

LAST RESOURCE ANTIBIOTICS ARE IN USE; ANYTHING ELSE FOR FUTURE ?



Human beings are in a continuous battle with emerging and re-emerging infectious diseases. Emerging and re-emerging infectious diseases are increasing globally and the threat may increase in the future too. New report from Indian Council of Medical Research (ICMR) reveals that the antibiotics we rely on to treat severe infections are becoming less effective in India. This is a bad news for patients who are very sick and need these antibiotics to get better. In premodern times, colonization, slavery and war led to the global spread of infectious disease, with devastating consequences. Diseases such as tuberculosis, polio, smallpox and diphtheria circulated widely, and before the advent of vaccines, these diseases caused substantial morbidity and mortality.

Today a sudden health crisis in one region of the world is now only a few hours away from becoming a public health emergency in another. The world has developed an elaborate global health system as a bulwark against known and unknown infectious disease threats. Certainty abounds with respect to infectious disease threats and their consequences. Nevertheless, outbreaks and epidemics are virtually guaranteed to continue. Several factors have helped accelerate the spread of diseases around the world: the increasing ease of international travel (each year airlines carry more than two billion passengers), population growth, resistance towards drugs, under-resourced healthcare sys-

tems, intensive farming practices, and degradation of the environment.

With Covid-19 in the centre of attention for nearly two years, other infectious diseases should not be left forgotten. Some of them already had a couple of outbreaks in the Covid years. Viruses like Ebola, SARS, Marburg, Monkeypox and Zika are just a small portion of possible epidemic-prone viruses that could lead to the next pandemic. Being aware and prepared for the next pandemic should be our main focus for the future.

WHAT ARE INFECTIOUS DISEASES?

Infectious diseases are disorders that are caused by organisms, usually microscopic in size, such as bacteria, viruses, fungi or parasites that are passed directly or indirectly from one person to another. Humans can also become infected following exposure to an infected animal that harbors a pathogenic organism that is capable of infecting humans.

WHAT IS EMERGING INFECTIOUS DISEASE?

Emerging infectious diseases are defined as infectious diseases that are newly recognized in a population or have existed but rapidly increasing in incidence or geographic range, or they may be infections resulting from changes or evolution of existing organisms, known infections spreading to new geographic area or populations, previously unrecognized infections appearing areas undergoing ecologic transformation, or old infections re-emerging because of antimicrobial resistance in known

agents or breakdowns in public health measures.

Infectious diseases are responsible for an immense global burden of disease that impacts the public health system and economy worldwide, disproportionately affecting vulnerable populations. The number of outbreaks have progressively increased since many years in India. In this era of globalization and rapid international travel, any infectious disease in one country can become a potential threat to the entire globe. Outbreaks of Nipah, Zika, Crimean Congo Haemorrhagic fever and Kyasanur Forest Disease have been reported for a decade and now we have just resolved Covid-19 pandemic. Death from the infectious diseases HIV/AIDS and Tuberculosis have fallen significantly in recent years, and they no longer appear on the list of top ten causes of death globally. However these diseases are still a leading cause of death in low-income countries.

Malaria is another infectious disease that is the top cause of death in low income countries. Zoonotic diseases are transmitted from animals to humans through direct contact or through food, water and the environment. The incidence of zoonosis increases when humans live in close contact with animals and when humans encounter animals in new geographic regions. Eg: Lyme disease (Spread by ticks) and Salmonella (Spread by poultry). One may recall recent outbreaks of Salmonella in shell eggs, chicken products, raw turkey products and pet guinea pigs. Vector borne diseases are also a major

source of mortality and morbidity globally. Three mosquito-borne viruses are yellow fever, Chikungunya and dengue fever. Recent EIDs include Nipah, Chikungunya, Human enterovirus-71, Hanta-virus infection, Influenza, SARS Corona viral infection, Dengue and Japanese encephalitis viral infection etc.

