



Exploring The Disparity Between Human Resilience And The Nuclear Dilemma

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Abstract: Exponential growth in nuclear warfare has unfolded true human potential towards how far human research is capable of advancing. The creation of the atomic bomb and further advancements towards military armaments have proved humanity's capabilities, although the possession of such nuclear weaponry poses unprecedented danger. On the other hand, mankind's abilities to recover and overcome adversities show the true will for survival for humanity but is this will enough to recover the widespread devastation nuclear warfare can induce? This essay talks about the capabilities of mass destruction of nuclear warfare, humanity's resilience for survival and the urgent need for diplomatic solutions, disarmament efforts, and global cooperation.

Index Terms: Epidemic, Pandemic, Virus, Atomic, Nuclear Warfare, Nuclear Weapons, Treaty

I. INTRODUCTION

Within the intricate, expansive, and modern urban landscape unfolds a sanctuary possessing menacing predators, breathtakingly beautiful avians, and fascinating beings. A vast zoo, full of such dangerous and delicate beings as the aquatic inhabitants, the majestic sharks, dolphins, stingrays, and sea turtles, or the mighty terrestrial beings, like the colossal elephants, ferocious lions, and striped tigers, or even sky voyagers, like the ethereal peacock, the hummingbird, and of course the mighty eagle. There are a lot more mysterious and extravagant animals than I have mentioned, as God's creations and the enormous and dynamic animal kingdom don't fail to mesmerise us as we discover more. A zoo possesses all these different beings as part of the animal kingdom, safely kept in captivity for amusement, but they also give us the privilege of witnessing the ultimate predator, which is not caged but is simply a mirror, where a human being can look at himself as well as the most destructive weapon, the human mind. The Bronx Zoo came up with this innovative yet profound message in 1963. The title 'The Most Dangerous Animal in the World', with the message 'This animal, increasing at a rate of 1,000 every 24 hours, is the only creature that has ever killed off entire species of other animals. Now it has the power to wipe out all life on earth. It has made people realise that even though the presence of various microorganisms capable of causing deathly pandemics, diseases with no cure, and deadly predators, the greatest threat to humanity, and humanity's future, is humanity itself.

II. HUMANITY'S RESILIENCE

Humans have proven to be resilient fighters, that show their perseverance through all kinds of natural disasters, environmental changes, war and pandemics. In the face of these kinds of adversities, where great minds and fearless individuals meet in a united response, to demonstrate not only healing but also a fighting spirit in an effective and impactful manner. One such instance was the Spanish Flu pandemic of 1918. Although only a year long, the Spanish Flu outbreak was one of the most, if not the deadliest virus and challenge humanity has had to face. Caused by the influenza A virus, the Spanish Flu infected a significant number of the global population which resulted in countless deaths. With World War 1 depleting the scarce healthcare resources, the Spanish Flu aggravated world problems, by adding pressure on hospitals with limited funds, World War 1 casualties, and no knowledge of any known cure for the Spanish Flu. Regardless of the catastrophic times, humanity once again emerged from this unprecedented predicament. This challenging situation saw humanity bring out their want for survival, seeing exponential growth in healthcare, medicine, industrialisation and the economy. In a few decades, the world population recovered from both World War 1 and the Spanish Flu. What should have hinted at the beginning of human extinction, ended up proving humanity's resilience, potential and tenacity.

