To improve the microbiology capacities of the provincial laboratories, the staff of all sentinel labs has been trained in basic microbiological techniques. In this background, a mentoring session on basic microbiology for staff of disease investigation laboratory Peshawar and AFP laboratory, under the leadership of NVL and NRLPD, was organised from 19th - 22nd April 2022. The participants consisted of laboratory veterinary officers, laboratory technicians, research fellow and program in-charge, who were trained in sample collection, labelling and transportation processes, bacterial isolation, identification processes, AMR data management and were familiarised with laboratory quality management systems, ISO 17025 and National External Quality Assurance Scheme (NEQAS). The ultimate objective of such activity to promote diagnostic harmonisation at all sentinel AMR labs.

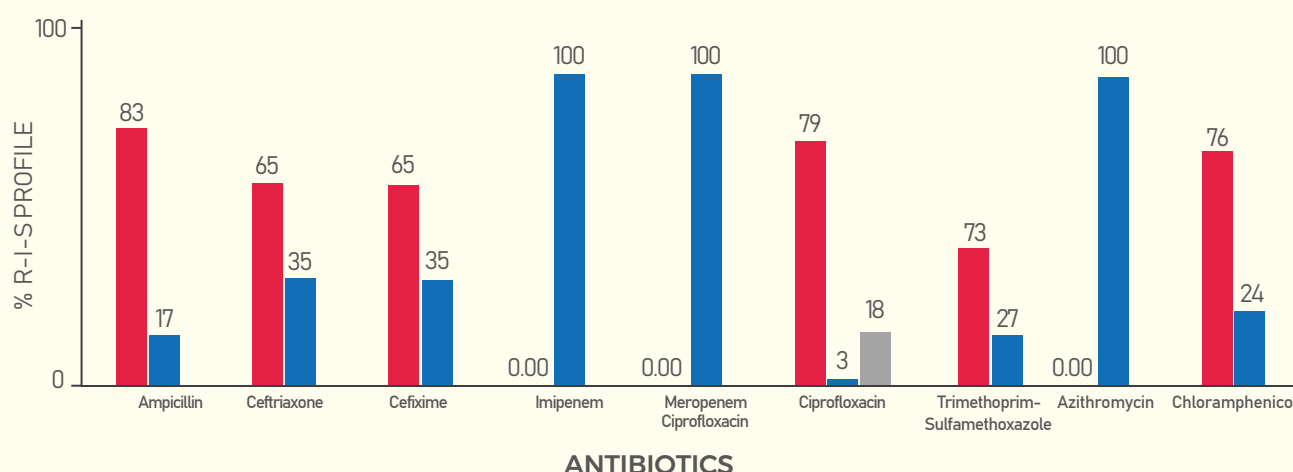


Surveillance Data

Human Health

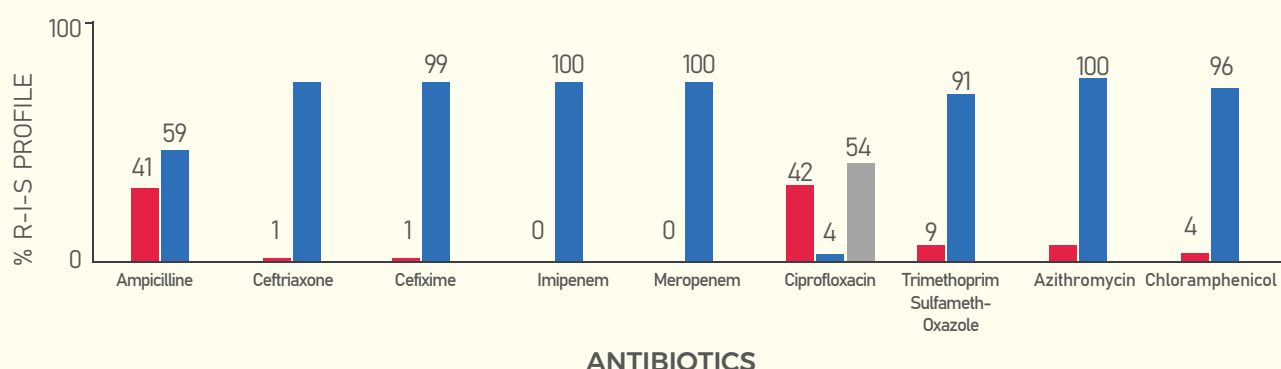
Salmonella Typhi (S. Typhi) is the leading cause of typhoid fever. Typhoid fever poses a major public health threat with high morbidity and mortality rate mainly in developing countries.

