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Engaging Global Communities: The Role of Higher Education Institutions in Combating Antibiotic Resistance for a Healthier Future

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>>> This policy brief explores the current challenges, highlights good practices, and provides recommendations for fostering better engagement between HEIs and the community to enhance public understanding and mitigate the risks associated with antibiotic misuse.

4 key points

- Antibiotic Resistance (ABR) occurs when bacteria no longer respond to antibiotics and is considered a global health threat, contributing to 1.27 million deaths, more than malaria (>640 000) or HIV/AIDs (>860 000).
- Higher Education Institutions (HEIs) are pivotal in combating ABR through communication and community engagement.
- By simplifying language, translating materials, and using relatable terminology, HEIs can effectively communicate the seriousness of ABR and promote responsible antibiotic use.
- Using modern communication tools such as social media platforms (TikTok, Instagram Reels, YouTube Shorts) and employing behavioral nudging techniques, HEIs can reach younger audiences and encourage positive changes in antibiotic use habits.

Introduction

Antibiotic Resistance (ABR) is one of the most pressing global health threats of our time contributing to 1.27 million deaths in the year 2019, more than malaria (>640 000) or HIV/AIDs (>860 000).[1] ABR occurs when bacteria no longer respond to antibiotics, thereby compromising the ability to treat infectious diseases or infections, leading to prolonged illnesses, higher medical costs, and increased mortality.[2] According to The World Health Organization (WHO), at least 700000 deaths globally each year are attributed to only drug-resistant infections, a number that could rise to 10 million by 2050 and result in a cumulative economic cost of up to 100 trillion dollars if no action is taken.[3,4] The inappropriate use and overuse of antibiotics in human medicine, agriculture, and animal husbandry are key drivers of this crisis, necessitating a comprehensive and coordinated response across all sectors and those within the sectors (community).[5]

As centers of learning, research, and knowledge creation, Higher Education Institutions (HEIs) are uniquely positioned to educate future healthcare professionals, conduct research, and engage in community outreach.[6] Their role in shaping public health policies and practices places them at the forefront of combatting ABR.[6,7] By fostering collaborations between academia, healthcare providers, and public health organizations, HEIs can enhance the implementation of effective antibiotic stewardship programs.[6] These institutions can also lead public education campaigns to raise awareness about the dangers of ABR and the importance of responsible antibiotic use.[6–8] Furthermore, HEIs can conduct and disseminate research that informs policy decisions and clinical practices, ensuring that strategies to combat ABR are evidence-based, efficient, and oriented toward the most susceptible to antibiotic resistance social groups.[6–8]

Sustainable Development Goal 3 (SDG 3) aims to ensure healthy lives and promote well-being for all at all ages. This goal encompasses a broad spectrum of health-related targets, including efforts to combat ABR. Specifically, SDG 3.3 focuses on ending epidemics of communicable diseases, which is directly related to combating ABR, as it is crucial in managing and preventing the spread of resistant infections. ABR directly impacts this target by complicating the treatment and control of these diseases. Resistant infections can lead to higher mortality rates, longer hospital stays, and increased healthcare costs. Additionally, SDG 3.4 emphasizes the call for early warning, risk reduction, and management of national and global health risks, which includes initiatives aimed at improving surveillance, monitoring, and control of ABR, as well as promoting best practices in antibiotic use. ABR represents a significant health risk that requires robust surveillance, early detection, and prompt action to mitigate its impact.

Subsequently, this brief focuses on improving communication between governing bodies and HEIs to raise awareness among health practitioners and population groups about the consequences of inappropriate antibiotic prescription and use, such as taking antibiotics without a prescription. Moreover, it

explores the current challenges, highlights good practices, and provides recommendations for fostering better engagement between HEIs and the community to enhance public understanding and mitigate the risks associated with antibiotic misuse. By addressing these issues, we aim to create a more informed public that is better equipped to use antibiotics responsibly, thereby contributing to SDG3: ensure good health and promote well-being for all at all ages.

Problems/Current Challenges

Despite the role of HEIs in engaging the public about ABR, there are significant barriers that hinder effective communication and engagement of the complex topics, such as ABR, to the general public. These include the presentation of information, the presenters of the information, the terminology and language used, and the existing engagement methods. HEIs often utilize various platforms to disseminate information about ABR, including seminars and public health campaigns.[9] The effectiveness of these methods in reaching and influencing the public is questionable as studies indicate that public awareness and understanding of ABR remain low despite these efforts.[10–12] Information presented by HEIs may be too technical or not sufficiently engaging,[13] leading to a disconnect between the message and the audience. Additionally, the frequency and consistency of these messages may not be enough to make a significant impact.

