

Submission Type	Breakout/Quick/Lightning/Poster
ID	11603
Abstract Type	Breakout
Abstract Title	Automating NHSN Antimicrobial Usage Reporting

Abstract

BACKGROUND: Antimicrobial stewardship is crucial to the viability of existing therapies. To facilitate stewardship, the National Healthcare Safety Network (NHSN) receives antimicrobial usage data from hospitals and provides comparisons to national usage patterns. Hospital personnel can then assess whether their antimicrobial policies are consistent with current best practices. Participation in this program is limited. Barriers to participation include the challenge of mapping local medication information to the NHSN list of antimicrobials, the burden of tabulating the necessary statistics, and the technical requirements of generating CDA documents for submission. An automated solution based on existing HL7 interfaces and producing valid CDA documents could significantly lower some of these barriers.

METHODS: Medication administration and patient volume data from a multi-hospital health system were obtained via continuous HL7 message feed. Medication administration data elements included administration time, patient location, and a facility-specific medication identifier. Patient data included admission, transfer and discharge times and locations. Facility medication codes were reconciled to NHSN antimicrobial identifiers via a semi-automated process. The health system formulary included National Drug Code (NDC) identifiers. An RxNorm API mapped NDC identifiers to formulation-specific RxNorm identifiers, and then to parent identifiers for antimicrobials provided by NHSN. Duplicates were removed and missing associations were added manually by comparing names. Antimicrobial route was mainly indicated in the formulary; in rare cases when this was not sufficiently specific, site of administration was used. Antimicrobial therapy days, days present and facility-wide inpatient admissions were calculated per NHSN specifications. Results were compiled via CDA and submitted to NHSN via the web portal.

RESULTS: The RxNorm API yielded mapping between 15,472 NDC identifiers and 847 RxNorm codes, covering 86 (96%) NHSN antimicrobials. After automated and manual reconciliation and excluding formulations administered via nonreportable routes, 216 reportable antimicrobial formulations were identified, covering 67 (74%) NHSN antimicrobials. For July 2018, 206,921 medication administration messages were received, including 11,637 administrations of 48 NHSN antimicrobials at 14 NHSN inpatient locations. Antimicrobials represented 7% of completed administrations and 6,909 days of therapy. An additional 189,717 ADT messages for 5,420 distinct visits were received. These yielded 13,885 facility-wide days present and a 14,797 location-specific days present summed across all inpatient locations and facilities, from 4,054 facility-wide admissions.

CONCLUSIONS: Reconciling local facility formularies with a national standardized list of antimicrobials can be a complicated task requiring human intervention. Once completed, HL7 messages from existing interface engines can supply sufficient information for calculating antimicrobial usage statistics to report to NHSN.

Submission Complete?	Yes
Committee	Infectious Disease
Topic	Antimicrobial Resistance
Keywords	Healthcare Associated Infections (HAI); Informatics; Antimicrobial Resistance
Consider for Different Presentation?	Yes
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Submission Type	Breakout/Quick/Lightning/Poster
ID	11754
Abstract Type	Breakout
Abstract Title	Descriptive Analysis of Carbapenemase Gene Distribution Among Enterobacteriaceae, <i>Pseudomonas Aeruginosa</i> , and <i>Acinetobacter baumannii</i> —Antibiotic Resistance Laboratory Network, 2017–2018

Abstract

BACKGROUND: In 2016, CDC began funding regional, state, and local public health laboratories (PHLs) across the United States to identify and characterize clinical isolates of carbapenem-resistant Enterobacteriaceae (CRE), *Pseudomonas aeruginosa* (CRPA), and *Acinetobacter baumannii* (CRAB) as part of the Antibiotic Resistance Laboratory Network (AR Lab Network). We summarize and describe data collected from the AR Lab Network from January 2017 through October 2018.

METHODS: AR Lab Network PHLs performed testing for organism identification, antimicrobial susceptibility (AST), carbapenemase production, and detection of KPC, NDM, VIM, IMP, and OXA-type carbapenemase genes. Network PHLs submitted monthly testing reports to CDC. On a small subset of isolates, CDC conducted AST for additional drugs, PCR, and whole genome sequencing for detection of carbapenemase genes not targeted by existing assays and identification of variants. ARLN regional laboratories also conducted colonization screening for carbapenemase-producing organisms (CPO) related to the CDC AR Containment Strategy.

RESULTS: Through October 2018, AR Lab Network tested 28,466 isolates. Isolates were considered carbapenemase-producing (CP) if positive by either the modified carbapenemase inactivation method or Carba-NP test or PCR-positive for at least one carbapenemase gene. The percentage of CP isolates and the distribution of carbapenemase genes varied by organism and geographic region. Among CP-CRE, KPC was the most common carbapenemase identified, but the distribution of carbapenemase genes varied by genera. NDM- and OXA-48-like-positive isolates were most common among *E.coli*; VIM was most common among *Enterobacter*, and IMP was most common among other genera. There were 86 CP-CRE isolates reported as having more than one carbapenemase gene. Among CRPA tested, 2.8% were CP and VIM was the most common carbapenemase gene detected. Among CRAB, 5.3% were CP and OXA-23-like carbapenemase genes were the most common. Of 10,925 swabs obtained through colonization screenings, 11% were positive for at least one carbapenemase gene.

CONCLUSIONS: The AR Lab Network now provides increased local testing capacity to detect and prevent the spread of emerging resistance threats. With almost 40,000 specimens tested in the first 22 months of the program, the data generated by AR Lab Network is helping identify targets for rapid public health responses and furthering our understanding of the biology and epidemiology of carbapenemase genes.

Submission Complete?	Yes
Committee	Infectious Disease
Topic	Antimicrobial Resistance
Keywords	Healthcare Associated Infections (HAI); Infectious Diseases
Consider for Different Presentation?	Yes
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Submission Type	Breakout/Quick/Lightning/Poster
ID	10764
Abstract Type	Breakout
Abstract Title	Inappropriate Intravenous Antimicrobial Starts: A New Antimicrobial Stewardship Metric for Hemodialysis Facilities

Abstract

BACKGROUND: Antimicrobial use is the most important modifiable risk factor for antimicrobial resistance. Roughly 50% of all antibiotics prescribed in the outpatient setting are inappropriate. This estimate excludes hemodialysis facilities (HDFs), where little is known about prescribing patterns. We measured the incidence of intravenous antimicrobial starts (IVASs) in Philadelphia HDFs and estimated the burden of inappropriate prescribing using a newly devised metric.

METHODS: All HDFs in Philadelphia report dialysis-related clinical events [IVASs, positive blood cultures (PBCs), and/or suspect infections (pus, redness, or increased swelling at the vascular access site)] into the National Healthcare Safety Network (NHSN). All prescribing data were from NHSN. An inappropriate IVAS was defined as one that was initiated in the HDF and reported without all of the following: a PBC, a blood sample collected for culture, and a suspect infection. Rates were calculated from January 2018-June 2018 and were stratified by access type. Pooled mean rates (PMRs) were calculated as the total count of an event over the number of patient-months reported.

