ANTIBIOTIC RESISTANCE

FROM RESEARCH TO ACTION

The 59th ITM Colloquium

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GLOBAL POINT PREVALENCE SURVEY OF ANTIMICROBIAL CONSUMPTION AND RESISTANCE (GLOBAL-PPS): RESULTS OF ANTIMICROBIAL PRESCRIBING IN INDIA

Dr. Sanjeev K Singh

Antimicrobial resistance – a global threat

Antibiotic resistance—the need for global solutions

Ramanan Laxminarayan, Adriano Duse, Chand Wattal, Anita K M Zaidi, Heiman F L Wertheim, Nithima Sumpradit, Erika Vlieghe, Gabriel Levy Hara, Ian M Gould, Herman Goossens, Christina Greko, Anthony D So, Maryam Bigdeli, Göran Tomson, Will Woodhouse, Eva Ombaka, Arturo Quizhpe Peralta, Farah Naz Qamar, Fatima Mir, Sam Kariuki, Zulfiqar A Bhutta, Anthony Coates, Richard Bergstrom, Gerard D Wright, Eric D Brown, Otto Cars

Access to effective antimicrobials: a worldwide challenge

Ramanan Laxminarayan, Precious Matsoso, Suraj Pant, Charles Brower, John-Arne Røttingen, Keith Klugman, Sally Davies

Recent years have seen substantial improvements in life expectancy and access to antimicrobials, especially in low-income and lower-middle-income countries, but increasing pathogen resistance to antimicrobials threatens to roll back this progress. Resistant organisms in health-care and community settings pose a threat to survival rates from serious infections, including neonatal sepsis and health-care-associated infections, and limit the potential health benefits from surgeries, transplants, and cancer treatment. The challenge of simultaneously expanding appropriate access to antimicrobials, while restricting inappropriate access, particularly to expensive, newer generation antimicrobials, is unique in global health and requires new approaches to financing and delivering health care and a one-health perspective on the connections between pathogen transmission in animals and humans. Here, we describe the importance of effective antimicrobials. We assess the disease burden caused by limited access to antimicrobials, attributable to resistance to antimicrobials, and the potential effect of vaccines in restricting the need for antibiotics.

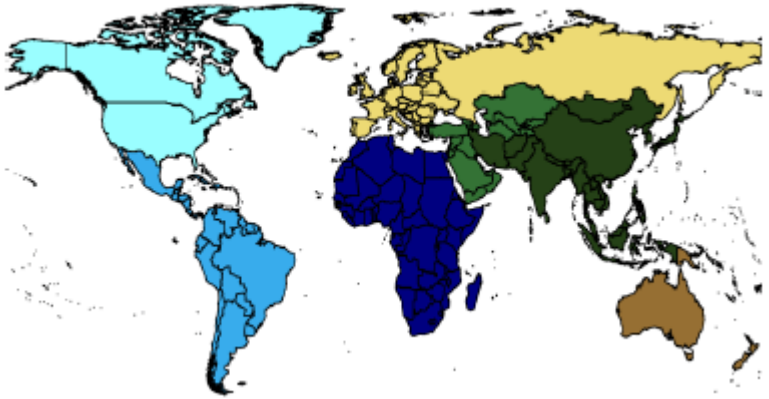
The Antibiotic Resistance Crisis

The rapid emergence of resistant bacteria is occurring worldwide, endangering the efficacy of antibiotics, which have transformed medicine and saved millions of lives.[1–6] Many decades after the first patients were treated with antibiotics, bacterial infections have again become a threat.[7] The antibiotic resistance crisis has been attributed to the overuse and misuse of these medications, as well as a lack of new drug development by the pharmaceutical industry due to reduced economic incentives and challenging regulatory requirements.[2–5,8–15] The Centers for

