**ABSTRACT**  

Tertiary-care medical centres (12 in 2007, 10 in 2008, 15 in 2009, 14 in 2010) representing 8 of 10 provinces across Canada submitted pathogen strains from patients attending hospital clinics, emergency rooms, medical and surgical wards, and intensive care units. Fifty-two percent of the isolates were from respiratory specimens (sputum and bronchoalveolar lavage), 28% from blood, and 20% from other sources (urine, stool, wound, etc.). The most common pathogens in Canada in 2007-2010 were as follows:  

**Table 1. Percent susceptible, intermediate, resistant, MIC<sub>50</sub>, MIC<sub>90</sub> and range (mg/L) are shown below**  

<table>
<thead>
<tr>
<th>Organism</th>
<th>MIC&lt;sub&gt;50&lt;/sub&gt;</th>
<th>MIC&lt;sub&gt;90&lt;/sub&gt;</th>
<th>% S</th>
<th>% I</th>
<th>% R</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>S. pneumoniae</td>
<td>0.06 - 0.12</td>
<td>≥ 64</td>
<td>8</td>
<td>99</td>
<td>1</td>
<td>≤ 0.06 - &gt; 64</td>
</tr>
<tr>
<td>Antimicrobial</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Amoxicillin / Clavulanate</td>
<td>≤ 0.06</td>
<td>16</td>
<td>71.4</td>
<td>28.6</td>
<td></td>
<td>≤ 0.06 - &gt; 64</td>
</tr>
<tr>
<td>S. aureus, MRSA (349)</td>
<td>0.006 - 0.12</td>
<td>&gt; 512</td>
<td>99.9</td>
<td>0.1</td>
<td></td>
<td>≤ 0.06 - &gt; 512</td>
</tr>
<tr>
<td>E. coli (298)</td>
<td>0.006 - 0.12</td>
<td>&gt; 512</td>
<td>99.9</td>
<td>0.1</td>
<td></td>
<td>≤ 0.06 - &gt; 512</td>
</tr>
<tr>
<td>K. pneumoniae (259)</td>
<td>0.12 - 2</td>
<td>&gt; 128</td>
<td>92.3</td>
<td>7.7</td>
<td></td>
<td>≤ 0.12 - &gt; 128</td>
</tr>
<tr>
<td>S. maltophilia (232)</td>
<td>0.12 - 2</td>
<td>&gt; 128</td>
<td>92.3</td>
<td>7.7</td>
<td></td>
<td>≤ 0.12 - &gt; 128</td>
</tr>
<tr>
<td>* bla (101)</td>
<td>0.006 - 0.12</td>
<td>&gt; 512</td>
<td>99.9</td>
<td>0.1</td>
<td></td>
<td>≤ 0.06 - &gt; 512</td>
</tr>
</tbody>
</table>

**RESULTS**  

Overall, the MIC distributions of LRTI pathogens were as follows:  

- **S. pneumoniae:** MIC<sub>50</sub> 0.06 mg/L, MIC<sub>90</sub> ≥ 64 mg/L, % S 8%, % I 99%, % R 1%  
- **S. aureus, MRSA:** MIC<sub>50</sub> 0.006 mg/L, MIC<sub>90</sub> > 512 mg/L, % S 99.9%, % I 0.1%, % R 0.1%  
- **E. coli:** MIC<sub>50</sub> 0.006 mg/L, MIC<sub>90</sub> > 512 mg/L, % S 99.9%, % I 0.1%, % R 0.1%  
- **K. pneumoniae:** MIC<sub>50</sub> 0.12 mg/L, MIC<sub>90</sub> > 128 mg/L, % S 92.3%, % I 7.7%, % R 0%  
- **S. maltophilia:** MIC<sub>50</sub> 0.12 mg/L, MIC<sub>90</sub> > 128 mg/L, % S 92.3%, % I 7.7%, % R 0%  

The percentage of isolates resistant to amoxicillin/clavulanate was ≤ 0.06 mg/L in 71.4% of the isolates, 0.06 – 0.12 mg/L in 28.6% of isolates, and > 0.12 mg/L in 0.1% of isolates. In total, 10.0% of isolates were resistant to amoxicillin/clavulanate.  

**INTRODUCTION**  

Infections in hospitals is a worldwide escalating public health issue. Increasing prevalence of methicillin-resistant Staphylococcus aureus (MRSA) both in hospital and community associated, vancomycin-resistant Enterococcus faecium (VRE), penicillin and ceftriaxone resistant Neisseria gonorrhoeae, and aspergillus resistant carbapenem antimicrobials, as well as carbapenem resistant Enterobacteriaceae pose significant management challenges and increasingly risk our ability to provide effective treatment.  

CANDARW is an ongoing national surveillance study in Canada whose goals are:  

- Document pathogens associated with respiratory, bloodstream, urinary tract and skin/skin structure infections each year and monitor pathogen shifts.  
- Document the prevalence of resistance associated with these pathogens each year.  

This study reports on the prevalence of resistance to antimicrobials used for the treatment of LRTI pathogens isolated in Canada in 2007-2010 as part of the larger CANDARW study.  

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**CONCLUSIONS**  

1. LRTI pathogens accounted for approximately 29% of all pathogens submitted.  
2. The most common lower respiratory tract infection pathogens were S. pneumoniae, Staphylococcus aureus (MRSA) susceptible, Pneumococcus aureus, and H. influenzae.  
3. Highest antimicrobial resistance rates occurred with MPNSA, P. aeruginosa and E. cloacae.  
4. Overall resistance in LRTI pathogens in Canada continues to increase.