

Committee: United Nations Development Programme

Issue: Addressing the coronavirus pandemic in correlation with the issue of Antimicrobial Resistance

Student Officer: Eirini Angelouli

Position: Deputy President

PERSONAL INTRODUCTION

Dear Delegates,

My name is Eirini Angelouli, I will be serving as a Deputy President in this year's United Nations Development Programme of the 3rd DSTMUN and at the time of the conference I will be attending the 12th grade. Although I have been a Student Officer in the past, this time I am even more excited because this is where my MUN journey started, namely in the German School of Thessaloniki.

Furthermore, I am delighted to be part of this new committee, which, in my opinion, provides us with an amazing opportunity to tackle many important issues, that we also encountered ourselves. These specific topics are of utmost importance since they affect us directly. I am certain we are all familiar with the coronavirus pandemic and through this year's topics we will be able to provide a solution to many problems our world came and will come across due to the pandemic. Moreover, this year's agenda strives towards Peace, Justice, and Strong Institutions and addresses many important and demanding issues, which need to be resolved, because of their impact on a global scale.

More specifically, this study guide is dedicated to the third topic of this committee, which focuses on how Antimicrobial Resistance might affect the coronavirus pandemic in various ways. This is a very alarming issue, thus I anticipate our debate and hearing the solutions that you come up with.

Lastly, I would like to stress that this guide is for introductory purposes only and further research is necessary. Shall you have any questions on the topic or the study guide you are more than welcome to contact me through my email address (eirini.angelouli3@gmail.com).

I am looking forward to meeting you all and to our fruitful debate at the conference!

Sincerely,

Eirini Angelouli

TOPIC INTRODUCTION

Antimicrobial Resistance, also known as Antibiotic Resistance, is when bacteria are no longer responding to drugs designed to eradicate them. It is an ongoing threat for people and animals and swift action is necessary, to continue combating it. Ever since the creation of the first antibiotics, bacteria started acquiring resistance. Thus, antimicrobial resistance is one of the biggest medical challenges known to man. The creation of antibiotics needs to be constant and it is a time consuming and expensive procedure, but this is not an issue that scientists can fight on their own since individual action is also needed by everyone.

The coronavirus pandemic, on the other hand, is a brand-new issue that took everyone by surprise, made countries go into lockdown overnight, and turned the world, as we knew it, upside down. The well-known coronavirus is a deadly virus, which has affected most countries economically, medically, and socially. But unfortunately, the effects of Covid-19 do not end there. When Covid-19 gets involved with the AMR (Antimicrobial resistance) issue the situation becomes even more dangerous than we can imagine.



Figure 1: The streets of Paris during the lockdown

Firstly, however, we need to make the difference between a bacterial and a viral infection clear. Both are caused by microbes and spread similarly, but certain differences do exist, mostly when it comes to their treatment. Antibiotics are only effective against bacteria, while a vaccine is the only way to combat a virus. However, many doctors have difficulties understanding whether a patient is infected by a virus or a bacteria, so they carelessly prescribe them antibiotics, which can be extremely risky, because the patient's illness might not even be treated. The treatments of these infections are completely different, so how does the issue of antimicrobial resistance actually affect the coronavirus pandemic?

Ever since the pandemic started, most if not all scientists and medical researchers are striving towards the creation of a vaccine that can successfully eliminate the coronavirus. Thus, most research that was being conducted to combat antimicrobial resistance and create new antibiotics has been put on hold, but bacteria continue becoming more resistant and harder to combat.

This is important for several reasons. Firstly, one in seven Covid-19 patients has had secondary bacterial infections, because their immune system weakens, and it is now exposed to other pathogens. 50% of patients, who have died because of

Covid-19, were also infected by those secondary bacterial infections.¹ It is unclear if those bacterial infections have any impact on Covid-19. Secondly, since antibiotics are often used to prevent bacterial infections, their use has significantly increased and that causes the emergence of resistant bacteria. So even if a vaccine for the coronavirus is created, the AMR issue will be drastically impacted.

