



Global Conflict Escalation during the Pandemic, Climate, and Economic Dilemmas: Healthcare Sustainability Challenges in Conflict Zones and Elsewhere

Abdul Kader Mohiuddin¹

¹Alumnus, Faculty of Pharmacy, Dhaka University, Dhaka, Bangladesh

Web of Science Researcher ID: T-5428-2019

<p>Abstract: Religion, governance, and politics—as well as related topics such as human rights, justice, and so on—have historically caused many of the world's most significant conflicts, and they continue to do so because these issues are often the most fundamental in the structure of a society. To gain a military advantage, parties to armed conflicts have polluted water, burned crops, cut down forests, poisoned soils, and killed animals over the years. A variety of context factors, particularly socioeconomic conditions, governance, and political factors, interact and play a key role in translating climate change into conflict risks. The present unrest all over the world risks putting more than half of the countries into a crisis of health, economy, and social safety, which is the biggest threat to human civilization. The security and safety of healthcare facilities, workers, and supply lines remain paramount concerns along with access to health services, technology, and innovation.</p>	<p style="text-align: center;">Research Paper</p>
	<p>*Corresponding Author: <i>Abdul Kader Mohiuddin</i> Alumnus, Faculty of Pharmacy, Dhaka University, Dhaka, Bangladesh</p>
	<p>How to cite this paper: Abdul Kader Mohiuddin (2022). Global Conflict Escalation during the Pandemic, Climate, and Economic Dilemmas: Healthcare Sustainability Challenges in Conflict Zones and Elsewhere. <i>Middle East Res J. Humanities Soc. Sci.</i>, 2(1): 1-41.</p>
<p>Keywords: Catastrophes, COVID-19, civil unrests, inflation, public health, Ukraine conflict, Middle-East unrest.</p>	<p>Article History: Submit: 21.11.2022 Accepted: 23.12.2022 Published: 25.12.2022 </p>
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INTRODUCTION

Global health has grown in popularity as a concept and academic discipline in recent years. The COVID-19 conference emphasized the world's interconnectedness and how public health threats are no longer the sole concern of single nation-states, regions, or discrete sectors. War and conflict among pandemic and climate change, have resulted in a humanitarian crisis affecting millions of people worldwide. A joint study by WHO and World Bank says that, healthcare cost pushed more than 500 million people to extreme poverty just before Covid-19 outbreak and the pandemic made the situation even worse (Sabet-Parry & Guo, 2021) (Figure 2). Already 25% of the world population lack access to essential medicines (Ozawa *et*

al., 2019) and 50% of them deprived of essential health services, according to WHO (Yoshizu, 2017) (Figure 2). The planet earth is probably seeing its worst days after civilization has started as climate (Carrington, 2022) and economic crisis (Georgieva, 2022), along with global conflicts (Xia *et al.*, 2022) are reaching their top. When viewed from the perspective of humanity, wars and invasions are always disastrous for both combatants and war victims—specially women, the injured, children of all ages, the elderly, the functionally disabled, and the refugees. The present study aims to bring and correlate effects of pandemic, conflict and climate issues over world economy and interconnect them with victims and future public health (Figure 1).

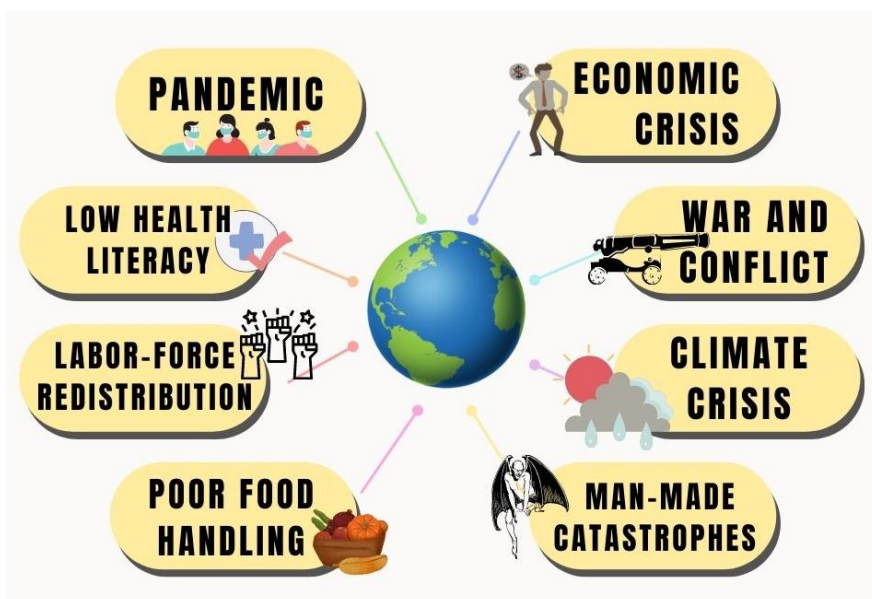


Figure 1: The modern world is plagued by major issues



Figure 2: Even before the pandemic, the global health and economy were not in good shape

Objective of the Study and Social Implication

Several platforms have discussed the global health impacts of climate change, economic crisis, pandemics, and humanitarian crises, but they have been found to be inadequate because they rarely brought out the overall global situation. The current study's goal is to cover them all and bring them together on a single platform through a descriptive review. Students, journalists, healthcare providers, and even the mediocre can boost their knowledge, and of course, economists and policymakers may get a direction for future projections and strategic tools to get rid of this unique condition.

METHODOLOGY

Relevant papers were extensively reviewed, mostly from online resources focusing on climate, conflict, and pandemic issues over public health. Many articles, press releases, and media broadcasts have covered the present global conflicts among pandemics and climate changes. Since journal publications lag behind many updates, popular online news platforms such as Financial Times, Washington Post, The Wall Street Journal, The Guardian, The Daily Star, BBC, CNN, CNBC, New York Times, Business Standard, Bloomberg, Washington Post, Forbes and Reuters were carefully added to the keywords "global warming and public health," "war and conflicts among climate

crises," and "war and conflicts among pandemics" during online search. War, conflicts, the world economy, war-weary economies with their concurrent health issues, pandemic and climate related economic losses, and changes in health system access during war and pandemic were studied. Therefore, news from online portals was carefully judged, and statistical data were correlated with journal articles, where possible. Daily reports of aggression and violence were omitted, along with complex mathematical analysis and data projections, to keep this review more understandable to common readers. Media propaganda is common among conflict situations. Strenuous efforts have been made to correlate pandemic, climate, economic, and conflict issues with public health. PubMed, ALTAVISTA, Embase, Scopus, Web of Science, and the Cochrane Central Registers were prioritized to collect public health issues. Journals from Elsevier, Springer, Wiley Online Library, and Wolters Kluwer were extensively searched.

A Brief Review of Present Global Situation

A. Climate Issues over Public Health

About 7.6 billion people—or 96% of humanity have experienced a global warming effect on temperature in the past 12 months. The World Bank says, more than 1 billion people could be displaced globally by 2050 due to climate change and natural disasters (Henley, 2020) (Figure 3). And more than five million extra deaths a year can be attributed to the disease burden associated with climate change, which is at least 30 times higher compared to 20 years ago (Zhao *et al.*, 2021) (Figure 3). In those years, the lion's share (more than 96%) of disaster-related deaths had taken place mainly in developing countries (Kirigia *et al.*, 2004), which has greatly shifted across 19 countries in North America, Europe, and the Asia-Pacific region that label global climate change as a major threat (Smart, 2022). Global warming is influencing weather

patterns, causing heat waves, heavy rainfall, droughts, cyclones, and wildfires (Zamir, 2021). According to the Centre for Research on the Epidemiology of Disasters, Brussels (CRED), floods, storms, and draughts caused losses to the global economy of more than \$224 billion in 2021 and could cost \$5.6 trillion by 2050 (Dickie, August 2022) (Figure 3). Less than 3% of the earth's water is fresh water that can be used for daily necessities or agricultural use, and less than half of it can be used for drinking (Albert *et al.*, 2021; National Geographic Education). Disastrous shrinking of rivers has been reported in the US, Europe, Asia, and the Middle East (Sullivan, 2022; Henley, 2022; Croker *et al.*, 2022; Bradsher & Dong, 2022), while nearly a quarter of the world's population is at risk of flooding—10 times more rain in Sindh province (AFP, September 2022) and 10 times faster melting of Himalayan glaciers are reported by the European Space Agency and Scientific Reports journal respectively (Lee *et al.*, 2021). Temperature extremes can deteriorate chronic illnesses like malnutrition (Dietz, 2020), auto-immune diseases like arthritis (Levine, 2022) and diabetes (Natur *et al.*, 2022), cardio-respiratory symptoms (Bell *et al.*, 2018), certain cancer types (Nogueira *et al.*, 2020; Hiatt & Beyeler, 2020) as well as spread contagious diseases like mosquito-borne illnesses, COVID-19 (Khojasteh *et al.*, 2022), and fungal or bacterial infections (Hauser *et al.*, 2021; Nnadi, & Carter, 2021). For instance, a 1-degree Celsius increase in global temperature may result in more than 100,000 new cases of diabetes each year in the USA alone (Mohiuddin, 2020a) and six times more premature deaths among respiratory patients compared to the general population (D'Amato *et al.*, 2015) (Figure 3). Also, occupational heat-related mortality is 35 times higher among agricultural workers compared to workers from other industries (El Khayat *et al.*, 2022) (Figure 3).

