Antimicrobial and multidrug resistance (MDR) in Streptococcus pneumoniae is a global public health threat. The prevalence of antibiotic resistance continues to rise, particularly in children and young adults. The emergence of severe and often fatal infections caused by resistant strains highlights the need for continued surveillance and research to understand the factors driving resistance development.

**Materials & Methods**

Isolate Collection:
S. pneumoniae isolates from blood and respiratory samples were collected as part of the CANWARD study from 2007 to 2013. All isolates were retested for sensitivity to ampicillin, ceftriaxone, tetracycline, and amoxicillin-clavulanate.

**RESULTS**

Table 1. MDR and XDR pneumococci determined by microdilution and agar diffusion.

<table>
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<th>Strain Type</th>
<th>V</th>
<th>X7692</th>
<th>TET</th>
<th>T 2500</th>
<th>T 1000</th>
<th>STF</th>
<th>TER</th>
</tr>
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<tr>
<td>Isolate 1</td>
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<tr>
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</tbody>
</table>

**CONCLUSIONS**

2.8% of S. pneumoniae isolates collected in Canada in 2007-13 were MDR, while 91.2% of MDR 10A and 19A were also XDR, with 2 isolates resistant to six different classes of antimicrobials, including resistance to penicillin.

Penicillin resistance was associated with mutations in key genes of PBP 1A, 2B, and 2D. Resistance to XDR was associated with high levels of the dual mef(A)/erm(M) phenotype.

S. pneumoniae from Canada are associated with well-described epidemiology and population genetics, with the majority of isolates (99%) being type 19A and 19F.

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**References**


**Figure 1. 16S rRNA gene microarray for XDR pneumococci.**