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NATIONAL CENTER FOR EMERGING AND ZOONOTIC INFECTIOUS DISEASES

National Trends in Infections caused by *Pseudomonas aeruginosa* and Carbapenem-resistant *Pseudomonas aeruginosa*, 2017 - 2020

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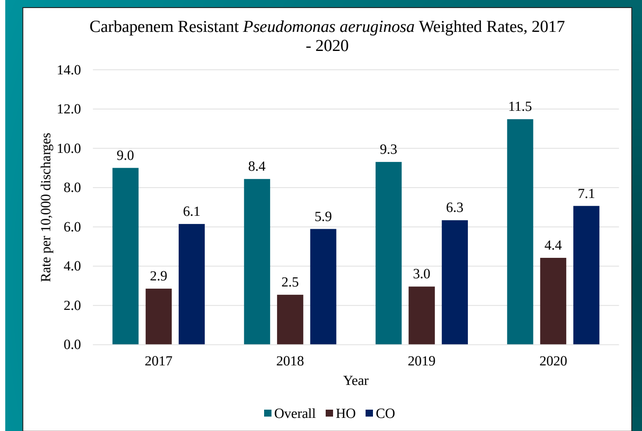
BACKGROUND & METHODS

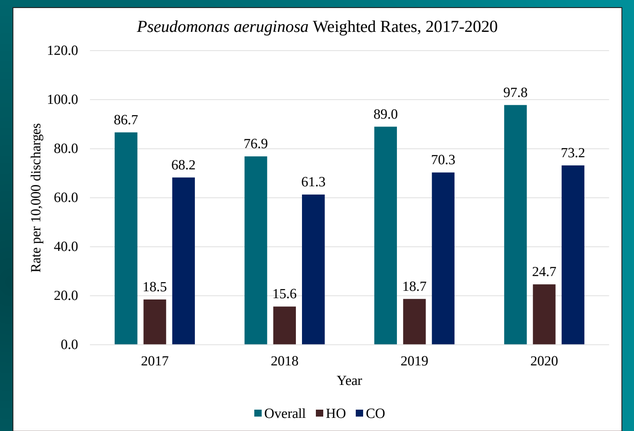
***Pseudomonas aeruginosa* is an opportunistic pathogen commonly found in the environment, including water and plumbing, which may serve as a reservoir of spread. We examined *P. aeruginosa* and carbapenem resistant *P. aeruginosa* (CRPA) rates and trends in recent years.**

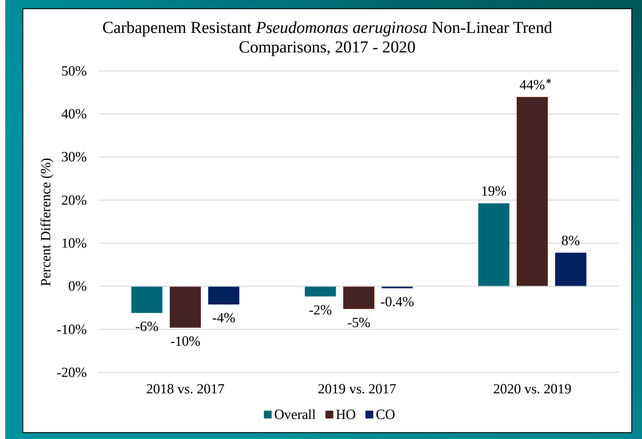
- **2017-2020 data obtained from hospital cohort in the PINC – AI Healthcare Database**
- **Identified a cohort of inpatients with any clinical culture yielding an isolate of *P. aeruginosa* with accompanying susceptibility testing results**
- **CRPA was defined as any isolate with at least 1 resistant result to imipenem, meropenem, or doripenem**
- **Community-onset (CO) was defined as when the culture was obtained immediately preceding admission or within the first 3 days of hospitalization**
- **Hospital-onset (HO) was defined as when the culture was obtained on day 4 or later**
- **We used monthly hospital level data to control for**
  - hospital characteristics
  - month of discharge
  - proportion of patients in specific age groups
  - and proportion of male patients

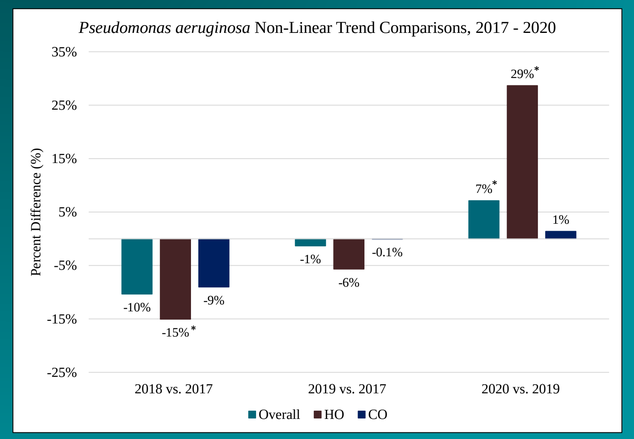
- **We developed weights using a raking procedure to match the American Hospital Association distribution for acute care hospitals to produce national estimates**
- **Weighted multivariable logistic regression models were used to estimate national trends in rates per 10,000 discharges**

Rates of *P. aeruginosa* and Carbapenem-resistant *P. aeruginosa* increased in 2020, largely driven by increases in hospital-onset infections.









*Indicates statistical significance at the P<0.05 level

RESULTS & CONCLUSIONS

P. aeruginosa

- **HO rates increased 29% in 2020 compared with 2019 (p<.0001)**
- **From 2019 – 2020, overall adjusted rates increased 7% (p=0.037)**

CRPA

- **HO rates increased 44% in 2020 compared with 2019 (p=0.001)**
- **Increases from 2019 to 2020 in overall adjusted rates were not significant**

We observed an increase in the overall rate of *P. aeruginosa* in 2020 compared with 2019, driven by an increase in HO *P. aeruginosa* rates. HO CRPA rates also increased. These increases were consistent with reports of increases in other HO antibiotic resistant infections during 2020. Further evaluation of drivers of increasing HO *P. aeruginosa* infections is warranted, including exploration of the hypothesis that pandemic-associated changes in water use and management, such as intermittent closure and reopening of hospital units, may have increased exposure to water harboring *P. aeruginosa.*

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