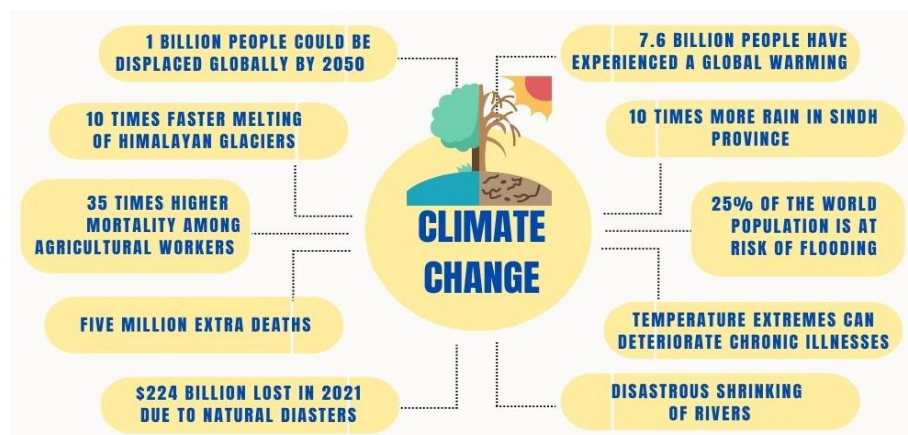


Figure 3: The present climate issues are of great concern.

B. The Global Economy and Public Health are Being Impacted by a Pandemic

The US government issued a new alert in May 2022 stating that the upcoming fall and winter could

potentially see 100 million Covid-19 infections in the US (Abutaleb & Achenbach, 2022). According to Worldometer data, during the course of the manuscript's writing, globally more than 655 million people were

already affected, and 66 million had already died, as of December 14, 2022 (Figure 2). The epidemiologist estimates that more than 60% of China and 10% of the Earth's population are likely to be infected by February to March of 2023, with deaths likely in the millions (Asian News International, December 2022). As the world becomes more interconnected, the economic impacts of the COVID-19 pandemic become more serious. Because of its negative economic implications, the pandemic may also spark and intensify armed conflict (Mehrl & Thurner; Ossai, 2022; Ide, 2021), or at least worsen already precarious situations by escalating grievances, increasing mistrust, discrimination, and perceptions of injustice among vulnerable population in war or conflict zones (Rubinson & Hitman, 2022; McKay *et al.*, 2021; Crow, 2020; Chen *et al.*, 2020; Gover *et al.*, 2020; ILO, 2020). However, fuel crisis induced by Russian aggression in Ukraine, supply chain disruptions, climate disaster, and the continued economic fallout of the COVID-19 pandemic are pushing approximately 345 million people around the globe into food insecurity (Georgieva *et al.*, 2022). "Hunger leads to one death every four seconds"—more than 200 NGOs from 75 countries were calling on global statesmen gathering at the 77th

UN General Assembly to take decisive action (Agencies, 2022). According to the UN, a record \$51.5 billion is required in 2023 to assist 230 million of the world's most vulnerable people in nearly 70 countries (UN News, December 2022) (Figure 4). Already, the cost of illiteracy to the global economy has exceeded \$1 trillion, and UNESCO estimates that close to 900 million learners have been affected by the closure of educational institutions, and 100 million children would fall below the minimum reading proficiency level (Nicola *et al.*, 2020) (Figure 4). Globally, 3.3 billion people, which constitute 81% of the world's workforce, were affected by the lockdown, and the world incurred a loss of 9% of global working hours, followed by 4.4% of the global GDP in lost labor incomes (Moyer *et al.*, 2022). Economically and socially disadvantaged populations were twice as likely to present with COVID-19 symptoms to the emergency department and were more likely to require re-hospitalization within 30 days of discharge (Tuczyńska *et al.*, 2022). During the pandemic, child marriage, gender-based or domestic violence increased; routine health services were jeopardized; and routine vaccinations were halted for 80 million children in 70 countries (Dhaliwal *et al.*, 2022) (Figure 4).

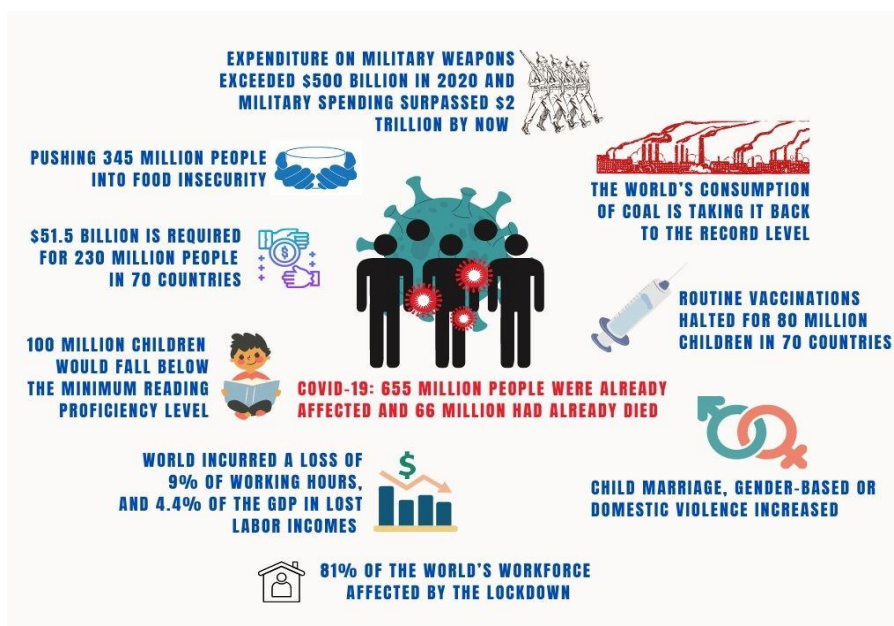


Figure 4: The pandemic pushed the world into a deep mess.

C. Man-Made Catastrophes

Major oil companies don't disclose the huge amount of greenhouse gases their oil fields emit—BP, Eni, ExxonMobil, Chevron, and Shell emit millions of tons of gas from their oil fields (Stallard *et al.*, 2022). According to the World Wildlife Fund (WWF), as a result of deforestation and ocean pollution, the world's wildlife populations have decreased by more than two-thirds since 1970 (Dickie, October 2022). Man-made catastrophes like mountain destruction, deforestation, and pollution not only hamper food, fuel, and habitat but also cause the spread of acute infections

(Reddington *et al.*, 2021; Zimmer, 2019), chronic conditions (Beyer, 2022) and communicable diseases (Rainforest Foundation Norway, n.d.). For example, cardiovascular disease accounts for more than 60% of pollution-related disease and death (Münzel *et al.*, 2022); each kilometer square of Brazilian Amazon deforestation results in 27 new malaria cases (Chaves *et al.*, 2018). This is particularly important as, from California to Germany and China; droughts have shrunk the rivers that drive huge hydroelectric plants (Bloomberg News, October 2022). As global energy supplies tightened last year, India (Varadhan, 2022),

China (Chen, 2022), Australia (Mandavia, 2022), and many European Union countries (Dvorak & Hirtenstein, 2022) increased their reliance on coal-fired power—along with the Russia-Ukraine conflict (Figure 4). The world's consumption of coal is taking it back to the record level it reached nearly a decade ago, says an International Energy Agency press release (IEA, 2022). In its recent publication, Nature Food journal is saying “*We estimate more than 2 billion people could die from nuclear war between India and Pakistan, and more than 5 billion could die from a war between the United States and Russia—underlining the importance of global cooperation in preventing nuclear war*” (Xia *et al.*, 2022).

D. Present Global Economic Crisis: Fact is Stranger Than Fiction

Three largest economies in the world—namely, the US, Eurozone, and China—are facing impediments due to higher than expected inflation or lockdown (Gourinchas, 2022). For example, the UK economy is being battered by rising energy costs, rising interest rates, tax increases, and Brexit (TBS Report July 31, 2022). Global central banks continued raising interest rates following Federal Bank of America to prevent inflation, at the fastest pace in decades but failed, so far (Fairless, 2022; Canepa & Schneider, 2022; Hole, 2022; Smialek, 2022). Inflation hits 40 years high in the US, UK (Hagstrom, 2022; Hannon November 16, 2022; Lopez, April 2022), Japan (Reuters, November 2022), Germany (Arnold, March 2022); 37 years high in France (Alkhalifa, 2022) and Italy (Indo-Asian News Service, September 2022); 20 years high in Russia (Bloomberg News, May 2022) and Turkey (Pitel, 2022), mostly due to fuel crunch, food crisis, currency devaluation and business confidence nosedive over panic. China's factory inflation hits 25% in 2021 (AFP-Beijing, 2021), economy is slowing down due to adoption of “Zero-Covid strategy” (Tewari, 2022; Woo *et al.*, 2022), amid a risk of 1 million deaths in “winter wave” (Asian News International, December 2022; White & Lin, 2022). Eurozone inflation averaged 2.12% from 1991 until 2022, climbed closed to 11% in October, 2022 (Arnold, October 2022; Hannon November 1, 2022). Nearly half of the countries of the EU, 40% of the countries of Africa, and 30% of the countries of Asia declared bankruptcy during the previous two centuries (TBS Report July 05, 2022; Mohamed, 2022). However, according to a UN official at the November 2022 climate change conference, COP27, held in Egypt, 54 countries with the poorest development are currently in danger of bankruptcy (Harvey, 2022) (Figure 5). Lebanon, Sri Lanka, Russia, Suriname and Zambia are already in a debt default (Reuters, June 2022). In addition to increased employer's healthcare insurance cost (Mathews, 2019), currency devaluation (Lubin, 2022), a reduced labor force or lack of skilled labor (Pizzinelli & Shibata, 2022), fuel-power crisis (Englund, 2021), and the transportation freight cost (Carrière-Swallow *et al.*,

2022; Golle, 2021; Miller & Curran, 2022) has hit the supply and demand chain massively and caused trouble for manufacturers, who have undergone layoffs or delayed their economic activities to prevent more loss.

