Introduction

• Antimicrobial resistance led to 1.27 million deaths worldwide in 2019 (1)
• Leads to higher medical costs and difficulty treating infections (2)
• Mutations in penicillin-binding proteins of gram-positive bacteria can contribute to resistance to Beta-Lactam antibiotics. (3)

Objective of the Study

The purpose of this research internship was to use systematic literature review to identify mutations in penicillin-binding proteins of gram-positive bacteria, document their resistance to beta-lactam antibiotics, transform the mutations to Streptococcus Suis, and document patterns in the mutations.

Methods

• Review literature to make a database of mutations
• Covert the mutations into S. Suis with BioEdit and R Studio
• Analyze patterns in the mutations and the statistical significance of the patterns.

Results

• In the literature, more than 300 mutations were identified that showed an increase in antimicrobial resistance
• Many mutations were common across different species and different strains.

Discussion

• Mutations in penicillin-binding proteins of gram-positive bacteria contribute significantly to antimicrobial resistance

Questions

• How might antimicrobial resistance differ among different communities? Does race or class play a role in one’s susceptibility to acquiring antimicrobial-resistant bacteria?

Conclusion

Looking at bacteria on a genomic level is important to addressing antimicrobial resistance and ultimately for informing policy.

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References