RESULTS: Over the six-month study period, 483 IVASs (PMR=2.30 per 100 patient-months) occurred in Philadelphia HDFs (n=54). Of these, 303 (62.73%) were categorized as outpatient starts, as opposed to a continued inpatient course. Of the new outpatient starts, 171 (56.44%) were categorized as inappropriate (PMR=0.82 per 100 patient-months). Of the inappropriate starts, 71.35% involved vancomycin and 70.76% occurred without at least one reported symptom (cellulitis, chills/rigors, drop in blood pressure, and/or fever). The PMRs of inappropriate IVASs started in HDFs in patients with a central line compared to those with a fistula or graft were 2.04 and 0.57 per 100 patient-months, respectively ($p<0.0001$).

CONCLUSIONS: We estimate that more than half of all IVASs in Philadelphia HDFs occurred without an apparent indication; these likely represent opportunities to reduce inappropriate antimicrobial use. These findings show a need for promoting antimicrobial stewardship among HDFs. This new metric can allow HDFs and public health agencies to track and understand inappropriate prescribing, which can lead to targeted prevention efforts in high burden facilities or jurisdictions. This metric can also serve as a measure for longitudinally assessing the effectiveness of stewardship interventions. Secondary results showed a significantly higher rate of inappropriate IVASs in central line patients. In addition to reducing bloodstream infection rates, limiting the use of central lines may also reduce the rate of inappropriate antimicrobial prescribing in the hemodialysis setting.

Submission Complete?	Yes
Committee	Infectious Disease
Topic	Antimicrobial Resistance
Keywords	Outcome Measures; Epidemiology; Antimicrobial Resistance
Consider for Different Presentation?	Yes
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Submission Type ID	Breakout/Quick/Lightning/Poster
Abstract Type	Breakout
Abstract Title	Surveillance of Hospital Antimicrobial Use and Antimicrobial Stewardship Programs Via the National Healthcare Safety Network (NHSN): A State and National Progress Report

Abstract

BACKGROUND: The Centers for Disease Control and Prevention's (CDC's) National Healthcare Safety Network (NHSN) launched antimicrobial use (AU) surveillance in 2012 and added questions about antimicrobial stewardship program (ASP) status to the NHSN annual healthcare facility survey in 2014. State health departments, including Tennessee's and Oregon's, are spurring hospital participation in AU surveillance and are using AU data submitted to NHSN for analysis and action. The presenters in this session will provide a progress report on programmatic efforts underway at the state and national levels to expand and enhance AU surveillance and measure and motivate ASP activities.

METHODS: Descriptive statistical analyses of NHSN data provide up-to-date snapshots of AU surveillance coverage at the state and national levels, the extent of hospital variation in AU rates, and recent growth of hospital ASPs. The Tennessee Department of Health's (DOH's) use of AU data reported from hospitals throughout the State enable analysis of geographic variation. The Oregon Health Authority (OHA) has garnered practical insights into expanding AU surveillance coverage through its efforts to spur AU participation in hospitals. NHSN's newly updated AU summary measure—the Standardized Antimicrobial Administration Ratio (SAAR) —is reviewed and AU analytic features available to NHSN users in state, territorial, and local health departments are highlighted.

RESULTS: As of December 1, 2018, 1155 hospitals have submitted at least one month of AU data to NHSN, and in 2017 the percentage of hospitals reporting ASPs that include all core programmatic elements reached a new high of 76.4%. The Tennessee DOH's statewide analysis for all antimicrobials showed significant regional rate variation, with the highest rate in northeast Tennessee hospitals: 710 days of therapy/1,000 days present in 2017. Through AU onboarding efforts, OHA strengthened partnerships with ASPs and academic stakeholders and developed an antimicrobial stewardship collaborative. In late 2018, NHSN introduced a second iteration of the SAAR, enabling targeted analysis of an expanded set of antimicrobial categories across additional patient care locations and providing a new resource for public health and clinical professionals who seek to curb antimicrobial overuse.

CONCLUSIONS: New methods for measuring AU, substantial growth in AU surveillance coverage, and innovative analyses of AU data are important steps. Additional advances by public health programs at all geographic levels, accompanied by cross-jurisdictional knowledge transfers and extension of ASPs, including to healthcare settings beyond hospitals, can enable more rapid progress against the dual threats of indiscriminant AU and the spread of resistant pathogens.

Submission Complete?	Yes
Committee	Infectious Disease
Topic	Antimicrobial Resistance
Keywords	Antimicrobial Resistance; Infectious Diseases; Surveillance
Consider for Different Presentation?	Yes
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Submission Type ID	Breakout/Quick/Lightning/Poster
Abstract Type	Lightning
Abstract Title	An Epidemiologic Response to an Area of High Carbapenemase-Producing Carbapenem-Resistant Enterobacteriaceae Prevalence in Indiana

Abstract

BACKGROUND: Carbapenem-resistant *Enterobacteriaceae* (CRE) are an emerging antibiotic resistant threat, largely due to the emergence of carbapenemase-producing CRE (CP-CRE). In December 2015, the Indiana State Department of Health (ISDH) mandated CP-CRE reporting for both isolates and condition, allowing the ISDH to identify CP-CRE statewide. Through this surveillance, the ISDH identified a high prevalence of CP-CRE in northwest Indiana, with 43% (N=152/355) in 2016 and 46% (N=135/294) in 2017.

METHODS: In response to the CP-CRE burden, the ISDH refocused efforts to prioritize northwest Indiana long-term care facilities (LTCFs) for intervention. At the time of initial response, 51 LTCFs were located in the area. Response activities included site visits to promote education and identification of best practices and opportunities for improvement in all northwest LTCFs regarding infection prevention and CP-CRE transmission. All site visits utilized the Centers for Disease Control and Prevention (CDC) Infection Control Assessment and Response (ICAR) tool. Site visits were followed up with a written report outlining identified best practices and opportunities for improvement.

RESULTS: Site visits were conducted at 43 of the 51 (84%) LTCFs in northwest Indiana. Eight LTCFs declined a site visit. Most facilities reported having policies for implementing transmission-based precautions and having a written surveillance plan for tracking infections occurring within the facility. Improvement opportunities identified included the need for formal infection prevention and annual personal protective equipment (PPE) training, performing bundle measure audits, and increased staff retention.

CONCLUSIONS: Historically, healthcare facilities have viewed the ISDH as only a regulatory agency. This proved challenging for the ISDH team to collaborate with LTCFs. However, through careful communication and explanation of the non-punitive site visit, the ISDH was able to successfully reach nearly all northwestern LTCFs. This response effort allowed the ISDH to provide informational resources such as infection prevention guidance, communicable disease reporting requirements, and health department contact information. Furthermore, this response greatly improved communication channels between the ISDH and LTCFs in northwest Indiana. This communication has proved invaluable for collaboration to decrease healthcare-associated infections in Indiana healthcare facilities.

Submission Complete?	Yes
Committee	Infectious Disease
Topic	Antimicrobial Resistance
Keywords	Healthcare Associated Infections (HAI); Infectious Diseases; Antimicrobial Resistance
Consider for Different Presentation?	Yes
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Submission Type	Breakout/Quick/Lightning/Poster
ID	11378
Abstract Type	Lightning
Abstract Title	Infection Control Assessment of Long-Term Acute Care Facilities (LTACs)/Skilled Rehabilitation Facilities (SRFs) in Massachusetts: Building Capacity to Contain Antibiotic Resistant Pathogens

Abstract

BACKGROUND: Emergence of carbapenem-resistant *Enterobacteriaceae* as well as *Candida auris* represents substantial infection threats. Transmission of these and other multi-drug resistant organisms (MDROs) in healthcare settings is of concern as an increasing number of facility-based outbreaks are identified. Many outbreaks occur in LTACs where advanced, post-acute care is provided to patients with extensive prior exposure to healthcare and antibiotics, known risk factors for MDRO acquisition. To assess and support infrastructure to contain MDROs in LTACs, the Massachusetts Department of Public Health (MDPH) received funding from CSTE to partner with JSI Research and Training Institute, Inc. (JSI) in conducting infection control assessments at LTACs/SRFs. Previous MDPH assessments have targeted dialysis and long-term care facilities.

