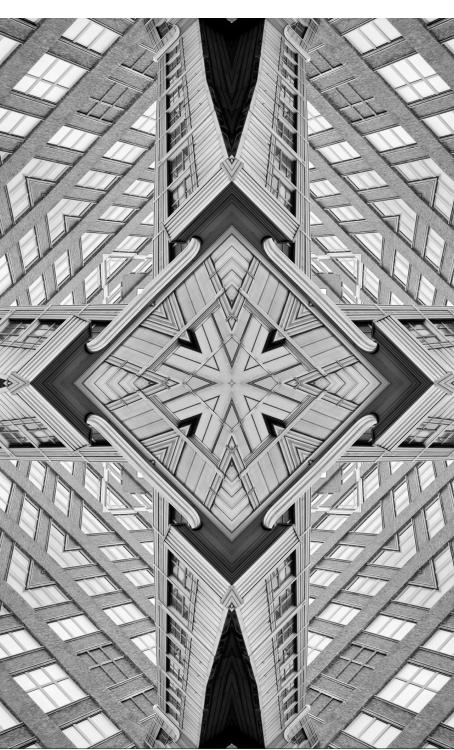


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The Case for Securitising Pandemics

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Abstract

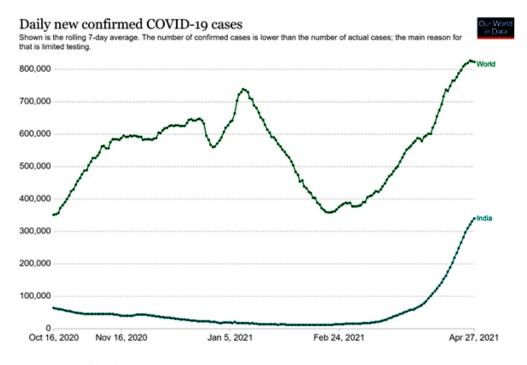
The COVID-19 pandemic has wreaked havoc across the globe since the first outbreak in 2019, causing massive losses in lives and livelihoods. This brief examines the nature of the threat, the blind-spots in global health security that were revealed by the pandemic, and why a values-based geopolitical order is critical for the world's future. It makes a case for the global community to treat health crises, such as the COVID-19 pandemic, as global security threats—this will help ensure the mustering of political will to organise appropriate, rapid, and sustained domestic and international response.

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y the time the World Health Organization (WHO) declared the COVID-19 outbreak as a pandemic on 11 March 2020, the virus had already reached every continent except Antarctica. The global record as of 27 April 2021, stands at more than 147 million cases and over 3 million confirmed deaths from COVID-19 (See Figure 1). Many countries are now facing a second, third, and fourth wave, their healthcare infrastructure overwhelmed and unable to provide care for other patients, resulting in avoidable deaths from non-COVID-19 causes. The confirmation of the confirmation

Figure 1: Global COVID-19 Cases

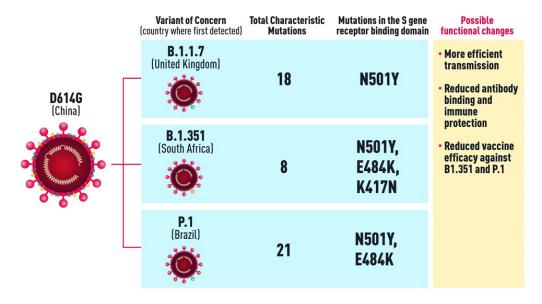


Source: Ourworldindata.org

Since the rollout of vaccines against COVID-19—which is regarded as what will lead the way in arresting the pandemic—a number of new variants of the virus have emerged (See Figure 2). Several hybrids (recombinants from merged variants) have also been reported. These developments may render the existing vaccines less effective, if not ineffective, against the newer stains, potentially increasing the challenges of controlling the pandemic in the coming days.^{4,5,6}



Figure 2: SARS CoV-2 Variants



SARS Cov-2 has had many mutations since it was first identified, producing many variants. These are the 3 variants of concern. New hybrid variants have also been identified recently. (Image Source: www.jax.org)

The Spanish Flu, which happened a century ago in 1918, reduced life expectancy at birth in the United States (US) by 11.8 years.^{7,8} Since then, scientific and medical advances have helped the world increase life expectancy at birth significantly. In the 1920s, life expectancy was 55.4 years in the US and 57.3 years in the UK; by the 2000s, it increased by over 20 years in the developed world, and consequently, there was a rise in the proportion of people aged 60 and above in these countries. It is in this context that the impact of COVID-19 must be viewed, as it has disproportionally affected the elderly. While age is not the only risk factor, eight out of 10 COVID-19 deaths in the US have been of adults over the age of 65.9 Similarly, over 95 percent of the COVID-19 deaths in the European Union (EU) have been from the 60+ population.¹⁰ Thus, the pandemic has effectively wiped out much of the gains of the last century in terms of increasing the average lifespan.



