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IFMSA Policy Document Control of Emerging Infectious Disease

Proposed by Team of Officials

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Policy Commission

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Policy Statement

Introduction

Emerging Infectious Diseases (EIDs) are infections with increasing incidence and spread with a threat to increase in the near future. In the past years, new EIDs have emerged at an unprecedented rate, and a global pandemic has risen to highlight the importance of managing this group of diseases. This setting highlights the insufficiencies of existing hierarchical constructions and worldwide systems to give a compelling reaction.

IFMSA position

The International Federation of Medical Students' Associations (IFMSA) recognizes the need to strengthen preparedness for control of Emerging Infectious Diseases and response to public health disasters as a means to reducing the event of outbreaks of diseases and further disaster if there should arise an occurrence of an outbreak, in light of the pandemic context. EIDs have negative economic and social impacts on the societies affected which can be mitigated through a well-prepared health system for emergencies. IFMSA also recognizes that Universal Health Coverage and wider health system strengthening are more cost-effective and widely beneficial, than spending to control outbreaks.

Call to Action

Therefore, IFMSA calls on:

Governments to:

- Commit to Universal Health Coverage, health financing and recognize that this is the main key to build resilient health systems and achieve global health security.
- Fund research projects, WHO Contingency Fund for Emergencies and World Bank Pandemic Emergency Financing Facility and invest in the production of effective and accessible vaccines and treatments.
- Capacitate communities and future healthcare workers about disease prevention and infection control practices to mitigate the current and future EIDs
- Have a transparent and evidence-based response to EIDs.
- Develop initiatives that provide students with the opportunity to collaborate with experts from various professional backgrounds to learn more about EIDs.
- Develop a resilient health system that will withstand the changes in disease pathogenicity and outbreaks.

The World Health Organization to:

- Sustain the coordination of the WHO Health Emergencies Programme with technology developers/innovators, government and research institutions to ensure that health technologies are affordable, safe, and effective.
- Harness the innovative abilities of youths by supporting their initiatives focused on the control of emerging infectious diseases and providing opportunities for continuous training and capacity building



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- Work with all member states with a special focus on low-income countries, to build well-prepared health systems for public health threats.

Healthcare providers to:

- Improve and implement the updated infection control practices to prevent EIDs.
- Train the medical personnel accordingly in emergency prevention, infection control strategies and treatment protocols.
- respect different cultures when providing medical care with maintenance of clinical competency during emergencies.
- Commit to the national mechanisms and the international health regulations.

Epidemiologists and Researchers to:

- Support EIDs research projects through interprofessional collaboration.
- Support research on EIDs and the importance of multi-sectoral collaborations in mitigating the EIDs.

IFMSA National Member Organizations to:

- Implement education and advocacy activities to increase awareness about infection prevention and control among healthcare students and the general public.
- Establish multistakeholderism approaches with different sectors to combat emerging diseases, especially in their own countries.
- Promote interprofessional collaboration to apply one health approach to facilitate a better understanding of the control of emerging infectious diseases.



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Position Paper

Background Information:

Emerging infectious diseases are diseases that either have recently shown up among a population or have long existed however are essentially expanding in incidence or geographic range [1]. Emergent disease establishment occurs when the pathogen is introduced into a vulnerable population and spreads from person to person, thereby causing a disease outbreak [2]. EID can be caused by known agents that spread to new geographic populations, a known agent with a previously unrecognized role in the disease, or diseases that have had a significant decline but re-emerged with a higher incidence termed as “re-emerging infectious diseases” [2]. The World Health Organization (WHO) mentioned in the 2007 report that infectious diseases are emerging at a very rapid rate that has not been seen before [3]. Since the 1970s, about 40 infectious diseases have been discovered, including SARS, MERS, Ebola, chikungunya, novel strains of influenza, Zika, and lastly COVID-19, caused by a novel strain of coronavirus, SARS-CoV-2 [2]. Additionally, the resurgence of old diseases, such as malaria and cholera, is also concerning. Deterioration in social conditions and public health programs underlie the rebound of diseases transmitted person-to-person (e.g., tuberculosis, diphtheria). The resurgence and rearrangement of contaminations including at least two species (mosquitoes, ticks, deer, birds, rodents, or people) reflect changing biological and climatic conditions just as social changes (such as suburban sprawl). Waves of infectious diseases come in cycles. Many surge crest when populations overwhelm infrastructures or exhaust environmental resources. In some cases, pandemics can spread across continents [4].

