538. Extended-Spectrum β-Lactamase (ESBL): Producing Enterobacteriaceae Surveillance Pilot, New Mexico, 2017
Erin C. Phipps, DVM, MPH, Kristina Flores, PhD and Emily B. Hancock, MS; University of New Mexico, Albuquerque, New Mexico
Session: 58. HAI: MDRO – GNR Surveillance
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Background. Extended-spectrum \( \beta \)-lactamase – producing (ESBL) Enterobacteriaceae pose a serious antibiotic resistance threat, yet gaps remain in our understanding of their epidemiology. New Mexico was one of five Emerging Infection Program (EIP) sites to participate in a surveillance pilot from October 1 to December 31, 2017.

Methods. A case was defined as a resident of Bernalillo County, NM with E. coli, K. pneumoniae, E. faecalis, or Klebsiella oxytoca cultured from urine or normally sterile body sites and resident at least one extended-spectrum cephalosporin and non-resistant to all carbenepenam antibiotics tested. EIP staff assessed prior healthcare exposures, risk factors, and outcomes through medical record review.

Results. NM EIP identified 390 incident cases among 288 individuals; 263 medical records were reviewed. Cases ranged in age from 3–95 years, with a median age of 63 years. Most isolates were E. coli (n = 270, 87.4%); 35 (11.3%) were K. pneumoniae and 4 (1.3%) were K. oxytoca. The majority of isolates were cultured from urine (297, 96.1%). Blood cultures comprised 11 cases (3.6%). The majority of ESBL cultures were collected in an outpatient setting; 15% were collected from hospital inpatients and fewer than 5% from residents of a long-term care facility (LTFC) or long-term acute care facility (LTACH). However, 21% of those collected in an outpatient setting, primarily the ED, were hospitalized within 30 days.

Conclusion. Over 60% of the cases had at least one relevant risk factor documented in their medical record. One-third had documented antimicrobial use in the prior month, 39% had been hospitalized in the year prior, and 19% had a urinary catheter in place in the 2 days prior to culture collection. Interestingly, while only 2% had documentation of international travel in the two months prior to culture, 18% had either documented international travel outside of that timeframe, or required the use of language interpretation, possibly indicating extensive time living internationally in the past.

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539. Canaries in a Coal Mine?: Early Identification of Regional Spread of Novel Multidrug-resistant Organisms (MDROs) Using Sentinel Surveillance in Skilled Nursing Facilities Caring For Ventilated Patients (vSNFs)
Prabhas P. Paul, PhD, MPH1; Rachel Slayton, PhD, MPH1; Maroya S. Walters, PhD2 and John A. Jernigan, MD, MS1; 1Centers for Disease Control and Prevention, Atlanta, Georgia; 2Division of Healthcare Quality Promotion, Centers for Disease Control and Prevention, Atlanta, Georgia
Session: 58. HAI: MDRO – GNR Surveillance
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Background. Regional containment of novel or targeted MDROs depends on detecting their presence as soon as possible following their introduction. Prior modeling studies suggest that after an introduction to a region, non-epidemic strains can appear relatively quickly in certain high-risk post-acute long-term care facilities via patient movement. Sentinel surveillance in such facilities might facilitate early detection of emerging MDROs, thereby enhancing the effectiveness of containment efforts.

Methods. We simulated the introduction and spread of carbapenem-resistant Enterobacteriaceae (CRE) in a region using an adaptation of a previously described susceptible-infectious-susceptible model (Clin Infect Dis. 2019 March 28 doi: 10.1093/cid/ciz248). The model includes the patient sharing network among healthcare facilities in an exemplar US state, using claims data and the Minimum Data Set from the Centers for Medicare & Medicaid Services for 2015. Disease progression, transmission and testing rates were estimated for CRE using data from the literature. Each simulated outbreak was initiated with a single importation to a Dartmouth Atlas of Health Care hospital referral region. The predicted timing of first CRE detection using two different data sources was compared: (1) real-time monitoring of clinical microbiology test results, or (2) results from quarterly point prevalence colonization surveys (PPS). For each data source, the timing of earliest detection was compared according to availability of data from: (a) all healthcare facilities statewide, (b) only long-term acute care hospitals, (c) only vSNFs, or (d) only the largest acute care hospitals in the state (n = 23).