According to a report from the US Centers for Disease Control and Prevention (CDC), life expectancy in the US fell by a year in the first six months of 2020. Preliminary data released by the agency in February 2021 reveals that life expectancy at birth for the total US population declined from 78.8 years in 2019 to 77.8 years in 2020. Thus, within a span of six months, the nation was pulled back by nearly 14 years, to 2006 levels. In particular, the average life expectancy for African Americans went down by 2.7 years, exposing wide gaps in the country's access and equity. Indeed, the COVID-19 pandemic is expected to have lingering effects on life expectancy, with long-term health and economic implications that will likely increase the mortality rates in the coming years. One study estimates that life expectancy will drop by three to nine years in North America and Europe.

The spread of the COVID-19 pandemic across almost all countries of the world has left economies in dire states. With many governments now struggling with new lockdown measures to tackle the succeeding waves of the pandemic characterised by mutant and possibly more virulent strains, the UN has said that the world is facing a global health crisis unlike any in its 75-year history. The economic impact has resulted in many countries going into recession, and it will likely be years before employment levels return to pre-pandemic levels.

While there has been a recent recovery in the stock markets,¹⁷ the projections for the long term remain grim, with most economic sectors facing severe restructuring. The scale of disruption caused by the pandemic, the shrinkage in demand, and the increased unemployment will continue to drastically alter the business landscape.¹⁸ In big, services-reliant economies hit hard by the outbreak, recovery is expected to be slow.¹⁹

Furthermore, the pandemic has attacked societies at their core.²⁰ Bereavement, isolation, loss of income and fear are triggering mental health conditions and exacerbating existing ones.^{21,22} The shutting down of schools and the consequent shift to digital platforms is exacerbating learning inequities among children, pushing many of them out of the system due to the digital divide.²³ The shift to remote learning has also removed the human element from education, and the loss of social connections has affected the overall well-being and social development of children.²⁴ Indeed, the ways of living and working across societies have been transformed in unalterable ways.



his section attempts to comprehend how the COVID-19 crisis reached its current state. It will outline the nature of the threat and the reasons governments and populations have failed to acknowledge the severity of the threat, and respond to it, in a timely manner.

Blind-spots

Pandemics have been a latent threat for some time now—i.e., there was always the potential for a deadly infectious disease to emerge and spread globally. Until the outbreak of COVID-19, however, it had been a distant possibility for the current generation, with the last pandemic— the 1918 influenza pandemic—having occurred a century ago. Moreover, scientific advancement in the last century had empowered the medical industry to effectively deal with most infectious diseases. Thus, the infrequency of pandemic outbreaks combined with a complacent attitude resulting from medical advances, has fostered a blind-spot towards infectious diseases. The Cold War preoccupation with nuclear war and military defence further precluded the inclusion of this non-traditional adversary in governments' threat assessments.²⁵

Neglected Diseases

With the development of antibiotics and vaccines, the world seemed to have gone through a "health transition," leaving the age of infectious disease permanently behind. By the turn of the 20th century, the average lifespan of people across populations had increased significantly, and much of the perceived threats to life were chronic conditions such as heart disease and cancer. However, the shift in focus to non-communicable diseases exposed the world to a "third epidemiologic transition," or the resurgence of infectious diseases characterised by newly emerging, re-emerging, and antibiotic-resistant pathogens. To be sure, WHO should continue to maintain its broad definition of health in terms of non-communicable diseases, environmental health, social determinants of health, and health systems. But can WHO, and the international community that it represents, afford to overlook infectious diseases? Not without the risk of massive and catastrophic consequences, as evidenced by the ongoing COVID-19 pandemic.



A State of Denial

Most emerging infectious diseases are zoonoses, i.e. diseases of animals that have crossed over to humans.²⁸ This zoonotic spill-over is fuelled by many environmental, demographic and behavioural factors.^{29,30} Urbanisation, burgeoning populations, and radical changes in land use increase opportunities for animal-to-human contact, mostly in unpredictable ways. While contact with animals is the entry point of a disease that can neither be predicted with any degree of certainty nor prevented, human-to-human transmission can be detected through robust surveillance systems and can be contained at the source to prevent its subsequent geographic spill-over. However, instead of capitalising on this window at the initial stages of the emergence of a new infection, the developed world fell into the trap of "exoticising" the outbreak.

