

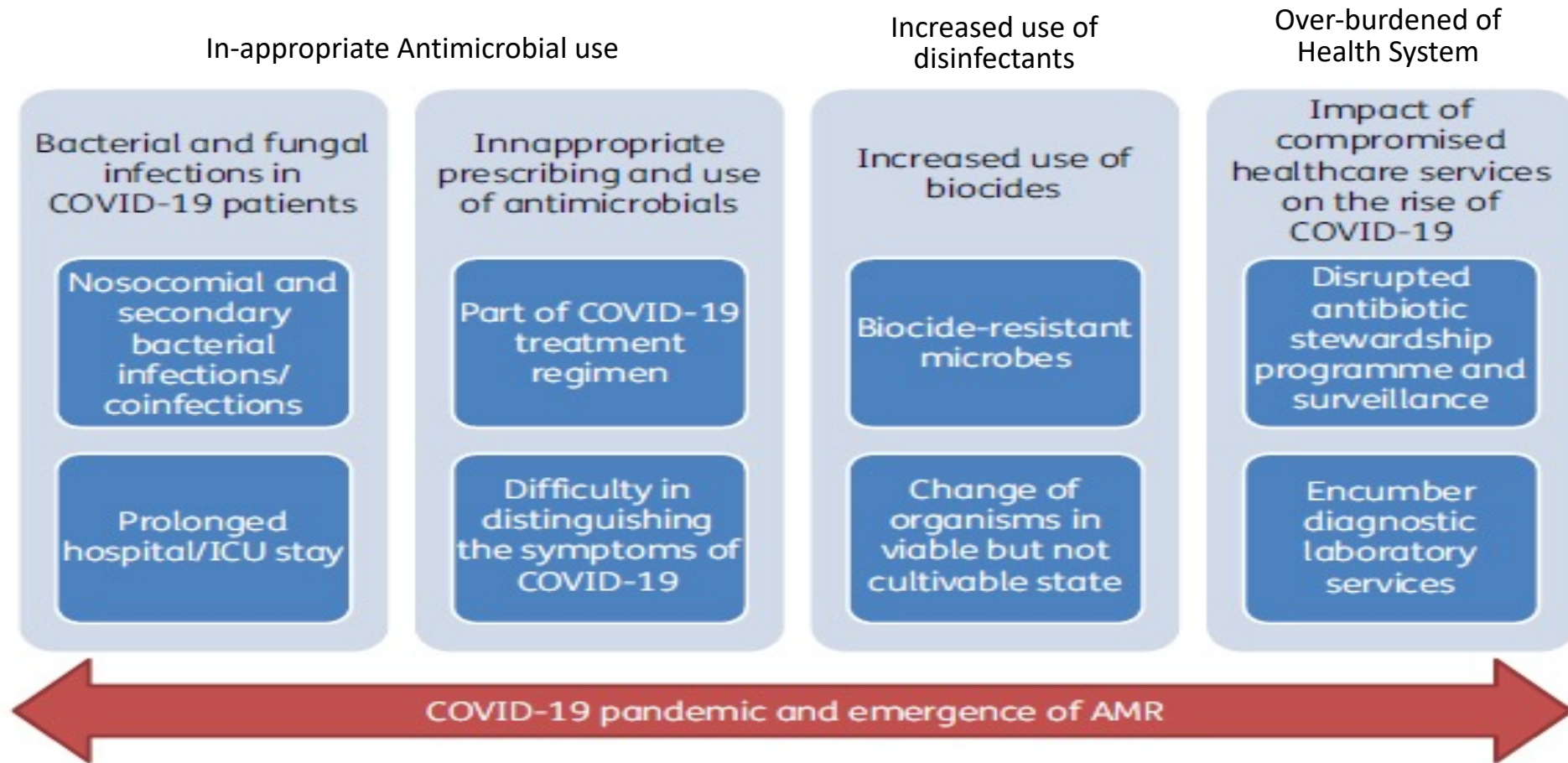
# The trend of antibiotic consumption during the Covid-19 pandemic



Siswanto

SA, Science and Innovation, SEARO

# Inter-twinning between Covid-19 pandemic and the emergence of AMR



# Bacterial Co-infection in Covid-19 patients

## ARTICLE INFO

Article history:  
Accepted 23 May 2020  
Available online 27 May 2020

Keywords:  
Coronavirus  
COVID-19  
Coinfection  
Meta-Analysis

## SUMMARY

**Objectives:** In previous influenza pandemics, bacterial co-infections have been a major cause of mortality. We aimed to evaluate the burden of co-infections in patients with COVID-19.