Results. Compared with real-time monitoring of clinical microbiology testing results from all facilities statewide, quarterly PPSs at all facilities detected CRE 446 days (median; range 312–608 days) earlier, while PPSs at only vSNFs (representing 4.4% of inpatient bed-days statewide) detected CRE 385 days (range 194–553 days) earlier (Figures).

Conclusion. Regular point prevalence surveys in vSNFs may detect new MDROs in a region approximately one year sooner than real-time monitoring of clinical microbiology results, and may be an efficient strategy for early regional detection and subsequent containment.

Disclosures. All authors: No reported disclosures.
### 540. The Impact of Diet and Oral Hygiene on the Risk of Multidrug-Resistant Organism Carriage in the Mouth and Gut

#### Methods

Participants were adults over age 18 from the 2016–2017 Survey of the Health of Wisconsin (SHOW) and its ancillary Wisconsin Microbiome Study. SHOW surveys residents of Wisconsin, collecting health determinants including a food frequency questionnaire, oral health, as well as biologic specimens. MDROs were defined as the presence of methicillin-resistant *Staphylococcus aureus*, Vancomycin-resistant *Enterococcus*, and Fluoroquinolone-resistant Gram-negative bacteria identified via culture from saliva, oral swabs, and stool samples. Statistical analysis was performed in R v3.5.1. Univariate analyses were conducted for all variables in the data set. Any variable with a P-value < 0.2 in the univariate analysis was considered for the logistic regression. Logistic regression using the glm function was done modeling MDRO carriage in either the saliva, oral swab, saliva and oral samples combined, and stool against diet, oral health, and known confounders.

#### Results

876 participants were included in the dataset with all 876 providing oral and stool samples and 784 providing saliva samples. Thirty-three patients were MDRO positive in the saliva (4.2%), 36 were positive in the oral swabs (4.1%), 55 were positive in either the saliva or oral swabs (6.3%), and 103 were positive in the stool (11.8%). In the logistic regression, consumption of whole grains was significantly associated with reduced MDRO carriage in the saliva (P = 0.066) and saliva and oral swab combined (P = 0.036) data sets (Table 1).

#### Conclusion

Consuming more whole grains was associated with a lower prevalence of MDRO carriage in the oral cavity. Higher levels of sugar consumption were associated with a higher prevalence of MDRO in the gut. Oral hygiene was not found to be associated with MDRO colonization in the mouth and a higher prevalence in the gut in this cross-sectional study. This may be due to over-reporting of hygiene practices by participants. Being positive for an MDRO in the oral cavity significantly increased the risk of MDRO carriage in the gut.

### Disclosures

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### 541. Factors Associated with the Persistence of Colonization by Multidrug-Resistant Organisms in Cali, Colombia

#### Background

Colonized patients represent a reservoir for transmission to other non-colonized patients for health institutions, so surveillance measures and contact precautions have been taken in the worldwide to mitigate transmission. However, despite the different interventions implemented, factors associated with persistence have not been evaluated in our context. This study aimed to describe the persistence of colonization in patients with multidrug-resistant organisms (MDROs) re-admitted to a health institution.

#### Methods

A retrospective observational study was conducted. Patients re-admitted with a previous positive rapid test for MDROs, who had received chlorhexidine bathing and contact precautions during hospitalization were included. Samples were obtained from two rectal and one nasal swap. Colonization was defined as MDRO detection in at least one anatomical site, in the absence of symptoms or signs of infection. Persistence was defined as two positive screening for the same MDRO. Laboratory tests were chromID®, CHROMID® CARBA and MacConkey agar. VITEK MS® MALDI-ToF conducted MDROs genus identification, and carbapenem-resistant was evaluated using chromogenic Enterobacteriaceae. There was a statistically significant difference in length of hospitalization (P = 0.003) and ICU (P = 0.035) between non-colonized and persistence of colonization. Factor associated with persistence of colonization included liver disease (OR=3.1; 95% CI: 1.086–9.019; P = 0.037), history of infection in the last year (OR=3.78; 95% CI: 1.636–13.439; P = 0.044), use of permanent urinary catheter (OR=6.48; 95% CI: 1.314–31.975; P = 0.022), history of gastroenterology before hospitalization (OR=5.57; 95% CI: 1.547–18.638; P = 0.008), and use of nasogastric tube (OR=5.14; 95% CI: 1.108–23.861; P = 0.044).