In conclusion, what this committee strives to achieve is to find a method for both pieces of research to be conducted successfully without neglecting either. So our committee will need to take into consideration both Covid-19, which spreads way too quickly and has already killed thousands as well as the AMR issue, which has been a global threat for almost a century and is estimated to be killing approximately 700.000 people annually.²

DEFINITION OF KEY TERMS

Antimicrobial Resistance

Antimicrobial resistance occurs when microorganisms such as bacteria, viruses, fungi, and parasites change in ways that render the medication used to cure the infections they cause ineffective.³

Antimicrobial

An antimicrobial product. Antimicrobials are generally regulated into two categories—those used on inanimate objects and those used in or on living things, as antibiotics or hand sanitizers. Any product that kills bacteria or viruses is an antimicrobial, but that doesn't mean any antimicrobial will kill both bacteria and viruses.⁴

Pandemic

An outbreak of a disease that occurs over a wide geographic area and affects an exceptionally high proportion of the population.⁵

¹ "COVID-19 And AMR – What Do We Know So Far? – 2020 – React". *Reactgroup.Org*, 2020, <https://www.reactgroup.org/news-and-views/news-and-opinions/year-2020/covid-19-and-amr-what-do-we-know-so-far/>.

² "Drug-Resistant Superbugs: A Global Threat Intensified By The Fight Against Coronavirus". *The Conversation*, 2020, <https://theconversation.com/drug-resistant-superbugs-a-global-threat-intensified-by-the-fight-against-coronavirus-135790>.

³ "What Is Antimicrobial Resistance?". *World Health Organization*, 2020, <https://www.who.int/features/qa/75/en/>.

⁴ "Definition Of Antimicrobial | Dictionary.Com". *Www.Dictionary.Com*, 2020, <https://www.dictionary.com/browse/antimicrobial>.

⁵ "Definition Of PANDEMIC". *Merriam-Webster.Com*, 2020, <https://www.merriam-webster.com/dictionary/pandemic>.

Antibiotics

A drug used to treat bacterial infections.⁶

Covid-19

Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus.⁷ It is also defined as a potentially severe respiratory illness caused by a coronavirus and characterized by fever, coughing, and shortness of breath.⁸

Acquired Resistance

Acquired resistance occurs when a particular microorganism obtains the ability to resist the activity of an antimicrobial agent to which it was previously susceptible.⁹

BACKGROUND INFORMATION

Historical Background of Antibiotics

Back in the early 1900s people had no medicine to fight against diseases that are now common and simple to us. Some of the bacteria could be fought by the body's immune system, but there were still many strong microbes that could not be combated. In the pre-antibiotic era, 90% of children with bacterial meningitis died and the ones who survived had severe and lasting disabilities.¹⁰

A few years later, in the 1920s, the British scientist Alexander Fleming invented almost by accident the first antibiotic, a naturally growing substance that could attack certain bacteria. In his experiments in 1928, he observed how this new mold made substance could eliminate or kill colonies of the common *Staphylococcus aureus* bacteria. Fleming named that substance Penicillin and continued experimenting with it for the next two decades to remove the mold from it and only have penicillin.

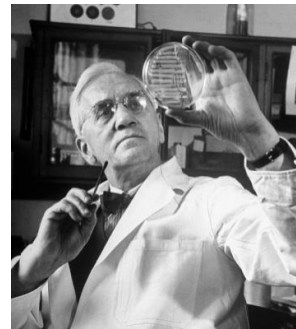


Figure 2: Alexander Fleming

⁶"Definition Of Antimicrobial | Dictionary.Com". *Www.Dictionary.Com*, 2020, <https://www.dictionary.com/browse/antimicrobial?s=t>.

⁷"Coronavirus". *Who.Int*, 2020, https://www.who.int/health-topics/coronavirus#tab=tab_1.

⁸"Definition Of Covid-19 | Dictionary.Com". *Www.Dictionary.Com*, 2020, <https://www.dictionary.com/browse/covid-19#>.

⁹"Acquired Resistance". *Wiki.Ecdc.Europa.Eu*, 2020, <https://wiki.ecdc.europa.eu/fem/Pages/Acquired%20resistance.aspx>.

¹⁰"The History Of Antibiotics". *Healthychildren.Org*, 2020, <https://www.healthychildren.org/English/health-issues/conditions/treatments/Pages/The-History-of-Antibiotics.aspx>.



