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## PUBLIC AWARENESS FOR PREVENTION OF ANTIBIOTIC RESISTANCE

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### **ABSTRACT**

*This report looks at some of the reasons behind the spread of antibiotic resistance. From the literature four key factors were identified that contribute to antibiotic resistance: over prescription, self-medication, agricultural use and hospital use of antibiotics. This report identifies the factors that contribute to antibiotic resistance and the methods used to prevent them.*

**KEY WORDS:** Awareness, Antibiotic, Resistance, Prevention

## INTRODUCTION

Antibiotic resistance is becoming an increasing problem all over the world. The percentage of resistant bacteria has increased by 65% from 2010 to 2015 and has been predicted to increase continuously (NHS, 2018). The increase in resistance bacteria does not only decrease the ability to treat infections and illnesses but it also causes serious health problems, suffering, and even death. Furthermore, this leads to increased cost and extended treatments which causes financial strain on hospitals and nursing homes. This problem, however, can be resolved by using prevention methods and raising public awareness. This paper will discuss the factors that contribute to the spread of antibiotic resistance and the methods used to prevent them. Overall, raising public awareness and prevention methods could help reduce the spread of antibiotic-resistant bacteria.

## KEY FINDINGS AND DISCUSSION

From the literature, four main issues were identified as causing antibiotic resistance and are discussed below.

### OVER-PRESCRIPTION

Unnecessary prescription of antibiotics has been noted as being one of the main reasons for antibiotic resistance. In Britain, it is found that 10% to 50% of outpatient antibiotic prescriptions are unnecessary (Schwartz, B. 1998). The most important decision is to be made by primary care physicians, and that is whether to prescribe antibiotics to a patient with the evident signs and symptoms of a bacterial infection. As it is difficult to distinguish the symptoms of a bacterial infection from a viral infection, physicians are uncertain about whether to prescribe antibiotics. The physicians might feel under pressure and a duty to prescribe patients with antibiotics for a mild but uncomfortable

illness (Robert, M et al. 1996). When antibiotics are taken unnecessarily, the antibiotics attack the beneficial bacteria in the human body. As a result of this misdirected treatment, antibiotic-resistant properties can be developed in harmless bacteria which can be shared with other bacteria or create an opportunity for potentially harmful bacteria to replace the harmless ones (Ventola, Cl. 2015). However, encouraging detained prescription of antibiotics, increasing communication skills with patients and limiting the prescription of antibiotics can decrease the rate of antibiotic resistance (Llor, C and Bjerrum, L. 2014).

## **SELF-MEDICATION**

Another factor contributing to the resistance of antibiotics is self-medication. Self-medication with the use of antibiotics is becoming increasingly common in different parts of the world. (Llor, C and Bjerrum, L. 2014). In some countries, antibiotics are sold by vendors illegally, without a prescription. This can be done on the street or online. This is common in various different parts of Asian countries and even in Southern European countries. In other countries, antibiotics are made available to the free market, outside of pharmacies. As a result of these antibiotics being unprescribed, people may consume them the wrong way or when they are not required (Rose-Ann, G. 2012). Bacteria are able to adapt and change over a period of time and this is especially the case for those bacteria that are exposed to an antibiotic but not entirely killed. If bacteria has survived an antibiotic course, another antibiotic is required in order to get rid of the remaining bacteria. If the bacteria become resistant to the second course of antibiotics, yet another is required. This problem can be repeated until a bacterium that is unable to be treated is produced (Stuart, B. 2002). The Enforcement of governmental laws prohibiting over-the-counter sales of antibiotics, educational interventions such as public relations campaigns with small messages, community accessible outreach activities and patient education at clinics can possibly cause a reduction in the rate of resistant bacteria (Schwartz, B. 1998).

## **AGRICULTURAL USE**

Antibiotic resistance can also develop through the use of antibiotics in agriculture. Alongside medical misuse of antibiotics, the agricultural use of antibiotics is another factor that is susceptible to resistance (Khachaturian's, G. 1998). In various parts of the world, vast quantities of antibiotics are used in the production of meat and aquaculture. This is done by adding small quantities of antibiotics to the animals feed over a long period of time. One of the main reasons for this is to increase growth rates of livestock, which in turn benefits the farmers as they make more profit (Witte, W. 1998). However, some antibiotics can be used to prevent illnesses or are used as a treatment for illnesses. The use of antibiotics in livestock does not only harm the animal but can also bring antibiotic resistance to humans through the consumption of meat. Health problems such as indigestion through airborne bacteria can also be transmitted (Uppsala University, 2018). Some strategies that can be used to reduce this problem include training farmers in animal health care, setting reduced targets for food production and illegalizing the use of antibiotics for meat production purposes (Timothy, L et al. 2012).

## HOSPITAL USE

The use of antibiotics is common in nursing homes and hospitals and therefore critically ill patients are more likely to infections and often require the need for antibiotics (Mellon, L. 2001). Person-to-person transfer of resistant bacteria is very common in situations where the susceptible population is in close contact with individuals that possess resistant bacteria. As a result of this, antibiotic-resistant bacteria is most rapidly spread in nursing homes and hospitals (Rao, G. 1998). Resistant bacteria are transmitted indirectly through the environment, staff, and equipment. This is the most common method of spread in nursing homes and hospitals. The staff may also carry the resistant bacteria on their hands, clothes and could even become carriers of the resistant bacteria for a long period of time. The environment of a patient could be contaminated by resistant bacteria and therefore is easily transmitted to other patients. As the direct transmission of resistant bacteria is unlikely, droplet or droplets of nuclei can be transmitted to staff or patients through airborne bacteria. Prevention of the development of antibiotic-resistant bacteria can be limited by evaluating hospital hygiene practices and infection controls, shortening the time of hospitalized patients and providing at home treatment (Rao, G. 1998).

## CONCLUSION

There are a number of different factors that contribute to the spread of antibiotic resistance but can be reduced by raising public awareness and prevention methods. The over-prescription of antibiotics is identified as one of the most important factors which lead to antibiotic resistance. The factor can be addressed by encouraging detained prescription of antibiotics, increasing communication skills with patients and limiting the prescription of antibiotics. Ultimately, if all these factors are addressed the spread of antibiotic-resistant bacteria will decrease. If these prevention methods were more widespread and comprehensive, then they would be more effective at preventing the spread of antibiotic resistance.

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