WORLD HEALTH ORGANIZATION

Introduction

Greetings, delegates!

I'm Nanditha Dileep, and I'm delighted to serve as the chair of the World Health Organization for NMMUN 2021.

Being a delegate is especially challenging, and involves an unimaginable amount of research. This background guide is an introduction to the issue, and will further aid you in your research. I suggest that you start your preparation as soon as possible. Although this background guide covers the issues at hand, I strongly recommend not relying exclusively on this document as other research must be done too.

In every council, each delegate and their country play their own unique role, and contribute in their own way to the session. Each of you will play a vital part in the functioning of the council. As a delegate, you must be well prepared with your issues, factually accurate, open-minded, and confident enough to convince a gathering of inflexible delegates. You must consider all aspects of the issue and come to a resolution which leads to the platform for further development of all the nations.

While this background guide covers the basics, do not limit your research to the subtopics mentioned here. As delegates, you must consider all dimensions of the issue, and research on key aspects like your country policy, how your country has been affected by the issue, and the general status of all member states of this council.

I look forward to a great conference, and hope to see some exciting debate. Please do not hesitate to contact me in case of any doubts or questions.

Regards,
Nanditha Dileep
Chair- WHO

Committee overview

History

World Health Organization (WHO),is a specialized agency of the United Nations (UN) established in 1948 to further international cooperation for improved public health conditions. Although it inherited specific tasks relating to epidemic control, quarantine measures, and drug standardization from the Health Organization of the League of Nations (set up in 1923) and the International Office of Public Health at Paris (established in 1907), WHO was given a broad mandate under its constitution to promote the attainment of “the highest possible level of health” by all peoples. WHO defines health positively as “a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.” Each year WHO celebrates its date of establishment, April 7, 1948, as World Health Day

Mandate

The WHO's broad mandate includes advocating for universal healthcare, monitoring public health risks, coordinating responses to health emergencies, and promoting human health and well being. It provides technical assistance to countries, sets international health standards and guidelines, and collects data on global health issues through the World Health Survey. Its flagship publication, the World Health Report, provides expert assessments of global health topics and health statistics on all nations. The WHO also serves as a forum for summits and discussions on health issues

Functions and Power

The World Health Organization provides global leadership in public health within the United Nations system. Founded in 1948, WHO works with 194 Member States, across six regions and from more than 150 offices, to promote health, keep the world safe and serve the vulnerable. Its goals for 2019-2023 are to ensure that a billion more people have universal health coverage, to protect a billion more people from health emergencies, and to provide a further billion people with better health and well-being.

WHO's main functions can be summed up as follows: to act as a directing and coordinating authority on international health work, to ensure valid and productive technical cooperation, and to promote research.

The objective of WHO is the attainment by all peoples of the highest possible level of health. Health, as defined in the WHO Constitution, is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity. In support of its main objective, the organization has a wide range of functions, including the following:

- To act as the directing and coordinating authority on international health work;
- To promote technical cooperation;
- To assist Governments, upon request, in strengthening health services;
- To furnish appropriate technical assistance and, in emergencies, necessary aid, upon the request or acceptance of Governments;
- To stimulate and advance work on the prevention and control of epidemic, endemic, and other diseases;
- To promote, in cooperation with other specialized agencies where necessary, the improvement of nutrition, housing, sanitation, recreation, economic or working conditions, and other aspects of environmental hygiene;
- To promote and coordinate biomedical and health services research;
- To promote improved standards of teaching and training in the health, medical and related professions;
- To establish and stimulate the establishment of international standards for biological, pharmaceutical, and similar products, and to standardize diagnostic procedures;
- To foster activities in the field of mental health, especially those activities affecting the harmony of human relations.

WHO also proposes conventions, agreements, and regulations and makes recommendations about international nomenclature of diseases, causes of death, and public health practices. It develops, establishes, and promotes international standards concerning foods and biological, pharmaceutical, and similar substances.

Introduction to agenda

The rapid emergence of resistant bacteria is occurring worldwide, endangering the efficacy of antibiotics, which have transformed medicine and saved millions of lives. Many decades after the first patients were treated with antibiotics, bacterial infections have again become a threat. Antimicrobial resistance threatens the world as we know it, and can lead to epidemics of enormous proportions if preventive actions are not taken. In this day and age current antimicrobial resistance leads to longer hospital stays, higher medical costs, and increased mortality.