Figure 3: The discovery of Penicillin

Other European and American researchers heard about his discoveries and soon after they also started experimenting with penicillin. They made enough of it to start testing it on animals and humans. In 1941 scientists confirmed that even low levels of penicillin could cure many serious infections. A few years later, in 1945, Fleming won a Nobel Prize, for his great scientific discovery.

Drug companies' attention was quickly captivated by Fleming's discovery and started mass producing it. Penicillin was soon introduced on a large scale to the world for bacterial infections after efficiently being purified. Once it became publicly accessible after World War II, it was hailed by newspapers and radio stations as a "miracle drug". It was a worldwide success and scientists quickly began trying to create the next antibiotic.

Penicillin Resistance

Unfortunately, Penicillin didn't live up to the title that it was given. The "miracle drug" almost immediately lost its effect on bacteria. In 1940, before Penicillin was even available to customers, the first indication of antibiotic resistance to it was reported, an *E. coli* (a type of bacteria that normally lives in your intestines) had acquired resistance and could now break down penicillin and completely negate its antibacterial effect. *Staphylococcus aureus* also became resistant to penicillin two years later. Nowadays most bacteria are resistant to Penicillin.

How bacteria acquire resistance

Most antibiotics insert a patient's body and only kill some of the bacteria, the non-resistant, and the beneficial ones. The beneficial ones are killed because they as well have no resistance towards antibiotics and unfortunately get eradicated in the process of the patient's treatment. The ones remaining are either already resistant or they now adapt and become resistant to the new antibiotic. They survive and spread throughout the whole body. Those bacteria that have acquired resistance can now infect other people and pass information to other germs.

Modern Issues with Antibiotics

Numerous issues also need to be tackled when it comes to the use of antibiotics. The most important ones are explained in the following sections.

Overuse of Antibiotics in Industrial Farming

The main method that farmers use to give antibiotics to their animals is through their food and water. Most of the time they use more medicine than it is needed and the excess they toss away into fields or waterways. This gives the antibiotics the chance to escape into the natural environment and allows them to enhance their spread of resistant genes in microbial communities.

Another issue that arises in farms is that farmers start distributing antibiotics to all their animals when only one or a few become sick, as a preventative measure. Many factory farms may use antibiotics because of their weight gaining effect. All these have led to 70% of all antibiotics in the USA being sold for livestock.¹¹ Thus, the constant use of antibiotics increases the chances of bacteria becoming resistant. Sadly this also affects humans directly, since such bacterial infection can be transmitted from animals to humans, not only when humans come to contact with them but also when consuming meat.