METHODS: MDPH recruited nine licensed LTACs/SRFs to participate in Infection Control and Response (ICAR) assessments. The standard CDC acute care hospital ICAR tool was utilized for these settings to conduct day-long, on-site assessments, including direct observation of practices. This tool assessed three domains: Infection Control Program and Infrastructure; Infection Control Training, Competency, and Implementation of Policies and Practices; and Systems to Detect, Prevent, and Respond to Healthcare-Associated Infections and MDROs. A debriefing was held with facility leadership to review findings and an infection control resource toolkit was provided. A facility-specific report summarized findings, highlighting areas for improvement and providing resources specific to the gaps identified. Findings from all ICAR assessments were analyzed and synthesized into a single comprehensive report and needs assessment to share with stakeholders and facilities.

RESULTS: ICAR assessments indicated that 100% of facilities achieved best practices in several key activities including: providing infection prevention information to families/visitors; performing hand hygiene audits with feedback; preferential promotion of alcohol-based hand rub; and having systems for inter- and intra-facility communication of patient infectious disease status. Activities for which *fewer than* 50% of facilities achieved best practices included: performing audits and feedback on urinary and central venous catheter insertion; competency-based trainings for proper use of PPE, ventilator adverse event prevention, injection safety and environmental cleaning; having policies for cleaning non-critical equipment; and having systems to detect infectious patients at the point of entry.

CONCLUSIONS: LTAC/SRF ICAR assessments identified key infection control gaps and provided opportunities for immediate feedback and corrective recommendations. A comprehensive needs assessment has also provided clear objectives for ongoing support from MDPH and other stakeholders for infection control to contain MDROs.

Submission Complete?	Yes
Committee	Infectious Disease
Topic	Antimicrobial Resistance
Keywords	Antimicrobial Resistance; Infection Control; Prevention
Consider for Different Presentation?	Yes
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Submission Type	Breakout/Quick/Lightning/Poster
ID	11732
Abstract Type	Poster
Abstract Title	Carbapenem-Resistant <i>Enterobacteriaceae</i> Surveillance, Wisconsin, 2010–2018

Abstract

BACKGROUND: Carbapenemase-producing carbapenem-resistant *Enterobacteriaceae* (CP-CRE) are emerging in the United States as important healthcare-associated pathogens. Carbapenemases, which include KPC, NDM, OXA, VIM, and IMP, are plasmid-encoded enzymes that can mediate resistance to penicillins, cephalosporins, monobactams, and carbapenems. Infections with these organisms are associated with high morbidity and mortality and represent both a clinical and public health challenge. To better characterize and prevent transmission of CP-CRE, during August 1, 2010 the Wisconsin State Laboratory of Hygiene (WSLH) began to request and conduct molecular testing on isolate submission of carbapenem non-susceptible *Enterobacteriaceae*.

METHODS: Demographic data is included for clinical isolates submitted to WSLH. PCR for KPC carbapenemase has been performed on carbapenem non-susceptible *Enterobacteriaceae* isolates since 2010. PCR tests for NDM (2013), OXA (2014), VIM (2017) and IMP (2018) have been added to the testing algorithm. Beginning in July 2017 all isolates were screened for the presence of any carbapenemases using the modified carbapenemase inactivation method (mCIM). mCIM-positive isolates were then tested by PCR. Speciation was confirmed by MALDI-TOF, antimicrobial susceptibility testing (AST) was performed using broth microdilution, and pulsed-field gel electrophoresis (PFGE) was performed on CP-CRE isolates.

RESULTS: From August 1, 2010 to November 30, 2018, clinical laboratories in Wisconsin submitted a total of 2912 isolates from 2309 unique patients. Patients ranged in age from 0 to 103, with a median age of 69; 59% of patients were female. Patients were residents of 62 of 72 counties (86%) with a plurality of the patients (36%) residing in the southeastern region of the state. Among the 2912 isolates, 432 (15%) tested positive for a carbapenemase (393 for KPC, 18 for NDM, 12 for OXA, and 9 for IMP); 253 were *Klebsiella* spp., 62 were *Enterobacter* spp., 59 were *Escherichia coli*, and 48 were other *Enterobacteriaceae* species; 406 (94%) were tested using PFGE. Among the 1033 isolates with AST performed, 466 (45%) were found to be resistant to at least one carbapenem. A total of 22 potential clusters were identified by PFGE, with resultant epidemiologic investigations by the Wisconsin Division of Public Health, and infection prevention education to staff members at the involved hospitals.

CONCLUSIONS: Enhanced CRE surveillance in Wisconsin has provided comprehensive data on CRE and CP-CRE in the state. Future analysis includes review of differences between patient characteristics among the different carbapenemases, in particular IMP, which has largely been found in patients from more rural counties.

Submission Complete?	Yes
Committee	Infectious Disease
Topic	Antimicrobial Resistance
Keywords	Surveillance; Antimicrobial Resistance; Healthcare Associated Infections (HAI)
Consider for Different Presentation?	Yes
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Submission Type	Breakout/Quick/Lightning/Poster
ID	11347
Abstract Type	Poster
Abstract Title	Clinician Perceptions and Experiences with Antibiotic Prescribing for Acute Respiratory Infections before and after an Outpatient Antimicrobial Stewardship Campaign

Abstract

BACKGROUND: More than 50% of antibiotic prescriptions for acute respiratory infections (ARI) in primary care clinics (PCC) are inappropriate which contributes to the development of antimicrobial resistance. Factors influencing inappropriate prescribing include patient pressure, clinician perceptions of decreased patient satisfaction, and visit time constraints. Nebraska Medicine partnered with Nebraska Antimicrobial Stewardship Assessment and Promotion Program (NE ASAP), an initiative funded by Nebraska DHHS through a CDC grant, in an antimicrobial stewardship campaign (ASC) to reduce antibiotic prescribing for ARI in PCC. Clinician perceptions on antibiotic prescribing were evaluated pre- and post-ASC.

METHODS: The ASC was implemented in 10 PCC in Winter 2018. Five clinics received clinician-directed interventions (ARI educational videos, management pocket cards and posters) with the remaining 5 received both clinician- and patient-directed (empowerment posters, Be Antibiotic Aware pledge card) interventions. Clinicians (N=164) in all 10 PCC received anonymous web-based surveys before and after ASC. Self-reported responses were captured using Likert scale. The survey was opened for 3 weeks, with reminders sent weekly. Statistical analyses used Fisher's exact test.

