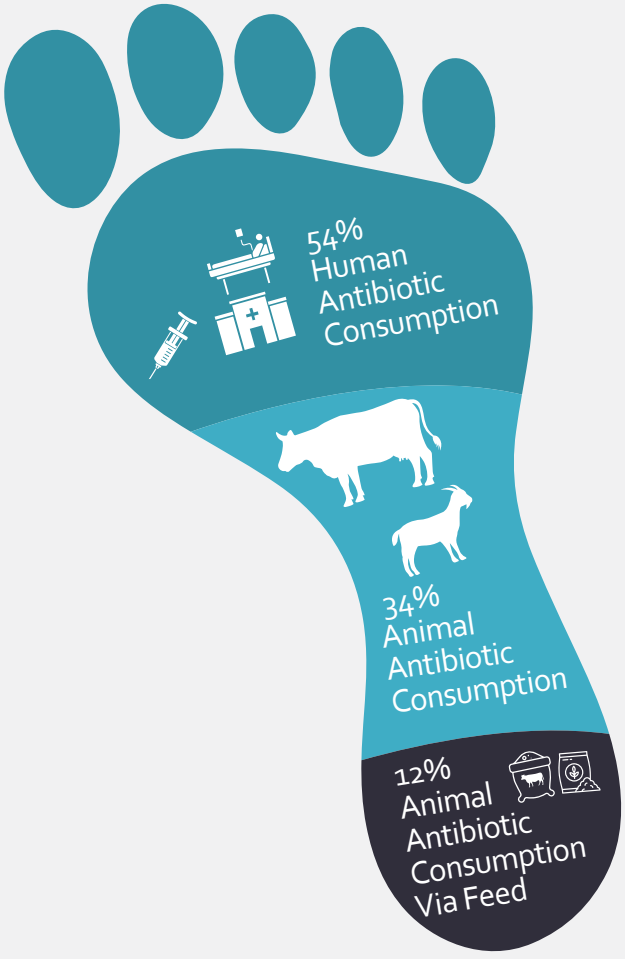
FIRST-EVER ANTIBIOTIC FOOTPRINT ANALYSIS FOR ANIMAL AND HUMAN HEALTH SECTORS IN PAKISTAN

Consumption, Analysis, Findings and Way forward

The Antibiotic Footprint (AF) is an advocacy tool both to create public awareness on antibiotic consumption and the link with AMR, as well as to provide evidence for policies aiming to affect use reduction in practice.

It relies on data aggregation and simple comparative visualization for effectiveness.The objectives of antibiotic footprint analysis were - to develop a method for estimating animal antimicrobial consumption from import data and to estimate and evaluate total and relative human and animal antimicrobial consumption.



Footprint Values

Total Antimicrobial Consumption by human and animal sectors:

The estimated combined antibiotic consumption across sectors for 2019 in Pakistan was 3,072 MT. Human antibiotic consumption contributed 1659 MT. The relative consumption by Animals, as a proportion of total antimicrobial consumption, is 1044 MT directly and 368 MT by animal feed.

