

Current status of AMU/AMR monitoring and surveillance in Bangladesh

WOAH Laboratory Training on AMU/AMR Surveillance in Terrestrial Animals

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World Organisation
for Animal Health
Founded as OIE

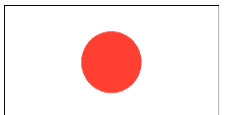


Rakuno Gakuen University
School of Veterinary Medicine

WOAH Collaborating Centre
for Food Safety



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Introduction

Antimicrobial resistance (AMR) has emerged as one of the defining public health crises of this century.

AMR is directly responsible for [1.3 million deaths](#) and contributes to 5 million deaths every year.

By 2050, AMR could cause over **80,000** deaths annually in Bangladesh and can face a **£67.12 billion decrease in GDP**

AMR resistance can lead to losses in **livestock production of up to £184 million (BDT 2106 crore)**

3–5% reduction in GDP due to AMR-related health costs and productivity losses

Healthcare expenditure could increase by **\$1–2 billion** annually



National Coordination and Governance

1. The Directorate General of Drug Administration (DGDA) is the national regulatory and national center for monitoring AMU/C surveillance both in human, livestock and fisheries in Bangladesh
2. DGDA also implementing the National Action Plan and Strategic Plan for AMR (DGDA's role) and Creating various guidelines on AMR
3. Veterinary AMU data is handled now by the DLS under the MoFL, but there is no single national system as mature as the DGDA human AMU system yet.
4. Bangladesh has joined the WHO's Global Antimicrobial Resistance and Use Surveillance System (GLASS) platform in 2022, improving the systematic collection of AMU data.

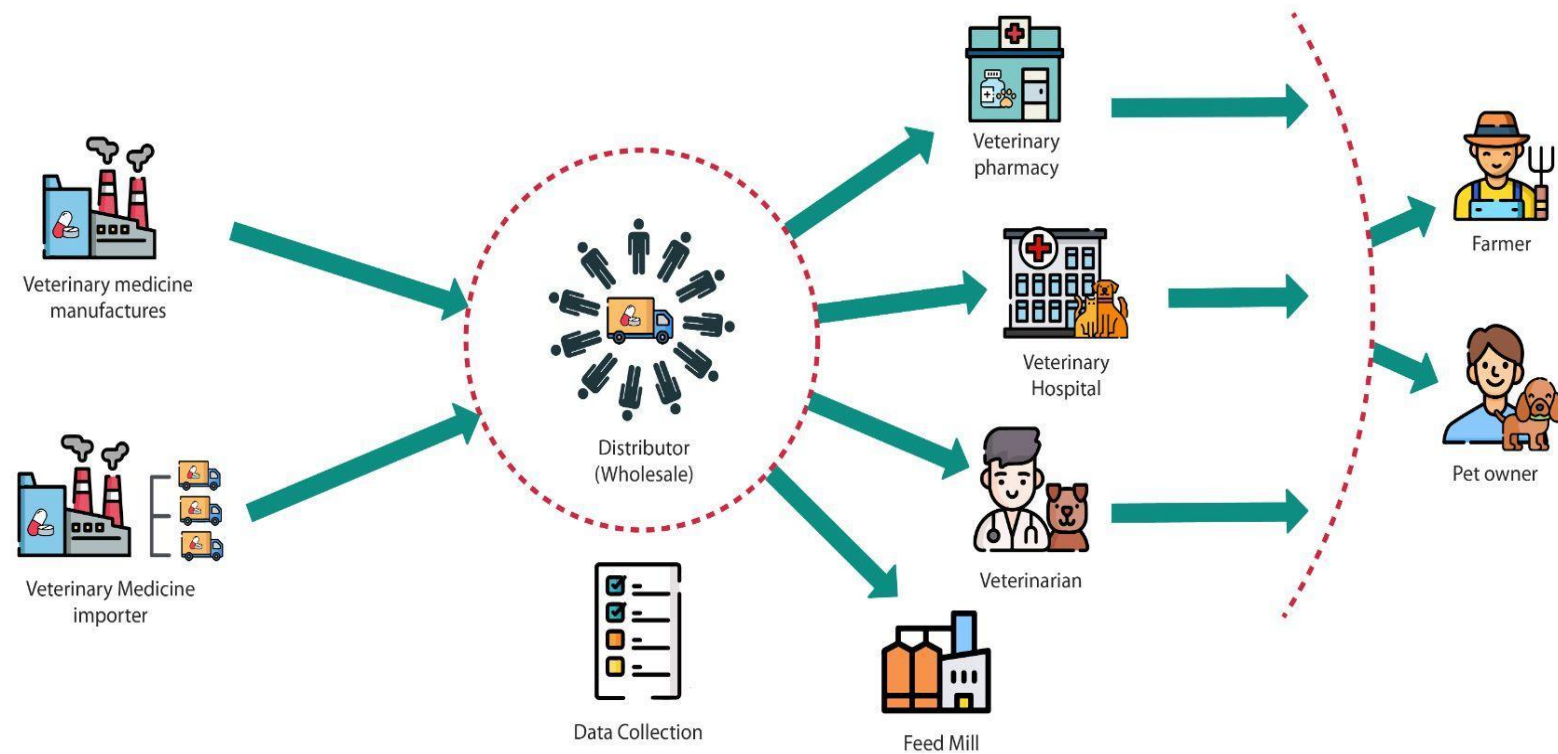


- i. AMU monitoring implemented is mostly national level sales data for human use, with fragmented efforts for animal and pharmacy-level data since 2022 by DGDA with WHO/Fleming Fund support
- ii. Antimicrobial medicines dispatched from manufacturers' and importers' central warehouses > Collection of Sales/Distribution data
- iii. National Strategy for AMR Containment 2023-2028 calls for AMU surveillance in animals, but no mature system like DGDA's human system exists yet but it is under development.
- iv. Bangladesh started reporting to WOAHA ANIMUSE (Animal Nutrition Interactive Multi-sectoral Surveillance and Expert System) from 2024



Data collection points for conducting antimicrobial use surveillance for veterinary medicine in Bangladesh.

AMU





Antimicrobial Uses at Farm Conditions

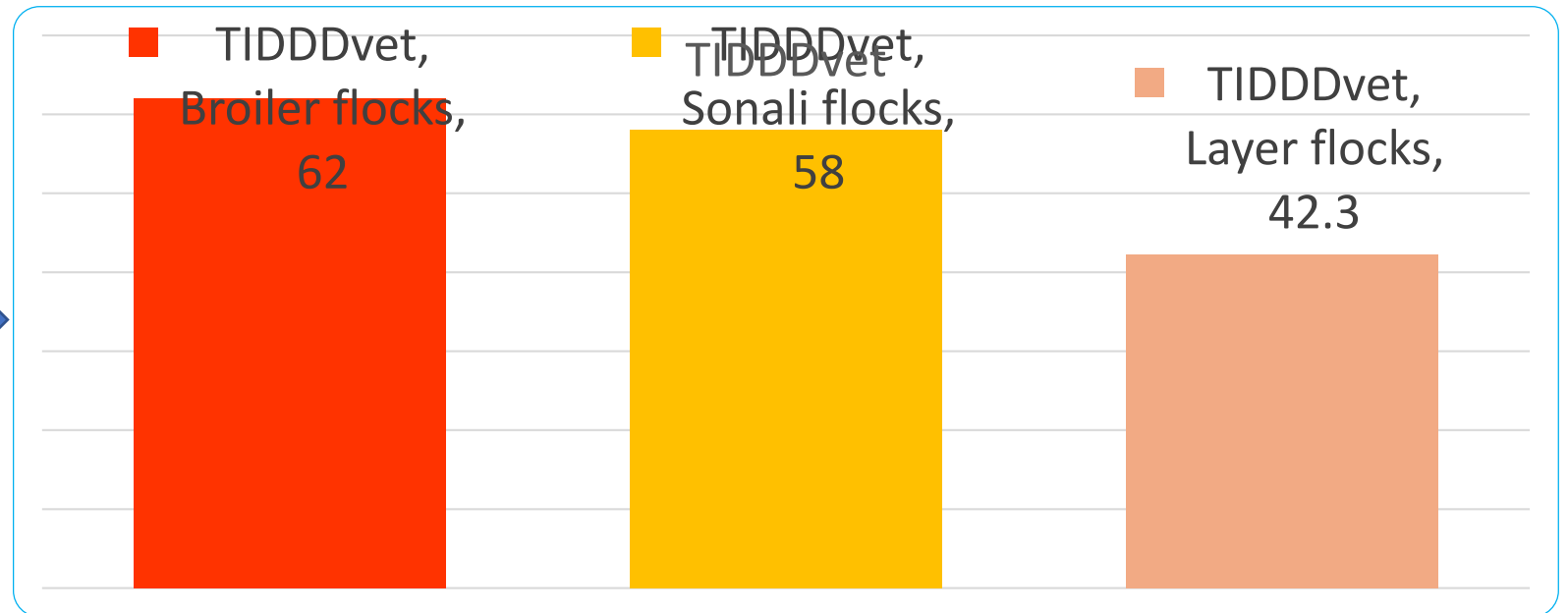


Therapeutic use (treatment of clinically ill animals) => **10–40%**

Prophylaxis + metaphylaxis (prevent disease in healthy animals or treat entire groups when some animals are sick) => **30–60%**
in many settings

