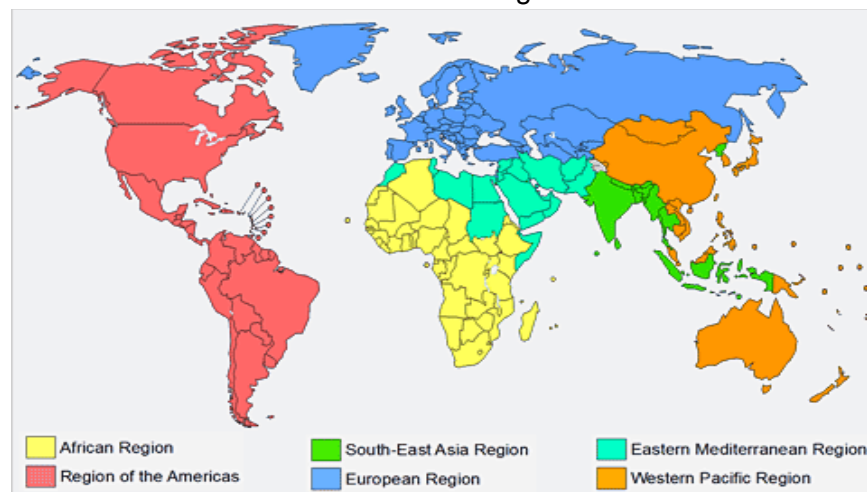


World Health Organization

Introduction to the Body

The World Health Organization's goal is "to build a better, healthier future for people all over the world"¹. First established in 1948, the WHO is now the premier international health body within the United Nations². All countries which are Members of the United Nations are members of the WHO. Currently, there are 194 Member States³ divided up into 6 WHO geographic regions - Americas, Africa, Europe, South-East Asia, Eastern Mediterranean and Western Pacific. WHO works across the world in its Member States and has active offices in 150 countries.

WHO Regions



http://www.who.int/about/regions/en/WHO_Regions.gif

Dr. Margaret Chan who was appointed in 2006 is the current WHO Director-General. Before her role as Director-General, Dr. Chan served as WHO Assistant Director-General for Communicable Diseases and a Representative of the Director-General for Pandemic Influenza⁴. Originally from Hong Kong, she has brought considerable experience handling epidemic outbreaks and managing public health efforts on macro-levels⁵.

WHO works to provide assistance to countries in scaling up prevention, treatment and care services through their health systems as well as set national guidelines, targets and regulations to establish international health standards. WHO works in many health fields such

¹ "About WHO." *World Health Organization*. World Health Organization, n.d. Web. 10 Dec. 2016.

<http://who.int/about/en/>.

² Charles, John. "Origins, history, and achievements of the World Health Organization." *British Medical Journal* 2.5600 (1968): 293-96. Web.

³ "Countries." *World Health Organization*. World Health Organization, n.d. Web. 10 Dec. 2016.

<http://www.who.int/countries/en/>.

⁴ "Director-General." *Director-General's Office*. World Health Organization, n.d. Web. 10 Dec. 2016.

<http://who.int/dg/en/>.

⁵ "Bird flu expert to head up WHO." *BBC News*. BBC, 09 Nov. 2006. Web. 29 Dec. 2016.

<http://news.bbc.co.uk/2/hi/health/6128220.stm>.

as infectious diseases like HIV and malaria, noncommunicable diseases like cancer and diabetes, maternal and child health, air and water quality, medicine and vaccination production and distribution, and more.

The WHO supports its member states in many different ways. WHO is engaged in regular policy reviews within broader UN bodies, inter-agency efforts to strengthen UN presence in specific countries, and discussions on how to effectively support country's individual efforts towards sustainable development and healthy communities. WHO has to collaborate with other UN bodies, NGOs, private donor groups and foundations, academic institutions and Member States' governments and health officials. Navigating and balancing how to most efficiently and effectively work through each of these channels to implement positive change is a constant challenge for WHO.

WHO works actively within many bodies of the UN as health is a pertinent issue and integral part of policy decisions in the UN. Health is discussed in the General Assembly, the Economic and Social Council (ECOSOC) and the Security Council. In September 2015 the UN adopted a new set of goals to end poverty and ensure prosperity called the Sustainable Development Goals, the third of which "Ensure healthy lives and promote well-being for all at all ages", directly relates to health and involves the WHO each and every day⁶. In all of its work, the WHO should strive to establish effective policy to honor their goals, aid the health agencies of their Member States and advance progress on Goal 3 of the Sustainable Development Goals. Health is an increasingly interdisciplinary issue, thus, in all its work, the WHO will have to create multi-faceted policy and work in tandem to other bodies of the UN to best implement their goals.

⁶ "Health - United Nations Sustainable Development." *Sustainable Development Goals*. United Nations, n.d. Web. 1 Jan. 2017. <<http://www.un.org/sustainabledevelopment/health/>>.

Topic A: Antibiotic Resistance

Statement of the Issue: Background of Antibiotics

Before antibiotic resistance can be discussed it is essential to understand how antibiotics function and ultimately prevent disease. Antibiotics kill bacteria by either blocking the synthesis of new proteins or interfering with the making of cell walls. Bugs and bacteria can become resistant to antibiotics by variation evolving in the bacteria's genome. The genetic variation can change the physiology of the bacteria, the structure, the shape or the function and production of enzymes from the bacteria. These changes make the bacteria unrecognizable by the antibiotics which are developed to target specific bacteria based off their known structural and functional characteristics. When chance mutations occur, advantageous mutations that help the bacteria evade the antibiotic are selected for and so they stick around in future generations of the bacteria and evade the antibiotic successfully. The benefit will be continue to be passed on through reproduction to the next generation of bacteria. The genetic variation will spread as surviving bacteria multiply until the entire bacterial population is resistant to the antibiotic created to kill it⁷.

