World Health Organization

PREVENTING RADIATION AND CHEMICAL EMERGENCIES

BACKGROUND GUIDE B

Director's Letter

Dear Delegates,

My name is Arushi Choudhury, a junior at Woodinville High School, and I'm thrilled to be directing the World Health Organization (WHO) at Oakridge Model United Nations' third iteration! Completing the WHO Dias is my amazing Chair, Finn Liu, and my wonderful Assistant Director, Rachel Wei. We are so excited to have you here at Oakridge MUN 2021!

The World Health Organization serves as a convention for discussion surrounding all aspects of health and the constantly evolving industry within it. Considering the current economy after the COVID 19 crisis, the importance of ensuring every country has proper access to health care cannot be overstated. The broad range of topics allows delegates in WHO to debate issues of relevance and importance. This year, we will be discussing how to Eliminate Health Inequality in Rural Countries and Preventing Radiation and Chemical Emergencies.

Firstly, the issue of ensuring all countries have equal access to top-notch healthcare is one of WHO's utmost priorities. It ponders the question: which should be valued more, investing in efficient outcomes to prevent health inequalities in the future, or, annihilating the effects of ongoing health discrepancies going on right now? That being said, poor environmental conditions are a major factor to illness and foodborne diseases, which is why it's important for delegates to research their country's stance when it comes to health inequality.

Secondly, preventing radiation and chemical emergencies range from protecting victims who have been harmed by external exposure, nuclear power plant accidents, and strengthening security of radiational objects. While sources of radiation and chemical experiments can be beneficial within the medical and agricultural fields, it is vital that there are guidelines in place to ensure radiational activities do not get into the wrong hands and reduce the frequency of chemical spills.

The Dias team encourages everyone to read the lovingly written background guide and use it as a tool to further research your country's position. More credible sources you research directly correlate with a higher understanding of our topics and your overall

enjoyment within the committee sessions. Position papers are strongly encouraged and are mandatory to be considered for awards.

That being said, our ultimate goal is for every delegate to walk away from WHO at Oakridge MUN 2021 with new lifelong skills, memories, and friends. MUN encouraged me to step out of my comfort zone and become more actively involved in prevalent issues in today's society, and I hope it does the same for you! If you have any questions, please do not hesitate to reach out to who@oakridgemun.com. On the behalf of your dias team, we are so thrilled to meet you and become part of your MUN journey!

Sincerely,
Arushi Choudhury
Director of WHO -- OakridgeMUN (III) 2021

Committee Overview

Founded in 1948, the World Health Organization coordinated access to safe and affordable medicine in order to achieve the goal of maintaining the greatest quality of health. With 194 member states, the WHO is the United Nations (UN) organization in charge of health policy and ways to overcome health challenges.

WHO has established itself as a key player in the field of international public health and public health policy, with working on the front lines in over 150 locations across six regions. Every year, delegates meet at the World Health Assembly to set priorities and discuss overall global health progress, since the World Health Assembly is WHO's highest level decision making conference. The World Health Organization is a United Nations organisation that brings together countries, partners, and people to promote health, keep the world safe, and help the most vulnerable - so that everyone, everywhere may live a healthy life.

In the past, WHO has contributed to eliminating smallpox, while combating other diseases and outbreaks such as HIV, COVID-19, and AIDS. Specifically towards developing nations, WHO continues to ensure hygiene and efficient healthcare to better the lives of civilians in rural areas. Currently, WHO is involved in setting up local health centers, conducting progress surveys, planning long term health plans, and more. Ultimately, WHO's goal is to ensure people have universal health coverage and to promote a better well-being.

https://www.britannica.com/topic/World-Health-Organization
https://www.e-ir.info/2010/11/08/what-are-the-main-functions-of-the-world-health-organization/
https://www.who.int/about

Topic Introduction

Radiation refers to the energy traveling through space at the speed of light, in fact, we're exposed to radiation almost every day in its most common form: sunlight. On the other hand, when we think of chemical incidents and emergencies that could come from it, we think of lab factories and oil spills. Overtime, it's important that members of WHO think outside the box and address the medical issues associated with both of these in order to promote healthy living.