The antibiotic resistance crisis has been attributed to the overuse and misuse of these medications, as well as a lack of new drug development by the pharmaceutical industry due to reduced economic incentives and challenging regulatory requirements. Coordinated efforts to implement new policies, renew research efforts, and pursue steps to manage the crisis are greatly needed.

Key terms and concepts

Antimicrobials

Antimicrobials - including antibiotics, antivirals, antifungals and antiparasitics - are medicines used to prevent and treat infections in humans, animals and plants. They help fight and prevent the effects of different microorganisms and microbes.

Antibiotic

The term antibiotic refers to a type of antimicrobial substance which is active against bacteria. It is widely used as a type of antibacterial agent for fighting against bacterial infections, and helps in the treatment and prevention of such infections. They may either kill or inhibit the growth of bacteria. A limited number of antibiotics also possess antiprotozoal activity.

Antimicrobial Resistance

Antimicrobial resistance refers to the phenomenon of microbes evolving mechanisms that protect them from the effects of antimicrobials. Resistant microbes are more difficult to treat, requiring higher doses, or alternative medications which may prove more toxic. These approaches may also be more expensive.
Antimicrobial resistance can take place in all microorganisms, with fungi evolving antifungal resistance,viruses evolving antiviral resistance and Protozoa evolving antiprotozoal resistance, and bacteria evolve antibiotic resistance.

Multidrug resistants

Microbes resistant to multiple antimicrobials are called multidrug resistant (MDR).

Superbug

When the microorganisms become resistant to most antimicrobials they are often referred to as “superbugs”.

Recreational drug use

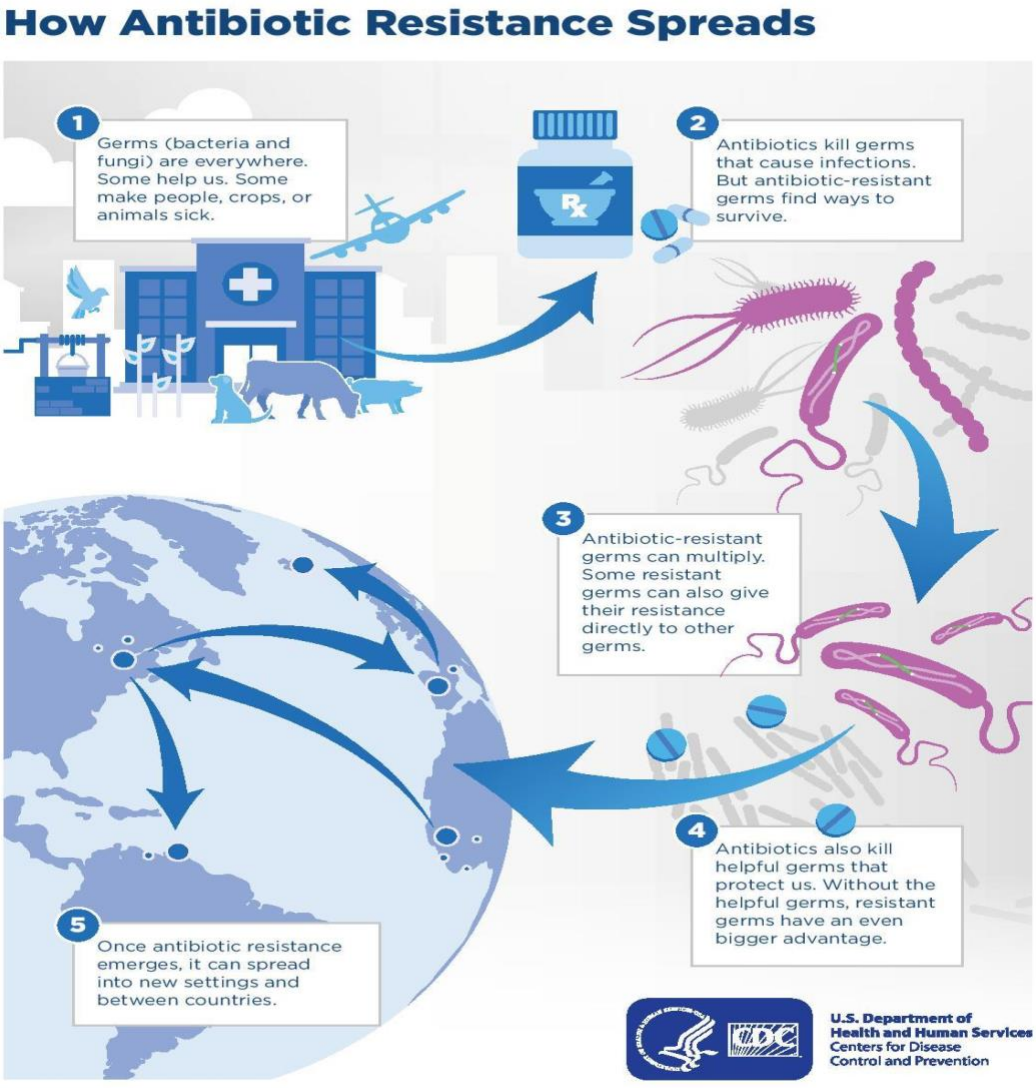
Recreational drug use is the use of a psychoactive drug to induce an altered state of consciousness, by modifying the perceptions, feelings, and emotions of the user. When a psychoactive drug enters the user's body, it induces an intoxicating effect.

