

## Resistance on the rise

**Research question:** How is antibiotic resistance developing, how it is impacting on current and future healthcare, and what can be done to minimise antibiotic resistance?

(Osaba, 2015)

### Introduction

Antibiotic resistance is a worldwide healthcare problem affecting the future of the healthcare system. Infections and antibiotic resistance occur in all healthcare settings including hospitals, general practice and the community. Antibiotic resistance is a natural phenomenon occurring when bacterial microorganisms survive exposure to an antibiotic, therefore making the antibiotic less therapeutic and infections more difficult to overcome (Harris, Nagy, & Vardaxis, 2014).

### Causes of Resistance

- Patients stop usage when they feel better, rather than taking the full course which causes some resistant bacteria to survive, often resulting in recurring infections (Costelloe, Metcalfe, Lovering, Mant & Hay, 2010).
- Convenience prescribing of wide spectrum antibiotics with an easier administration regime to increase compliance (Thomas, Smith & Tilyard, 2014).
- Pharmaceutical companies not developing new antibiotics to compensate for increasing resistance as antibiotics are less financially desirable than drugs for chronic conditions (Ventola, 2015).
- Preconceived beliefs that antibiotics are required to combat illnesses such as a common cold (Hobbs et al., 2017).
- Antibiotics are used widely in the agricultural industry to prevent infection and promote growth (Ventola, 2015).

### Impacts of Resistance

- Antibiotic use during early ages of life can contribute to weight gain, asthma, allergies, and development of immune diseases (Hobbs et al., 2017).
- Wide spectrum antibiotics disrupt the normal protective microflora and increase susceptibility to infections (Hobbs et al., 2017).
- High risk surgical procedures such as organ transplants may be unsafe to perform in the future if prophylactic antibiotics cannot be used (Susana, 2016).
- Increased emergence of 'superbugs' such as Methicillin-resistant *Staphylococcus aureus* (MRSA) that cannot be easily treated with a regular course of antibiotics (Barratt, Shaban, & Moyle, 2010).
- Increased hospital stays and healthcare costs as second line treatment options are more expensive (Susana, 2016).

### Recommendations

#### For Patients

- Take the full course of prescribed antibiotics.
- Ask about alternative treatment options.
- Do not expect to be prescribed antibiotics for all infections.
- Prevent infections with effective handwashing, vaccination, safe sex and prepare and cook food properly.

#### For Nurses

- Promote vaccination to reduce reliance on antibiotics later for vaccine preventable infections.
- Provide health education to ensure antibiotics are taken as prescribed and infections are minimised.

#### For Prescribers

- Consider alternative treatments such as silver and hydrogen peroxide (Roberts, Leaper & Assadian, 2017).
- Favour narrow spectrum antibiotics.
- Await laboratory results to confirm infection details before prescribing. This is implicated by wanting to start treatment immediately, before the infection worsens or clients may have time or financial constraints that prevent them from having follow-up appointments.

### Conclusion

Antibiotic resistance is a global crisis having a detrimental impact on the healthcare system and patient health outcomes. While resistance is a natural process, healthcare professionals and healthcare consumers can play a vital role in reducing its emergence. Without immediate interventions to reduce resistance, delivery of healthcare will become more challenging and result in higher levels of morbidity and mortality from infections previously cured with antibiotics. Recommendations to slow resistance need to be applied to practice now to protect the future healthcare system and ensure effective treatment options for the subsequent years.

### References

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## Submission Rationale

Research is focused on expanding the knowledge base and literature revealed that increased awareness and education about antibiotic resistance to both healthcare consumers and healthcare professionals is the key to reducing it (Ilic & Rowe, 2013; Schneider & Whitehead, 2016). For this reason, I decided to create an informative poster to easily present this information. A poster is easily accessible and can be placed around healthcare facilities, including client waiting areas to reach a wide audience (Schneider & Whitehead, 2016). A written submission would only reach a small audience and take significant time for findings to be distributed to healthcare professionals and consumers, in contrast to a poster which is readily available (Schneider & Whitehead, 2016).

When presented at a forum or conference, posters are interactive and provide the viewers with a concise overview of the research, which can be supplemented with informal discussion to enhance knowledge and inform practice (Ilic & Rowe, 2013; Perrin, 2015; Schneider & Whitehead, 2016). Posters are visual communication tools that allow research to be presented in a clear and concise format (Perrin, 2015; Schneider & Whitehead, 2016; University of Texas at Austin, 2017). Bullet pointing facts helps break up information making it easier to read (University of Texas at Austin, 2017).

## References

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## PECOT Model

The following table was used to generate the research question and guide the research presented.

PECOT Category	Information relating to the question	Explanation
Population	Healthcare professionals and the general population who access healthcare in New Zealand.	Healthcare professionals are responsible for prescribing and administering antibiotics thus contributing to resistance. Nurses also play a role in providing patients education on alternative treatments in order to make an informed decision regarding their care. They are also involved in patient education and helping the patient understand their medication regime. Health care consumers are also included as the population are influenced by the biomedical model and often seek medication for health issues. I have not limited my population by age as all ages are subject to sickness.
Exposure (intervention)	Nurses, prescribers and patients who are exposed to antibiotics and will experience future healthcare in a world of increasing antibiotic resistance.	People exposed to the prescribing, administering, education and use of antibiotics are going to be affected by antibiotic resistance. As resistance builds, health is more likely to be influenced by infection without sufficient treatment options.
Comparison (control)	Health practitioners and healthcare consumers that use alternative healthcare options to antibiotics.	I will compare what the future of medicine and healthcare may look like if antibiotic resistance increases and ways in which it can be reduced but still maintaining good health.
Outcome	To develop a strong argument on how antibiotic resistance affects global health and the delivery of healthcare	I will review a wide scope of research on how antibiotic resistance will influence the future of healthcare options and how healthcare professionals can be involved in minimizing antibiotic resistance.
Time	20th Century to 21 <sup>st</sup> century extending to the next 100 years.	Since the discovery of penicillin in 1928 antimicrobial agents have been increasingly used and relied on to restore good health following an infection. While time is not always included in the framework, I have decided to include it as a factor as antibiotic resistance has developed over time and will have a major impact on the future of healthcare delivery and patient outcomes as we progress through the 21st Century.

Schneider, Z., & Whitehead, D. (2013). Identifying research ideas, questions, statements and hypotheses. In Z. Schneider, D. Whitehead, G. LoBiondo-Wood, & J. Haber. (Eds.). *Nursing and midwifery research methods and appraisal for evidence* (4<sup>th</sup> ed.). (pp. 57-76). Sydney, Australia: Elsevier.