

## THE PREDICTABILITY OF COVID-19 CRISIS

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**Abstract:** The view that national security cannot be achieved by military security alone has long prevailed in the scientific community, a pandemic caused by COVID-19 painfully confirmed. The most developed world and regional powers, which allocate huge funds from budgets for their national security, succumbed to this invisible enemy. We are witnessing a rethinking of the international security and peace agenda, respectively redefinition of the national security. We are witnessing the formation of a new world order and new relations between the states. In conditions of a pandemic, it has become more than obvious that the states do not cooperate with each other at the required level, they do not help each other, nor exchange data for the common good, but act on their own. Each of them leads a special struggle and tries with all its might and means to protect its citizens, realizing that individual human security also affects the overall national security. Besides its threat to health security, the real impact of COVID-19 is its enormous threat to economic security with far reaching negative consequences on socio-political stability, international relations, peace, and civil rights. COVID-19 may either consolidate global solidarity or it may take humanity on a path toward the demise of globalization and multilateralism. There is no doubt that the world will not be the same again after the end of this pandemic. All this raises the question of whether the COVID-19 crisis could have been foreseen. Whether with the use of special systems for forecasting events and risk measurement could have been possible to obtain approximate results for the hazard from COVID-19 in order to undertake timely measures and activities for hazard management.

**Keywords:** predictability, effects, security, crisis,

### 1. Introduction

Due to its severity, magnitude, rapid spread, and the widespread disruption that it causes, the COVID-19 pandemic is an exceptional global health crisis. The world has faced pandemics in the past, notably the 1918-1920 flu pandemic that led to the deaths of tens of millions of women and men around the world. More recently, epidemics such as SARS, MERS, H5N1 and Ebola have been recorded in several regions of the globe, but all of them were contained. However, combined with globalisation and the intensification of economic and human exchanges in recent decades, the high infectivity of the new SARS-CoV-2 coronavirus allowed it to spread throughout the world with unprecedented speed. In this, the COVID-19 crisis seems unparalleled in recent human history (Maylam, 2020: 1-2).

The current crisis revealed that our countries were not ready to face this pandemic. Although this risk was known, it was considered hypothetical. In the majority of countries, preparations were only superficial. Until now, health had not been regarded as an area directly

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affecting security. Although the current priority should be addressing the seriousness of the health crisis, the COVID-19 pandemic demonstrates the need to work today to make sure that our societies are more resilient tomorrow, so that our citizens are ready to face future crises, whatever they may be (Maylam, 2020: 15-16).

COVID-19 has been an unexpected test for the US, China and Russia, not just in how they handle and control the virus at home and limit the damage to their economies, but also in whether they benefit or suffer from the crisis in terms of their international reputation, political influence and material power (Policy Department for External Relations, Directorate General for External Policies of the Union, 2021: 15).

The spread of infectious disease (ID) in catastrophic proportions, such as in endemics and pandemics, is a threat to national and international security. In fact, the threat to human security and biosecurity should be included along with other perceived security threats such as conventional warfare and terrorism. Unlike ISIS, al-Qaeda, and the Taliban, ID has no natural enemy; it cannot be stopped by policy, borders, or alliances. Yet it gets less treatment in the literature and by policy wonks than do more traditional security threats (Albert et al., 2021: 83).

## 2. Predictability of COVID-19

The advent of the COVID-19 pandemic has instigated unprecedented changes in many countries around the globe, putting a significant burden on the health sectors, affecting the macro economic conditions, and altering social interactions amongst the population through a number of mitigation measures and governmental instructions. In response, the academic community has produced multiple forecasting models, approaches and algorithms to best predict the different indicators of COVID-19, such as the number of confirmed infected cases, the number of deceased and economic indicators. Specifically at the beginning of the pandemic, researchers had little to no historical information about the pandemic at their disposal in order to inform their forecasting methods (Gordeev et al., 2020: 1-2). Considering the global scenario on the series of waves and different (new) strains of COVID-19, there is a need for more studies/research to timely and effectively curtail the spread of the disease (Musa et al., 2021: 2).