E. Global Conflicts over Health Economics: Adding Insult to Grave Injury

Conflict was responsible for more than 10 million deaths of children under the age of five between 1995 and 2015 worldwide (Bendavid *et al.*, 2021). From 2021 to 2022, more than 100 million people will have been driven from their homes by war, violence, persecution, and human rights abuse, according to the UN refugee agency (UNHCR) (UN News, June 2022). Ukraine, Afghanistan, the Democratic Republic of the Congo, Ethiopia, Sudan, the Syrian Arab Republic, and Yemen are the countries with the highest numbers of internally displaced persons (Bendavid *et al.*, 2021; Mahase, 2022). Since 2017, more than one in every six children lived in a conflict zone around the world (were living less than 50 km from where the actual fighting took place) (UN News, 2019; Save the Children, 2021, Sever, 2022); highest number of women and children living in conflict zone has been twice since 2000 (Bendavid *et al.*, 2021). Armed conflict, in its various forms and manifestations, is prevalent throughout the world and often results in forced migration, an energy crisis, capital flight, and the destruction of societies' infrastructure, which includes a lack of access to food, health care, housing, employment, clean water, and sanitation, as well as a loss of community and homes. And the resulting stress or unrest has been shown to drive violent extremism, fostering recurring cycles of conflict. Global expenditure on military weapons exceeded \$500 billion in 2020 and military spending surpassed \$2 trillion by now (Rolander, 2022) (Figure 4). After seeing 50-100 million deaths in 1918-1919 Flu pandemic and more than 34 million deaths in World War II, the incorrigible world is thirsty for another great war in the midst of Covid-19 pandemic (Jahan, 2021; Ferguson, 2022; Mollman, 2022; Rosenfeld, 2022; Waheeduzzaman, 2022). Whoever wins the war, humanity loses.

[1]. Russian Aggression against Ukraine

The present cold winter distress in Europe and the power-fuel crisis, price volatility, inflationary pressure, and recession around the globe are a consequence of this war. The GDP of Ukraine could decrease by up to 35 to 40% if the war lasts longer (Astrov *et al.*, 2022). As of August 4, 2022, more than 7 million people remain, and around 10 million refugee movements have been recorded out of Ukraine (Haque *et al.*, 2022) (Figure 5), making this the fastest-growing refugee crisis since World War II. Over 90% of the fleeing population was women and children, including unaccompanied minors. Children account for 40% of the refugee population (Figure 5). Hundreds of thousands of people are still trapped and faced with a shortage of food, water, and medicines (Kumar *et al.*,

2022). Depression, social withdrawal, and anxiety are just a few of the long-term psychological and physical health repercussions that will afflict subsequent civilizations (Dhawan *et al.*, 2022). In Ukraine, close to 3 million people with disabilities are registered, facing a greater risk of abandonment, violence, and death, while their access to safety and recovery support is limited (United Nations, 2022; Casey, 2022) (Figure 5). The correlation between low vaccination and Russian aggression is still a question, as Ukraine was the second lowest (15%) vaccinated country after Armenia in Europe until the end of October, 2021 (AP, 2021). With a population of 42 million people, Ukraine has reported more than 10% cases of COVID-19 and over 0.1 million deaths from March 2020 through February 2022 (Yakovleva *et al.*, 2022). Among deaths from COVID-19, close to 60% were teenagers aged 10–19 years, and more than 40% were children aged 0–9 years (Seriakova *et al.*, 2022). However, the number of vaccinated people in Ukraine will not surpass 40% until June 2022. It has one of the lowest rates of vaccination among middle-income countries (Poberezhets, 2022; Uwishema *et al.*, 2022). Ukraine has among the highest global burdens of non-communicable diseases and chronic infectious diseases, such as drug resistant tuberculosis, measles, HIV/AIDS, and hepatitis B, and C (Jankowski & Gujski, 2022). The age-adjusted death rate in Ukraine from ischemic heart disease is more than six times greater than that in European Union countries, and it has among the highest suicide rates in

the world (Greenaway *et al.*, 2022). Linguistic problems during hospitalization, including lack of continuity of medical care and lack of retained medical records, have been reported among refugees in Poland, Romania, Moldova, and Slovakia (Kardas *et al.*, 2022; Klas *et al.*, 2022). Thousands of tons of sulfur dioxide and smoke poisoned the air, driving up respiratory illnesses, damaging crops, and causing four times more deaths per capita than the five cleanest countries altogether (Popov *et al.*, 2020). Moreover, most of the energy used for agricultural production, including fuels, electricity, fertilizers, pesticides, and lubricants, is reallocated for military use (Nchasi *et al.*, 2022). The occupiers have so far attacked more than 800 health care facilities; at least hundreds of them were completely damaged (Ваніян, 2022) (Figure 7). At least three major oxygen plants in Ukraine have been damaged, making treatment uncertain for approximately 2,000 people requiring high oxygen flow (Howard, 2022) (Figure 7). Until the 1st week of December 2022, a quarter of its population was facing power shortages and blackouts amid strong winds, rain, and sub-zero temperatures, along with half of its capital Kyiv, for days (Guy *et al.*, 2022; Mckinley, 2022; Reuters, December 2022). Europe is facing a new challenge that could lead to a new wave of COVID-19 and an increase in the number of cases of TB, polio, parasitic stomach disorders, and HIV from the Ukrainian refugees; the EU is already home to 12.5% of HIV patients, according to the WHO (Aipanjiguly, 2022; Patel & Erickson, 2022).



Figure 5: The Ukraine's aggression is making an impact elsewhere, too.

[2]. China's Multiple Disputes including Trade War

China's growing control over one-third of the world's shipping lanes in the South China Sea poses an imminent threat to the US and Europe (TO, 2003). In the past, China has frequently been involved in border disputes with its neighbors. Southeast Asian countries such as China, Vietnam, the Philippines, Brunei, Malaysia, and Taiwan have disagreements about the disputed South China Sea (Shukla, 2020).

U.S. goods and services trade with China will total an estimated \$615.2 billion in 2020 (U.S.-China Trade Facts, 2021). Amid an economic slowdown, China's four-year 'trade war' with the US has resulted in a total loss of USD 550 billion in import tariffs, the majority of which are aimed at Beijing (Asian News International, March 2022). China's vaccine diplomacy is believed to be based on the country's holistic approach to national security, as well as the importance China places on the "Belt and Road" Initiative (Liu *et al.*, 2022). China is a major manufacturer of medical products, including many vaccines, drugs, medical devices, and diagnostics. India and China are the two most important players in the global pharmaceutical raw materials and excipients market. And China accounted for 28% of the \$236.7 billion global API market in 2018 (Kay & Makol, 2022). Close to 40% of antibiotic APIs used in the US are sourced from China, where they are typically 35%–40% less expensive than competitors (Sadek, 2022).

In present years, China has increased economic, military, and political competition with the US, as depicted in numerous official documents and statements (Papageorgiou & de Melo, 2022). The trade war and escalating tariffs could raise manufacturing costs for generics and biosimilars in the US (Zha, 2021). However, the trade war has opened up India's opportunity to export APIs. Currently, more than half of the 342 manufacturing facilities worldwide with more than ten active US-approved API products are located in India (Jimenez, 2022). And very recently, a bill "H.R.7121(IH)-Protecting our Pharmaceutical Supply Chain from China Act of 2022" is introduced in the U.S (Authenticated US Government Information, 2022).

The 2,100-mile long India-China border has long been a source of contention between New Delhi and Beijing (Sud & McCarthy, 2022). Border tensions and the pandemic have jeopardized the supply of drugs and food between these two countries (Chatterjee, 2020; Sharma, 2020; Guerin *et al.*, 2020). However, to reduce Chinese API dependency, India launched a government-backed Production Linked Incentive (PLI), as India's \$42 billion pharmaceutical sector is heavily dependent on China for API (Buddhavarapu, 2022).

A military confrontation between China and Japan has come into being for the first time since the end of World War II. After the Diaoyu Islands crises of

2010 and 2012, Japan began to regard China as a main security threat (Zhang, 2021). They have economic relations and cultural exchange but Japan was a pioneer in creating the concept of both the QUAD and the Indo-Pacific area (Cannon & Rossiter, 2022). The volume of trade between Japan and China shrank in 2019 due to China–US trade frictions (Wang, 2022). Japan, the largest pharmaceutical importer in the world, obtains the majority of its supplies from India, the United Kingdom, and Italy. In light of growing concerns about dependence on China around the world, the Japanese government plans to increase domestic pharmaceutical production (Kokumo, 2020).

Taiwan, missiles, and spying remain China's top priorities in the new Xi administration, as spread in many US news media (Shepherd & Wu, 2022). Despite this, President Xi has stated that China is looking for ways to "get along" with America, even as tensions rise (Tang, 2022). However, Taiwan tensions, have raised concerns about the safety of undersea cables around the world (Heijmans *et al.*, 2022), as well as the semiconductor industry. In the midst of the US tech war, TSMC (the largest chip foundry with some big clients like Apple, Intel, Qualcomm, AMD, and Nvidia, based in Hsinchu Science Park, Taiwan) is under increasing threat from China (Wintermeyer, 2022). Furthermore, Taiwan is home to more than 90% of the world's advanced semiconductor manufacturing capacity (Cheng, 2022). Semiconductors are widely used in high-performance computer chips, medical equipment, drug delivery systems (implants) and in-vitro diagnostic devices, among other things (Sutradhar & Sumi, 2014). Therefore, China has blocked imports of citrus, fish and other foods from Taiwan but avoided disrupting important technology and manufacturing relationships (AP, 2022).

[3]. Civil unrest in Asian or Eurasian countries

(a) *The Nagorno-Karabakh conflict (Between Armenia and Azerbaijan)*

Heat wave, drought, and war left Nagorno-Karabakh losing over 80% of its access to water during the war last year (Mnatsakanyan, 2021). The conflict became even more relevant for Azerbaijan in terms of its drinking water, irrigation, and hydropower. Between 20,000 and 30,000 people were killed in military operations during the Armenia- Azerbaijan clashes (Khurshudyan *et al.*, 2022). Ballistic missiles, drones, and other heavy artillery have been used, including the use of internationally banned cluster bombs (Kazaryan *et al.*, 2021). Among the series of clashes, 50,000 people were injured or disabled, 700 medical institutions were destroyed, and the damage to the healthcare system was estimated to be \$1.2 billion (Shoib *et al.*, 2022a) (Figure 7). Only 15% of the Armenian population was found to be doubly vaccinated until October, 2021. They were found to have the lowest vaccination rates in the Caucasus region as the pandemic has been politicized (Cookman, 2021).

