Presentation Type: Poster Presentation

National Trends of Prevalence of Fluoroquinolone Resistance Among Healthcare-Associated Escherichia coli Infections
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Background: Escherichia coli is the third most common pathogen responsible for healthcare-associated infections (HAIs), but it is increasingly resistant to multiple antibiotics. Antimicrobial susceptibility test (AST) results for fluoroquinolones (FQs) among E. coli implicated in select HAIs are reported to the NHSN surveillance system. Trend analyses in the prevalence of FQ resistance among healthcare-associated E. coli infections reported to NHSN have not been previously assessed. Objective: We investigated the national trends of prevalence of FQ resistance among E. coli HAIs in acute-care hospitals from 2009 through 2018. Method: We analyzed E. coli AST data from central-line–associated bloodstream infections (CLABSI), catheter-associated urinary tract infections (CAUTI), and surgical site infections (SSI) reported to the NHSN between 2009 and 2018. Fluoroquinolone resistance is defined as the number of E. coli isolates that tested resistant or intermediate to at least 1 of 3 quinolones (ciprofloxacin, levofloxacin, and moxifloxacin), divided by number of pathogens tested for susceptibility, multiplied by 100. To evaluate the trends of fluoroquinolone resistance over time, we conducted an interrupted time-series analysis using a generalized linear mixed model with a logit function. Substantial HAI definitional changes, most consequentially CAUTI in 2015 and a directional incidence change in 2018, were treated as interruptions to the outcome. Regression models adjusted for patient-level (ie, age, gender, HAI type) and facility-level characteristics (ie, facility type, teaching status, number of beds in intensive care units, and average length of stay) were obtained from the NHSN annual hospital surveys. Random-intercept and slope models were evaluated with covariance tests and were included to account for differential baseline fluoroquinolone resistance and trends among reporting facilities. Data were analyzed using SAS with statistical significance defined at alpha = 0.05. Results: During 2009–2018, the number of E. coli isolates with AST results for FQ reported to NHSN (Fig. 1) increased. After adjusting for covariates, fluoroquinolone resistance significantly increased from 2009 through 2015 at an average of 4.2% per year (Fig. 2, β1). There was no significant change in fluoroquinolone resistance from 2015 through 2017 (Fig. 2, β1 + β3). In 2018, there was 6.4% decline in fluoroquinolone resistance compared to 2017 (Fig. 2, β4) Conclusions: An increasing trend of fluoroquinolone resistance from 2009 through 2015 was observed, and fluoroquinolone resistance was stable during 2015–2017. Despite a relatively brief decline in fluoroquinolone resistance in 2018, the absolute change was small (~2%). Sustaining this decline warrants continued efforts in infection prevention and antimicrobial stewardship.

Funding: None
Disclosures: None

Doi: 10.1017/ice.2020.930

Presentation Type: Poster Presentation

Nationwide Survey of Antimicrobial Dispensation and Training in Pharmacies and Nonpharmacy Stores in the Dominican Republic
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Background: Antimicrobial use in low- and middle-income countries (LMICs) can play a major role in the development of antimicrobial resistance (AMR). In many LMICs, antimicrobials can be dispensed without prescriptions; they often available in pharmacies and nonpharmacy stores alike. We conducted a nationwide survey to describe the availability and antimicrobial dispensation practices in pharmacies and nonpharmacy stores in the Dominican Republic. Methods: A survey was administered to staff responsible for dispensing antimicrobials at pharmacies and nonpharmacy stores in the Dominican Republic. Stores were randomly selected from March through November 2019 in 7 cities representing all geographic regions of the Dominican Republic. Data on availability of antimicrobials and staff education on antimicrobial use were obtained. Case scenarios with commons symptoms were used to survey staff on antimicrobial use recommendations. Symptoms included dysuria, throat pain, diarrhea, fever, and cough. The availability of antimicrobials ordering by phone and via online delivery was assessed for each store. Results: Staff from 125 stores were invited to participate; 34 pharmacies and 48 nonpharmacy stores participated and 43 refused to participate. Overall, 200 antimicrobial use recommendations were given in pharmacies and 43 in nonpharmacy stores. The most common type of antimicrobial use recommendations were aminopenicillins (Fig. 1). Staff received prior training or education on antimicrobials in 61% of pharmacies.
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.

**Funding:** None

**Disclosures:** None

**Doi:** 10.1017/ice.2020.931

**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 $t_1$ and $t_2$, each pair of rooms $i$ and $j$ is assigned a weight $W(i, j)$ representing the number of times an HCW spends at least $t_1$ seconds in room $i$ followed by at least $t_1$ seconds in room $j$, within $t_2$ 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...