**Methods:** We systematically searched Embase, Medline, Cochrane Library, LILACS and CINAHL for eligible studies published from 1 January 2020 to 17 April 2020. We included patients of all ages, in all settings. The main outcome was the proportion of patients with a bacterial, fungal or viral co-infection.

**Results:** Thirty studies including 3834 patients were included. Overall, 7% of hospitalised COVID-19 patients had a bacterial co-infection (95% CI 3-12%, n=2183, I<sup>2</sup>=92.2%). A higher proportion of ICU patients had bacterial co-infections than patients in mixed ward/ICU settings (14%, 95% CI 5-26, I<sup>2</sup>=74.7% versus 4%, 95% CI 1-9, I<sup>2</sup>= 91.7%). The commonest bacteria were *Mycoplasma pneumonia*, *Pseudomonas aeruginosa* and *Haemophilus influenzae*. The pooled proportion with a viral co-infection was 3% (95% CI 1-6, n=1014, I<sup>2</sup>=62.3%), with Respiratory Syncytial Virus and influenza A the commonest. Three studies reported fungal co-infections.

**Conclusions:** A low proportion of COVID-19 patients have a bacterial co-infection; less than in previous influenza pandemics. These findings do not support the routine use of antibiotics in the management of confirmed COVID-19 infection.

© 2020 The British Infection Association. Published by Elsevier Ltd. All rights reserved.

- Only 7% of Hospitalized Covid-19 patients had a bacterial co-infection
- For ICU patients → 14% had bacterial co-infection

# Antibiotic prescribing in Covid-19 patients

## ARTICLE INFO

### Article history:

Received 1 September 2020

Received in revised form

8 December 2020

Accepted 15 December 2020

Available online 5 January 2021

Editor: Mariska Leeftang

### Keywords:

Antibiotic Prescribing

Antibiotics

Antimicrobial Stewardship

Antimicrobial therapy

COVID-19

SARS-CoV-2

## ABSTRACT

**Background:** The proportion of patients infected with SARS-CoV-2 that are prescribed antibiotics is uncertain, and may contribute to patient harm and global antibiotic resistance.

**Objective:** The aim was to estimate the prevalence and associated factors of antibiotic prescribing in patients with COVID-19.

**Data Sources:** We searched MEDLINE, OVID Epub and EMBASE for published literature on human subjects in English up to June 9 2020.

**Study Eligibility Criteria:** We included randomized controlled trials; cohort studies; case series with  $\geq 10$  patients; and experimental or observational design that evaluated antibiotic prescribing.

**Participants:** The study participants were patients with laboratory-confirmed SARS-CoV-2 infection, across all healthcare settings (hospital and community) and age groups (paediatric and adult).

**Methods:** The main outcome of interest was proportion of COVID-19 patients prescribed an antibiotic, stratified by geographical region, severity of illness and age. We pooled proportion data using random effects meta-analysis.

**Results:** We screened 7469 studies, from which 154 were included in the final analysis. Antibiotic data were available from 30 623 patients. The prevalence of antibiotic prescribing was 74.6% (95% CI 68.3–80.0%). On univariable meta-regression, antibiotic prescribing was lower in children (prescribing prevalence odds ratio (OR) 0.10, 95% CI 0.03–0.33) compared with adults. Antibiotic prescribing was higher with increasing patient age (OR 1.45 per 10 year increase, 95% CI 1.18–1.77) and higher with increasing proportion of patients requiring mechanical ventilation (OR 1.33 per 10% increase, 95% CI 1.15–1.54). Estimated bacterial co-infection was 8.6% (95% CI 4.7–15.2%) from 31 studies.

**Conclusions:** Three-quarters of patients with COVID-19 receive antibiotics, prescribing is significantly higher than the estimated prevalence of bacterial co-infection. Unnecessary antibiotic use is likely to be high in patients with COVID-19. **Bradley J. Langford, Clin Microbiol Infect 2021;27:520**

Crown Copyright © 2021 Published by Elsevier Ltd on behalf of European Society of Clinical Microbiology and Infectious Diseases. All rights reserved.