Discussion:

Factors driving disease emergence:

Emergence and re-emergence of disease is often due to a combination of multifactorial causes. Over the past 35 years, a minimum of 30 new infectious agents affecting humans have emerged, most of which are zoonotic and correlate significantly with socioeconomic, environmental, and ecological factors [1]. With globalization, increased international travel, and increased contact with animals, new pathogens and infected humans are increasing [5].

Additionally, environmental, occupational, demographic, and ecological factors led human beings to be at increased risk of contact with microbes through their natural hosts, leading to an increase in emergent diseases [1]. The research tracked down that 75% of emerging infections are zoonotic, and zoonotic microbes are twice as prone to be related to emerging diseases than non-zoonotic microorganisms [2]. Vector-borne zoonotic diseases are proved to be directly affected by environmental factors [3]. Climate is a key determinant of health and a driver for the emergence of infectious diseases [4, 5]. Environment restricts the range of infectious illnesses, while climate influences the strength and timing of their outbreaks [6]. Long-term warming is encouraging the geographic expansion of many infections [7], while extreme weather events are sparking ‘clusters’ of disease outbreaks [8, 9].



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These events may lead to changes in ecology and economic inequities, which strongly influence disease patterns. Moreover, warming and unstable climate is playing an ever-greater role in driving the global emergence, resurgence, and redistribution of infectious diseases [5]. Warm climate has been blamed for the northward spread of pathogens, previously typically confined closer to the tropical belt, as seen in Dengue, Chikungunya, or West Nile virus, or changes in migratory bird patterns resulting in new strains of avian influenza spilling over to humans [10, 11, 12]. Further, climate change may lead to the displacement of people, indirectly impacting disease emergence. Displaced people, often housed in poor and crowded living conditions, may become prime areas for disease transmission and causing even more damage to already oppressed populations [13]. A very significant factor in the development of new or re-emergence of diseases is antimicrobial resistance. Over time, microorganisms can develop resistance to the drugs used to treat diseases caused by these pathogens. That is why drugs that were previously effective are not any longer useful in controlling the disease.

As ecosystems have no borders, the dissemination of drug-resistant pathogens has accelerated through human life activity and travel, animals and the food trade, wild animals, migration, transportation, as well as water and wind flow. Emerging infectious diseases are becoming untreatable and uncontrollable due to antimicrobial resistance [14].

War and conflict can contribute to the emergence of infectious diseases by damaging health infrastructure as well as causing displacement of large populations into temporary settlements or camps. These camps are often characterized by overcrowding and usage of rudimentary shelters, inadequate water sanitation, and hygiene, and increased exposure to disease vectors during the acute phase of the emergency [15]

Poor infection control practices in healthcare facilities are the leading factors in outbreaks of viral hemorrhagic fevers [16]. Medical settings have been the focus for several outbreaks of Ebola hemorrhagic fever (EHF) in Yambuku, Democratic Republic of Congo, in 1976, in Sudan in 1976 and 1979, in Kikwit, Democratic Republic of Congo, in 1995, and in Gulu, Uganda, in 2000 [16]. Compared with other resource-poor settings, conflict situations, because of their disrupted health services, may have brought about even more substandard infection control mechanisms, employment of insufficiently trained staff, and shortage of personal protective equipment, which have made Ebola hemorrhagic fever containment difficult. 11 of the 17 EHF outbreaks from 1976 through 2006 occurred in countries affected by conflicts [17].

Land-use changes, such as deforestation, urbanization, and agriculture development, have also been cited to be the key promoters for the emergence of EIDs [18]. The risk was determined to be the highest in tropical forests globally that is characterized by high biodiversity [19]. Land-use change shifts the ecosystem balance and allows humans to be exposed to animals, vectors, and the pathogens they carry [20].