Vaccine skepticism and being seriously hit by the COVID-19 pandemic have also been reported. Both Azerbaijan and Armenia faced a GDP shrinkage of nearly 5% due to the pandemic outbreak (OECD, 2020; IMF, Middle East and Central Asia Dept., 2021). Azerbaijan's Caspian Sea, the world's largest landlocked body of water, is already rising, threatening the country's major urban centers and industrial resources along the coast (Yazdanpanah *et al.*, 2020). With an increase in the frequency of extreme weather events, worsening desertification, and worsening land degradation, climate change is making Armenia more vulnerable. Agriculture, human health, water resources, forestry, transportation and energy infrastructure, and human health are the most at risk (World Bank/ADB, 2021).

(b) Kyrgyzstan-Tajikistan border Conflicts

Kyrgyzstan-Tajikistan border tensions erupted into a brief open conflict in September 2022, and there have been more than 230 border clashes over the last 20 years between the two countries (Reuters, September 20, 2022). The two landlocked countries share an approximately 1,000-km long border, a third of which is disputed (Davies, September 2022). As a result of the COVID-19 pandemic, both of these countries have seen a precipitous drop in migrant laborer remittances from Russia (Tompson *et al.*, 2020). Both of these countries' progress in Western-style public health education and science has been found to be slow (Gotsadze *et al.*, 2022).

(c) Sanctions and Anti-regime protests in Iran

The current anti-regime protest in Iran is a perpetuation of the previous one, sparked by the government's subsidy cut decision that caused price hikes by as much as 300% for a variety of staples (Associated Press, 2022). Almost half of Iran's 82 million populations are now below the poverty line (Reuters, May 2022). The annual rainfall is less than one-third of the global average (Javadi *et al.*, 2022), and climate changes have severe consequences for food and health (Mousavi *et al.*, 2020). Iran's economic woes have sparked several waves of protests in recent years. The UN human-rights chief has urged Iranian authorities to stop the "disproportionate use of violence" that has reportedly killed over 50 children and injured many more during Iran's public unrest (Cooper & English, 2022). Many Iranians injured by security forces during the protests are afraid to seek medical attention because some protesters seeking medical assistance have been detained. Iran has long been subject to severe international economic sanctions, which have limited their access to healthcare and are thought to be a contributing factor to their suffering (Kokabisaghi, 2018). Iran's ability to import drugs and medical equipment has been constrained by the majority of pharmaceutical companies being wary of getting into trouble due to US sanctions (Bastani *et al.*, 2022). Patients with thalassemia, hemophilia, cancer,

epilepsy, and multiple sclerosis who need medical care have been severely hampered by sanctions (Asadi-Pooya *et al.*, 2022). According to the 2018 statistics, among those who inject drugs in the Middle East and North Africa (MENA) region, more than 45% of them were from Iran (Mirzaei *et al.*, 2022).

(d) The War-weary Afghanistan

The US Armed Forces completed their withdrawal from Afghanistan on December 31, 2021, ending 20 years of war and leaving 13 million children facing malnutrition (Essar *et al.*, 2022) and one-third of the people food unsecured (Islam *et al.*, 2021). The IMF says, long-run war in Afghanistan lowered yearly national income by roughly 50% in 2016 (Hameed *et al.*, 2022). Inflation began to rise in early 2021 as strengthening oil prices increased food transportation costs by as much as 50% in some areas (Islam *et al.*, 2021). Since the USA's withdrawal, the World Bank, one of the project's main funders, has stopped funding the country's largest health project, which constituted nearly 80% of the country's total health expenditure (Hussaini *et al.*, 2022). This has created ripple effects for the healthcare system, as hospitals operate with minimum resources (Walraven *et al.*, 2021). The country has gone through four waves of the COVID-19, and trading economics data shows that the vaccination rate has just touched 30% as of December 3, 2022 (Asady *et al.*, 2022). According to the WHO, deaths due to environmental risks and pollution constitute 26% of overall mortality in Afghanistan. More than 30% children under 5 are underweight and malnutrition reported among 60% children (Masood *et al.*, 2022). Drug abuse prevalence is close to 13% among those who are 15 years and older, and the country is known as the world's largest producer of opium, with an estimated 85% share of the total global supply in 2020 (Nafeh *et al.*, 2022).

[4]. Arab and Middle East Unrest

Several Arab countries are in a humanitarian crisis as a result of armed conflict. Syria, Iraq, Lebanon, Sudan, Yemen, Libya, and the occupied Palestinian territory are among these countries (World Bank Group, 2016). Between 1970 and 2019, there were 41,837 attacks in the Middle East, making up almost 25% of all terrorist attacks worldwide (Tin *et al.*, 2022) (Figure 6). Since the beginning of 2022, thousands of children have been killed in conflict or violence in several Middle Eastern and North African countries (English and Oweis, 2022). Nearly 6.5 million COVID-19 cases and over 100,000 fatalities had been documented in the MENA region as of July 1, 2020. The highest number of cases have been reported in Iraq, Jordan, and the United Arab Emirates, while the highest number of fatalities have been reported in Egypt, Tunisia, Jordan, and Morocco (Norlén, 2022) (Figure 6).

- (a) The Syrian Arab Republic has remained a civil warzone for over a decade. Killing, sexual offenses, multiple healthcare crises followed

- by daily life struggles, a cholera outbreak among refugees, and damage to 42% of hospitals are the consequences of this war (Ahmed & Nashwan, 2022). Physicians for Human Rights' (PHR) June 2022 report shows that violence caused the deaths of more than 90% of medical personnel in the Assad regime, and a severe fear of healthcare worker shortage occurred when 70% of them fled (Alhaffar & Janos, 2021; Butt *et al.*, 2022). Syrian refugees have affected Jordan's economy, labor market and society through different aspects. According to Ministry of Planning and International Cooperation (MOPIC), the direct and indirect cost of hosting Syrian refugees reached approximately \$8 billion (Khawaldah & Alzboun, 2022) (Figure 6) and each refugee cost the Jordan government almost \$3,750 (Al Qaralleh, 2022).
- (b) Yemen has been dealing with the worst humanitarian crisis for seven years, where more than 80% of the population requires aid (Al-Ahdal & Farahat, 2022). According to the UN report July 2022, more than four million Yemenis have been internally displaced since the crisis began, making up nearly six million people who have been forced from their homes (UNHCR, 2022a). A World Bank, UNICEF, and WHO partnership study reveals that almost 40% of the population living more than two hour from comprehensive emergency obstetric and surgical cares (Garber *et al.*, 2020). More than 50% of Yemen's population had to face hunger in 2021 (Hashim *et al.*, 2021). Around 90% foods are imported and Norwegian Refugee Council reported that more than 90% families have cursed COVID-19 for food and other necessity inflation (Rahmat *et al.*, 2022). Nearly 70% of additional deaths between 2015 and 2019 were related to violence in armed conflict (Guha Sapir *et al.*, 2022) (Figure 6). Nearly 2,50,000 people have died as a direct or indirect result of the conflict during this time, including over 12,000 civilians who were killed in targeted attacks. Additionally, 60% of the deceased are children under the age of five (AlKarim & Attal, 2021). Early in 2020, the WHO reported that less than 50% of Yemen's medical facilities were fully operational due to the country's ongoing civil war, which was accompanied by seasonal outbreaks of cholera, dengue fever, malaria, chikungunya, and diphtheria (Saleh *et al.*, 2022). Around 65% of diphtheria patients were under the age of 15, and nearly 50% of those cases had never received the diphtheria vaccine (Dureab *et al.*, 2019).
- (c) Lebanon has been without a president for over a month (Chehayeb, 2022) and banks are remained closed for clients (England & Jalabi, 2022). After decades of war, Lebanon and Israel/Occupied Palestinian Territory agreed to resolve conflicts over maritime boundary (Reuters, October 2022). With a population estimated at around 6 million, Lebanon is home to the largest number of refugees per capita in the world. Around 30% of its population is made up of Syrian refugees (Figure 6). Being hit by a long-running economic and financial crisis, a pandemic, and a Beirut food grain store blast in 2020, more than 50% of the population in the country lives below the poverty line (Dahham *et al.*, 2022; UNHCR, 2022b). According to the World Bank's recent data, Lebanon was one of the top four countries with the highest food inflation in 2012 (Daily Mirror, 2002). In real terms, it had experienced 122% food inflation YOY (Inman, 2022) (Figure 6). As the outbreak in Syria has grown, cholera has spread to neighboring Lebanon (Gebeily, 2022).
- (d) Afro-Arab Sudan faces 'generational catastrophe'--floods, militia raids and hunger mean a third of children are not in school at all (Salih, 2022). Among the most internally displaced people on the African continent, Sudan is home to over 1.1 million refugees, the majority of whom are fleeing South Sudan (UNHCR, 2022c) (Figure 6). The country has been in the midst of a political crisis ever since long-time leader Omar al-Bashir was overthrown there in April (Sirgany *et al.*, 2019). In addition, Sudan has endured a number of humanitarian and economic crises, including a 22-year civil war and the Darfur genocide in 2003, which caused over two million deaths, four million displacements, food shortages, and famine, and for which an estimated 7 million people urgently require life-saving assistance (Shoib *et al.*, 2022b; UNHCR, 2022d). Additionally, the COVID-19 pandemic, severe health risks, malnutrition, poor transport infrastructure and a severe lack of funding for essential services all plague South Sudan (Lutwama *et al.*, 2022). In addition, the country has less than 30% healthcare access and less than 50% vaccination coverage (Anib *et al.*, 2022). The climate crisis and displacements, malaria cases in Sudan nearly doubled between 2015 and 2019 (Elagali *et al.*, 2022). More than 70% of people use mobile phones, but the country's telemedicine coverage is still facing challenges (Elahssan *et al.*, 2022).
- (e) Libya has experienced decades of armed conflict and political instability. During the Gaddafi regime, oil-rich Libya enjoyed free

education, electricity, and health facilities (John, 2008). Libyan health-care infrastructure continues to deteriorate due to civil war, inadequate human and financial support, and inadequate health facilities. More than 37 attacks reported over health facilities and medical personnel after violence began in April, 2019 (Raghavan, 2019). Libya's health system is on the verge of collapse, with three-quarters of primary health care facilities closed due to a lack of medical personnel, supplies, medication, and equipment (Iwendi *et al.*, 2021). Only 40% of hospitals' inpatient beds

are adequately functioning with an overall bed capacity of 15 per 10,000 (Elhadi & Msherghi, 2020). According to data from Trading Economics, food inflation in Libya averaged 9.87% from 2005 to 2022 and peaked at 52.64% in December of 2017. Over 80% of all deaths and 78% of years with a disability-adjusted life expectancy in Libya are due to non-communicable diseases, which are particularly susceptible to long-term breakdowns in health services and policymaking processes (Allen *et al.*, 2022).