Self-medication

Self-medication is a human behavior in which an individual uses a substance or any exogenous influence to self-administer treatment for physical or psychological ailments.

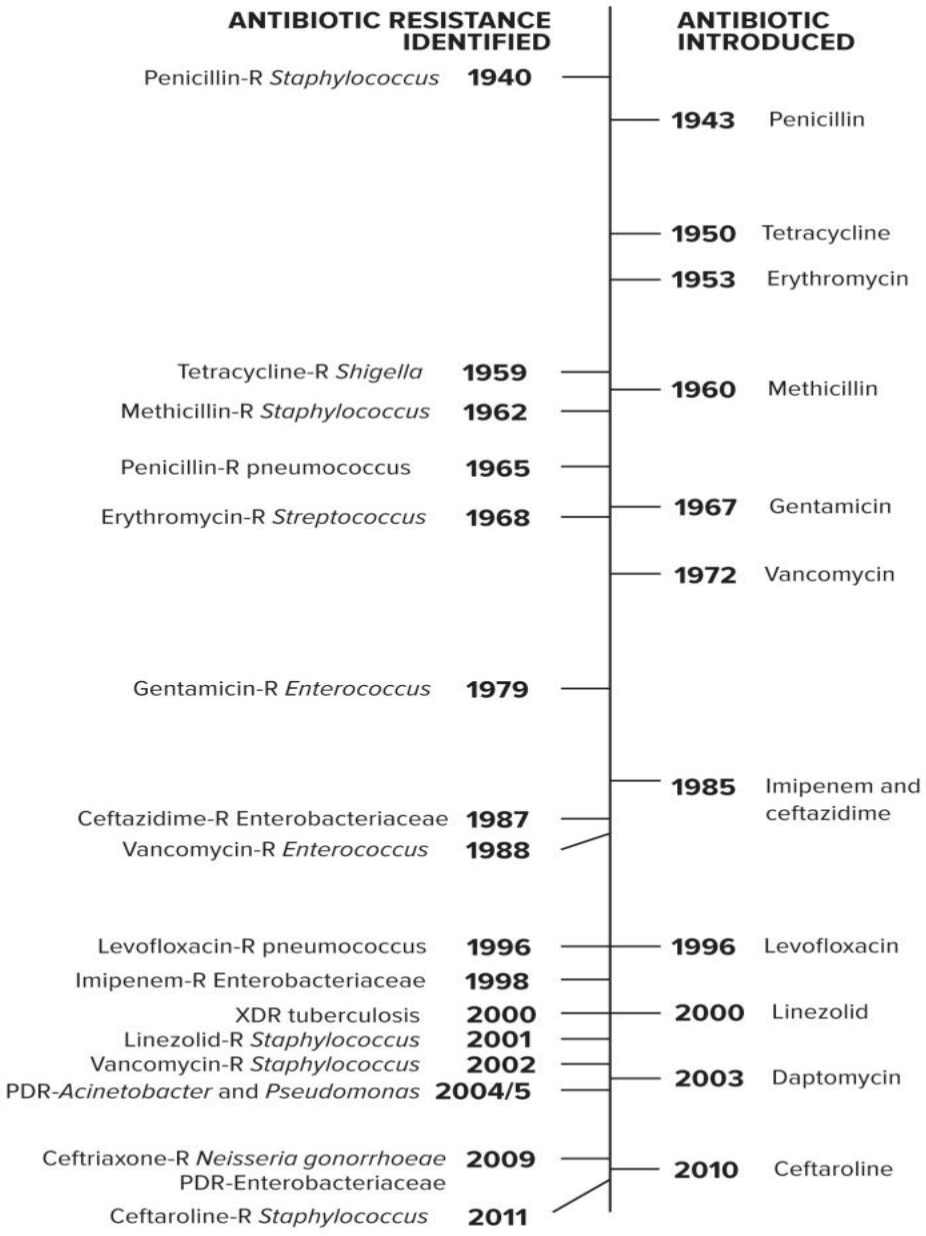
How do microbes develop antimicrobial resistance?

