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1. Introduction to the Committee

The World Health Organization (WHO) is a specialized agency that aims to provide everyone with equal opportunities by leading and supporting global efforts to live healthy lives. The constitution of the WHO came into effect on April 7, 1948. The World Health Assembly serves as the decision-making body of the WHO and is attended by delegations from all member states. WHO's global headquarters is located in Geneva, Switzerland, and it has six regional offices in Africa, Europe, the Americas, Southeast Asia, the Eastern Mediterranean, and the Western Pacific. WHO's response to the global health crisis is the International Health Regulations (IHR). IHR has an emergency committee that can advise the

Director-General of WHO to declare a public health emergency of international concern(PHEIC)if the event meets the criteria for a PHEIC. PHEIC is defined as an exceptional event in which the spread of disease poses a public health risk to other States and potentially requires a coordinated international response.

2. Introduction to the Agenda Item

Ebola poses a serious threat to human health.It is severe and often fatal illness in humans.Three different viruses are known to cause large Ebola disease outbreaks and these are Ebola virus, Sudan virus and Bundibugyo virus.The average Ebola disease case fatality is around 50%.In past outbreaks,case fatality rates have ranged from 25% to 90%.Approved vaccines and treatments are only available for one of the viruses (Ebola virus) and are under development for the others.

Ebola poses a threat not only from a health perspective but also from an economic one.The countries that are affected by Ebola outbreaks slow down the economic growth for example Guinea and Sierra Leone, which had a decline during the 2014-2016 Ebola outbreak.These outbreaks also cause economic losses for countries by leading them to close ports, cancel flights, and prevent people from going to work.In addition, the decrease in economic activities such as imports and exports is dealing a major blow to the manufacturing and service sectors of countries affected by the outbreak and can lead to unemployment.

The Ebola vaccine (Ervebo) should be stored between -80 and -60 degrees Celsius for long-term and between 2 and 8 degrees Celsius for short-term (14 days).It is difficult to properly store and deliver these vaccines to remote corners of Africa where there is no electricity, asphalt roads, or refrigerators.

People need to be educated about Ebola awareness. Locals are afraid of doctors in white Western uniforms, and a certain segment of the country believes that Ebola is a lie spread by the government. Therefore, some people hide their illnesses when they are sick and attack healthcare workers.Furthermore,when some locals perform traditions such as washing and kissing the deceased in traditional funeral ceremonies contributes to the spread of this virus and increases its rate of transmission.For these reasons, people should be educated about the ways of the Ebola virus transmission.

In underdeveloped countries, already weak hospitals are suddenly overwhelmed with hundreds of Ebola cases, resulting in a lack of space for other patients and ultimately, deaths among those with other urgent conditions.This is called “collateral damage”.

3. Key Terms and Definitions

Public Health Emergency of International Concern(PHEIC):This is the highest level of alert declared by the WHO for outbreaks. It is declared when the disease reaches a level where it can affect the entire world.

Contact Tracing:Contact tracing is the process of monitoring and tracking everyone who has come into contact with, or may have come into contact with, an infected person for the duration of the virus's incubation period (21 days).

Ring Vaccination:Ring vaccination is a vaccination strategy that aims to prevent the spread of the virus and control outbreaks by vaccinating close contacts and potential contacts of a patient or suspected patient, thereby creating a ring of immunity around them.

Cold Chain:The cold chain is a logistics network that enables the transportation, storage, and management of vaccines without spoilage. Temperature control is maintained throughout this process to prevent vaccine deterioration.

Triage:Triage is the process of quickly classifying and separating patients according to their symptoms upon their arrival at the hospital.

Nosocomial Transmission:Nosocomial transmission is the spread of an infection to patients or healthcare workers within a hospital due to poor triage or inadequate precautions. In other words, it is the spread of infection within the hospital.

Fomites:Fomites are infectious, inanimate surfaces that have come into contact with the blood, sweat, or vomit of an infected person, and can therefore transmit the virus.

Safe and Dignified Burials:Safe and Dignified Burials are the process of burying bodies of those who have died from illness in a way that respects the culture and beliefs of the local community, while also preventing the spread of viruses to others.

Aversion Behaviour:Aversion behavior refers to fear-driven actions such as people not going to work because they are afraid of the virus, the closure of the country's ports, a decrease in international flights, and foreign workers returning to their home countries. This deals a major blow to the economy.

4. Historical Background

5.1. 1976 Democratic Republic of Congo Outbreak

Ebola disease was first identified in the Democratic Republic of Congo in 1976. The first outbreaks were occurred in Zaire and South Sudan and the first case was recorded by Yambuku. The virus, named after the nearby Ebola River, was initially thought to be the Marburg virus, but it was later identified as a new species belonging to the Marburgvirus family.

