samples with 1 targeted gene and 2 samples with double targeted genes, 1 NDM+/IMP+ and 1 VIM+/IMP+), and 5 were negative. Overall, 198 tests were conducted in the study, and 217 were saved compared with testing individually. The efficiency of the pooling strategy was 215%. The overall sensitivity was 1 (95% CI, 0.840–1), the specificity was 0.987 (95% CI, 0.968–0.995), the accuracy was 0.987 (95% CI, 0.970–0.996), positive predictive value was 0.838 (95% CI, 0.655–0.939), and the negative predictive value was 1 (95% CI, 0.988–1). **Conclusions:** The pooling strategy using the Xpert Carba-R assay showed good potential in screening CPO with good sensitivity and a significantly lower cost.

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Subject Category: Multidrug-Resistant (MDR) Organisms
Abstract Number: SG-APSIC1081
Healthcare cost of antibiotic resistant infections: A hospital-based study in Vietnam
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Objectives: Antimicrobial resistance is a serious threat to health and economic well-being worldwide. The impact of antibiotic-resistant infections is reflected by higher mortality, increased lengths of hospital stay (LOS), and increased healthcare costs. We analyzed the direct healthcare costs attributable to treating patients infected with methicillin-resistant *Staphylococcus aureus* (MRSA) and carbapenem-resistant Enterobacterales (CRE) in a tertiary-care referral hospital in Vietnam. **Methods:** A retrospective descriptive cross-sectional study was conducted in an intensive care unit (ICU) in the University Medical Center in Ho Chi Minh City from June 2018 to September 2019. Participants were ICU patients diagnosed with either MRSA or CRE infection, and patients infected with non–multidrug-resistant organisms (non-MDROs) were used as the comparison group. Medical records were obtained to collect data on medical services expenditures such as medications, diagnostic testing, medical procedures, and hospital rooms. Statistical significance was determined using the Mann-Whitney and Kruskal-Wallis tests for comparing the average costs and the χ^2 test for comparing the proportions. **Results:** In total, 227 patients, including 37 MRSA-infected patients, 97 CRE-infected patients, and 93 non–MDRO-infected patients, were included in the study. The additional average healthcare costs for a treatment episode of a CRE infection case (367.7 million VND or ~US $16,000) and of a MRSA infection case (139.1 million VND or ~US $6,043) were 3.8 times higher ($P < .001$) and 1.5 times higher ($P < .001$), respectively, than the average cost for a non-MDRO case (94.8 million VND or ~US $4,121). Resource use for a CRE infection was higher than that for MRSA infection, with longer antibiotic treatment (13.4 additional days), greater LOS (15.8 additional days), and higher costs (additional 228.6 million VND or ~US $9,939). **Conclusions:** Multidrug-resistant infections create a heavy economic burden in a low- to middle-income country like Vietnam. The elevated cost was mainly due to longer antibiotic treatment and increased LOS.

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Subject Category: Multidrug-Resistant (MDR) Organisms
Abstract Number: SG-APSIC1083
Prevalence and classification of carbapenemase-producing gram-negative bacilli at a medical center in Ho Chi Minh City, Vietnam
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Objectives: The identification and classification of carbapenemases are meaningful in clinical treatment, epidemiology, and multidrug-resistant bacteria control. We sought to identify the proportion of carbapenemase-producing and carbapenemase classifications in gram-negative bacilli in our hospital. **Methods:** Isolates of gram-negative bacilli were extracted from sputum, blood, and urine samples in a medical center in Ho Chi Minh City. The identification of gram-negative bacilli was performed using the Phoenix M50 automated system (Becton Dickinson, Franklin Lakes, NJ). An antibiogram was conducted using the disk-diffusion method to detect meropenem-resistant gram-negative bacteria. Carbapenemase confirmation and classification of isolates resistant or intermediately resistant to meropenem were performed using the NMIC500 CPO kit on the Phoenix M50 system. **Results:** Among 599 isolates of gram-negative bacilli, 108 isolates were resistant or intermediately resistant to carbapenem (meropenem). Of these108 isolates, 107 (99.1%) were resistant due to the carbapenemase-producing mechanism. The proportions of resistant or intermediately resistant isolates to carbapenem were as follows: 73.8% for *Acinetobacter baumannii*, 26.4% for *Klebsiella pneumoniae*, 25.9% for *Pseudomonas aeruginosa*, and 2.8% for *Escherichia coli*. Class D carbapenemase accounted for the highest proportion, with 53 (49.5%) of 107 isolates, followed by class B with 31 isolates (29%), and class A with the lowest proportion of 2 isolates (1.9%). Also, 44.4% of *Acinetobacter baumannii* isolates and 74.4% of *Klebsiella pneumoniae* isolates produced class D carbapenemase. **Conclusions:** Gram-negative bacilli are resistant to carbapenem primarily due to the carbapenemase-secreting mechanism. D-class carbapenemase accounted for the highest percentage, followed by B-class type, and A-class carbapenemase in gram-negative bacilli.

