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The CEASE approach: A framework to tackle COVID-19 and other microbial threats

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Detail

Bio

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Dr Rahube is Senior Lecturer in the Department of Biological Sciences and Biotechnology at Botswana International University of Science and Technology (BIUST) in Palapye, Botswana. Teaches undergraduate and postgraduate Microbiology, and his research focus is on One Health Antimicrobial Resistance Surveillance, and Microbial Genomics.

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Personal Response

Who can use the CEASE approach, and how could it help to tackle the COVID-19 crisis, AMR and other microbial threats more effectively?

// CEASE approach is critical especially for African countries and can be used to further explore opportunities that can lead to improvements in sanitation, access to clean water, health care, education and infectious disease surveillance systems. The governments however, have a huge responsibility in the successful implementation of the CEASE approach, and this should begin with establishing robust multi-disciplinary teams of experts that deal strictly with microbial diseases. Funding research that is conducted locally can help to generate scientific evidence, dissemination of relevant information that can inform government policies for prediction, early response, prevention and control spread of microbial infectious diseases. //

The CEASE approach

A framework to tackle COVID-19 and other microbial threats

While the COVID-19 virus continues to spread in many countries worldwide, some researchers are investigating the implications of regularly using antimicrobial products and antibiotics, which could contribute to a concerning phenomenon known as antimicrobial resistance (AMR).

Dr Teddie Rahube at Botswana International University of Science and Technology has recently developed CEASE, an approach that addresses some of the challenges associated with the COVID-19 pandemic, as well as AMR and other microbial threats that could arise in the future.

For over a year now, people in different parts of the world have been facing a threatening and challenging health crisis, brought about by the spread of the new virus COVID-19. As there is still no desirable anti-viral treatment and a vaccine is yet to become widely available, most countries are still heavily relying on the use of chemical disinfectants, such as hand sanitisers and antimicrobial soaps, as well as existing antibiotic and anti-malarial treatments.

While they can partly prevent or reduce the spread of viruses and microbes, sanitizers and other antimicrobial products sometimes contain toxic ingredients that are known to persist in the environment. In addition, the widespread use of antimicrobial drugs such as antibiotics has been found to facilitate the occurrence of what is known as antimicrobial resistance (AMR).

AMR occurs when bacteria, viruses, parasites or other microbes evolve over time and develop the ability to fight off pharmaceutical drugs designed to kill them. This evolution, which is known to be partly caused by an exaggerated use of antibiotics or antimicrobials, makes microbes resistant to these drugs and thus far more difficult to treat. AMR can have serious consequences, as it can ultimately facilitate the spread of germs that cannot be exterminated using existing treatment strategies.

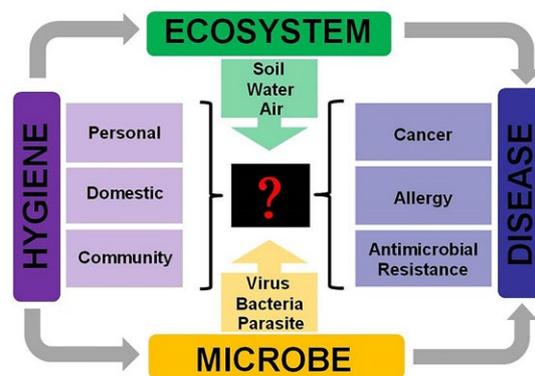
WHY THE INTENSIVE USE OF ANTIMICROBIALS COULD CONTRIBUTE TO AMR: THE HYGIENE HYPOTHESES

In 1989, David Strachan introduced the idea that 'excessive' hygiene could ultimately reduce people's exposure to essential microbes and thus weaken their immune system. For instance, he suggested that an increase in allergies, asthma and hay fever could be linked to a lower exposure to microorganisms in the environment during childhood. This is known as the 'hygiene hypothesis'. More recently, other researchers introduced an alternative hypothesis called 'targeted hygiene', which highlights the need to strike a balance between exposure to essential microbes and protection against harmful pathogens.

Both the hygiene and targeted hygiene hypotheses highlight the potential risks associated with the excessive use of antimicrobial products designed to kill or fight off germs and viruses. As the COVID-19 crisis has led to an extensive use of chemical disinfectants, antimicrobials and antibiotics, it might also contribute to a weakening of human immune systems and to the evolution of viruses or microbes to the point that they develop a resistance to existing treatments.

Many scientists worldwide are advocating for a unified approach to health and hygiene that takes into consideration the risks of excessive hygiene and antibiotic use (including those associated with

AMR), while also delineating measures that could be used to efficiently prevent and control the spread of COVID-19 and other viruses. Understanding microbes in relation to hygiene; use of chemical disinfectants and their implication to the ecosystem (soil, water, air) health and development of human diseases is vital.



The hygiene hypotheses linked to ecosystem, microbes and human disease.

THE CEASE APPROACH

After reviewing previous literature related to AMR and the potential implications of excessive hygiene, Dr Teddie Rahube devised a multi-dimensional approach called CEASE, which stands for 'Communicate Educate Advocate Socialize Experiment'. CEASE is designed to guide the dissemination of sustainable strategies for combating COVID-19, AMR and other threats to human health.