Mabalo Lokela was the first Ebola case of the 1976 outbreak. He was diagnosed with Malaria at the Yambuku Mission Hospital and was injected with chloroquine in August 1976 however his disease was not Malaria. Later on 1 September, he returned to the hospital with a high fever so the doctors recommended rest and sent Lokela to home. In 5 September, Lokela was in a critical condition, he was bleeding from all orifices, vomiting, having acute diarrhea, chest pains, headache, fever, agitation, and confusion. Despite the medical staff's treatment attempts

such as giving antibiotics, chloroquine, vitamins, and intravenous fluids however Lokela didn't respond to any treatments and he died in 8 September.

On August 28 another patient came to Yambuku Mission Hospital with similar symptoms(nosebleeds and diarrhea)however he left the clinic and was never found.

The nurses who took care of Lokela and the people who prepared his body for burial also contracted the disease.The disease infected 21 people who were relatives and friends of Lokela, and 18 of them died.

Dr. William Close, former physician to Zairean President Mobutu Sese Seko, was tasked by the Minister of Health in order to get assistance from the United States. He contacted the Centers for Disease Control and Prevention (CDC) in Atlanta, Georgia, which provided laboratory support. In mid-October, health authorities imposed a quarantine on the Bumba region. Village elders instructed community members to stay home.

Then the authorities started an internationally supported investigation. 550 villages and 34,000 families were surveyed. Scientists took blood samples from a total of 442 people in the areas where the disease was most widespread. In addition, they took blood samples from local insects and animals, but they could not find a reservoir animal.After 1976,there was no major Ebola outbreak until 1995.

5.2. 1995 Kikwit Ebola Outbreak

In 1995, the Kikwit Ebola outbreak occurred. This outbreak is one of the best-studied outbreaks in the world. The methods used to identify, control, and treat this outbreak have been used in future outbreaks. The importance of this outbreak lies in the lessons learned.

A lesson learned from this outbreak was about the importance of an efficient triage system.During the outbreak, the hospital did not have a simple triage system since triage could not be applied to incoming patients, the disease spread within the hospital. Without triage, a patient with Ebola could infect other patients while waiting in the waiting room, spreading the disease to everyone in the hospital also doctors and nurses could not identify a patient with Ebola beforehand and might come into contact with the patient wearing ordinary masks and with bare hands. This happened during the outbreak and many hospital staff lost their lives.

Another lesson learned from this outbreak is the importance of protecting the physical and mental health of hospital workers. Healthcare workers and their families were being excluded by the community,neighbors feared contracting the disease and even stoned them. Healthcare workers and their families could not shop outside because grocery and market owners feared getting sick and prevented healthcare workers and their families from shopping at their stores. At times, healthcare workers' homes were burned. So, when healthcare workers returned home, instead of being welcomed like heroes, they were treated as if they were diseased.

This raised the question of whether healthcare workers should be quarantined. Quarantine is logical to prevent the spread of the disease outside the hospital, but more importantly, it reduces the risk of healthcare workers' families being exposed. By reducing the risk of family exposure, the problem of exclusion is largely eliminated. At the height of the Ebola epidemic, 10 people died each day,most of these deaths were colleagues of healthcare workers. This caused emotional isolation among healthcare workers. To improve the mood of the healthcare

workers when special rooms were available, sick staff members would stay in these rooms. This demonstrated that the dedicated workers working during the crisis were valued by giving them special privileges.

Even if there was not a long-lasting strike, there were times when there was a threat of a strike. Workers who had previously agreed to work with endemic patients faced life-threatening situations. When faced with outbreaks, they could change their minds and want to resign. Nursing staff and other support staff were demanding more nursing autonomy, higher levels of infection control, and better safeguards for patients and their families, and they were threatening to resign if these demands were not met. Because of these events, this outbreak is very important and many lessons have been learned.

5.3. 2014-2016 Western African Ebola Pandemic

The outbreak began in the village of Meliandou, Guinea, with the death of two-year-old Emile Ouamouno, who died from fever, headache, and bloody diarrhea. The virus spread to Emile's three-year-old sister, Philomene, and their pregnant mother, Sia, first and then it spread to the healthcare workers in the village. Meliandou is located in an isolated area; reaching the nearest town takes about two hours. Furthermore, because the local population was accustomed to illnesses with symptoms similar to Ebola, the disease was not recognized as Ebola, and as a result, it did not immediately attract the attention of the government, allowing the virus to spread silently. Additionally, people in Guinea frequently traveled to Sierra Leone and Liberia for trade and market purposes. Consequently, the disease spread among communities unaware of Ebola for three months.

Funeral ceremonies and burial rituals also play a significant role in the spread of this virus. Due to traditions in the region's burial rituals, such as washing, touching, and kissing the body, and because funerals attract people from surrounding areas, the spread of the virus has increased and accelerated. The virus subsequently spread to Liberia and Sierra Leone.

