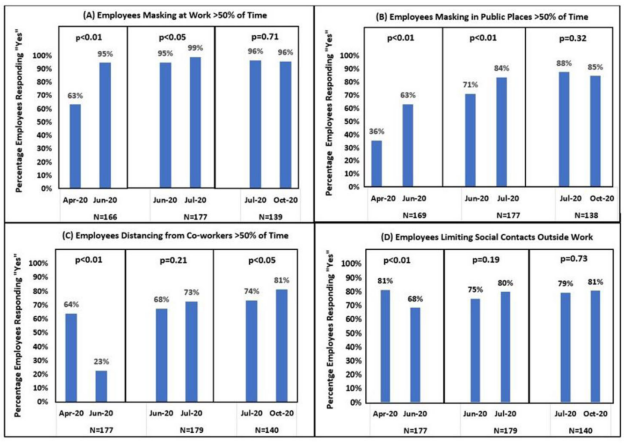

Figure 2: Employee Self-Reported Infection Prevention Adherence

Panel A shows an increase in employees who reported wearing masks at work >50% of the time from April to June and from June to July with high levels of masking sustained from July to October. Panel B shows a similar pattern of increase in masking outside of work when going to public places. Panels C and D shows an initial decrease in distancing at work and limiting social contact from April to June followed by an increase, although not statistically significant, in adherence from June to July.

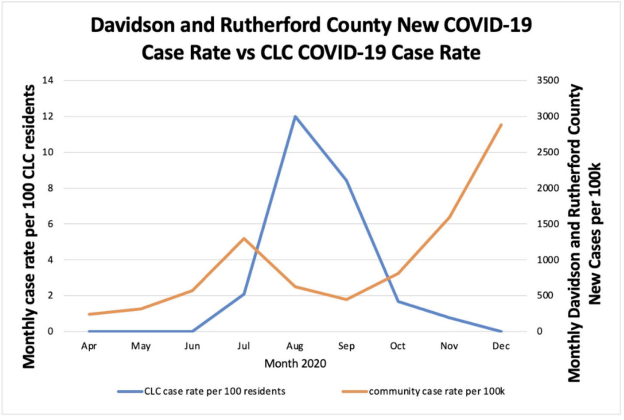

Figure 3: COVID-19 Incidence Rate of Community Living Center Residents Compared to COVID-19 Incidence Rate of Surrounding Counties

Incidence rate calculated as positive COVID-19 cases per 100 community living center (CLC) residents is shown via the blue line. The CLC monthly census from April through December 2020 ranged from 119 to 153 residents. Incidence rate calculated as positive COVID-19 cases per 100,000 population in the surrounding Davidson and Rutherford Counties is depicted in orange. The initial peak and fall pattern of CLC cases mirrors county cases; however, unlike in the community, there is no second peak.

pre–COVID-19 vaccination era suggest that widespread, increased support for and emphasis on LTCF IP adherence, especially masking, may have effectively prevented COVID-19 outbreaks in the vulnerable LTCF population.

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Presentation Type:
Poster Presentation - Poster Presentation
Subject Category: Long-Term Care

Experiences of nurses responding to the COVID-19 outbreak at a long-term care hospital in Korea: A qualitative study

EunJo Kim and JaHyun Kang

Background: The COVID-19 pandemic revealed the fundamental vulnerability of long-term care hospitals (LTCHs) related to infection control and prevention (ICP). We examined the experiences of nurses who worked at a hospital where a COVID-19 outbreak occurred from February 24 to March 16, 2021. **Method:** This qualitative research was performed with 9 nurses who were engaged during the COVID-19 outbreak. We prepared a semi-structured questionnaire based on the main question, "How was the experience among the nurses during the outbreak, and what difficulties did they encounter while resolving the situation?" The data were collected through in-depth, individual interviews from May to August 2021 after the approval of the institutional review board, and the results were analyzed thematically. **Results:** The average age of the participants was 52.1 years, and they had an average of 15.2 years of clinical experience. We extracted 4 themes and 16 subthemes from the results. The first theme, "sudden onset of the outbreak," included the following subthemes: (1) found myself accustomed to COVID-19 and desensitized; (2) unavoidable occurrence despite compliance with ICP guidelines; (3) LTCHs are gradually recognized as a breeding ground for COVID-19 by the public; and (4) fear of spreading the infection in the hospital and of becoming a spreader. The second theme, "heavier workload," included (1) daily overtime and extra shifts in violation of self-quarantine recommendations due to the shortage of nurses; (2) a barrage of phone calls from family members, other departments, public health centers, and hospitals where confirmed cases were transferred; (3) nursing assistants and private caregivers who do not have ICP knowledge as well as patients who do not cooperate due to cognitive impairment; and (4) accomplishing additional tasks while wearing personal protective equipment with some suffocation. The third theme, "emotions and lessons," included (1) unsatisfied with the initial responses; (2) awareness of the entire infectious disease; (3) increased compassion and attachment for patients; and (4) take pride in the job and the profession as a nurse. The fourth theme, "necessary support and attention," included (1) need to install isolation rooms and replenish infection control supplies; (2) need for ICP specialists in LTCHs; (3) need for continuous national-based monitoring on ICP for LTCHs; and (4) need to improve working environment and acknowledge nurses in LTCHs. **Conclusions:** Overall, participants expressed their experiences with the insufficient infection control and response system toward COVID-19 in the LTCH. To enhance ICP in LTCHs, customized policies, regulations, and financial support for infection control activities and ICP professionals must be established.