Epidemics and pandemics have always had major social and economic impacts on affected populations, but in our current interconnected world, the impacts are truly global. This has been clearly demonstrated by the COVID-19 pandemic that began in 2019. Infections in one region can easily spread to another. Until the virus can be contained globally, a surge in cases in one area can cause a resurgence of cases in other areas around the world. Emerging infections account for at least 15% of all human pathogens according to the 10th International conference on EID. Kerala has emerged a hotbed for communicable diseases leaving an indelible blotch in the enviable health record. Recently one student from Veterinary and Animal Sciences at Pookode in Kerala's Wayanad district was infected with a lesser known Norovirus. Keralites had also been at the receiving end of Nipah Viral infection (Causative organism- Nipah virus belongs to Paramyxoviridae family) spread by fruit-eating bats. The first outbreak on 17th July 2018 localized to Kozhikode and Malappuram districts claimed 17 lives among 19 cases. After that outbreak was effectively contained, a 23-year-old student was diagnosed with Nipah in Kochi on June 4, 2019. Recently, Nipah was reported in Kerala in the month of September in Kozhikode, reported six confirmed cases including two deaths. The Nipah virus emerged as a new virus 25 years ago. I.e. In 1998 in Malaysia which caused morbidity and mortality and demolished the pig farming industry in Malaysia. This virus caused outbreaks in Bangladesh and Siliguri, India in 2001 where bats of the Pteropodidae family were incriminated as potential reservoirs. Kerala's share of communicable diseases does not end there. Leptospirosis or rat fever has been a major threat to Kerala with more than 1,000 cases reported annually, causing the highest number of deaths among all communicable diseases in Kerala. The number of cases of rat fever and deaths caused by it in Kerala were 1821 and 104 (5.7 percent), 1359 and 229 (16.9 percent) respectively. Another villain in the list of Kerala's share of communicable diseases is Dengue fever. Kerala recorded the highest number of dengue-related deaths (165) and the second highest number of cases in the country (21,993) after Tamil Nadu. This

was the highest ever dengue-related fatality and cases reported in Kerala. Kerala's experience with Covid-19 proved to be an enigma to epidemiologists. The state's tryst with Covid-19 commenced on January 30th 2020, which was the first ever case in India. Fresh from her spectacular success in taming Nipah, Kerala showcased stellar results initially in the Covid front too.

Hospital-acquired or health-care-associated infection (HAI), formerly called nosocomial infection has been defined as "an infection occurring in a patient in a hospital or other health-care facility in whom the infection was not present or incubating on admission to that hospital/ facility". Some of these infections may be manifested only after patient discharge. The commonly reported HAIs are surgical site infections (SSIs), urinary tract infections (UTIs), pneumonia, and bloodstream infections. A recent European study revealed that of every 20 patients hospitalized, at least one acquired a preventable HAI. Most HAIs caused by *Staphylococcus aureus*, *Pseudomonas aeruginosa*, *Klebsiella pneumoniae*, or the *Acinetobacter* species were highly resistant to multiple antimicrobials, and the lack of new antimicrobials increases the huge burden in Europe. Similar findings have been reported in South east Asian countries, where the most common microorganisms were *Pseudomonas aeruginosa*, *Acinetobacter baumannii* and *Klebsiella* species. An epidemiological study carried out by WHO in 14 countries reported that the overall incidence of HAIs was 7.6% in North America and Europe and 10.1% in Asia, Latin America, and Sub-Saharan Africa.

Antimicrobial resistance is widely recognized as a crucial concern. Antibiotic use and antimicrobial resistance in long-term care facilities (LTCFs) are substantial due to the significant use of antibiotics. Several studies have demonstrated high rates of inappropriate prescribing of antibiotics, reaching 24% or higher, in LTCFs. Multidrug resistance for pathogens involved in sepsis is worsening, both globally and in LMICs, with greater at-

tention advocated for antibiotic stewardship. Antimicrobial resistance, or reduced susceptibility, to the combination of penicillin and gentamicin and to third-generation cephalosporins was reported, in more than 40% of cases of neonatal bacteremia acquired in a community setting. Overall resistance to third-generation cephalosporins in Gram-negative bacteria, estimated to be around 50% in Africa, is increasing. Recent initiatives advocate the need to investigate new management algorithms to reduce unnecessary antibiotic use for neonatal sepsis, especially in the neonatal intensive care unit (NICU) setting.

Carbapenem-resistant gram-negative bacteria (CR-GNB), including carbapenem-resistant *Enterobacteriaceae* (CRE), carbapenem-resistant *Acinetobacter baumannii* (CRAB), and carbapenem-resistant *Pseudomonas aeruginosa* (CRPA), have emerged as significant global public health crisis. Intensive care units (ICU) are a hotspot for the emergence and spread of CR-GNB owing to the complex ICU environment, critical patient conditions, frequent invasive procedures, extensive antibiotic use, and inadequate staffing. The limited treatment options and unfavourable outcomes associated with CR-GNB infections necessitate practical and effective preventive strategies.