The first case across the border was confirmed a few days after the World Health Organization (WHO) officially declared the outbreak on March 23. However, its full impact wasn't understood until August, when the virus spread to the Montserrado region of Monrovia, the capital of Liberia. A quarter of Liberia's population lived in Monrovia, and throughout September, there were approximately 200 new cases per week.

Liberia experienced a 14-year civil war that ended in 2003 and had difficult times since the war resulted in extensive destruction of the country's infrastructure, rendering it almost unusable. Even before the outbreak, Liberia struggled to provide basic healthcare services to its population. At the beginning of the outbreak, there were approximately 60 doctors in Liberia, and the deaths of some of them further demoralized the healthcare workforce. These factors made the fight against Ebola extremely difficult for Liberia.

Darin Portnoy, a medical doctor treating patients at a Medicines Sans Frontieres unit in Monrovia said "People are hesitant and fearful as they do not know what happens in a treatment unit and have heard lots of negative stories," and "That's where we lose the battle - when people hesitate to come in. We can't get on top of the disease when people turn up four, five days into their illness." These words explain how people are afraid to come and therefore cannot receive treatment also since people do not trust the government and hospitals, they

bury their deceased relatives secretly at night instead of allowing healthcare workers to bury them resulting an increase of the transmission rate of the Ebola virus.

It is suspected that the reason the outbreak spread to Sierra Leone was due to the funeral of a well-known traditional healer. People who attended the funeral contracted the Ebola virus from the corpse of the well-known traditional healer.

Ebola triggered major outbreaks in Guinea, Liberia, and Sierra Leone. The virus also spread to Nigeria, however the Nigerian government managed to contain the outbreak before it could escalate. At the time, Nigeria had a population of approximately 170 million, far exceeding the combined populations of Guinea, Liberia, and Sierra Leone. Despite this, Nigeria managed to contain the outbreak with only 8 deaths through swift action and monitoring of around 1000 potentially infected individuals. In addition to the sound policies implemented by the government in preventing this outbreak in Lagos, Dr. Ameyo Stella Adadevoh's selfless act played a major role. While in Lagos, Dr. Adadevoh diagnosed her patient, Patrick Sawyer, with Ebola. When Sawyer attempted to leave the hospital, Dr. Adadevoh and other healthcare workers prevented him, but due to excessive physical contact, Dr. Adadevoh and three of her staff contracted Ebola and died.

The pandemic caused population losses in Guinea, Liberia, and Sierra Leone, but it didn't just cause loss of life; it also resulted in very serious economic losses. In Guinea, annual economic growth estimates fell from 4.2% to 2.4% that year. In addition, the country's agricultural sector suffered a major blow, resulting in a decrease in cocoa and palm oil exports. Sierra Leone, which was on its way to becoming a middle-income country, also suffered significant economic losses from the pandemic. Once 11.3%, its economic growth dropped to 8% in 2014, and even stalled in 2015. The country experienced significant economic losses due to international travel restrictions, market closures, and disruptions to agricultural activities. Liberia suffered the worst economic losses. In Liberia, the economic losses stemmed less from death, illness, and the resulting lack of care, and more from the changing behavior patterns of people due to fear. The number of commercial flights to Liberia dropped from 27 to 6 per week, and as a result of some hotels in the country experiencing occupancy rates as low as 10%, hotel workers lost their jobs.

This outbreak was the largest Ebola outbreak in the world which resulted in over 11,000 deaths and more than 28,000 cases. (It is believed that a large proportion of Ebola cases during the outbreak were not recorded.) Furthermore, this outbreak marked the first time the Ebola virus spread outside of Africa, with cases appearing in Europe and the Americas, including the US, UK, and Italy.

The outbreak was so serious that the United Nations created a website called the United Nations Global Ebola Response specifically to combat this outbreak.

5.4. 2018-2020 Kivu Outbreak

The 2018-2020 Congo Ebola outbreak is recorded in history as the second largest Ebola outbreak in the world. The first case of the Kivu outbreak was confirmed on August 13, 2018. The biggest factor preventing the containment of this outbreak was the military conflict within the country. There were approximately 70 armed groups in the country during the

outbreak. The WHO stated that a total of 85 health workers were killed or injured between January 2019 and May 2019.

The spread of the virus to Goma, a city with a population of 2 million, led the WHO to convene an emergency committee and declare a PHEIC (Public Health Emergency of International Concern) in the region. From the beginning of the outbreak, the majority of people potentially infected with Ebola were under surveillance, but armed conflicts in some areas made these observations difficult, sometimes almost impossible. 25% of the population in Beni and Butembo believed that Ebola was a lie told by the government so the health workers also had to correct the misinformation spread by politicians regarding the Ebola outbreak. Vaccination and treatment were also could not be done because of the people's disbelief of the Ebola outbreak.

Although effective methods were developed to control the outbreak, military conflicts and health hindered the process. The violence and life-threatening situations experienced by personnel make it difficult to control these types of outbreaks.