Another important part of bacteria to understand to understand resistance is that bacteria keep their genes on loops of DNA called *plasmids*. Plasmids can be swapped easily across individual bacteria, and also across species. The collection of these resistance plasmids allows bacteria to develop resistance to many antibiotics over time, becoming increasingly lethal. The problem with resistance is that it is not a free good – resistance come at cost. The more frequently antibiotics, the more opportunities to incorporate the plasmids of the antibiotics into their own genome and build resistance

There is a common yet problematic misunderstanding among the general public surrounding the phenomena of antibiotic resistance. According to research recently published by the World Health Organization, $\frac{3}{4}$ of people in poor and middle-income countries believe that individuals themselves, and not the microbes become resistant to drugs⁸. This notion causes major problems in the development of possible solutions. If a policy maker believes that resistance is within bacteria, then the reduction of antibiotic use presents a logical strategy in confronting this public health problem. Alternatively, if someone believes that people become resistant, there would be no reason to decrease the use of antibiotics. As WHO representatives of your country, it is imperative that delegates recognize the importance of public education in addressing this policy issue, while simultaneously recognizing the issues the lack there of has presented.

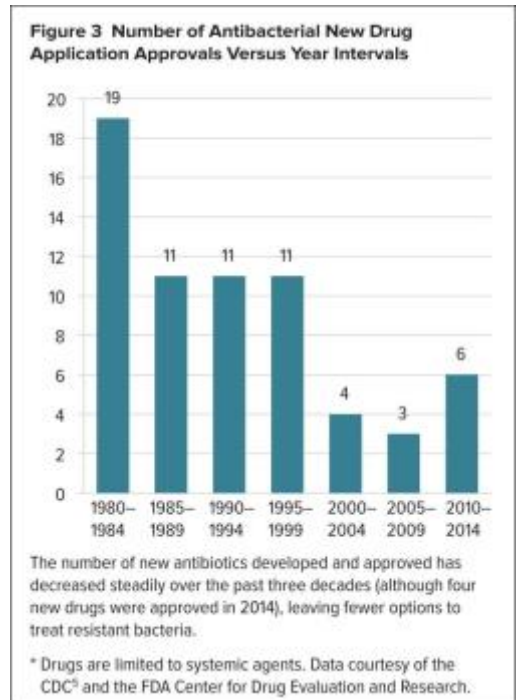
⁷"The grim prospect." *Economist (US)* 21 May 2016: n. pag. Print.

⁸"The grim prospect." *Economist (US)* 21 May 2016: n. pag. Print.

History of the Topic

The modern era of antibiotic use started in 1928 with the discovery of penicillin by Alexander Fleming. Penicillin was first used to treat infections in 1942 among World War II soldiers. Antibiotics have extensive benefits and have played a pivotal role in major medicine and surgical advances. Chemotherapy is safer due to the use of antibiotic treatment against infections that can occur in patients receiving the treatment. Additionally, post-surgical infections are treated more effectively and they have helped combat general bacterial infections that have helped extend expected life spans significantly.

Antibiotic resistance has been a problem as early as the 50s when resistance to penicillin emerged and threatened any advances within the prior decade. In response, more drugs were developed but resistance was a common phenomenon present in nearly all antibiotics that have been developed. In the late 1960s through the early 1980s there was a large push within the pharmaceutical industry to research and develop new antibiotics; however, within the past few decades there has been a significant decline in the production of new antibiotics. Fewer and fewer antibiotics are passing through the pipeline because of the increased regulations and lack of investment return on products⁹.



Current Problems

Today, the overuse of antibiotics by patients, over-prescription of antibiotics by physicians, lack of research and development within the pharmaceutical industry, and more frequent use of antibiotics in the agricultural industry has made common bacterial infections a threat.

Overuse / Misuse

One of the largest issues exacerbating the problem of antibiotic resistance is overuse of antibiotics. This is due to both improper use and over-prescription. Across the United States in particular there is a vast excess of antibiotic prescription. In some states within the US, the

⁹ Sukkar, Elizabeth. "Why are there so few antibiotics in the research and development pipeline?" *The Pharmaceutical Journal* (2013): n. pag. Print.

number of prescribed courses of treatment with antibiotics per year exceed the population, totaling to more than one treatment per person per year¹⁰.

Another large issue is misuse. Many patients unfamiliar with the way antibiotic prescriptions work will improperly take their medication. Antibiotics are prescribed in set dosages to be taken completely by patients. To effectively reap the benefits of this prescription and most importantly not facilitate resistance, patients must *complete* their treatment course in full. However, more often than not patients will stop taking the medication upon the mitigation of symptoms. Without taking the full dosage, patients increase the chance of fostering antibacterial resistance. Further awareness and education is needed to inform the public on appropriate use of antibiotics and the importance of not overusing or misusing prescribed antibiotics.

Inappropriate prescribing

Studies have shown that treatment and duration of antibiotic therapy is incorrect in 30% to 50% of cases – a serious concern even in many developed Western Nations. The problem is especially apparent in the intensive care unit treatment where antibiotic prescription are more often than not unnecessary or inappropriate for care¹¹. Many doctors have felt pressure to prescribe antibiotics because patients want something tangible to show for their visit. This “pester power” has caused doctors to prescribe antibiotics for, say a sore throat, that is likely viral, an infection in which antibiotics cannot treat¹². This example illustrate a tension dividing physicians who are by oath bound to their patients, yet must still be conscious of the greater public health and their duty to practice responsibility. It is clear from the high rates of ineffective and unnecessary prescription that better antibiotic regulation and training of physicians needs to be a priority of health policy delegates.

Extensive agricultural use

Many farmers, in order to increase profit returns use antibiotics to make their livestock grow faster and healthier. It is estimated that over half of the antibiotics in the U.S. are used in food animal production. Farm animals are now being fed antibiotic as food and indirectly the antibiotics are passed on to meat consuming citizens. Additionally, these drugs pass into the soil and watercourses where they further encourage resistance¹³. There are several lines of research evidence that show direct correlations between the use of antibiotics in animal cultivation and rise in antimicrobial resistance. Infections in humans have been traced to specific meat and poultry productions and cases have occurred in which certain bacterial pathogens previously only found in animals have been found in humans.