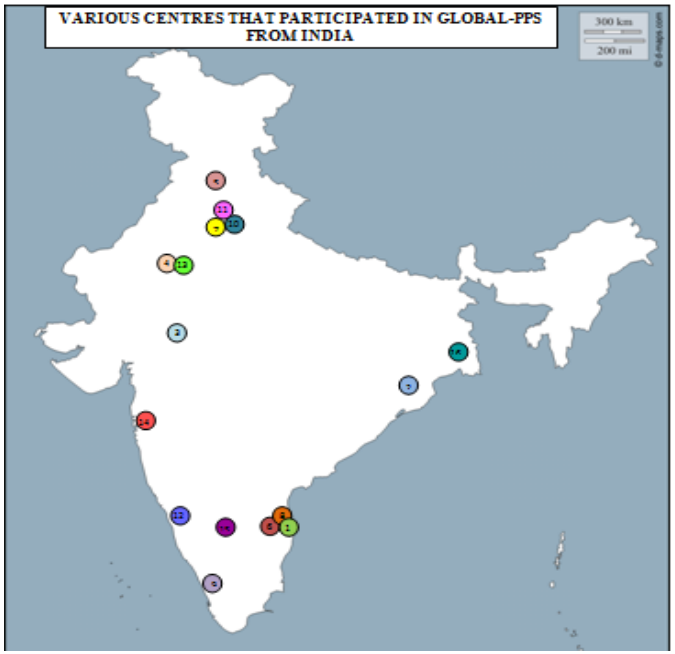
WHO's first global report on antibiotic resistance reveals serious, worldwide threat to public health

New WHO report provides the most comprehensive picture of antibiotic resistance to date, with data from 114 countries

- Antimicrobial Point prevalence surveys (PPS) is a tool to understand antimicrobial consumption and its resistance pattern in healthcare organizations.
- A software for Global Point Prevalence Survey (Global-PPS) of Antimicrobial Consumption and Resistance was developed by University of Antwerp, Belgium.



	Number of countries	Number of hospitals
North America	2	18
South America	7	52
Africa	4	31
Europe	16	106
West & Central Asia	4	36
East & South Asia	9	68
Australia & New Zealand	0	0



- Out of 25 only 16 healthcare organisations in our country got Ethics approval to participate in the study.

- Orientation of the software was given to all participating hospitals.

DATA MINING

- Global-PPS covered - 1750 patients - 1715 adult patients
- The overall percentage of admitted patients who were treated with antimicrobials was 57.4%.

GLOBAL-PPS PATIENT Form (Please fill in one form per patient on antimicrobial treatment/prophylaxis)

Ward Name/code	Activity [1] (M, S, IC)	Patient Identifier [2]	Survey Number [3]	Patient Age [4] Years (if ≥ 2 years)	Months (1-23 month)	Days (if <1 month)	Weight in kg, 2 decimals	Gender M or F

Antimicrobial Name [5]		1.		2.		3.		4.		5.	
Single Unit Dose [6]	Unit (g, mg, or IU) [7]										
Doses/ day [8]	Route (P, O, R, I) [9]										
Diagnosis [10] (see appendix II)											
Type of indication [11] (see appendix III)											
Reason in Notes (Yes or No) [12]											
Guideline Compliance (Y, N, NA, NI) [13]											
Is a stop/review date documented?(Yes/No)											
Treatment (E: Empirical; T: Targeted)											
The next section is to be filled in only if the treatment choice is based on microbiology data (Treatment=targeted) AND the organism is one of the following											
MRSA (Yes or No) [14]											
MRCoNS (Yes or No) [15]											
VRE (Yes or No) [16]											
ESBL-producing Enterobacteriaceae (Yes or No) [17]											
3rd generation cephalosporin resistant Enterobacteriaceae non-ESBL producing or ESBL status unknown (Yes or No)											
Carbapenem-resistant Enterobacteriaceae (Yes or No) [18]											
ESBL-producing non fermenter Gram-negative bacilli (Yes or No) [19]											
Carbapenem-resistant non fermenter Gram-negative bacilli (Yes or No) [20]											
Targeted treatment against other MDR organisms (Yes or No) [21]											

Treatment based on biomarker data (Yes or No)	0 Yes – 0 No				
If yes, which biomarker (CRP, PCT or other) [22]		Type of biological fluid sample (Blood/urine/other)		Most relevant value of biomarker on the day of the PPS: Value	Unit (in µg/L, mg/L, ...) [23]

- The percentage of admitted adults treated with atleast one antimicrobial was 57.1% (N=979).