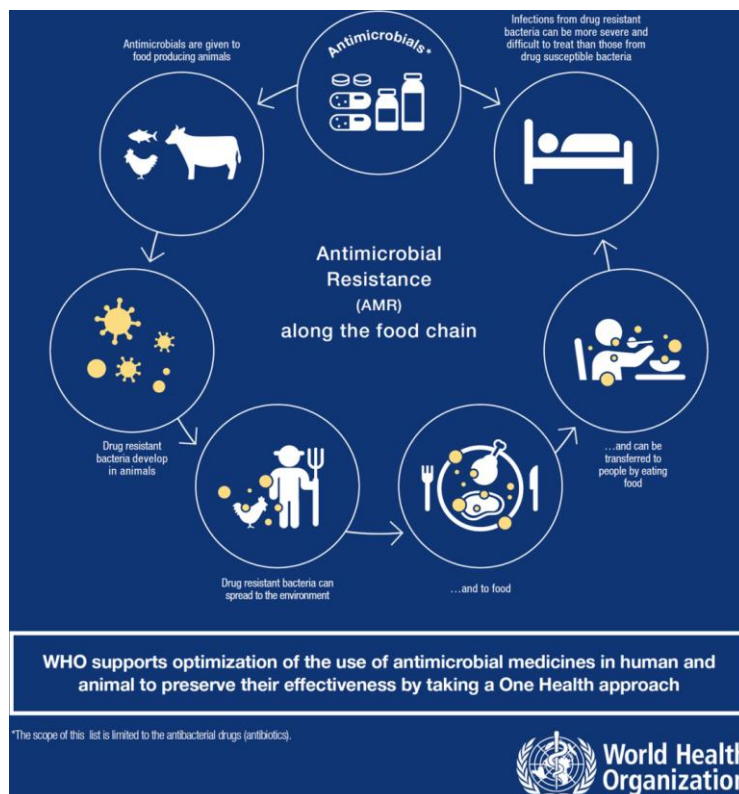


Figure 3: Antimicrobial Resistance along the food chain. WHO

¹¹ "Stop The Overuse Of Antibiotics On Factory Farms | CALPIRG". *Calpirg.Org*, 2020, <https://calpirg.org/issues/cap/stop-overuse-antibiotics-factory-farms-0>.

Overprescribing Antibiotics

Doctors tend to prescribe more antibiotics than the ones needed, and patients also overuse them even without a prescription. This is another reason why bacteria became resistant so quickly to antibiotics. Taking for example sore throat, which is a symptom that could be appearing because of strep throat (a bacterial infection), but it can also be a symptom of a virus or an allergy. But patients either self-diagnose themselves wrongly because of the internet or doctors prescribe it without further examination of the patient's symptoms.

This creates two issues, firstly the bacteria now have a new chance to become resistant and secondly, the patient's illness is not cured. Furthermore, it specifically concerns LEDCs, which most times don't have access to many other medical supplies, and people also can't afford different treatments, so doctors simply prescribe them with antibiotics.

Economic Issues

When antibiotics were first created, they were able to fight against all bacterial infections, now the newer antibiotics can only cure a few bacterial diseases. This may not seem like a big issue at first, but it affected how pharmaceutical companies viewed antibiotics.

Antibiotics were a big success when it came to sales. They were overprescribed and they sold rapidly. This encouraged scientists and companies to fund research towards their creation and manufacturing since it brought in a huge income. Nowadays, since most new antibiotics can only cure some bacterial diseases, it is not beneficial to pharmaceutical companies to try to create or sell them, since fewer doses are needed. Medicine such as blood-pressure and anti-anxiety medications became more appealing since they are medicines that are used indefinitely and not only once.

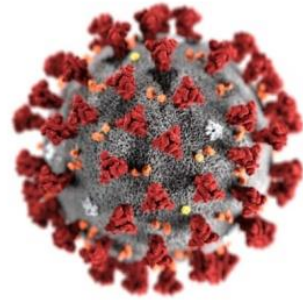
This resulted in most big pharmaceutical companies to stop any attempts at creating new antibiotics. So, there were only a few small companies that still believed they could provide the world with a new much-needed antibiotic. Unfortunately, most of them go bankrupt not long after, such as "Achaogen". This leaves us with the biggest issue when it comes to antibiotic development, which is funding.

Covid-19

COVID-19 is a zoonotic virus that took the whole world by storm. It began spreading in late 2019 from a Chinese seafood market in Huanan. This

virus appears to be related to two other deadly coronaviruses that originated in bats. However, there is uncertainty when it comes to the Covid-19 origin story, which experts are still trying to unravel.

Coronaviruses seem to have been around us for a long time, with only light symptoms similar to a common cold. Covid-19, which comes from the Sars-CoV-2 virus, is much more serious than the previous ones. Since it affects everyone on a global scale the creation of a vaccine to combat it is currently every scientist's



dream since it would largely benefit them economically and socially. There is also no doubt that the world would also be highly benefited by such a vaccine, but with all this attention on Covid-19, bacteria have the biggest chance now more than ever to become even more resistant.

Figure 4: The Corona Virus

The correlation with Covid-19

The correlation between the coronavirus pandemic and antimicrobial resistance may not seem clear at first but in reality, Covid-19 has had a huge impact on AMR:

Infections by both Covid-19 and Bacteria

Secondary bacterial infections were firstly observed near the end of January when a Chinese hospital noticed that half the patients that died because of Covid-19 were also infected by a secondary bacterial infection. This made countries that were facing issues with antimicrobial resistance even more worried about the disease. However, it remains unclear whether the antibiotics were ineffective because they were resistant or because the patients were so weak that death was inevitable.

