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## Brief Report

# The impact of the COVID-19 pandemic on healthcare acquired infections with multidrug resistant organisms

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## Key Words:

COVID-19

Personal protective equipment

Hand washing

This retrospective, cross-sectional study was conducted in four community hospitals in Los Angeles County, California. The assumption of this study was, coronavirus disease-19 (COVID-19) contributed to the increase in healthcare workers compliance with infection prevention measures. IP initiatives fostered among HCWs have increased awareness of effective hand washing, cleaning equipment after use and appropriate personal protective equipment use which has subsequently decreased healthcare acquired infections with multidrug-resistant organisms.

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## BACKGROUND

Multidrug-resistant organisms (MDROs) are microorganisms that are resistant to one or more therapeutic classes of antimicrobial agents and MDRO HAIs are a major concern in hospitals across the country.<sup>1</sup> Previous methods that worked successfully to reduce MDROs include improvements in hand hygiene, use of contact precautions, active surveillance cultures, education, enhanced environmental cleaning, and improvements in communication about patients with MDROs within and between various health care facilities.<sup>2</sup> The spread of MDROs was thought to be a complicated and complex issue that required numerous interventions to reduce the incidence rates.<sup>3</sup> However, the COVID-19 pandemic has been a stark reminder of the importance of basic infection measures including hand washing, cleaning equipment and the use of PPE when providing patient care to prevent MDRO HAIs from occurring.

When COVID-19 become a significant concern in Los Angeles County, our health care workers received additional education regarding appropriate PPE usage, donning, and doffing techniques, cleaning equipment after use and the importance of hand hygiene before and after patient contact. This education was provided during 5-minute huddles at the change of shift. Additionally, educational flyers with this information were posted strategically near clock-in areas and break rooms.

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## METHODS

This retrospective, cross-sectional study reviewed the prevalence of healthcare onset infections with multidrug resistant organisms including, methicillin-resistant staphylococcus aureus, Extended Spectrum Beta-Lactamase, and Vancomycin-resistant Enterococcus pre and post COVID-19 pandemic. Specimen types included urine, wound, blood, or sputum cultures. In each instance, the patient did not have a positive culture for the specific organism until on or after day 4 of hospital admission.

## RESULTS


Overall, MDRO rates decreased from Q1-2020 to Q2-2020 and ranged from 21% to 80% (Table 1). Utilizing the National Healthcare Safety Network (NHSN) statistical calculator, MDRO rates were decreased from 0.3% per 1,000 patient days to 0.2% per 1,000 patient days with a *P*-value of .03 indicating statistical significance (Table 2).

## DISCUSSION

HCWs are at the front-line of COVID-19 pandemic, frequent exposure to infected patients can put them at a greater risk for acquiring and transmitting the infection. COVID-19 has increase awareness of basic infection control measures and subsequently reduced the incidence of MRDO HAIs in our hospitals. One of the most frequently reported strategies implemented in hospitals was frequent hand hygiene with soap and water or hand sanitizer by HCWs.<sup>4</sup> During Q2-2020, when COVID patients began arriving at our four Los Angeles

**Table 1**

In 2020, MDRO rate per 1,000 patient days has decreased from Q1 to Q2: MRSA 41%, ESBL 21%, VRE 80% with an overall reduction of 35% for all three MDROs

Health care onset-MDRO rate per 1,000 patient days	Q1-2020 Patient days	Q2-2020 Patient days	Percentage decrease
	19,096	17,937	
MRSA	1.2	0.7	41%
ESBL	1.4	1.1	21%
VRE	0.5	0.1	80%
Total	3.1	2.0	35%

County hospitals, alcohol-based hand sanitizer and hand soap usage increased by 25% compared to Q1-2020 (pre-COVID).

## CONCLUSION

Infection Prevention initiatives fostered in healthcare organizations among HCWs has contributed to a reduction in rate of HAI with MDROs. Further research is needed over a longer duration to determine if the reduction of these rates are sustainable. Limitations of this study and confounding variables include pooled data between different hospitals with varied practices and resources. Furthermore, conducting hospital specific research over a longer duration could assess the need for the enhanced cleaning technologies and an

**Table 2**

In 2020 from Q1 to Q2, HAI-MDRO proportion decreased 0.3% and 0.2% respectively with a proportion *P*-value of 0.0342

NHSN Statistical Calculator, Comparing two proportions, HAI- MDRO	Q1-2020	Q2-2020
Numerator	61	37
Denominator	19096	17937
Proportion (shown as %)	0.3%	0.2%
Proportion <i>P</i> -value	.0342	

electronic hand hygiene system to further reduce the incidence of MDRO-HAIs.

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