- 41.1%(N=720) patients received antibiotic treatment.

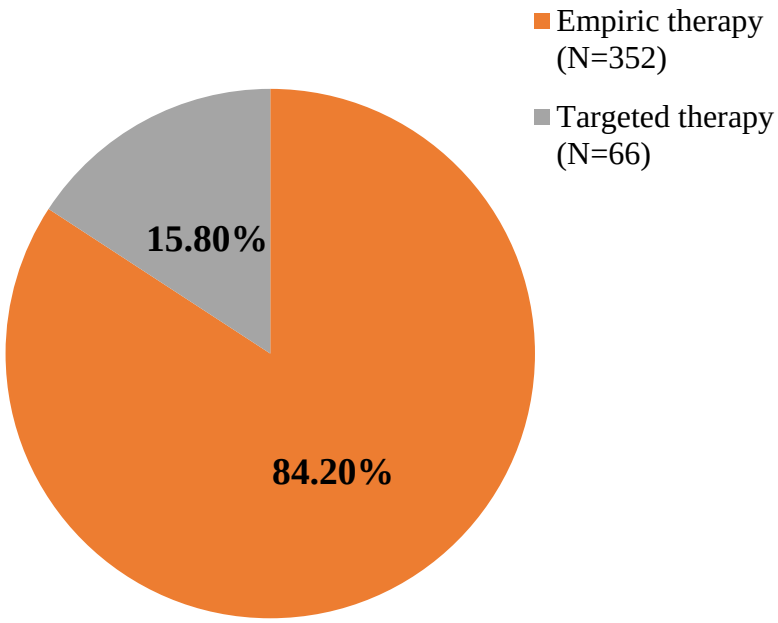
- 40.5%(N=709) patients received antimicrobial prophylaxis.

Among patients on treatment

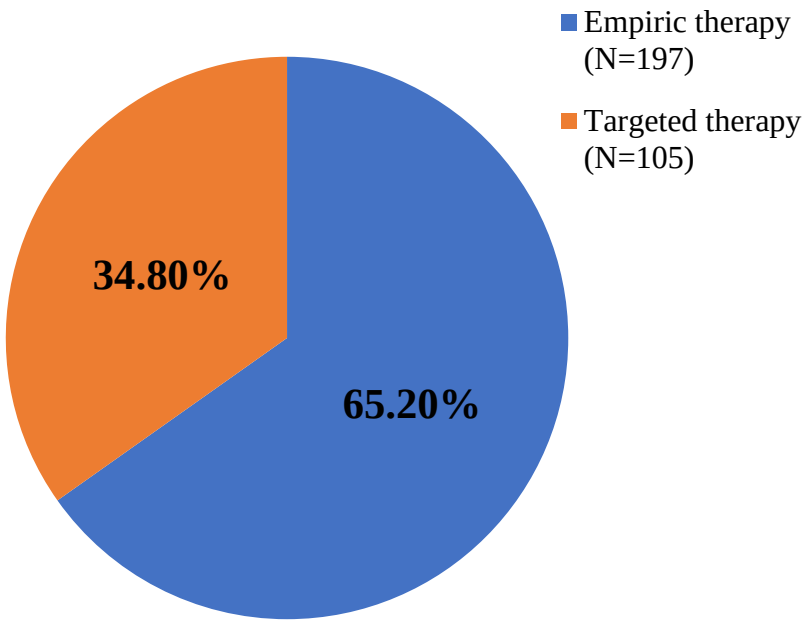
- 58.1%(N=418) had community acquired infections.

- 41.9%(N=302) had hospital acquired infections.