Research and funding

When it comes to research the whole world is currently focused on the development of a vaccine for Covid-19 since it is a new and "exciting" issue. This, however, resulted in all the funding for research to be provided towards the scientists trying to develop the cure for the coronavirus. Undoubtedly, it is a very much needed vaccine and the scientists that achieve its development would be rewarded with huge success for them, career-wise. So, it is understandable that everyone would strive for its creation, but this makes the already existing issue of AMR even worse.

There is never any funding when it comes to tackling the issue of antimicrobial resistance. Now more than ever nobody would fund research toward the creation of antibiotics and preventing bacteria from acquiring resistance when the vaccine for Covid-19 is far more profitable. However there needs to be a balance and people should not neglect antibiotics, because their impact might be far worse in the long run. According to studies the deaths caused by AMR are estimated to be approximately 10.000.000 by 2050, so when it comes to AMR the world needs to act quickly and effectively because time is certainly running out.¹²

MAJOR COUNTRIES AND ORGANISATIONS INVOLVED

The United States of America

The United States of America has already created a National Strategy for Combating Resistant Bacteria and has been implementing it since 2014. This National Strategy has many guiding principles to tackle the issue of AMR, such as encouraging the development of more therapies and drugs and recognizing that this issue needs global attention. Furthermore, some of its main goals are to advance the development of antibiotics, to stop bacteria from becoming resistant, and to improve international collaboration.

However, when the USA had to face the threat of Covid-19 they reacted rather slowly and underestimated the disastrous effect that the pandemic would have on the country. The USA is now the leading country in both Covid-19 cases and deaths and it does not seem to be slowing down any time soon.

The United Kingdom

The UK is currently implementing a 5-year and 20-year national action plan to combat the AMR issue. The 5-year plan started in 2013 and finished in 2018, its goal was to set a basis for the 20-year plan which strives to have completely controlled and contained the AMR issue by 2040. The plan is so far coming along, and the UK has successfully started to raise awareness over this global threat. The UK has also partnered with China, since May 2019, to collaborate on tackling the AMR issue.

The reaction from the UK when it came to Covid-19 was relatively slow. The country had finally exited the European Union on the 31st of January and the political leaders were celebrating their achievement. Boris Johnson was preparing for his next move in the now independent UK and was overconfident in his actions. So while he was focused on polishing a few last issues that were left open after Brexit, the death

¹² "Drug-Resistant Superbugs: A Global Threat Intensified By The Fight Against Coronavirus". *The Conversation*, 2020, <https://theconversation.com/drug-resistant-superbugs-a-global-threat-intensified-by-the-fight-against-coronavirus-135790>.

of Li in Wuhan was UK's awakening call. On the 13th of February, the prime minister and his team started working on ways to combat the pandemic. After the first many cases were confirmed the country went into lockdown and the economy is now facing detrimental damages.

The European Union

The EU has been implementing the EU One Health Plan against AMR since 2017. The plan's goal is to make the EU an excellent practice region, where the appropriate use of antibiotics must be practiced. Secondly, the EU also focuses on boosting research, development, and innovation, and thirdly the EU wants to create a global agenda, to tackle this global threat.

China

China is the country most affected by the pandemic. The virus originated in China, so there now is a huge stigma around its people. Rather than that from an AMR point of view, China is one of the biggest pharmaceutical powers in the world, it is the third country with the most medicine exports. Seeing also how quickly China jumped back on its feet after Covid-19, by taking many needed measures and also by its medical powers, it seems like China could provide a huge amount of assistance when it comes to AMR.

Actions are taken by China such as raising awareness, but most importantly by the Antimicrobial Resistance Partnership Hub that launched in 2019. Together the UK and China are trying to tackle the AMR issues with several methods, such as research.

Thailand

Thailand is currently facing a huge issue with Gonorrhoea. The bacteria responsible for Gonorrhoea are transmitted through unprotected sexual contact, the treatment is antibiotics, but there seem to be an increasing amount of drug-resistant strains in Gonorrhoea. Today 90% of all Gonorrhoea strains are resistant to antibiotics. So as long as a treatment is developed, Gonorrhoea will continue thriving in Thailand.¹³ Although many programs were implemented, and many new rules were being applied, this disease will never stop torturing the people of Thailand if a new antibiotic is not developed.