Social determinant of health and EIC:



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Social determinants of health (SDH) are situations during which people are born, grow, work, live, and age, and therefore the wider set of forces and systems shaping the conditions of life. The social gradient is present in countries with the lowest income in the form of variations in income, health, and illness: the lower the socioeconomic position, the more deteriorating one's health status is [21].

Factors related to socioeconomic position, income or wealth, educational achievements and access, occupation, gender, race/ethnicity, and other dimensions generate stratifications in society. The socio-economic position, in turn, is the main stratified in most contemporary societies [22].

Emerging infectious diseases further contribute to stratifications and inequities. The impact of COVID-19 is a significant example of this. Reports emerged in late March 2020 saying that the COVID-19 morbidity and mortality disproportionately affected populations by policies that have created and reinforced health disparities [23-24]. The COVID-19 pandemic has highlighted that adverse working conditions are related to multiple factors, including ethnicity, migrant status, gender, and class, to influence which population groups are most exposed to COVID-19 infection. People in precarious forms of employment have limited access to healthcare services and their often low wages mean they cannot afford sufficient quality food, water, sanitation and housing. Mostly they won't be committed to quarantine when they are infected by Covid-19 because they cannot afford to lose income [25].

The Effects of emerging infectious diseases on health systems:

The healthcare system continues to be disrupted due to the EIDs' impact. Moreover, the detection and treatment of these diseases are becoming progressively complicated. Most importantly, the public health system is also continually challenged by unanticipated disease outbreaks, whether an influenza epidemic or an act of bioterrorism. To be ready and fully responsive to these infections and outbreaks, the public health framework requires attention, resources, and collaborative work [26].

Seasonal infectious disease outbreaks serve to remind the public of the importance of maintaining a prepared and properly funded public health system. The outbreaks and the epidemics of infectious diseases have been successfully prevented and managed which subsequently led to the common misinterpretation that the public health system is more than sufficient, however, believe the true risks and strengthen the public's expectations in the face of continually complex Emerging Infectious Diseases as well as changing the healthcare environment [26].

The diversity of new pathogens and risk factors made the disease investigation more complicated taking into account the natural habitats they were present at in the past, their significant outbreaks, and any bioterrorist activities that cross state and national borders, often raising political and economic concerns. The current era of continually global population mobility, as well as the vast distribution of centrally-produced foods, made the prompt recognition and ample response to the most broadly spread outbreaks, a significant challenge to the public health systems [26].



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The WHO mentioned that maintaining a well-functioning public health infrastructure can prevent many infections, particularly those that are food-borne or water-borne. Defects in the healthcare system can result in massive epidemics. A well-prepared and sufficient public health system not only promptly detects and responds to the immense epidemics during its initial phase but is also sensitive and sophisticated enough to spot a new or hitherto unidentified infection [27].

The Sustainable Development Goals, Universal Health Coverage, and EIDs

The Sustainable Development Goals (SDG) was launched by the United Nations in 2015 to address the key issues pertaining to humanity's increased use of natural resources. As its name suggests, the SDG aims to promote sustainable development and includes 17 goals aimed to be achieved by 2030 [28]. Amongst the many goals are poverty reduction, elimination of hunger, providing health and access to education.

EIDs have a profound impact on the ability of the world to achieve SDG targets and goals. As demonstrated by both the Ebola Virus Disease outbreak in West Africa and COVID-19, global pandemics caused by these emerging pathogens cause widespread disruption and have shown a reversal in the progress made in previous years. The 2014-2016 Ebola Outbreak in West Africa saw the incidence of poverty worsen in Guinea, Liberia, and Sierra Leone. Food security was likewise threatened in the region, and children's schooling has been affected [29]. As for the current COVID-19 pandemic, it was shown that the number of individuals who were pushed into extreme poverty increased for the first time in decades while the rich have gotten richer causing a disparity. More students are out of school due to school closures and due to inaccessibility of remote learning options [30].

Universal Health Coverage (UHC) – an aspiration of ensuring access to quality healthcare services while at the same time not posing a financial burden to the user is a component of the SDG [31]. It is not immune to the effects of pandemics [5]. The WHO reports that many countries are finding it more difficult to deliver healthcare compared to the situation prior to the outbreak of COVID-19. Healthcare workers, who are key to enabling UHC, are also affected by COVID-19 [32]. Financing UHC, which often derives from government funds, has been more challenging in the era of COVID-19 as economies shrink and national revenues decline [33].