Towards the direction of finding new methods and approaches for disease surveillance, it is crucial to make use of real time internet data. Infodemiology, i.e., information epidemiology, is a concept introduced by Gunther Eysenbach. In the field of infodemiology, internet sources and data are employed in order to inform public health and policy, and are valuable for the monitoring and forecasting of outbreaks and epidemics, as for example Ebola, Zika, MERS, influenza, and measles. During this pandemic, several approaches in using Web based data have been already published in this line of research. Google Trends, the most popular infodemiology source along with Twitter, has been widely used in health and medicine for the analysis and forecasting of diseases and epidemics (Mavragani1 and Gillas, 2020: 2).

Forecasting of time series with the estimation of time-varying parameters is useful for many statistical, probabilistic, and optimization processes that allow models to consider past observations and detect the disease pattern. Researchers and developers are increasingly using stochastic models to track and prevent chronological diseases and gain a more comprehensive understanding of the disease. Recently, many researchers, journalists,

and amateur data enthusiasts are working on stochastic models to help people monitor the Coronavirus's spread and effects over time (Bhuiyan et al., 2021: 1). Several methods have already been used to study COVID-19. We can highlight the application of mathematical modelling, statistical approaches, physics analysis, machine learning methods and many others (Fernandes et al., 2021: 2).

There is no effective and authorized vaccine for this novel infection although few countries have claimed it. The best prevention strategies used in almost countries to decrease and delay the epidemic pick (flattening the curve) are the frequent tests to determine the infected persons, isolation and lockdown, social distancing, use of strict SOPs, etc. until effective treatments and vaccine become available. The preventive measures are only the way to reduce the chances of infections and slow the spread of the virus. The researcher around the globe are focusing to plan a strategy to overcome the COVID-19 pandemic (Moussa et al., 2021: 1-2).

## 2.1 Models

The field of investigation of biological is now a day encountered by many researchers. In many cases, the formulation of biological models by mathematical modeling based on ordinary differential equations i.e., on classical derivatives have some limitations and may not be able to describe the biological phenomenon accurately. To deal with these biological models very efficiently and accurately, fractional mathematical models are being in used. The mathematical formulation of the dynamics of many infectious diseases has a very deep history. Many researchers have developed a successful formulation of biological models using fractional calculus theory. The fuzzy logic approach for various epidemic mathematical models was also discussed and analyzed by many researchers (Pandey et al., 2021: 2).

In the event of a pandemic outbreak, stakeholders such as politicians, pharmaceutical companies or hospitals attempt to forecast the spread of the pandemic to make informed decisions about actions and policies such as lock-downs, supply chain optimization, or, in worst case, even crucial decisions about intensive care units. However, every pandemic is unique in itself and COVID-19 reached a magnitude and severity that has not been observed over the last decades. As a result, little historical information about similar pandemics was at our disposal at the beginning of the outbreak in order to make good estimates about the future development of the disease. This information bottleneck leads to uncertainty in forecasting methods and can be crucial in the efforts to develop new medicine, vaccines, public guidelines and other important aspects to guarantee public health and safety. Many different types of models have been proposed to model and forecast the number of infections within and across countries.

A prominent and frequently applied type is the classical epidemiological framework modeling susceptible, exposed, infected, and recovered agents (SEIR) that has also found its application in several COVID-19 forecasting approaches. A second type of category represents autoregressive moving average models that attempt to extrapolate future data by means of aggregating recent data. These types of models have had many successful implementations in time series forecasting e.g. financial methods and have recently also been applied to predict COVID-19 numbers. Third, several curve fitting and statistical models have been proposed to be well-tailored for COVID-19 forecasting, including power-law models, simple linear or

polynomial models, logistic models, mixed-effects models, and many others. Finally, many approaches in the realm of machine learning have been developed, including e.g. Facebook's prophet algorithm, gradient boosted trees, or neural networks. This list only covers a small fraction of published models, an exemplary overview of others is also given in Kaggle, a large competitive data science platform with around five million users, conducted a series of five competitions allowing data scientists to develop and submit their COVID-19 forecasting models to predict confirmed cases and fatalities across 300 regions including mostly country-level and in certain cases province-level or state-level predictions for no less than 30 days into the future. The models were always developed on historical data and then evaluated live over a period of four succeeding weeks or more. Across all competitions, different types of models have performed well including the above-mentioned machine learning models (boosting trees, neural networks) as well as a diverse set of curve fitting, statistical, and autoregressive models. The series of competitions captures the state of development of these kinds of models during a pandemic quite well, with the models being initially quite simple and uninformed, and developing to more robust models and ensembles overtime. While many strong solutions have been developed, it has also been shown that a lot of subjective adjustments can make a model shine or fail and that it is explicitly complex to forecast rapidly changing patterns (Gordeev et al., 2020: 1-2).