#### Results

A total of 4,362 screening for MDROs was analyzed form July 2015 to December 2016, and 142 patients were included in the study; the median age was 39 years (IQR=12–62) and 56% were male. The most frequent MDRO was carbapenem-resistant Enterobacteriaceae. Factor associated with persistence of colonization included liver disease (OR=3.1; 95% CI: 1.086–9.019; P = 0.037), history of infection in the last year (OR=3.78; 95% CI: 1.636–13.439; P = 0.044), use of permanent urinary catheter (OR=6.48; 95% CI: 1.314–31.975; P = 0.022), history of gastroenterology before hospitalization (OR=5.57; 95% CI: 1.547–18.638; P = 0.008), and use of nasogastric tube (OR=5.14; 95% CI: 1.108–23.861; P = 0.044).

#### Conclusion

It is necessary to consider the previous history of infection in the last year, and other patient’s comorbidities and conditions as risk factors of persistence to colonization by MDROs.

### Disclosures

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### 542. Los Angeles County Acute Care Regional Anti-biogram Suggests Changing Landscape of MDRO Threats Between 2015 and 2017

#### Background

The Los Angeles County (LAC) system has a profound impact on public health, serving approximately 6.5 million residents. The goal of the LAC Anti-biogram is to identify trends, areas of concern, and strategies to mitigate the spread of MDROs.

#### Methods

A total of 4,362 screening for MDROs was analyzed form July 2015 to December 2016, and 142 patients were included in the study; the median age was 39 years (IQR=12–62) and 56% were male. The most frequent MDRO was carbapenem-resistant Enterobacteriaceae. There was a statistically significant difference in length of hospitalization (P = 0.003) and ICU (P = 0.035) between non-colonized and persistence of colonization. Factor associated with persistence of colonization included liver disease (OR=3.1; 95% CI: 1.086–9.019; P = 0.037), history of infection in the last year (OR=3.78; 95% CI: 1.636–13.439; P = 0.044), use of permanent urinary catheter (OR=6.48; 95% CI: 1.314–31.975; P = 0.022), history of gastroenterology before hospitalization (OR=5.57; 95% CI: 1.547–18.638; P = 0.008), and use of nasogastric tube (OR=5.14; 95% CI: 1.108–23.861; P = 0.044).

#### Results

A total of 4,362 screening for MDROs was analyzed form July 2015 to December 2016, and 142 patients were included in the study; the median age was 39 years (IQR=12–62) and 56% were male. The most frequent MDRO was carbapenem-resistant Enterobacteriaceae. There was a statistically significant difference in length of hospitalization (P = 0.003) and ICU (P = 0.035) between non-colonized and persistence of colonization. Factor associated with persistence of colonization included liver disease (OR=3.1; 95% CI: 1.086–9.019; P = 0.037), history of infection in the last year (OR=3.78; 95% CI: 1.636–13.439; P = 0.044), use of permanent urinary catheter (OR=6.48; 95% CI: 1.314–31.975; P = 0.022), history of gastroenterology before hospitalization (OR=5.57; 95% CI: 1.547–18.638; P = 0.008), and use of nasogastric tube (OR=5.14; 95% CI: 1.108–23.861; P = 0.044).

#### Conclusion

It is necessary to consider the previous history of infection in the last year, and other patient’s comorbidities and conditions as risk factors of persistence to colonization by MDROs.

### Disclosures

All authors: No reported disclosures.