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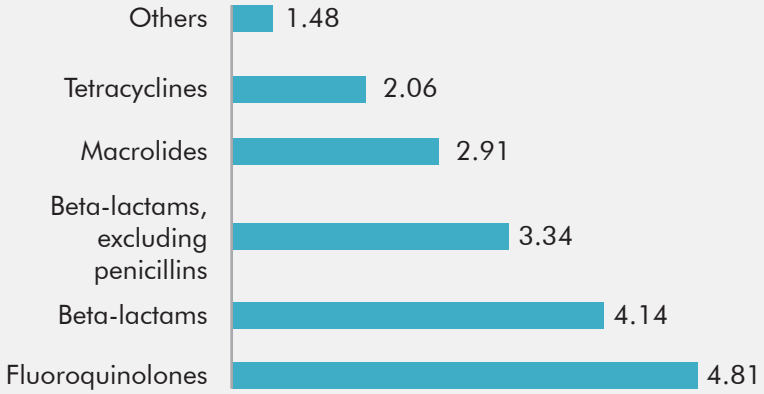
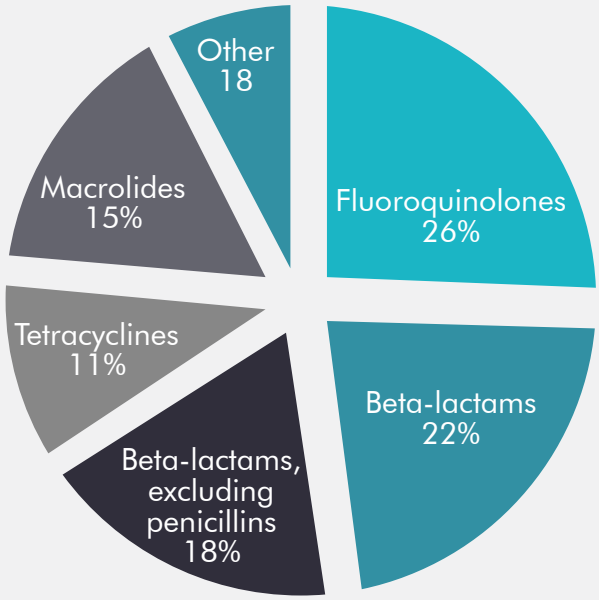
Human Health Antibiotic Use Pattern

The Pattern of Antibiotic Consumption in the Human Health Sector in 2019 (values Defined Daily Doses per 1,000 inhabitants per day - DID)



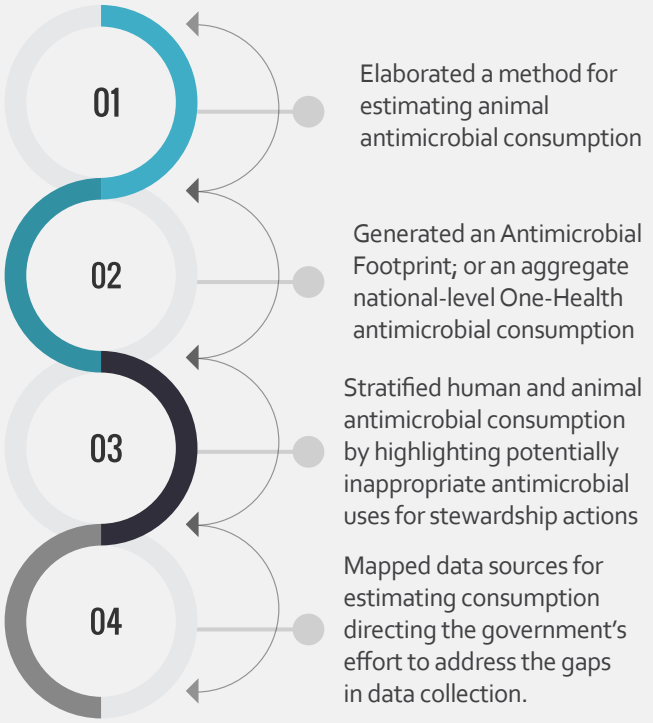
Therapeutic sub-group

Antibiotic consumption by therapeutic sub-group /ATC sub-groups in the human health sector (2019)