NEWER TRENDS IN ANTIBIOTICS

The 'golden age' for antibiotic discovery, from 1940 until the early 1970s, ushered in a new era in human and animal health and the associated dramatic increase in human life expectancies. Indeed the possibility of eradicating infectious disease seemed feasible. However it soon became apparent that microorganisms wouldn't be defeated so easily. Their weapon: antibiotic resistance. Today microbial antibiotic resistance is rapidly exhausting our supply of effective compounds and making the possibility of a global public health disaster seems likely. Resistance to antibiotics and other antimicrobial compounds permanently increases and

it appears that the struggle against antibiotic resistance is a war we can never win. The strength of the immense numbers of microorganisms appears to overpower our drugs. However, there are hopes and chances to at least improve the situation. In the present review we want to discuss certain steps to be used to tackle antibiotic resistance including: 1. Preparation of new vaccines against resistant bacterial strains, Search for new antibiotics in both traditional and non-traditional sources, Search for genes specifying biosynthesis of antibiotics, Use of forgotten natural compounds and their transformation, and Search for new antibiotic targets. New antibiotics are continuously required to combat antibiotic-resistant bacteria and pathogenic yeast. Such resistance increasingly limits the effectiveness of current antimicrobial drugs. The problem is not just antibiotic resistance, but also the appearance of an increasing number of multidrug-resistant pathogenic bacteria. Resistant bacteria were detected in hospitals and nosocomial infections have become a major problem. New screening approaches, including the search for novel targets and exploration of non-conventional places as sources of the producer microorganisms, are needed. In addition, metagenomic and genome-mining techniques have shown strong potential for discovery of new antibiotics. Antibiotics and other ribosomally synthesized peptides have attracted increasing attention in the search for new chemical classes of antibacterial agents effective against multidrug-resistant pathogens. Several factors have probably contributed to this resurgent interest. Newer forms of antibiotics that are currently under advanced preclinical or early clinical development state. We want to devote a special attention to the search for new compounds that would inhibit the currently antibiotic resistant pathogenic bacteria.

ID Congress 2024- The 2nd International congress on infectious diseases and clinical pharmacy on the theme "Infectious diseases and antimicrobial stewardship in critical care" will

be held on Lavandis Convention Centre from 19th January 2023- 21st January 2023, Organized by IQRRA International Hospital and Research Centre in collaboration with Federation of Clinical Pharmacists in India.

SCOPE

Rising resistance amongst microorganisms and limited antimicrobial reserves have always been challenging in treating critically ill patients. It is very important to understand this global threat and optimize the use of antimicrobials in a critical care setting. After the success of the ID congress 2023 at Thiruvalla, Kerala attended by 950+ delegates, the cVclinical pharmacy department at IQRRA International Hospital and Research Centre organizing the conference "ID Congress 2024". Renowned infectious disease experts including intensivists, ID physicians, clinical pharmacists and clinical microbiologists gather to provide a learning feast in infectious diseases and antimicrobial stewardship.

1. Infectious disease in an era of global change. Rachel E. Baker, Ayesha S. Mahmud, Ian F. Miller, et al. a nature research journal.
2. Zoonoses. World Health Organization. Published July 29, 2020. [Accessed 3 April 2023]. <https://www.who.int/news-room/fact-sheets/detail/zoonoses>
3. Taylor LH, Latham SM, Woolhouse ME. Risk factors for human disease emergence. *Philos Trans R Soc Lond B Biol Sci.* 2001;356:983-989. [PMC free article] [PubMed] [Google Scholar]
4. CDC, WHO. The Centers for Disease Control and Prevention and the World Health Organization; 2001. Course: "Smallpox: Disease, Prevention, and Intervention" <http://www.emergency.cdc.gov/agent/smallpox/training/overview/> [Online]. Available: (accessed and retrieved 28.04.16) [Google Scholar]
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6. Past, Present, and Future of Antibacterial Economics: Increasing Bacterial Resistance, Limited Antibiotic Pipeline, and Societal Implications.
7. Luepke KH, Suda KJ, Boucher H, Russo RL, Bonney MW, Hunt TD, Mohr JF 3rd. *Pharmacotherapy*. 2017 Jan;37(1):71-84. doi: 10.1002/phar.1868. Epub 2016 Dec 27.

