

# SUMMARY OF RESULTS



**POP**

Antibacterial Resistance Leadership Group

The Antibacterial Resistance Leadership Group (ARLG) funds, designs, and conducts clinical research that will help prevent, diagnose, and treat infections caused by bacteria that are resistant to antibiotics.

The ARLG, along with the team of study doctors, scientists, and researchers, are pleased to describe the results from a study focused on antibiotic review strategies in community hospitals to prevent overuse of antibiotics.

## WHAT IS THE STUDY TITLE?

Global epidemiology and clinical outcomes of carbapenem-resistant *Pseudomonas aeruginosa* and associated carbapenemases (POP): a prospective cohort study



### WHAT IS THE PURPOSE OF THE RESEARCH? WHAT IS THE PRIMARY ENDPOINT?

The purpose of the study was to identify characteristics of the types of patients who have carbapenem-resistant *Pseudomonas aeruginosa* (CRPA), characterize the patients' outcomes and how they were managed clinically, and determine how often these bacteria have enzymes that inactivate carbapenem antibiotics (carbapenemases) across geographical regions.

The POP study's main objective was to describe how many patients died within 30 days of infection.



### WHY WAS THIS RESEARCH CONDUCTED? WHAT IS THE RATIONALE?

Carbapenem-resistant *Pseudomonas aeruginosa* (CRPA) is a group of bacteria that resists treatment by a class of antibiotics called carbapenems. The World Health Organization lists CRPA as one of the top three drug-resistant pathogens and recognized CRPA as a threat to global public health.

Prior to this study, researchers' understanding of CRPA was limited. Previous studies of CRPA included a single geographic region or lacked clinical data or molecular characterization of the bacteria. Researchers need to learn more about the characteristics of CRPA and how they differ in regions around the world and in differing patient populations.



### WHY IS THIS RESEARCH IMPORTANT TO PATIENTS, CLINICIANS, AND OTHER RESEARCHERS?

CRPAs are of specific concern in the fight against antibiotic resistance. Infections due to CRPA are common and often lead to death. Researchers know that CRPA infections are a global threat, but they need to learn more about how they are treated, how patients respond to treatment, and what molecular differences exist.

Different types of CRPA may need different treatments and have different outcomes. Understanding more about these differences will help researchers know how best to study and treat CRPA infections.



### MANUSCRIPT OF PRIMARY RESULTS

<https://www.sciencedirect.com/science/article/pii/S2666524722003299?via%3Dihub>



### WHEN DID THE RESEARCH TAKE PLACE?

Between December 1, 2018 and November 30, 2019



**ARLG**

Antibacterial Resistance Leadership Group



## WHO WAS INVOLVED?

The study involved 44 hospitals, including 16 in the U.S., 10 in South and Central America, 9 in China, 5 in Australia, 2 in Singapore, 1 in Lebanon, and 1 in Saudi Arabia.

Researchers followed 972 hospitalized patients with CRPA found in their bloodstream, respiratory, urinary, or wound culture.

**44**  
Hospitals

**US**  
**16**

South and  
Central America

**10**

China

**9**

Australia

**5**

Singapore

**2**

Saudi Arabia

**1**

Lebanon

**1**



## WHAT HAPPENED DURING THE STUDY?

In this study, researchers collected data about patients from electronic health records (EHRs). They also collected a copy of the bacteria, that had been previously collected by the patient's physician, and analyzed the bacterial DNA.



## HOW WILL THE RESULTS HELP PATIENTS AND DOCTORS?

Understanding CRPA clinical and genetic characteristics will help focus research and resources on the right methods for combating antibiotic resistance.

The results from these analyses show that the CRPA genetic characteristics can vary from one region to another, and patients' outcomes may vary as well.

This important information helps researchers understand that research and treatment strategies for CRPA need to be tailored to a particular region and patient population.

## IS THE STUDY REGISTERED WITH CLINICALTRIALS.ORG?

No

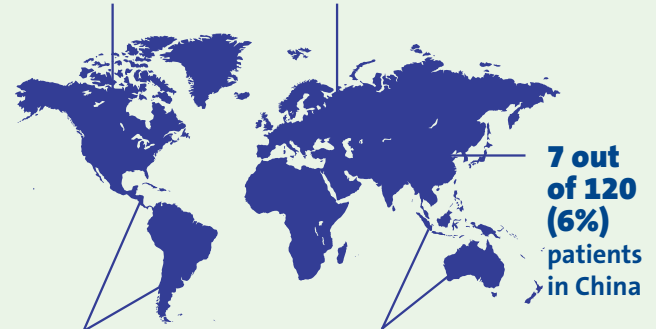


## WHAT WERE THE RESULTS?

Of 581 patients infected with CRPA, 105 (18%) died within 30 days and 148 (25%) died within 90 days. The number of deaths within 30 days varied by geographical location:

**60 out of 308 (19%)**  
patients in the U.S.

**15 out of 52 (29%)**  
patients in the Middle East



**20 out of 73 (27%)**  
patients in South and  
Central America

**3 out of 28 (11%)**  
patients in Australia  
and Singapore

A carbapenemase gene was detected in 211 (22%) of 972 CRPA isolates. Prevalence of carbapenemase genes in CRPA isolates varied by region:

**10 out of 527 (2%)**  
in the U.S.

**27 out of 91 (30%)**  
in the Middle East



**88 out of 127 (69%)**  
in South and Central America

**32 out of 56 (57%)**  
in Australia and Singapore



## WHAT'S NEXT?

Researchers are using the information from these analyses to inform additional research in carbapenem-resistant pathogens, to design clinical trials using new antibiotics, and to help inform treatment decisions to improve the outcomes of patients.