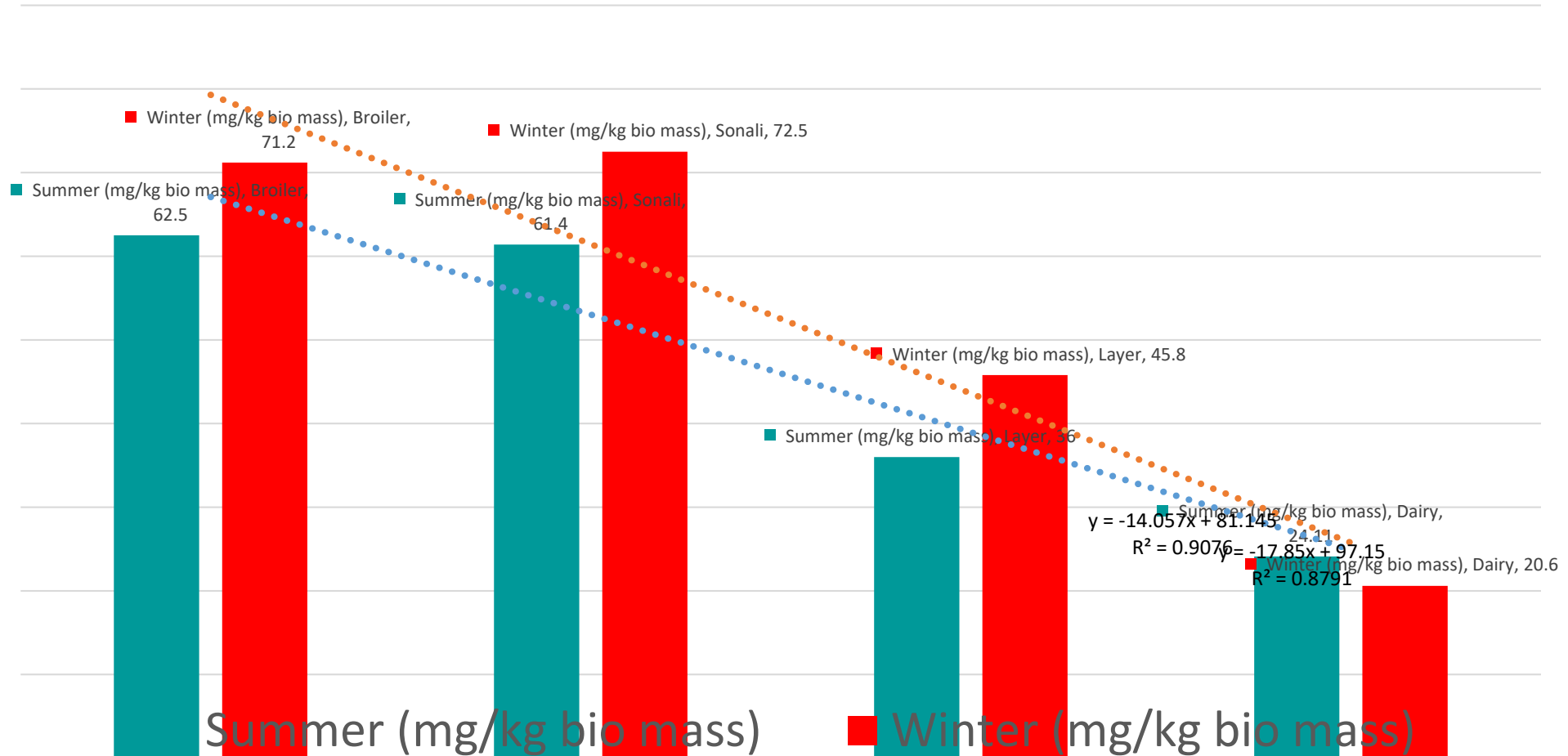
Growth promotion / productivity uses => **very country-dependent (0–70%)-this is most commonly use.**

Distribution of AMU in Commercial Poultry



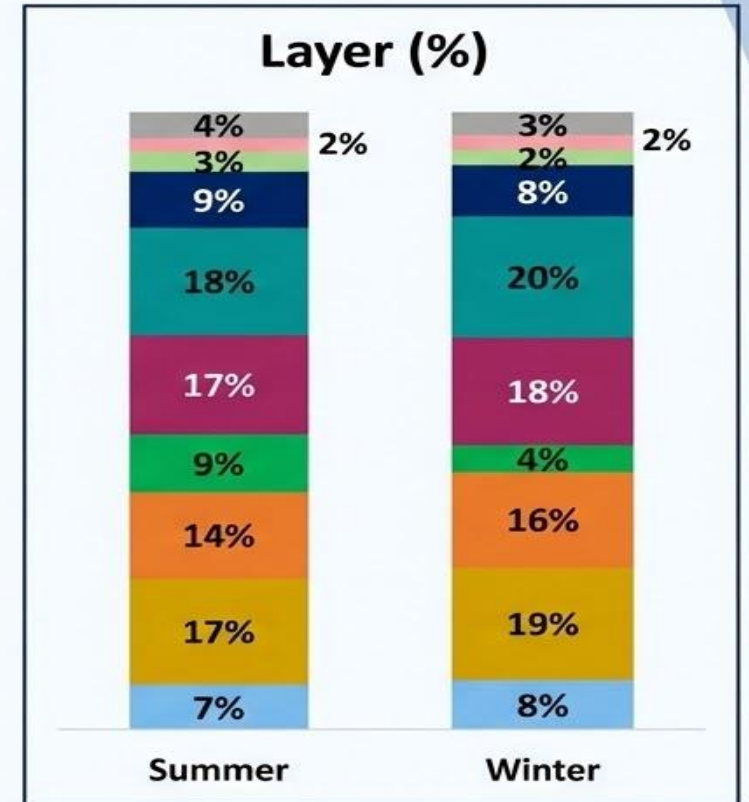
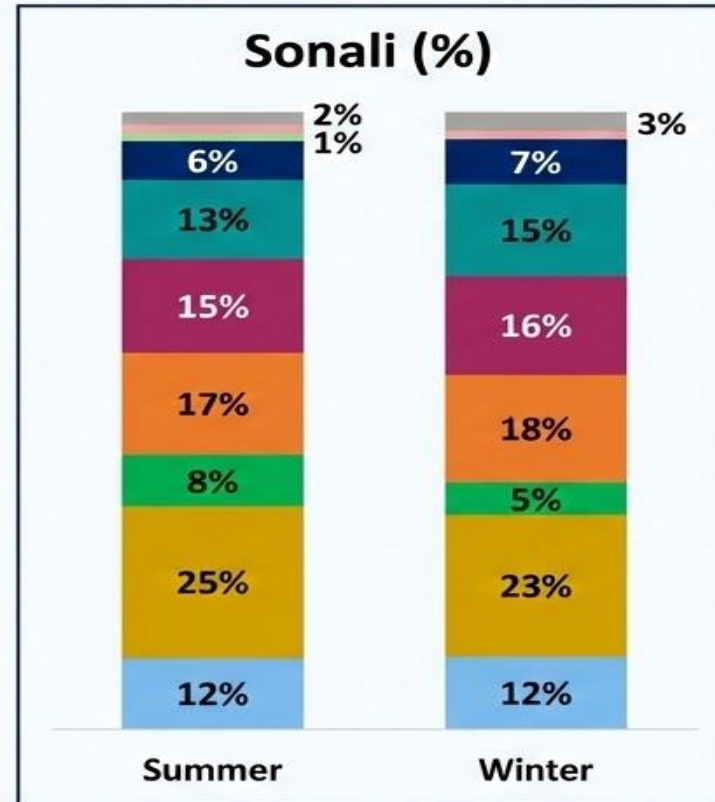
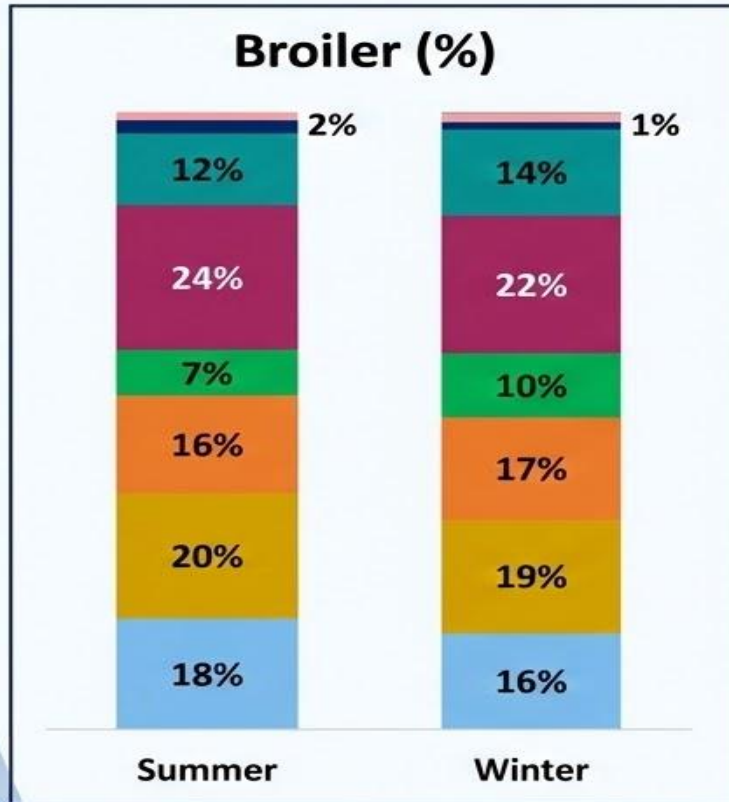