### 2.1.1 Susceptible-Infectious-Removed (SIR) model

The global outbreak of COVID-19 requires us to accurately predict the spread of disease and decide how adopting corresponding strategies to ensure the sustainable development. Most of the existing infectious disease forecasting methods are based on the classical Susceptible-Infectious-Removed (SIR) model. However, due to the highly nonlinearity, nonstationarity, sensitivities to initial values and parameters, SIR type models would produce large deviations in the forecast results.

Reasonable epidemic prediction can provide the total number of infections, the lifecycle of the epidemic, the arrival time of the epidemic peak, and the assessment of the epidemic severity. In addition, model forecasting provides the scientific foundation for decision-making and intervention strategy adjustment. Since the outbreak of COVID-19, various models have been proposed to simulate, analyze, and predict the pandemic. With the increasingly severe COVID-19 spread, infectious disease models have played key roles in the prediction of pandemic trends, scientific prevention and control, and outbreak assessment. Studies of infectious disease models have a long history and can be traced back to the 1760s, with the famous Susceptible-Infectious-Removed (SIR) model established in the 1920. The SIR model divided the population under natural conditions into three categories, namely, susceptible individuals, infected cases and removed cases (Li et al., 2020: 317-320). Most of the existing infectious disease forecasting methods are based on the classical SIR model. The SIR-type model can be used to accurately predict uncontrolled disease spread at the early stage since it has a clear pathological dynamic mechanism. However, for medium- and long-term epidemic spread (such as 60 days or more), SIR-type models have poor predictability, which can be defined as the qualitative or quantitative correctness of the system predictions. The reasons are that the epidemic characteristics and transmission patterns vary by region and season. The parameters of each SIR-type model are spatial and time variant at different

stages i.e., affected by changes in pathological characteristics, the social environment, the human intervention for prevention and control measures, medical conditions, and self-protection awareness. In addition, the stochasticity and non-stationarity of the models indicate that the prediction of SIR-type models is sensitive to the initial value of the model and the total population in the region. Therefore, due to the nonlinearity, heterogeneity, and randomness of the epidemic dynamics and the significant impact of prevention and control policies, a better epidemic forecasting method to improve predictability is required, both for volatile and normal epidemic spreads (Ibid).

### **2.1.2 Susceptible-exposed-infectious-recovered (SEIR) model**

For example, during the outbreak of COVID-19 since December 2019, a commonly adopted approach for predicting the number of infections is the susceptible-exposed-infectious-recovered (SEIR) model, which adds an exposed period to the SIR model for accounting the reported incubation period of COVID-19 during which individuals are not yet infectious. More recently, it was developed a multi-risk SIR model, which takes into account that different subpopulations have different risks and is applied to analyzing optimal lockdown. However, there are several limitations to use deterministic epidemic models to describe the transmission dynamics of the COVID-19 pandemic. First, the SIR and SEIR models require the assumptions of the incubation period, the duration of infection, the initial reproduction number, the number of isolated cases once identified, the subclinical infection percentage etc. which are mostly unclear at the early stage of the pandemic. Second, for most countries and regions around the world, the existing COVID-19 recovery and mortality data are generally underreported, which would lead to underestimations of key epidemiological quantities such as reproduction number (Chen et al., 2021: 2).

## **3. Security sector and COVID-19**

Due to high morbidity and mortality attributed to the COVID-19 pandemic, drastic changes were made not only in healthcare but also in national security. It was probably the first in history phenomenon, which caused an international collaboration between distant countries in order to prevent a pandemic-level outbreak of COVID-19. All countries were, in some part, focused not only on the interest of the individuals, on a shared future for humanity. Various new tools and global resources were mobilized in order to equip hospital facilities and supplies to protect noisome infections and to provide personal protective tools such as a facemask to the general population. Moreover, never seen an increase in the research project activity focused on drug and vaccine development was observed. The capacity of the armed forces to cooperate with the state administration at local level and non-governmental organizations, including those working for public health, should be increased. The long-term effect of the epidemic, in terms of healthcare and national security, may only be assessed after the global lock-down lift and so-called return to the 'new normality' (Szymanski et al., 2020: 5).