The mounting evidence of the relationship between antibiotic use in animal care and the increase in bacterial resistance in humans has prompted reviews of agricultural practices by farmers and enacted some legislative change. However, policy varies across countries. Current

¹⁰ Ventola, C. Lee. “The Antibiotic Resistance Crisis: Part 1: Causes and Threats.” *Pharmacy and Therapeutics* 40.4 (2015): 277–283. Print.

¹¹ Ventola, C. Lee. “The Antibiotic Resistance Crisis: Part 1: Causes and Threats.” *Pharmacy and Therapeutics* 40.4 (2015): 277–283. Print.

¹² “The grim prospect.” *Economist (US)* 21 May 2016: n. pag. Print.

¹³ “The grim prospect.” *Economist (US)* 21 May 2016: n. pag. Print.

policy in the United States has been lax compared to many other Member States such as in the European Union which has completely banned the use of some antimicrobials for growth promotion on farms¹⁴. In Denmark, enactment of policies that regulate antimicrobial use in agriculture from 1992-2008 were in fact shown to positively improve productivity of swine farms in Denmark despite the >50% decrease in antimicrobial consumption of pigs, thus providing positive evidence for a ban on the use of antimicrobial growth promoters¹⁵. Other think the ban on antibiotics would not be great. Further debate on proper regulation is needed on both national and international policy levels.

Lack of development

Unfortunately, motivating the pharmaceutical industry to invest in antibiotic development is challenging. Because of the nature of antibiotics and the continual evolution of resistance, once the antibiotic is used for a while resistance is soon developed and we lose its effectiveness. In turn, antibiotic development does not represent a steady, lucrative investment for the pharmaceutical industry. However, in the current state we are in now what public health officials desire is an antibiotic we never need to use, but have on reserve to save lives in the most extreme instances of resistance. Unfortunately, few drug companies want to create drugs that will never be used and thus be unprofitable to their companies. Thus the questions international health policy makers must consider are how do we drive investment? And how do we create a market for antibiotic drug development? John Rex, vice-president and head of infection for global medicines development at AstraZeneca, explains, "We must find ways to fund and incentivize this work. Our answer must address several basic tensions: we want to minimize use of all antibiotics; we want to have new(er) antibiotics available on demand; we want those antibiotics developed before the epidemic."¹⁶

Future concerns

The rise of antibiotic resistance has negative effects across future medicine. Infections acquired in hospitals will be more prevalent and elective surgeries will be much more dangerous and risky to perform. Common, routine procedures such as hip replacements, organ transplants and cancer chemotherapies will be more risky as chance of infection becomes more common and severity of infection more dangerous¹⁷. Currently, hospital infections are at an all time high. MRSA is a bacteria that normally lives on skin and can cause pimples, pneumonia, meningitis or sepsis. Hospitals have high risk of MRSA as they are easy places to catch infections. Currently, if you are admitted to a hospital you have a 5% chance of contracting a Healthcare Associated Infection (HAI). Current statistics show that 1.7 million people per year get an infection during a hospital stay and HAIs in total kill more people each year than Breast Cancer and Prostate

¹⁴ "Science of Resistance: Antibiotics in Agriculture." *Alliance for the Prudent Use of Antibiotics*. Tufts Med, n.d. Web. 23 Dec. 2016. http://emerald.tufts.edu/med/apua/about_issue/antibiotic_agri.shtml .

¹⁵ Aarestrup, Frank M., Vibeke F. Jensen, Hanne-Dorthe Emborg, Erik Jacobsen, and Henrik C. Wegener. "Changes in the use of antimicrobials and the effects on productivity of swine farms in Denmark." *American Journal of Veterinary Research* 71.7 (2010): 726-33. Web.

¹⁶ Sukkar, Elizabeth. "Why are there so few antibiotics in the research and development pipeline?" *The Pharmaceutical Journal* (2013): n. pag. Print.

¹⁷ "The grim prospect." *Economist (US)* 21 May 2016: n. pag. Print.

Cancer combined¹⁸. In turn, given the high prevalence of HAIs, antibiotic resistance would present an insurmountable obstacle to treating them effectively.

Economically the impacts of Antimicrobial resistance are huge. Jim O'Neill, former chief economist at Goldman Sachs published an extensive financial review and list of policy recommendations on resistance to antimicrobial drugs on behalf of the Wellcome Trust, a medical research funding NGO. The report estimates that 700,000 people die each year from infections due to drug-resistant bacteria and by 2050 has the potential to rise to 10 million. Economic estimates show this will eliminate 2-3% of global GDP. This staggering statistic shows that the problem of antimicrobial resistance will have impacts beyond just health¹⁹.

Relevant International Action

2015 - Global Action Plan on AMR

At the Sixty-Eighth World Health Assembly in May 2015 the World Health Assembly endorsed a global action plan to tackle antimicrobial resistance. This plan called upon each Member State of the WHO to adopt national action plans. These plans were to align with the objectives outlined in the 2015 Global Action Plan (GAP) and be developed within 2 years. The GAP emphasized the importance of a "One Health" approach to AMR and the importance of collaboration among WHO, the World Organization for Animal Health (OIE) and the Food and Agriculture Organization (FAO)²⁰.

2016 - The UN General Assembly High Level Meeting on Antimicrobial Resistance

The Un General Assembly had convened a high-level meeting on global health issues only 3 times in its history before The UN General Assembly High Level Meeting on Antimicrobial Resistance. The three topics of the previous meetings were HIV/AIDS, non communicable disease and Ebola. As the fourth in history, Antimicrobial Resistance has clearly come to the forefront of the international health community and demanded attention and action. Margaret Chan, WHO Director-General, warned at the meeting that "We are on the verge of a post-antibiotic era in which common infection once again will kill"²¹ and encouraged delegates to come up with tangible targets. Despite Chan's emphasis, members did not adopt any new targets to curb the use of antibiotics. Member States promised to draw up and fund national action plans to tackle issues, but it is clear that there is still a lack of international action, communication and collaboration necessary to tackle this issue²². With projections of drug-

¹⁸ Broverman, Sheryl. "Antibiotic Resistance." AIDS and Emerging Diseases, April 13 2016. Duke University, Durham NC.