Antimicrobial resistance occurs when bacteria, viruses, fungi and parasites change over time and no longer respond to medicines making infections harder to treat and increasing the risk of disease spread, severe illness and death. As a result, the medicines become ineffective and infections persist in the body, increasing the risk of spread to others. This is a major concern because a resistant infection may kill, can spread to others, and imposes huge costs to individuals and society.



Timeline of events

Figure 1 Developing Antibiotic Resistance: A Timeline of Key Events[5]



PDR = pan-drug-resistant; R = resistant; XDR = extensively drug-resistant

Dates are based upon early reports of resistance in the literature. In the case of pan-drug-resistant *Acinetobacter* and *Pseudomonas*, the date is based upon reports of health care transmission or outbreaks. Note: penicillin was in limited use prior to widespread population usage in 1943.

Background of the issue

Starting with the discovery of penicillin in 1928, medical researchers developed the capacity to treat the dangerous infections that have plagued humankind for millennia. Ever since, there has been discovery and acknowledgement of resistance alongside the discovery of new antibiotics. In fact, germs will always look for ways to survive and resist new drugs. More and more, germs are sharing their resistance with one another, making it harder for us to keep up.

For two decades, starting in the 1950s, the creation of a range of new antimicrobials proved lifesaving for many. But increased use and misuse of antimicrobials over the years has allowed some pathogens to withstand available treatments, thus prolonging and intensifying human infections.

Multiple factors lead to antimicrobial resistance: overuse (i.e., prescribing antibiotics for conditions such as viral infections, on which the drugs have no effect); inappropriate use (i.e., not taking the right drug at the right time for the full duration, allowing some pathogens to survive treatment); excessively broad reliance in food animals; presence of antibiotics in wastewater where the drugs accumulate from human and animal waste; and, in some countries, drug manufacturing runoff. Another driver of AMR is the increased availability of antimicrobials in developing countries with inadequate control mechanisms.

Antimicrobial Resistance has multiple dimensions:

a) Antimicrobial Resistance in man
b) Antimicrobial Resistance in food animals
c) Antimicrobial Resistance in the environment

Causes of Antimicrobial Resistance

Overuse of antibiotics:

There is a direct relationship between antibiotic consumption and the emergence and dissemination of resistant bacteria strains. Resistance can also occur spontaneously through mutation. Overuse of antibiotics is creating stronger germs. Some bacteria are already "resistant" to common antibiotics. When bacteria become resistant to antibiotics, it is often harder and more expensive to

treat the infection. Losing the ability to treat serious bacterial infections is a major threat to public health.

Inappropriate Prescribing

Incorrectly prescribed antibiotics also contribute to the promotion of resistant bacteria.Studies have shown that treatment indication, choice of agent, or duration of antibiotic therapy is incorrect in 30% to 50% of cases. Antibiotic overprescribing is most prominent in outpatient settings such as clinics and emergency departments. In Europe, approximately 80% to 90% of antibiotic prescriptions are written by general practitioners. Risks of antibiotic overprescribing include not only increases in antibiotic resistance, but increases in disease severity, disease length, health complications and adverse effects, risk of death, healthcare costs, re-hospitalization, and need for medical treatment of health problems that previously may have resolved on their own.