5. Information About Ebola Virus Disease

6.1. The Strains of Ebola

Ebola is a virus belonging to the Filovirus family, related to the Marburg virus. It takes its name from the Ebola stream near where the virus originated. Ebola's genetic material is single-stranded RNA. Because Ebola is a negative-stranded virus, it is not contagious if it enters the body alone. For the virus to replicate, it must carry its own replication enzyme. Furthermore, RNA viruses lack an error correction mechanism, so faulty viruses are replicated thousands of times. This lack of an error correction mechanism leads to rapid mutations. Because of this rapid mutation a new strain of the virus constantly emerges, which leads to vaccine evasion.

There are six types of Ebola viruses: Zaire Ebola virus, Sudan virus, Bundibugyo virus, Tai Forest virus, Reston virus, and Bombali virus.

Zaire Ebola Virus

The Zaire Ebola virus was the first and original Ebola virus to emerge in 1976, originating in a village called Yambuku in Zaire (now the Democratic Republic of Congo). The Zaire Ebola virus is very closely related to the Marburg virus. It is the most deadly variant of Ebola and has a very high mortality rate (approximately 70% to 90%). The Zaire Ebola virus was responsible for the world's largest Ebola outbreak in West Africa between 2014-2016 and the second largest, the Kivu outbreak, between 2018-2020. There is also a vaccine called Ervebo, specifically developed for the Zaire Ebola virus.

Sudan Virus

The Sudan virus, like the Zaire Ebola virus, emerged in southern Sudan in 1976. While not as deadly as the Zaire Ebola virus, the Sudan virus is still a highly lethal virus, with mortality rates ranging from 40% to 60%. Furthermore, compared to the Zaire Ebola virus, the Sudan virus is less contagious. Its name was changed from Sudan Ebola virus in 2000 to Sudan Ebolavirus in 2002, and finally to Sudan virus in 2010. A recent outbreak occurred in Uganda

in 2022 which shows how current the topic really is. Generally, the Sudan virus causes cases in southern Sudan and Uganda. While a vaccine and some treatments exist for the Zaire Ebola virus, the same is not true for the Sudan virus so there is currently no vaccine developed for the Sudan virus.

Bundibugyo Virus

Bundibugyo virus was first discovered in Uganda. The virus emerged in the Bundibugyo district during an outbreak in Uganda in 2007. While its mortality rate is approximately 40%, making it less deadly than the Zaire and Sudan virus strains, its higher mortality rate doesn't mean it's harmless. Bundibugyo virus can be confused with malaria due to its common symptoms such as fever, vomiting, and diarrhea. This makes early diagnosis and treatment more difficult. The most important feature that distinguishes bundibugyo virus from other Ebola virus strains is that it poses a greater risk factor for the elderly compared to younger individuals.

Tai Forest ebola virus

Tai forest virus emerged in 1994 and only one case has been reported to date. The virus is named after the Parc National de Tai national park in Ivory Coast, where it was first discovered. The virus can be transmitted from chimpanzees to humans. How the virus spread to the western chimpanzee population is unknown.

Reston Virus

The virus takes its name from the town of Reston in Virginia, USA. While all Ebola viruses cause outbreaks in Africa, this Reston variant of the Ebola virus is causing outbreaks in Asia, particularly in China and Bangladesh. The virus causes illness and death in monkeys and pigs. It does infect humans, but it doesn't cause illness; people remain asymptomatic. This is thought to be due to slight differences in the amino acids of the VP24 protein in the Reston variant, a protein found in Ebola viruses that effectively inhibits the human immune system. Even though the virus doesn't currently cause illness in humans, the rapid and frequent mutation of the Ebola virus means it could one day evolve into a variant that does, posing a threat to humans. Furthermore, the fact that pigs, a food source for humans, carry this virus means that if it ever evolves into a human-threatening variant, it could spread widely through the food chain.

Bombali Virus

The virus was first discovered in Sierra Leone in 2018 and a year later it was also found in Kenya. It is found in bats. While it is known to have the capacity to infect human cells, no human has yet been found to be infected or become ill.

6.2. The Origin of the virus

The virus is thought to be hosted by fruit bats from the Pteropodidae family, a member of the Pteropodidae family, but this is likely incorrect. While evidence suggests bats transmit the disease to other animals, no active Ebola virus has ever been isolated from a bat. Therefore, it is more likely that bats are intermediate hosts, like chimpanzees, monkeys, and gorillas, rather than direct hosts. Furthermore, the lack of definitive information regarding the virus's natural reservoir, fruit bats, creates uncertainty about its origin, making it difficult to predict outbreaks.

6.3. Transmission Ways of Ebola

The virus is transmitted to humans through close contact with the blood, secretions, organs, or other bodily fluids of infected animals such as fruit bats, chimpanzees, gorillas, monkeys, forest antelopes, and porcupines. The virus is also transmitted from person to person through blood, vomit, and other bodily fluids, but not through the air. Humans cannot transmit the virus to another person unless they show symptoms. When an infected person dies, the amount of virus in their blood reaches its highest levels, making contact with dead bodies very dangerous.