¹⁹ The grim prospect." *Economist (US)* 21 May 2016: n. pag. Print.

²⁰ So, Anthony D., and Reshma Ramachandran. "3 Key Steps After the UN Political Declaration on AMR." *Global Health NOW*. Johns Hopkins Bloomberg School of Public Health, 20 Sept. 2016. Web. 20 Dec. 2016.

²¹ Simpson, Brian W. "Margaret Chan's 3 Slo-Mo Disasters." *Global Health NOW*. Johns Hopkins Bloomberg School of Public Health, 23 May 2016. Web. 1 Jan. 2017.

²²"The Other Global Drugs Problem; Resistance to Antibiotics." *Economist (US)* 24 Sept. 2016: n. pag. Print.

resistant bugs killing as many as 10 million people a year by 2050²³, there is no time to waste on developing a more effective plan.

Bloc Positions

As a result of the Global Action Plan on Antimicrobial Resistance, the World Health Assembly urged all Member States to develop and have in place by 2017 national action plans on antimicrobial resistance. These plans are to be aligned with the objectives and initiatives of the global action plan and highlight individual member state's priorities and action going forward. The WHO has created a library of national action plans that consists of the existing plans. This is an excellent resource to utilize for learning about your country and region's initiatives, writing your background guide and preparing for committee debate. A link to the library can be found here: <http://www.who.int/antimicrobial-resistance/national-action-plans/library/en/> .

The following is meant to be a *preliminary* insight into some of the significant policy and legislative action taken by these regions. It is by no means the only action from these regions and by no means the only relevant policy brief you should consult. It is meant to be a starting point for delegates for further research and inquiry into your Member States' action on this issue.

(1) WHO African Region

One of the most prevalent issues the African Region faces is multidrug-resistant tuberculosis (MDR-TB). Like many bacteria that develop resistance to antibiotics, the bacteria that cause TB can develop resistance to the antimicrobial drugs used to cure the disease. MDR-TB is a strain of TB that is resistant to the 2 most powerful TB treatment drugs isoniazid and rifampicin²⁴.

Many member states in the African Region have had to deal with this problem and many of the solutions and policies they have implemented can be of use to the problem of antibiotic resistance. Similar issues occur in both problems such as inappropriate and incorrect use of drugs and premature treatment or mismanagement of treatment. Delegates from the the African Region will be looked to for their experience handling this issue and will be crucial in policy discussion.

(2) WHO Region of the Americas

In December 2013 the Pan American Health Organization (PAHO) Technical Advisory Group on Antimicrobial Resistance and Infection Prevention and Control met in Washington D.C. to discuss a process for supporting countries in developing integrated national plans for AMR and to guide PAHO on the most efficient approach to promote the development of these plans. Out of the meeting, the PAHO advisory group came up with a set of recommendations,

²³ "The Other Global Drugs Problem; Resistance to Antibiotics." *Economist (US)* 24 Sept. 2016: n. pag. Print.

²⁴ "What is multidrug-resistant tuberculosis (MDR-TB) and how do we control it?." *Online Q&A*. World Health Organization, October 2016. Web. 10 Dec. 2016. <http://who.int/features/qa/79/en/> .

many of which have potential to be useful on a larger national scale. Some of the recommendations include to promote the development of national lists of essential antimicrobials of proven quality, promote responsible prescribing practices and improve surveillance of AMR²⁵.

The United States has been a significant actor in the problem of Antibiotic Resistant. As one of the largest headquarters for major international pharmaceutical companies, the regulations and legislation the US enacts to regulate these companies has large impacts on the ways in which drugs and antibiotics are research, developed, produced and distributed in the Region of the Americas and around the world. Undoubtedly there will be significant debate around the policy recommendations for the US, and the US and Member states of the Region of the Americas should be prepared to engage in active debate and collaboration on these issue.

(3) WHO European Region

In the European Region, 25,000 out of 400,000 people die every year in the European Region due to an infection with a resistant bacterial strain. In addition to health effects, AMR has caused the EU an estimated economic loss of more than 1.5 billion euro each year²⁶. The European Region has taken many strides to demonstrate that it is making antimicrobial resistance a priority. Many countries have taken tangible action to bring attention to this issue. Poland held "World Antibiotic Awareness Week"²⁷ and the WHO recently launched a major training team in Uzbekistan to develop and train teams in routine laboratory diagnostics and antibiotic stewardship²⁸.

The EU has significant surveillance set up across 27 EU countries in coordination with the European Centre for Disease Prevention and Control that collects annual data on infections caused by 7 major resistant bacteria²⁹. This resource, the Central Asian and Eastern European Surveillance of Antimicrobial Resistance (CAESAR) is a significant stride taken to build an international network of surveillance of antimicrobial consumption and resistance. These reports provided to the WHO regional offices are the foundation for further recommendations and further actions taken. During the conference, the WHO will look to Member States in the EU to share their successful surveillance on a national level and help other countries implement effective surveillance databases in their own regions.

(4) WHO Eastern Mediterranean Region

²⁵ PAHO Technical Advisory Group on Antimicrobial Resistance and Infection Prevention and Control . Publication no. PAHO/CHA/IR/AMR/003-14. N.p.: Pan American Health Organization / World Health Organization, n.d. Print.

²⁶ "Data and statistics." *WHO/Europe*. World Health Organization, n.d. Web. 1 Jan. 2017.

<<http://www.euro.who.int/en/health-topics/disease-prevention/antimicrobial-resistance/data-and-statistics>>.

²⁷ "World Antibiotic Awareness Week 2016." *WHO/Europe*. World Health Organization, 5 Jan. 2017. Web. 10 Jan. 2017.

<<http://www.euro.who.int/en/media-centre/events/events/2016/11/world-antibiotic-awareness-week-2016>>.