Extensive Agricultural Use

In both the developed and developing world, antibiotics are widely used as growth supplements in livestock.Treating livestock with antimicrobials is said to improve the overall health of the animals, producing larger yields and a higher-quality product.

The antibiotics used in livestock are ingested by humans when they consume food. This occurs through the following sequence of events: 1) antibiotic use in food-producing animals kills or suppresses susceptible bacteria, allowing antibiotic-resistant bacteria to thrive; 2) resistant bacteria are transmitted to humans through the food supply; 3) these bacteria can cause infections in humans that may lead to adverse health consequences

Lack of regulation

In many countries, antibiotics are unregulated and available over the counter without a prescription. This lack of regulation results in antibiotics that are easily accessible, plentiful, and cheap, which promotes overuse. The ability to purchase

such products online has also made them accessible in countries where antibiotics are regulated.

Availability of Few New Antibiotics

The development of new antibiotics by the pharmaceutical industry, a strategy that had been effective at combating resistant bacteria in the past, had essentially stalled due to economic and regulatory obstacles. Mergers between pharmaceutical companies have also substantially reduced the number and diversity of research teams. Antibiotic research conducted in academia has been scaled back as a result of funding cuts due to the economic crisis.

Current Estimate of the Scenario

Antibiotic resistance is rising to dangerously high levels in all parts of the world. New resistance mechanisms are emerging and spreading globally, threatening our ability to treat common infectious diseases. A growing list of infections – such as pneumonia, tuberculosis, blood poisoning, gonorrhoea, and foodborne diseases – are becoming harder, and sometimes impossible, to treat as antibiotics become less effective.

By 2050, an estimated 10 million human lives per year will be at risk if we fail to attenuate the rise of drug resistance, and critical medical procedures such as administration of cancer chemotherapy, joint replacement, and gastrointestinal surgery may be associated with increasing morbidity The increase in AMR burden correlates with a 65% increase in antimicrobial consumption in humans between 2000 and 2015 in 76 countries and administration of 63,000 tons in animals in 2010, with a projected 67% increase in consumption by 2030

International Action

The World Health Organization (WHO) lists AMR among its top threats to global health. While monitoring of AMR- related morbidity and mortality is sorely lacking in all but the most advanced economies, estimates attribute 700,000 deaths

globally per year to resistant infections.Antimicrobial Resistance was recognized as a serious public health threat by WHO in 2011.

Some of the measures implemented by WHO to combat AMR are:

The Global Antimicrobial Resistance Surveillance System (GLASS)

The WHO-supported system supports a standardized approach to the collection, analysis and sharing of data related to antimicrobial resistance at a global level to inform decision-making, drive local, national and regional action.

Global Antibiotic Research and Development Partnership (GARDP)

A joint initiative of WHO and Drugs for Neglected Diseases initiative (DNDi), GARDP encourages research and development through public-private partnerships. By 2023, the partnership aims to develop and deliver up to four new treatments, through improvement of existing antibiotics and acceleration of the entry of new antibiotic drugs.

Interagency Coordination Group on Antimicrobial Resistance (IACG)

The United Nations Secretary-General has established IACG to improve coordination between international organizations and to ensure effective global action against this threat to health security. The IACG is co-chaired by the UN Deputy Secretary-General and the Director General of WHO and comprises high level representatives of relevant UN agencies, other international organizations, and individual experts across different sectors.

Country studies

India

India is known as ‘the AMR capital of the world’ with one of the highest rates of resistance to antimicrobial agents used both in humans and food animals. Resistant organisms or their genes are present in the environment, especially the water bodies. Specific socio-economic and cultural factors prevalent in India make the containment of resistance more challenging. Injudicious use of antimicrobials and inadequate treatment of waste waters are important contributing factors of Antimicrobial resistance in India. Use of sludge in agriculture, improper discard of livestock animals and aquaculture industry are considered AMR contributors in other countries but Indian data regarding these are lacking. The Indian health authorities have tried many methods to combat Antimicrobial Resistance, but are still at preliminary stages.