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Poster Presentation - Poster Presentation
Subject Category: MDR GNR

Pseudomonas aeruginosa bacteremia mortality and resistance trends in the Veterans' Health Administration (VHA) system

Leila Hojat; Brigid Wilson; Federico Perez and Robert Bonomo

Background: *Pseudomonas aeruginosa* is an important pathogen in the hospital setting; it has the ability to cause severe disease and a high mortality rate. Its increasing ability to elude even novel antimicrobial mechanisms of action is a significant cause for concern. More effective treatment options and increasing understanding of this pathogen likely effect *P. aeruginosa* incidence and severity; however, longer-term studies are lacking. The Veterans' Health Administration (VHA) population is a socially, demographically, and medically distinct entity, representing a rich source of data for studying contributing factors to *P. aeruginosa* infection and mortality. We sought to identify the system-wide case count and mortality rate of *P. aeruginosa* bacteremia and the rate of resistance to antipseudomonal agents over the course of several years. We described trends observed over the study period. **Methods:** We utilized the nationwide VHA database to identify all inpatients with a positive blood culture for *P. aeruginosa* treated between January 1, 2009, and December 31, 2020. We identified the annual count of bacteremia cases and associated 30-day mortality rate.

Figure 1. *P. aeruginosa* Bacteremia Total Cases and 30-Day Mortality Rate by Year

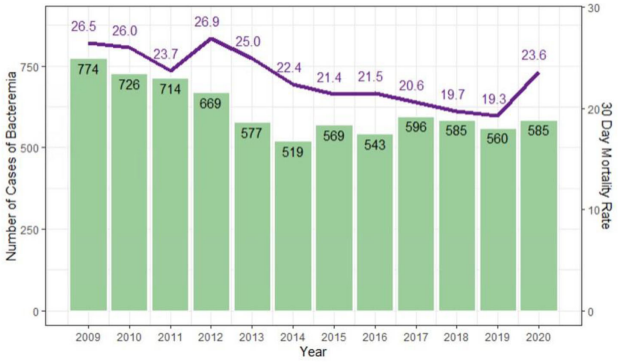
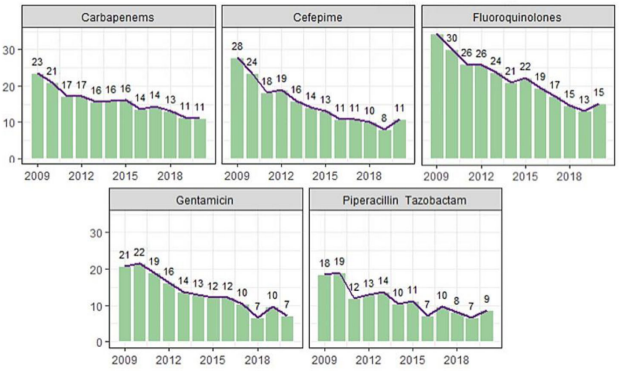


Figure 2. Percentage of *P. aeruginosa* Isolates with Resistance to Selected Classes/Agents by Year



Additionally, we determined rates of resistance to antipseudomonal agents. **Results:** In total, 7,480 cases of *P. aeruginosa* bacteremia were identified. The total case count of *P. aeruginosa* bacteremia decreased from 774 in 2009 to 519 in 2014, then remained relatively stable. The 30-day mortality rate decreased from 26.5 in 2009 to 19.3 in 2019, but this rate increased to 23.6 in 2020 (Fig. 1). The fluoroquinolone class had the highest resistance rate at 23%, followed by ceftazidime, cefepime, and the carbapenem class with rates of ~15%–16%. All classes were noted to have decreased resistance over time (Fig. 2). **Conclusions:** Occurrences, mortality rate, and associated resistance of *P. aeruginosa* bacteremia across the VHA system generally decreased during the study period. Potential explanations for these observations include improved infection control measures, more effective therapeutic agents, and enhanced antimicrobial stewardship efforts. The increased mortality in 2020 could be related to concomitant COVID-19 or the result of delayed medical care in the pandemic setting. Limitations of this study include inability to identify causative factors for observed trends and potential variability between labs affecting the rates of observed resistance. Additionally, VHA data may not be representative of entire adult population. Future studies could explore the relationship between *P. aeruginosa* bacteremia and infection prevention and antimicrobial stewardship efforts and could describe associations between *P. aeruginosa* and COVID-19 and identify risk factors associated with *P. aeruginosa* bacteremia and mortality.