The world's ongoing reliance on nuclear technology slowly increases the likelihood that radiational and chemical emergencies could occur. Radiation and chemical emergencies refer to situations where there is a release of radiation or chemical substances that result in a risk of exposure. These substances may harm people's health, unintentional or not. Some examples of unintended accidents are accidental oil spills or a leak from a storage unit during transportation. However, some intentional accidents that cause a major emergency notice range from nuclear bombs to purposeful food contamination.

Preventing these emergencies is crucial to avoid severe side effects affecting people's well being ranging from skin reddening up to death. In order to successfully reduce the frequency of these outbreaks and emergencies, delegates in WHO must discuss how to effectively communicate risks between countries and nations before it's too late. Adding on, they should choose how to create stricter guidelines in regards to radiation available within healthcare facilities, chemical transportation, and prevent chemicals and radiation from falling into the wrong hands.

https://www.cdc.gov/nceh/features/beready/index.html ,
https://www.who.int/health-topics/chemical-incidents#tab=tab_1
https://medlineplus.gov/radiationemergencies.html

Historical Analysis

The history of radiation dates back to 1896 when Nikola Tesla - creator of the modern motor and the remote control system - purposely burned his fingers by putting them under X-rays. Even though radiation was discovered in the late 19th century, the genetic effects of a radiation emergency were not realized until decades later, in 1927 when Hermann Joseph Meller won a Nobel prize for his research on the increased genetic and cancer risk when radiation is exposed to the public, unintentionally or not.

As stated before, unintentional radiation emergencies typically come in the form of nuclear accidents. As of 2014, over 100 serious nuclear incidents came from the use of nuclear power, with 60% occurring in the USA. However, the most serious radiation emergency was the Chernobyl disaster - an accident involving nuclear reactor flaws and unstable conditions - in Ukraine in 1986. The Chernobyl disaster killed 31 people and WHO estimated it led up to 4000 additional cancer-related deaths. Another notable accident was the Soviet submarine *K-27,* where 1/5th of the reactor core was exposed to inaccurate cooling temperatures that resulted in the reactor dropping sharply. In the

past, scientists have been working on how to prevent radiation emergencies from happening and strict protocols to follow if in the unlikely situation they do happen. The government advises citizens to stay inside, updated, and as far away from radiation as possible, however, in developing countries experiencing poverty, most don't have a home to go to during emergencies like these, and those to do have unstable electricity and a network to listen to updated news and headlines concerning their safety.

Although it's rare for radiation emergencies to occur when they are transported, chemical accidents may occur more frequently. The most severe chemical accident, which is the unintentional release of hazardous chemical substances, was the Bhopal Gas Tragedy in 1984 in India. The accident resulted in over 500,000 people being exposed to methyl isocyanate, a highly toxic substance that even spread into small towns located near the factory.

Some other moments in history involving drastic chemical accidents were the O'Connor Plating Works disaster, caused by improper safety handling of perchloric acid and resulted in 130 gallons of acid igniting, and the Seveso disaster occurring in Italy. The Italian government decided to take legal actions to clean up the waste using protective clothing and pack the waste into waste drums. However, in countries that can't afford proper protection care, they don't have much power in controlling how far the aftereffects spread out since countries can't afford measurements to prevent spiral spreading.

Current Situation

Between 2009-2018, around 65,000 people died from chemically related events, possibly increasing as the production and use of chemicals and radioactive material are quickly expanding. Exposed toxic substances for both the short and long term can potentially result in extreme detriments to public health. Prolonged chemical exposure in factories, contamination of agriculture and water, and deliberate release of chemicals during conflict are all current events that disturb the lives of many around the globe.

Water contaminations

As more popular products use chemicals and substances harmful to humans when ingested, bodies of water are being contaminated, slowly rendering them toxic to drink.

While the developed world is polluting most of the world's water, developing countries are facing its drawbacks, with toxic substances from factories readily dissolving and polluting rivers and bodies of drinkable water. By using polluted water for agriculture, these countries face disease outbreaks and a far higher infant mortality rate due to malnutrition and death from illnesses. Countries that are big in uranium mining and production of military weapons release radioactive waste into the environment that is near impossible to dispose of from its ability to persist.