AST profile of S. Typhi year 2020 (n=2742)



A total of 2742 isolates of S. Typhi were reported from 15 sentinel sites in the year 2020. Antimicrobial Susceptibility Profile shows high-level resistance to the first-line antibiotics (Ampicillin 83%, Trimethoprim-sulfamethoxazole 73%, Chloramphenicol 76%) previously used for the treatment of typhoid fever. Similarly, 79% of isolates showed resistance to Ciprofloxacin and 65% to ceftriaxone which are the potential drugs of choice after first-line antibiotics. Imipenem, Meropenem and Azithromycin remain 100% sensitive to all the isolates.

AST profile of S. Paratyphi A year 2020 (n=369)



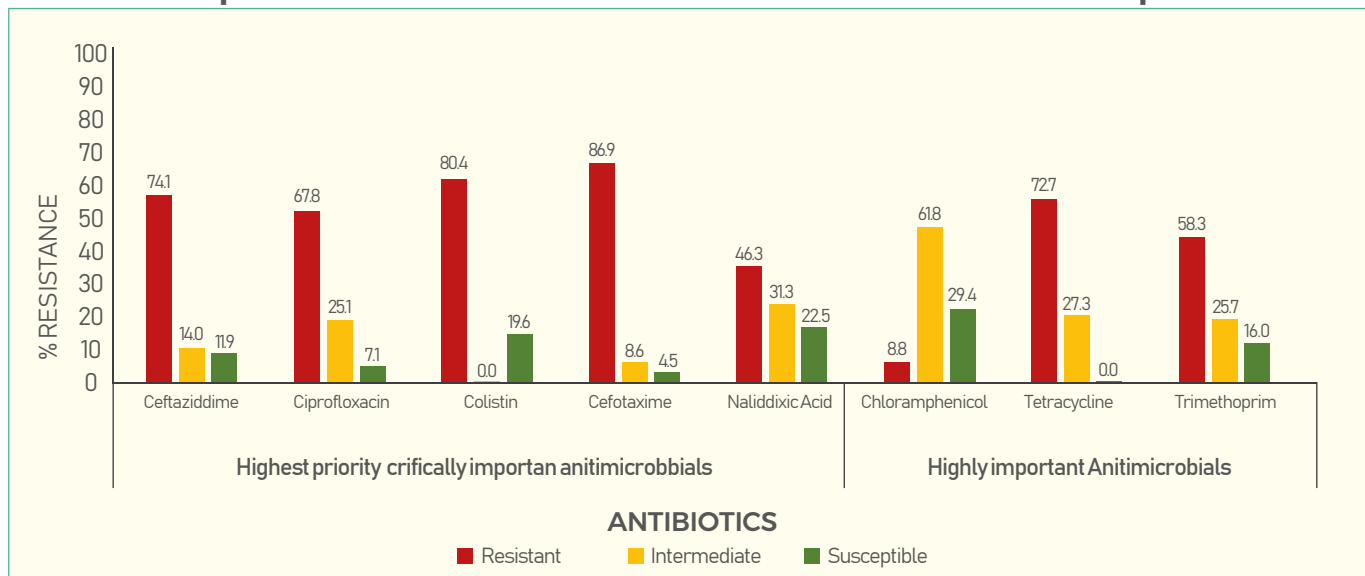
A total of 369 isolates of S. Paratyphi A were reported from 15 sentinel sites in 2020. S. Paratyphi A showed 99 - 100% sensitivity to Cephalosporins and Carbapenems. Ampicillin was resistant to 41% of the isolates. Similarly, 42% of isolates were resistant and 54% were Intermediate to Ciprofloxacin.