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Presentation Type:
Poster Presentation - Poster Presentation
Subject Category: MDR GNR

Characterization of carbapenem-resistant gram-negative bacteria collected in the Sentinel Surveillance Program, 2018–2019

Lori Spicer; Davina Campbell; J. Kristie Johnson; Cynthia Longo; Thomas Balbuena, Thomas Ewing; Maria Karlsson; J. Kamile Rasheed; Christopher Elkins; Amy Gargis and Joseph Lutgring

Background: Carbapenem resistance in gram-negative organisms is an important public health problem. The CDC conducted Sentinel surveillance in 2018–2019 to characterize these organisms from 9 facilities in 9 different states. **Methods:** Carbapenem-resistant Enterobacterales (CRE), *Pseudomonas aeruginosa* (CRPA), and *Acinetobacter* spp (CRA) obtained from clinical samples of patients in acute-care or long-term care facilities were submitted to the CDC. Identification was confirmed using matrix-assisted laser desorption ionization time-of-flight (MALDI-TOF), and antimicrobial susceptibility testing (AST) was performed via broth microdilution for 27 antibiotics. All confirmed CRE and CRPA were tested for carbapenemase production (CP) using the modified carbapenem inactivation method (mCIM). The isolates that were mCIM-positive were assessed by real-time PCR for presence of *bla*KPC, *bla*NDM, *bla*VIM, and *bla*IMP. CP-CRE were also assessed for *bla*OXA-48-like. All confirmed CRA were tested for the same genes as CRPA and *bla*OXA-23–like, *bla*OXA-24/40-like, *bla*OXA-58–like, and *bla*OXA-235–like genes. Difficult-to-treat resistance (DTR) was defined as resistance to all β-lactams (excluding newer β-lactam combination agents) and quinolones tested. **Results:** The CDC confirmed 208 CRE, 161 CRPA, and 94 CRA. Table 1 summarizes AST results for a selection of drugs. We identified 112 (53.8%) mCIM-positive CRE and 6 (3.7%) mCIM-positive CRPA. The PCR results are summarized in Table 2. One mCIM-positive and PCR-negative isolate was positive in a metallo-β-lactamase screen. **Conclusions:** Resistance among CRE and CRPA to newer β-lactam combination agents was detected. Options for treating CRA are limited. Of 112 CP-CRE, 85.7% harbored *bla*KPC; CP-CRPA were rare (3.7%); and most CRA harbored *bla*OXA-23-like (55.3%) or *bla*OXA-24/40-like (30.9%). Whole-genome sequencing is planned to better understand gene variants, sequence types, and additional resistance markers present among the isolates.

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Table 1. Frequency of resistance to key drugs

	n	CZA %R	MVB %R	I-R* %R	C/T %R	COL %R	TGC %R	DTR %	Pan-NS
CRE	208	4.3%	2.9%	6.5%	91.3%	17.4%	3.4%	43.3%	0%
CRPA	161	17.4%		8.8%	11.8%	4.3%		34.2%	3.1%
CRA	94			96.7%		20.2%		80.9%	21.3%

CZA: ceftazidime-avibactam; %R: percentage of resistant isolates; MVB: meropenem-vaborbactam; I-R: imipenem-relebactam; C/T: ceftolozane-tazobactam; COL: colistin; TGC: tigecycline; Pan-NS: number of isolates intermediate or resistant to all tested antibiotics
*Not all isolates were tested against I-R

Table 2: PCR Results

	n	*bla*KPC	*bla*NDM	*bla*OXA-48-like	*bla*IMP	*bla*VIM	*bla*OXA-23-like	*bla*OXA-24/40-like	*bla*OXA-58-like	*bla*OXA-235-like	mCIM +/PCR -
CRE	112	85.7%	4.5%	4.5%	0%	0%					5.4%
CRPA	6	33.3%	16.7%		0%	16.7%					33.3%
CRA	94	0%	0%		0%	0%	55.3%	30.9%	1.1%	3.2%	

bla: β-lactamase gene; +: positive; -: negative