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Trends in *Stenotrophomonas maltophilia* antibiotic resistance rates

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ABSTRACT

Background: Studies from the 1990's and 2000's identified increasing rates of *Stenotrophomonas maltophilia*, particularly among respiratory isolates and in intensive care populations. Additionally, resistance in S. maltophilia was found to be worsening. We aimed to quantify recent trends in prevalence and resistance of *S. maltophilia* in the national Veterans Affairs (VA) Healthcare system.

Methods: We identified positive *S. maltophilia* clinical cultures among VA adult patients from 2010 to 2018, collected in either VA medical centers (VAMCs), community living centers (CLCs), or the outpatient (Outpt) setting. Multidrug resistance (MDR) was defined as resistance to sulfamethoxazole/trimethoprim (SMX/TMP) and minocycline or levofloxacin. Time trends were assessed with regression analyses to estimate annual average percent changes (AAPC) with 95% confidence intervals using Joinpoint Software.

Results: Over the 9-year study period, we identified 18,285 *S. maltophilia* cultures (57% VAMCs, 3% CLCs, 40% Outpt). *S. maltophilia* cultures made up 0.4% of all positive cultures in the VA. In VAMCs and CLCs, the number of *S. maltophilia* cultures decreased (5.4%, 8.4% per year respectively). Alternatively, of all positive cultures in VAMCs, the proportion that were S. maltophilia increased significantly by 2.6% per year. SMX/TMP resistance decreased significantly by 8.5% (2010, 15%; 2018, 6%) per year in VAMCs, and decreased non-significantly by 8.7% (2010, 13%, 2018, 6%) per year in CLCs and 6.0% (2010, 12%; 2018, 7%) in the outpatient setting. No other significant changes in resistance were observed over the study period. MDR increased non-significantly by 1.2% per year.

Conclusion: While previous studies found increasing rates of *S. maltophilia*, the number of positive *S. maltophilia* cultures decreased in the national VA Healthcare System between 2010 and 2018. However, *S. maltophilia* is making up a greater proportion of positive culture over time. During the study period, resistance to SMX/TMP decreased and now more closely reflects previously reported resistance rates worldwide (0-10%).

INTRODUCTION

Stenotrophomonas maltophilia (S. maltophilia) resistance to standard of care antibiotics has made treatment of these associated infections more challenging. We sought to assess resistance over the study to frequently used empiric agents.

OBJECTIVE

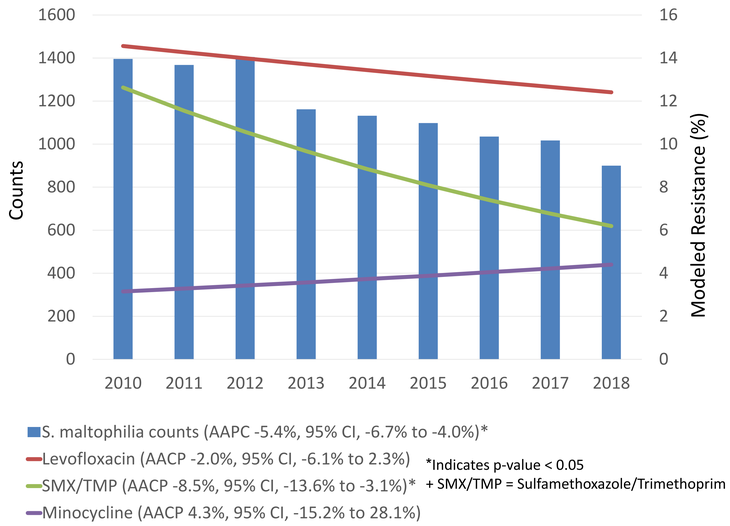
Identify trends in resistance rates of *S. maltophilia* isolates across the Veterans Affairs (VA) Healthcare System nationally.

METHODS

- *S. maltophilia* clinical cultures, 2010 to 2018 collect in VA medical center (VAMC), community living center (CLC), or outpatient (Outpt).
- For resistance, included the first isolate per patient, per facility, per year. Antibiotic susceptibility based on latest Clinical Laboratory Standards Institute breakpoints to numeric minimum inhibitory concentrations (MIC) data were available. Where MIC values were not available, we used the reported textual interpretations (i.e., resistant [R], intermediate [I], or susceptible [S]).
- Time trends were analyzed using Joinpoint (JP) regression to calculate average annual percent changes (AAPC) and 95% confidence intervals (CI).