Animal Health

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

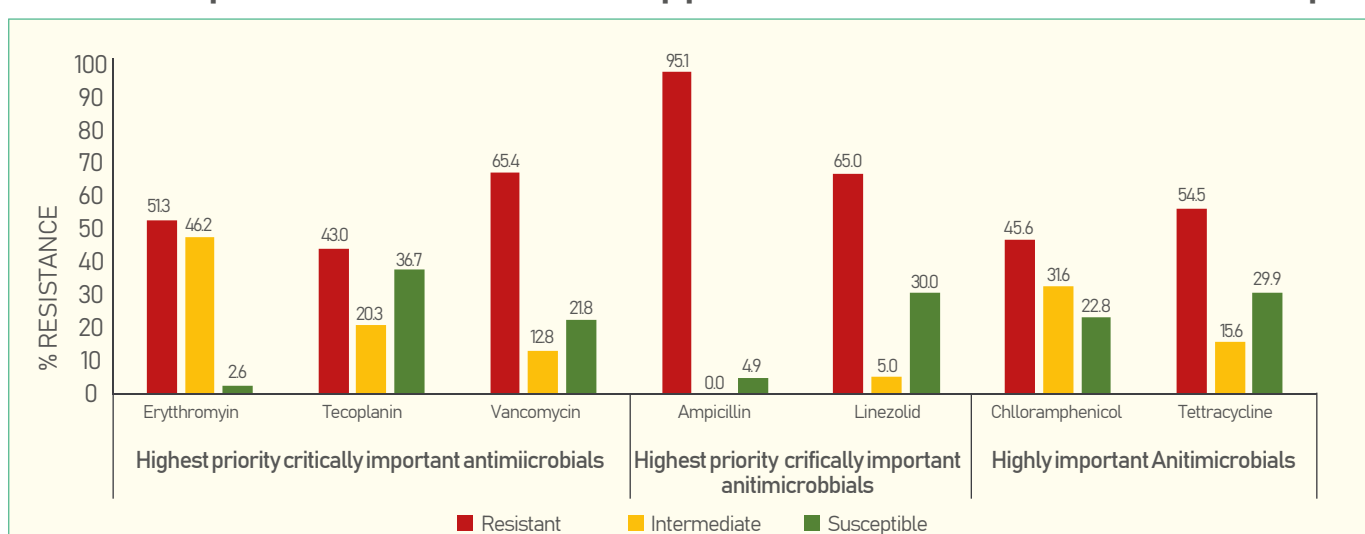
- Azithromycin, Colistin and Nalidixic acid of highest priority critically important antibiotics have shown >70% resistance whereas Ciprofloxacin >60% while Cefotaxime and Ceftazidime have shown least <20% resistance
- Of high priority critically important antibiotics, gentamicin and meropenem are <20% 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.

Resistance pattern of *E. coli* isolates from livestock faecal samples



- All highest priority critically important antibiotics have shown considerably higher resistance, except Nalidixic Acid.
- *E. coli* is more resistant towards the antibiotics frequently used in animals including tetracycline and trimethoprim among highly important antibiotics. Chloramphenicol pattern is different from other antibiotics.

Resistance pattern of *Enterococcus* spp. isolates from livestock faecal samples



- *Enterococcus* has shown 95.1% resistance towards Ampicillin, and nearly 65% towards Linezolid and Vancomycin.
- Highly important antimicrobials viz. Tetracycline and Chloramphenicol, as well as other antimicrobials including Erythromycin and Teicoplanin have shown nearly 50% resistance.

Microbiology National External Quality Assurance Scheme NIH (Micro-NEQAS NIH)

Ayesha Zaman works as a scientist at the microbiology lab of the National Institute of Health's (NIH). She works as a focal person for NEQAS (National external quality assurance scheme) since 2016. She has put dedicated efforts in establishment of NEQAS and ever since working to upscale the program. She with her determined and focused approach pursues goal of ISO 17043 conformance for NEQAS.

NEQAS is vital to ensure correct testing to improve patient management. The main purpose of external quality assessment (EQA) is to establish inter-laboratory comparability of results and thereby to improve performance.

The NIH acts as the country's reference lab and external quality assurance provider. The Microbiology National External Quality Assurance Scheme NIH (Micro-NEQAS NIH) of the National Institute of Health works as both the organiser and PT Provider for bacterial culture and sensitivity.

National Institute of Health (NIH), in liaison with the Fleming Fund Country Grant and technical support from Liverpool School of Tropical Medicine (LSTM), has been working on ISO 17043 preparedness for Microbiology National External Quality Assurance Scheme. In this context, the documents, procedures and scoring scheme has been improved based on international standards.

Quality Assessments are a very useful indicator of a laboratory's performance. The Micro NEQAS has been serving since 2016. Until now 5 surveys have been conducted.

