Figure 1. Total number of recommendations by antimicrobial in pharmacies and non-pharmacy stores

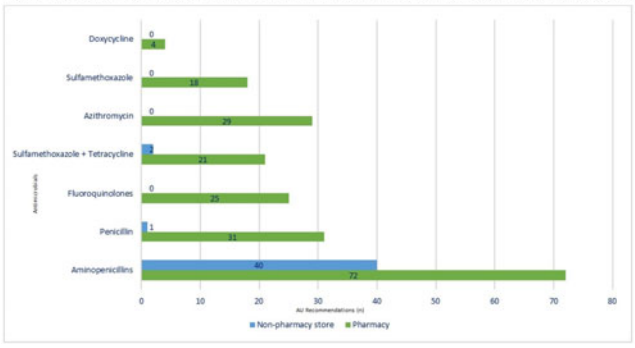

Fig. 1.

Figure 2. Antimicrobial recommendations by symptom in pharmacies

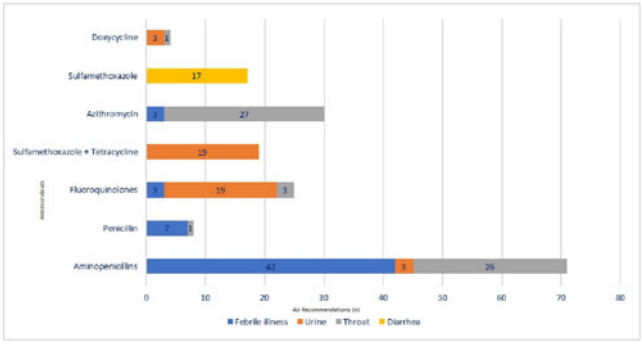

Fig. 2.

Figure 3. Antimicrobial recommendations by symptom in non-pharmacy stores

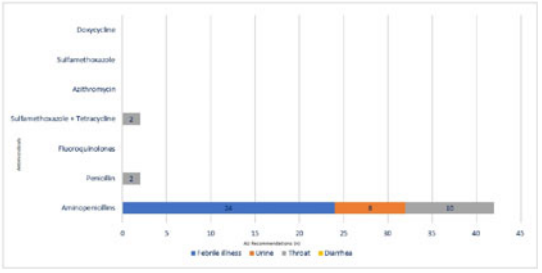

Fig. 3.

and 0% of nonpharmacy stores. Antimicrobial recommendations by case scenario in pharmacies and nonpharmacy stores are shown in Figs. 2 and 3. Antimicrobials are available for phone order in 80% of pharmacies and 90% of nonpharmacy stores. No antimicrobials were available via online delivery apps. **Conclusions:** Antimicrobials are widely available in the Dominican Republic and can be obtained without a prescription, in person or via delivery. Staff at pharmacy stores recommended different antimicrobials by symptom, whereas staff at nonpharmacy stores commonly recommended aminopenicillins for all symptoms. Training or education on antimicrobial use was common for staff at pharmacy stores but nonexistent for staff at nonpharmacy stores. In LMICs with easy access to antimicrobials, frontline staff in pharmacies and nonpharmacy stores are gatekeepers for antimicrobial use and may represent an important target for outpatient antimicrobial stewardship initiatives.

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Presentation Type:
Poster Presentation

Naturally Emerging Cohorting Behavior of Healthcare Workers and Its Implications for Disease Spread

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Background: Mobility patterns of healthcare workers (HCWs) (ie, the spatiotemporal distribution of patient rooms they visit) have a significant impact on the spread of healthcare acquired infections (HAIs). **Objective:** In this project, we used fine-grained data from a sensor deployment at the medical intensive care unit (MICU) in the University of Iowa Hospitals and Clinics (UIHC) to study the mobility patterns of HCWs and their impact on HAI spread. **Methods:** We analyzed 10 days of data from a 20-bed MICU sensor deployment. For parameters t1 and t2, each pair of rooms i and j is assigned a weight $W(i, j)$ representing the number of times an HCW spends at least t1 seconds in room i followed by at least t1 seconds in room j, within t2 seconds of each other. $W(i, j)$ is a measure of HCW traffic going from room i to room j; we study the correlation between $W(i, j)$ and the distance between rooms i and j. Additionally, we perform 2 disease-spread simulations: (1) a base simulation, obtained by replaying observed HCW mobility traces and (2) a perturbed simulation, which is the same as the base simulation, except that we replace each HCW who visits a room by a random available HCW. Thus, the perturbed simulation removes correlations in the observed HCW mobility traces. **Results:** We

Fig. 1.