Prescribing pattern

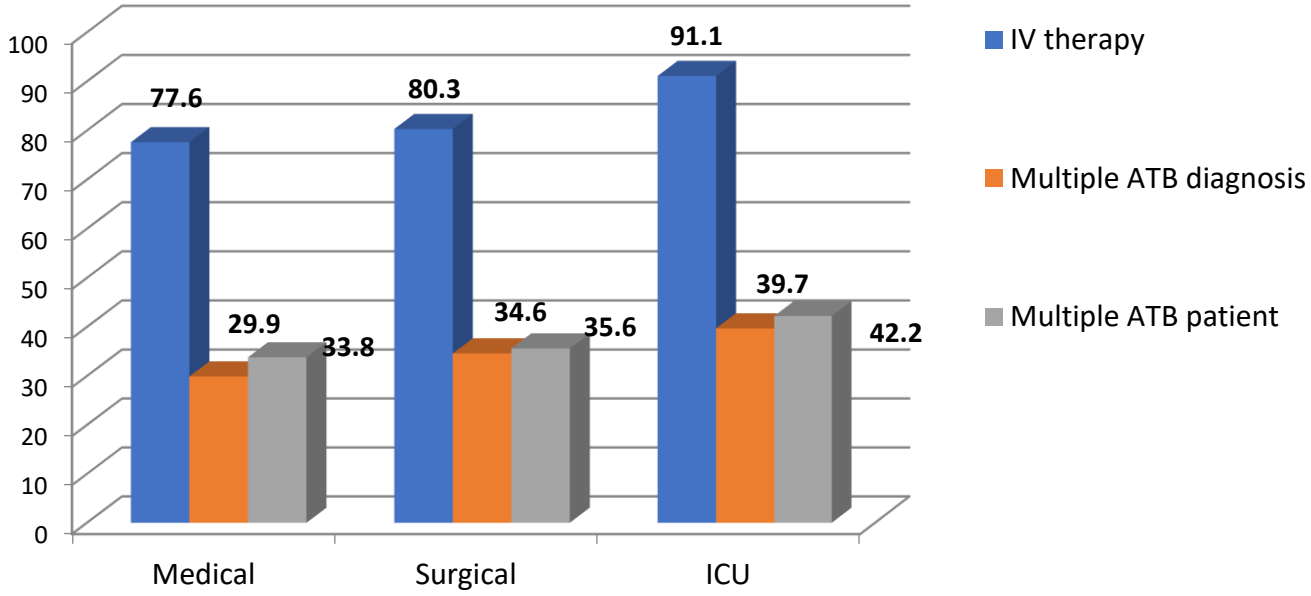


Therapeutic antimicrobial use for CA Infections

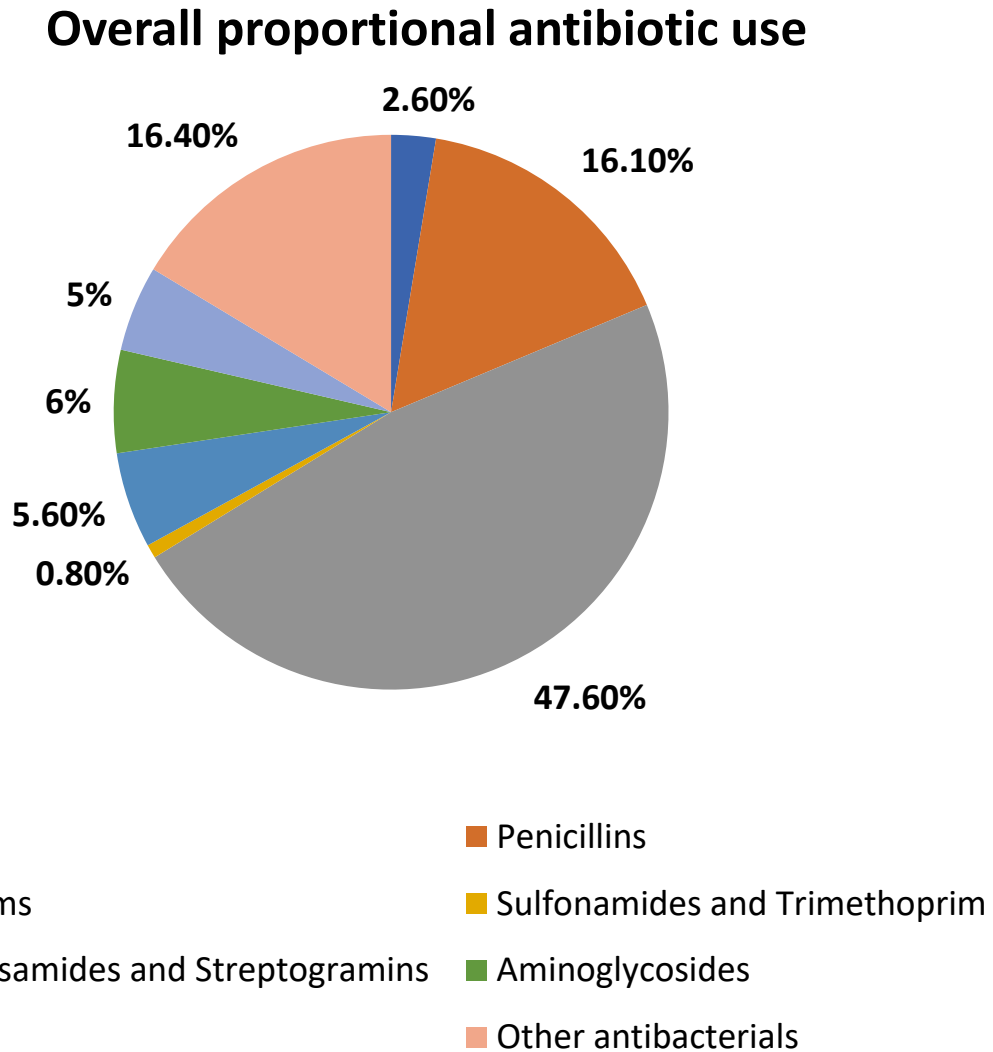


Therapeutic antimicrobial use for HA Infections

