Annual Surveillance Summary: Bacterial Infections in the Military Health System (MHS), 2015

The Hospital Associated Infections and Patient Safety Division of the EpiData Center (EDC) performs ongoing, comprehensive surveillance of bacterial infections considered urgent, serious, and concerning threats as recommended by the Centers for Disease Control and Prevention (CDC) within the Military Health System (MHS). This brief summarizes incidence rates (IRs), subpopulation impacts, prescription practices, and antimicrobial resistance for the following infections among MHS beneficiaries for calendar year (CY) 2015:

- *Acinetobacter* species
- *Clostridium difficile*
- *Escherichia coli*
- *Klebsiella* species
- Methicillin-resistant *Staphylococcus aureus* (MRSA)
- *Pseudomonas aeruginosa*
- Vancomycin-resistant Enterococci (VRE)


Summary of Results

The following tables summarize activity identified for the bacterial infections evaluated among MHS beneficiaries in CY 2015 as compared to weighted historic baseline data from CY 2012-2014.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><em>Acinetobacter</em> spp.</td>
<td>5.63</td>
<td>5.08</td>
<td>0.28</td>
<td>↑</td>
<td>10.9</td>
</tr>
<tr>
<td><em>C. difficile</em></td>
<td>20.8</td>
<td>16.1</td>
<td>5.9</td>
<td>↑</td>
<td>29.4</td>
</tr>
<tr>
<td><em>E. coli</em></td>
<td>702.3</td>
<td>592.2</td>
<td>157.4</td>
<td>↑</td>
<td>18.6</td>
</tr>
<tr>
<td><em>Klebsiella</em> spp.</td>
<td>100.8</td>
<td>80.9</td>
<td>22.2</td>
<td>↑</td>
<td>24.6</td>
</tr>
<tr>
<td>MRSA</td>
<td>61.1</td>
<td>68.2</td>
<td>16.0</td>
<td>↓</td>
<td>10.4</td>
</tr>
<tr>
<td><em>P. aeruginosa</em></td>
<td>32.6</td>
<td>28.7</td>
<td>5.2</td>
<td>↑</td>
<td>13.6</td>
</tr>
<tr>
<td>VRE</td>
<td>1.60</td>
<td>1.34</td>
<td>0.32</td>
<td>↑</td>
<td>19.4</td>
</tr>
</tbody>
</table>

Rates are presented as the rate per 100,000 persons per year.

A green arrow indicates an increasing percent change and a blue arrow indicates a decreasing percent change.

Historic IR reflects the weighted average of the three years prior to the analysis year.

This reflects the percent change from the weighted historic IR to the IR of the current analysis year.

Results are presented by two decimal places to account for low incidence rates.

Data Source: NMCMPHC HL7-formatted CHCS microbiology and M2 databases.

Prepared by the EpiData Center Department, Navy and Marine Corps Public Health Center, on 24 March 2017.
Table 2. Infection Impact: Demographics, Resistance, Prescription Practices, and Infection Setting within the MHS, CY 2015

<table>
<thead>
<tr>
<th>Organism</th>
<th>Demographics Most Impacted:</th>
<th>Multidrug-Resistance IR(^a) and Epi Trend</th>
<th>Prescription Practices and Antibiogram:</th>
<th>Proportion of Healthcare- (HA) and Community-Associated (CA) Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Age (in Years)</td>
<td></td>
<td>- Most Frequently Prescribed Drug</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Geographic Region</td>
<td></td>
<td>- Percent Susceptibility</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Beneficiary Type</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Acinetobacter spp.</td>
<td>18-24 OCONUS Active Duty</td>
<td>0.3 ↑</td>
<td>Trimethoprim/sulfamethoxazole 88.2%</td>
<td>HA – 35.0% CA – 65.0%</td>
</tr>
<tr>
<td>C. difficile(^b)</td>
<td>65+ South Family Members</td>
<td>-- --</td>
<td>Metronidazole (Not applicable)</td>
<td>HA – 18.3% CA – 77.5% Indeterminate – 4.2%</td>
</tr>
<tr>
<td>E. coli</td>
<td>18-24 OCONUS Active Duty</td>
<td>126.9 ↑</td>
<td>Nitrofurantoin 97.0%</td>
<td>HA – 15.0% CA – 85.0%</td>
</tr>
<tr>
<td>Klebsiella spp.</td>
<td>No significant age or beneficiary type. West, South, South Atlantic</td>
<td>6.7 ↑</td>
<td>Ciprofloxacin 97.5%</td>
<td>HA – 27.4% CA – 72.6%</td>
</tr>
<tr>
<td>MRSA(^c)</td>
<td>18-24 South Active Duty</td>
<td>15.2 ↑</td>
<td>Trimethoprim/sulfamethoxazole 97.2%</td>
<td>HA – 25.0% CA – 75.0%</td>
</tr>
<tr>
<td>P. aeruginosa</td>
<td>65+ South Retired</td>
<td>1.9 ↑</td>
<td>Ciprofloxacin 87.5%</td>
<td>HA – 47.0% CA – 53.0%</td>
</tr>
<tr>
<td>VRE(^d)</td>
<td>65+ West Retired</td>
<td>-- --</td>
<td>Daptomycin 98.0%</td>
<td>HA – 81.9% CA – 18.1%</td>
</tr>
</tbody>
</table>