Seasonal variation of Antimicrobial Uses (mg/kg)





Pattern of Antimicrobials Used in Poultry Farm



Aminopenicillins Sulfonamides Tetracyclines Aminoglycosides Phenicol
Fluoroquinolones Macrolides Cephalosporins Nitroimidazoles Pleuromutilins



Coordination Regarding AMR/AMU

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Coordination on AMR/AMU in Bangladesh through a One Health approach, but it's still a work-in-progress with gaps between policy and implementation.

National AMR Coordination Committee:

Human Health Sector:

MoHFW
•DGHS
•DGDA
Supported by WHO



Animal Health Sector

MoFL
•DLS
•DoF
•BLRI
Supported by FAO, WOA



Environment Sector

MoEFC
•Department of Environment
Supported by UNEP

Stakeholders

Government:

DGHS, IEDCR, DGDA, DLS

Research/academia:

icddr,b, DU, BLRI, Universities etc.

UN agencies:

WHO, UNICEF

NGO/development partners:

Fleming Fund, FAO, WOA, ILRI

Data sharing via BARA (Bangladesh AMR Response Alliance) One Health community of practice, OAHIS (One Health Antimicrobial Stewardship) platform and BAHIS (Bangladesh Animal Health Intelligence System)



National AMR Action Plan (2023-2028)



National AMR Surveillance Strategy (2020-2025, 2025-2030)



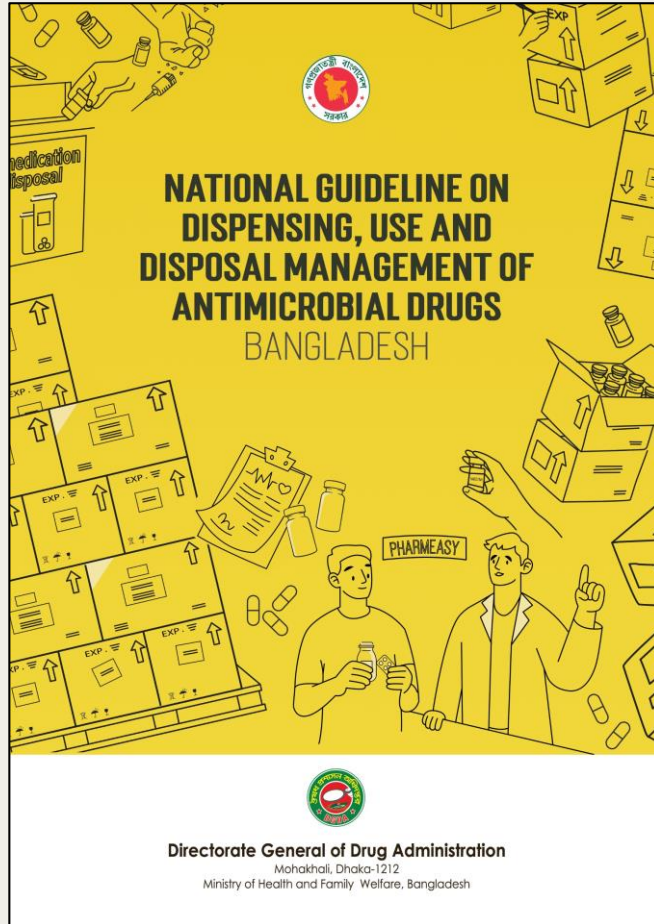
National AMR Surveillance Protocol in Human, Animal, Aquatic and Environmental Health



National AMR Communication Strategy



National AMU Surveillance Protocol in Human, Animal, Aquatic Health

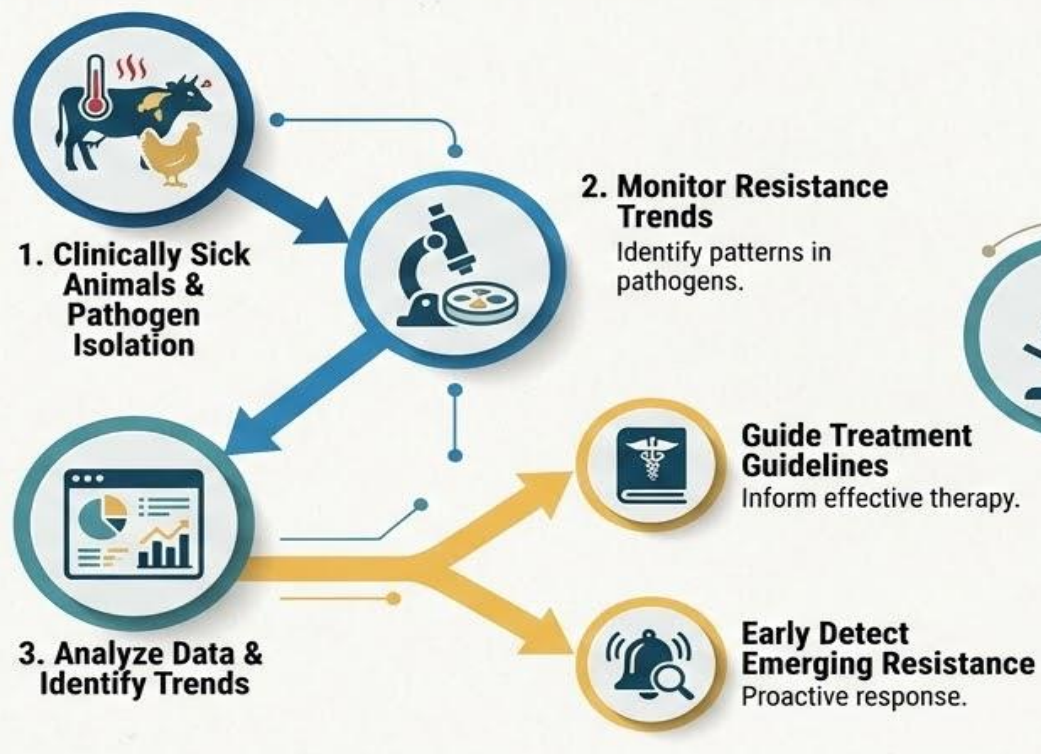


- i. DGDA has banned 34 antibiotics in veterinary use that are critically important for human use.
- ii. Like: All dosage form of Colistin, Fosfomycin, Azithromycin, all combination of ciprofloxacin, 23 combination of access group, 05 combination of Watch group.
- iii. **DGDA is developing the National Guideline on Dispensing, Use and Disposal Management of Antimicrobial Drugs – Bangladesh**
- iv. DGDA collaborating with DGHS, DLS, BLRI, CDC, IEDCR etc.