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Subject Category: Multidrug-Resistant (MDR) Organisms
Abstract Number: SG-APSIC1159
Control of hospital-acquired carbapenemase-producing carbapenem-resistant Enterobacteriaceae colonization: A descriptive study
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Objectives: Carbapenemase-producing carbapenem-resistant Enterobacteriaceae (CP-CRE) are nosocomial pathogens, and control of CP-CRE transmission is one of the most important infection control issues healthcare organizations face today. Increasing colonization acquisition and clinical infections of CP-CRE occurred in our institution in 2019. In this observational study, we monitored CP-CRE acquisition following implementation of multimodal control measures, and we describe the impact of this intervention on clinical infections. **Methods:** Increased hospital-acquired CP-CRE colonization and clinical infections were observed in early 2019. Increased CP-CRE surveillance was implemented to include CP-CRE contacts, patients with lengths of stay >7 days, patients with a recent history of hospitalization in other hospitals, and renal dialysis patients. The following interventions were also implemented**:** (1) isolation or placing CP-CRE patients in cohorts in a designated multidrug-resistant organism (MDRO) ward; (2) emphasis on hand hygiene and contact precautions; (3) mandatory use of gown and gloves for predefined 'high-risk' nursing activities, including diaper changing, toilet assistance, wound dressing, and handling urine or stool; (4) enhanced environmental and equipment cleaning; (5) regular audit and feedback regarding compliance; and (6) weekly feedback on ward-level CP-CRE acquisition. CP-CRE colonization cases and clinical infections were tracked by infection prevention and control nurses. **Results:** The hospital-acquired CP-CRE colonization rate was 4.39 per 10,000 patient days in 2019; it decreased slightly to 3.61 in 2020 and remained steady at 3.77 in 2021. The predominant CP-CRE genes were NDM, OXA-48–like, and KPC. There were 12 hospital-acquired CP-CRE infections in 2019, a rate of 0.37 per 10,000 patient days. This incidence decreased to 6 infections in 2020 and 3 infections in 2021, with corresponding

infection rates of 0.19 and 0.09 per 10,000 patient days, respectively. **Conclusions:** Control of CP-CRE remains extremely challenging in hospitals with multibed open wards. A bundle approach to infection control showed a gradual reduction in CP-CRE cases, with a significant impact on the prevention of clinical infections.

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Subject Category: Multidrug-Resistant (MDR) Organisms
Abstract Number: SG-APSIC1102
Antimicrobial resistance and related factors in an intensive care unit—A study at Hue Central Hospital

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Objectives: Antimicrobial resistance (AMR) has emerged as a major concern in Vietnam, mainly due to the inappropriate use of antibiotics. Appropriate antibiotic management enables us to minimize the likelihood of antibiotic resistance and the spread of resistant bacteria. We evaluated vancomycin and colistin resistance and related factors in the intensive care unit (ICU) of Hue Central Hospital, a national hospital in central Vietnam. **Methods:** Using a cross-sectional descriptive study, we enrolled 362 patients who were prescribed antibiotics and were admitted to the ICU in 2019. Pathogens isolated from 473 routine clinical samples were subjected to antimicrobial susceptibility testing following the recommendations in the *Clinical & Laboratory Standards Institute M100, 28th Edition.* Colistin testing was performed using the broth microdilution method. Statistical significance was determined using the Fisher exact test. **Results:** The most commonly identified microorganisms were *Acinetobacter baumannii* (31.5%), *Klebsiella pneumoniae* (31.2%), *Pseudomonas aeruginosa* (12%), and *Staphylococcus aureus* (8.9%). All isolates of *A. baumannii*, *K. pneumoniae*, and *P. aeruginosa* tested with colistin were nonresistant. Moreover, >65% of *A. baumannii* isolates were resistant to all antibiotics except colistin. *S. aureus* had the highest resistance rate to erythromycin (80.6%), but no vancomycin-resistant isolates were identified. Factors associated with resistance to at least 1 antibiotic tested included length of stay (OR, 5.32; 95% CI, 1.47–19.17; $P = .017$), duration of antibiotics therapy (OR, 5.25; 95% CI, 1.46–18.95; $P = .017$), and the use of tracheal intubation and ventilator (OR, 3.08; 95% CI, 1.09–8.72; $P = .038$). **Conclusions:** These data indicated that although the vancomycin and colistin resistance rate is low, patients with longer length of stay, longer time on antibiotics, and invasive ventilation were at higher risk of AMR infection. Decreasing device use and strong antibiotic stewardship program at the hospital would help to reduce AMR infections.