6.4. Pathogenesis of Ebola

The virus first invades macrophages and dendritic cells, which protect the body, hiding within them before circulating in the lymph nodes and throughout the entire body. Then, using VP24 and VP35 proteins, the virus disrupts the body's interferon system. Infected macrophages release excessive amounts of pro-inflammatory cytokines and chemokines. This leads to widespread inflammation, fever, and tissue damage (cytokine storm). The cytokine storm also disrupts the blood clotting system, causing small clots that block blood vessels. These clots can rupture, leading to internal and external bleeding. Due to the resulting drop in blood pressure, the patient dies from hypovolemic shock and multiple organ failure.

6.5. Incubation period and the symptoms

The incubation period, or the time from infection to the appearance of symptoms, is between 2 and 21 days. The first stage of incubation includes symptoms such as fever, severe headache, and muscle pain, and because these symptoms are similar to malaria, the virus can be mistaken for malaria during this initial stage. A few days after these symptoms appear, the second stage of incubation begins, with vomiting and diarrhea. Internal and external bleeding occurs in the final stages. Symptoms of the virus include fever, fatigue, malaise, muscle pain, headache and sore throat, vomiting, diarrhea, abdominal pain, rash, and impaired kidney and liver function.

6. Tracking changes in how Ebola is treated

Away from emergency responses, handling Ebola now leans on prepared systems using modern tools. Though danger persists, progress appears - especially through better treatments and sharper awareness of social and political roots behind flare-ups.

7.1. Progress in making and storing vaccines

A transition marks today's landscape: vaccines now move beyond trial phases into regular application. Not long ago seen as uncertain, they take fixed form within health frameworks. This change does not emerge suddenly; it builds slowly through repeated validation. Where testing once dominated, structured deployment now steps forward. Routine integration replaces isolated tests across many regions. Confidence grows not by claim but by consistent practice. What was provisional became a common method without fanfare.

Though Ervebo works well for the Zaire strain, research now targets broader protection. Instead of single-virus coverage, new formulations aim at Sudan and Bundibugyo together. Progress centers on combining antigens capable of triggering responses across multiple strains. With outbreaks varying by region, a wider shield becomes more relevant. This shift responds to patterns seen in recent epidemics. Rather than separate solutions, one shot may

soon address several threats. Development moves toward flexibility in the face of evolving risks.

Within two days, vaccine supplies can reach any region needing urgent support. Managed by the ICG, a worldwide reserve for Ebola shots now exists. Availability hinges on coordinated oversight across borders. When outbreaks occur, distribution follows swiftly. This system relies on pre-positioned doses. Rapid access is made possible through structured logistics. Oversight comes from an established international body.

Stability under stress becomes key when transporting vaccines to distant regions. Instead of relying on deep-freeze conditions, scientists now explore formulations resistant to heat. These versions remain effective even after extended exposure to warmer environments. Progress emerges not from colder storage but from altering the vaccine itself. Room-temperature endurance may soon replace extreme cooling needs. Shifts in design could eliminate dependence on complex logistics.

7.2. The Integration of Community Led Response Models

The outbreaks from 2014 to 2016, and then again between 2018 and 2020, have shown just how difficult it is to stop a pandemic and make progress when communities don't trust the government, doctors, and aid providers.

Where outbreaks occur, social scientists support health efforts by adjusting procedures to match community practices; one example is burial methods designed to respect cultural norms while preventing disease spread. Among those involved are anthropologists, who guide modifications so interventions remain effective yet acceptable locally. Their presence allows guidelines to align with belief systems already in place. Such coordination becomes especially visible when handling deaths during epidemics. Rituals around dying matter deeply - and altering them requires careful thought. Input from experts in human behavior helps shape rules that people will follow naturally. Instead of imposing foreign ideas, teams reshape strategies using existing frameworks. This way, safety does not override meaning.

Because false information spreads quickly online, public health groups now work with trusted community figures - such as faith guides and popular voices on the radio - to challenge myths suggesting Ebola does not exist or is part of a political scheme.

Close-to-home medical care is becoming more common. Instead of big, remote facilities that feel unfamiliar, people now prefer smaller clinics within neighborhoods. These allow family visits, easing discomfort during recovery. Rather than distant structures often seen as intimidating, local setups build comfort through familiarity.

7.3. Tracking Health After Outbreaks and Living with Ebola

With improved therapies allowing greater survival from Ebola, attention now shifts toward prolonged health issues alongside lingering virus activity. Though recovery rates rise, observations reveal persistent symptoms appearing months after initial infection clears. Because treatment advances save lives, previously unseen complications surface in survivors' later years. From these cases, researchers detect traces of the virus remaining active within bodily reservoirs. When healing seems complete, some individuals experience joint pain, vision disorders, or neurological disturbances returning unexpectedly. Since medical progress continues, understanding delayed effects becomes necessary for future care strategies.