The survey 2021-1 was conducted in accordance with the updated NEQAS statistical model.



Progress towards ISO 17043

The NIH continues to make excellent progress towards ISO 17043 accreditation for the updated proficiency testing scheme for microbiology. The NIH has implemented several quality procedures to ensure the ongoing quality of the PT scheme. Firstly, the quality department undertook an audit of the PT scheme to assess the readiness of NIH for ISO 17043 in November 2021. The Liverpool School of Tropical Medicines (LSTN) reviewed the progress they have made towards ISO 17043, and suggestions were made to ensure all the specifications for accreditation are covered. Secondly, feedback from labs on the scheme was also received in the form of email, feedback questionnaires, and most recently, feedback sessions with participants. The combined findings from

the audit, and feedback from participants has led to changes in internal and external procedures. Most notably, the instructions distributed with the PT items have been updated and the return results form has been amended to allow laboratories to report additional antibiotics as per their internal protocols.

Another exciting development in the ISO 17043 process, was the incorporation of the new technology at the NIH into the quality control testing of the test isolates. Both the VITEK MS and the VITEK 2 were used to confirm the test items for the second round of PT both before and after distribution. The incorporation of this technology into the routine testing of PT items ensures results are highly accurate and reliable.

Upscaling Tri-cycle *E. coli*

NIH with the collaboration of the WHO country office has conducted 3 days Hands-on Laboratory Training for "Capacity Building of Laboratory Staff in ESBL *E. coli* Tri-cycle Surveillance" held during 29 - 31 March 2022 for the participants of Khyber Pakhtunkhwa. The project started in 2018, after piloting in ICT and now moved on to provincial up-scaling. The objective of the training was to provide sentinel sites with a common, simplified, and integrated multi-sectoral surveillance system, designed to detect and estimate the prevalence of a microorganism indicator, *E. coli*, producing a specific resistance mechanism conferring resistance to third-generation cephalosporins (ESBL) in three key sectors i.e., Human, Animal and Environment. Resources from the National Institute of Health (NIH), National Veterinary Laboratories (NVL) and Environment Protection Agency (EPA) were engaged to facilitate the participants from Rehman Medical Institute, Northwest general hospital, Livestock & Dairy Development

Department and Environment Protection Agency Peshawar respectively. Several interactive sessions, on-site sampling and microbiological techniques were carried out and deliberations on frequency and modality of data were also discussed among the participants.

Executive Director and Chief, PHLD NIH attended the sessions to encourage the participants to further collaborate among three sectors for integrated AMR surveillance and One Health transmission dynamics of AMR-related factors.



Provincial Updates

Strengthen AMR Data Sharing Mechanism in the Sindh Province

The Fleming Fund Country Grant Pakistan Sindh team has been successful in advocating the adoption of the newly devised data-sharing mechanism to the relevant hospital management and health department officials. The selected hospitals have now agreed to share their hospital AMR data with the health department on a quarterly basis. Considering this agreement, the following tasks have been accomplished:

- As per the devised strategy, the health department issued directives to targeted hospitals to share AMR data with Director General Health Services office on regular basis.
- The two largest public sector hospitals in Sindh (Jinnah Postgraduate and Medical Center (JPMC), Karachi and Civil Hospital, Karachi have shared AMR data for January – March 2022, with the Director-General Health Services, Sindh.
- The Director General Health Services, Sindh shared the data with the National Institutes of Health in May 2022.
- In order to expand the AMR surveillance network in Sindh, the Health Department has also directed the management of two new sentinel sites: the Liaquat University of Medical and Health Sciences (LUHMS) and the Peoples University of Medical and Health Sciences (PUMHS), to share AMR data with the AMR Secretariat.
- The Fleming Fund Country Grant Team held a meeting with the management of Khyber Medical University Public Health Reference Laboratory in the month of June 2022. The KMU management has consented to offer their services & their lab to be officially declared as the Provincial AMR Reference Lab. The Fleming Fund technical team assessed the provincial 'Public Health Reference Laboratory' and will provide consumables and capacity-building training to Lab staff.