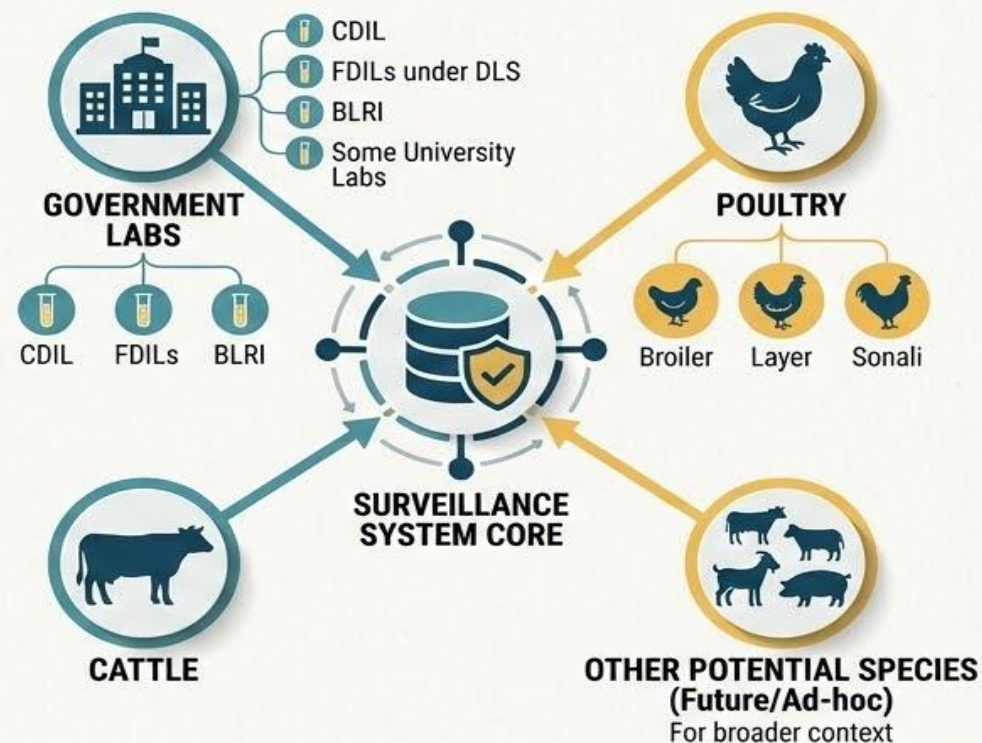


CLINICAL AMR SURVEILLANCE IN ANIMALS (PASSIVE SURVEILLANCE): OBJECTIVES & SOURCES OF SAMPLES

OBJECTIVES: THE SURVEILLANCE PROCESS

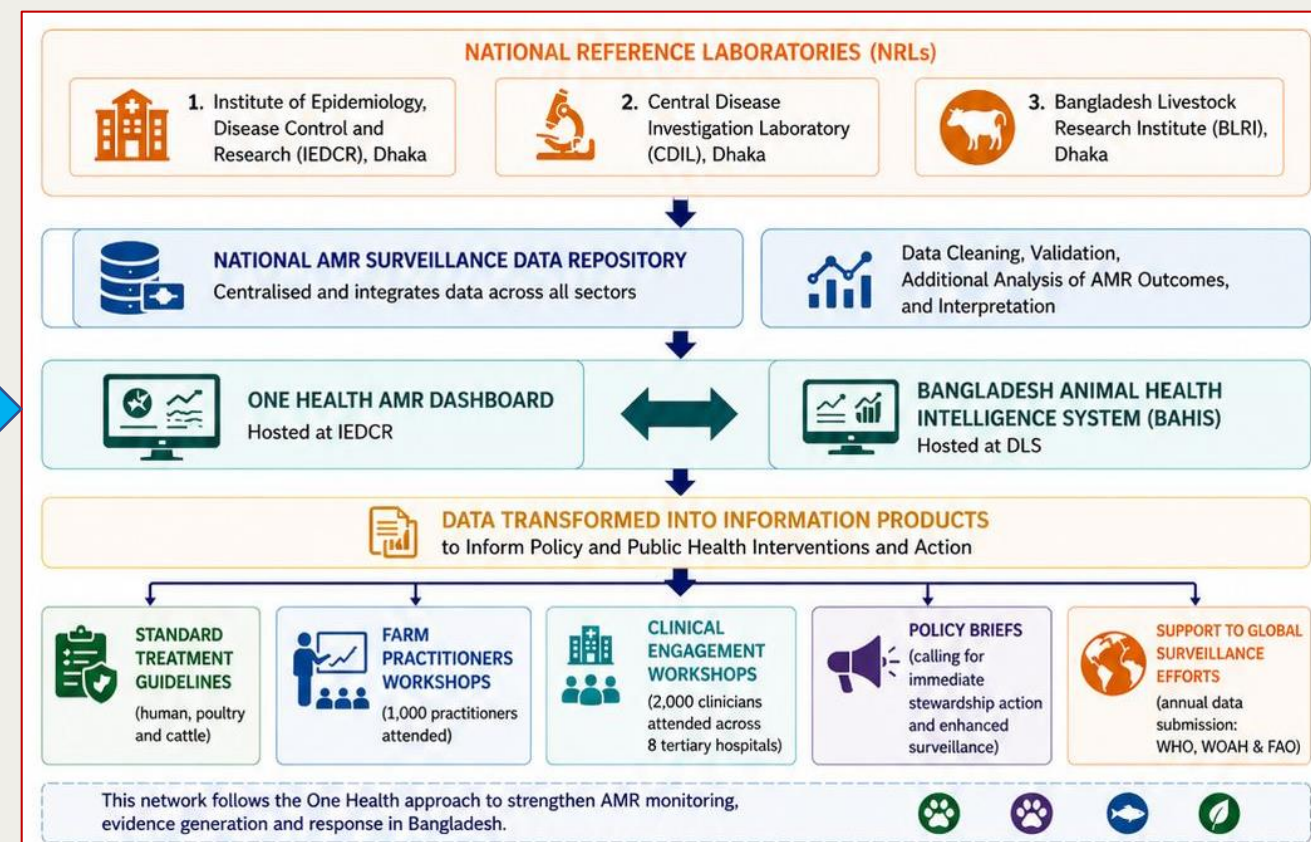
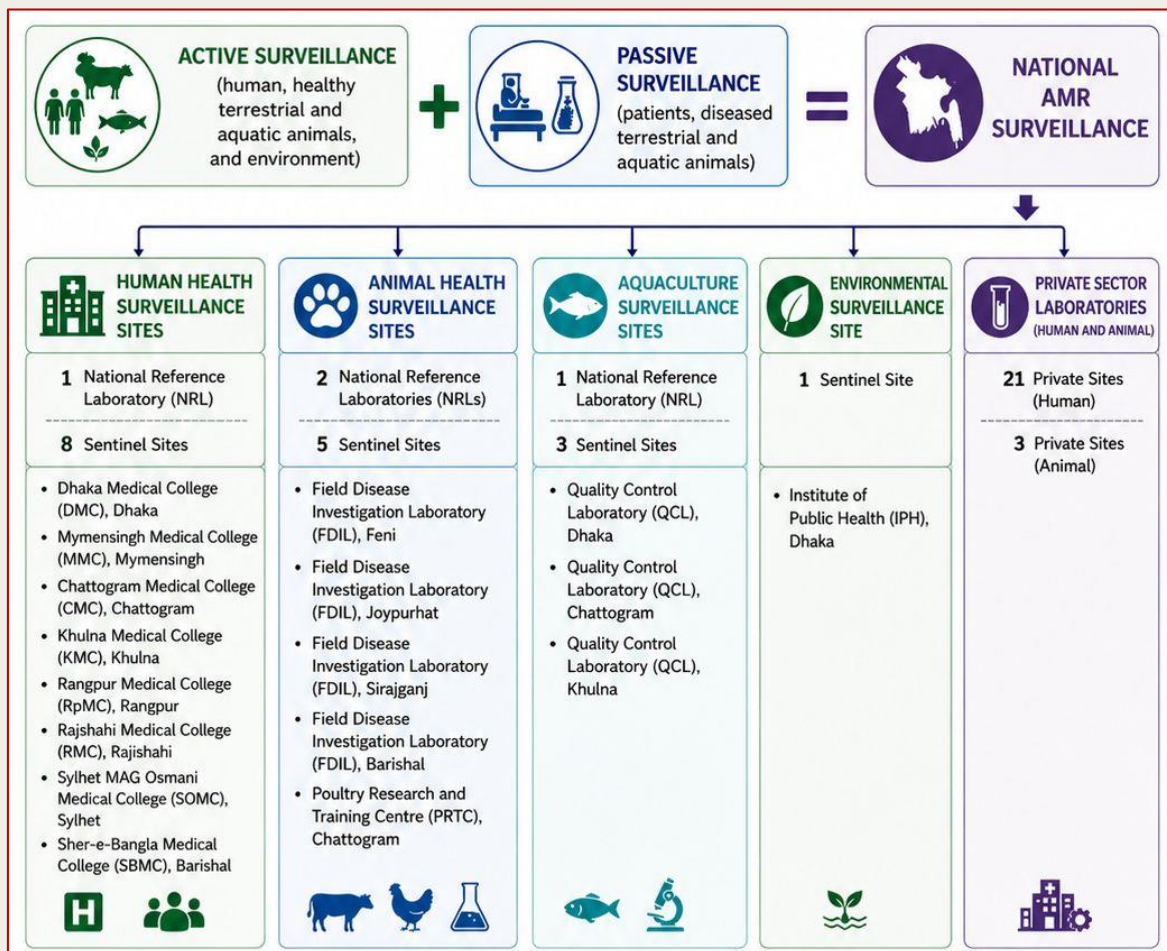