- About 75% Covid-19 patients got Antibiotic prescription, with increased prevalence in adults, as well as, patients with mechanical ventilation
- Even though, Estimated bacterial co-infections was 8.6%

# Secondary infections of hospitalized Covid-19 patients: India experience

## Secondary Infections in Hospitalized COVID-19 Patients: Indian Experience

Sonam Vijay<sup>1</sup>  
Nitin Bansal<sup>1</sup>  
Brijendra Kumar Rao<sup>2</sup>  
Balaji Veeraraghavan<sup>2</sup>  
Camilla Rodrigues<sup>4</sup>  
Chand Wactal<sup>5</sup>  
Jagdish Prasad Goyal<sup>6</sup>  
Karuna Tadepalli<sup>7</sup>  
Purva Mathur<sup>8</sup>  
Ramanathan Venkateswaran<sup>9</sup>  
Ramsubramanian Venkatasubramanian<sup>10</sup>  
Sagar Khadanga<sup>11</sup>  
Sanjay Bhattacharya<sup>12</sup>  
Sudipta Mukherjee<sup>13</sup>  
Sujata Baveja<sup>14</sup>  
Sujatha Sista<sup>15</sup>  
Samiran Panda<sup>1</sup>  
Kamini Walia<sup>1</sup>

<sup>1</sup>Division of Epidemiology and Communicable Diseases, Indian Council of Medical Research, New Delhi, India; <sup>2</sup>Institute of Critical Medicine, Sir Ganga Ram Hospital, New Delhi, India; <sup>3</sup>Department of Clinical Microbiology, Christian Medical College, Vellore, India; <sup>4</sup>Department of Microbiology, PD Hindu Hospital, Mumbai, Maharashtra, India; <sup>5</sup>Department of Clinical Microbiology, Sir Ganga Ram Hospital, New Delhi, India; <sup>6</sup>Department of Pediatrics, All India Institute of Medical Sciences, Jodhpur, India; <sup>7</sup>Department of Microbiology, All India Institute of Medical Sciences, Bhopal, India; <sup>8</sup>Department of Laboratory Medicine, Jai Prakash Narayan Apex Trauma Center, All India Institute of Medical Sciences, New Delhi, India; <sup>9</sup>Department of Medicine, JIPMER, Pondicherry, India; <sup>10</sup>Department of Infectious Diseases, Apollo Hospital, Chennai, Tamil Nadu, India; <sup>11</sup>Department of Medicine, All India Institute of Medical Sciences, Bhopal, India; <sup>12</sup>Department of Microbiology, Tata Medical Center, Kolkata, West Bengal, India; <sup>13</sup>Department of Critical Care Medicine, Tata Medical Center, Kolkata, West Bengal, India; <sup>14</sup>Department of Microbiology, Lokmanya Tilak Municipal General Hospital, Mumbai, India; <sup>15</sup>

**Purpose:** Critically ill coronavirus disease 2019 (COVID-19) patients need hospitalization which increases their risk of acquiring secondary bacterial and fungal infections. The practice of empiric antimicrobial prescription, due to limited diagnostic capabilities of many hospitals, has the potential to escalate an already worrisome antimicrobial resistance (AMR) situation in India. This study reports the prevalence and profiles of secondary infections (SIs) and clinical outcomes in hospitalized COVID-19 patients in India.

**Patients and Methods:** A retrospective study of secondary infections in patients admitted in intensive care units (ICUs) and wards of ten hospitals of the Indian Council of Medical Research (ICMR) AMR surveillance network, between June and August 2020, was undertaken. The demographic data, time of infection after admission, microbiological and antimicrobial resistance data of secondary infections, and clinical outcome data of the admitted COVID-19 patients were collated.