Figure 6: The never-ending Middle East conflict

(f) The conflict between Palestine and its occupiers/Israel is a century-old issue. The occupiers have also experienced bereaved displacement as a result of persecution in Europe during World War II's Holocaust (BBC World Service, n.d.). They have launched over a thousand airstrikes in Syria and dropped 5,500 bombs in Arab countries since 2017, facing new threats on various fronts (Ahronhem, 2022; The New Arab Staff, 2022) (Figure 6). It is a perfect example of “fostering

recurring cycles of conflict” as depicted earlier. However, for a noble cause, two authorities signed an agreement to transfer vaccines for the COVID-19-afflicted people in June 2021, as the vaccination rate was below 10% in Palestinians (Dahdal *et al.*, 2021). Afterwards, the donor withheld vaccines for the Palestinian population due to the escalation of conflicts and violence, which increased the risk of COVID-19 transmission and damage to health facilities—including COVID-19

diagnostic testing facility. Close to 40% of patients admitted in ICUs during the escalations had complications related to COVID-19 (Alkhalidi *et al.*, 2022). In the West Bank and Gaza Strip in 2018, there were an unprecedented 432 attacks on healthcare facilities (WHO, Occupied Palestine Territory, 2019) (Figure 7). In just 13 days in May 2021 alone, the WHO reported 117 attacks on healthcare facilities in Gaza and the West Bank (Asi *et al.*, 2021).

[5]. War and Conflicts in African Countries

Deserts, grasslands, tropical forests, and semiarid lands are the four major climate zones in Africa (Williams *et al.*, 2007). The three most important security concerns in Africa to watch in 2022 are intra-state conflict, terrorism, and unconstitutional changes in government (Gruzd *et al.*, 2022). Droughts in Sub-Saharan Africa more than tripled between 1970 and 2009. According to the African Development Bank, climate change is costing Africa up to 15% of GDP growth (Reuters, September 13, 2022). Another recent study commissioned by Christian Aid claims that unless significant investments in climate adaptation are made, global warming will reduce Africa's economic growth by two-thirds by the end of the century (Pearce & Andrijevic, 2022). In 2018, 2.2 million people were affected by devastating cyclones in Malawi, Mozambique, and Zimbabwe. Malaria, dengue fever, Lassa fever, Rift Valley fever, Lyme disease, Ebola virus, West Nile virus, and other infections have been linked to natural disasters (Anugwom, 2021). Furthermore, due to the central role agriculture plays in African economies, malnutrition has increased by nearly 50% since 2012 (Atwoli *et al.*, 2022). African nations, which have contributed the least to the global climate crisis, could see a 64% decline in their GDP growth rate by the end of the century (Lakhani, 2022). However, the UN and Red Cross blame the Ukraine crisis for contributing to nearly 25% of Africans' food insecurity (Phillips, 2022; Sacko & Mayaki, 2022). Additionally, until December 2, 2022, only one-third of the population will have received at least one dose of a vaccine, making them the continent with the lowest vaccination rate (Holder, 2022). The pandemic delayed the first dose of Diphtheria, Pertussis, Tetanus, Hepatitis B, and Hemophilus influenza B vaccines for 8 million African children in 2020 (Njoh *et al.*, 2022). In addition, more than 95% malaria is reported in African countries (Elagali *et al.*, 2022). Since 1989, 75% of non-state armed conflicts have been in Africa (Okiro & Ayieko, 2018). Many authors have argued climate crisis have strong association with conflicts in Africa (O'Loughlin & Witemer, 2014; Burke *et al.*, 2009; Cappelli *et al.*, 2022; Ikoku, 2022). Sub-Saharan Africa has the highest number of conflicts in the world, with at least a thousand people killed each year on average over the last two decades (Chol *et al.*, 2018). Half of the Hepatitis E outbreaks in sub-Saharan Africa have

occurred among refugees and displaced persons living in humanitarian crisis settings (Ahmed *et al.*, 2022).

(a) Ethiopia's Tigray conflict

Ethiopia, a landlocked country in the Horn of Africa, is a federal democratic republic. In Ethiopia, the pooled level of poor COVID-19 prevention practice was 51.60%. Inadequate COVID-19 knowledge, a negative attitude toward COVID-19 management, low educational attainment, living in a rural area, and being female were all significantly associated with poor COVID-19 prevention practices (Tegegne *et al.*, 2022). Armed conflict between the Ethiopian military and the Tigrayan Defense Force (TDF) in northern Ethiopia began on November 4, 2020 (Teka & Berhe, 2022) and has displaced over 3 million people and killed about 500,000 in the last 2 years (Sharif, 2022). Armed militants destroyed crops, killed people, looted and vandalized hospitals, clinics, health posts, and ambulances, as well as ransacked and destroyed schools (Wall, 2022). Rape, gang rape, sexual enslavement, torture, beatings and killings of friends and family and derogatory ethnic slurs has all been reported (Teka & Berhe, 2022). According to the United Nations World Food Programme (WFP), nearly half of Tigray's six million residents are classified as "heavily food insecure," with nearly 90% lacking regular access to food. According to the UN, nearly one in every three children under the age of five is malnourished (Davies, August 2022). Among patients with severe illness, the Covid-19-related mortality rate went up to 40.3% (Temesgen Abebe *et al.*, 2022). Fistula is raging in Tigray as a result of obstructed labor, limited or absent maternal care services, under-nutrition growth, birth difficulties, trauma, and sexually transmitted diseases (STDs) caused by conflict-related sexual violence (Gesese *et al.*, 2022). According to Médecins Sans Frontières (MSF) assessment of 106 health facilities in the Tigray region between mid-December 2020 and early March 2021, "nearly 70% had been robbed, and more than 30% had been disrupted; only 13% were operating normally" (Gebregziabher *et al.*, 2022). The ongoing conflict resulted in the destruction or damage of more than 1500 health facilities in Ethiopia in 2021, according to the country's health ministry (Anderson, 2022) (Figure 7). However, a surprise deal has been reached in the Ethiopian civil war with both sides agreeing to halt their two-year conflict (Macaulay & Soy, 2022).

(b) Democratic Republic of the Congo-Rwanda Conflict

On April 23, 2022, the Ministry of Health of the Democratic Republic of the Congo announced an Ebola virus outbreak (mortality rate 30-90%) which was declared ended by 2016 in West Africa, claimed more than eleven thousand death (CDC, 2019; Sun *et al.*, 2022b). It witnesses 45% of deaths of children fewer than 5 years old due to malnutrition (Murhima'Alika *et al.*, 2021). According to the United

Nations, the most recent fighting with Rwanda, which started in October 2022, has forced nearly 300,000 people to flee their homes (Al Jazeera, 2022). Multiple occasions have seen Rwandan forces fighting alongside Congolese rebels while crossing into the Congo. The same number of individuals was displaced by ethnic conflict in the Ituri province in 2019 during a second Ebola outbreak. Six years of conflict in the DR Congo resulted in a total death toll of six million people. The majority of deaths were caused by illness and malnutrition (AFP, 2019).

[6]. Myanmar Military Vs Arakan Army

Clashes between the Arakan army and the military junta in 2019 displaced more than 20% people across the Rakhaine state, one of Myanmar's poorest (AFP, November 2022). However, millions of Rohingya refugees fled from Myanmar in the last 50 years, and an estimated 1.4 million refugees are seeking asylum in Bangladesh, India, Indonesia, Nepal, Thailand, and Malaysia (Bearak, 2017; Rashid *et al.*, 2017; UN News, March 2022). Pneumonia, liver diseases, breathing difficulties (Ismail *et al.*, 2022); diphtheria, HIV, sexually transmitted diseases, Covid-19 (Mohiuddin, 2020b); Hepatitis B and C (Ali *et al.*, 2022) have so far reported among refugees. The forced migration has created anxiety, depression, emotional distress, and PTSD among more than 60% of them (Palit *et al.*, 2022). Approximately 80% of humanitarian aid providers were denied entry into refugee camps during lockdowns (Chowdhury *et al.*, 2022). Also, the host country was due to receive 12 million doses in early 2021 through the COVAX initiative, but by May 2021, the country had not received a single dose (Alam, 2022). According to the UN, Rohingya aid represents only half of the funds raised this year (Reuters August, 2022). In addition to limited access to voluntary contraception, 50% of refugee settlement areas lack basic skills for general sexual, reproductive, and post-rape care (including emergency contraception and safe abortions), and more than 75% of births are attended by unskilled personnel (Stoken, 2020). Also, discrimination, violence, lack of safe drinking water, poor sanitation and health education reported in other studies. Forging national identity cards or passports through bribery or fraud, traveling abroad illegally without a passport, illegal weapons, drug trafficking, smuggling, quarrels, fights, kidnap and murders are common with them (Staff Correspondent, 2022; Chowdhury & Lion, 2022; Indo-Asian News Service, June 2022).