²⁸ "WHO trains national AMR surveillance teams to promote routine laboratory diagnostics and antibiotic stewardship in Tashkent, Uzbekistan." *WHO/Europe*. World Health Organization, 22 Dec. 2016. Web. 1 Jan. 2017.

<<http://www.euro.who.int/en/health-topics/disease-prevention/antimicrobial-resistance/news/news/2016/12/who-trains-national-amr-surveillance-teams-to-promote-routine-laboratory-diagnostics-and-antibiotic-stewardship-in-tashkent,-uzbekistan>>.

²⁹ "Data and statistics." *WHO/Europe*. World Health Organization, n.d. Web. 1 Jan. 2017.

<<http://www.euro.who.int/en/health-topics/disease-prevention/antimicrobial-resistance/data-and-statistics>> .

The Eastern Mediterranean Region has taken some steps to bring AMR to the forefront of the public's mind. In 2011, the theme for World Health Day was "Antimicrobial resistance: no action today, no cure tomorrow"³⁰. The Eastern Mediterranean Region has recognized that antimicrobial resistance is not a new problem and is one that is becoming more and more dangerous. They advocate that urgent and consolidated efforts are needed to avoid regressing to the "pre-antibiotic" era but have done little to coordinate a regional or national approach. Countries in this region should be prepared to engage actively in debate and strive to coordinate with other Member States to develop international policy that still upholds their regional and individual interests.

(5) WHO Western Pacific Region / Southeast Asia Region

In 2010 the WHO South-East Asia Region developed the Jaipur Declaration on Antimicrobial Resistance that proposed a multidisciplinary approach towards prevention and containment of antimicrobial resistance to improve public health in the South-East Asia Region. The declaration promised to develop national antibiotic policies and formulate multisectoral national alliances against antimicrobial resistance, strengthen legislation to prevent the manufacture, sale and distribution of substandard antibiotics, and promote behavioral changes in prescribers and communities through continuous training and educational campaigns³¹. This Declaration has been used as the foundation of all recent policy and action on antibiotic resistance in this region.

In November 2014 the Regional Meeting on Antimicrobial Resistance was held in Jaipur, India. The meeting reaffirmed the recommendations of the Jaipur Declaration and further proposed to strengthen the national regulations on drug quality³². Although significant strides have been made by the South-East Asia Region to tackle this issue, it is clear that there is still more to do. The conclusions and recommendations of the Jaipur Declaration will be useful for delegates to bring to the table for debate. Countries from this region should share their successes but also look to fellow UN Member States on guidance for improving the implementation and effectiveness of their desired goals.

The Western Pacific Region and Southeast Asia Region are areas plagued by MDR-TB. In a 2015 WHO study and estimated 480,000 people worldwide developed MDR-TB. India, China and the Russian Federation accounted for 45% of the 580,000 cases³³. Similar to the African Region, these countries experiences handling the MDR-TB epidemics in their regions can lend valuable insights into the world-wide antibiotic resistance crisis.

³⁰ "World Health Day 2011." *WHO EMRO*. World Health Organization, n.d. Web. 30 Dec. 2016. <<http://www.emro.who.int/world-health-days/2011/overview.html>>.

³¹ *Jaipur Declaration on Antimicrobial Resistance*. Issue brief. N.p.: WHO South-East Asia Region, n.d. Print.

³² *Regional Meeting on Antimicrobial Resistance*. Conclusion and Remarks.: World Health Organization Regional Office for South-East Asia. November 2014.

³³ "What is multidrug-resistant tuberculosis (MDR-TB) and how do we control it?." *Online Q&A*. World Health Organization, October 2016. Web. 10 Dec. 2016. <http://who.int/features/qa/79/en/>.

Questions A Resolution Should Consider

1. Is the WHO strategy effective as it stands to tackle the issue of antibiotic resistance?
2. How can this strategy be effectively adapted and implemented by countries at national, regional and global levels?
3. How can public awareness of the issue be raised and effective education promoted?
How can current public mentality on the matter be changed?
4. How do we address the issue of over-antibiotic prescription by healthcare practitioners?
5. What changes need to be made to make the public adhere to antibiotic prescription instructions better?
6. What guidelines and restrictions (if any) on the use of antibiotics in the agricultural sector should be implemented. How can WHO ensure that the agricultural sector of individual countries follows these guidelines?
7. How should the issue of antibiotic resistance be handled on an international level? By individual countries? By the healthcare industry? By policy makers? By pharmaceutical companies? By drug research and development companies? What does a multi-tiered solution look like?
8. How can the WHO tackle outbreaks of resistant bacterial infections?

Topic B: Effects of Population Growth on Public Health

Statement of the Issue

One of the crucial issues of modern times is the issue of overpopulation. For hundreds of thousands of years the human population has grown at a low steadily increasing rate. However, in the last 200 years the world population has exploded at an alarming exponential rate increasing from several hundreds of millions to more than 7 billion people. In the last 40 years alone the population has doubled³⁴. Currently, the world's population is 7.47 billion people and increasing by the second³⁵. The population is growing at a rate of around 1.11% per year which equates to an approximate 80 million additional people per year³⁶. The latest United Nations projections indicate that world population will reach 10 billion people in the year 2056³⁷.

Today we must prepare our world for the next generation and ensure our descendants have adequate resources to thrive on our planet in the future. The Earth has finite limitations of its available resources to increasing populations and these resources, contrary to the public belief, are not infinite and endless. Overpopulation is significantly impacting the environment, our standards of living, and the general quality of life. As long as the growth rate remains positive, our species will eventually reach numbers and densities where technological solutions cannot ameliorate resource scarcity. With the pressures of an expanding population ahead, it is the direct responsibility of the World Health Organization to take initiative in foreseeing an end to this crisis and creating a solution that achieves sustainability rather than merely population control.

