Title: Policy Statement on Antimicrobial Resistance

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Introduction

Antimicrobials are substances used to combat harmful microorganisms, this includes antibiotics, antifungals, antivirals and antiprotozoals. Antimicrobial resistance (AMR) is the developed inefficacy of these antimicrobials which leads to increased susceptibility to harmful disease [1] AMR is projected to cause up to 10 million deaths annually by 2050 if urgent action is not taken. In 2019, AMR caused 1.27 million deaths which was more than HIV/AIDS. Antimicrobials are used in many branches of medicine including cancer care ,neonatal and obstetric care and so it is important that we protect the efficacy of these antibiotics to the best of our ability.[2] AMR is a global concern as it affects all healthcare systems, and contributing factors include access to vaccines, lack of access to sanitation and lack of awareness. Resistance occurs by biochemical changes within the cells that result in the changes being advantageous to the organisms allowing them to thrive. The mechanisms involved include naturally developing mutations becoming advantageous as they result in less antimicrobial uptake or can efflux pump these antibiotics out.[3] Efflux transporters are responsible for moving the antibiotics from the cytoplasm out of the bacteria and hence are said to be the first line defence for bacteria against antibiotics. They also utilise pre-existing mutations, mutations altering the antibiotic target site and enzymic activity to further their defence mechanisms against out pre-existing antibiotics. [4]

SfGH UK's Position

SfGH aligns with IFMSA's position adopted at the 73rd General Assembly in March 2024 They highlight that AMR is a rising global concern and pandemic. It calls for interdisciplinary input addressing both healthcare and non-healthcare settings. SfGH acknowledges that AMR affects communities across the globe and that lack of access to hygiene and sanitation and other provisions can bring additional challenges and therefore increase the health inequities present. Public education thus far has helped to raise awareness surrounding AMR however more needs to be done to further develop this and maintain the momentum that is required. Not only do patients need further education, but also healthcare professionals, vets and other disciplines and it is important that we continue to work within the UK to help educate and aid understanding surrounding the importance of combating resistance in a timely manner. SfGH is working to improve public health by tackling the AMR pandemic by using primary and secondary interventions including utilising the media to spread awareness on the issue and encouraging more research into new antimicrobial developments.

Calls to Action

Student for Global health members:

- To adhere to the appropriate antimicrobial guidelines set out by their trusts in their future careers if relevant which includes prescribing and issuing of antibiotics.
- Adhere to their own prescriptions by finishing the prescribed course of antibiotics and encouraging family and friends to do the same.

Students for Global Health branch committees:

- To continue to promote and raise awareness surrounding antimicrobial resistance not limited to antibiotic resistance, whether that be at events or by running workshops available and accessible to all.
- To work with university bodies to raise awareness campus wide especially through AMR awareness week to encourage people to adhere to their prescriptions.
- To work with all healthcare courses to promote antimicrobial stewardship and to ensure they take an active role in antimicrobial awareness in their future careers.

Students for Global Health National committee:

- To continue to support and encourage regional branches to promote awareness surrounding AMR.
- Engage with the UK government and local councils and trusts to ensuring that the conversations surrounding antimicrobial resistance are not forgotten.

Healthcare providers:

- To educate their patients on the importance of finishing and adhering to their prescriptions
- Secondary care providers to ensure that they take the appropriate cultures and swabs prior to prescribing antibiotics to ensure that the appropriate regime is followed to prevent building further resistance
- Trusts to continue to update their guidance and teaching on antimicrobial resistance in all departments and to critically appraise their guidelines.
- Trusts to work with their clinicians to make their guidelines surrounding antibiotics accessible.

NGOs:

- To help fund research into the development of new antimicrobial agents as there has been a significant decline in research in the past few years.
- To aid countries who need their support to help provisions in terms of education, hygiene and sanitation to help alleviate the external factors that contribute to antimicrobial resistance in middle and lower income countries.