¹³ "Gonorrhoea In Thailand - Microbewiki". *Microbewiki.Kenyon.Edu*, 2020, https://microbewiki.kenyon.edu/index.php/Gonorrhoea_in_Thailand.

Israel

Israel is the first country to have, allegedly, successfully tested a coronavirus vaccine. An Israeli lab used rodents to conduct the tests, which was extremely successful and is now slowly starting to test on animals and humans. They expect the vaccine to be ready in 2021.

The World Health Organization

The World Health Organization has made numerous attempts to not only raise awareness over the AMR issue but to also combat it directly. It is also a leading organization when it comes to Covid-19. WHO helps fund research and also reports on what is happening, concerning new and treatments.

The Centers for Disease Control and Prevention

The Centers for Disease Control and Prevention is another organization that funds research and reports on facts on diseases. As far as AMR is concerned, CDC provides everyone with up to date data on antimicrobial resistance. CDC also is a leading organization in raising awareness, since they've created multiple quick videos that explain thoroughly and in simple terms the dangers of different diseases, health issues, and also antibiotic resistance.

BLOCS EXPECTED

In this topic, two blocs are expected. On the one side, the More Economically Developed Countries, which are able and willing to fund and conduct the research towards the creation of antibiotics and the vaccine against Covid-19. Such countries are the USA, the UK, the Russian Federation, China, and many more. Together with the MEDCs, there will be countries that are strong pharmaceutical powers, such as Israel and Japan, which can be beneficial when it comes to research. On the other side, there will be the Less Economically Developed Countries, such as Afghanistan and Myanmar, which are unable to fund research and in this bloc countries that have difficulty accessing medicine will be included, such as Sub-Saharan African and Southern Asian countries

TIMELINE OF EVENTS

Date	Description of event
1928	The creation of Penicillin.
1940	Bacteria started becoming resistant to Penicillin, specifically E. coli was the first bacteria to have acquired resistance.

1945	Penicillin was introduced on a large scale, by efficiently purifying the medicine by Florey and Chain. Fleming won a Nobel prize and, in his speech, warned the world about the issue of AMR and how it can make this revolutionary discovery a nightmare.
1945-1962	The golden era of antibiotics. Most effective antibiotics that we still use to this day were created then.
2013	There are now only four pharmaceutical companies with the antibiotic division.
December 2019	The COVID-19 first report in the seafood market in China.
January-March 2020	The global spread of Covid-19.
May 2020	Israel successfully tested its cure on COVID-19 on roaches.

RELEVANT RESOLUTIONS, TREATIES, AND EVENTS

World Health Organization Resolution

The World Health Organization has been trying to resolve the issue of AMR ever since 1998 with its resolution on “emerging and other communicable diseases: antimicrobial resistance”. Since then 5 more resolutions were implemented on antimicrobial use and resistance, the latest being from 2015, the resolution on AMR, which introduces the draft global action plan on antimicrobial resistance.

The Interagency Coordination Group (IACG) on Antimicrobial Resistance

The United Nations Secretary General established the Interagency Coordination Group on Antimicrobial Resistance in 2016. The IACG has been working with international organizations and experts in order to create a global plan to combat the antimicrobial resistance issue and to provide guidance for approaches needed to ensure it. On the 29th of April 2019, the IACG completed its mandate and handed its report to the Secretary General.

Treaties

An attempt was made in 2017 towards the establishment of a treaty that aimed towards tackling antimicrobial resistance. The treaties’ main goal was to create flexible provisions to reduce the use of antibiotics, to provide incentives for

countries to participate and to establish a system that reports and monitors the use of antibiotics. The treaty was unfortunately never established but there are records of this attempt on the Center for Global Development.

Events

Ever since 2017, multiple events have taken place, for instance in November 2019 the EU dedicated a day towards Antibiotic Awareness. Previously there have been many other events such as the one mentioned above, that all were trying to raise awareness on AMR issues, for example, workshops and meetings, which focused on strengthening partnerships in the fight against AMR.

Furthermore, the Antibiotic Awareness Week was established in 2015 and has been held for every November ever since, by the World Health Organization. Its aim is to raise awareness on AMR and promote the proper use of antibiotics.