History of the topic

The human population has always had a relatively positive growth rate within the past millennium. The human population has been growing continually since the end of the plague (around the year 1400) where the majority of the drastic changes have occurred in the past couple of centuries, and particularly in the past 50 years. In the early 1800s life expectancies were low across the world including western Europe and the United States. However, as the Industrial Revolution took off there was a huge shift in the life expectancy of individuals. During this time a cascade of advances in medical technology and agricultural productivity drastically improved living conditions in industrialized nations³⁸. Improvements in urban sanitation and waste removal, water supply and quality, public health guidelines and policies and vaccines and antibiotics all transitioned industrialized nations to a new standard of living that extended the life

³⁴ Alder, Jeremy. "The Effect of Overpopulation on Public Health." *The Effect of Overpopulation on Public Health | MPH Online*. MPH Online, 2017. Web. 12 Jan. 2017.

³⁵ "Current World Population." World Population Clock. Worldometers, n.d. Web. 2 Jan. 2017. <<http://www.worldometers.info/world-population/>>.

³⁶ "Current World Population." World Population Clock. Worldometers, n.d. Web. 2 Jan. 2017. <<http://www.worldometers.info/world-population/>>.

³⁷ "Current World Population." World Population Clock. Worldometers, n.d. Web. 2 Jan. 2017. <<http://www.worldometers.info/world-population/>>.

³⁸ "Unit 5: Human Population Dynamics // Section 4: World Population Growth Through History." Annenberg Learner. N.p., 2016. Web. 2 Jan. 2017. <<https://www.learner.org/courses/envsci/unit/text.php?unit=5&secNum=4>>.

expectancy by many years and lowered infant mortality. In 1900 the infant mortality rate was 165 per 1,000 births. Today, that rate has been lowered to 7³⁹.

By the mid-20th these technologies were standard in developed nations and making their way into developing nations. The world's population growth rate peaked in the late 1960s at just over 2%, in developing nations as high as 2.5%⁴⁰. In the period from the 1950s to the 1980s, concerns about global population growth and its effects on poverty, the environment and political stability led policy makers to begin thinking about ways to reduce human population growth. While many population planning policies take measures to promote sustainable living by increasing individual's control over their reproduction or improving living conditions in the most highly densely populated areas, some more extreme measures, most notably the Chinese government's "one-child policy" have been aimed at curbing population directly. The variety in approach illustrate the diverse strategies that have been employed to fight this issue and illustrate the multiple viewpoints on this topic.

Current Issues

Population Growth and Environmental/Ecological Concerns

As world population continues to grow, natural resources are under increasing pressure. Humans are exploiting nature to meet present needs and destroying resources needed for the future. As the population increases, this problem is exacerbated and will severely threaten public health and social and economic development.

In 64 of 105 developing countries, population has grown faster than food supplies. Overcultivation, largely due to pressures of the increasing population, has degraded almost 5 billion acres of land available for cultivation⁴¹. Additionally, water resources are at high risk of depletion and contamination. In 25 years, humankind could be using over 90% of all available freshwater, leaving just 10% for the rest of the world's plants and animals and little in reserve for the future⁴². Overpopulation will only create more polluted water supplies. Currently, 3.4 million people die each year because of contaminated water related disease. Disappearance of nonrenewable resources such as oil and natural gas are also major concerns. It is currently estimated that the earth's supply of natural gas will run out in the next 35 years, and this could happen much sooner if the population rate continues to increase⁴³.

In a Report published by the Johns Hopkins Population Information Program, *Population Reports, Population and the Environment: The Global Challenge*, experts claims that "most developed economies currently consume resources much faster than they can regenerate. Most developing countries with rapid population growth face the urgent need to improve living standards but risk irreparable harm to natural resources on which they depend"⁴⁴. This conflict is difficult for policy makers to deal with and coming up with a solution that achieves both will be one of the most challenging parts of forming a successful resolution on this topic. Governments and policymakers need to take immediate steps towards implementing sustainable development that raises current living standards without destroying the resource base required to meet future

³⁹ Alder, Jeremy. "The Effect of Overpopulation on Public Health." *The Effect of Overpopulation on Public Health | MPH Online*. MPH Online, 2017. Web. 12 Jan. 2017.

⁴⁰ "Unit 5: Human Population Dynamics // Section 4: World Population Growth Through History." Annenberg Learner. N.p., 2016. Web. 2 Jan. 2017. <<https://www.learner.org/courses/envsci/unit/text.php?unit=5&secNum=4>>.

⁴¹ "Population Growth Threatens Public Health, Report Says." UniSci. N.p., n.d. Web. 2 Jan. 2017.

⁴² "Population Growth Threatens Public Health, Report Says." UniSci. N.p., n.d. Web. 2 Jan. 2017.

⁴³ Alder, Jeremy. "The Effect of Overpopulation on Public Health." *The Effect of Overpopulation on Public Health | MPH Online*. MPH Online, 2017. Web. 12 Jan. 2017.

⁴⁴ "Population Growth Threatens Public Health, Report Says." UniSci. N.p., n.d. Web. 2 Jan. 2017.

needs. The world needs to begin to recognize that it must begin to live in an ecologically sustainable way rather than living at a rate that will expend its ecological capital. Steps towards sustainable development include using energy more efficiently, managing cities better, managing water resources and protecting freshwater sources, curbing waste, preserving arable land and increasing sustainable food production and protecting biodiversity hotspots.

Population Growth and the Spread of Diseases

With an increase in population growth there is a correlated increase in population density and urbanization. These all increase the spread of diseases greatly. Logistically, diseases spread more quickly among people who live in close proximity to each other where in dense conditions, increased contact between individuals more easily facilitates the transmission of diseases. With over 50% of the global population currently living in urban areas, the density of humans is becoming more and more concentrated⁴⁵. Diseases such as Tuberculosis, which is spread rapidly among densely populated people, will be continually exacerbated by population growth. Additionally, as global travel becomes more common and more accessible, an increased number of travellers make it easy for diseases to transcend huge distances and oceans. Outbreaks can spread thousands of miles in a matter of hours. Uninfected regions become infected very quickly as people migrate and travel to and from.

