



# Antimicrobial Resistance

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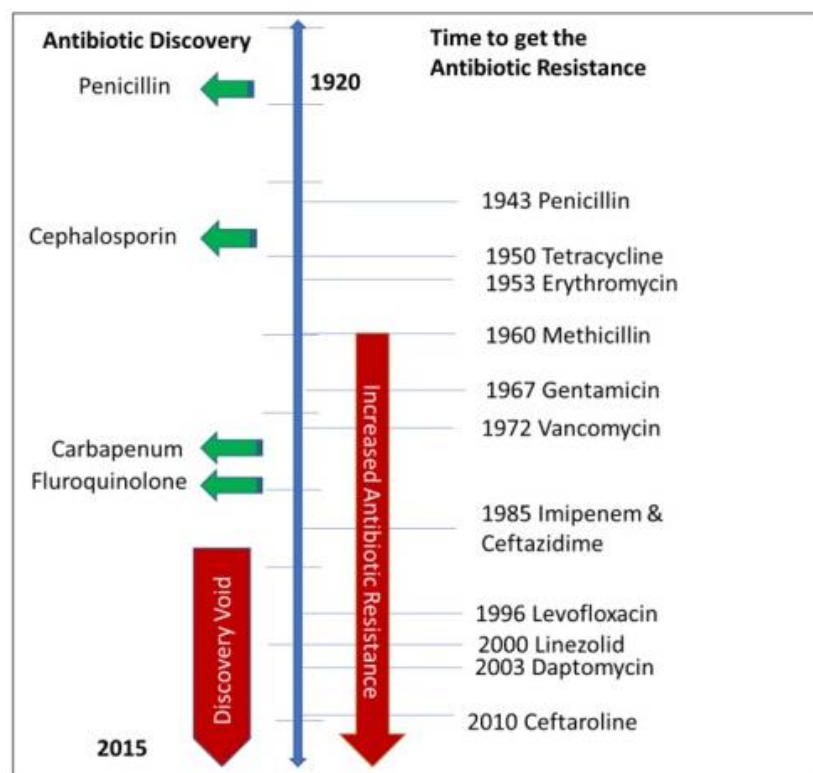
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## ANTIMICROBIAL RESISTANCE

Antimicrobial resistance is the global public health concern. Emergence of antimicrobial resistance increases risk of failure of antimicrobial therapy. It is more dominant in the developing or underdeveloped countries. Lack of awareness in general population and lack of concern by the healthcare workers, are the major contributing factors.

Antimicrobial resistance is reported to occur when a drug loses its ability to inhibit microbial growth effectively. Microbes become 'resistant' and continue to multiply in the presence of therapeutic levels of the antimicrobials.