RESULT AND DISCUSSION

Collectively, the pandemic, climate change, rising inflation, economic stagflation, and global conflicts pushed human civilization into a unique situation that the world has never experienced before. Following other issues are taken into considerations:

(a) *Poor food handling and a lack of population control threaten public health and safety*

Globally, close to one-third of agricultural produce is lost annually due to insect pests, diseases, weeds, and rodents (Sawicka, 2019; Mohiuddin, 2019a). The US Centers for Disease Control and Prevention (CDC) confirmed more than 11,000 foodborne infections caused by only a few types of bacteria (Salter, 2014). According to the WHO, 600 million cases of foodborne diseases are recorded each year, affecting nearly 10% of the world's population (WHO, 2022), and food safety is associated with 7.5% of deaths annually (Lee & Yoon, 2021). Furthermore, adulterated and contaminated foods cause 60% of all foodborne illnesses (Yeasmin *et al.*, 2022). Food adulteration affects almost all food commodities, and the main enticing factors are high population demand and the desire for fraudulent gain (Spink *et al.*, 2019; Mohiuddin, 2020c). Only 11 years after passing seven billion, the United Nations declared that the world population had surpassed eight billion (Victor, 2022). Climate change is making the Egyptian government ask parents to have fewer children (O'Grady & Mahfouz, 2022). Uncontrolled population growth not only creates food insecurity but also threatens health safety. High population density appears to be associated with cancers, cardiovascular and respiratory diseases (Carnegie *et al.*, 2022); a higher risk of transmission of COVID-19, especially with the Delta variant (Jamal *et al.*, 2022; Md Iderus *et al.*, 2022); poor living conditions, such as insufficient access to healthy food, drinking water, poverty-related diseases with poor healthcare access. Also, food vulnerability and price volatility are an explosive combination for certain types of conflicts (Gutiérrez-Romero, 2022).

(b) *Malnutrition is still a world health crisis*

Global acute malnutrition increased dramatically and staggeringly from 10% in 2019 to 28% in 2019, and household food security significantly decreased from 59% in 2019 to 15% (Mulugeta & Gebregziabher, 2022). According to the World Innovation Summit for Health, 2018 60% of chronically food-insecure and malnourished people globally, including 75% of all children with stunted growth, live in conflict-affected countries (Gebregziabher *et al.*, 2022) (Figure 7).

(c) *Poor health literacy still prevails in wealthy and dominant countries*

Unfortunately, many European citizens lack health literacy, limiting their ability to make decisions about their own, their families', and their communities' health and well-being (WHO, Regional Committee for Europe, 2019). Even low health literacy (Figure 2) is reported in nearly 40% of US (Emerson *et al.*, 2022) and UK adults (Public Health England, 2015); 60% of the older population in the EU (Shebehe *et al.*, 2022); 60% of the adult populations in Canada (Kyabaggu *et al.*, 2022); Australia (Ellender *et al.*, 2022); the UAE

(Ibrahim & Nair, 2021); and more than 70% in China (Li *et al.*, 2022). Despite long-term improvements in health indicators like mortality and morbidity, there are still problems with the provision of healthcare in many low- and middle-income countries. Poor health literacy is a sign that health promotion techniques are not being used properly, and it is linked to the population's deteriorating health status and low compliance with disease prevention initiatives (Meherali *et al.*, 2020; Mohiuddin, 2022).

(d) "Net-Zero Carbon" delayed by decades due to 'collaboration gap'

Approximately 80% of global carbon emissions are attributed to energy, according to the International Energy Agency (IEA) (Bhardwaj, 2021). Current trends in global food systems would prevent the 1.5 °C target from being met and put the 2 °C target by the end of the century in jeopardy, even if fossil fuel emissions stopped now (Costa *et al.*, 2022). According to an Oxford study, decarbonizing the energy system by 2050 could result in enormous cost savings, but it will require a massive increase in private investment in renewable energy and sustainable infrastructure around the world. Estimated annual private investment in these sectors until 2050 ranges from US\$4.4 trillion to \$9.2 trillion (Way *et al.*, 2022; Copley, 2022). Not surprisingly, America and China, two major polluters (40% of total CO₂ emissions), were hesitant and noncommittal on the issue at COP27 (Hye, 2022). The IEA estimates that global nuclear capacity will need to double by 2050 to meet net-zero targets (Chestney, 2022), but obstacles remain. In the aftermath of the Fukushima disaster in Japan, Germany, for example, was required to close nuclear power plants by 2022 (BBC News, 2011; Editorial Board, 2021; Russo *et al.*, 2022).

(e) Pandemic hits on healthcare system

The pandemic's longest and most deadly surge has posed risks to quality of care and left medical professionals exhausted. Various studies on health professionals show work-related stress, sleep disturbances and burnouts in 60% (Koontalay *et al.*, 2021; Al-Otaibi *et al.*, 2022; Biber *et al.*, 2022); and hospitalization within 6 months of the pandemic starting 15% (Gholami *et al.*, 2021). Also, WHO assumes that more than 1,15,000 health professionals may have died in the period between January 2020 and May 2021, and illnesses kept at least 500,000 health workers out of the US labor force alone (WHO, 2021; Guilford, 2022). Nearly 20% of 1000 American allied health workers (nurses, assistants, etc.) who responded to the survey stated that the pandemic was one of the main reasons they quit their jobs (Poon *et al.*, 2022). According to a cross-sectional study conducted by the US Bureau of Labor Statistics and the University of Minnesota Data Service, pandemic-induced physician turnover was four times that of allied professionals (Frogner & Dill, 2022). Lack of PPE, medical supplies,

and adequate compensation has been reported in several studies.

(f) Humanitarian crisis over treatment guideline adherence and drug misuse

Migration and displacement are social determinants of health problems for refugees and other migrants (Ekblad, 2020). Health care may be low on the list of priorities for children and adolescents who face severe pressures ranging from overcrowded camps or asylums to deep anxiety about their future (Hawke, 2020). Humanitarian crises are associated with increased short- and long-term cardiac morbidity and mortality, as well as elevated blood pressure (Keasley *et al.*, 2020). Hypertensive patients with diabetes mellitus was twice as likely to exhibit poor BP control, as found in war-torn Palestine (Alawneh *et al.*, 2022). Also, a US-based survey of re-settled Rohingya refugees from Myanmar shows a higher trend of chronic diseases like diabetes, hypertension, and obesity (Rahman *et al.*, 2022). A huge increase in benzodiazepine (sedative) dispensing is reported in Canada, and abuse of similar drugs doubled in Italy among people suffering from anxiety and stress caused by COVID-19, between the years 2020 and 2021 (Sarangi *et al.*, 2021) (Figure 7). An announcement from authorities on "simple possession of cannabis" to thousands of convicted citizens prior to the US midterm elections exploded recreational drug abuse in both the US and the EU (Lopez, November 2022; Oltermann, 2022).

(g) War and terrorism hits on healthcare system

A terrorist attack on a hospital is not uncommon. In just 2017, there were at least 188 hospitals and clinics that were destroyed or damaged. More than 60 people were kidnapped and 64 healthcare workers were killed; 203 patients died and 141 were injured. Health facilities have been forced to close in Afghanistan, Burkina Faso, the Central African Republic, Egypt, and Turkey (The Lancet-Editorial, 2018). Research finds 454 terrorist attacks against hospitals were identified in 61 different countries over a 50-year period by the Global Terrorism Database (GTD), where more than 50% of the attacks took place in the Middle East, Northern Africa, and South Asia (Figure 7). And in more than 50% of cases, attacks targeted medical personnel (Ulmer *et al.*, 2022). Two other similar studies show that close to 70% of those attacks involved in bomb explosion (McNeilly *et al.*, 2022) and close to 60% attacks taken place after 2001 (Cavaliere *et al.*, 2021). Attacks on hospitals may have long-term consequences: hospital units may be unavailable for an extended period of time, and replacing staff may take several months, further complicating hospital operations. In addition, hospitals are houses of resources (drugs, toxins, radioactive elements, and biological cultures) and information that could be used for nefarious purposes, making them a tempting target for terrorist groups. A full-fledged war

and siege can have devastating consequences for patients who require constant care and well-functioning health infrastructural facilities, especially in resource-limited settings where providing optimal care is already difficult (Sekkarie *et al.*, 2020).

(h) Global transition or a massive work-force redistribution

The pandemic has accelerated job redistribution across sectors, with an estimated 25% of workers worldwide choosing or being forced to change occupations by 2030 (Peters *et al.*, 2022). Interestingly, the SMEs seeking to recover are now confronted with skilled labor shortages (Giles, 2022; Simon, 2022; Fox, 2021), whereas big tech giants (Apple, Alphabet, Microsoft, Netflix, Meta, Twitter, HP, Stripe) (Carpenter, 2022; WSJ Staff Report, 2022), media giants (The Guardian, BBC, CNN, Bloomberg) (Krouse & Flint, 2022; Gold, 2020), finance giants (JPMorgan Chase, Goldman Sachs, Morgan Stanley, Citigroup, Barclays, HSBC) (Clarke, 2022; Fontanella-Khan, 2022; Nguyen *et al.*, 2022), retail giants (Amazon, Tesco, Walmart) (Francis, 2022; Mathers, 2022) and fashion chain giants (Gucci, Nike, H&M) (Taylor, 2020; Jacobsen, 2022) have seen mass layoffs in recent years, mostly in 2022.