Currently, in the developed world, public water systems face serious outbreaks of diseases such as copper, salmonella, legionella, and norovirus. Oftentimes, what factories release into the water goes unchecked, threatening the drinking water from citizens' taps and potentially leading to disease outbreaks if left unchecked. As technology continues to advance, and nuclear production in large nations continues to expand, radioactive waste has become more and more commonly seen in surface water, groundwater, and even marine resources. The cost and effort it takes to clean up waste from production sites are extremely high as well. In Washington, US, the cleanup of 56 million gallons of nuclear waste from the decommissioned Handford nuclear weapons production site is likely to cost more than 100 billion and not finish until 2060. Waste that is then accidentally and intentionally released every day is likely to stay in our water systems until we find a way to properly regulate factories and find better solutions for disposing of hazardous waste.

Factory exposures

Factory workers, especially those in the nuclear mining and weapon production industry are exposed to dangerous chemicals every day. So far, the use of nuclear energy does not expose members of the public to dangerous radiation levels, but workers in these plants may possibly face health problems after prolonged periods of exposure. This is most prominent in the developing world, where more radioactive factory plants are present and regulations often loose with health drawbacks

overlooked. WHO needs to push for more preventative measures on factory exposure for workers to ensure the safety of all in any field which involves harmful substances.

http://nuclearsafety.gc.ca/eng/resources/radiation/introduction-to-radiation/radiation-health-effects.cfm
https://www.safeopedia.com/definition/1780/chemical-transportation-emergency-center-chemtrec
https://www.epa.gov/privatewells/potential-well-water-contaminants-and-their-impacts
https://www.nrdc.org/stories/water-pollution-everything-you-need-know
https://www.who.int/emergencies/outbreak-toolkit/disease-outbreak-toolboxes/chemical-hazards-outbreak-toolbox
https://www.who.int/health-topics/chemical-safety

Past Actions

World Health Assembly (WHA) Resolution 55.16

The World Health Assembly (WHA) Resolution 55.16 is a solution that talks about global public health response to a natural occurrence, accidental release or deliberate use of biological and chemical agents or radio-nuclear material that affect health. Member States are urged to ensure national strategies to monitor diseases complement regional and global procedures to monitor diseases; cooperate in the rapid analysis and exchange of international humanitarian surveillance data and to enhance their capacity in the field of field epidemiology, in laboratory diagnostics, in toxicology, etcetera; strengthen surveillance of public health and response operations for diseases that occur naturally or accidentally is one of the best methods to prepare for deliberately produced disease and this resolution was very focused on this notion. Since 2002, when this resolution paper was put in place, WHO has observed a decline in intentionally created illnesses and has the backing of all Member States.

World Health Assembly (WHA) Resolution 64.10

Strengthening national health emergency and disaster management capacities and resilience of health systems is the World Health Assembly's (WHA) Resolution 64.10. This resolution states that it encourages Member States to improve health outcomes, decrease mortality and morbidity, protect investments in health infrastructure, and strengthen national and sub-national system resilience, enhance the overall risk-management programmes for emergencies in health and disaster risk (includes

disaster risk reduction, emergency preparedness and response); integrate into national and sub-national health plans, and institutionalisation of risk assessment and multisectoral actions to reduce risk proactively and prepare, respond to and remediate for emergencies, disasters or other crises, all risk health emergencies and disaster risk management programmes including disaster risk reduction; develop programmes to assure the safety of the current hospitals and the remediation process and that all health facilities are ready to respond to internal and external crises; to resist local hazards in a safe way; promote regional and subregional collaboration in mitigating, responding and recovering risks, including the sharing of expertise and know-how for developing capacity and to provide local leadership and health care services, by improving the plan, training and access to other resources. Supported by many Member States of the WHO, this resolution has ensured increased safety from radiation and chemical emergencies.

https://www.who.int/health-topics/radiation-emergencies#tab=tab_1
https://apps.who.int/iris/handle/10665/78533
https://apps.who.int/iris/bitstream/handle/10665/78533/ewha5516.pdf?sequence=1&isAllowed=y
https://apps.who.int/gb/ebwha/pdf_files/EB128/B128_R10-en.pdf?ua=1

Case Studies

On March 28, 1979, the worst accident occurred in the US Nuclear power plant industry: the three-mile island accident. Taking place three miles down a river in Middletown, Pennsylvania, the second reactor's cooling system malfunctioned just three months after operating. Even though the reactor shut down immediately, the intense heat and pressure still broke through. Radioactive material entered through rivers and released radioactive containment into surrounding areas.