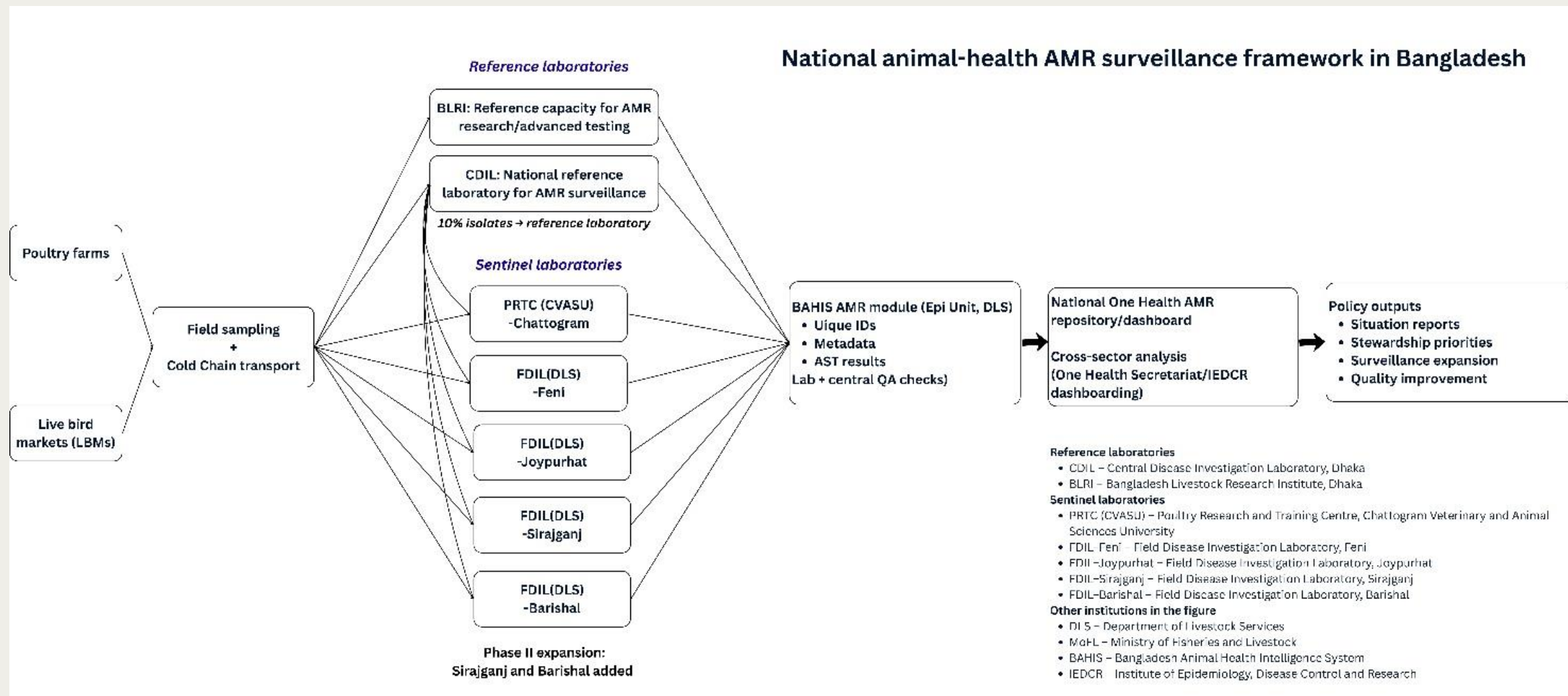
SOURCES OF SAMPLES: LABS & SPECIES





National One Health AMR Surveillance Network in Bangladesh with Laboratories involved







Antimicrobial resistance proportions by organism and sentinel sites, Bangladesh poultry AMR surveillance, 2022–2025.

Types of Samples Collected

- ✓ Cloacal swabs or freshly voided faecal samples were collected from individual birds for isolation of *E. coli*, *Salmonella* spp., and *Enterococcus* spp.
- ✓ Whole caeca were collected from freshly slaughtered broiler chickens for *Campylobacter* spp.
- ✓ At farms, faecal material pooled from multiple deposition sites within a shed

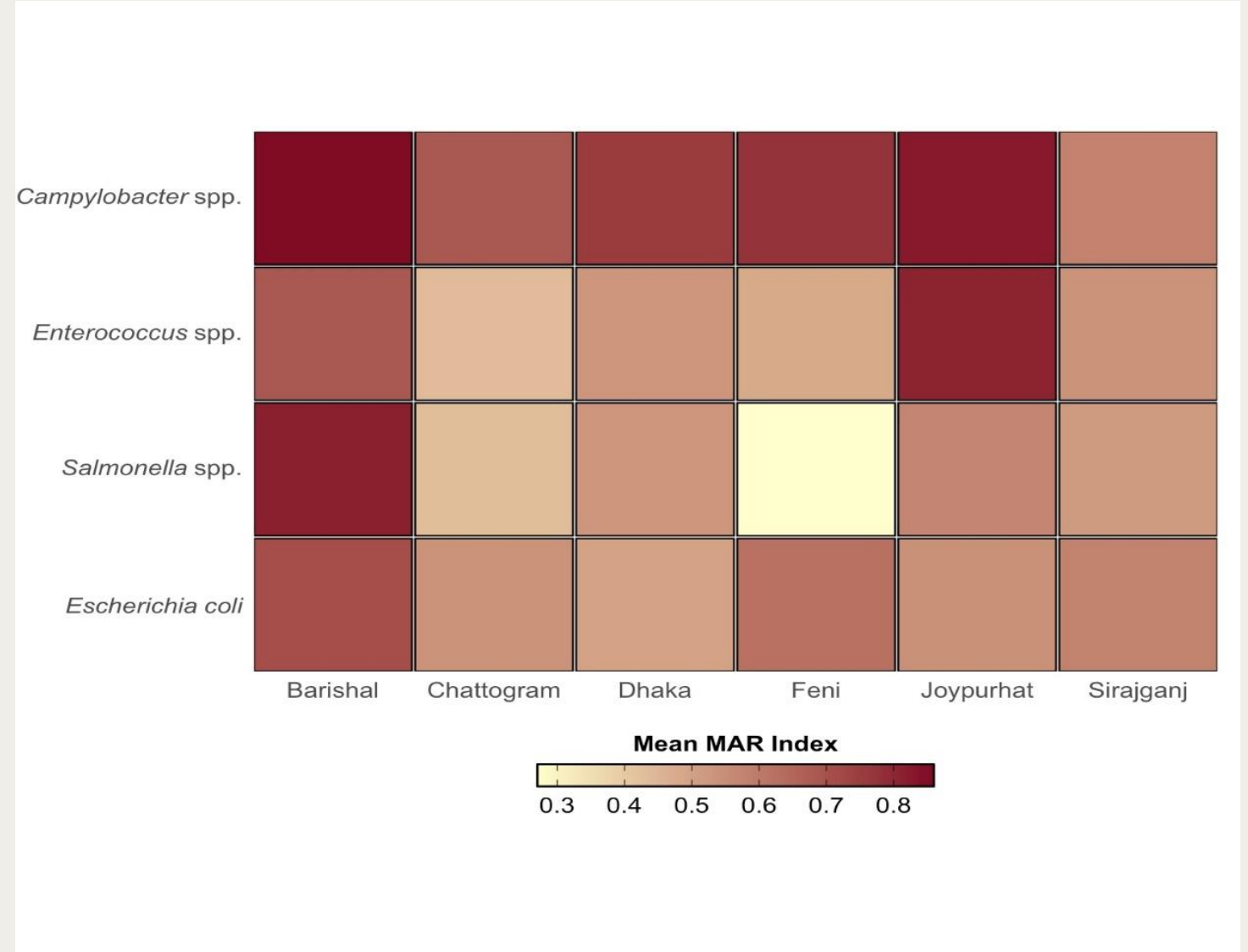
Testing Methods:

- ✓ Kirby-Bauer disk diffusion with EUCAST v10.0 breakpoints.