2.1 THE BLACK DEATH

One more such pandemic calamity which humanity faced was the Black Death, which claimed 10% of the lives of the world population in the 14th century. With limited research and little availability of healthcare, the Black Death scared and scarred the Europeans of the 14th century, flourishing in arts and sciences. It quickly spread through trade routes, starting from China and India, crossing the Middle East and moving into Europe, where it truly marked its presence on the European people taking the lives of almost 40 % of the European population [8]. Although the Black Death wiped out a great number of Europe's population, it gave rise to adaptability and advancements. People slowly started to realise maintaining social distancing would reduce the probability of them catching the disease, especially when a disease like the black death has an 80% death rate. Although, there wasn't any direct advancement or contribution to medical sciences during these times, understanding the epidemic and finding reasonable solutions helped in improving the approach to such catastrophic plagues. This was first seen in Ragusa, the Venetian-controlled port city where incoming sailors were kept on their ships in isolation for 30 days. To increase measures of safety, this period was increased to 40 days which in Italian was called '*quarantino*', leading to the origin of the current word '*quarantine*' [20]. This practice proved to work, as incoming cases of the black plague were greatly reduced. The rats and fleas which were then suspected to be carrying this virus were tackled through logical approaches, as civilians were advised to keep their houses and workplaces clean, as it was observed that rats and fleas were less present in cleaner environments. The combination of sanitation and quarantines helped reduce the short-term effects caused by the plague, which allowed doctors more time to research this subject [9]. Moreover, with time human DNA mutations allowed to fight the plague better, as well as highly deadly pathogens must eventually find a way to be less deadly to keep reproduction going [11]. These little adaptations and advancements have now helped the Black Death to be not even close to as fatal as it once was, being able to be treated with antibiotics and claiming less than 0.001% of the lives it once did [10].

2.2 THE SMALLPOX

A deadly virus caused by the variola virus arose in north-eastern Africa, approximately ten thousand years ago [12]. This new virus had a peculiar way of attacking its victims, first showing itself in the skin cells, then to the spleen, bone marrow and lymph nodes of its victims. Victims developed rashes, and vomiting and suffered from high fever. 30% of people affected by smallpox died by the second week of infection. The lucky ones to survive were not lucky enough as they developed scars were the rest of their life [15]. Humanity's first countermeasure towards smallpox was actually in 1022 A.D. A Buddhist nun practising between 1022 and 1063 AD would grind up scabs taken from a smallpox sufferer into a powder, and then blow it into the nostrils of someone not yet immune. She did this because she noticed an odd pattern in patients who already had gotten smallpox and recovered from it, did not end up getting the virus again [13]. This marked the start of a process called variolation or inoculation.

The practice of inoculation had been common in China, India, and Turkey for hundreds of years but did not spread to Europe until the eighteenth century. In the case of smallpox, it involves infecting a patient with a tiny amount of fluid from a pustule by placing it in a small incision or puncture wound, usually on the upper arm. This then hopefully produces a mild case of the disease, providing immunity from further infection [14]. However, the inoculated persons would be as contagious as if they had caught it naturally, so this danger was not reduced. In the case of smallpox, inoculation can also be called variolation after the Latin for pustule: variola.

Variolation wasn't foolproof. There was still a probability that 3 in 100 people would die from the inoculation. With an increasing death toll and a need for a working and modern solution to smallpox, Edward Jenner's conclusion commenced the modern-day solution to smallpox and vaccination [16]. Jenner observed that dairymaids were protected from smallpox naturally after having suffered from cowpox. Jenner concluded that cowpox not only protected against smallpox but also could be transmitted from one person to another as a deliberate mechanism of protection. In May 1796, Edward Jenner found a young dairymaid, Sarah Nelms, who had fresh cowpox lesions on her hands and arms. On May 14, 1796, using matter from Nelms' lesions, he inoculated an 8-year-old boy, James Phipps. Subsequently, the boy developed mild fever and discomfort in the axillae. Nine days after the procedure he felt cold and had lost his appetite, but on the next day, he was much better. In July 1796, Jenner inoculated the boy again, this time with matter from a fresh smallpox lesion. No disease developed, and Jenner concluded that protection was complete. Although smallpox devastated mankind for centuries, taking the lives of millions, humanity's survival instinct became apparent. The urgency to combat this formidable disease not only showcased our determination but also pressured humanity to make significant advancements in medical sciences which have helped generations.