The COVID-19 pandemic is prompting shifts in security priorities for countries around the world. As militaries face growing calls to cut budgets, gaps are emerging in UN peacekeeping operations; military training and preparedness; counterterrorism operations; and arms control monitoring, verification, and compliance. These gaps are likely to grow without a quick end to the pandemic and a rapid recovery, making managing conflict more

difficult particularly because the pandemic has not caused any diminution in the number or intensity of conflicts. COVID-19-related disruptions to essential health services such as vaccinations, aid delivery, and maternal and child health programs will increase the likelihood of additional health emergencies, especially among vulnerable populations in low-income countries. As examples, the pandemic has disrupted HIV/AIDS treatments and preventative measures in Sub-Saharan Africa, as well as measles and polio vaccination campaigns in dozens of countries. World populations, including Americans, will remain vulnerable to new outbreaks of infectious diseases as risk factors persist, such as rapid and unplanned urbanization, protracted conflict and humanitarian crises, human incursions into previously unsettled land, expansion of international travel and trade, and public mistrust of government and health care workers (Annual threat assessment of the US intelligence community, 2021: 17-18).

In response to COVID-19, many security actors have been tasked with responsibilities that are not typically part of their day-to-day activities. In addition to the rights of security providers, many questions persist as to whether they have the proper structures, training, and equipment (in addition to PPE), and the normative or legal frameworks and institutions, to deal with pandemics (Lui, 2020: 5-7).

In many contexts, armed forces are being deployed to support domestic police functions and health authorities, as well as to monitor border restrictions. These and other new tasks, while technically within the scope of their legally mandated responsibilities, are unusual. This has been the case in varying systems of governance, from consolidated democracies to autocratic regimes. States are facing similar challenges in many cases, but in some contexts, the impact may be felt more severely than in others. In addition, infection rates are rising within the ranks of many militaries (although data is limited), due to high-density shared living spaces, a lack of resources, and tasks such as patrolling streets and disinfecting public spaces (Ibid).

Civil protection forces are often among the first to be deployed during emergencies, to support the government in their provision of assistance to the population in times of crisis. They play a vital role in providing logistical support to, or backstopping, all other security actors. Since the outbreak of COVID-19, the tasks of these forces have ranged from providing first-aid, to relocating residents, to delivering medical equipment and essential items and setting up temporary isolation centers, among others. Similar to armed forces, civil defense forces have had to take on roles and responsibilities outside their typical scope of activities, and for which they may not be adequately prepared. This has the potential to result in increased vulnerability for these forces and the populations they are tasked to assist (Ibid).

Since the outbreak of the pandemic, patterns of crime have changed. Law enforcement agencies are playing a key role in both supporting the implementation of public health measures to contain the outbreak (e.g., restricting movement, imposing public order, facilitating contact tracing, securing the delivery of emergency supplies, and engaging in public messaging) and preventing specific criminal activities arising from new circumstances (including intimidation or attempts to deliberately spread contamination, the sale of fake and counterfeit medical products, fraud and scam schemes, and cybercrime). The gaps left by these forces in addressing crime more generally, as a result of their efforts to prioritize new tasks, may mean that alternative governance structures are required to ensure that existing forces are not stretched too thin (Ibid).

Since the outbreak of COVID-19, many states have closed their borders, prohibiting the entry of non-nationals into their territory. This has led to an increase in the personnel deployed to various entry points via land, air, and sea to address the cross-border trafficking of persons and goods. Moreover, postal operators, customs authorities, and transport and delivery services are struggling to handle the considerable increase in incoming and outgoing goods caused by a sharp rise in global e-commerce. Potential security concerns associated with this growth of e-commerce and other trade include online fraud and personal data protection (Ibid).

Intelligence agencies play a key role in keeping their countries safe, especially during a crisis. In the case of the COVID-19 pandemic, this includes providing policymakers with assessments about the spread of the virus and its impact, sometimes by uncovering information others want to keep secret; countering disinformation campaigns; and conducting surveillance. When it comes to surveillance, governments are increasingly reliant on digital technologies to implement social controls that minimize contact between people, and to carry out contact tracing or track down the source of infection. Questions remain concerning the institutions that are supervising and leading data gathering in tracking individuals via apps and other remote technologies (Ibid).