Months following recovery, the Ebola virus may linger in parts of the body shielded from full immune response - sites such as the eyes or specific bodily fluids. Evidence suggests these reservoirs can reactivate, sparking renewed symptoms or fresh outbreaks. Long-term presence in such areas complicates assumptions about when infection truly ends. From medical monitoring to public health planning, implications emerge quietly but persistently.

Specialized clinics now form part of national health strategies. These services respond to lasting conditions seen after Ebola infection. Physical difficulties often persist alongside emotional distress. Because recovery extends beyond survival, medical support continues years later. Some patients experience joint pain or vision loss long afterward. Mental health challenges may emerge gradually over time. Treatment protocols adapt as new patterns appear in patient records. Follow-up care becomes necessary even when initial symptoms fade. Health authorities observe improvement where structured monitoring exists. Chronic effects demand sustained attention within public infrastructure.

7.4. Tools for digital tracking and tech monitoring

Now tracking outbreaks happens faster because systems update instantly. How quickly data moves changes everything about response times. With alerts appearing minute by minute, decisions shift earlier rather than later. What once took days now finishes before lunch. Speed alters outcomes more often than expected. Real-time signals replace guesswork across regions.

Out in the field, healthcare staff rely on compact gene-analysis tools - no larger than a standard computer - to detect exact Ebola variants swiftly. Hours after sample collection, results emerge, guiding precise immunization responses. This speed comes from devices that fit into travel bags yet deliver lab-grade data. Immediate matching of virus type to countermeasure becomes possible when time is limited. Accuracy improves because analysis happens near outbreak sites instead of distant facilities.

Using artificial intelligence along with data analysis allows officials to anticipate viral spread by tracking how people move and goods travel. This foresight supports placement of health checks ahead of time. Mapping these patterns happens prior to outbreaks reaching new areas. Preparation becomes possible because movement trends reveal likely transmission paths. Insight into human mobility guides decisions on where medical resources get deployed. Forecasting helps position screening stations proactively rather than reactively. Such models rely on continuous streams of location-based information. Early intervention grows more feasible when logistics inform public health planning.

7.5. Navigating Health Security in Conflict Zones

A shift now visible: health measures are shaped by security needs where fighting continues. Not care alone, but protection drives decisions in these areas. Where armies move, medical actions follow a different rule. Security concerns override traditional healing priorities amid unrest. In war zones, medicine answers to defense logic more each day.

After the Kivu outbreak injured 85 medical staff, reliance on impartial mediators has increased. Because conflict disrupts care, temporary peace windows are now arranged through third-party negotiators. With vaccines at risk, calm periods emerge via neutral actors in active combat areas. Though violence persists, pauses in fighting enable immunization

under fragile truces. Since health missions face danger, coordination bypasses warring factions entirely.

When health systems face Ebola plus conflict or overlapping outbreaks, new strategies emerge. These approaches aim to avoid full breakdowns in care during compound emergencies. Planning now reduces strain on services later. Responses adjust when multiple dangers coincide. Stability depends on preparation for more than one threat at a time.

7. Stopping Disease Spread

Speed matters most when facing Ebola, yet adaptation shapes outcomes just as much. Public health basics meet advanced tools, though their fit within communities often decides progress. Timing blends with location-specific adjustments, where terrain and culture shift how tactics work. Methods succeed only if applied fast enough, but also flexible enough.

8.1. Tracking and monitoring of close contacts

Who comes into contact with illness often gets traced through systematic steps. Those near infected persons face evaluation as part of control efforts. Exposure pathways are followed carefully by health workers. Prevention grows stronger when contacts receive timely follow-up. Management includes monitoring symptoms over time. Steps unfold to limit spread beyond initial cases. People touched by risk enter structured observation phases.

Following confirmation of Ebola in a patient, tracing begins. Health personnel locate individuals exposed during symptom onset. Contact history guides each step forward. Every shared interaction becomes relevant. From that point onward, movement patterns matter most.

For Ebola, observation lasts 21 days due to its maximum incubation span. Each contact requires daily checks; signs like fever or digestive issues are watched closely. This duration covers the full window when illness might appear after exposure.

Should symptoms appear, isolation begins without delay. This step stops further spread by interrupting how the illness moves between people. One link removed, the pathway collapses. A single gap halts the progression entirely.

Where conflict persists, such as in the Democratic Republic of Congo, monitoring disease spread becomes complicated. Health personnel face risks when tracing individuals, due to ongoing hostilities. Armed factions limit access, reducing the ability to operate freely. Movement restrictions emerge not solely from violence but also from distrust. Safety concerns shape how data is collected - or whether it can be gathered at all.