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Subject Category: Multidrug-Resistant (MDR) Organisms
Abstract Number: SG-APSIC1096
Changes in resistance patterns of "ESKAPE" pathogens to azithromincin and levofloxacin in Yogyakarta

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Objectives: Bacterial coinfection occurred in 3.5% of COVID-19 patients, and secondary bacterial infection occurred in 14.3% of patients. In Indonesia, one of the guidelines for COVID-19 therapy is to administer azithromycin 500 mg per 24 hours for mild and moderate cases and azithromycin 500 mg per 24 hours and levofloxacin 750 g per 24 hours for severe cases with suspected secondary bacterial infection. At the beginning of the pandemic, many antibiotics were used, even without proven or suspected bacterial infection. We sought to determine changes in the resistance of "ESKAPE" bacteria (ie, *Enterococcus faecium*, *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Acinetobacter baumannii*, *Pseudomonas aeruginosa*, and *Enterobacter* spp) to the antibiotics levofloxacin and azithromycin prior to and during the COVID-19 pandemic. **Methods:** The study was conducted retrospectively by examining the culture and sensitivity test results of "ESKAPE" bacteria to levofloxacin and azithromycin antibiotics in 2019 (before the pandemic) and April 2020–April 2021 (during the pandemic) in 4 hospitals in Yogyakarta. The number of samples represents all cultures completed within the specified period to detect antibiotic sensitivity patterns. **Results:** In a top referral hospital, resistance to levofloxacin and azithromycin increased significantly for *E. faecium* and *P. aeruginosa*, but at a private hospital, an increase in resistance to azithromycin and levofloxacin occurred for *A. baumannii* and for *Enterobacter* spp and resistance to levofloxacin increased significantly. At an academic hospital, there was a considerable decrease in *S. aureus* and *E. faecium* resistance to levofloxacin and azithromycin. At the government hospital, *S. aureus*, *K. pneumoniae*, *P. aeruginosa*, *Acinetobacter baumannii*, and *Enterobacter* spp developed resistance to levofloxacin. **Conclusions:** Resistance to azithromycin and levofloxacin by different ESKAPE bacteria increased on average during the COVID-19 pandemic.

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Subject Category: Multidrug-Resistant (MDR) Organisms
Abstract Number: SG-APSIC1164
Cost-effectiveness of temporary isolation rooms in acute-care settings in Asia

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Objectives: We estimated the change to health-service costs and health benefits resulting from a decision to adopt temporary isolation rooms, which are effective at isolating the patient within a general ward environment. We assessed the cost-effectiveness of the decision to adopt temporary isolation rooms in a Singapore hospital. **Methods:** Existing data were used to update a model of the impact of adopting temporary isolation rooms on healthcare-associated infections. We predicted the expected change to health service costs and health benefits, measured in life years gained. Uncertainty was addressed using probabilistic sensitivity analysis, and the findings were tested with plausible scenarios to determine the effectiveness of the intervention. **Results:** We predicted 478 fewer HAIs per 100,000 occupied bed days resulting from a decision to adopt temporary isolation rooms. This decreased would result in cost savings of SGD $329,432 (US $247,302) and 1,754 life years gained. When the effectiveness of the intervention was set at 1% of cases of HAI prevented, the incremental cost per life year saved was SGD$16,519 (US $12,400), indicating that this