BACKGROUND

• Regional measures of antibiotic resistance (AR) are needed to monitor trends and inform local public health prevention efforts.
• California hospitals are required to report specific healthcare-associated infections (HAI) to the California Department of Public Health (CDPH) via the National Healthcare Safety Network (NHSN). NHSN HAI reports include pathogen and antibiotic susceptibility information.
• We analyzed NHSN HAI data to assess AR among select bacteria in California hospitals.

METHODS

• California hospitals are required to report central line-associated bloodstream infections (CLABSI) and surgical site infections (SSI) to CDPH via NHSN. Hospitals may electively share catheter-associated urinary tract infection (CAUTI) data with CDPH for AR surveillance.
• We aggregated CLABSI, SSI, and CAUTI data from 2014 and 2015 to measure percent resistance among specific antibiotic-bacteria combinations.
• We mapped percent resistance by county when data for 30 or more isolates were available.
• Analyses were completed with SAS, version 9.4 and ArcMap, version 10.4.

ADDITIONAL FINDINGS

• 342 of 374 (91.4%) hospitals shared CLABSI, SSI and CAUTI pathogen data.
• Among counties with susceptibility data for 30 or more Enterobacteriaceae isolates, 17 (65.4%) reported at least one carbapenem-resistant isolate.

RESULTS

Figure. Percentage of Isolates Resistant to Specific Antibiotics among HAI, California Counties, 2014-2015

Table. Number and Percent of Isolates Tested and Percent of AR Isolates among HAI, California, 2014-2015

Antibiotic, Pathogen | No. (%) Isolates Tested | Percent Resistant (95% CI)
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**Carbapenems**
Acinetobacter spp. | 199 (78.7) | 42.7 (36.0, 49.7)
Enterobacteriaceae | 6,287 (63.2) | 3.5 (3.1, 4.0)
Pseudomonas aeruginosa | 1,804 (73.8) | 15.6 (14.0, 17.4)
**MDR**
Acinetobacter spp. | 246 (97.2) | 43.9 (37.8, 50.2)
E. coli | 5,800 (98.0) | 11.9 (11.1, 12.7)
Enterobacter species | 1,705 (97.6) | 6.3 (5.2, 7.5)
Klebsiella pneumoniae/Oxytoca | 2,336 (98.1) | 13.1 (11.7, 14.5)
Pseudomonas aeruginosa | 2,396 (98.1) | 8.7 (7.6, 9.9)

NOTES. *Isolates tested intermediate or resistant to at least one drug from three or more of the following five categories: cephalosporins, fluoroquinolones, aminoglycosides, carbapenems, piperacillin group; bIsolates tested intermediate or resistant to at least one drug from three or more of the following six categories: cephalosporins, fluoroquinolones, aminoglycosides, carbapenems, piperacillin group, ampicillin/sulbactam.

LIMITATIONS

• Selective susceptibility reporting by laboratories and/or suppression of susceptibility test results contribute to the restricted sample sizes. Selective reporting may also lead to under- or overestimation of isolates’ aggregate percent resistance.
• We excluded data from 32 hospitals that did not share CAUTI data; this included data from 13 (57%) of California’s 23 long-term acute care hospitals.
• Counties with less than 30 isolates reported may still have AR HAI.

DISCUSSION

• We analyzed NHSN pathogen data to identify regions where AR among HAI may be more prevalent.
• NHSN pathogen data provide opportunities to describe multidrug resistant phenotypes that cannot be readily identified using traditional hospital antibiogram data.
• Future analyses will include estimating the incidence of AR HAI at state and regional levels.
• Public health agencies can use this information to engage healthcare facilities in regional, coordinated AR prevention activities and antibiotic stewardship.

The authors have nothing to disclose. Please direct questions and comments to Kyle.Rizzo@cdph.ca.gov.