The regression that is seen in the global quest to achieve the SDG serves as an important reminder that EIDs not only impact human and animal health, it also has far-reaching repercussions that may have an impact on poverty, security, and sustainability.

The economic impact of EID

The limited estimation of the economic impact of disease events is typically characterized by a dichotomy of direct costs - e.g. healthcare costs and 'limited' indirect costs - e.g. wages lost and informal health costs related to the patient care [34].



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Disease burden may be captured using health metrics (e.g. number of deaths or Disability-Adjusted Life Years - DALY). While they remain meaningful for the health community, it is becoming increasingly evident that this limited scope of analysis does not provide a comprehensive view of the economic consequences of disease events, including contagion avoidance behaviors. These are required to inform the decision-making of a wider range of stakeholders and connect to broader economic development agendas. Direct and indirect economic impacts of disease events are affected by disease preparedness and prevention (practices that mitigate risk), the event itself (e.g. business continuity, supply chain disruption, trade and travel bans, public contagion avoidance behavior), and the event's aftermath (e.g. long-term employment loss, permanently closed markets or farms, long-term stigmas associated with specific animal products, impacts of having missed out on education or losing a parent/guardian/family member., etc.) [34].

Risks to healthcare workers with EID:

The health systems worldwide have been highly affected by several EIDs. Healthcare personnel (HCPs) are at the highest risk of acquiring emerging infections while providing care to patients. The infections with Middle East Respiratory Syndrome, coronavirus, Ebola, and SARS have been reported among 1-27%, 2.5-12%, and 11-57% of total cases were Healthcare personnel respectively. Up to 73% of the reported cases of Ebola were HCPs with a high fatality rate. In 2004 the WHO developed the global surveillance of SARS and used it as a template for other emerging diseases preparedness. Inappropriate and inadequate infection control measures during the initial encounter, at the beginning of the outbreak, and with an overwhelming number of patient cases, put the HCPs under high risks of emerging diseases [35].

The healthcare workers are directly exposed to highly virulent infectious pathogens through the body fluids and respiratory droplets - it is exactly why Personal Protective Equipment (PPE) urgently needs to be offered. The recent outbreaks of contagious infectious diseases worldwide, including the Ebola virus and Middle Eastern respiratory syndrome, determine the optimal PPE in high-risk settings for the HCWs. Further research is urgently and highly needed [36].

To prevent the transmission of pathogens, especially in resource-limited settings, access to sufficient PPE supplies is crucial. Commitment to appropriate PPE use is a challenge due to lack of education on its usage, technical difficulties, and tolerability of PPE in the workplace. To mitigate the current situation, further projects must include redesigning PPE which is crucial to improving the safety of HCWs [36].

Preparedness for health emergencies:

Emerging infectious diseases (EID) are global threats to public health. Novel and re-emerging pathogens such as Ebola, SARS, MERS, Zika and currently COVID-19, cause



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sizable outbreaks. Given the constant threat posed by these emerging infections, it is imperative to be prepared.

EID preparedness is a broad topic and five main aspects will be addressed in this section: surveillance, investing in talent and infrastructure, addressing social and economic drivers of EID emergence, the role of the World Health Organization (WHO), and pandemic vaccine development. Other aspects, such as communication, governance, and trust, are covered elsewhere. A review by Palagyi et al provides a summary of EID preparedness in health systems [37].

Surveillance

Surveillance is considered one of the cornerstones of EID preparedness as it transcends the monitoring of human pathogen or disease incidence by the inclusion of studying pathogens circulating in the high-risk wildlife population [38, 37, 39]. To illustrate this point, since the SARS outbreak in the early 2000s, studies have shown that bats harbor a wide range of coronaviruses – some of which has spilled over to humans in the past decade [40,41]. Identifying high-risk pathogens circulating in wildlife may give scientists and public health experts clues to anticipate the next zoonosis to facilitate research and development works in advance [6]. Establishing an international mechanism for surveillance, similar to the ones implemented for influenza, will likewise be helpful [43,44].