PREVIOUS ATTEMPTS TO SOLVE THE ISSUE

Global Action Plan on Antimicrobial Resistance

The Global Action Plan on Antimicrobial Resistance came into force after the 68th World Health Assembly in 2015. It sets five strategic objectives, improves the awareness, strengthens knowledge, reduces the incidence of infection, optimizes the use of antibiotics, and develops an economic case for sustainable investment. Many previous plans were taken into consideration to come to this plan and were also guided by the advice of several countries at different global and regional forums.

POSSIBLE SOLUTIONS

Stricter medical rules when it comes to antibiotic prescription

Antibiotics have been prescribed carelessly and in large amounts for decades. Therefore stricter measures need to be applied in the medical and pharmaceutical fields. Doctors need to be more careful when prescribing antibiotics, firstly concerning the number of antibiotics, they are providing a patient with and secondly the medical experts need to be 100% sure that their patient is suffering from a bacterial infection and not a virus. On the other hand, pharmacies also need to have stricter measures implemented since farmers are buying huge amounts of antibiotics and give them to animals for their benefit.

Stricter checks to tackle the overuse of antibiotics for livestock

What is also very important is the monitored use of antibiotics for livestock. Many times, antibiotics are needed to treat bacterial diseases, but there should be certain boundaries. Firstly, the animals should be provided with antibiotics in other

ways, rather than through their food and water, so that they can be sure the antibiotics will not later on find room to grow and become resistant in waterways and fields. If that is not possible, farmers should make sure that the food, in which the antibiotic was provided, is not thrown to their farms or waterways. That food should be thrown out in a place, where bacteria are unable to reach our natural environment.

Raising awareness

Raising awareness, although it may seem cliché, is the best solution to this issue because individual action is needed to resolve it. By raising awareness of the dangers that AMR has on people's lives, we can alarm everyone to take action and be responsible for their bodies. Awareness can be raised by informing the public through the media, the news, documentaries, workshops in the schools and the workplaces and advertisements about the deadly consequences antimicrobial resistance can have and by what they can do to keep themselves safe.

Raising awareness is also needed when it comes to the coronavirus pandemic, however, in this particular case, the problem lays elsewhere. In this pandemic, there have been numerous articles, posts and tweets posted on how to stay safe, but unfortunately, most of it is false information or simply spreads panic. What should happen is that the public should be provided only with accurate information and sources for them to educate themselves.

Furthermore, it is equally important for the public to be aware of the dangers of both AMR and Covid-19 and how those two are correlated. This is a tricky and difficult concept to grasp because the two issues are not directly connected, are affected by completely different circumstances and overall seem to not have any effect on each other. So although it is a hard topic to explain and understand, that is not an excuse for it to be neglected by the government and the media. In this case, presenting the issue in more mainstream media and news channels is needed in order to raise awareness, because unfortunately only a few small medical newspapers and websites have picked up on the danger these issues bring when correlated. This way the topic can get more attention and people will start taking individual action.

Global cooperation

Another important aspect of this issue is the need for global cooperation. Even if a few countries solve this issue, there is still global trade that affects everyone. Countries need to come together to firstly fund research, raise awareness, and help each other tackle this problem. If not, then it will never truly stop being a threat to everyone.

Funding towards research for the creation of antibiotics and other ways to tackle AMR

Through funding from organizations and MEDCs, many countries could focus on the creation of antibiotic development methods, without however neglecting the creation of a vaccine against Covid-19. Moreover, a subscription system can be established for the purchase of antibiotics. Through these methods, pharmaceutical companies could have the reassurance that they won't end up bankrupt, due to the fact that their employees will be able to continue their job without the fear of unemployment while antibiotics constitute a one time purchase. Furthermore, countries that can't access antibiotics will benefit tremendously through such funding.

Pandemic Playbook

A pandemic playbook is a draft plan that needs to be prepared before a pandemic becomes a threat to the country and it will provide multiple strategies that can be used if a pandemic occurs. Such a playbook needs to be created by a government and can be passed on to the next political leader. Through the implementation of a pandemic playbook, countries can be ready to combat any pandemics or epidemic that might happen. This will prepare countries for future crisis and action plans. It will help tackle future pandemic immediately and prevent its spread.

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