Khyber Pakhtunkhwa

- To support and strengthen the diagnostic services for antimicrobials Resistance/culture sensitivity investigations the existing Lab of the Directorate of Livestock & Dairy Development Department was refurbished and handed over to the department. The Director General Livestock & Dairy Development appreciated the good work and support of Fleming Fund Country Grant management team.
- The Fleming Fund Country Grant organized a capacity-building session in Peshawar to implement the Dashboard of key AMR indicators for Khyber Pakhtunkhwa (KP) province. The session focused on "System Administration" training as well as the capacity building of end-users from the KP Livestock and Dairy Development Department (L&DD).



MESSAGE

AMR FOCAL PERSON GB

Antimicrobial resistance is becoming an issue of major concern both for public and animal health. The issue is becoming worsened over the period. In Gilgit- Baltistan, the initiative taken by the Fleming Fund Country Grant is one of the pilot projects on antimicrobial resistance particularly in animal health sector, while prior to this, a very limited work has been done particularly in GB. During the project tenure main Veterinary laboratory in Gigit-Baltistan was assessed and capacity building of staff was conducted.

As a focal person for AMR/AMU animal sector GB, I worked closely during sample collection, dispatch and analysis of results. During the same period multiple seminars both for veterinarians and farmers were conducted to create awareness about growing AMR and to minimize AMU in the animal sector.

Gilgit Baltistan imports most of the food commodities including poultry and livestock products from other parts of Pakistan and due to that reason AMU in the animal sector is merely manageable, while human health is at stake too. To contain growing AMR there is a dire need to combat the issue through one health approach both at the provincial and national level. There should be coordination between the stakeholders to minimise its impact by strengthening the surveillance sites. Action plans and/or strategies to lessen the growing AMR on the provincial level are also needed both in the human and animal health sector.

Finally, I would like to express my gratitude to the Fleming Fund Country Grant for piloting the initiative, highlighting its importance and its future impact and for providing physical and technical assistance both at national and provincial level.

Pakistan at present has a huge burden of multi and pan resistant bacterial infections leading to significant mortality and morbidity, consequently, limiting out options for treating infectious diseases.

Dr Sumaira Baig

Veterinary Officer, GB Veterinary Laboratory Gilgit
Focal person AMR/AMU AH sector GB



MESSAGE

DIRECTOR GENERAL OF HEALTH - MONHSR&C

The government of Pakistan has included Antimicrobial Resistance (AMR) containment as priority agenda and fully endorsed the Global Action Plan for AMR adopted vide the resolution World Health Assembly (WHA) 68.7 during the 68th WHA, with five strategic objectives; 1. To improve awareness and understanding of antimicrobial resistance; 2. To strengthen knowledge through surveillance and research; 3. Reduce the incidence of infection; 4. To optimise the use of antimicrobial agents; 5. To develop economic case for sustainable investment based on country needs and increase investment in new vaccines, diagnostics and other interventions.

The Government of Pakistan has taken several key initiatives and interventions to support the AMR agenda within the country, i.e., Designated National Focal Person for AMR, Notified multi-sectoral & multi-disciplinary AMR oversight committee, Endorsed National AMR Containment Strategic Framework-Pakistan based on the "One Health" approach, Endorsed National AMR Action Plan with seven strategic priorities in line WHO, Global Action Plan for AMR, Approved National PC-1 with the cost of 361.9 million PKR for AMR Containment and Infection Prevention and Control for a period of 3 years.

Endorsed National Action Plan for XDR Typhoid, Designated NIH as the focal point for AMR Global Antimicrobial Surveillance System (GLASS) and data is shared on WHO GLASS portal for last 4 years and Point prevalence survey on AMR Consumption has been initiated to include all major tertiary care hospitals across the country.

Moreover, The Ministry of NHSRC is collaborating with other stakeholders, organisations and professional societies to undertake various initiatives like setting integrated AMR surveillance, antibiotic stewardship program, antimicrobial consumption and utilization surveillance, developing different guidelines on AMR and capacity enhancement of AMR-related laboratory diagnostics. Pakistan aims to implement the National Action Plan and endorses the challenges to tackle AMR through a One Health approach effectively, to achieve the delivery of Sustainable Development Goals.

Dr. Shabana Ahmed

During this period Dr Safdar was DGH
The Director-General of Health
Ministry of National Health Services Regulation
& Coordination Islamabad



The
Fleming Fund



CONTACT DETAILS

Email: munnaza_sarfraz@dai.com, amr@nih.org.pk
Address: National Institutes of Health, Islamabad.



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