Presentation Type:
Poster Presentation - Top Poster Award
Subject Category: Emerging Pathogens
Alarming prevalence of *Candida auris* among critically ill patients in intensive care units in Dhaka City, Bangladesh
Fahmida Chowdhury; Kamal Hussain; Sanzida Khan Khan; Dilruba Ahmed; Debashis Sen; Zakiul Hassan; Mahmudur Rahman; Sajeda Prema; Alex Jordan; Shawn Lockhart; Meghan Lyman and Syeda Mah-E-Muneer

Background: *Candida auris* is a multidrug-resistant yeast capable of invasive infection with high mortality and healthcare-associated outbreaks globally. Due to limited labratory capacity, the burden of *C. auris* is unknown in Bangladesh. We estimated the extent of *C. auris* colonization and infection among patients in Dhaka city intensive care units. **Methods:** During August 2021–September 2022 at adult intensive care units (ICUs) and neonatal intensive care units (NICUs) of 1 government and 1 private tertiary-care hospital, we collected skin swabs from all patients and blood samples from sepsis patients on admission, mid-way through, and at the end of ICU or NICU stays. Skin swab and blood with growth in blood-culture bottle were inoculated in CHROMagar, and identification of isolates was confirmed by VITEK-2. Patient characteristics and healthcare history were collected. We performed descriptive analyses, stratifying by specimen and ICU type. **Results:** Of 740 patients enrolled, 59 (8%) were colonized with *C. auris*, of whom 2 (0.3%) later developed a bloodstream infection (BSI). Among patients colonized with *C. auris*, 27 (46%) were identified in the ICU and 32 (54%) were identified from the NICU. The median age was 55 years for *C. auris*–positive ICU patients and 4 days for those in the NICU. Also, 60% of all *C. auris* patients were male. Among 366 ICU patients, 15 (4%) were positive on admission and 12 (3%) became colonized during their ICU stay. Among 374 NICU patients, 19 (5%) were colonized on admission and 13 (4%) became colonized during their NICU stay. All units identified *C. auris* patients on admission and those who acquired it during their ICU or NICU stay, but some differences were observed among hospitals and ICUs (Figure). Among patients colonized on admission to the ICU, 11 (73%) were admitted from another ward, 3 (20%) were admitted from another hospital, and 1 (7%) were admitted from home. Of patients colonized on admission to the NICU, 4 (21%) were admitted from the obstetric ward, 9 (47%) were admitted from another hospital, and 6 (32%) were admitted from home. In addition, 18 patients with *C. auris* died (12 in the ICU and 6 in the NICU); both patients with *C. auris* BSIs died. **Conclusions:** In these Bangladesh hospitals, 8% of ICU or NICU patients were positive for *C. auris*, including on admission and acquired during their ICU or NICU stay. This high *C. auris* prevalence emphasizes the need to enhance case detection and strengthen infection prevention and control. Factors contributing to *C. auris* colonization should be investigated to inform and strengthen prevention and control strategies.
Disclosure: None

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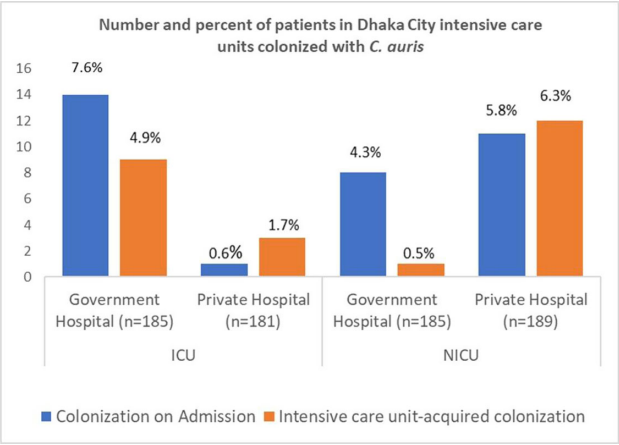

Presentation Type:
Poster Presentation - Top Poster Award
Subject Category: Environmental Cleaning
Modifying water use practices to eliminate *Pseudomonas aeruginosa* bloodstream infections in the neonatal intensive care unit
Ingrid Camelo; Srilatha Neshangi and Amy Thompson