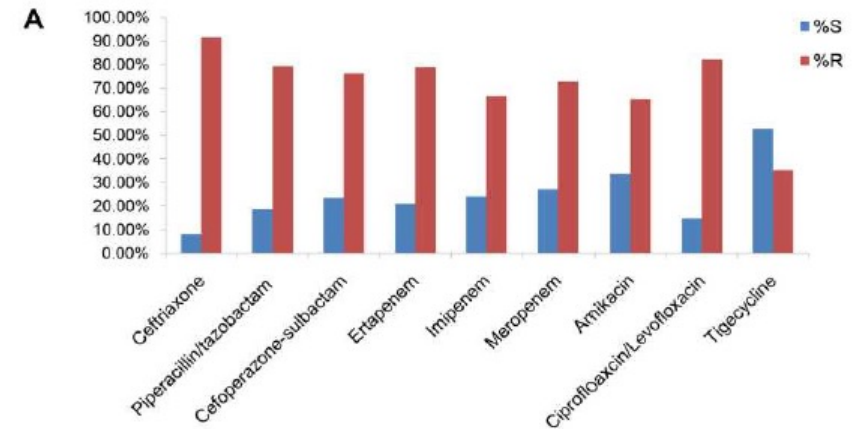
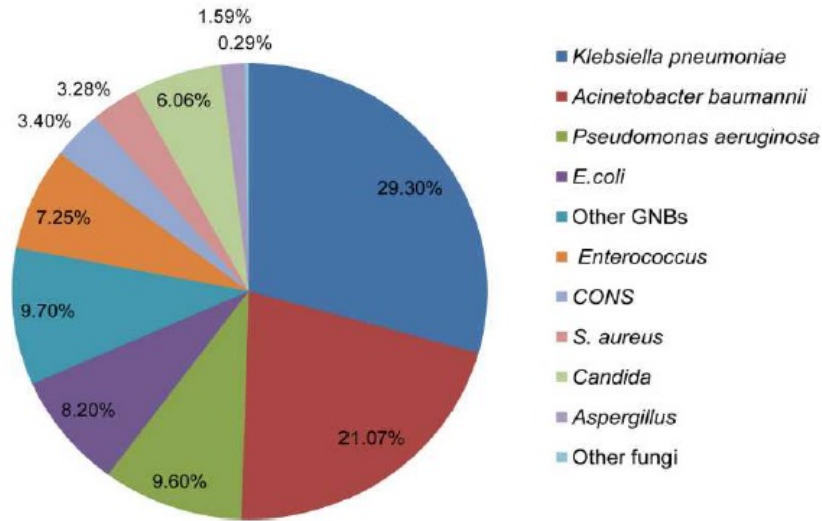
**Results:** Out of 17,534 admitted patients, 3.6% of patients developed secondary bacterial or fungal infections. The mortality among patients who developed secondary infections was 56.7% against an overall mortality of 10.6% in total admitted COVID-19 patients. Gram-negative bacteria were isolated from 78% of patients. *Klebsiella pneumoniae* (29%) was the predominant pathogen, followed by *Acinetobacter baumannii* (21%). Thirty-five percent of patients reported polymicrobial infections, including fungal infections. High levels of carbapenem resistance was seen in *A. baumannii* (92.6%) followed by *K. pneumoniae* (72.8%).

**Conclusion:** Predominance of Gram-negative pathogens in COVID-19 patients coupled with high rates of resistance to higher generation antimicrobials is an alarming finding. A high rate of mortality in patients with secondary infections warrants extra caution to improve the infection control practices and practice of antimicrobial stewardship interventions not only to save patient lives but also prevent selection of drug-resistant infections, to which the current situation is very conducive.

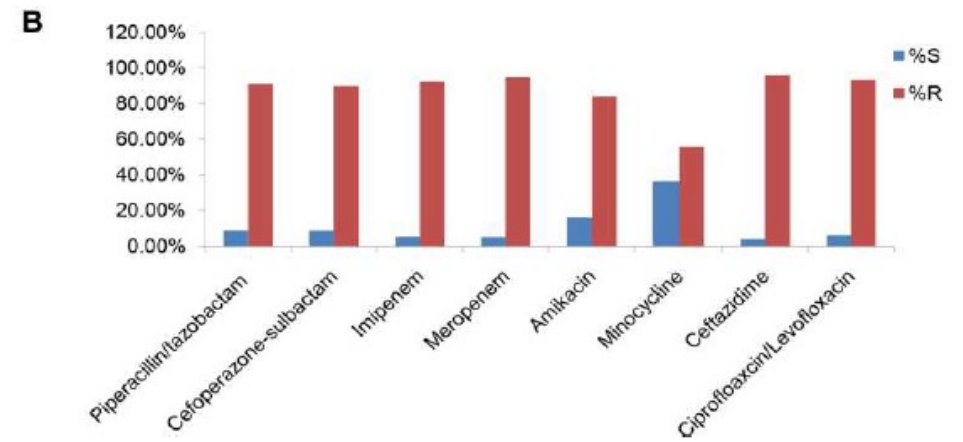
**Keywords:** COVID-19, secondary infections, antimicrobial resistance, hospital acquired infections, antibiotics