Building Talent and Investing in Infrastructure

Building talent and investing in infrastructure is imperative to prepare for EIDs' emergence. This is even more vital as areas at the highest risk of zoonoses are typically located in regions marked by low and middle-income economies. Training in-country and subnational teams to plan for and run their own epidemiological investigations during the times of outbreaks, and for them to conduct human and animal surveillance for EIDs are beneficial [37,44]. As was seen in south-eastern Liberia in 2014, training workshops for surveillance conducted in the region were credited, amongst other factors, for a reduced Ebola caseload in the region [37].

Addressing the Social and Economic Drivers of EIDs

Given the complex nature of EID emergence, the often-cited, holistic One Health Approach is required for EID preparedness [45]. One Health involves a wide range of sectors in addressing diseases [46]. It involves an integrated approach to confronting multiple factors affecting disease - not just from the human medicine point of view [47], but it is also one that includes veterinary medicine, public health, environmental sciences, and, in some definitions, social sciences [44,45]. Social science research in the realm of EID emergence is essential as it seeks the social and economic drivers of disease emergence. These factors have a tendency to mold the animal-human interfaces, where zoonoses and EIDs typically



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start. Understanding these will help in decision-making and crafting policies that take social and economic drivers for EID preparedness into account.

The World Health Organization (WHO) and EIDs

The WHO is a specialized agency of the United Nations system and serves as an institution providing guidance and coordination on matters relating to international health. On the infectious disease front, the WHO has mechanisms in place for members to report diseases that may lead to international spread, as mandated by the International Health Regulations. The WHO's response to infectious diseases has been shaped by past outbreak experiences and has since expanded in scope[48]. The WHO does not only publish guidelines that help member states deal with pandemics at 'war-time, the Organization also works with member states to strengthen their public health infrastructure and preparedness at 'peacetime. Although initially meant for combatting pandemic influenza, the Pandemic Influenza Preparedness (PIP) Framework, for example, was credited with facilitating the response during the early stages of the COVID-19 pandemic[49]. This demonstrates the importance of preparedness – having mechanisms in place before outbreaks occur.

Pandemic Vaccine Development

A component of EID prevention strategies involves the development of vaccines even before a pandemic occurs. The WHO maintains an updated list of 'priority diseases' they determined to be the greatest public health risk and includes the likes of Crimean-Congo Haemorrhagic Fever, MERS, SARS, and Disease X – a pathogen that is yet unknown to cause human disease [50]. Having solid research and development platforms set up during 'peacetime is imperative; these can be co-opted during 'war-time and valuable time may be saved in the development of vaccines or therapeutics against the novel pathogen. Investments by organizations like the Coalition for Epidemic Preparedness Innovations (CEPI) for their MERS vaccine program paid off during the COVID-19 pandemic. Such technologies were repurposed from MERS to SARS-CoV-2 and thus helped develop COVID-19 vaccines in a relatively short period of time[51]. Apart from research and development, agreements should be in place at 'peacetime to discuss how these platforms (e.g. intellectual property rights) are to be shared amongst different parties and stakeholders [43].

Pandemic Preparedness: Making COVID-19 the Last Pandemic:

Upon the request of member states during the 73rd World Health Assembly, the World Health Organization formed a panel to review COVID-19 responses and how these can be improved moving forward. Earlier this year, the Independent Panel for Pandemic Preparedness and Response published their report, "Pandemic Preparedness: Making COVID-19 the Last Pandemic". This report outlines the Panel's findings and provides guidance on steps needed to make pandemics a thing of the past. Steps enumerated include strengthening the WHO, having a global surveillance system for pathogens with pandemic potential, financing pandemic preparedness, amongst others [43]. As



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demonstrated by the report, pandemic preparedness is a complicated endeavor and requires the collaboration of international organizations, national governments, financial institutions, scientists, and the healthcare field.