Objective: To describe the strategies implemented at a tertiary-care healthcare center neopnatal intensive care unit (NICU) to control and assure prevention of subsequent central-line bloodstream infections (CLABSIs) with *Pseudomonas aeruginosa* after 4 cases of CLABSI with this organism were detected. **Methods:** During the months of September 2020 to February 2021, 4 cases of CLABSI with *Pseudomonas aeruginosa* were reported in our NICU in patients meeting criteria for extremely low birthweight (ELBW) infants. All patients were treated according to IDSA guidelines for management of bloodstream infections. To avoid the appearance of new events and to improve existing policies, we implemented a stepwise approach by reviewing routine disinfection and/or cleaning procedures of isolettes: (1) liners for bath basins were applied, (2) sterile water was provided for bathing newborns, (3) we ensured timely biomed preventive maintenance of water reservoirs for patient care equipment (nebulizers, isolettes and fluid warmers), and (4) we implemented the installment of point-of-care filters for tap water. **Results:** Measures were implemented from February 2021 to July 2021. During the following year from July 2021 to June 2022, no CLBSIs related to *Pseudomonas aeruginosa* were reported in our NICU in patients meeting criteria for ELBW infants. **Conclusions:** Recognition of CLABSI from organisms from water resources is important to implementing focused prevention strategies targeting water resources and water utilization practices. In our institution, these interventions yielded complete resolution, with no new infection events.
Disclosure: None

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Presentation Type:
Poster Presentation - Top Poster Award
Subject Category: Infection Control in Low and Middle-Income Countries
Approach for sustainable district-led production and distribution of alcohol-based hand rub in Uganda
Maureen Kesande

Background: A sustainable, continuous supply of alcohol-based hand rub (ABHR) is essential for healthcare workers in health facilities. The WHO provides guidance for production in individual health facilities. In Uganda, using this guidance, an innovative approach was implemented at the district local government level to produce and subsequently distribute ABHR to primary-care health facilities that have limited capacity for local facility-level production. This project was supported by the CDC in collaboration with the Infectious Diseases Institute (IDI) and targeted governmental or district engagement with local partners to ensure sustainability. **Methods:** District stakeholders were engaged to obtain buy-in and define roles and responsibilities. Overall, 4 staff members in each of 6 supported districts were nominated by District Health Officers for training: 2 staff members were trained to produce ABHR and conduct internal quality control and 2 were trained on external quality control. Districts provided ABHR production-unit facilities and facilitated integration within the government essential supplies delivery system, National Medical Stores in Uganda, which supports last-mile delivery to facilities. An implementing partner purchased initial raw materials necessary for production. The cost of materials for local production was compared to the price of commercial ABHR available in Uganda. **Results:** Between January and August 2021, 23 staff

members were trained, and 380 batches of quality-assured ABHR (17,820 L) were produced and distributed to 278 health facilities. Consumption of ABHR in the first distribution was used to benchmark predicted ABHR consumption per targeted facility in subsequent months. Increased demand for ABHR due to the COVID-19 pandemic and the Ebola virus disease outbreak in central Uganda (September 2022) was addressed through emergency requests on a case-by-case basis. ABHR local production costs $3 per liter for materials, less than half of commercial ABHR ($8 per liter). **Conclusions:** Early results suggest that this approach is potentially sustainable but requires national advocacy as well. Leveraging existing distribution systems while building local capacity for ABHR production and distribution may improve longevity of such innovations in similar resource-limited settings.

Disclosure: None

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Presentation Type:
Poster Presentation - Top Poster Award
Subject Category: Infection Control in Low- and Middle-Income Countries

Assessment of ventilation in low-resource healthcare settings: Montserrado County, Liberia—2022–2023

Krithika Srinivasan; Ronan Arthur; Ashley Styczynski; Ethan Bell; Thomas Baer and Jorge Salinas

Background: Mitigating the risk of nosocomial respiratory disease transmission in the healthcare facilities of low- and middle–income countries (LMICs) poses unique challenges because mechanical ventilation and mixed–mode strategies are often unavailable. Carbon dioxide (CO_2) can serve as a proxy for ventilation and, hence, airborne infectious disease transmission risk in naturally ventilated spaces. We assessed the adequacy of ventilation in Liberian hospitals. **Methods:** We sampled 3 hospitals, both urban and rural, in Montserrado County, Liberia. Moreover, 3 CO_2 meters were concurrently utilized to measure CO_2 levels at a 1-meter height in every patient-care room in each facility. We recorded temperature, humidity, room dimensions, and number of people in the rooms. From these variables, we calculated absolute ventilation using the ASHRAE equation to determine areas with the highest risk of nosocomial respiratory disease transmission. We also recorded qualitative observations about the sampled spaces. **Results:** From August 2022 to February 2023, 39 rooms in 3 healthcare facilities were sampled. Initial quantitative findings show that only 8 rooms (21%) met the WHO-recommended ventilation rate of 60 L per second per person. The average ventilation rate per person in the adequately ventilated settings was 86 L per second per patient, compared to 19 liters per second per patient in inadequately ventilated rooms. Additionally, 467 ppm mean CO_2 was noted in well-ventilated rooms compared to 895 ppm mean CO_2 in inadequately ventilated rooms.