Major diseases like HIV/AIDS and malaria will be exacerbated among populations through many of the unsafe behaviors linked to overpopulation such as high-risk sexual practices, a lack of access to contraception and an increase in the number of sex workers⁴⁶. Additionally, as population increases, in areas where there are limited resources, general poverty increases, leaving many hungry, thirsty, sick and without employment. Poverty perpetuates the sex trade in many areas which increases the spread of HIV/AIDS. For example, in Kenya, extreme poverty has forced many women into the "sex for fish" trade. Women have sex with local fisherman in exchange for a portion of the fish they catch to feed themselves, their children and their families⁴⁷. Many of these women have inadequate access to contraceptives and condoms, thus increasing the spread of STIs such as HIV/AIDS and additionally making unwanted pregnancies more likely.

Population Growth and the lack of Family Planning

Across the world, in developing countries, fewer than 1 in 5 women use a form of family planning⁴⁸. Family planning is the regulation of the number and spacing of children in a family often controlled by means of contraception or sterilization. Access to safe, voluntary family planning has been declared by the United Nations Population Fund to be a basic human right everyone is entitled to and should have access to. Family planning is important in promoting gender equality and women's basic rights and is a key factor in reducing undesired pregnancies and poverty. An estimated 225 million women in developing countries would like to delay or stop childbearing but are not using a methods of contraception⁴⁹. Worldwide, in 2015 about 12% of

⁴⁵ "Population Growth and the Spread of Diseases." Population Education. N.p., 8 Apr. 2014. Web. 2 Jan. 2017. <<https://www.populationeducation.org/content/population-growth-and-spread-diseases>>.

⁴⁶ Krans, Brain. "Overpopulation: An Overlooked Factor in Global Health." Healthline. N.p., 19 Mar. 2014. Web. 2 Jan. 2017.

⁴⁷ Krans, Brain. "Overpopulation: An Overlooked Factor in Global Health." Healthline. N.p., 19 Mar. 2014. Web. 2 Jan. 2017.

⁴⁸ Alder, Jeremy. "The Effect of Overpopulation on Public Health." *The Effect of Overpopulation on Public Health | MPH Online*. MPH Online, 2017. Web. 12 Jan. 2017.

⁴⁹ "Family planning/Contraception." World Health Organization. World Health Organization, n.d. Web. 2 Jan. 2017. <<http://www.who.int/mediacentre/factsheets/fs351/en/>>.

married women have an unmet need for family planning and the level is much higher (as high as 24%) in the least developed countries⁵⁰. Reasons for this include limited choice of methods, limited access to contraception (particularly among young people, poor populations and unmarried people), fear or experience of side-effects, cultural or religious opposition, gender-based structural barriers and poor quality of available services. With a lack of education about contraception and a lack of availability to women that need it the most, the population continues to boom.

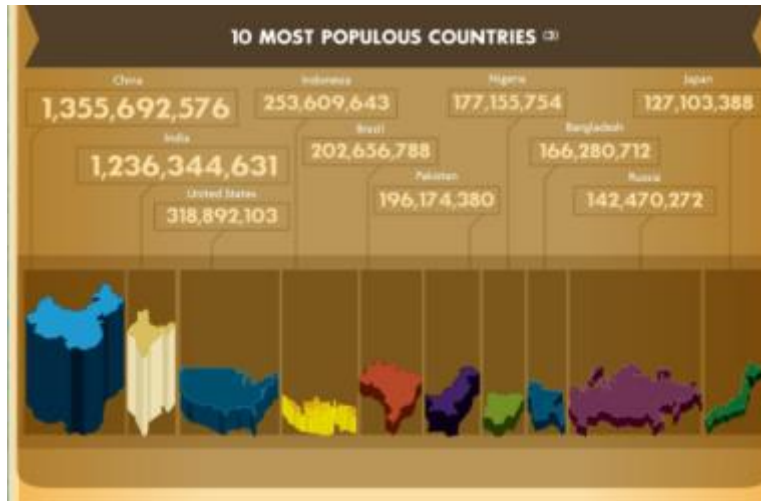
Investment in contraception and family planning improves health-related outcomes such as reduced maternal mortality and infant mortality, improves school attendance and economic outcomes especially for girls and women, and decreases the number of unwanted pregnancies thus curbing the increasing population growth rate. Although the number of people in developing countries who need access to family planning services has risen, annual global spending on family planning programs is low in comparison. Developed-country annual commitments total just \$2 billion - less than half the US \$5.7 billion promised by the US at the UN International Conference on Population and Development. Stabilizing population through good quality family planning services would buy time to protect natural resources and provide opportunities for women and families to raise their living standards. Family Planning is a very plausible and important solution to tackle the problem of population growth; however, due to many religious and cultural barriers preventing family planning advocacy and services it faces resistance in many areas. This cultural barrier is something member states should be aware of when crafting collaborative policy solutions.

Bloc Positions - Crucial Countries

While the official geographic WHO regions will still be important in debate and policy collaborations, for the topic of population growth it makes sense to group countries into groups of (1) Most Populous Countries, (2) Growing Countries and (3) Shrinking Countries. The 2015 Revision of World Population Prospects is a fantastic resource prepared by the Population Division of the Department of Economic and Social Affairs of the United Nations that has in-depth maps, graphs and interactive data for all UN Member States on their current population levels and growth rates. This resource will be highly valuable and useful to all countries and delegates as they learn about their country and prepare for committee debate. The resource can be accessed here: <https://esa.un.org/unpd/wpp/> .

⁵⁰ Trends in Contraceptive Use Worldwide 2015. Rep. no. ST/ESA/SER.A/349 . N.p.: UN Department of Economic and Social Affairs, n.d. Print.