2.3 THE ATOMIC BOMBINGS OF HIROSHIMA AND NAGASAKI – REALISATION AND RECOVERY

Another conspicuous example of humanity's potential and ability to recover is the atomic bombings of Hiroshima and Nagasaki in World War 2. On the 6th of August, 1945 an American B-29 bomber dropped the world's first deployed atomic bomb over the city of Hiroshima, Japan [2]. In less than a minute, the city of Hiroshima was incinerated, taking the lives of almost 70000-80000 innocent people. Just three days later, a second American B-29 bomber dropped another atomic bomb on Nagasaki. Wiping out almost all infrastructure, leaving the city to dust and claiming the innocent lives of approximately 40000 people [5]. The brutality and detriment caused by the bombings on Hiroshima and Nagasaki made Japan surrender immediately in World War 2 [1]. Nevertheless, Hiroshima rose from the ashes of nuclear destruction. Its population managed to recover within a decade. Small 5-year project plans were launched to help raise domestic production. Rather than being referred to as the damaged traumatized city, national politicians passed the Peace Memorial City Construction Law, Article 1 of which states: "Hiroshima is to be a peace memorial city symbolising the human idea of the sincere pursuit of genuine and lasting peace." [3]. Hiroshima also has a museum called the 'The Hiroshima Peace Memorial Museum' which contains significant information on Hiroshima's perspective of the bombings. Hiroshima and Nagasaki have made a remarkable recovery, and today they are thriving cities of approximately 2.5 million people [4]. These remarkable recoveries definitely strengthen the argument for humanity's unshakable resilience and perseverance. Although, with the creation of the atomic bomb humanity harnessed a power so immense, that it had the power to unravel and obliterate its existence.

III. THE PURSUIT OF NUCLEAR WARFARE

In the pursuit of nuclear and technological advancement, significant ecological damage has been inflicted. Humans have always been relentless about territorial and resourceful dominance. In the pursuit of advancement in artillery and armaments, humanity now has an unprecedented power, capable of launching attacks as fatal as jeopardising its whole existence and causing billions of deaths. Global nuclear warfare stands as the biggest threat to humanity, as over the years the possession of lethal nuclear warfare has exponentially increased. Human greed and need still stand as they always did, although, with the addition of nuclear weapons, the risk of extinction and a major population wipeout has substantially increased over the years. The 21st century marks an incredible time to witness such advances in scientific, bioterror and nuclear warfare, as our governments live with the choice of the most destructive, inhumane and indiscriminate path

of annexation. The main victims of nuclear warfare are the innocent civilians, who have to face the destruction of their homes, the death of their loved ones, the toxic climate and suffer from ecological degradation which would lead to a severe famine. In addition, the likelihood of humanitarian aid and healthcare is slim to none leading to a major refugee crisis. The effects of nuclear warfare go beyond the immediate loss of lives and infrastructure incineration [6]. In today's world, it is highly unlikely that a single nuclear bomb would be utilized, and would lead to a chain of events leading to the use of tens or hundreds of nuclear bombs that would disrupt the global climate, causing widespread famine. The radioactive fallout caused by a nuclear bomb would lead to cancer and genetic damage, causing later generations to suffer from complex genetic disorders [7]. They produce ionizing radiation which is capable of contaminating the whole ecosystem. The availability of these mass-destructing weapons is enormous, and using only one per cent of the present nuclear weapons would greatly disrupt the global climate and threaten approximately two billion people with nuclear famine in the long term.

3.1 Existential Risks

The consequences of unconstrained nuclear attacks and the counterattacks that would occur until would far exceed any cataclysm humanity has suffered in all of recorded history. The probability of nuclear warfare in the next hundred years is 0.01% [18], but with that fact comes another fact that a global nuclear warfare would wipe out the human population. Several experts today suggest that human-induced existential risk is more than a hundred times higher than the background risks. There is no denying the resilience and perseverance for survival that humanity possesses is robust, although what we can conclude from our past of surviving major catastrophes is that they have either been natural, such as the Black Death or the Spanish Flu, or the scale of destruction, such as the World Wars, doesn't compare to what humanity is capable of causing today. The consequences of existential risks are truly incalculable, including the lives not only of all human beings currently living but also of all those yet to come; involving not only *Homo sapiens* but all species that may descend from it [17].