Key prescription patterns in medical, surgical wards and ICU



Commonest antibiotic



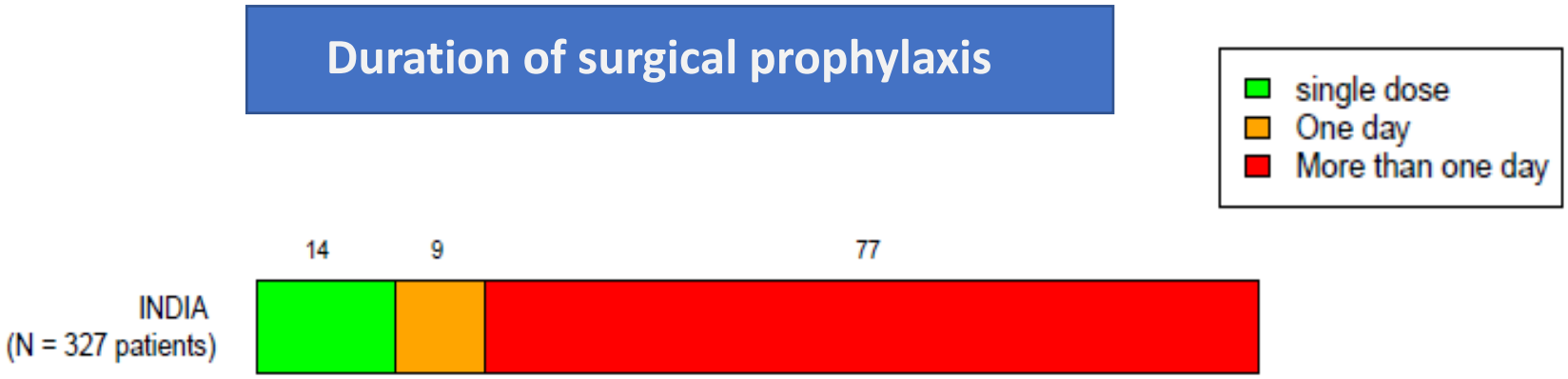
Prophylaxis

Among patients on prophylactic antimicrobials,

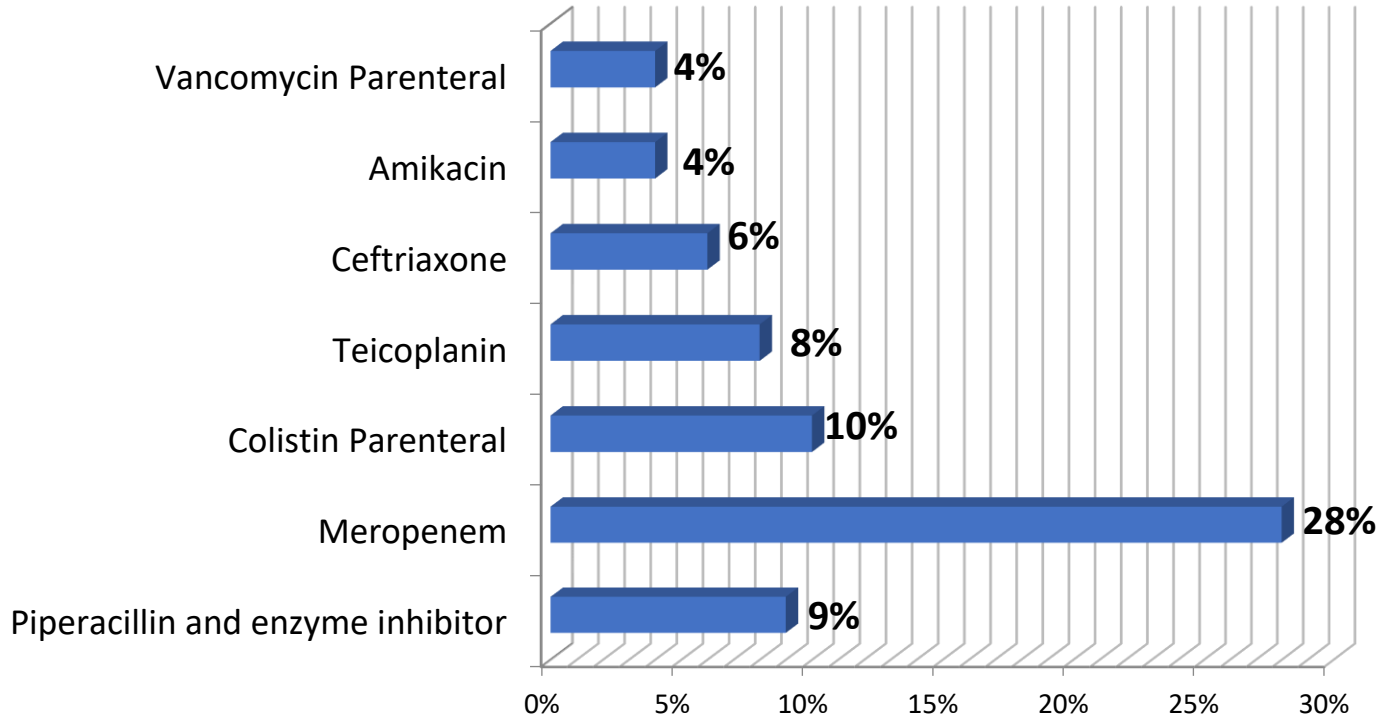
- 36.1%(N=256) received medical prophylaxis
- 63.9%(N=453) received surgical prophylaxis

- Ceftriaxone (24%), Piperacillin-tazobactam (8%) and Meropenem (8%) were the commonest antimicrobial prescribed for medical prophylaxis.