RESULTS: Survey response rate was higher pre- vs. post-ASC periods (54.3% vs. 31.1%, $p < 0.01$). Most respondents cared for both children and adults (69.2%) with 50% in practice >5 years. One-third of clinicians in both periods (32.6% pre- and 31.4% post-ASC) reported experiencing frequent patient requests for antibiotics. Many clinicians (44.9% pre- and 47.1% post-ASC) felt moderate to extreme pressure from patients to prescribe antibiotics. Some (11.8%) clinicians perceived a change in prescribing pressure post-ASC. When patients requested antibiotics for ARI, 39.3% of clinicians reported prescribing antibiotics occasionally or often before, decreasing to 23.5% after ASC ($p = 0.06$). Majority of clinicians reported success in both periods in convincing patients that antibiotics were unnecessary (78.7% pre- and 80.4% post-ASC). When asked whether they will prescribe antibiotics for ARI upon patient request in the next 6 months, over two-thirds in both periods reported they would not (77.5% vs 66.7%, $p = 0.17$). While 45.1% of clinicians thought ASC materials facilitated meaningful discussion with patients, only 15.7% changed prescribing practices. More than half of survey responders (54.9%) agreed or strongly agreed ASC was useful and should continue.

CONCLUSIONS: Clinicians in PCC frequently experience patient pressure to prescribe antibiotics for ARI. Implementation of ASC was associated with a reduction in self-reported antibiotic prescribing. State health departments can play a vital role in supporting outpatient antimicrobial stewardship efforts by educating the public never to pressure clinicians to prescribe antibiotics.

Submission Complete?	Yes
Committee	Infectious Disease
Topic	Antimicrobial Resistance
Keywords	Antimicrobial Resistance; Health Care
Consider for Different Presentation?	Yes
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Submission Type	Breakout/Quick/Lightning/Poster
ID	10823
Abstract Type	Poster
Abstract Title	Resistance to Antifungals in <i>Candida Glabrata</i> Isolates in the Southeast Region

Abstract

BACKGROUND: *Candida* spp. are the leading cause of central line-associated bloodstream infections (CLABSI) in adult and pediatric wards and ICUs in Tennessee. *C. glabrata* causes approximately one-third of all candidemia, and this proportion has increased over time. This species is commonly resistant to antifungal medications, leading to treatment challenges and increased morbidity and mortality. Primarily due to high rates of fluconazole resistance in *C. glabrata* (10% in recent Emerging Infections Program [EIP] surveillance), recommended initial therapy for candidemia recently changed from fluconazole to echinocandins. However, the proportion of *C. glabrata* isolates nonsusceptible (NS) to echinocandins is increasing, with 6.0% of isolates NS (4.6% resistant and 1.4% intermediate) in EIP surveillance. In 2016, the Antibiotic Resistance Laboratory Network (ARLN) was created to monitor for resistance threats, including in *Candida*. The Tennessee State Public Health Laboratory serves as the Southeast ARLN laboratory for six states and Puerto Rico and performs confirmatory identification and susceptibility testing of *Candida* isolates from sentinel laboratories. We describe the proportion of resistance in *C. glabrata* isolates sent to the Southeast ARLN since 2017.

METHODS: *C. glabrata* isolates submitted to the Southeast ARLN from Alabama (n=6), Florida (n=1), Georgia (n=4), Mississippi (n=4), and Tennessee (n=53) sentinel laboratories were included for analysis. Species identification was confirmed by Bruker Biotyper matrix assisted laser desorption-ionization time of flight (MALDI-TOF). Antimicrobial susceptibility testing (AST) was performed using TREK frozen broth microdilution panels. Data were extracted from the laboratory information management system. Analyses were conducted using SAS v9.4.

RESULTS: During April 2017–November 2018, the Southeast ARLN performed AST on 68 *C. glabrata* isolates, all from U.S. residents. Of the 68 isolates, 12 (18%) were resistant to fluconazole and 5 (7%) were NS (2% [n=1] intermediate, 6% [n=4] resistant) to at least one echinocandin. One isolate was echinocandin NS and resistant to fluconazole. The predominant specimen source was blood (n=41, 60%), followed by urine at 13% (n=9). When restricted to bloodstream isolates, 9 of 41 (22%) were resistant to fluconazole, 1 of 41 (2%) was intermediate to echinocandins, and 1 of 41 (2%) was both echinocandin and fluconazole resistant.

CONCLUSIONS: Although the sample size was small and not necessarily representative, the proportion of isolates resistant to fluconazole was higher than expected, particularly in bloodstream isolates. Characterizing *C. glabrata* isolates submitted to the Southeast ARLN informs both regional resistance patterns and clinical decision-making, and should allow for monitoring of dynamic resistance profiles.

Submission Complete?	Yes
Committee	Infectious Disease
Topic	Antimicrobial Resistance
Keywords	Antimicrobial Resistance; Surveillance; Healthcare Associated Infections (HAI)
Consider for Different Presentation?	Yes
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Submission Type	Breakout/Quick/Lightning/Poster
ID	10891
Abstract Type	Poster
Abstract Title	Understanding the Needs of Antibiotic Stewardship Program Leaders: A Survey of Statewide Antibiotic Stewardship Summit Attendees

Abstract

BACKGROUND: Antibiotic resistance (AR) is a serious threat to public health and antibiotic stewardship (AS) is the most important action to combat AR. We studied the needs of AS program leaders to inform public health AS efforts.

METHODS: Nebraska Antimicrobial Stewardship Subcommittee and Nebraska Antimicrobial Stewardship Assessment and Promotion Program (ASAP), funded by the Nebraska Department of Health and Human Services Healthcare-Associated Infections Program through a CDC grant, developed a 13-question survey. The anonymous survey was conducted with all attendees during the inaugural statewide AS summit held in June 2018. The survey instrument included questions on demographics, identified areas of antibiotic misuse, barriers to AS implementation, and expectations for infrastructure and educational assistance from the health department. Results were summarized using descriptive statistics.

RESULTS: Of 264 attendees, 153 (58%) responded to the survey. Most respondents (54%) worked primarily in long-term care, followed by acute care hospitals (42%) and outpatient (11%) settings. Respondents included pharmacists (37%), infection preventionists (20%), nursing leaders (15%), nurses actively involved in patient care (15%) and prescribers (11%). An overwhelming majority (85%) have been in healthcare for >5 years with 43% having >20-year tenure. Top areas of antibiotic misuse identified by the respondents included asymptomatic bacteriuria (63%), inappropriate diagnostic testing (54%), unnecessary broad spectrum antibiotic use (43%), guideline-discordant antibiotic use for upper respiratory tract infections or chronic obstructive pulmonary disease (42%), and excessive duration of antibiotics (41%). The top three reported barriers of AS program implementation included lack of prescriber buy-in (41%), limited resources or competing priorities (40%), and deficiencies in knowledge (30%). The most requested support from the state health department included educational webinars for healthcare workers (51%), public education (47%), provision of local antibiotic use and resistance (AUR) data (37%) and benchmarking of statewide AUR (36%). The top three educational topics requested were infection management (48%), AS implementation (19%) and AS related laboratory and microbiology concepts (15%). Although most (87%) respondents reported having at least one social media account, the more preferred methods of receiving AS related updates included emails (81%), in-person conferences (60%) and webinars (59%). Social media and/or online videos were chosen as a preferred method by 30% of respondents.

CONCLUSIONS: Healthcare professionals expect state health departments to support development of AS programs in healthcare facilities by providing AS resources and disseminating AS education. Educational efforts should be multimodal, targeting both healthcare workers and the public.