If a nuclear-armed state cannot strike a target with ballistic missiles, this coding approach assumes that the state will still have some capacity to deliver the nuclear weapons to the target which makes their possession threatening. The concept of existential threats is distinct from but—in practical terms—related to states' first-strike and second-strike capabilities. States that can pose salient existential threats are also likely to be able to pose greater first-strike and second-strike threats. Yet, the ability to pose existential threats relates directly to the potential nuclear destruction states could inflict in first and second strikes and their likelihood of conducting them. As countries seemingly grow in possession of maintaining nuclear warfare due to the risk of not having nuclear security: A neighbouring nation possessing nuclear weapons would influence neighbouring nations to also possess and advance to nuclear weapons for nuclear safety [19].

If countries can generally be considered to be cautious in addressing the existential risks posed by nuclear weapons, we may presume a tendency for policymakers to overestimate the existential threats they face from other nuclear weapons possessors. Although estimates that a famine caused by a US–Russia nuclear exchange would kill around 5.5 billion people (90% confidence interval: 2.7 billion–7.5 billion deaths). That is, between 36% and 96% of the world population would die a horrible and prolonged death. But worse still, nuclear war is thought to create some risk of outright human extinction. Various estimates have been made of this risk:

- In *The Precipice*, Toby Ord estimates the chances of existential catastrophe resulting directly from nuclear war by 2120 as 0.1%.
- A survey of academics at the Global Catastrophic Risk Conference by the University of Oxford estimated a 1% chance of human extinction from nuclear wars over the 21st century.⁵
- Pamlin and Armstrong (2015) estimate a 0.005% chance of “infinite impact” from nuclear war by 2115[18].

IV. THE NEED FOR INTERNATIONAL CONSENSUS

Although the scale and possibility of mass destruction and widespread eradication are growing by the day with advancements in such fields, ultimately, the odds of human and ecological annihilation completely depend on human choices, as the intent roots in human behaviour, and the initiation of such warfare is within human control. This amazing civilization that has taken millions of years to converge is deeply interconnected, implying that nuclear warfare in one part of the world causing industrial and economic collapse would directly affect millions or billions of people around the world. The globalized civilization today is so advanced that the industries and economies of several countries are dependent on other countries, indirectly leading to more vulnerabilities within our civilization in case of globalized destruction. In complex and advanced times like this, where humanity possesses the most destructive weapon, the need for global peace, cooperation and security becomes paramount. The catastrophic consequences that humanity could potentially face call for the requirements of diplomatic solutions and disarmament. Efforts towards nuclear treaties would greatly reduce the potential use of nuclear warfare. Making the world a more peaceful place, and reducing the risk of any war, would greatly also reduce nuclear warfare. Fortunately, humanity has already made such efforts such as the Treaty of 1970 on the Non-Proliferation of Nuclear Weapons (NPT), the Treaty of 1996 on Comprehensive Nuclear-Test-Ban Treaty (CTBT)[21] and most recently the First Meeting of States Parties to the Treaty on the Prohibition of Nuclear Weapons. The Second Meeting of State Parties to the Treaty on the Prohibition of Nuclear Weapons will take place from 27 November to 1 December 2023 at the UN Headquarters in New York[22]. It is only through efforts to make the world a better place and reduce the risk of global warfare and decimation that the fear and risks of nuclear conflict will finally be replaced by a more secure and peaceful world to live in, as well as for the greater generations to come.

V. CONCLUSION

In the vast complexities faced in human history, marked by triumphs and resilience through pandemics and catastrophes such as the Spanish Flu, Black Plague, and the atomic bombing of Hiroshima and Nagasaki, humanity now sees a new lethal threat emerge, global nuclear warfare. This realisation of the potential of the effects of global nuclear warfare can cause, calls for a profound reconsideration in priorities, less towards advancements in nuclear armaments and more towards treaties, diplomatic solutions and global cooperation.

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