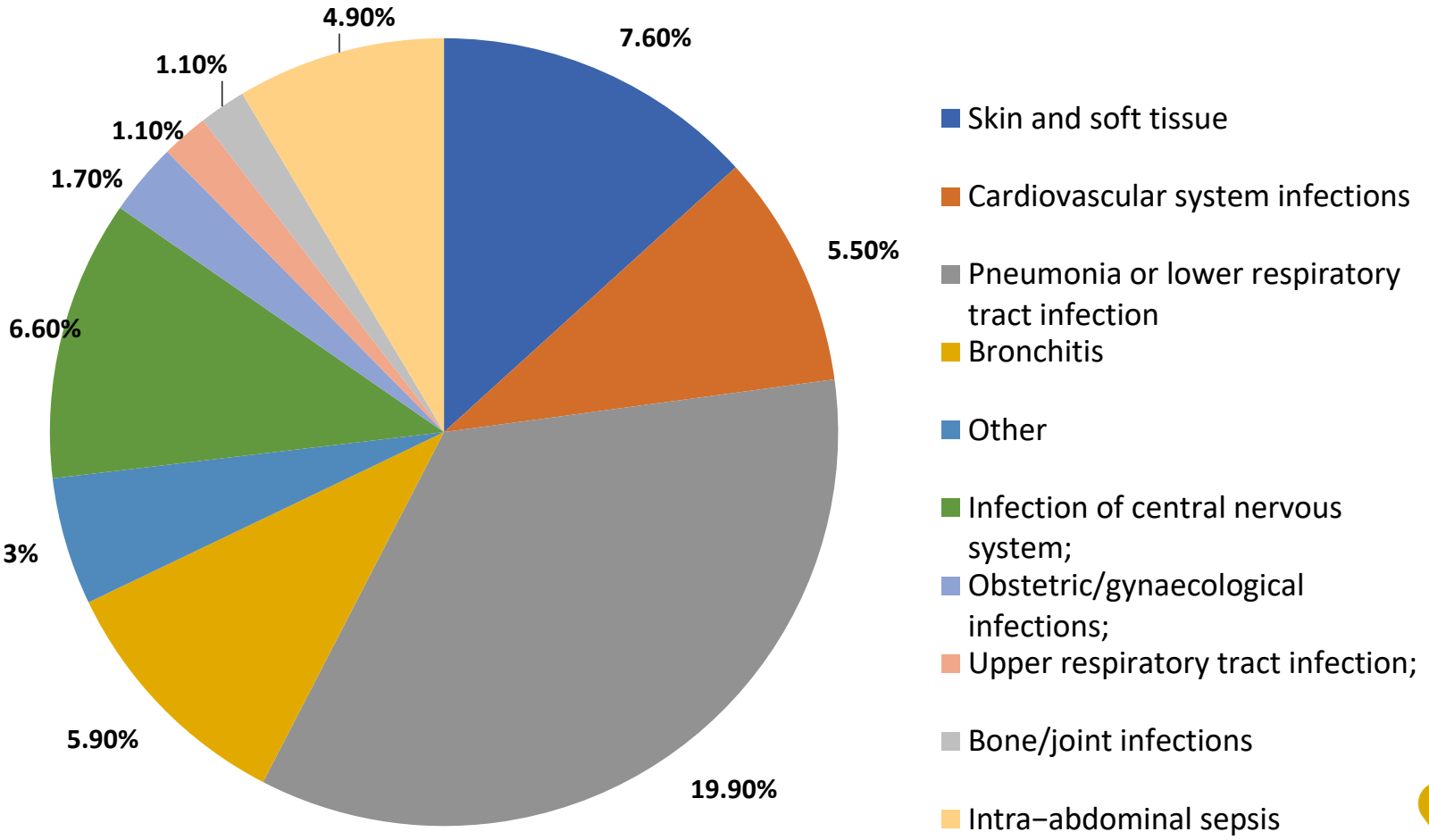
- Cefuroxime (36%), Amikacin (10%) and Ceftriaxone (8%) were the most frequently given antimicrobial for surgical prophylaxis.