Background

Sir Alexander Fleming was a Scottish scientist who in 1928 facilitated the discovery of penicillin. This drastic turning point resulted in a decrease in mortality rates. However, within the last few decades, there have been few developments in this area. New antibiotics are critical for fighting this current pandemic. For example, there is extensive resistance to E.Coli, a bacteria that is common in urinary tract infections. In addition, third generation cephalosporins such as ceftriaxone are now ineffective in certain strains of gonorrhoea in 10 countries including the UK, Sweden and South Africa. AMR was deemed a priority by the UK government in 2014. In the UK between 2013 and 2017, 80% of the antibiotics used by humans were prescribed in primary care and these were frequently used in acute respiratory infections which do not derive much benefit from antibiotics.[5] UK economist Jim O'Neill, an economist was commissioned by previous prime minister David Cameron, to analyse the situation in the UK at the time. The review evaluated how we can reduce the demand for antimicrobial drugs and increase the supply. It was predicted that in 2050 AMR would cause 10 million deaths. Additionally, procedures that previously were not high risk due to prophylactic antibiotics now may be more difficult [6] the Organisation for Economic Co-operation and Development (OECD) released a report in 2018 that found that 39% of all resistant infections were very difficult to treat as they were resistant to last line antibiotics. [7]

Commenting on the rising number of pathogens that are resistant to antimicrobials, the review stated that there could be a death every 3 seconds and it could come to a cumulative cost of 100 trillion USD.[6] In the 2018 OECD report, they predicted that 2.4 million people in Europe, North America and Australia will die as a result of AMR, in 2048 which could cost 3.5 billion US dollars a year. If 2 US dollars were invested per year per person, 75% of deaths associated with AMR could be avoided. [7] The world bank predicted a decline of 3.8% in global gross domestic product (GDP) due to AMR but in Ghana and other lower middle income countries this is estimated to be up to 4.4%. Certain countries have developed National Action Plans (NAPs) with allocated budgets however, in certain African countries, there were major gaps in their NAPs and this shows the level of underfunding in these areas and the need AMR interventions to be further incentivised. The study also found that AMR could cost Ghana 435 million dollars annually between 2024 and 2030 and most of these costs would come from children under 5.[8] A study conducted in Pakistan in 2025, suggested that those infected with a resistant bacteraemia were susceptible to a longer length of stay which associated itself with higher economic burden on the individuals than their bacteria susceptible counterparts. [9] This further reinforces the societal and personal economic burden that AMR carries.

There has been a real decline in investment into antimicrobials as it is not seen as appealing to academics or pharmaceutical companies.[6] Pharmaceutical companies struggle to derive profit from the development of antibiotics for several reasons. The development of any new drug can not only be expensive but also very risky and time consuming. Antibiotics can derive resistance and this as a result means a limited effectivity window. Therefore without government funding, many pharmaceutical companies will continue to pull out of antibiotic development initiatives. [10]In Europe, according to data from the Dynamic Dashboard, there is an increasing trend in AMR investment and funding between 2017 and 2021. However, it

did highlight evidence of neglect in the anti-fungal sector and the animal sector which as a result means that zoonotic spread of AMR still poses as a threat. [11]
A difference between AMR in high income countries and low middle income countries is that in the latter, there is also a consideration of animal related drivers. In Africa, poultry was the most commonly contaminated with extended spectrum beta lactamases (ESBL) E. coli and in Asia this was even higher. Antimicrobials are commonly used for the growth of these animals. The use of vaccines can help to reduce this issue as in comparison to high income countries, there are less restrictions on the use of antimicrobials in livestock . [12]
Developing countries do not regulate the use of antimicrobials. In South Africa between 2002 and 2004, 1500 tonnes of antibiotics were used for livestock. High-value fruit crops such as rice, tomato and citrus fruits are also susceptible to antibiotic use. There are 6 antibiotics which could lead to AMR development due to their use in agriculture, streptomycin, tetracycline, oxytetracycline, gentamicin, cefadroxil and amoxicillin. The One Health approach has been adopted to help combat this which recognises the interaction between animals and humans in term of AMR and aims to limit the horizontal transmission of AMR using the food chain.[13]

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