Health effects

After studies were conducted by the NRC (the Nuclear Regulatory Commission) along with several other independent groups, results came to show around 2 million people surrounding the incident were exposed to radiation above the healthy dose. Though this was the case, no individuals were in severe condition from the radiation itself, with the accident's maximum dose being less than 100 millirems. Due to the unique nature of the incident, government agencies that monitored the area gathered samples of the air, agriculture, and water. Results showed little harm was caused, as low levels of radionuclides were released. So though serious damage was made towards the reactor,

its radioactive release impacted very little for the environment surrounding the area, and individuals directly affected.

Significance of incident

In order to prevent further personnel error and failures from plant design, this incident has greatly changed the nuclear industry. From the public's fear, more pressure was put onto the NRC to further regulations and manage plants much more carefully. Problems identified were developed to reduce health risks to the surrounding public in the following year. Emergency preparedness, for example, was a big issue the NRC pushed to better. Enforcing response plans to be tested multiple times spanning over a year, and drills being practiced by workers and local agencies showed to prepare them better for any future accidents. Especially in the technical areas, the NRC expanded to share their knowledge of nuclear safety with other nations to ensure the prevention of radiation emergencies.

https://www.sas.upenn.edu/~dludden/WaterborneDisease3.pdf
https://www.nrc.gov/reading-rm/doc-collections/fact-sheets/3mile-isle.html

Bloc Positions

Countries with First-Hand Experience

Although countries can try to understand and prepare their best for radiation and chemical emergencies, they never know what to expect unless they experience a disaster themselves. Countries such as Ukraine, Japan, Russia, the United Kingdom, and the United States of America have all encountered serious nuclear disasters that have had a major impact on their society as a whole. The most famous disaster would be the 1986 Chernobyl disaster (rated INES Level 7). Others include the 2011 Fukushima disaster (INES Level 7), the 1957 Kyshtym disaster (INES Level 6), the 1957 Windscale Fire disaster (INES Level 5), and the 1979 Three Mile Island disaster (INES Level 5). Having gone through a radiation disaster(s), countries in this bloc know how to prepare themselves (specifically) for future radiation disaster(s) if they were to occur.

Developing Countries

This bloc is composed of countries that have yet to experience radiation and/or chemical disasters. Although they can do everything in their power to prepare for these disasters, they will never know exactly how they should handle the situation because they have never had to in their countries' history. The most they can do is learn from

observing how countries who have experienced such disasters handle these situations and doing research. Although these developing countries do not know anything too specific about how to prepare for radiation disasters, they can try their best and learn from other nations' mistakes and successes.

Guiding Questions

1. What were some major radiation or chemical spills in your country and what were the
2. biggest challenges your country faced while cleaning it up?
3. How can your country ensure safer protocols so accidents don't happen in the future?
4. Should safety measures be held at a global standpoint or should each measure be specific to your own country?
5. Which does your country value more, taking measures to prevent accidents from happening in the first place or strengthening policies to prevent severe effects of accidents
6. How can your country warn nearby areas about a radiation or chemical accident before the effects spread out?

Further Research

- Different types of radiation emergencies, from nuclear explosions to transportation accidents - please use the “learn more” section when wanting to learn more about a specific type.

https://www.cdc.gov/nceh/radiation/emergencies/typesofemergencies.htm

- Article on “forever chemicals” in American waterways - contains possible recent solutions from president Biden.

https://www.scientificamerican.com/article/forever-chemicals-are-widespread-in-u-s-drinking-water/

- Possible cancer risks from nuclear power plants accidents.

https://www.cancer.gov/about-cancer/causes-prevention/risk/radiation/nuclear-accidents-fact-sheet

- Harvard article on the risk factors of nuclear energy and long-term radiation.

https://sitn.hms.harvard.edu/flash/2016/reconsidering-risks-nuclear-power/

- Article from WHO on radiation emergencies, policies to prevent them, and possible plans for when they occur

https://www.who.int/ionizing_radiation/a_e/emergencies/WHO_stockpile_report_2007.pdf