**Figure 1.**

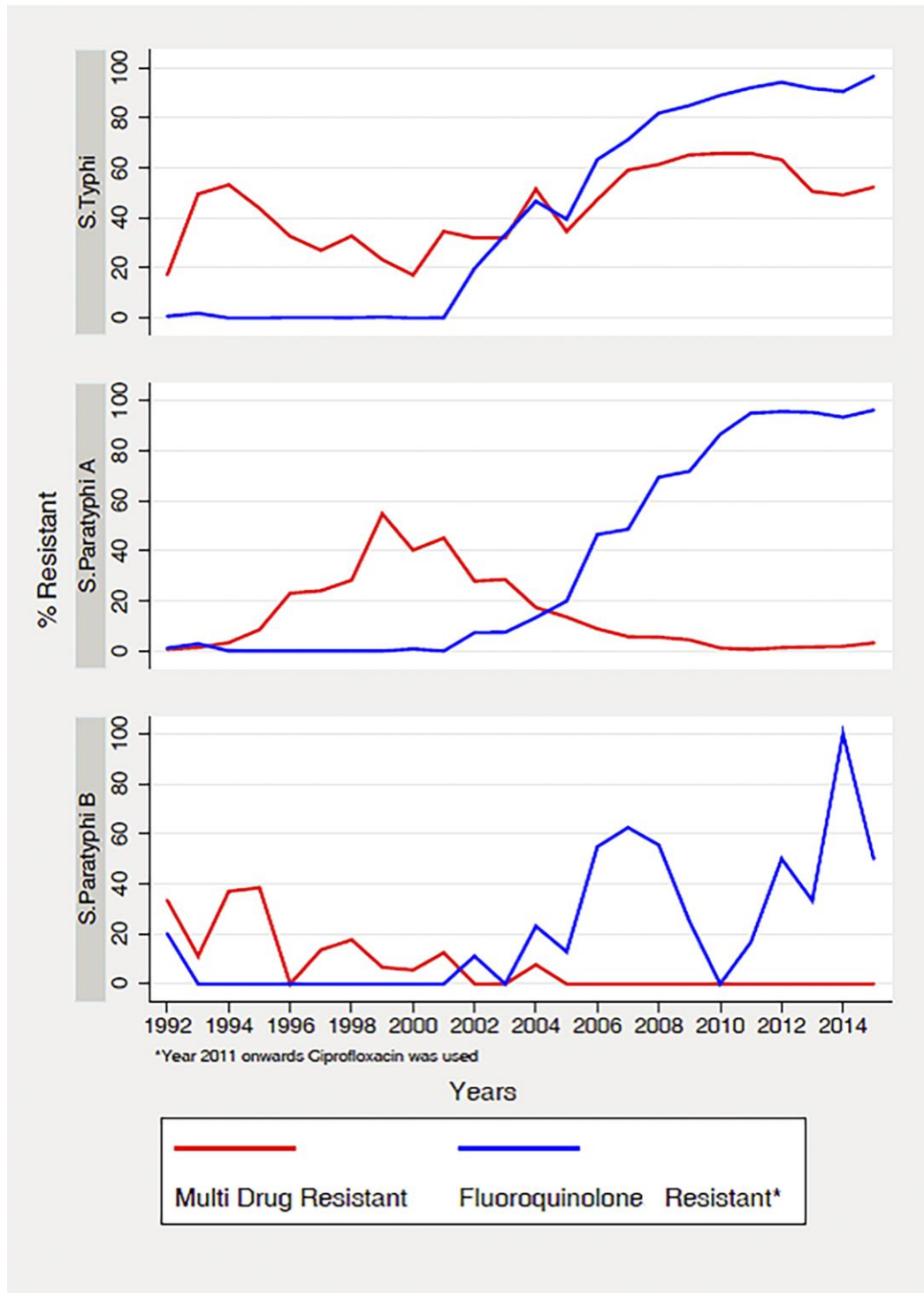
**Graphical representation of onset of antibiotic resistance versus time to get antibiotic resistance**

## ANTIMICROBIAL RESISTANCE IN PAKISTAN

A study showing the trends for *S. Typhi* and *S. Paratyphi* AMR conducted at AKU Karachi which has the largest sample and duration from 1992 to 2015.

The data suggests high prevalence of MDR strains of *S. Typhi*, rising from around 20% in 1992 to around 50% in 2015, whereas the MDR *S. Paratyphi A* and *B* strains have declined since the year 2004 to almost negligible levels.

Fluoroquinolone resistance for *S. Typhi* started rising in the year 2002 and reached to 96.5% in 2015, and similar patterns were observed for *S. Paratyphi A* with a resistance of 96.2% in the year 2015.



**Figure 2.**

**Data for antimicrobial resistance patterns from 1992 to 2015 at The Aga Khan University.**

Another study was conducted in the city of Lahore between June to November 2017 on the carbapenem-resistant *A. baumannii* strains. The in vitro susceptibility profiling expressed as resistance percentages are presented in the Table 1.

**Table 1. Percentage resistance, MIC50, MIC90 and MIC distribution of *A. baumannii* strains**

Antibiotics	%age resistance
Meropenem	89.1
Ceftazidime	89.7
Cefepime	89.1
Ampicillin-Sulbactam	89.7
Piperacillin	90.4
Piperacillin-Tazobactam	89.1
Amikacin	84.6
Ciprofloxacin	92.9
Doxycycline	55.8
Trimethoprim-Sulfamethoxazole	78.2
Colistin	0.0
Tigecycline	0.0

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3. Khurshid, M., Rasool, M. H., Ashfaq, U. A., Aslam, B., Waseem, M., Xu, Q., ... & Wang, M. (2020). Dissemination of blaOXA-23 harboring Carbapenem-Resistant *Acinetobacter baumannii* clones in Pakistan. *Journal of Global Antimicrobial Resistance*.