PATIENT - REPORTED OUTCOME MEASURES (PROMS)

Patient-Reported Outcome Measures (PROMs) are tools that measure outcomes reported by patient. The quality of PROMs are measured from patient's perspective and not from providers. If the quality of service provided to the customer is to be measured, it should be understood from the perspective of a patient, and the effectiveness of service or care from the patient's own perspective is measured through PROM.

Why are PROMs used ?

- Measurement of the patient's health status or health related quality of life.
- Measures outcome of specific intervention (a surgery or a procedure).
- Changes in health status at two different points in time (before and after intervention).

- Which is the best treatment for the condition? (by involving patient in decision making)

How to use PROM?

- Firstly identify the existing PROM tool using in the organization for ex: Questionnaire
- Test for reliability, validity, responsiveness and feasibility of use.
- PROM tool should not be a burden to patient.
- Once the outcome is identified, aggregated the data, and prepare a benchmark.
- Evaluate the threats to validity (exclusions, missing data, poor response rate...)

Examples of PROMs

- The Short Form 36 (SF-36) Health Survey assesses overall health status

and specific aspects of health, such as physical function and mental health.

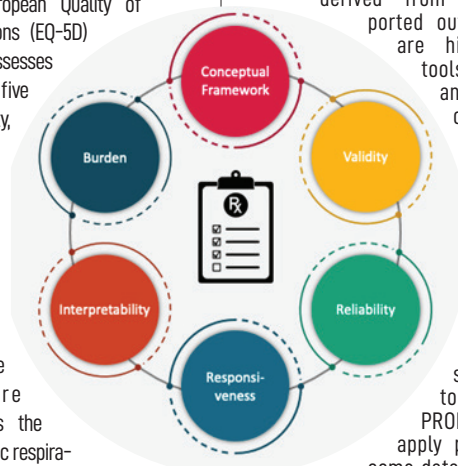
- The European Quality of Life-5 Dimensions (EQ-5D) questionnaire assesses

health status in five domains: mobility, self-care, usual activities, pain/discomfort, and anxiety/depression.

- The Chronic Respiratory Disease Questionnaire (CRQ) assesses the impact of chronic respiratory disease on a patient's quality of life.

Conclusion

PROMs are quality measures derived from patient-reported outcomes and are high priority tools for NABH and other accreditation agencies. These measures present some design challenges and require stakeholders to construct PROMs that apply patient outcome data to measure quality of care.





2nd International Congress on Infectious Diseases and Clinical Pharmacy

ID CONGRESS 2024

'Infectious Diseases and Antimicrobial Stewardship in Critical Care'

JAN 2024

19 Masterclass **20-21** Conference

Lavandis Convention Centre
Mokavoor Rd, Kozhikode, Kerala

FOR REGISTRATION



Scan Here

ID CONGRESS 2024

2nd INTERNATIONAL CONGRESS ON
INFECTIOUS DISEASES AND CLINICAL PHARMACY

19th JAN 2024 (FRIDAY)

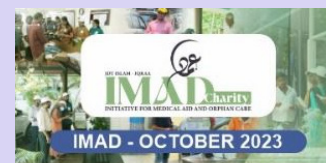
SCIENTIFIC PROGRAM - MASTERCLASS			
TIME	TOPIC	FACULTY	DURATION
07:30 - 08:30	REGISTRATION		60 min
08:30 - 08:40	Overview of the Masterclass	Shareek PS	10 min
08:40 - 10:40	Session Theme: Difficult to Treat Infections in ICU Patients: A Case-based Approach	Shihabudheen P	25 min
		Faris Hussain KN	25 min
		VK Sureshkumar	25 min
		Shareek PS	25 min
	Q&A Session		15 min
	Felicitation		5 min
10:40 - 11:00	TEA BREAK		20 min
11:00 - 12:40	Session Theme: Antimicrobial Administration and Dosing Complexities		
	Principles of RRT and Antimicrobial Dosing	Grace Mary John	20 min
	Use of Inhalational Antibiotics in Mechanically Ventilated Patients	Saidulu Ganta	20 min
	Principles of Antimicrobial Dosing in ECMO Patients	Mohamed Hisham	20 min
	Use of Antimicrobials for Intrathecal and Intraventricular Administration	Senthur Nambi	20 min
	Q&A Session		
	Felicitation		
12:40 - 13:40	LUNCH BREAK AND FRIDAY PRAYERS		
13:40 - 15:00	Session Theme: Diagnostics and Microbiology in ICU		
	Rapid Diagnostics in ICU: A Stewardship Purview	Sayli Gore	20 min
	Real World Data on Biomarkers for ICU Infections	Deepthi Madhu	20 min
	Optimizing Clinical Microbiology Inputs in ICU	Priyanka R Nair	20 min
	Q&A Session		15 min
	Felicitation		5 min
15:00 - 15:15	TEA BREAK		15 min
15:15 - 16:50	Session Theme: Hospital Acquired Infections in ICU		
	Catheter Associated Urinary Tract Infection (CAUTI) - Is it over diagnosed and (or) overtreated in the ICU?	Senthur Nambi	25 min
	Catheter Related Bloodstream Infection (CRBSI) - How Common is it in the ICU?	Rajalakshmi A	25 min
	Ventilator Associated Pneumonia (VAP) - What makes it Dangerous?	Anup Warriar	25 min
	Q&A Session		15 min
	Felicitation		5 min
END OF MASTERCLASS			