Most frequently used antibiotics for sepsis



Commonest diagnosis



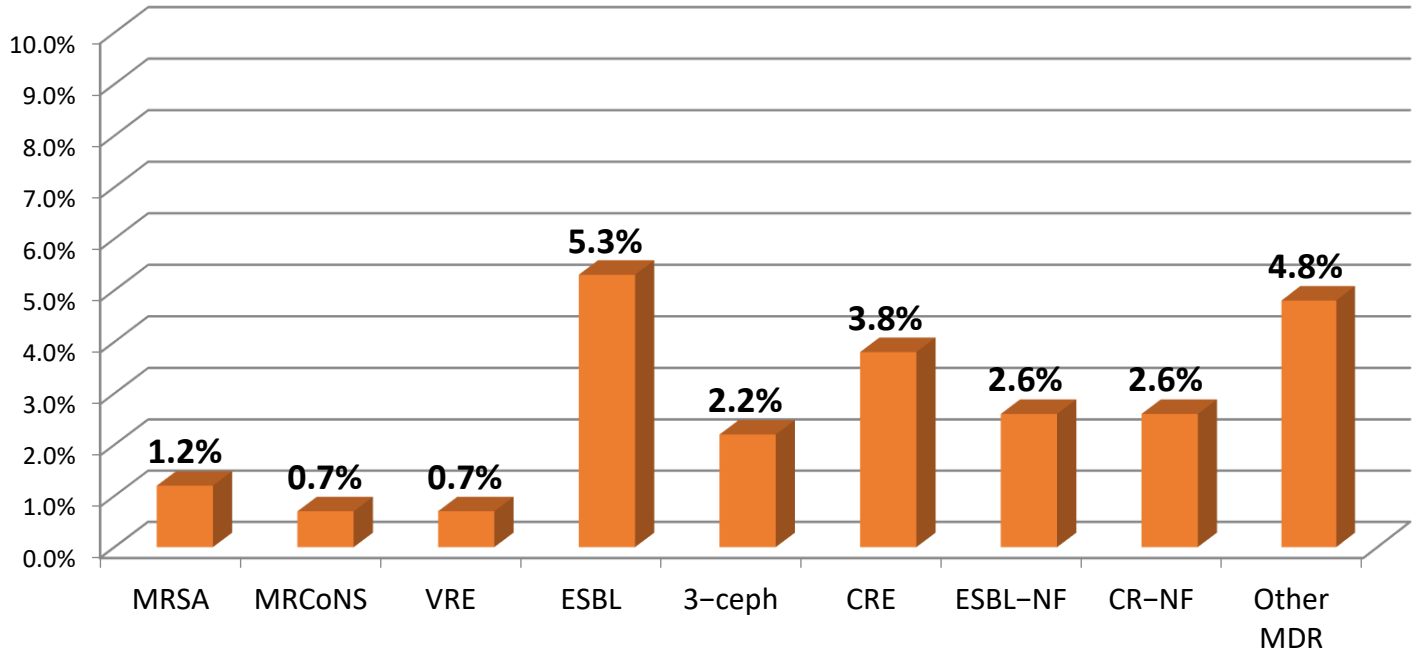
Summary of quality indicators for antibiotic use

	N	%
MEDICAL		
Reason in notes	188	45.5
Guidelines missing	85	20.6
Guideline compliant	167	70.2
Stop/review date documented	78	18.9
SURGICAL		
Reason in notes	178	47.3
Guidelines missing	91	24.2
Guideline compliant	142	70.0
Stop/review date documented	181	48.1
ICU		
Reason in notes	245	37.9
Guidelines missing	103	15.9
Guideline compliant	276	79.5
Stop/review date documented	315	48.7

- The documentation of reason for prescribing antimicrobials in notes was done for 42.5% prescriptions, stop or review date was documented for 40% prescriptions, guidelines were missing for 19.4% prescriptions and guidelines were complied by 74.2% prescriptions.

Treatment based on microbiology data

- 18.4% patients were reported to have received microbiology-based treatment against multidrug resistant organisms.



SUMMARY

- More than half of admitted patients (57.4%) were treated with antimicrobials.
- Majority of the patients on antibiotic treatment had community acquired infections.
- Majority of the patients received empiric therapy rather than targeted therapy.
- Penicillins were the most commonly prescribed antibiotic. Ceftriaxone (24%) and Cefuroxime (36%),was the most commonly prescribed antimicrobial for medical and surgical prophylaxis respectively.
- Pneumonia or lower respiratory tract infection was the most common diagnosis.
- Antibiotic quality indicators such as reason in notes and post prescription review score was low.
- Less no. of 18.4% patients (18.4%) received microbiology-based treatment against multidrug resistant organisms.

THANK YOU