HEIs often rely on medical professionals to convey information about ABR to the public. There are several issues with this approach:

1. Not all doctors are trained in effective communication strategies for public health education. While they may possess technical knowledge, translating this into accessible information for the general public can be challenging;[13,14]
2. Medical professionals are often overloaded with clinical duties and patient volumes, [15] thus leaving them little time to engage in detailed discussions about ABR with patients or within their regional community; and
3. The reliance on medical professionals as intermediaries creates a gap where the messages from the HEIs may be diluted or altered, reducing their impact.[16]

The language and terminology used by HEIs in their communication about ABR often appears academic and technical, and this does not effectively highlight the “seriousness” of ABR to the general public. Jargon like “antimicrobial resistance” or “stewardship” may not serve the severity of the global health threat message.[17,18] There is a need for simplified, relatable language that can convey the urgency and importance of the issue without overwhelming or alienating the audience.[17,18]

Patients often hold misconceptions about antibiotic use, contributing to unjustified usage behaviors and worsening ABR. Some studies reveal that the general population requests antibiotics from their primary care physicians and purchases non-prescription antibiotics.[19,20] Some patients believe antibiotics are effective against viral infections.[21] Additionally, patients may prematurely stop antibiotic courses once they feel better[20] and exaggerate symptoms to obtain prescriptions.[21] These misconceptions and behaviors highlight the need for improvements in awareness, knowledge, and attitudes amongst the general public. Figure 1 highlights the arranged approach to treating bacterial infections, prioritizing life-threatening conditions at the top, followed by serious, common, and less severe infections at the lower levels. Effective antibiotics are critical across all levels of this pyramid to ensure successful treatment and prevention of complications. The general community may not be fully aware of the consequences of the misuse of antibiotics, and the understanding of the vital role antibiotics play across all levels of the bacterial infection treatment pyramid should be communicated to the public to mitigate the use of unnecessary antibiotic use.

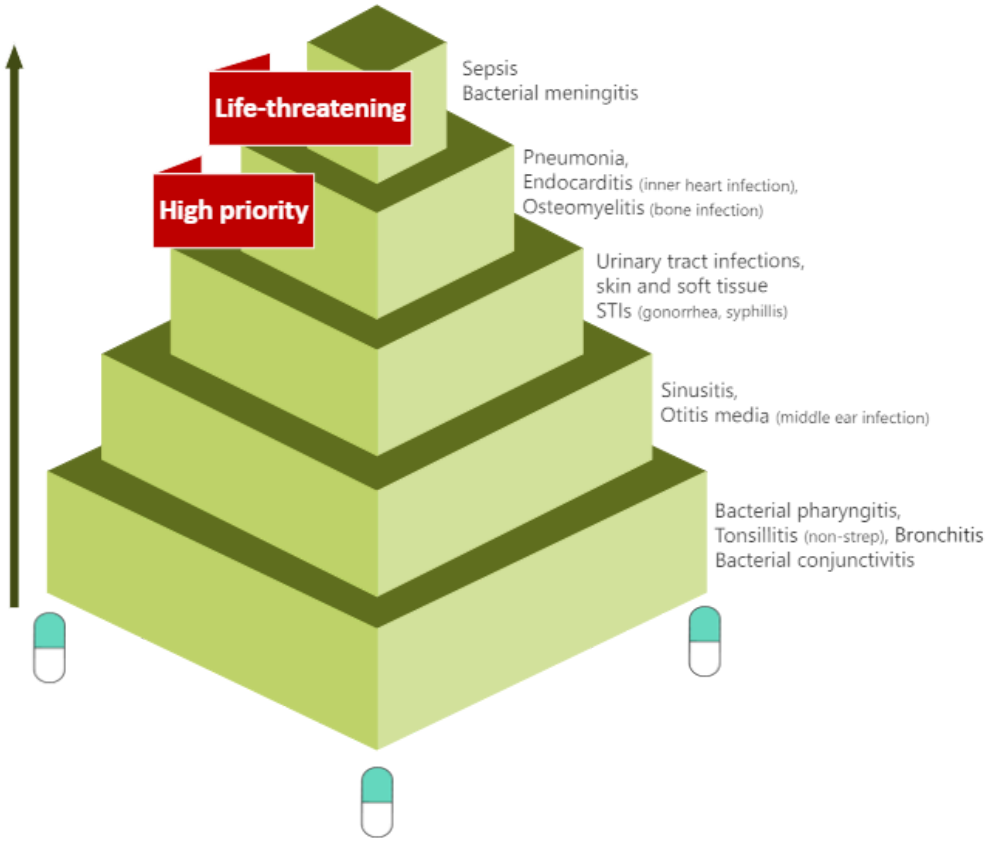

Fig.1. Antibiotics are the cornerstones of medicine: the pyramid of disease treatment and safe procedures relies on effective antibiotics. *made by authorship team

Besides the aforementioned weaknesses that HEIs should overcome, the global governmental policies that have been implemented to raise awareness about the danger of ABR lack long-term success as well.[23] For instance, hospital-based antimicrobial stewardship programs have been criticized as not well-established in the primary health care services.[23] In rural and remote areas, the absence of clinician support systems leads to increased rates of ABR and inappropriateness of antimicrobial prescribing. The dissemination of practical knowledge from HEIs for the update of governmental decisions seems vital and leads to the necessity of solutions and good practices from the HEIs side.