ID CONGRESS 2024

2nd INTERNATIONAL CONGRESS ON
INFECTIOUS DISEASES AND CLINICAL PHARMACY

20th JAN 2024 (SATURDAY)

SCIENTIFIC PROGRAM - CONFERENCE - DAY 1			
TIME	TOPIC	FACULTY	DURATION
08:00 - 09:00	REGISTRATION		
09:00 - 10:15	Session Theme: Tropical Infections		
	Approach to Tropical Fevers in ICU	Kavitha Saravu	20 min
	Dengue: Complications and Management	Netto George	20 min
	Severe Scrub Typhus: Management and Updates	Shareek PS	20 min
	Q&A Session		10 min
	Felicitation		5 min
10:15 - 10:30	TEA BREAK AND E-POSTER PRESENTATION		15 min
10:30 - 11:15	Inauguration of the ID Congress 2024		45 min
11:15 - 12:05	Plenary Session		
	Antimicrobial Stewardship in India: Way Forward	Abdul Ghafur	25 min
	Top Practice Changing ID Papers in 2023	Rajeev Soman	25 min
12:05 - 13:20	Session Theme: Cardiopulmonary Infections		
	Infective Endocarditis: What's New?	Anup Warriar	20 min
	Implantable Cardiac-assist Devices related Infections	Mohamed Hisham	20 min
	Management of Nontuberculous Mycobacterial Infections	Rajeev Soman	20 min
	Q&A Session		10 min
	Felicitation		5 min
13:20 - 14:20	LUNCH BREAK AND E-POSTER PRESENTATION		60 min
14:20 - 16:00	Session Theme: Complexities of Mycobacterial Infections		
	Approach to Extra-Pulmonary Tuberculosis	Netto George	20 min
	Treatment of Drug-Resistant Tuberculosis	Sanjeev Nair	20 min
	Prevalence and Management of Childhood Tuberculosis in India	Vidya Krishna	20 min
	How to Approach Atypical Pneumonia?	Namitha R	20 min
	Q&A Session		15 min
	Felicitation		5 min
16:00 - 16:20	TEA BREAK AND E-POSTER PRESENTATION		20 min
16:20 - 17:30	Session Theme: What else in Infectious Diseases and Antimicrobial Stewardship?		
	Prevalence and Management of Melioidosis	Kavitha Saravu	20 min
	Antimicrobial Stewardship in ICU	Rajalakshmi A	20 min
	Antimicrobial Stewardship in Pediatrics: Is it Different from Adults?	Vidya Krishna	20 min
	Q&A Session		10 min
END OF CONFERENCE DAY 1			



Total No. of Patients : 194
Total amount spent in IMAD : 18,04,926/-

CARDIOLOGY	-	7
NEUROLOGY	-	9
NEPHROLOGY	-	31
ORTHOPEDICS	-	18
GASTRO SURGERY	-	12
OBSTETRICS & GYNAECOLOGY	-	7
PAEDIATRIC SURGERY	-	2
GENERAL MEDICINE	-	36
GENERAL SURGERY	-	11
PULMONOLOGY	-	9
VASCULAR & INTERVENTIONAL RADIOLOGY	-	6
GASTROENTEROLOGY	-	8
NEONATOLOGY	-	6
ENT	-	1
SPINAL SURGERY	-	7
HAEMATOLOGY	-	1
UROLOGY	-	11
CCM	-	3
DENTAL	-	3
PLASTIC SURGERY	-	4