Overcrowded detention facilities represent high-risk settings for COVID-19 transmission. To pre-emptively prevent outbreaks, some states have released detainees held for minor offences, or those who have served two-thirds of their sentences. Despite these measures, many institutions continue to face significant challenges related to poor hygiene conditions and limited access to healthcare for detainees. More broadly, pre-existing challenges related to the absence of normative frameworks that facilitate the efficient, transparent, and equitable application of alternatives to punishment by imprisonment or deprivation of freedom can be exacerbated during a crisis (Ibid).

In certain contexts, the private security industry is being recognized as a key part of the sector, and is providing support to state security providers, including in medical facilities. In addition to being given new and unfamiliar roles, there remain significant concerns in fragile contexts regarding training, vetting, and oversight of private security that may come more into focus due to pandemic-related activities (Ibid).

#### **4. Effects of COVID-19**

In a matter of months, COVID-19 has infected [over 90 million people worldwide, has caused over 2 million deaths], and has erased decades of gains in global health and development. Nowhere will the effects of this pandemic be more devastating than on the world's most vulnerable communities (National Strategy for the COVID-19 Response and Pandemic Preparedness, 2021: 107-109). COVID-19 has redefined and strengthened the approach of non-traditional security studies. The approaches and dimensions provided by non-traditional/comprehensive/widener school of thought has provide the theoretical foundations about how we are dealing with the COVID-19 pandemic. The pandemic has impacted economics, politics and social spheres of human civilization. Traditional security apparatus is comprehensively facing new challenges due to the pandemic (Nihas, 2020: 5899-5902).

COVID-19 rapidly elevated health security as a human, national and global security threat. Responses can partly be explained through securitization theory and particularly the

existential language coupled with unprecedented extraordinary measures taken. Overall, COVID-19 has probably impressed upon decision-makers how a previously peripheral threat perception rapidly became pivotal in global and national security debates and forced leaders to introduce responses beyond normal politics in order to deal with an existential threat to all societies. The ripple effect across societies is unpredictable and this is visible in how leaders react, containment measures and the will to enforce decisions with police, and even military agencies. As the world recognizes that health insecurity anywhere is a threat to security everywhere, we need to make common cause with all the nations in the world as a collective to accept extraordinary measures to serve the common good of humanity.

The key rights affected by the COVID-19 emergency were the rights to freedom of movement and assembly. Hybrid democracies with weaker institutions and lower public trust toward the government demonstrated certain risks to democracy and human rights in their implementation of emergency measures. As the executive expanded its power, the legislature and the judiciary were limited in their ability to oversee the measures and their implementation (Skendaj et al., 2021: 41).

In the midst of this crisis, the role of the various aspects of the civil dimension of security and the impact of the pandemic on the latter could appear as secondary. Yet, fundamental freedom and democratic principles, access to verified and unmanipulated information, migration, women's rights, and participation, as well as the protection and education of children, are all at the core of this crisis. Indeed, some even have a catalytic effect on the pandemic.

While certain aspects of the civil dimension have been instrumental in the evolution of the health emergency, in turn the crisis could have long-term repercussions in many areas related to the civil dimension. The COVID-19 pandemic threatens to cause a lasting global challenge to certain liberal principles (Maylam, 2020: 1-2). The COVID-19 health crisis has a direct impact on many aspects of the civil dimension of security. Indeed, the health crisis is characterised by a confrontation between democratic principles and the authoritarian model, an escalation of disinformation and propaganda, and a threat to the values of inclusiveness and solidarity. For now, these elements have overshadowed and continue to overshadow the emergence of a comprehensive and coordinated global response to the pandemic, which knows no state boundaries and affects – albeit to varying degrees – every country in the world (Maylam, 2020: 17-18).

The COVID-19 crisis also has short- and long-term implications on gender issues. The containment measures adopted in several countries in response to the pandemic have led to an increase in domestic violence against women (+44% cases in France). Moreover, the health crisis has led to a worsening of socio-economic inequalities between women and men. To avoid a lasting deterioration in these areas, these elements must be taken into account fully in the short and long-term responses to the crisis and its aftermath. On the other hand, the health crisis has had, and continues to have, dramatic repercussions on the security and future opportunities of children and young people around the globe. The increase in violence against them with, for example, a 30% increase in intra-family violence in France (Moiron-Braud, 2020), and loss of access to education during the same period could have serious long-term implications for society (Maylam, 2020: 1-2).