Submission Complete?	Yes
Committee	Infectious Disease
Topic	Antimicrobial Resistance
Keywords	Antimicrobial Resistance; Infectious Diseases
Consider for Different Presentation?	Yes
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Submission Type	Breakout/Quick/Lightning/Poster
ID	11684
Abstract Type	Quick
Abstract Title	An Outbreak of Oxa-23 Carbapenem-Resistant <i>Acinetobacter Baumannii</i> (CRAB) in a Connecticut Acute Care Hospital

Abstract

BACKGROUND: *Acinetobacter baumannii* is known to efficiently contaminate the healthcare environment and lead to outbreaks of healthcare-associated infections. Carbapenem-resistant *Acinetobacter baumannii* (CRAB) is reportable in Connecticut (CT); characterization of these isolates is conducted by the CT State Public Health Laboratory (SPHL) and the Antibiotic Resistance Laboratory Network (ARLN) regional laboratory.

METHODS: In July 2018, the Connecticut Healthcare Associated Infections/ Antimicrobial Resistance (HAI/AR) Program of the CT Department of Public Health (DPH) received notification from the Northeast ARLN regional laboratory at Wadsworth Center that a patient in Connecticut had tested positive for the carbapenemase gene, Oxa-23, in an *Acinetobacter baumannii* blood isolate collected from a patient at an acute care hospital. The HAI/AR Program reached out to the infection prevention team at the acute care hospital to provide technical assistance in the interpretation of test results and the implementation of an investigation and control strategy. The hospital infection control team worked to identify potential sources of the infections and to implement recommendations for outbreak control. Staff from the HAI/AR Program travelled to the facility to provide CRAB education to staff and to provide on-site technical assistance regarding the implementation of infection control guidance.

RESULTS: Working closely with DPH, the acute care hospital identified 9 patients with CRAB isolates carrying the Oxa-23 gene collected over an eight-week period, representing an outbreak of CRAB at the facility. The majority (6/9, 67%) of cases were identified with isolation of the organism from a respiratory site. Unreported construction within an area used for the cleaning and storage of ventilator equipment for affected units was identified.

CONCLUSIONS: This outbreak investigation illustrates the complex nature of outbreaks of emerging antimicrobial-resistant organisms, including the need for targeted education of medical, infection control, laboratory, and pharmacy staff. The ability to identify clusters of antimicrobial-resistant organisms may be impacted by the specimen sources included in routine surveillance. Investigations of antimicrobial-resistant organisms should also account for both potential points of organism acquisition and onset of infection. Outbreaks of Oxa-23 CRAB present specific challenges, as this carbapenemase gene is not identified by commercial systems typically used for the characterization of clinical isolates and/or colonization screening.

Submission Complete?	Yes
Committee	Infectious Disease
Topic	Antimicrobial Resistance
Keywords	Healthcare Associated Infections (HAI); Infection Control; Antimicrobial Resistance
Consider for Different Presentation?	Yes
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Submission Type ID	Breakout/Quick/Lightning/Poster
Abstract Type	Quick
Abstract Title	Carbapenem Resistant Enterobacteriaceae Infections in New Hampshire

Abstract

BACKGROUND: Carbapenem-Resistant *Enterobacteriaceae* (CRE) are a family of bacteria that are difficult to treat due to high levels of antibiotic resistance. The New Hampshire (NH) communicable disease rules require facilities, laboratories, and providers to identify, and report CRE to the NH Division of Public Health Services (DPHS) within 72 hours of diagnosis or suspicion of diagnosis.

METHODS: A confirmed CRE case was defined as a NH resident or patient with an *Enterobacteriaceae* isolate recovered from a culture that tested resistant to one of the following carbapenems: imipenem, meropenem, doripenem or ertapenem and/or demonstrated production of a carbapenem inactivation enzyme (2012 CDC CRE definition). However, organisms intrinsically resistant to imipenem, were required to be resistant to a carbapenem other than imipenem to be considered a case. Twelve months are required to elapse between positive culture results with the same organism from the same person for an individual to be considered a new case. DPHS requested that all CRE isolates be sent to the Public Health Lab (PHL) for further cascade testing which included identification confirmation, select antibiotic susceptibility testing, phenotypic as well as carbapenemase genetic testing for common CP-CRE mechanisms of resistance.

RESULTS: In 2017, the NH Healthcare-Associated Infections Program identified 52 confirmed CRE cases. The majority of isolates were resistant to ertapenem only (54%), isolated from urine specimens (75%), and obtained from an outpatient setting (54%). Additionally, 42% had documented inpatient and 43% had outpatient healthcare exposure in the six months prior to the isolation of a CRE organism. The PHL identified 3 carbapenemase producing CRE (CP-CRE) among 50 tested by the Public Health. All 3 harbored the KPC plasmid; 2 were *Klebsiella oxytoca* while 1 was *Enterobacter cloacae*.

CONCLUSIONS: While the relatively high percentage of patients identified as having CRE isolated from a culture had healthcare exposure aligns with the results of recent research indicating the main risk factor for CRE acquisition is healthcare exposure, further exploration of this correlation is needed overall[1]. However, these data have implications for important infection prevention activities for the state of NH as well as for surrounding states. NH is one of the few states collecting data on CP-CRE and Non-CP-CRE cases. The low incidence of CRE, especially CP-CRE, has allowed NH a more aggressive containment approach to prevent the further emergence of CRE.
[1] <https://www.cdc.gov/hai/organisms/cre/cre-clinicianfaq.html>

Submission Complete?	Yes
Committee	Infectious Disease
Topic	Antimicrobial Resistance
Keywords	Healthcare Associated Infections (HAI); Surveillance; Antimicrobial Resistance
Consider for Different Presentation?	Yes
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Submission Type	Breakout/Quick/Lightning/Poster
ID	11302
Abstract Type	Quick
Abstract Title	Cumulative Regional and Statewide Antibigram Using Whonet and National Healthcare Safety Network (NHSN) Antimicrobial Resistance (AR) Module Data

Abstract

BACKGROUND: Cumulative antibiograms inform empiric antibiotic therapy. They report proportions of specific organism isolates that are susceptible to antimicrobials tested. The National Healthcare Safety Network (NHSN) Antibiotic Resistance (AR) Option allows facilities to voluntarily report AR data for certain bug-drug combinations. The Tennessee Department of Health (TDH) extracted NHSN data and developed a statewide antibiogram and for Tennessee's eight emergency medical services (EMS) regions.

METHODS: Acute care hospitals across Tennessee submitted data to the NHSN AR Option and conferred rights to TDH. NHSN data was transposed in SAS 9.4 with each row representing all susceptibility results for a single isolate. The final antibiotic interpretation (susceptible, intermediate, or resistant) entered in NHSN was used as the variable to create susceptibility profiles. Isolates without a clear interpretation were excluded. A data library, created using BacLink, was analyzed using WHONET 5.6. Antibiogram specimens were stratified by type and location of collection (wards, critical care units, and emergency departments [ED]).

RESULTS: During February 2017–November 2018, twenty-one hospitals from four EMS regions submitted data to NHSN for a total of 48,917 isolates. Of submitting hospitals, eleven were from the Northeast region, four from the Middle region, and three from the Southeast and South Central regions. Thirty organisms were reported: 22 gram-negative rods, six gram-positive cocci, and two candida species. Forty antibiotics were tested in urine, blood, and respiratory samples. 70% of isolates were collected from the ED, 14% from inpatient wards, 9% from critical care units and the remaining 6% from various units. Urinary *E. coli* isolates from EDs were more likely to be ciprofloxacin susceptible (73.8%) than those from inpatient units (63.4%). 83.9% of Northeast TN *E. coli* isolates were ciprofloxacin susceptible vs. 70.5% in Middle TN. Northeast TN had the highest percentage imipenem susceptible *Enterobacter* spp. (95.2%) vs. Middle TN (90.8%). For *Klebsiella* spp., Middle TN had the most imipenem susceptible isolates (99.4%) vs. Northeast TN (98%).

