Background: Antimicrobial resistance increases the risk of exposure to inappropriate empiric treatment (IET), which results in increased costs, length of stay (LOS), mortality, and readmission. The objective of this study was to determine whether carbapenem resistance (CR) among hospital-acquired and ventilator-associated pneumonia (HAP/VAP) patients is associated with increased LOS and costs.

METHODS: We performed a retrospective cohort study utilizing data from The Premier Research Database (2009-2016) of 180 US hospitals. We included all hospitalized adult patients with a pneumonia diagnosis (ICD-9-CM codes 481-486) who were identified using the provider order entry (POE) carbapenem order (ICD-9-CM codes 99.60, 99.61, and 99.62) and were treated with at least one carbapenem class drug during hospitalization. Charlson Comorbidity Index 3 vs. 2, p<0.001). P. aeruginosa was the most common GN pathogen overall (24.9%) and among CS (23.5%) and second to S. maltophilia (44.0%) among CR (35.3%). A. baumannii accounted for 11.8% of CR and 5% of CS (p<0.001). Patients with CR were more likely to receive IET (25.8% vs. 14.5%, p<0.001).

RESULTS: Of the total cohort N = 8,969, 1,059 (11.8%) had a CR organism. Patients with CR were more likely female (41.4% vs. 33.2%, p<0.001) and medical patients (47.6% vs. 38.9%, p<0.001). Those admitted from an extended care facility (ECF, 7.2% vs. 4.6%, p=0.014), medical patients (14.5%) and neurologic the lowest (8.4%) prevalence of CR. Majority (56.4%) cared for on a surgical service. A. baumannii was the most common GN pathogen overall (24.9%) and among CS (23.5%) and second to S. maltophilia (44.0%) among CR (35.3%). A. baumannii accounted for 11.8% of CR and 5% of CS (p<0.001). Patients with CR were more likely to receive IET (25.8% vs. 14.5%, p<0.001).

CONCLUSION: Our study demonstrates a significant association between CR status and increased LOS and costs associated with CR- HAP/VAP. Further research is needed to determine the cause of longer LOS and increased costs associated with CR- HAP/VAP.