(i) Healthcare workforce shortage and transition

The redistribution of the workforce and the shortage of workers could lead to a unique situation in healthcare systems around the world. The Eurozone is dealing with severe healthcare shortages (Figure 7). There are fewer doctors in France today than there were in 2012. In Germany, there were 35,000 unfilled positions in the care industry last year, a 40% increase from ten years prior. More than 700,000 people in Spain were awaiting surgery. By 2030, Finland will require 200,000 additional workers. At least 40% of doctors in one-third of the Eurozone's nations were close to retirement age (WHO, 2015; Deutsche Welle, 2018; Bencharif, 2022; Henley *et al.*, 2022; World Health Organization, 2022; WHO Media Release, 2022). Because of the physician shortage in general practice (GP), clinical pharmacists are working in general practice across England (Robinson, 2019; Mohiuddin, 2019b). According to a recent Lancet study, the Middle East and North Africa are lacking 636,000 doctors, with South Asia having the biggest gaps (GBD 2019 Human Resources for Health Collaborators, 2022). Also, turnover intentions have been reported in close to 50% of physicians in emergency department, resident physicians and village doctors in China (Feng *et al.*, 2022; Sun *et al.*, 2022a; Chen *et al.*, 2022); more than 50% health professionals in Ethiopia (Mekonnen *et*

al., 2022); more than 55% doctors in Iraq and 30% doctors in South Korea (Hou *et al.*, 2021). Burnout among healthcare workers and deteriorating care quality are the immediate effects (De Hert, 2020). Also, globally, more than 20% of health professionals are located in areas where there are many care gaps and it is a major determinant of job dissatisfaction (Bourget *et al.*, 2022). Some 30-60% nurses leave their first job in less than a year due to work related stress, job satisfaction and better opportunities elsewhere (Hu *et al.*, 2022; Machitidze, 2022). And it is estimated that the cost is four to five times higher as productivity decreases with new hires (Smokrović *et al.*, 2022). Altogether, the motivation of health workers towards their professions has declined at a time when it is already projected that the world will face an 18 million healthcare workforce shortage by 2030. And the WHO says, more than 40% of them, or 7.6 million, will be nursing shortages (Hu *et al.*, 2022). Moreover, there is a 6.5-fold difference between high-income and low-income countries (Boniol *et al.*, 2022; Kamarulzaman *et al.*, 2022).

(j) Fears of nuclear war or biological weapons are not entirely false

Invaders of Ukraine launched projectiles at Chernobyl nuclear facility and the active Zaporizhzhia complex, causing international concern and raising fears of a nuclear disaster in Eastern Europe (Tansu & Culp, 2022). The pandemic, hunger, discrimination or racism, climate change, rising inflation or economic crisis, imperialism, political turmoil and nuclear war share a common thing—conflict. In the last 100 years, human civilization has experienced multiple acts of bioterrorism, chemical warfare, and nuclear explosions that have targeted civilians (Williams *et al.*, 2022); all of them were borne out of conflicts. Although, the Geneva Protocol, which was first signed in 1925 and is still in effect today, forbids the development, manufacture, and use of biological weapons in armed conflict (Rathish *et al.*, 2022). However, already Switzerland, Sweden, Finland, Germany, US, Russia, Italy, Belgium, UK, Japan and Israel/occupied Palestinian Territory have spent billions for nuclear shelters (The Guardian Art and Design Gallery, 2017; Schaer, 2019; Noack, 2021; Harding, 2022; Horowitz, 2022) (Figure 7). And, no nuclear-armed state is currently disarming, nor engaged in nuclear disarmament negotiations (Ruff, 2022). Also, SARS-CoV-2 has already demonstrated its ability to start a pandemic and, in spite of efforts made around the world, it still poses a serious threat to use as a bioweapon (Farkas *et al.*, 2022) (Figure 7).



Figure 7: Humanitarian crisis over global health.

Present Health System Sustainability Challenges in Conflict Zones and in Rest of the World

1. Food crisis, malnutrition, lack of health facility access, attacks on health facility structures or medicinal personnel, harder hit by pandemics, violent extremism, violence against women and children, displacements, discriminations and many other nefarious things are common among war or conflict zone (Birn *et al.*, 2017; Daw, 2021; Quinn *et al.*, 2022; Wells & Scheibein, 2022).
2. Climate-related challenges have escalated 30 times compared to 20 years ago, which will cost the global economy \$224 billion in 2021 alone, accompanied by a precipitation of both chronic and contagious disease burdens. The non-cooperation of two major polluters at COP-27 may be associated with trade war-related privations, an economic crisis due to the pandemic, and fuel and power crisis. Rather, the pandemic and the fuel crisis forced major polluters to return to fossil fuel energy production.
3. Climate disasters are not under human control but are not completely beyond human reach. Much less of the money spent on war could have been spent on innovation, food, and the health system (Ikegami & Wang, 2022). The world's medical system is still lacking (Kaiman *et al.*, 2014; Rahman *et al.*, 2020), facing newer types of diseases and challenges and will face more in coming days (Cazzolla Gatti, 2021; Koumoundouros, 2022; Geddes, 2022). Many cancer types, HIV, autoimmune diseases, genetic disorders, antibiotic resistance—solutions of many vexing problems remain to be found.
4. Russia's invasion of Ukraine threatens to exacerbate the global inflationary surge, unbalancing oil demand and investment. The triple whammy of pandemic, fuel price shock, and currency depreciation causes economic and financial turmoil in low- and middle-income countries. Medical care and health spending generally increase faster than general inflation (Goss, 2022). Also, rising inflation is associated with infant mortality rise (Bao *et*

- al.*, 2022); child and maternal health compromise (Cader & Perera, 2011); hospital labor expenses per patient (American Hospital Association, 2022); depression, anxiety, frustration and stress (Guerra *et al.*, 2022); cost burdens of chronic illnesses (Jung *et al.*, 2022); less access to assisted-living and independent-living facilities for the elderly population (Ansberry, 2022); low-income households to compromise food quality (Jimenez Rincon *et al.*, 2022); decline insurance coverage (Chernew & Keenan, 2005); worsening clinical labor shortage, lack of potential educators and high turnover (Fleron *et al.*, 2022); lack of clinically necessary pharmaceuticals and supplies, as well as the accessibility of insecticides necessary to control vector-borne disease (Claborn, 2020), are just a few examples of such problems.
5. Both conflict and climate crises cause displacements, which bring not only food and health crises but also unhealthy competition and newer conflicts. Pandemics, climate crisis, and economic downturns poses major hit during and/or after a major conflict. Environmental pollution would not cause 26% of mortality in Afghanistan if it had not been a war zone for the last 20 years. The Vietnam War lasted some 30 years and killed three million people or more (Shivakumar, 1995). Following the war, Vietnam was completely dedicated to an economic revolution and did not engage in any significant conflict. Violence was much lower after the Taliban took over, but it is now increasing as the Taliban fights two insurgencies. Azerbaijan and Armenia could resist more against a pandemic induced 5% GDP drop and \$1.2 billion in healthcare damage. A noticeable fact is that 700 medical institutions were destroyed at the cost of the Nagorno-Karabakh conflict, and the water crisis in Azerbaijan was a key factor, driven by the climate crisis (O'Lear & Gray, 2006; Kuyumjian, 2021). Medical advances in Iran have boosted the country both domestically and internationally; the country was once known for producing 80% of the world's medicinal herbs (Samadikuchaksaraei & Mousavizadeh, 2008). Conspicuous sanctions and spiraling unrests worsen their health situation, make life-saving drugs unavailable, and make it home to nearly half of the MENA region's injecting drug addicts.
 6. 80% of all humanitarian needs are also influenced by conflicts. Up to two-thirds of the world's extreme poor will reside in unstable and conflict-affected areas by 2030 (Cieslik, 2020; World Bank, 2022). If the food crisis, inflation, economic stagflation prevails, healthcare will be less focused. And above all, people below the poverty line, facing any sort of discriminations or crisis can easily be engaged in crime, conflict, and chaos by shrewd opportunists. It will further decline the public health facilities. The European race to conquer Africa was fueled by commercial greed, territorial ambition, and political rivalry (BBC World Service). They encouraged Africans to fight each other in order to gain power (Selassie, 2019; Wong, 2022). Gutiérrez-Romero, 2022, stated that a 10% increase in the local price index is associated with a 0.7 percentage point increase in violence against civilians in Africa. The Ukraine crisis contributes 25% of their food insecurity, according to the UN and Red Cross. Furthermore, Christian Aid claims severe economic stagflation will multiply conflicts in the future (Pearce & Andrijevic, 2022). Their health system is also a terrible mess. They may never get rid of this position unless there is a solution to their conflict.
 7. Approximately 450 terrorist attacks on healthcare facilities, mostly by bomb explosion, have been registered in more than 60 countries over the last five decades. It also raises the question of the credibility of these data, given that over 430 attacks on healthcare facilities in Palestine (WHO, Occupied Palestine Territory, 2019) and more than 800 attacks on medical facilities in Ukraine have already been reported (Bisset *et al.*, 2022; Ваніян, 2022; uacrisis, 2022; Vikhrov, 2022). Also, it is of great concern that victims of oppression are not even safe in hospitals, as are the caregivers and health providers.
 8. For whatever reason, the total number of displaced persons exceeded 100 million, and there were 32.5 million refugees worldwide as of mid-2022, according to the UNHCR's refugee data finder. They are posing healthcare and economic burden to the already stressed host countries. Like Sub-Saharan Africa, which is facing multiple viral disease outbreaks due to the climate crisis, an intolerable food crisis partially due to the Ukraine war and triple drought, and vaccine discontinuation due to the COVID-19 outbreak, it is now hosting refugees who have become half of its Hepatitis E population. Furthermore, the EU is home to one in every eight HIV patients in the world—more than 25% of Ukraine's population has been displaced and taken refuge in EU countries, where they are already among the highest rankers of HIV, drug-resistant tuberculosis, measles, and hepatitis B and C. Although close to 50% of the Ukrainian war refugees had returned by June 2022 (12.6 million vs. 6

- million), their vulnerabilities remained high (People in Need-PIN, 2022; UNICEF, 2022).
9. Transition in healthcare is not unusual; the same is happening in other sectors as well. Without sustainable economic growth, skilled workforce development is a myth. A peaceful, independent nation can take this challenge easier than a community under conflict (Yazdi Feyzabadi *et al.*, 2015; Kruk *et al.*, 2018; Takian & Rajaeieh, 2020). In response to an expected Russian attack, the Eurozone increased its arms purchases by nearly 20%, despite the fact that spending on healthcare would be more necessary given the region's severe healthcare shortages, which may cause the region's health system to collapse in the near future (Barber, 2022) (Figure 7). This was the case despite the fact that the global trade in major arms fell by 4.6% (Hasselbach, 2022).
 10. It is impossible to shelter the population from biological weapons, but possible antidotes or vaccines may have been developed in secret. However, they will not be given away for free, and there will be an option to purchase them at a bargain price. Opportunistic gain is at the heart of all types of mischiefs. If that is the case, the potential for a nuclear attack becomes almost non-existent, because there will be no opportunity for dirty instincts to be satisfied if civilization does not exist. But risk arises when terrorists capture a nuclear weapon through hijacking or, in some cases, misconceptions (Salami, 2022; Williams *et al.*, 2022).