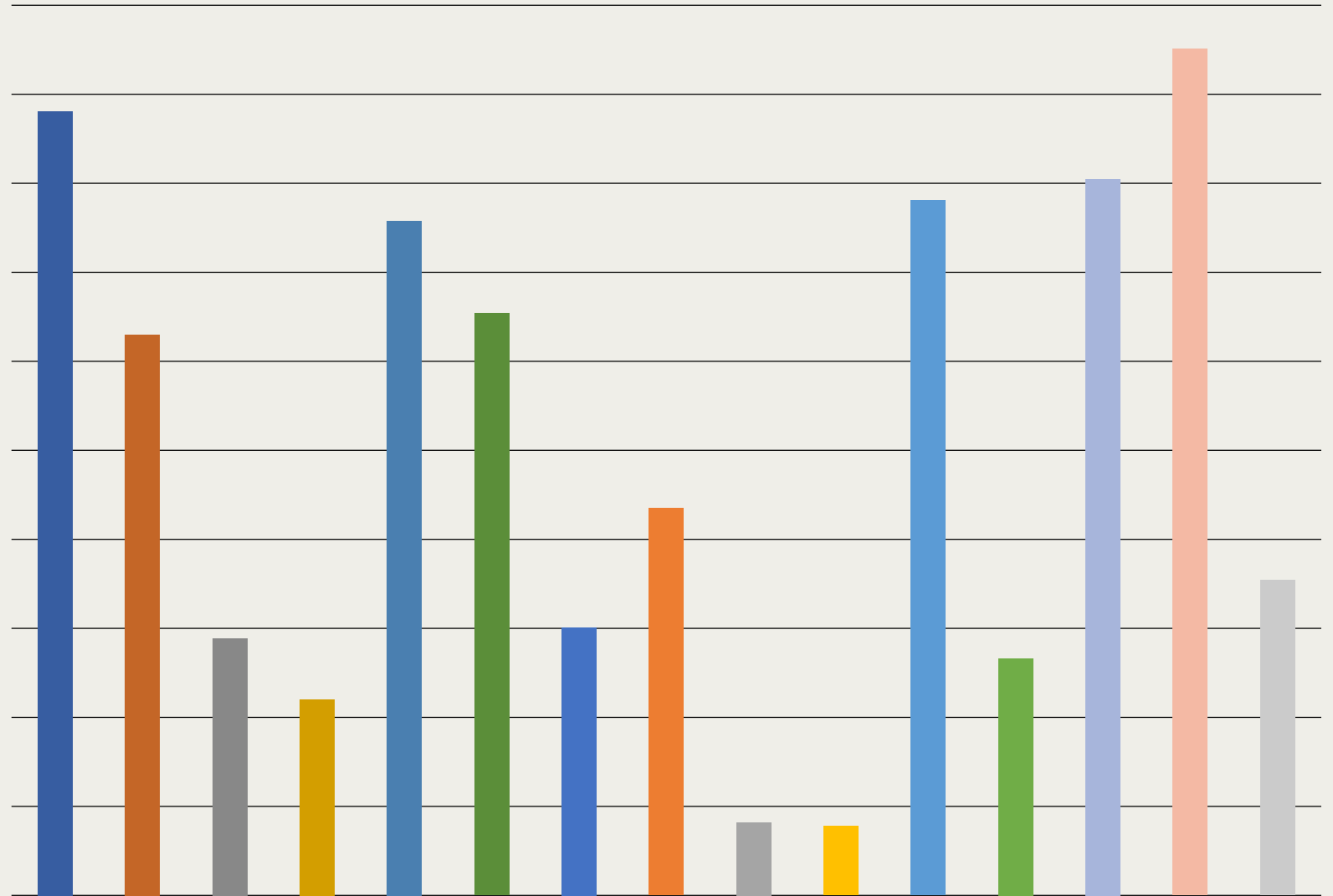
Mean multiple antibiotic resistance (MAR) index by organism and sentinel region, Bangladesh poultry AMR surveillance, 2022–2025.





Antimicrobial Resistance Patterns of *E. coli*

Tested Sample Size: 3,253



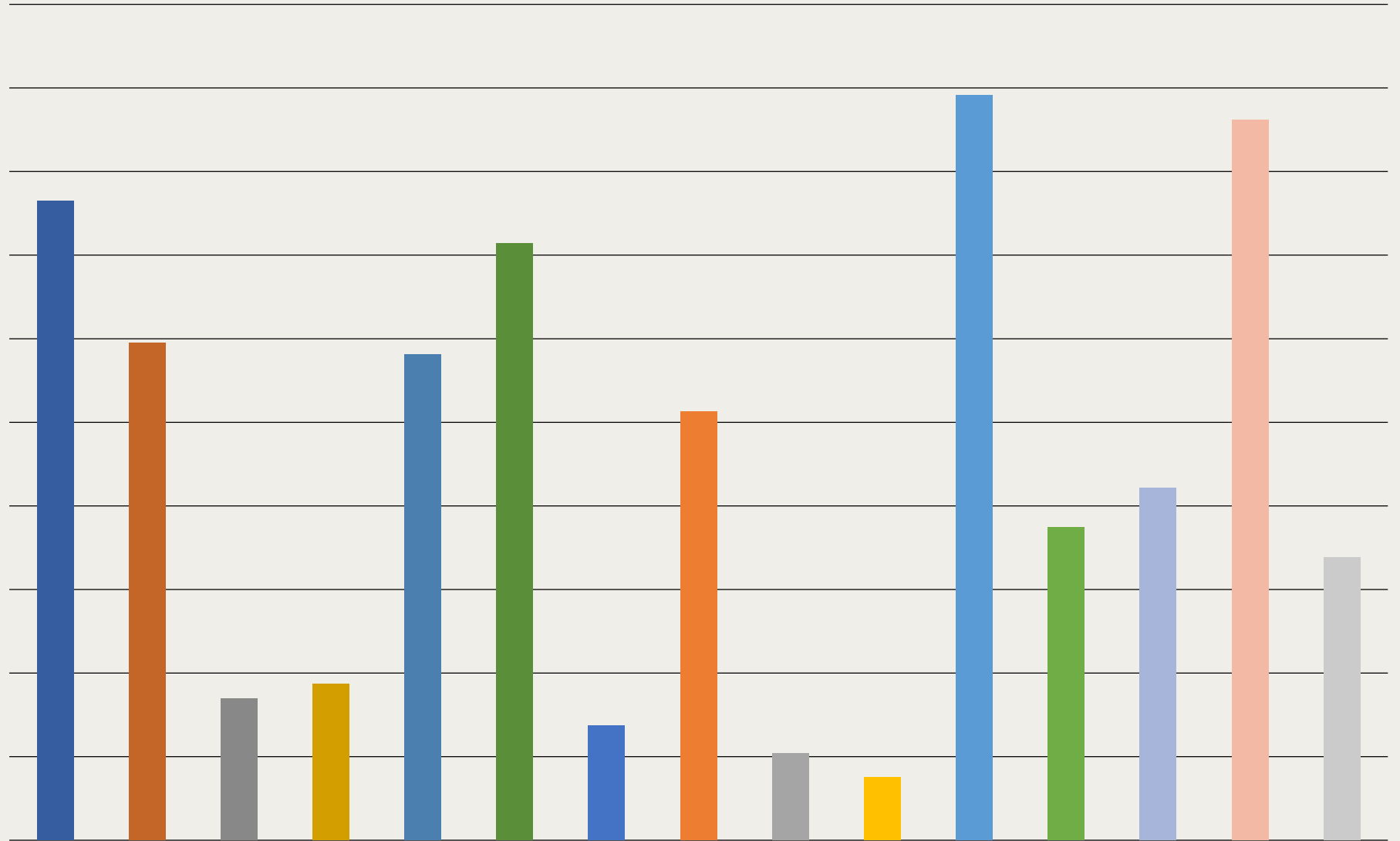


AMR Patterns of *Salmonella* spp. Recovered from Poultry

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Antimicrobial Resistance Patterns of *Salmonella* spp.