Controlling emerging infectious diseases:

When an arising infection is accounted for by the WHO, experts in the field of Emerging Infectious Diseases from WHO and the reporting nation survey the danger to people, determine the source and attempt to comprehend whether there are further transmission hazards. Should the contagion be deemed to be a continuous danger, measures to control spread might be suggested, including active surveillance, contact tracing, isolation, social separating, vaccination or prophylaxis in people or animals, and now and again winnowing of animals if they are a source of disease [52]. To control Emerging Infectious Diseases, the detection of the agent, the infectivity, the developments of immunizations and treatments, contact tracing, isolation, and screening may all be significant [53]. As far as disease management is concerned, preventive chemotherapy, vector control, and pesticide arrangements alongside access to pure drinking water, sanitation, and hygiene, education, veterinary public health administrations are a portion of the public health strategies and techniques utilized by the WHO for the control, disposal, and containment of arising infectious diseases. A definitive objective of emerging infectious prevention, notwithstanding, is to accomplish absolute eradication. Advances in molecular diagnostics and sequencing innovation have assumed a significant part in controlling numerous infectious diseases [54].

Proper management of new epidemic infectious disease hazards in the stage that no therapy or vaccination is yet available, is generally subject to precautionary conduct of the population. Execution of precautionary behavior is greatly reliant upon effective risk communication, for example, communication that encourages realistic danger discernments, one that sends the correct message and that encourages the adoption of precautionary practices [53].

The way to deal with Emerging Infectious Disease (EID) alleviation contrasts dependent on the individual pathogen. Immunizations are considered the primary weapon of disease prevention of EIDs as there is a dearth of treatment options and rapid clinical deterioration which restrict the effectiveness of available therapeutics. Vaccine advancement for each and every infectious disease has extraordinary challenges. At the hour of emergence, little might be known about the pathogenesis, the study of disease transmission, and the epidemic potential of a new, emerging infectious agent. In any case, for EID vaccine development, the desire for rapid vaccine deployment for newly emerging infections is tempered by the real factors of the life-cycle for drug advancement [57]. Following a conventional research and development pipeline, it takes approximately 5 to 10 years to create and register a vaccine for an infectious agent. What makes the COVID-19 pandemic unique is that the entire research pipeline, from the virus sequence to clinical trials took in mere 300 days. The collective experience and knowledge of the SARS-CoV-2 pandemic should be aggregated and applied to the improvement of future vaccines against arising infectious diseases and



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novel pandemic microorganisms. The perpetual danger of emerging microbes calls for cautiousness, observation, and readiness for vaccine improvement and arrangement. All cross-cutting activities are directed faultlessly amongst epidemiologists, researchers, engineers, human and veterinary healthcare specialists, regulators, and funders [58]. The current global healthcare environment is unprepared to address structural violence as a determinant of health, and the existing framework maintains the quality of discriminatory medical services. Worldwide healthcare requires coordinated, decolonized approaches—progressed by people and organizations—that address the complex association between histories of dominion with health, monetary developments, administration, and human rights. The global movement to decolonize global health, driven by medical students and different experts, is one stage towards this vision. To evacuate these sources of healthcare disparities, all professionals and specialists should use the interruptions brought about by this pandemic to more critically reflect on their actions. An ever-increasing number of voices calling for perceiving and reviewing these imbalances in global health [55]. Emerging Infectious Diseases can be controlled to a greater limit if this can be ensured.

The difficulties of both new and re-emerging infectious diseases on the human population are influenced by the rate and extent to which the novel and re-emerging infectious diseases spread across geological regions, contingent upon the development of human hosts or the vectors, or repositories of diseases. Travel has a significant role in bringing individuals into contact with infectious agents. Genetic shifts, or periodic gene reassortments, among human and animal viruses, may prompt pandemics, as happened in 1888, 1918, 1957, and 1968. Observation and response, the critical components in controlling EIDs, rely upon quick clinical findings and discovery and regulation in the population and the environment. It is of crucial significance to develop countermeasures, such as surveillance tools, diagnostic tests, vaccines, and therapeutics [56].

Synergistic, multisectoral approaches, such as One Health, are essential to improve EID control. Likewise, with different health spaces, mediations should exhibit adequacy, cost viability, and sustainability to treatment. The way forward should involve human, animal, and environmental health networks and ultimately draw in policymakers across different areas like trade and commerce [52].