8.2. Safe and Dignified Burials

For decades, burial customs contributed significantly to Ebola spread, given the intense concentration of virus in corpses. Though rooted in respect, such practices enabled infection through contact. Where rituals involve touching the dead, risk rises sharply under outbreak conditions. Because decomposition accelerates pathogen release, handling remains especially

hazardous. In affected regions, cultural traditions often clash with containment needs during epidemics.

Among risks tied to cultural customs, handling remains - through acts like cleansing, physical contact, or lip-touching - intensifies transmission potential. Though rooted in respect, these actions allow pathogens greater opportunity to move between individuals. Exposure rises when rituals involve close proximity to bodily fluids. Such traditions, long embedded, now intersect dangerously with contagious agents. Preventive measures often clash with deeply held beliefs during mourning periods. Infection pathways widen under these conditions without deliberate adjustments.

Respect for tradition marks SDB practices, where health workers wear protective gear during procedures. Observers remain apart yet involved through guided viewing. Rituals proceed without touch but retain meaning under modified conditions. Distance does not erase participation; it reshapes presence. Procedures follow safety rules, still honoring belief systems. Family roles shift slightly, though emotional weight stays unchanged.

Midst the 2014-2016 outbreak, refusal of safe disposal practices caused certain households to conduct nighttime interments without oversight, fueling disease spread. Present-day strategies emphasize dialogue with local populations so such rituals align with public health standards.

8.3. Vaccine Development and Ring Vaccination

Now prevention takes center stage, as vaccines reshape how Ebola is met. Instead of only limiting spread, responses begin halting disease before it starts. A new priority emerges - not just control, but foresight.

Surrounding a verified infection, medical teams administer vaccines to close connections - starting with relatives, then extending to nearby individuals who have interacted. This method focuses protection where risk is highest, forming a barrier through targeted outreach rather than broad coverage. Movement outward stops only when transmission paths break naturally.

A shield forms when enough people gain resistance, blocking the path of the virus. Where immunity clusters, transmission slows without reaching new hosts. Protection spreads not by chance but through careful placement of defenses. Movement of the pathogen halts where barriers stand firm. Safety emerges in layers, shaped by the presence of resistant members. The group remains intact because vulnerable points are covered. Distance between infected persons grows when coverage is strong. Interruption happens quietly, in unnoticed gaps. Resilience builds where connections break. A pause occurs - then silence follows.

Though protection exists for the Zaire variant through Ervebo, no authorized options cover Sudan or Bundibugyo - this absence undermines broader defense efforts. From a preparedness standpoint, uneven coverage creates lingering risk where uniformity should exist.

8.4. Challenges of Transporting at Very Low Temperatures

Among challenges posed by the Ebola vaccine, its physical traits stand out. In regions distant across Africa - where outbreaks emerge - the constraints grow sharper. Transporting it demands conditions hard to maintain. Stability issues arise when standard storage fails. These areas lack infrastructure to support strict requirements. Temperature control becomes a central concern. Without refrigeration, effectiveness drops. Local clinics face difficulties few

anticipate. Even distribution routes present complications. Each delay risks degradation. Where roads are poor, progress slows further. Beginnings of epidemics meet inflexible barriers.

Stability at low temperatures defines storage needs for the Ervebo vaccine. From minus eighty to sixty degrees Celsius, preservation occurs effectively. Specialized equipment maintains these conditions consistently. Ultra-cold freezers provide necessary environmental control. Longevity depends on sustained cold exposure within strict boundaries.

Where infrastructure is weak, power supplies often fail. Roads made of gravel replace smooth highways, slowing movement. Cooling systems are absent in many areas. Because of this, keeping vaccines cold while moving them becomes a serious challenge. Without stable conditions, temperature drops cannot be avoided.

After leaving deep-freeze conditions, stability lasts up to two weeks - provided temperatures stay within a narrow range just above freezing. Cooling below that window risks damage; warmth beyond it speeds degradation.

Out in distant regions, getting vaccines where they need to go depends on new approaches. Solar-charged mobile coolers make temperature control possible without grid power. Helicopter teams move fast when time runs short. Before doses lose effectiveness, transport systems must finish their task. Location alone does not stop delivery - careful timing does.

8. Global Cooperation and Legal Systems

When Ebola emerges, coordinated efforts follow through layered rules shaped by nations and institutions. From distant regions to central agencies, actions align under shared legal grounds to contain spread effectively.

9.1. The International Health Regulations 2005 and Public Health Emergencies of International Concern

The International Health Regulations (IHR) represent the primary legal framework for managing global health crises.

Binding under international law, the IHR sets clear duties for member states regarding certain outbreak reports. Reporting of defined public health events forms a core part of this framework. National monitoring systems must meet established standards. Compliance involves ongoing development of detection capabilities across countries.