Initial qualitative observations showed that facilities with lower CO_2 readings tended to be older constructions that likely had been constructed with airborne disease such as tuberculosis in mind. Willingness to open windows was limited by lack of window screens for malaria prevention, and there was a pervasive fallacy that air conditioning was a source of ventilation. Correspondingly, of the 31 inadequately ventilated rooms, 22 (71%) had operating air conditioning units compared with 4 (50%) of the 8 adequately ventilated rooms. Overall, of the 13 rooms without air conditioning, 7 (54%) were more frequently characterized by open windows compared to only 5 of 26 (28%) of rooms that did have air conditioners. **Conclusions:** Being prepared for the next respiratory disease outbreak and creating more resilient healthcare systems in LMICs requires a frameshift of prevention strategies. Measuring CO_2 provides a simple strategy for identifying areas at highest risk for nosocomial respiratory disease transmission, which can be prioritized for low-cost environmental interventions, such as provision of window screens, as part of routine infection prevention and control efforts.

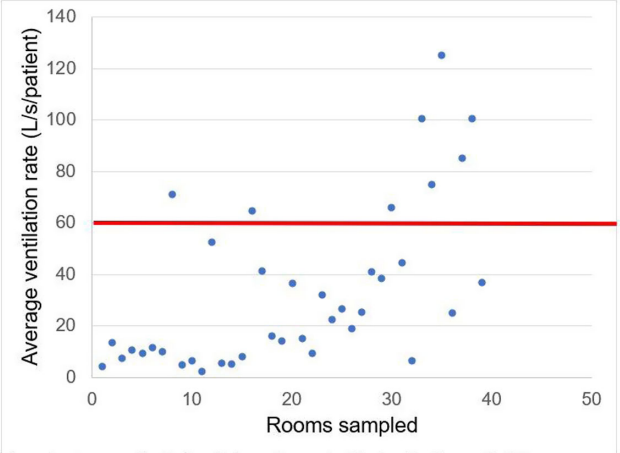

Figure 1: Average Ventilation Rate per Person in Liberian Healthcare Facilities. The red line represents the World Health Organization recommended ventilation rate of 60L/s/patient. Out of 39 rooms measured, only eight (21%), noted above the red line, met the WHO recommended ventilation rate of 60L/s/patient.

Disclosure: None

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Presentation Type:
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Subject Category: MDR GNR

Carbapenemase genes and mortality in patients with carbapenem-resistant Enterobacterales, Atlanta, Georgia, 2011–2020

Lucy Witt; Ahmed Babike; Gillian Smith; Sarah Satola; Mary Elizabeth Sexton and Jesse Jacob

Background: Carbapenemase genes in carbapenem-resistant Enterobacterales (CP-CRE) may be transmitted between patients and bacteria. Reported rates of carbapenemase genes vary widely, and it is unclear whether having a carbapenemase gene portends worse outcomes given that all patients with CRE infections have limited treatment options. **Methods:** Using active population- and laboratory-based active surveillance data collected by the US CDC-funded Georgia Emerging Infections Program from 2011 to 2020, we assessed the frequency of carbapenemase genes in a convenience sample of CRE isolates using whole-genome sequencing (WGS), and we investigated risk factors for carbapenemase positivity. Only the first isolate per patient in a 30-day period was included. We compared characteristics of patients with CP-CRE and non–CP-CRE. Using multivariable log binomial regression, we assessed the association of carbapenemase gene positivity and 90-day mortality. **Results:** Of 284 CRE isolates, 171 isolates (60.2%) possessed a carbapenemase gene (Table 1), and KPC-3 was the most common carbapenemase gene (80.7%), with only 7 isolates possessing NDM (Table 2). No isolates possessed >1 carbapenemase gene, and most isolates were from urine (82.4%) (Table 1). Carbapenemase gene positivity was associated with lower age, male sex, black race, infection with *Klebsiella pneumoniae*, polymicrobial infection, having an indwelling medical device, receiving chronic dialysis, and prior stay in a long-term acute-care hospital, long-term care facility, and/or prior hospitalization in the last year. The 90-day mortality rates were similar in patients with non–CP-CRE and CP-CRE: 24.8% versus 25.7% ($P = .86$). In multivariable analysis, carbapenemase gene presence was not associated with 90-day mortality (adjusted risk ratio, 0.82; 95% CI, 0.50–1.35) when adjusting for CCI, infection with *Klebsiella pneumoniae*, and chronic dialysis use. **Conclusions:** The frequency of CP-CRE among CRE was high in this study, but unlike prior studies, the 90-day mortality rates wer similar in patients with CP-CRE compared to non–CP-CRE. Our results provide