Limitation of the Study

Media control and propaganda always put strain over information broadcast, especially when it is related to war and conflict. Therefore, data collection from media source becomes a limitation for any researcher. However, the present analysis mostly uses statements from ADB, CDC (US), CRED, IMF, IEA, MOPIC, MSF, OECD, UNESCO, UNHCR, WFP, WWF, WHO, UNICEF, and World Bank, collected from their website or from the media.

CONCLUSION

War, conflicts, climate change, and pandemics are all contributing to the crisis's escalation, both directly and indirectly. The coexistence of all of these issues may endanger civilization by causing the loss of many basic healthcare facilities such as health system access, vaccination, poison control, coverage health insurance or co-payment policies, health vigilances and surveillances, monitoring of adverse drug reactions, telemedicine support, patient education or awareness programs, newer drug inventions, and allied technological advances and innovations. In a stable socio-political environment and sound economy, any of these facilities in countries or localities would take longer to develop and necessitate government and other

allied authority support, IT innovation and protocol advancements, and public adherence to the health system.

ACKNOWLEDGEMENT

Dr. Mark L. Graber, Professor Emeritus at Stony Brook University and Chief Medical Officer, Founder and President Emeritus of SIDM, for taking the time to review my paper and make thoughtful suggestions. I'm also grateful to the seminar library of the Faculty of Pharmacy, University of Dhaka, and BANSDOC Library, Bangladesh, for providing me with books, journals, and newsletters.

Financial Disclosure or Funding: N/A

CONFLICT OF INTEREST

The author declares that he has no competing interests.

DECLARATION

The present study was conducted solely for the purpose of examining global sustainability challenges and future health system projections.

Article Highlights

1. "Hunger leads to one death every four seconds"
2. Close to 1 billion global population is facing severe food insecurity, UN warns.
3. More than 11,000 food-borne infections caused by only a few types of bacteria
4. Only around 2% of the earth's water can be used for daily necessities and less than half of it can be used for drinking.
5. Up to two-thirds of the world's extreme poor will reside in unstable and conflict-affected areas by 2030
6. Ukraine crisis accounts for 25% of food insecurity in African countries.
7. Every year, one-third of agricultural produce is lost; additionally, adulterated and contaminated foods cause 60% of all foodborne illnesses.
8. 54 countries with the poorest development are currently in danger of bankruptcy
9. 25% of the world's population lack access to essential medicines and 50% of them are deprived of essential health services.
10. About 7.6 billion people—or 96% of humanity have experienced a global warming in the past 12 months.
11. 10 times more rain in Sindh province and 10 times faster melting of Himalayan glaciers are reported.
12. Natural disasters caused losses to the global economy of more than \$224 billion in 2021 and could cost \$5.6 trillion by 2050.
13. Occupational heat-related mortality is 35 times higher among agricultural workers compared to workers from other industries
14. Natural disaster deaths are now 30 times higher than they were 20 years ago.

15. Climate change and natural disasters may cause more than 1 billion people to be displaced globally by 2050.
16. A one-degree Celsius increase in global temperature may result in more than 100,000 new cases of diabetes in the United States alone each year, as well as six times more premature deaths among respiratory patients worldwide.
17. Cardiovascular disease accounts for more than 60% of pollution-related disease and death.
18. Global wildlife populations have cut by more than two-thirds since 1970.
19. Healthcare costs pushed more than 500 million people to extreme poverty just before the COVID-19 outbreak.
20. 80% of all humanitarian needs are also influenced by conflicts.
21. Inflation has reached 40-year highs in the US, UK, Japan, and Germany, 37-year highs in France and Italy, and 20-year highs in Russia and Turkey.
22. China's factory inflation hits 25% in 2021.
23. China-Taiwan tension threatens supply of chips, major components of medical equipment.
24. War, violence, persecution, and human rights violations will have driven more than 100 million people from their homes between 2021 and 2022.
25. COVID-19 affected more than 662 million people and claimed around 67 million death by December, 2022.
26. More than 80% of the world's workforce, were affected by the lockdown, and the world incurred a loss of 9% of global working hours.
27. The US has officially recorded more than 100 million COVID-19 cases; one-third of the US population can be affected by the running winter cold wave.
28. Cost of illiteracy to the global economy has exceeded \$1 trillion, 100 million children would fall below the minimum reading proficiency level.
29. Poor health literacy has been reported in 40% of US and UK adults, 60% of the EU's older population, and 60% of adult populations in Canada, Australia, and the UAE, and more than 70% of Chinese adults.
30. World will face an 18 million healthcare workforce shortage (20% of the workforce needed to keep healthcare systems going) by 2030.
31. Middle East and North Africa are lacking 636,000 doctors, with South Asia having the biggest gaps.
32. Palestine occupiers/Israel has launched over a thousand airstrikes in Syria and dropped 5,500 bombs in Arab countries since 2017.
33. Half of a million died in last two years due to Ethiopia's Tigray conflict.
34. Among terrorist attacks against hospitals in 61 different countries, more than 50% of the attacks took place in the Middle East, Northern Africa, and South Asia.
35. More than 1500 health facilities damaged in Ethiopia during 2021 conflict, 800 in Ukraine due to ongoing Russian aggression, 700 in Nagorno-Karabakh conflict between Armenia and Azerbaijan.
36. 117 attacks on healthcare facilities in Gaza and the West Bank in just 13 days in May 2021.
37. America and China, two major polluters (40% of global CO2 emissions), were noncommittal on Climate finance at COP27, mainly due to trade war-related privations.
38. India, China, Australia, and many EU countries increased their reliance on coal-fired power due to tightened global energy supply.
39. Despite severe healthcare shortages the Eurozone have increased arms purchases by nearly 20%, in fear of Russian attack.
40. Around 30% of Lebanese population is made up of Syrian refugees.
41. Over 80% of all deaths in Libya are due to long-term breakdowns in health services and policymaking processes.
42. Iran, once known as the home of 80% of the world's medicinal herbs, now faces a shortage of life-saving drugs due to sanctions and spiraling unrest.
43. Conflict was responsible for more than 10 million deaths of children under the age of five between 1995 and 2015 worldwide.
44. Since 2017, more than one in every six children has lived in a conflict zone.
45. Conflict-affected countries are home to 60% of the world's chronically food insecure and malnourished people, including 75% of all children with stunted growth.
46. The Eurozone is home to 12.5% of the world's HIV patients—to date, approximately 25% of Ukraine's displaced population has sought refuge in EU countries.
47. Along with many other conglomerates, big tech giants (Apple, Microsoft), media giants (The Guardian, BBC, CNN), finance giants (JPMorgan Chase, Goldman Sachs, Morgan Stanley), retail giants (Amazon, Walmart) have seen mass layoffs recently.
48. 2 billion people could die from a nuclear war between India and Pakistan, and more than 5 billion could die from a war between the United States and Russia.
49. In the last 100 years, bioterrorism, chemical warfare, and nuclear explosions have targeted civilians.
50. Between 1970 and 2019, there were 41,837 attacks in the Middle East, making up almost 25% of all terrorist attacks worldwide.

Abbreviations

ADB: Asian Development Bank

AFP: Agence France-Presse

AIDS: Acquired Immune Deficiency Syndrome

AMD: Advanced Micro Devices, Inc.

API: Active Pharmaceutical Ingredient

BBC: British Broadcasting Corporation
 CDC: US Centers for Disease Control and Prevention
 COVID-19: Coronavirus disease of 2019
 COVAX: COVID-19 Vaccines Global Access
 CNN: Cable News Network
 COP27: 27th Conference of the Parties to the United Nations Framework Convention on Climate Change
 CRED: Centre for Research on the Epidemiology of Disasters, Brussels
 CNBC: Consumer News and Business Channel
 EU: The European Union
 GDP: Gross Domestic Product
 GP: General Practitioner
 GTD: Global Terrorism Database
 HIV: Human Immunodeficiency Virus
 HP: Hewlett-Packard
 H&M: Hennes & Mauritz AB
 HSBC: Hongkong and Shanghai Banking Corporation
 ICU: Intensive Care Units
 IEA: International Energy Agency
 IMF: International Monetary Fund
 JPMorgan Chase: JPMorgan Chase & Co.
 MENA: Middle East and North Africa
 MSF: Médecins Sans Frontières
 MOPIC: Ministry of Planning and International Cooperation
 OECD: The Organization for Economic Co-operation and Development
 MOPIC: Physicians for Human Rights'
 PLI: Production Linked Incentive
 PPE: Personal Protective Equipment
 PTSD: Post-Traumatic Stress Disorder
 QUAD: Quadrilateral Security Dialogue
 SMEs: Small and Medium-sized Enterprises
 STDs: Sexually Transmitted Diseases
 TBS: The Business Standard
 TDF: Tigrayan Defense Force
 TSMC: Taiwan Semiconductor Manufacturing Company Limited
 UAE: United Arab Emirates
 UNESCO: United Nations Educational, Scientific and Cultural Organization
 UNHCR: United Nations High Commissioner for Refugees
 UNICEF: United Nations Children's Fund
 WFP: World Food Programme
 WHO: World Health Organization
 WWF: World Wildlife Fund
 YOY: Year-over-year

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