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computed $W(i, j)$ for all room pairs i, j for parameters t1 = 30 seconds and t2 = 1,800 and 3,600 seconds. For nurses, there was a strong negative correlation of between pairwise room distance and the weights $W(i, j)$ (−0.768 for t2 = 1,800; −0.711 for t2 = 3,600), The more distant 2 rooms were, the less they shared nurse traffic. This was not true for physicians (correlation = −0.027 for t2 = 1,800; −0.014 for t2 = 3,600). Figure 1 shows a weight versus distance scatter plot for nurses for t1 = 30 and t2 = 1,800. This spatial correlation has positive implications for disease spread; the base simulation, which preserves these spatial correlations, has between 12% and 55% fewer mean infected patients (>100 replicates) for different simulation parameters compared to the perturbed simulation. **Conclusions:** Our results, based on fine-grained data, show a "naturally emerging" cohorting behavior of nurses, where nurses are more likely to visit rooms close to each other within a 30–60 minute time window, than rooms further away. Through simulations, this behavior provides substantial protection against disease spread.

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Poster Presentation

New Approaches to Colonization Screening in Response to Emerging Antimicrobial Resistance

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Background: The capacity to monitor the emergence of carbapenemase-producing organisms (CPO) is critical in limiting transmission. CPO-colonized patients can be identified by screening rectal specimens for carbapenemase genes and the Cepheid GeneXpert Carba-R (XCR), the only FDA-approved test, is limited to 5 carbapenemase genes and cannot identify the bacterial species. **Objective:** We describe the development and validation of culture-based methods for the detection of CPO in rectal cultures (RCs) and nonrectal cultures (NRCs) of tracheal aspirate and axilla-groin swabs. **Methods:** Colonization screening was performed at 3 US healthcare facilities; specimens of RC swabs and NRC ESwabs were collected. Each specimen was inoculated to a MacConkey broth enrichment tube for overnight incubation then were subcultured to MacConkey agar with meropenem and ertapenem 10 µg disks (BEMA) and CHROMagar KPC (KCHR) or CHROMagar *Acinetobacter* (ACHR). All media were evaluated for the presence of carbapenem-resistant organisms; suspect colonies were screened by real-time PCR for the most common carbapenemase genes. MALDI-TOF was performed for species identification. BEMA, a previously validated method, was the comparator for 52 RCs; clinical culture (CC) served as the comparator method for 66 NRCs. Select CPO-positive and -negative specimens underwent reproducibility testing. **Results:** Among 56 patients undergoing colonization screening, 12 (21%) carried a CPO. Only 1 patient had CPO solely from RC. Also, 6 patients had both CPO-positive RC and NRC, and 5 patients only had a CPO-positive NRC. Of the latter, 4 had a CPO-positive tracheal specimen, and 1 had a positive culture from both tracheal and axilla-groin specimens. Sensitivity of BEMA (70%) for NRC was lower than for KCHR (96%) and ACHR (88 %) for all specimens. All methods showed a specificity of 100% and reproducibility of 92%. The detected CPO included OXA-23–positive *Acinetobacter baumannii*, NDM-positive *Escherichia coli*, KPC-positive *Pseudomonas aeruginosa* and 4 genera of KPC-positive Enterobacteriaceae. **Conclusions:** The addition of nonrectal specimens and use of selective media contributed to increased sensitivity and enhanced identification of CPO-colonized patients. Positive cultures were equally distributed among the 3 specimen types. The addition of the nonrectal specimens resulted in the identification of more colonized patients. The culture-based method was successful in detecting an array of different CPOs and target genes, including genes not detected by the Carba-R assay (eg, blaOXA-23-like). Enhanced isolation and characterization of CPOs will be key in aiding epidemiologic investigations and strengthening targeted guidance for containment strategies.

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Disclosures: We discuss the drug combination aztreonam-avibactam and acknowledge that this drug combination is not currently FDA approved.
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Nonsusceptibility to Ceftazidime or Cefepime Can Predict Carbapenemase-Production Among Carbapenem-Resistant *Pseudomonas aeruginosaa*

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Background: In the United States, carbapenemases are rarely the cause of carbapenem resistance in *Pseudomonas aeruginosa*. Detection of carbapenemase production (CP) in carbapenem-resistant *P. aeruginosa* (CRPA) is critical for preventing its spread, but testing of many isolates is required to detect a single CP-CRPA. The CDC evaluates CRPA for CP through (1) the Antibiotic Resistance Laboratory Network (ARLN), in which CRPA are submitted from participating clinical laboratories to public health