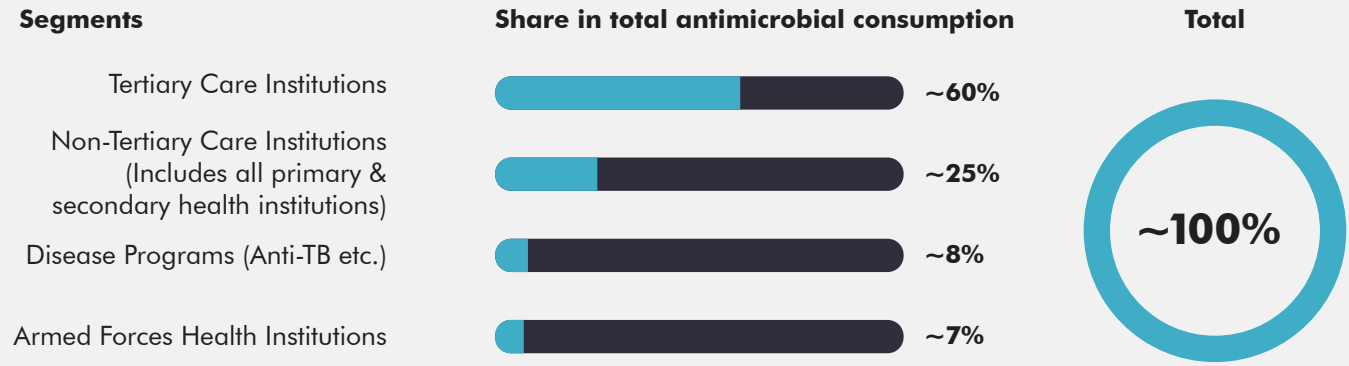
Consumption Analysis:

Antimicrobial consumption analysis lays down the base for the initiation, monitoring and evaluation of interventions addressing AMR through antimicrobial stewardship, or antimicrobial use reduction. The activity made four important contributions:



The two largest groups, in DID proportions (%), were Fluoroquinolones (26% of total consumption) and the Beta-lactams (22%).

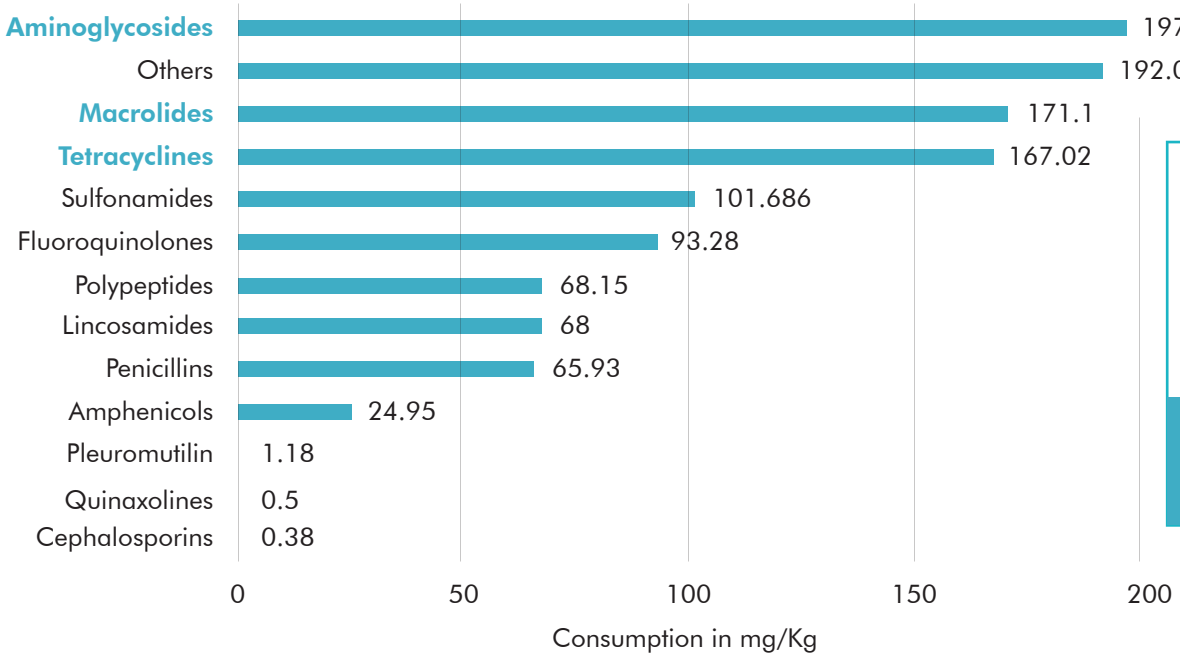
Segments with a share in antimicrobial consumption in human health



Animal Health Antibiotic Use Pattern in Pakistan

The estimated total consumption of medicines and medicated feed in the veterinary sector in 2019 was 1,481.78 kg. Total consumption comprised of 1,253.52 kg as Active Pharmaceutical
Ingredient (APIs) and 228.46 kg of medicated feed. The ratio of consumption of medicated feed to medicines was 0.2. That is, for every 1 MT of antimicrobials intended for use in animals imported into Pakistan in 2019, 0.2 MT of antimicrobials were also imported as medicated fees.