Tested Sample Size: 869



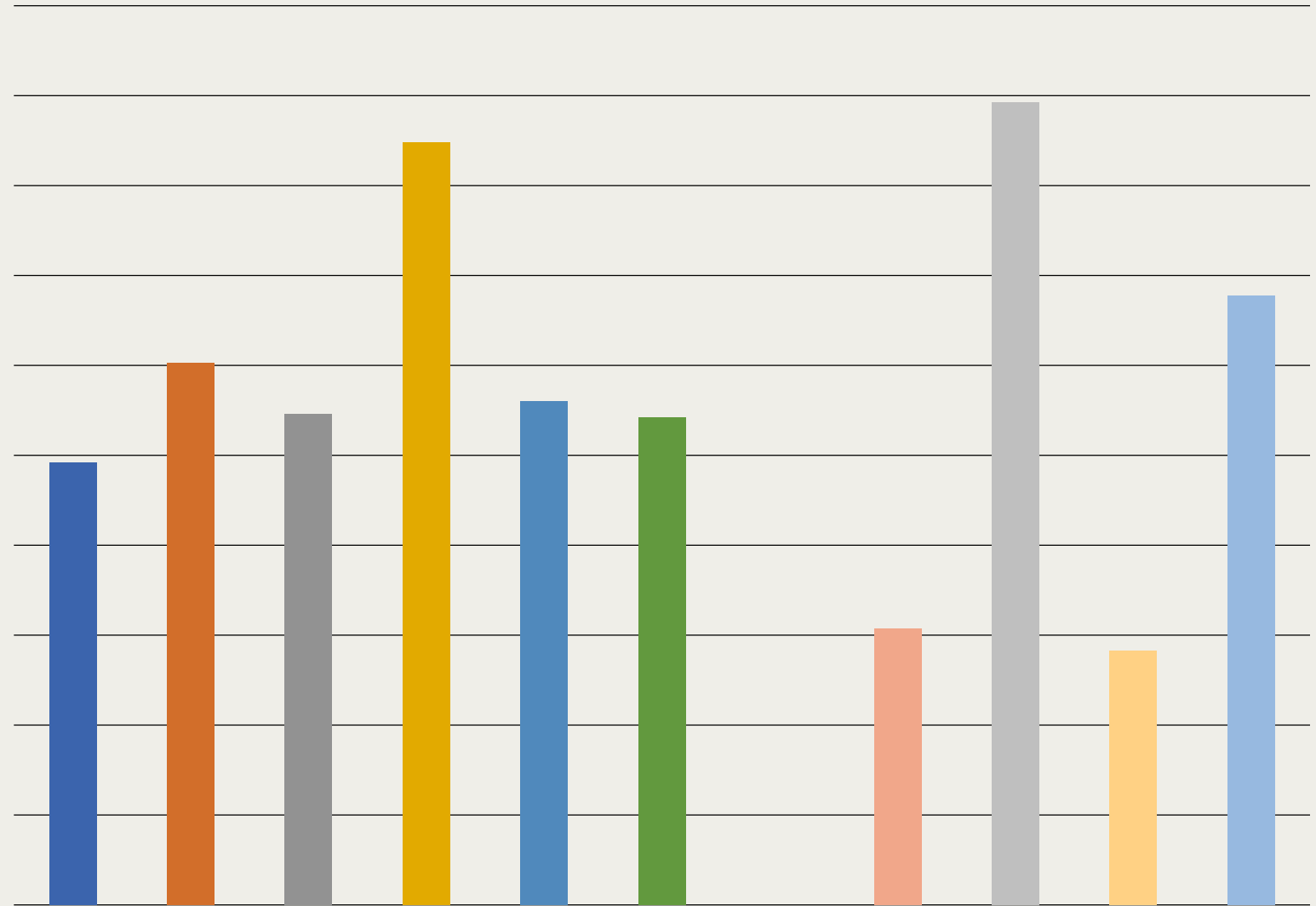


AMR Patterns of *Enterococcus spp.* Recovered from Poultry

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Antimicrobial
Resistance Patterns of
Enterococcus spp.