China

In China, the rate of antimicrobial resistance is extremely high because of the overuse of antimicrobials in clinical practice and in animal feed. No new antimicrobials against extensively drug-resistant gram-negative bacteria has been launched in the last 20 years, with the exception of tigecycline. Resistant bacteria are prone to disseminate in hospitals because of the dense patient population in China. The Chinese government and health authorities have been actively involved in tackling AMR. In 2016, 14 ministries in China, led by the National Health and Family Planning Commission (now National Health Commission), jointly issued the National Action Plan to Contain Antibacterial Resistance (2016–2020). The National Health Commission has issued several announcements related to the rational clinical use of antimicrobials and antimicrobial stewardship (AMS) since 2011 . National surveillance networks for bacterial resistance and for the clinical use of antimicrobials were established in 2005, and they release reports yearly

United States of America

Each year in the U.S., at least 2.8 million people are infected with antibiotic-resistant bacteria or fungi, and more than 35,000 people die as a result. The U.S. government redoubled its efforts to mitigate AMR over the last decade, increasing monitoring and prevention activities, supporting research and development, and revising how Medicare reimburses for new antibiotics. A 2013 CDC report highlighting AMR and the “potentially catastrophic consequences of

inaction” led President Obama to direct the National Security Council and the Office of Science and Technology Policy to develop a plan to address the threat.The result was a National Strategy for Combating Antibiotic-Resistant Bacteria issued in September 2014.

Case Studies

1. ***Carbapenem-Resistant Acinetobacter***

   Carbapenem-resistant Acinetobacter causes pneumonia and wound, bloodstream, and urinary tract infections. These infections tend to occur in patients in intensive care units. Some Acinetobacter are resistant to nearly all antibiotics and few new drugs are in development.

   Acinetobacter is a challenging threat to hospitalized patients because it frequently contaminates healthcare facility surfaces and shared medical equipment. If not addressed through infection control measures, including rigorous cleaning and disinfection, outbreaks in hospitals and nursing homes can occur.

   Acinetobacter is already resistant to many antibiotics. Resistance to carbapenems further reduces patient treatment options. Overall rates of carbapenem resistant Acinetobacter cases have decreased; however, carbapenem-resistant Acinetobacter that can produce carbapenemases, which can spread to other germs and amplify the problem of resistance through mobile resistance elements (e.g., DNA), appear to be increasing. This increase of carbapenemase production threatens to reverse decreases of carbapenem-resistant Acinetobacter cases. Infections caused by carbapenem resistant Acinetobacter baumannii are of particular concern because they are frequently difficult to treat with available antibiotics.

2. ***C. Auris***

   C. auris is a concerning drug-resistant fungus. Often multidrug-resistant, with some strains (types) resistant to all three available classes of antifungals.It can cause outbreaks in healthcare facilities. Some common

healthcare disinfectants are less effective at eliminating it. It can be carried on patients' skin without causing infection, allowing spread to others.

Suggested Moderated Caucus Topics

1. International response to AMR
2. The effect of AMR on developing countries
3. How can we regulate the sale of antibiotics?
4. The development of AMR surveillance mechanisms
5. The impact of recreational drug use on AMR
6. Regulation of overprescription by hospitals and medical practitioners

Guiding Questions

1. While countries have their national policies, AMR is global and doesn't respect boundaries. How can the council develop an international response while keeping respective national policies in mind?
2. What laws can be implemented to prevent the overuse of antibiotics?
3. How should the international community deal with recreational drug use ?
4. What are some effective methods to detect a new strain of AMR microbes as soon as they have been identified?

Further Research

1. https://www.cdc.gov/drugresistance/about/how-resistance-happens.html#:~:text=Bacteria%20develop%20resistance%20mechanisms%20by,make%20other%20germs%20become%20resistant.

2. https://www.who.int/topics/antimicrobial_resistance/en/#:~:text=Antimicrobial%20resistance%20occurs%20when%20microorganisms,referred%20to%20as%20%E2%80%9Csuperbugs%E2%80%9D.

3. https://www.who.int/news/item/20-11-2020-world-leaders-join-forces-to-fight-the-accelerating-crisis-of-antimicrobial-resistance