

US study suggests COVID-19 pandemic may be accelerating antimicrobial resistance

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Among those hospitalized during the pandemic, both COVID-19 patients and those tested for SARS-COV-2 but negative, had higher rates of antibiotic-resistant bacterial infections compared to patients hospitalized before the pandemic, according to a study evaluating the pandemic's impact on antimicrobial resistance (AMR) in 271 hospitals across the

U.S., to be presented at this year's European Congress of Clinical Microbiology & Infectious Diseases (ECCMID) in Lisbon, Portugal (23-26 April).

The study, by Dr. Karri Bauer of the pharmaceutical company MSD, a trade name of Merck & Co., Inc, Kenilworth, NJ, U.S. and Dr. Vikas Gupta, of the medical technology company Becton Dickinson (BD) and colleagues, also found that drug [resistant infections](#) were significantly higher in hospital-onset cases during the [pandemic](#).

An estimated 1.2 million people worldwide died in 2019 from [antibiotic-resistant infections](#), and this number is predicted to increase ten-fold by 2050. The COVID-19 pandemic presents many challenges for appropriate antibiotic use and stewardship, and there have been studies reporting that the pandemic was associated with AMR secondary infections, possibly due to the increase in the use of antibiotics to treat COVID-19 patients and disruptions to infection prevention and control practices in overwhelmed health systems. While conclusive evidence is lacking, these signals underscore the importance of continued monitoring of the impact of COVID-19 on AMR rates.

To provide more evidence, researchers conducted a multicenter, retrospective cohort analysis of all adults (aged 18 years or older) admitted to 271 hospitals across the U.S. before and during the COVID-19 pandemic, who had spent at least one day in hospital and had a record of discharge or death.

Patients were categorized according to when they were admitted: before the pandemic (from July 1, 2019 to February 29, 2020), or during the pandemic (from March 1, 2020 to October 30, 2021), and based on their COVID-19 status (with a positive SARS-CoV-2 result defined by positive PCR or antigen test within 7 days prior to admission or during hospitalization). All admissions with at least one AMR infection

(defined as a first positive culture for select gram-negative or gram-positive pathogens resistant to antibiotics) were recorded.

Researchers assessed AMR rates per 100 admissions before and during the COVID pandemic, and examined whether drug-resistant infections were acquired in the community-onset setting (defined as a culture collected less than 2 days after admission) or in the hospital-onset setting (more than 2 days after admission).

In total, 1,789,458 patients were admitted to the hospital in the pre-pandemic period and 3,729,208 during the pandemic. The number of patients admitted to the hospital with at least one AMR [infection](#) was 63,263 in the pre-pandemic period and 129,410 during the pandemic.

The analyses found that the AMR rate was 3.54 per 100 admissions before the pandemic and 3.47 per 100 admissions during the pandemic. However, patients who tested positive or negative for COVID-19 had higher levels of AMR than patients before the pandemic—4.92 per 100 admissions and 4.11 per 100 admissions, respectively (see table in notes to editors).

For [hospital](#)-associated infections, the AMR rate was 0.77 per 100 admissions before the pandemic and 0.86 per 100 admissions during the pandemic, and highest at 2.19 per 100 admissions in patients with COVID-19. When looking at community-onset infections, the AMR rate was 2.76 per 100 admissions in the pre-pandemic period, and 2.61 per 100 admissions during the pandemic.

"These new data highlight the importance of closely monitoring the impact of COVID-19 on antimicrobial resistance rates," says Dr. Bauer. "It is particularly worrying that [antibiotic resistance](#) has been rising during the pandemic in both SARS-CoV-2 positive and negative patients. Hospital-acquired infections are a major concern, with

antimicrobial resistance rates significantly higher during the pandemic than before."

Despite these important and timely findings, the authors note that additional evaluation of the pandemic's impact on [antimicrobial resistance](#) is needed. "As healthcare capacity remains at the forefront of everyone's mind, it will be critically important to keep a pulse on the growing impact of drug-resistant infections," said Gupta. "This type of data and surveillance will help healthcare leaders identify needed resources to support antimicrobial stewardship programs—and also support more detailed and sophisticated forecasting of future trends and outbreaks."

This study is limited to US hospitals and evaluation of the impact of COVID-19 on AMR outside the US is warranted.

Provided by European Society of Clinical Microbiology and Infectious Diseases

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