Post-emergent infectious diseases recovery:

Emerging infectious diseases place a great burden not only on the sector of health but also on communities while having a societal and economical component. Therefore, it is of vital significance to tackle the negative impact of outbreaks by developing strategies for ensuring recovery.

These strategies should include collaborative, multisectoral approaches, such as the One Health initiative, that demonstrate efficacy, cost-effectiveness, and sustainability. Evidence and knowledge generated by these programs and long-term applications can contribute to the shaping of policies that reposition the focus on the prevention of infectious diseases, rather than an emphasis on detection and outbreak response. In addition, we should



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underline the importance of forming policies that simultaneously are cost-effective and protecting the global economy or policies that are being accompanied by a legal framework in order to be supported. Above all, these policies should take into account human, animal, and environmental health [26].

A vital aspect of recovery would be to improve communication amongst the public and the authorities so that in an outbreak people will be well informed on how to manage the situation, how to receive the optimum healthcare services, and how to respond to the requirements imposed by the Public Health Emergency. This can be achieved with the delivery of messages in order to improve compliance and alleviate fear [59].

Furthermore, some lessons learned and advances made are the broader use of digital technologies and telemedicine. Such technologies enable rapid and versatile delivery of healthcare services remotely [60].

When it comes to hospitals, healthcare systems, and healthcare workers should re-evaluate workforce plans and forecast needs for the rest of the year and beyond. There is a need to rethink staffing models; staff deployment should be shaped according to tasks and competencies rather than roles and job titles. Furthermore, the development of rapid support and training to allow staff to allow redeployment, as well as managing their safety and mental health by strengthening support services to reduce staff attrition and burnout, are imperative moving forward [61].

The regional perspective of disease emergency:

Infectious diseases emerge and re-emerge in different parts of the world, each with its specific conditions and potentials to cause more substantial impacts. Even though this analysis consists of a geographical division for understanding purposes, It's important to reiterate that communicable diseases are not bound to geopolitical boundaries [62].

Africa is characterized by a fragile public health structure. Allied with poverty, the weak public health infrastructure magnifies the burden of infectious diseases like Malaria and HIV, that are already afflicting this region. What's more, half of the deaths on this continent are caused by infectious diseases. Most of the outbreaks in this region are zoonotic and have been responsible for outbreaks, like Ebola, Zika and chikungunya [63].

The Asia-Pacific region includes large areas subjected to the ever-increasing trend of globalization. As a result of that, although the continent has a large burden and high risk for the pathogen emergence of emerging infectious diseases, there is increasing implementation of research and preventive measures towards minimizing the incidence of infectious diseases [64]. The hotspot on this continent is the South-East Asian region, where the pandemic potential is considerably high. In recent years, viruses such as avian influenza A have brought international attention to the region. Factors that contribute to these scenarios are the diverse zoonotic factors, for example, the large concentration of animals in cities, and the high density of human beings [65].



The Americas also deserve some attention regarding infectious diseases. Those most prevalent, such as HIV, TB, and malaria, was responsible for 6% of the total burden of disability-adjusted life years and 7% of all deaths [66]. The Pacific region, Oceania in particular, has a high prevalence of Emerging Infectious Diseases, especially neglected tropical diseases. This group of infections is highly common amongst people who live in poverty. Numerous programs have been developed to facilitate disease control and to avoid the emergence, including a program towards drug administration and development [67].

There is a crescent problem of antimicrobial resistance in Europe, which leads to the emergence of resistant pathogen variants. This region is also a hotspot for the emergence of new infectious diseases, alongside bioterrorism. Globalization coupled with environmental, demographic changes, and other public health drivers carry a heavy responsibility towards these risks [68].

Conclusion

Emerging infectious diseases present a constant threat to humanity – it is not only a threat to the health of the individuals, but it is also a threat to economies, communities, and society at large. As the world becomes more interconnected, the risk carried by EIDs becoming pandemics becomes even greater. Control of EIDs, therefore, becomes one of paramount importance.

However, this is easier said than done. As the problem itself is multifaceted, the possible solution to it is – if not more – complicated. It requires collaboration, multilateralism, reflection and action to build resilient health systems and address EIDs-associated inequities.

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