WHO has identified carbapenem resistant Gram-negative organisms (Acinetobacter baumannii, Pseudomonas aeruginosa, Enterobacteriaceae) as priority 1 (Critical) for research and development of new antibiotics.1 This study estimated the national prevalence of carbapenem non-susceptible (NS) events in the acute care and ambulatory settings based on a large electronic database (Becton, Dickinson and Company) in 2016.

RESULTS

4.4% of isolates (28,569 of 652,346) tested from January 1 to December 31, 2016 were carbapenem NS (Table 1). The majority (73.8%) of carbapenem NS isolates identified were from non-fermenters.

Of the carbapenem NS cases identified, the onset rates varied by setting (Table 1):

- 11.8% (10,907/92,341) during the hospitalization
- 6.3% (5,709/91,265) at admission
- 2.6% (11,953/468,740) for ambulatory

Site of carbapenem NS differs by pathogen (Table 1):

- 41.4% of non-fermenters were from respiratory and 54.7% of them were hospital-onset
- 59.5% of Enterobacteriaceae were from urine and 65.4% of them were ambulatory

Total projected carbapenem NS events in 2016 was 287,915 (Table 1):

- 205,491 (71.4%) were from non-fermenters
- 40,524 (14.2%) were from Enterobacteriaceae
- 22,258 (7.7%) were from fermenters

Southeast regions were higher than others.

Table 1. Estimates of National Projections for Carbapenem NS Gram-negative Events: Q3 2016 - Q4 2016

<table>
<thead>
<tr>
<th>Pathogen</th>
<th>NS Events (n (%))</th>
</tr>
</thead>
<tbody>
<tr>
<td>P. aeruginosa</td>
<td>167,081 (29.6)</td>
</tr>
<tr>
<td>E. coli</td>
<td>95,909 (17.3)</td>
</tr>
<tr>
<td>K. pneumonia</td>
<td>19,879 (3.5)</td>
</tr>
<tr>
<td>A. baumannii</td>
<td>7,729 (1.4)</td>
</tr>
<tr>
<td>M. morganii</td>
<td>7,483 (1.3)</td>
</tr>
</tbody>
</table>

Table 2. Rate of Non-Carbapenem NS Isolates per 100 Admissions for Q4 2016 across 380 Acute Care Facilities in the US

<table>
<thead>
<tr>
<th>Facility Type</th>
<th>NS Rates (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital</td>
<td>1.6</td>
</tr>
<tr>
<td>Ambulatory</td>
<td>1.5</td>
</tr>
</tbody>
</table>

CONCLUSION

- Carbapenem NS pathogens had been identified in both inpatient and outpatient settings.
- Carbapenem NS rates were significantly higher during the hospitalization than at admission or ambulatory settings.
- Non-fermenters, especially P. aeruginosa and S. maltophilia, represented the majority of carbapenem NS cases.
- Respiratory was common site for non-fermenters while urinary was most common site for Enterobacteriaceae.
- Carbapenem NS rates varied by US region.
- Metropolitan areas in South East Region of US were highest.

REFERENCES