- 3.6% of Hospitalized Covid-19 patients had a bacterial or fungal co-infection
- Isolated bacteria was Gram negative (78%), with high levels of Carbapenem resistance

# Results of AST from Covid-19 patients with bacterial co-infection: India experience

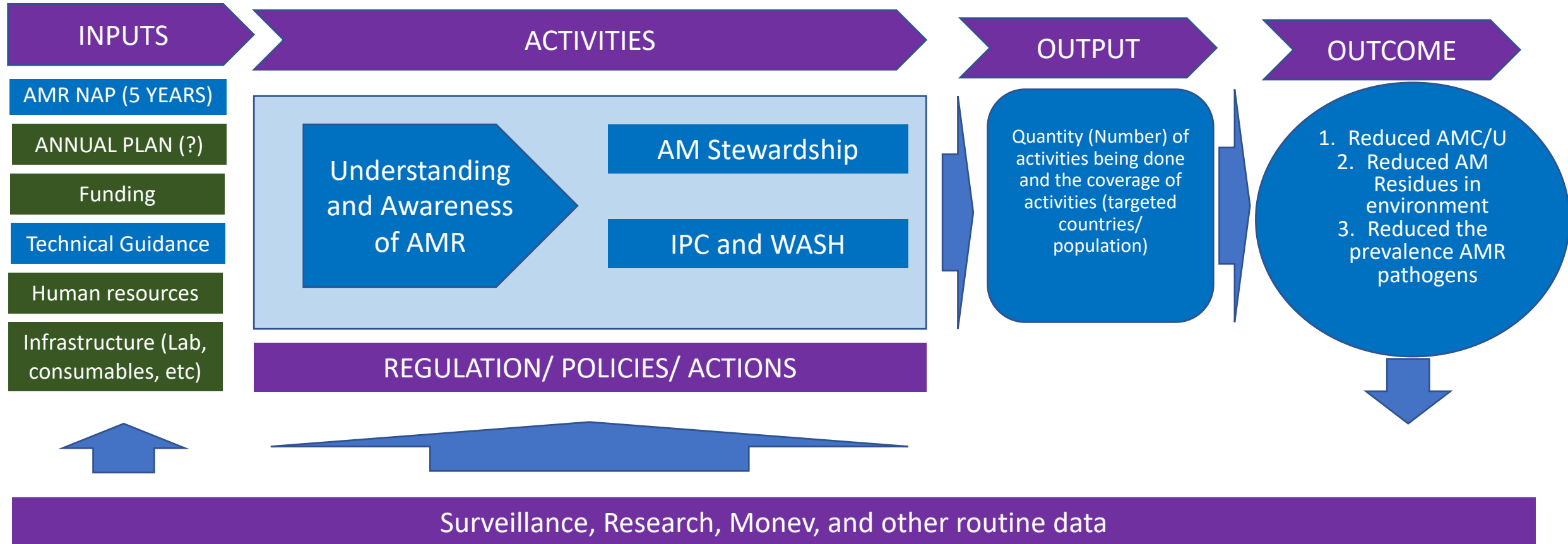


K Pneumonia



A Baumannii

# Antimicrobial Resistance: from evidence to better governance (management)



- Surveillance: GLASS AMR | GLASS AMC | GLASS AMU | One health surveillance (Tricycle, Tricycle Epi-X) | TISSA
- Operational research on AMR: individual research of AMR, systematic review
- Updated clinical guidance → For Covid-19: Living Guidance of Covid-19 Clinical Management

# Are there any gaps between evidence and policy?

## The use of antibiotics in COVID-19 management: a rapid review of national treatment guidelines in 10 African countries