RESULTS

Figure 1. *S. maltophilia* counts and resistance trends, VAMCs



*Indicates p-value < 0.05

+ SMX/TMP = Sulfamethoxazole/Trimethoprim

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RESULTS

Figure 2. *S. maltophilia MDR* resistance trends, all settings

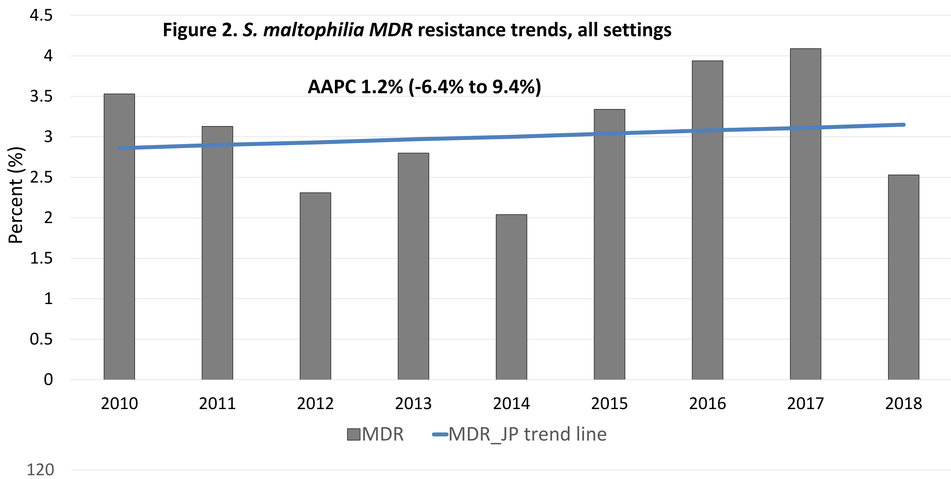
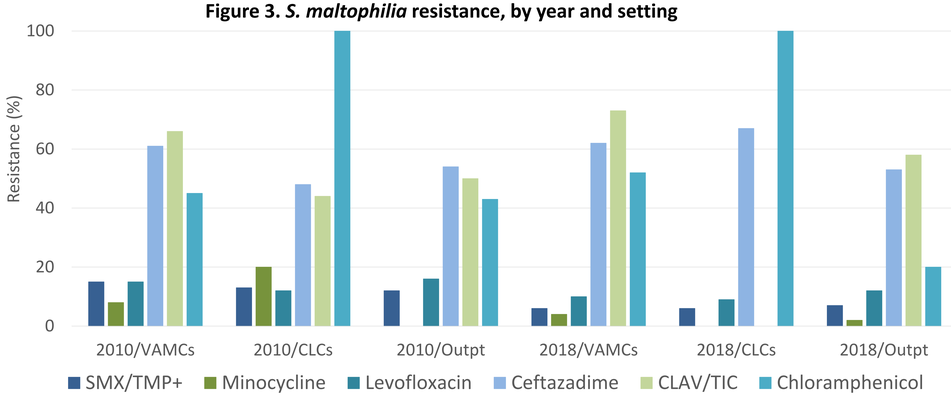


Figure 3. *S. maltophilia* resistance, by year and setting



Of isolates tested for susceptibility. + SMX/TMP = Sulfamethoxazole/Trimethoprim, CLAV/TIC = Ticarcillin/Clavulanate.

CONCLUSIONS

While the prevalence of *S. maltophilia* decreased in the national VA Healthcare System from 2010 to 2018, specifically in hospitals and long-term care, *S. maltophilia* is making up a greater proportion of positive culture over time. During the study period, the proportion of isolates that were MDR Increased non-significantly, as did resistance to minocycline, while resistance to levofloxacin decreased non-significantly. Resistance to SMX/TMP decreased significantly and now more closely reflects previously reported resistance rates worldwide (0-10%).