A situation qualifies as a PHEIC when it meets criteria set by global health authorities. Such events are rare, crossing borders via movement of people or goods. One state's outbreak may affect others far away. The classification triggers coordinated responses under international regulations. Risk beyond national boundaries marks the core condition.

A determination unfolds when the WHO's Director-General issues a PHEIC, guided by input from an emergency panel. Following such guidance became essential in Goma amid the Kivu crisis, prompting global support to begin.

When a public health emergency of international concern gets confirmed, global efforts align through guidance from the World Health Organization. Following confirmation, measures

related to movement across borders, commerce, and medical practices may be advised. Guidance emerges under structured collaboration among nations. Actions follow defined health strategies shaped by shared assessments. Direction shifts according to evolving risks observed worldwide.

9.2. The United Nations Security Council Resolution 2177

Known to challenge global stability, Ebola stands among rare illnesses formally acknowledged beyond health concerns. Its impact reaches into realms of diplomacy and safety, classified not merely as an outbreak but as a risk to worldwide order.

Midst the West African health crisis, Resolution 2177 emerged through UN Security Council approval in 2014. This measure classified the epidemic as endangering global stability. By late that year, such framing had shaped diplomatic responses. Because of its reach, the event crossed borders in more ways than one. Though rare, such designations signal deeper systemic fears. Following adoption, discussions shifted toward coordinated monitoring.

What made this decision stand out began with its departure from standard health protocols. Instead of following usual procedures, it called on nations to remove restrictions on movement. Urgent support in logistics arrived alongside requests for medical aid. Not through typical avenues did the appeal emerge, yet directly toward governments it went. A shift unfolded quietly, not loud but clear in intent.

Instability may arise when epidemics weaken economies, the council noted. Because nations like Liberia still recover from long conflicts, health crises deepen existing cracks. When public systems fail, unrest finds opportunity. Thus, disease impacts reach beyond hospitals into broader societal balance.

9.3. Unmeer United Nations Mission For Ebola Emergency Response

To combat the 2014-2016 pandemic, the UN established its first-ever specialized health mission.

Established only until recovery advances, UNMEER emerged to strengthen efforts already underway across Guinea, Liberia, followed by Sierra Leone. Its presence tied strictly to active outbreak conditions, adjusting as field needs shifted beneath it.

Beginning with operations, UNMEER handled movement and delivery tasks while the WHO delivered health guidance. Instead of clinical focus, attention went to meeting the target - separate 70%, inter 70%, achieve it by day sixty. Through coordination, execution shaped progress rather than expertise alone. Ending in timelines, speed defined success more than strategy did.

From above, decisions flowed through one main hub during the mission. This setup guided foreign assistance efficiently. Where roads thinned and towns scattered, resources arrived because coordination was unified. Oversight came from a single point, preventing confusion among helpers. In far places, impact showed clearly when support arrived without delay.

9.4. NGOs and Their Role

Frontlines of Ebola efforts commonly belong to NGOs, stepping in once public systems falter. Where state presence fades, these groups tend to appear. Their work unfolds amid

breakdowns others avoid. When official channels collapse, alternative structures take root instead.

Among those offering medical aid, Médecins Sans Frontières raised concerns early in 2014. Their presence brought most of the isolation capacity when cases peaked.

Where healthcare systems buckle under pressure, support arrives through nonprofit groups. These organizations step into spaces left bare by strained public facilities. Lives continue because routine care does not stop. When clinics cannot cope, outside aid keeps essential treatments running. Poorer nations see fewer avoidable losses when external teams provide steady medical presence.

Where trust is fragile, mediation becomes essential. Through trained personnel, connections form across cultural divides. Local knowledge guides outreach efforts. Western representatives adapt their approach through collaboration with community insiders. Suspicion fades slowly when dialogue replaces distance. Understanding grows where shared goals emerge quietly.

Among those who stand against outbreaks, some pay the highest price. Consider Dr. Ameyo Stella Adadevoh - her actions in Nigeria halted wider transmission, though at a personal cost. Facing danger is part of such work, not an exception. Lives are lost where protection is thin, yet duty remains. Though unseen by many, courage appears quietly, shaped by choice and consequence.

10. Domestic Approach

9. Questions To Be Answered

1. How can the Ervebo vaccine be delivered to underdeveloped regions of Africa, where there is no electricity or roads, under appropriate temperature conditions?
2. How can the safety of healthcare workers working in active war zones be ensured?
3. How can local people's trust in doctors and the government be restored?
4. How can the economic damage caused by aversion behavior be eliminated?

5. What systems can be established to treat chronic conditions experienced by people who have recovered from the disease and to prevent it from lurking in bodily fluids and triggering a new outbreak?
6. While a vaccine exists for the Zaire strain, how can vaccines be developed or accelerated for strains like the Sudanese and Bundibugyo strains, for which no vaccine currently exists?
7. How can nosocomial transmission and the spread of the virus within hospitals be prevented?

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