The global COVID-19 pandemic, along with the implemented social distancing efforts intended to slow down its spread, have brought economies and food systems into disruption



at a global and local scale, with wide ranging ramifications in terms of food security. Food insecurity is likely to lead into serious consequences in terms of public health. Public health, which is largely how the COVID-19 response has been led and initially classified, appears to be insufficient to describe or deal with the consequences of this type of pandemic. Moreover, COVID-19 highlights that the concept of "One Health" covers more than just the emergence of an infectious disease, but also extends to food-related health outcomes. Ultimately, to prepare for future outbreaks or threats to food systems, one must take into account the SDGs and "Planetary Health." By doing so, we should be able to mitigate the impact of larger societal and political risks such as vulnerability, livelihoods, etc., and their interactions with the natural environment (Mardones et al., 2020: 6).

#### **4.1 Economics effects**

Economic security has become an important priority, although this is not about social protection, but also about supporting strategic sectors of the economy. Balancing on the brink of the need for social protection, on one hand, and the rise of austerity, on the other, governments opted for severe economic restrictions (Pidyukov et al., 2021: 771).

As a result of the pandemic, poverty has grown and economic disruption has affected people in many countries. The World Bank estimates that in 2020, as a result of COVID-19 and its economic effects compounded by the effects of armed conflict and climate change, between 119 and 124 million people were pushed into extreme poverty (those living on under \$1.90 per day) 16. In 2021 the crisis will continue and is projected to intensify, and those figures will further rise to between 143 and 163 million. Measures to contain the spread of the virus such as repeated lockdowns brought economic disruption which threatened nearly half the world's workforce with loss of their livelihoods (Di Liddo, 2021: 14).

The economic and political implications of the pandemic will ripple through the world for years. The pandemic is raising geopolitical tensions, and great powers are jockeying for advantage and influence. States are struggling to cooperate and in some cases are undermining cooperation to respond to the pandemic and its economic fallout, particularly as some governments turn inward and question the merits of globalization and interdependence. Some governments, such as China and Russia, are using offers of medical supplies and vaccines to try to boost their geopolitical standing (Annual threat assessment of the US intelligence community, 2021: 17-18).

The economic fallout from the pandemic is likely to create or worsen instability in at least a few and perhaps many countries, as people grow more desperate in the face of interlocking pressures that include sustained economic downturns, job losses, and disrupted supply chains. Some hard-hit developing countries are experiencing financial and humanitarian crises, increasing the risk of surges in migration, collapsed governments, or internal conflict (Ibid). The resurgence in COVID-19 infections early this year may have an even greater economic impact as struggling businesses in hard-hit sectors such as tourism and restaurants fold and governments face increasing budget strains. The effects on developing countries especially those that rely heavily on remittances, tourism, or oil exports may be severe and longer lasting; many developing countries already have sought debt relief. The economic fallout from the COVID-19 pandemic, along with conflict and weather extremes, has driven food insecurity worldwide to its highest point in more than a decade, which increases

the risk of instability. The number of people experiencing high levels of acute food insecurity doubled from 135 million in 2019 to about 270 million last year, and is projected to rise to 330 million by yearend (Ibid).

## 5. Lessons learnt

If the connection between pandemics and national security is beyond conjecture, as has been demonstrated above, national leaders must begin to treat the threat of catastrophic infectious diseases with the seriousness and urgency it deserves. To begin with, there is a need for a greater investment in disease prevention and control. It does not make any security sense for a nation to invest heavily in building its military capabilities for great power competition but succumb easily to a devastating pandemic. A disease prevention and control programme that is not well funded will slow down scientific efforts aimed at developing appropriate vaccines and hamper the ability to even predict future scenarios of pandemics to aid adequate preparation. Finally, within the framework of global health diplomacy, critical stakeholders—nations, individuals, and corporations—must together strengthen the efforts of the World Health Organization (WHO) at delivering on its mandate. Everyone will surely benefit from efforts aimed at understanding changes that could impact global health and building capacity to respond to global health risks. This is why collective action for mitigating health emergencies is imperative. As infectious diseases continue to define global epidemiology and affect national security, national priorities must be broadened to include global health concerns, and the frontline role of the WHO in pandemic response demands greater recognition and appreciation. In this context, the rich and strong members of the WHO must invest in building stronger healthcare systems in poorer countries (Oshewolo and Nwozor, 2020: 265-275).