A green arrow indicates an increasing percent change and a blue arrow indicates a decreasing percent change.

\(^a\) Multidrug-resistance incidence rate (MDR IR). Rates are presented as the rate per 100,000 persons per year.
\(^b\) MDR IRs were not calculated for C. difficile or VRE infections.
\(^c\) For MRSA only, the MDR IR column depicts the percentage of MRSA infections with inducible clindamycin resistance within the MHS and not the MDR IR.

Data Source: NMCPHC HL7-formatted CHCS microbiology and M2 databases.
Prepared by the EpiData Center Department, Navy and Marine Corps Public Health Center, on 24 March 2017.

Conclusion
Bacterial activity of interest in the MHS in 2015 exhibited expected trends and closely resembled activity in the general United States population as reported by the CDC and other public health agencies. No significant threat to mission readiness or population health was observed, and traditional treatment options remain viable. Continued adherence to infection control practices is recommended in the clinical, occupational, and deployed settings. Please refer to the complete suite of 2015 annual reports for important organism-specific considerations: [http://www.med.navy.mil/sites/nmcphc/epi-data-center/Pages/2015-surveillance-summaries.aspx](http://www.med.navy.mil/sites/nmcphc/epi-data-center/Pages/2015-surveillance-summaries.aspx).

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Bacterial Infections in the MHS, 2015
Prepared March 2017
EpiData Center Department
NMCPHC-EDC-TR-222-2017

REPORT DOCUMENTATION PAGE

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1. REPORT DATE (DD-MM-YYYY) March 2017
2. REPORT TYPE Technical Report
3. DATES COVERED From - To 01 January 2015 - 31 December 2015
4. TITLE AND SUBTITLE Annual Surveillance Summary: Bacterial Infections in the Military Health System (MHS), 2015
5a. CONTRACT NUMBER
5b. GRANT NUMBER
5c. PROGRAM ELEMENT NUMBER
5d. PROJECT NUMBER
5e. TASK NUMBER
5f. WORK UNIT NUMBER

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Portsmouth, VA 23708-2103


10. SPONSORING/MONITORING AGENCY ACRONYM(S) EDC, NMCPHC

11. SPONSORING/MONITORING AGENCY REPORT NUMBER(S) NMCPHC-EDC-TR-222-2017

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release; distribution is unlimited.

13. SUPPLEMENTARY NOTES

14. ABSTRACT
The Hospital Associated Infections and Patient Safety Division of the EpiData Center (EDC) at the Navy and Marine Corps Public Health Center (NMCPHC) performs ongoing, comprehensive surveillance of bacterial infections considered urgent, serious, and concerning threats to the Centers for Disease Control and Prevention (CDC). This brief summarizes incidence rates, subpopulation impacts, prescription practices, and antimicrobial resistance for the following infections among Military Health System (MHS) beneficiaries for calendar year 2015: Klebsiella species, Pseudomonas aeruginosa, Escherichia coli, methicillin-resistant Staphylococcus aureus (MRSA), vancomycin-resistant enterococci (VRE), Clostridium difficile, and Acinetobacter species. Bacterial activity of interest in the MHS in 2015 exhibited expected trends and closely resembled activity in the general United States population as reported by the CDC and other public health agencies. No significant threat to mission readiness or population health was observed, and traditional treatment options remain viable. Continued adherence to infection control practices is advised.

15. SUBJECT TERMS
Health Level 7 (HL7), microbiology, surveillance, multi-drug resistance (MDR), Military Health System (MHS), mithicillin-resistant Staphylococcus aureus (MRSA), indole-positive Klebsiella species, Pseudomonas aeruginosa, Escherichia coli, vancomycin-resistant enterococci (VRE), Clostridium difficile, Acinetobacter species

16. SECURITY CLASSIFICATION OF:
a. REPORT U
b. ABSTRACT U
c. THIS PAGE U
17. LIMITATION OF ABSTRACT UU
18. NUMBER OF PAGES 3

19a. NAME OF RESPONSIBLE PERSON
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Reset Standard Form 298 (Rev. 8/98)
Prepared by AEC 028 129
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