Solutions/Good Practices

Engaging communities effectively about the consequences of ABR requires thorough action plan strategies from HEIs, through transformative practices in their internal operations and feasible solutions for health specialists in the field. There are many opportunities for HEIs to incentivize and navigate a change to the way antimicrobial prescribing and usage happen. Examples of good practices are presented in this section.

Investments must be made to develop awareness campaigns that educate society about the causes and consequences of ABR. This investment could improve societal knowledge and attitudes toward antibiotic consumption.[24] Public campaigns to address the concern of inappropriate use of antibiotics have been implemented in Greece,[25] the United Kingdom,[11] England, and Scotland. While some campaigns have shown positive effects in increasing awareness and knowledge about the appropriate use of antibiotics, others have highlighted the misconceptions and the need for further education.[26–28] In Isfahan, an antibiotic awareness campaign successfully used various methods to sensitize the general population and healthcare workers about antibiotics and AMR, with improved awareness levels amongst the participants.[29]

The use of mass media,[30] illustrated leaflets,[12] and evidence-based infographics[12] are instrumental in engaging the public and promoting responsible antibiotic use. Carefully designed mass education campaigns could improve antibiotic use nationally and should be considered in countries with high antibiotic use. However, these campaigns should employ techniques of social marketing and use appropriate outcome measures.[30,31] Studies have shown that social media platforms like X, formerly Twitter, can effectively engage healthcare professionals and researchers with AMR-related content,[32] highlighting the importance of targeted public health strategies to raise awareness about specific pathogens. However, interventions aimed at improving public awareness about AMR have not extensively utilized social media for recruitment or communication, with interactive elements like games or videos showing higher engagement levels.[30,32]

HEIs' dynamic involvement in the societal interactions for AMR/ABR change should entail potent affiliations with community pharmacists to encourage people's sensible use of antibiotics and observe citizens' drug use perceptions and behavioral patterns in the field.[23] One-off educational sessions with health-promoting activities in rural and remote hospitals for patients' behavioral change can positively affect their antibiotic use.[23]

Fig 2. Public antibiotic campaign posters developed for European Antibiotic Awareness Day November 2008 and beyond.[28] (http://dx.doi.org/10.1093/jac/dks199)

Recommendations

To effectively combat antibiotic misuse and contribute to SDG3, HEIs must take proactive steps to enhance community engagement and awareness. Our recommendations (Figure 3.) include:

1. The development of **communication strategies** that use clear, simple, and relatable language to explain ABR. Additionally, avoiding technical jargon and focusing on easily understandable terms like "superbugs" and "drug-resistant infections" can help contribute to the ease of understanding of complex topics. One such suggestion could be to create a glossary of terms and use analogies and stories to illustrate the concepts. It is imperative to also translate these educational materials to local languages to reach diverse communities, different cultures, and indigenous people. HEIs can collaborate with linguists and consultants to refine the messaging used in public health campaigns.

2. The design and implementation of comprehensive **awareness programs** that include interactive and engaging activities for various community groups by means of workshops, seminars, and interactive displays to educate the public about the threat of ABR and the importance of their role as end-users of antibiotics. HEIs could consider establishing regular events like Antibiotic Awareness Week to maintain consistent public engagement and education efforts. This includes addressing end-users of antibiotics, such as farmers using antibiotics for their crops and animals.

3. The implementation of **nudging techniques** to encourage responsible antibiotic use amongst citizens by designing subtle prompts and reminders such as posters in healthcare settings, reminders to complete their antibiotic course, and feedback loops to influence behavior without coercion. HEIs should invest in the development of smartphone apps that send reminders to complete an antibiotic course and provide information on proper usage. In addition, pilot studies that test the impact of smartphone apps on employing systematic nudging for delayed antibiotic prescription amongst healthcare practitioners can help the reduction of unnecessary antimicrobial drugs.

4. Making use of **social media platforms** is a unique opportunity, where engaging with the younger audience with tailored content about ABR can be implemented. This includes creating short, engaging videos for platforms like TikTok, Instagram Reels, and YouTube Shorts that convey key messages about ABR in a relatable and entertaining manner. HEIs can consider partnering with influencers and content creators to expand the reach and impact of these messages, ensuring they are culturally relevant and appealing to the youth.

Fig.3 Recommendations to HEIs to engage about ABR to the community *made by authorship team

Further relevant SDGs

Addressing ABR aligns with several other SDGs beyond SDG3. AMR affects 12 of the 17 SDGs, some specific relevant SDGs include: SDG 6 (Clean Water and Sanitation) and SDG 12 (Responsible Consumption and Production) are relevant, as reducing environmental contamination from antibiotics and promoting sustainable practices in agriculture and medicine are crucial for combating ABR. Additionally, SDG 17 (Partnerships for the Goals) emphasizes the importance of multi-stakeholder collaborations, including HEIs, governments, and the private sector, in tackling global challenges like ABR.

Relevance to the 2030 Agenda

The fight against ABR aligns with the 2030 Agenda for Sustainable Development by supporting SDG3: good health, well-being, and sustainable development through collaborative, informed action. This integrated approach is crucial for achieving global health security and sustainable development, underscoring the importance of coordinated efforts to combat ABR on a global scale.

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