Consumption by antimicrobial groups in the veterinary sector, Pakistan (2019 estimate; mg/kg animal weight)



Top 3 Antimicrobial Groups

Aminoglycosides
Macrolides
Tetracyclines

Estimated Antimicrobial Consumption in animals

Estimated antimicrobial consumption in 2019 and animal species indicated for 12 INNs(International Non-Proprietary Name) available as pharmaceutical forms and/or medicated feeds on the DRAP list include:

S.No.	INN	Animal species	FA/GP(MT)
1	Clopidol	Poultry	9.5
2	Colistin	Poultry, cattle, etc.	2.44
3	Diclazuril	Poultry, rabbits, etc.	0.71
4	**Enramycin**	**Poultry & pigs**	**15.3**
5	Florphenicol	Cattle	0
6	Lincomycin	Poultry & pigs	8.966
7	**Neomycin**	**Poultry, cattle, etc.**	**19.92**
8	**Salinomycin**	**Chicken, cattle, pigs, rabbit**	**35.41**
9	Tiamulin	Poultry & pigs	6.87
10	**Tilmicosin**	**Cattle, sheep**	**52.52**
11	**Tylosin**	**Cattle, poultry, etc.**	**112.00**
12	Zinc bacitracin	Poultry & pigs	0.956

Findings

Antibiotic use is prevalent and relatively high in Pakistan. The estimated total human antibiotic consumption was 18.70 Defined Daily Doses per 1,000 inhabitants per day (DID) for 2019. At this rate, Pakistan had a below-median consumption among countries that participated in the WHO global surveillance which saw countries reporting the consumption of systemic antibiotics between 4 and 64 DID.

This study estimated a total import of veterinary antimicrobials or consumption of 1,471 MT. Animal antimicrobial consumption was dominated by Medically Important Antibiotics. The excessive consumption of antimicrobials in animals, either through therapeutic uses or via feed for preventive or meat-production purposes is associated with an increase in AMR in humans.

Further research is needed to develop validation methods for antimicrobial consumption data in Pakistan. Apart from import data and its use to estimate antimicrobial consumption, further work is needed to improve data on livestock in Pakistan.

Policy Implication & Way Forward:

The high proportions of WHO Watch antibiotic consumption in the human health sector and of WHO MIA in the animal health sector point to the urgent need for antimicrobial stewardship in Pakistan. The high proportion of import of medicated feed not under the regulation of the medicines regulatory agency suggests the need for policy intervention in the regulation of veterinary feed additives. Visualizing the estimated consumption used in public communication strongly suggests the need to reduce the overall consumption of Antibiotics, as a means of containing AMR. The results also show the critical bottlenecks to any reliable antibiotic consumption in Pakistan: lack of high-quality data availability and accessibility. There is an urgent need for policy reforms to make reporting of antimicrobial sales data for human and animal consumption mandatory so that researchers and policymakers can identify specific, contextual, and implementable policies to tackle AMR. Many countries, including Thailand, have made this a requirement. The greater data availability must go hand in hand with capacity building in data use for decision-making. Following are the key recommendations of the AFA analysis:

- Setting up targets for the reduction antimicrobial consumption in the National Action Plan
- Establishing regional and federal structures for surveillance of antimicrobial use and resistance
- Mandating manufacturers, importers, others to provide antimicrobials data and report sales
- Enabling community-based surveillance systems
- Regulating the use of medicated feed for veterinary
- Evaluating consumption patterns of AMR periodically