10 Most Populous Countries



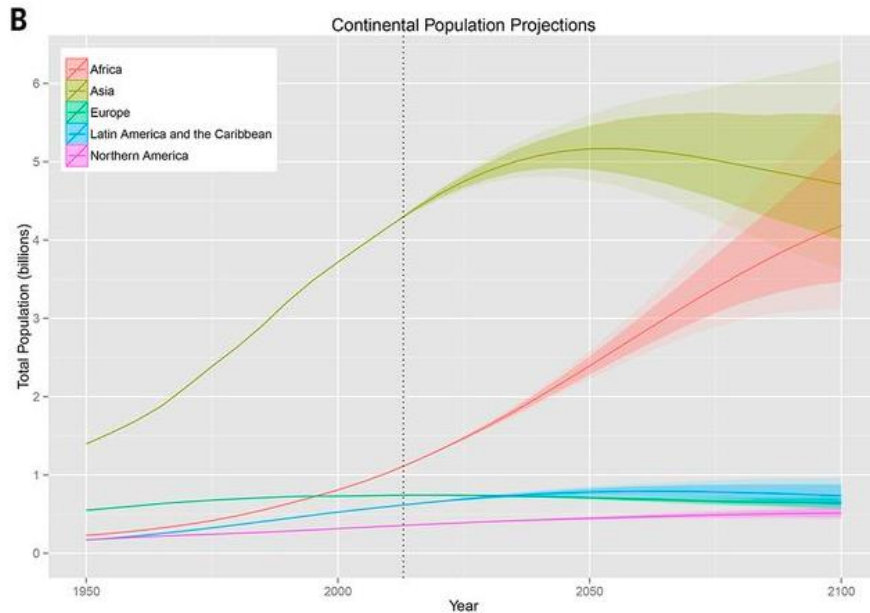
<http://www.mphonline.org/overpopulation-public-health/>

With 1.3 billion people, China today remains the world's most populous country. In a little more than a decade however, it will for the first time in its long history give up this title to India. India's rising population, most notably in the slum areas of urban cities is soon to push India to the top. All of the countries in the list of top 10 most populous countries should be aware of their influence and importance in policy discussions on this matter. These member states should be prepared to know what efforts their governments have taken to address the issue of population growth and sustainable development.

Growing Countries

In the United Nation's recently released population projects there is an 80% probability that world population will increase to between 9.6 and 12.3 billion in 2100⁵¹. Much of this increase is expected to happen in Africa. The general continental population projections can be seen in the figure below.

⁵¹ Gerland, Patrick, and Adrian Raftery. "World population stabilization unlikely this century." *Science* (n.d.): n. pag. Web. 18 Sept. 2014. <http://science.sciencemag.org/content/early/2014/09/17/science.1257469.full> .



<http://science.sciencemag.org/content/early/2014/09/17/science.1257469.full>

While Asia will likely remain the most populous continent, the most exponential increase is projected to occur in Africa. The continent's current population of about one billion is projected to rise between 3.1 and 5.7 billion by the end of the century. This increase would make Africa's population density roughly equal to that of China today⁵². The increase in projected population of Africa is likely due to the relatively high levels of fertility. Historically, in 1950, fertility declined rapidly in Asia and Latin America and many demographers had projected fertility in African countries to decline at similar rates. However, while fertility has been declining it is doing so at ¼ of the rate that occurs in Asia and Latin America. Family sizes are still large comparative to many developed nations with a median of 4.6 children per women. As mentioned previously, the unmet need for contraception has remained at about 25% with no systematic decline over the past 20 years⁵³. Fast growing nations like African countries need to be cognizant of the exponential rate their populations are changing and should look to many developed nations for ways in which to effectively manage population growth and the high fertility dilemma.

Shrinking Populations

As dramatic as the projected growth increases seems, some regions of the world are expected to grow far more than others. In fact, a handful of countries aren't expected to see any population growth at all. U.N. reports claim that as many as 48 countries around the world are expected to see their populations decline by 2050. Countries including Bulgaria, Croatia, Hungary, Japan, Latvia, Lithuania, Republic of Moldova, Romania, Serbia and Ukraine are expected to see their populations decline by more than 15% by 2050⁵⁴. Moldova is expected to

⁵²Gerland, Patrick, and Adrian Raftery. "World population stabilization unlikely this century." *Science* (n.d.): n. pag. Web. 18 Sept. 2014. <http://science.sciencemag.org/content/early/2014/09/17/science.1257469.full> .

⁵³ Gerland, Patrick, and Adrian Raftery. "World population stabilization unlikely this century." *Science* (n.d.): n. pag. Web. 18 Sept. 2014. <http://science.sciencemag.org/content/early/2014/09/17/science.1257469.full> .

⁵⁴ World Population Prospects: Key findings & advance tables. Rep. no. ESA/P/WP.241 . N.p.: UN Department of Economic and Social Affairs: Population Division, 2015. Print.

lose more than half its population by 2100⁵⁵. Many of these European countries are expected to decline in population levels because of low fertility levels.

Last year, Japan, one of the countries with the highest populations, officially shrunk by almost 1 million people over the past 5 years. Many officials point to Japan's aging population and its low birth rate⁵⁶. As the third largest economy in the world and a crucial trading partner for the United States and China, a decline in population in Japan could have drastic effects worldwide. It is imperative that countries work together with Japan to determine the best course of action to maintain a positive but low, steady growth rate. These startling and significant statistic demand attention from the country's governments and from the UN. Delegates from each country should be prepared to bring to light these issues that are usually overshadowed by countries dealing with exponential population growth.

Questions A Resolution Should Consider

- What can the WHO do to better help limit rampant population growth?
- How can the WHO work with other UN bodies such as UNFPA, UNDP towards creating policies and guidelines for countries that encourage sustainable development?
- How do changes in population growth affect citizens in developed nations? In developing nations?
- Does the proposed resolution tackle this problem equally for both developing and developed countries? How can the WHO make a resolution that successfully satisfies both interests?
- What can be done to encourage sustainable use of resources and limit waste of Earth's valuable resources?

⁵⁵ Taylor, Adam. "The 11 countries expected to shrink dramatically this century." The Washington Post. WP Company, 11 Aug. 2015. Web. 2 Jan. 2017.

⁵⁶ Taylor, Adam. "The 11 countries expected to shrink dramatically this century." The Washington Post. WP Company, 11 Aug. 2015. Web. 2 Jan. 2017.