Tested Sample Size: 981



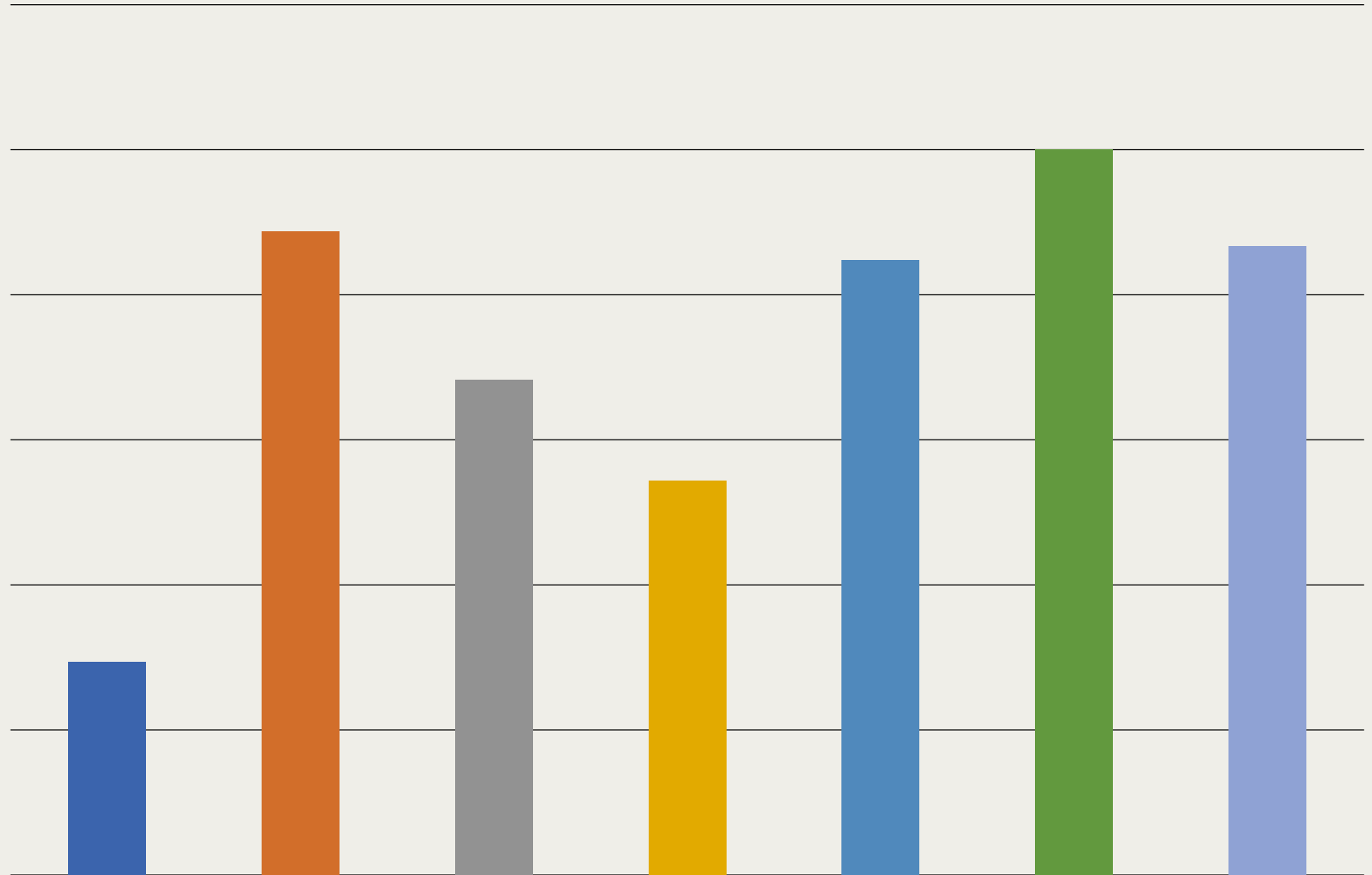


AMR Patterns of *Campylobacter* spp. Recovered from Poultry

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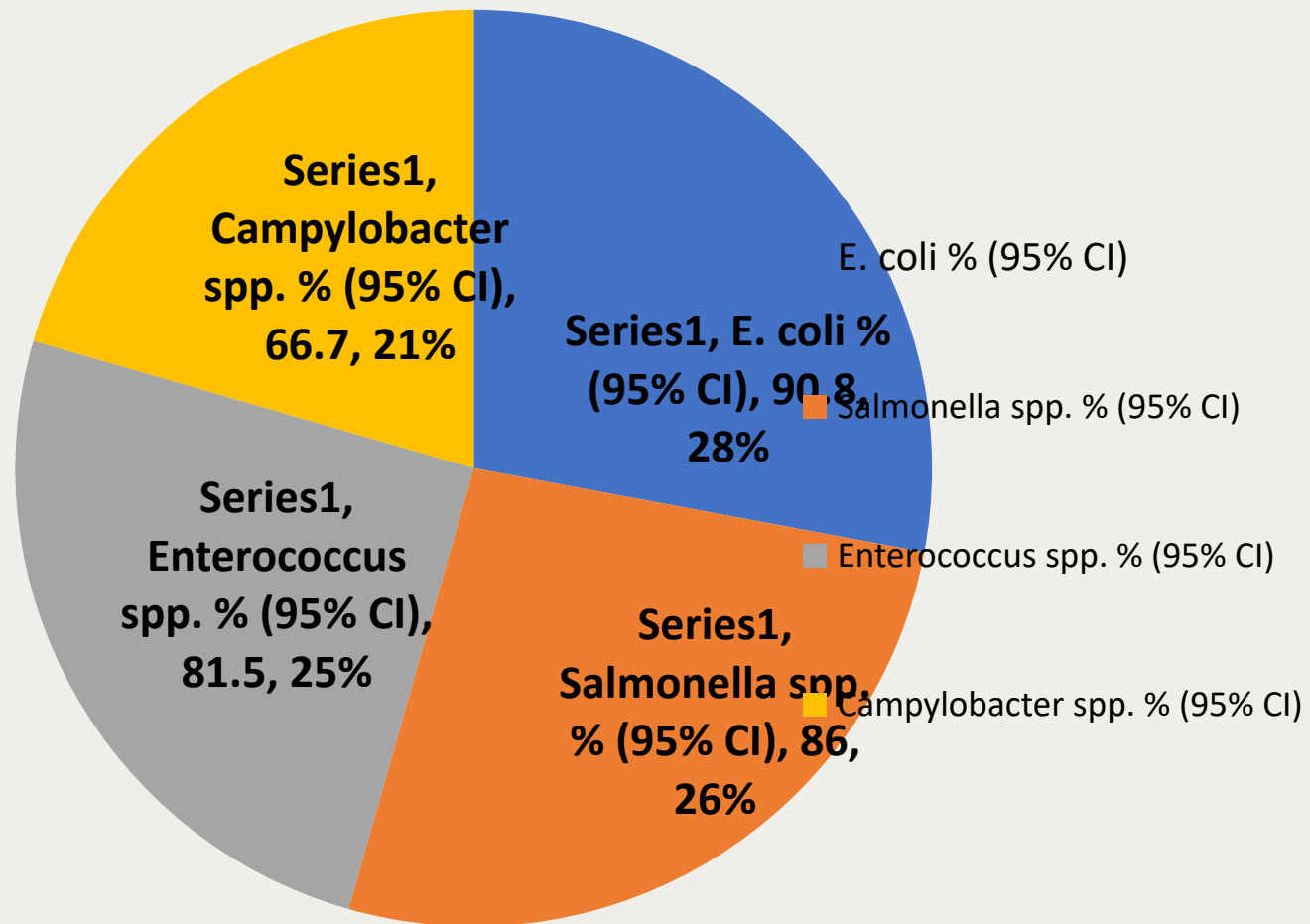
Antimicrobial
Resistance Patterns of
Campylobacter spp.

Tested Sample Size: 542





Multidrug
resistance (MDR)
prevalence



Multidrug resistance (MDR) was
classified per Magiorakos criteria



A National AMR Surveillance Dashboard developed and producing real-time data (around 100,000 data shared)

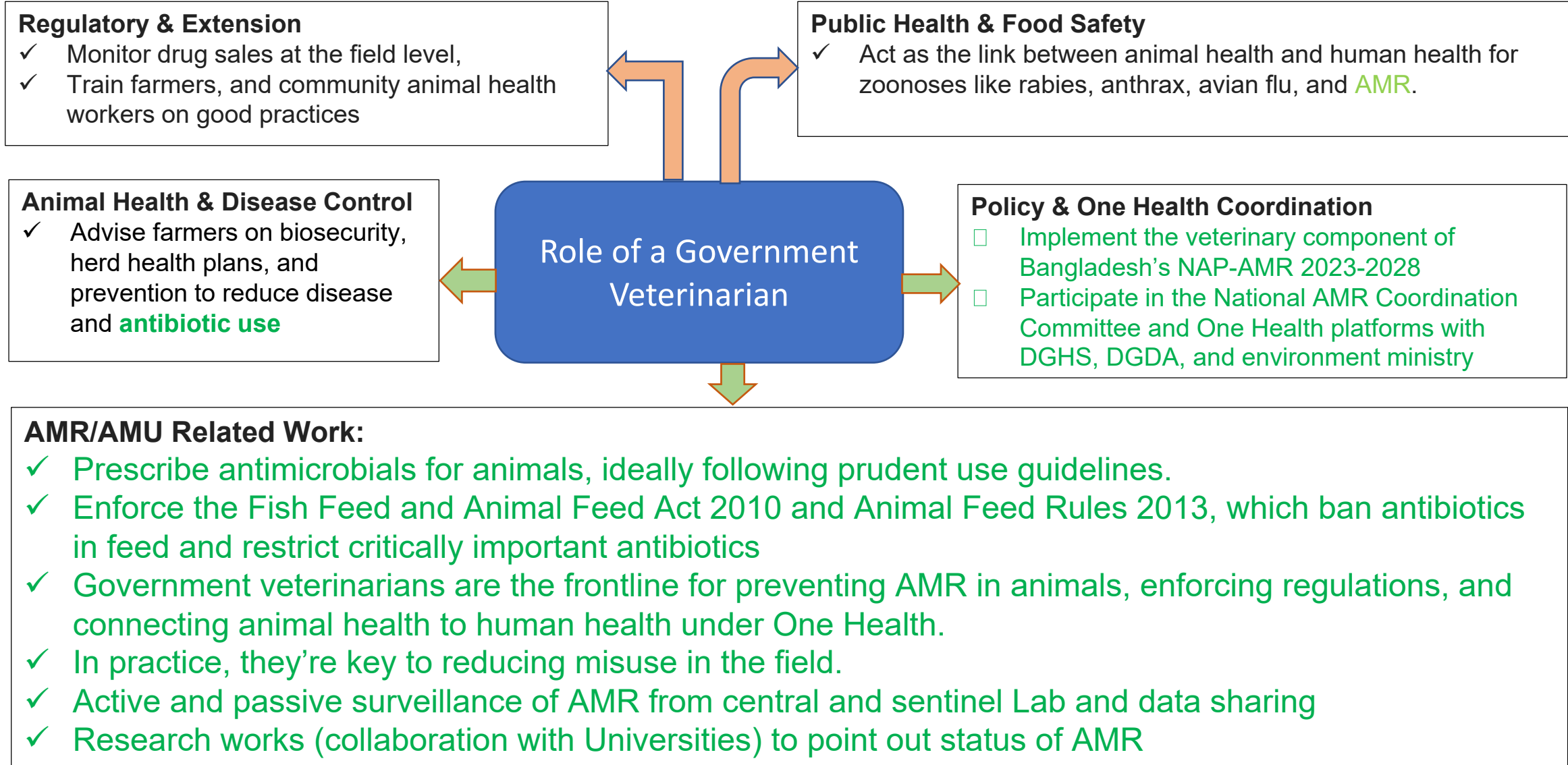
All sectoral AMR surveillance data produced through 44 laboratories, shared and visualised through National AMR Dashboard

AMR surveillance data shared globally via WHO GLASS platform and WOAHA ANIMUSE platform





1. Limited Lab infrastructure and capacity: Shortage of quality microbiology lab as well as trained microbiologists, lab technicians to do quality antimicrobial susceptibility testing (AST) and data analysis for sustained surveillance.
2. Most surveillance relies on 11 Government sentinel sites with only 1 private sector site.
3. Irrational antibiotic use in both human healthcare and agriculture, but data flows between sectors are fragmented.
4. Genomic surveillance is emerging but held back by infrastructure, bioinformatics capacity, and data governance gaps.
5. Lack of sustainable domestic Funding/Logistics as well as technical assistance for data collection and Gene mappings





- ✓ AMR in livestock is a major public health concern in Bangladesh because food animals act as reservoirs of resistant bacteria such as *E. coli*, *Salmonella*, *Enterococcus* and *Campylobacter*
- ✓ Excessive and inappropriate use of antibiotics for growth promotion and disease prevention drives the emergence of multidrug-resistant strains
- ✓ Addressing AMR requires a coordinated One Health approach involving responsible antibiotic use, improved farm practices, and strong policy enforcement

Thank you!



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