CONCLUSIONS: Regional cumulative antibiograms vary significantly. This suggests that in Tennessee, regional antibiograms may provide better data than statewide antibiograms to guide empiric therapy. At present, antibiotic resistance data submitted voluntarily to NHSN allows TDH to develop regional antibiograms that represent half of the EMS regions in Tennessee. Additional outreach and recruitment from facilities in non-reporting EMS regions is needed.

Submission Complete?	Yes
Committee	Infectious Disease
Topic	Antimicrobial Resistance
Keywords	Surveillance; Healthcare Associated Infections (HAI); Antimicrobial Resistance
Consider for Different Presentation?	Yes
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Submission Type	Breakout/Quick/Lightning/Poster
ID	11030
Abstract Type	Quick
Abstract Title	Epidemiology of Methicillin Resistant Staphylococcus Aureus (MRSA) Blood Stream Infections (BSI) in Acute Care Hospitals in Tennessee, 2011–2017

Abstract

BACKGROUND: Acute care hospitals in Tennessee have reported MRSA BSIs from inpatient areas and emergency departments (ED) to CDC’s National Healthcare Safety Network (NHSN) since July 2010. We describe trends in community onset (CO) and health-care onset (HO) MRSA BSI across the state.

METHODS: We assessed the burden of MRSA BSIs at 117 acute care hospitals between 2011 and 2017. NHSN definitions were used to classify events as HO or CO based on specimen collection day. CO BSIs were further stratified by location on specimen collection date (ED and inpatient [IP]). Accounting for 2015 NHSN protocol changes, individuals with same day cultures in ED and IP locations were classified as a single CO-ED event. BSI counts and proportions were calculated per year by each onset group for all emergency medical service regions as well as the state. Prevalence and incidence rates were defined as follows. HO incidence: number of HO BSIs per 10,000 patient-days, CO-IP prevalence: number of CO-IP BSIs per 10,000 admissions, and CO-ED prevalence: number of CO-ED BSIs per 10,000 encounters.

RESULTS: Between 2011 and 2017, all MRSA BSIs increased 33% from 2,271 to 3,031 cases per year. In 2011, the HO, CO-IP, and CO-ED groups accounted for 19.4%, 41.7%, and 38.9% of events, respectively. In 2017, HO, CO-IP, and CO-ED groups represented 9.6%, 27.4%, and 63.0% of MRSA BSIs, respectively. HO incidence decreased from 1.2 to 0.8 BSIs/10,000 patient-days from 2011 to 2015 and remained stable until 2017. In contrast, the CO-ED prevalence maintained an average of 3.2 BSIs/10,000 encounters until 2015, after which it increased by 69% to 5.4 BSIs/10,000 encounters in 2017. All regions except West Tennessee saw increases in CO-ED prevalence. East Tennessee had the highest prevalence of 8.9 BSIs/10,000 encounters in 2017, a 186% rise from 4.9 BSIs/10,000 encounters in 2011. CO-ED BSIs increased in all adult age and gender groups from 2011–2017. The proportion of all CO-ED BSIs attributable to women aged 18 to 34 increased from 4.5% in 2011 to 9.5% in 2017, making it the demographic with the largest increase.

CONCLUSIONS: HO MRSA BSIs in Tennessee have decreased since 2011. Despite this success, this analysis highlights the alarming rise of CO-ED MRSA BSIs. The regional and demographic differences observed, as well as results of data not described here, lead us to hypothesize that the increases in CO-ED MRSA BSIs may be associated with increasing injection drug use in Tennessee.

Submission Complete?	Yes
Committee	Infectious Disease
Topic	Antimicrobial Resistance
Keywords	Surveillance; Antimicrobial Resistance; Substance Abuse
Consider for Different Presentation?	Yes
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Submission Type	Breakout/Quick/Lightning/Poster
ID	11546
Abstract Type	Quick
Abstract Title	Outbreak of <i>Acinetobacter Baumannii</i> with Rare Carbapenemase OXA-72 in an Intensive Care Unit and Associated Long-Term Care Facilities, Wisconsin 2018

Abstract

BACKGROUND: During October 2018, the Wisconsin Division of Public Health (WDPH) was notified of a cluster of carbapenem-resistant *Acinetobacter baumannii* (CRAB) with identical resistance patterns on antimicrobial susceptibility testing (AST) in three patients admitted to intensive care units in one facility (facility A) in southeastern Wisconsin. In the United States, approximately half of *Acinetobacter* organisms are nonsusceptible to carbapenems. Carbapenem resistance mediated through plasmid-encoded carbapenemases contributes to transmissibility and spread of clinically important resistance. However, detecting plasmid-encoded resistance can be challenging.

METHODS: Additional cases were identified through the Wisconsin Clinical Laboratory Network. The three major clinical laboratories in southeastern Wisconsin were asked to provide information, including AST, on all CRAB isolate submissions from January 1 to October 31, 2018. For patients with available CRAB isolates, information on healthcare exposures was collected. Available isolates were submitted to Wisconsin State Laboratory of Hygiene (WSLH). AST was performed using broth microdilution. Isolates resistant to amikacin, aztreonam, ceftriaxone, gentamicin, levofloxacin, meropenem, piperacillin-tazobactam, tobramycin, and susceptible to polymyxin-B underwent Illumina whole-genome sequencing (WGS) at WSLH to determine their relatedness. Isolates that were closely related were analyzed using the MinION to obtain long read sequences for more comprehensive sequencing data, including plasmid identification.

RESULTS: During 2018, the three clinical laboratories reported 34 CRAB out of 73 *Acinetobacter baumannii* isolates. Twelve CRAB isolates were available for further analysis at WSLH. Seven isolates with characteristic AST pattern underwent WGS, with five found to be closely related. All five had plasmids that contained OXA-72 and were considered to be part of the same cluster. Among those five, three were further characterized using the MinION. The plasmids were subsequently found to be identical, suggesting that transmission occurred between these patients. Among the five patients with identical plasmids, two of the patients from facility A had been admitted from long-term care facility B, and one patient from an unrelated acute care facility had also been admitted from long-term care facility B. The remaining two patients from facility A had been admitted from home and an unrelated long-term care facility.

CONCLUSIONS: Clinical laboratory networks provide timely data in the investigation of clusters and outbreaks. In CRAB and other organisms with demonstrated resistance to multiple classes of antimicrobials, AST might prioritize resources such as WGS in the detection of plasmid-encoded carbapenemases and investigation of outbreaks. Furthermore, long read WGS might identify plasmids containing carbapenemases when PCR assays do not detect rare carbapenemases.