In the face of this risk, it is imperative that the Allies guarantee that all the measures adopted during and after the crisis to fight the pandemic and its consequences are based on the defence of liberal and democratic principles and respect for fundamental rights and freedoms. Similarly, in due course, lessons should be drawn from the various responses to the crisis to identify best practices. This will allow us to reinforce the resilience of our societies and to efficiently address future emergencies while respecting the principles, freedoms and rights underpinning our democracies (Maylam, 2020: 1-2).

The most important lesson that the COVID-19 pandemic has taught the world is the need to work together to address the problems that affect all of humanity. Working together, we are capable of more than acting alone. The world order began to change long before the crisis of the COVID-19 pandemic. The coronavirus has only accelerated the key geopolitical trends on which the new world order that awaits us on the other side of the pandemic will be built, including deglobalization, China's geopolitical rise, severe restrictions on human and civil rights, intensified interstate armed conflict and domestic protests (Pidyukov et al., 2021: 771).

In the face of these challenges, parliamentarians, together with civil society, must make sure that governments do not indefinitely increase their power and control over citizens through their response to the health emergency during and after the crisis. The Alliance should also reaffirm its democratic character and its commitment to liberal values in the context of this crisis. A system of co-ordination and collegial evaluation of the measures adopted by the different Member States, including their impact on fundamental freedoms,

could be set up at NATO level. After the crisis, the NATO Parliamentary Assembly will offer parliamentarians a unique forum to share best practices in this field. Lastly, in the light of their role in the early unfolding of the current pandemic, it is both necessary and legitimate for NATO, the Allies, the NATO Parliamentary Assembly and parliamentarians to join together in condemning the human rights violations of the Chinese authorities, as well as those of other authoritarian countries (Maylam, 2020: 17-18).

The first need is the development of a well-rounded health-care system, covering the critical aspects of universal health coverage. After that, how multilateral agencies, policymakers, societies, and individuals coordinate and communicate during a crisis is vital. A pandemic that has infected millions of people cannot be mitigated using unilateral approaches. The novel coronavirus has led countries to ban not only the movement of people but also the equipment needed to combat and contain it, such as personal protective equipment. Governments are primarily responsible for their populations, but a global crisis calls for solidarity. Countries should build their national health systems and promote medical research and innovation. Countries also need to develop systems that share necessary epidemiological and genomic data, vaccines, and other medical countermeasures. At this crucial time, policymakers and communities should support each other and the vulnerable groups around them. A pandemic is a global problem that requires a global resolution. Administrative setbacks, lack of coordination, and deficient communication can cost the world the valuable time needed to save lives (Kapur and Suri, 2020: 36-37).

NATO defines resilience as a society's ability to resist and recover easily and quickly from a major shock such as a natural disaster, failure of critical infrastructure, or a hybrid or armed attack. Resilience implies that public authorities must be prepared to continue operating in the event of a crisis. Resilience also requires that the civilian sector – including populations and businesses – is prepared to cope with many different potential crises. Finally, it also requires the civilian sector to be able to cooperate harmoniously and effectively with the military sector (Maylam, 2020: 15-16).

## **Conclusion**

The COVID-19 pandemic has disrupted life worldwide, with far-reaching effects that extend well beyond global health to the economic, political, and security spheres. It is expected COVID-19 to remain a threat to populations worldwide until vaccines and therapeutics are widely distributed.

The pandemic is reversing hard-fought gains in global health, including routine immunizations, maternal and child health, and the fight against tuberculosis, malaria, and HIV/AIDS, and is increasing the risk of gender-based violence. The pandemic has also disproportionately affected women and girls and significantly deepened existing gender inequalities around the world.

The security sector has a number of critical duties during a pandemic, most importantly to assist the implementation of public health policies. As has been the case during COVID-19, the police, army and other security agencies may be needed to support public compliance with laws or regulations regarding physical distancing, closing of businesses, bans on mass gatherings, lockdowns and stay-at-home measures or quarantines. Other aspects of pandemic

response are also natural responsibilities of the security sector, such as restrictions on international travel by border forces, immigration and port authorities.

The academic community has produced multiple forecasting models, approaches and algorithms to best predict the different indicators of COVID-19, such as the number of confirmed infected cases, the number of deceased and economic indicators.

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