"The CEASE approach aims towards attaining a sustainable solution, not only for combating COVID-19 and AMR, but also to aid the prediction and ultimate prevention of future disease outbreaks that have the potential to be pandemics," Dr Rahube explained. "Failing to control emerging and re-emerging infectious diseases will periodically lead to pandemics, and questions of how we survive COVID-19 now and begin to deal with future pandemics or similar situations that are a threat to humankind need to be addressed immediately."

The CEASE approach spans across five different dimensions: communication, education, advocacy, socialization, and experimentation. These five elements could all play a crucial role in the fight against current and future microbial threats, including the COVID-19 pandemic.

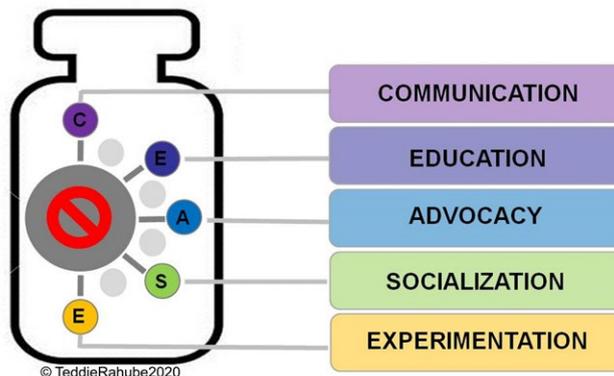
THE FIVE DIMENSIONS OF THE CEASE APPROACH

Communication, the first dimension covered by the CEASE approach, entails the exchange and dissemination of reliable information to the masses. Throughout the COVID-19 pandemic, people have been exposed to growing amounts of inaccurate scientific information, which led to great confusion and anxiety among the general public. The CEASE approach suggests that the first way to tackle the spread of COVID-19 and other microbial threats is to ensure that media platforms, including websites, social media sites, newspapers, magazines, radio stations, and TV channels, report information related to public health and medical issues reliably and responsibly.

The second component of the CEASE approach highlights the importance of educating members of the public on topics related to human health or disease. This could mean, for instance, offering services or courses that teach members of the public basic scientific concepts, helping them to understand what measures they can take to prevent the spread of COVID-19 and other microbial diseases.

Advocacy, the third part of the CEASE framework, focuses on activities aimed at influencing decisions related to socioeconomic or political issues, including those associated with public health. Organizations that can advocate for more responsible health-related strategies include the World Health Organization and a variety of other public, government-funded and private organizations. Scientific experts, such as microbiologists, medical practitioners and public health specialists, can also drive the implementation of strategies to prevent the outbreak of microbial threats.

The fourth element of the CEASE approach is socialization, which is defined as the process of internalizing



The CEASE approach spans across five different dimensions.

Dr Teddie Rahube devised a multi-dimensional approach called CEASE, which stands for 'Communicate Educate Advocate Socialize Experiment'.

norms and society-related ideologies. While cultural norms can vary significantly across different countries, they can also change over time based on the unique characteristics of specific historical periods. The CEASE approach highlights the importance of adapting societal norms to counteract virus outbreaks or other public health treats, such as AMR. The COVID-19 pandemic, for instance, has led to drastic changes in societal norms, for instance through the implementation of lockdown and social distancing measures.

The final dimension of CEASE is Experimentation, the process through which ideas and hypotheses are tested to gain a better understanding of scientific topics. Research and experimentation are of crucial importance for understanding the COVID-19 virus and how to tackle it, as well as to learn about other diseases or threats associated with the spread and evolution of germs and viruses.

A UNIVERSAL APPROACH TO COMBAT MICROBIAL THREATS

The new framework devised by Dr Rahube could help governments, organizations and individuals worldwide to navigate the COVID-19 pandemic and future microbial threats.

According to Dr Rahube, for the CEASE approach to be most effective, its five dimensions should be explored

simultaneously, receiving similar levels of attention.

While the outbreak of COVID-19 is the key focus of most current public health initiatives, it is important to continue exploring the risks associated with the excessive use of antibiotics and sanitisers, to prevent future microbial threats or reduce their impact.

"The WHO acknowledges that the extensive use and misuse of antibiotics in agricultural food production, human and veterinary medicine leads to antibiotic resistance, which is now considered one of the greatest human health threats," Dr Rahube. "Therefore, the use of antibiotics such as azithromycin for COVID-19 treatment should be avoided, as this could undermine the global antibiotic resistance stewardships aiming towards preserving antibiotics for therapeutic purposes."

By placing emphasis on reliable scientific communication, effective education of the masses, advocacy, socialization, and experimentation, the CEASE framework encourages the development of more sustainable solutions to face the COVID-19 pandemic, as well as future microbial threats. Moreover, the CEASE approach stresses the importance of working together and joining forces to ensure that public health issues are addressed as effectively, responsibly, and consistently as possible.

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