Submission Complete?	Yes
Committee	Infectious Disease
Topic	Antimicrobial Resistance
Keywords	Healthcare Associated Infections (HAI); Outbreaks; Antimicrobial Resistance
Consider for Different Presentation?	Yes
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Submission Type	Breakout/Quick/Lightning/Poster
ID	10860
Abstract Type	Quick
Abstract Title	Under the Radar: Detecting and Responding to IMP-13 Producing <i>Pseudomonas Aeruginosa</i> in Colorado, 2018

Abstract

BACKGROUND: In 2018, the Colorado Department of Public Health and Environment (CDPHE) identified the first isolate of carbapenemase-producing carbapenem-resistant *Pseudomonas aeruginosa* (CP-CRPA) in Colorado from a patient hospitalized in an intensive care unit (ICU) at an acute care facility. CP-CRPA is uncommon in the U.S.; a rapid response to contain emerging carbapenemases is crucial to halt their spread. We aimed to characterize the extent of transmission through culture-based point prevalence surveys (PPSs) in the ICU and to use whole genome sequencing (WGS) to contextualize the epidemiology of known cases.

METHODS: A six-month retrospective laboratory audit of clinical *P. aeruginosa* isolates non-susceptible to at least one carbapenem (excluding ertapenem) from ICU patients was reviewed to ascertain possible epidemiologically-linked patients. CDPHE and the hospital performed an infection prevention (IP) assessment among current ICU patients with a modified culture-based screening protocol using sputum specimens. Isolates were forwarded to the CDC's regional Antibiotic Resistance Laboratory Network (ARLN) for phenotypic and genotypic mechanism testing; isolates positive by modified carbapenem inactivation method (mCIM) at the ARLN were sequenced with Illumina MiSeq at the CDPHE laboratory. A CDC polymerase chain reaction (PCR) assay was used to identify the Imipenemase metallo-beta-lactamase (IMP) variants not detected by commercial PCR. High quality single nucleotide polymorphism (hqSNP) analysis was performed to determine relatedness.

RESULTS: Four patient isolates were identified from the laboratory review, and one of nineteen patients screened had CRPA identified as part of the PPS. In sum, six isolates were available for mechanism testing including the index patient. The index case and one additional isolate were found to harbor the IMP-13 variant by PCR. These two isolates had one hqSNP difference (1 hqSNP out of 83.1% shared core genome). Both patients resided in the same ICU room, six weeks apart. The remaining isolates were not genetically related (>1600 SNP difference) and did not harbor carbapenemases. The IP assessment identified gaps in hand hygiene, environmental cleaning practices, and equipment storage around room sinks.

CONCLUSIONS: The temporal lag between the two IMP-13 CRPA isolates suggests the presence of undetected colonized intermediates among patients and/or environmental contamination, although the specific mechanism of transmission was not identified. WGS augmented the molecular epidemiology when phenotypic and genotypic tests were unable to determine relatedness based on mechanism alone. Ongoing surveillance of CRPA, isolate testing for carbapenemase identification, and epidemiologic investigation and implementation of containment strategies are critical to preventing the transmission of these emerging organisms.

Submission Complete?	Yes
Committee	Infectious Disease
Topic	Antimicrobial Resistance
Keywords	Epidemiologic Methods; Emerging Infections; Antimicrobial Resistance
Consider for Different Presentation?	Yes
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Submission Type ID	Breakout/Quick/Lightning/Poster
Abstract Type	Quick
Abstract Title	Use of a Real-Time Regional Antibigram to Direct Stewardship and Infection Prevention Improvement Efforts in a Remote Community in Nebraska

Abstract

BACKGROUND: A higher number of CP-CRE (carbapenemase producing carbapenem resistant Enterobacteriaceae) infections were reported from a hospital and a long-term care facility (LTCF) in a remote part of Nebraska (small city/ region B). Since 2017 all isolates of gram negative species that can carry resistance to carbapenems are reportable by laboratories that report via ELR (electronic laboratory reporting.) From these data a statewide and some regional antibiograms were developed. Review of Region B antibiogram revealed concerning resistance patterns. All positive *Clostridioides difficile* lab tests are reportable in NE and Region B had a high rate of *C. difficile* infection. For all of these reasons, a community-wide effort to address antimicrobial resistance and infection prevention (IP) was warranted.

METHODS: Region B antibiogram was examined for resistance of *E.coli* to the fluoroquinolones and of *Klebsiella pneumoniae* to ceftriaxone to assess resistance of gram negative pathogens. For *E.coli* the percentage of isolates statewide in 2017 resistant to levofloxacin was 20%, for region B, 28%. For *K.pneumoniae*, resistance to ceftriaxone was 4% overall, 7% in Region B. The hospital and one LTCF had begun participation in ICAP (Nebraska Infection Control Assessment and Promotion Program) and ASAP (Nebraska Antimicrobial Stewardship Assessment and Promotion Program). A combined effort by the HAI/AR (Healthcare Associated Infection/Antimicrobial Resistance) program at NDHHS, ICAP and ASAP was made to recruit the hospital's outpatient clinics and the other 3 LTCFs in city B via educational presentations including the antibiogram resistance data, discussions with CEOs, Medical Directors, Directors of Nursing, Administrators and IPs.

RESULTS: The additional 3 LTCFs and 5 outpatient specialty clinics agreed to ICAP assessments and 3 out of the 4 LTCFs to the ASAP remote coaching program. Over 4 days, the HAI/AR team, ICAP and ASAP met with each facilities' leaders and relevant staff to assess and recommend solutions to challenges in IP and antimicrobial stewardship. Among gaps noted were some that might lead to transmission of resistant pathogens in LTCFs and gaps in disinfection and sterilization in one outpatient clinic. Most LTCFs had not begun antimicrobial stewardship. Many strengths and a community dedication to patient safety were noted.

CONCLUSIONS: Regional antibiograms provide epidemiologic data to direct public health efforts to contain the spread of resistance and promote stewardship to stem further development of resistance. Having data facilitated the establishment of relationships with facility leadership, prescribers, and frontline staff, and increased receptivity to infection-control tools and recommendations for improvement.

Submission Complete?	Yes
Committee Topic	Infectious Disease
Keywords	Antimicrobial Resistance
Consider for Different Presentation?	Healthcare Associated Infections (HAI); Surveillance; Antimicrobial Resistance
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Submission Type	Breakout/Quick/Lightning/Poster
ID	11198
Abstract Type	Quick
Abstract Title	Using Automated Code for Early Identification of Carbapenem-Resistant Enterobacteriaceae (CRE) Clusters

Abstract

BACKGROUND: Carbapenem-resistant Enterobacteriaceae (CRE) are reportable in Tennessee (TN); isolate submission is required. The State Public Health Laboratory (SPHL) performs additional characterization, including carbapenemase-production (CP) and resistance mechanism testing. CRE case investigation and laboratory data are entered into the National Electronic Disease Surveillance System Base System (NBS). Since 2017, additional CP-CRE epidemiological data (*e.g.* , healthcare facility of origin) was collected using REDCap. Containment is time-sensitive and ideally requires real-time and resource-efficient monitoring of surveillance data. We developed an automated code for early identification of clusters.

METHODS: We transformed NBS laboratory and case investigation data so that each line represents a single isolate. This was merged with the CP-CRE REDCap data. Patient addresses from NBS were matched with nursing home addresses to identify nursing home residents. Healthcare facility of origin was identified by prioritization of variables in the following order: healthcare facility of origin (REDCap), ordering facility (NBS), reporting facility (NBS), and nursing home. In addition, we analyzed for potential clusters among nursing home residents, even if the healthcare facility of origin was not a nursing home. Case counts within the last four weeks were aggregated by facility. Alerts were generated if the case(s) met the Council for Outbreak Response: Healthcare-Associated Infections and Antibiotic-Resistant Pathogens (CORHA) threshold for reporting of CRE and CP-CRE cases from facilities to public health. REDCap application programming interface (API) code, SAS macros, and task scheduler were used to automatically capture potential clusters and deliver daily alerts. We applied this automated code to historical CRE surveillance data to gain insights into how frequently alerts were generated.