Yusuff Adebayo Adebisi<sup>1,2</sup>, Nafisat Dasola Jimoh<sup>3</sup>, Isaac Olushola Ogunkola<sup>4</sup>, Theogene Uwizeyimana<sup>5\*</sup>, Alaka Hassan Olayemi<sup>6</sup>, Nelson Ashinedu Ukor<sup>7</sup> and Don Eliseo Lucero-Prisno III<sup>8</sup>

### Abstract

Antimicrobial resistance is a hidden threat lurking behind the COVID-19 pandemic which has claimed thousands of lives prior to the emergence of the global outbreak. With a pandemic on the scale of COVID-19, antimicrobial resistance has the potential to become a double-edged sword with the overuse of antibiotics having the potential of taking us back to the pre-antibiotic era. Antimicrobial resistance is majorly attributed to widespread and unnecessary use of antibiotics, among other causes, which has facilitated the emergence and spread of resistant pathogens. Our study aimed to conduct a rapid review of national treatment guidelines for COVID-19 in 10 African countries (Ghana, Kenya, Uganda, Nigeria, South Africa, Zimbabwe, Botswana, Liberia, Ethiopia, and Rwanda) and examined its implication for antimicrobial resistance response on the continent. Our findings revealed that various antibiotics, such as azithromycin, doxycycline, clarithromycin, ceftriaxone, erythromycin, amoxicillin, amoxicillin-clavulanic acid, ampicillin, gentamicin, benzylpenicillin, piperacillin/tazobactam, ciprofloxacin, ceftazidime, cefepime, vancomycin, meropenem, and cefuroxime among others, were recommended for use in the management of COVID-19. This is worrisome in that COVID-19 is a viral disease and only a few COVID-19 patients would have bacterial co-infection. Our study highlighted the need to emphasize prudent and judicious use of antibiotics in the management of COVID-19 in Africa.

**Keywords:** COVID-19, Clinical case management, Antimicrobial resistance, Antibiotic resistance, Pandemic, Africa

- 10 Selected Countries in African Region, their Clinical Guidance of Covid-19 pandemic management still recommended the use of antibiotics

## South-East Asian Region (?)

### **PROTOKOL** TATALAKSANA COVID-19 DI INDONESIA

**Indonesia, Edition 2 (January 2021)**

- Use Azythromycin for mild and moderate cases

### CLINICAL MANAGEMENT PROTOCOL FOR COVID-19

(In Adults)

**India, Version 6 (May 2021)**

- Antibiotics should not be prescribed routinely unless there is clinical suspicion of a bacterial infection

**Clinical Management Guidelines for  
COVID-19 Acute Respiratory Disease**

**Myanmar (23 July 2020)**

- Antibiotic therapy/prophylaxis is not recommended
- Antibiotics used if there is clinical suspicion of bacterial infection



# Challenges of Combating AMR in Covid-19 pandemic

- **AMSP policies**

- Countries' clinical guidance of Covid-19 management are not in line with WHO guidance (delay of updating, not following the WHO guidance)

- **Clinical care disruptions**

- Lack of diagnosis stewardship (Covid-19 vs common ARI?)
- In-security of clinicians (use of broad-spectrum antibiotics)
- Surge of Covid-19 cases >> over-burdened >> mis-use of antibiotics

- **Health systems**

- Self-care (self isolation) of Covid-19 patients >> On-line/ OTC purchase of antibiotics without prescription
- Telemedicine >> lacking optimal support for better Dx >> Use of antibiotics
- Prolonged ICU stay >> Hospital Acquired Infection (HAI) >> Use of Antibiotics

# Recommendation

- Always updating Clinical Guidance of Covid-19 management in line with “living guidance” of WHO
- Incorporating AMSP (including Covid-19 treatment) into the components of health care quality management (KARS, JCI)
- Strengthening Acute Febrile Illness (AFI) surveillance, and ILI/SARI surveillance >> Confirmed with laboratory Dx >> to get correct Diagnosis
- Conducting AMR surveillance and AMU surveillance at health facilities’ level (hospital)
- Utilizing AMR surveillance data (AST data) and AMU surveillance data (by departments, by diagnosis) for better actions in Antimicrobial Stewardship Programs (AMSP)

**Thank You**