RESULTS: Between July 1, 2018, and December 31, 2018, the code generated 18 alerts (21 cases). There were six alerts from single cases of non-KPC CP-CRE, two alerts from clusters of KPC- CP-CRE cases in a high prevalence county (2 cases each), one alert from a cluster of 2 CP-CRE from a hospital in a low prevalence county, two alerts from single CRE cases in critical access hospitals (CAH), and seven alerts from nursing home residents (all single cases of CRE). Three CRE cases from nursing home residents were also hospitalized in acute care hospitals. None of the nursing home cases had their isolates submitted to SPHL for characterization. **CONCLUSIONS:** An automated code allows for earlier detection of potential clusters. We will continue to evaluate this method by running this automated cluster detection in real time.

Submission Complete?	Yes
Committee	Infectious Disease
Topic	Antimicrobial Resistance
Keywords	Antimicrobial Resistance; Outbreaks; Surveillance
Consider for Different Presentation?	Yes
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Submission Type ID	Roundtable
Abstract Type	Roundtable
Abstract Title	AR Laboratory Network Experience Exchange: How HAI Programs Are Using the Antibiotic Resistance Laboratory Network to Detect and Protect

Abstract

Key Objectives:

Roundtable participants will discuss the impact the Antibiotic Resistance Laboratory Network (AR Laboratory Network) has had on state and local health departments and share strategies and challenges for using isolate-level antibiotic resistance data to guide public health actions.

Brief Summary:

The AR Laboratory Network consists of 56 state and local public health laboratories, including 7 regional labs. Begun in 2016, this ELC-funded program has increased public health capacities for AR threat detection and response. For state and local labs, testing has focused on detection and characterization of carbapenemase-producing Enterobacteriaceae (CP-CRE) and *Pseudomonas aeruginosa* (CP-CRPA). The isolate testing data has been used to inform rapid containment and prevention activities to halt the spread of these antibiotic resistance threats. As a fairly young program, feedback from stakeholders will help strengthen the program by identifying challenges, solutions, and emerging needs. This roundtable will provide participants with the opportunity to discuss how their jurisdictions have used the AR Laboratory Network and share stories or successes, hurdles, and novel solutions. Topics to be discussed include jurisdiction implementation and utilization of the AR Laboratory Network, protocols for epidemiologic response, procedural tools developed to aid local and state health departments in responding to antibiotic resistant threats, and communication strategies for crucial stakeholders and partners (i.e., hospital administration staff, medical staff, and clinical and commercial laboratories). The goal of this roundtable is to facilitate dialogue among state and local health departments and encourage participants to share their experiences in order to improve epidemiologic responses and strategies across the nation.

Submission Complete?	Yes
Committee Topic	Infectious Disease Antimicrobial Resistance
Keywords	Healthcare Associated Infections (HAI); Antimicrobial Resistance; Evaluation
Consider for Different Presentation?	No
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Submission Type ID	Roundtable
Abstract Type	Roundtable
Abstract Title	Future Proofing Antibiotic Resistance Surveillance

Abstract

Key Objectives:

Roundtable participants will discuss strategies to share and incorporate emerging knowledge and new methods as well as public health actions regarding emerging antibiotic resistant pathogens testing and surveillance at the state and local levels.

Brief Summary:

Antibiotic resistance is one of today's most serious public health threats. To combat this threat, state and local public health departments must conduct surveillance to generate data for action. The Centers for Disease Control and Prevention (CDC) has dedicated funding to establish and maintain the Antibiotic Resistance Laboratory Network (AR Lab Network), which aims to provide stronger detection, faster results to support containment and prevention activities, a more robust antibiotic resistance (AR) Isolate Bank, and more isolate-level data to inform epidemiologic investigations. The enhanced capacities provided by the AR Lab Network have supported more efficient and rapid responses to AR new and emerging threats at the state and local level. Despite these capacities for enhanced detection and response, many public health systems are not built to respond well to emerging threats. Many public health jurisdictions must work with outdated systems when updating communicable disease reporting regulations, sometimes waiting years for reporting rule updates. Given this, healthcare-associated infections and antibiotic resistance (HAI/AR) public health programs must work creatively to "future proof" reporting requirements in an attempt to catch the next big AR threat. This roundtable will provide participants the opportunity to discuss strategies for public health to keep AR surveillance relevant. Topics to be discussed include efforts to transition to a modernized communicable disease reporting rule structure (e.g., "Commissioner's List") and expanding AR surveillance to include antibiotic susceptibility testing for a list of pathogens, rather than for specific drug-bug resistance combinations. The goal of this roundtable is to provide a forum for jurisdictions to discuss successes and challenges in conducting surveillance in an ever-emerging field.

Submission Complete?	Yes
Committee Topic	Infectious Disease
Keywords	Antimicrobial Resistance
Consider for Different Presentation?	Antimicrobial Resistance; Surveillance
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Submission Type ID	Roundtable
Abstract Type	Roundtable
Abstract Title	Local Health Department Experiences in AR Containment in Healthcare and Community Settings

Abstract

Key Objectives:

- Share lessons learned and promising practices from local health departments who are or have recently been engaged in activities to contain the spread of new or emerging drug resistant pathogens;
- Identify strategies for provider and public outreach and education, inter-facility coordination, or healthcare facility assessments that have been successful in advancing local public health's prevention, preparedness, and response efforts for outbreaks of multidrug resistant organisms, as well as related healthcare-associated infection prevention and response activities; and
- Increase participants' understanding of how local health departments are involved in prevention, preparedness, and response efforts for infections that spread across healthcare and community settings.

Brief Summary:

Each year, antimicrobial resistance (AR) causes at least 23,000 deaths across the United States and novel and unusual resistance microbes continue to emerge. Rapid response to these emerging threats is vital to stop their spread and prevent costly, dangerous infections. Local health departments are on the front lines of public health, uniquely positioned to respond to AR. With proper support, local health departments can collect and analyze data to establish trends, target prevention, and identify outbreaks; investigate reportable diseases and unusual resistance; and promote containment strategies. Moreover, coordinated efforts across multiple healthcare facilities has a greater impact on preventing AR than independent, individual facility efforts alone and local health departments are in an ideal position to facilitate this coordination to reduce resistance community-wide. The National Association of County and City Health Officials (NACCHO) is working with local health departments to support response to unusual resistance and improve infection control, preparedness, and response through strengthening local public health organizational and administrative capacity, expertise, and partnerships with key stakeholders. This roundtable session will feature local health departments' experiences and lessons learned while implementing a response to novel drug resistant pathogens, such as Verona Integron Encoded Metallo-Beta-Lactamase producing *Pseudomonas aeruginosa* (VIM CRPA). During the session, participants will share strategies implemented and tools developed, and explore challenges that still remain. This conversation will provide an opportunity for health department representatives and other stakeholders to share useful approaches to strengthen capacity and partnerships for infection prevention, control, preparedness, and response.

Submission Complete?	Yes
Committee Topic	Infectious Disease
Keywords	Antimicrobial Resistance
Consider for Different Presentation?	Healthcare Associated Infections (HAI); Infection Control; Antimicrobial Resistance
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