The perception was amplified by the media, with imageries of wet markets, wild animals, and arcane rituals in the area of origin. This "othering," a psychological and sociological response, perpetuates a state of denial³¹ and trivialises the magnitude of the threat that such an outbreak poses to the whole world. Simply put, the disease is associated with an unfamiliar people—in the case of COVID-19, those who eat bats—creating a false sense of security among other peoples and their governments. Yet, in this interconnected world, it takes only a few weeks for a local outbreak to become a global crisis. Thus, initial denial often delays the timely execution of effective measures to prevent a massive geographic spill-over. As Nobel laureate Joshua Lederberg warned in 1988, "The microbe that felled one child in a distant continent yesterday can reach yours today and seed a global pandemic tomorrow."^{32,33}

Failure of Multilateral Organisations

WHO was created to strengthen collaboration between health systems across borders and prevent global health catastrophes. It is the guardian of the International Health Regulations (IHR), a binding global health treaty which includes provisions on early notification, surveillance, and developing core capacities to detect and respond to infectious diseases. In 2003, the proactive and effective actions by WHO helped in the control and containment of the SARS outbreak, preventing it from becoming a pandemic.³⁴ However, during the COVID-19 crisis, WHO did not show any sense of urgency in the application of IHRs. The first positive case of the infection was allegedly detected in Wuhan, China, on 17 November 2019,³⁵ and it was not until 31 December 2019 that China reported these to WHO.^a To make matters worse, WHO then took another

a As per Article 6 of IHR 2005, states are required to carry out an assessment of public-health events arising in their territories, utilising the decision instrument contained in Annex 2 of the Regulations, and then notify WHO of all events that may constitute a Public Health Emergency of International Concern (PHEIC), within 24 hours of such an assessment.



month to declare COVID-19 a Public Health Emergency of International Concern (PHEIC) on 30 January 2020. By then, the virus had already spread to five of the six WHO regions. By the time WHO finally declared it a pandemic, there were 126,140 recorded cases of COVID-19 across 114 countries, with over 4,600 deaths.^{36,37}

While the IHRs are a binding global treaty, there is no mechanism for its stringent enforcement. The COVID-19 crisis shows that the current global health architecture is far from sufficient and requires radical structural reforms.

Instead of capitalising on the window of opportunity during the initial outbreak of Covid-19, the developed world fell into the trap of "exoticising" the disease.



his briefs offers the following recommendations for securitising pandemics such as COVID-19.

Recognise Pandemics as a Security Issue

A pandemic is not only a medical crisis; the spread of a rapidly infectious virus constitutes a social, economic, and humanitarian emergency, which needs immense resources, logistics, and war-like planning. Even before WHO had declared COVID-19 a pandemic, on 3 March 2020, then US Homeland Security and Counterterrorism Adviser Lisa Monaco had called for the outbreak to be treated as a threat to national security. This was based on her experience and assessments of infectious disease outbreaks during the Obama administration. The association of pandemics with national security grew to prominence in the 1990s in response to the growing threat of emerging infectious diseases, with the understanding that such an association would underline the importance and gravity of health crises, thus helping sustain the political will needed to achieve the core capacities. The social part of the social part o

While the idea of securitising public health may appear excessive to some, the US has been practising such scenarios for years with simulated pandemic tabletop exercises, including responses to global transportation stoppages and supply-chain disruptions.⁴⁰ These exercises have repeatedly demonstrated the confusion, poor decision-making, and lack of coordination of resources and messaging that would occur in the absence of crisis-contingency planning and preparation.

The consequences of not securitising pandemics are evident. All recent outbreaks of emerging infectious diseases, such as SARS, MERS, and Ebola, were treated as "black swan events", b with responses being largely reactive. In most of these cases, by the time governments realise the magnitude of the threat, it is already too late and urgency is critical. Handling a pandemic, therefore, requires a comprehensive strategy for prompt and effective response as part of the global security architecture. The starting point, of course, is to prioritise health threats and raise them to the level of global security.

b Which means they were treated as largely unpredicted and rare.



Military-Level Planning

Making pandemics a global security issue is not as alarming as it sounds; it simply means getting organised to respond at the scale required. Having a defined structure for the response and assigning high-level responsibility and accountability are critical to effective and urgent response. To this end, the precepts of military planning offer a lesson.

The military focuses on flexibility, logistics, and maintaining readiness for any foreseeable situation. It develops a comprehensive strategy, with enough built-in flexibility for it to evolve as conditions demand, and then its members repeatedly review, simulate, and rehearse it. The military does not wait until a war is declared to start developing or procuring weapons; platforms to anticipated threats are developed and modified over years. The same type of approach is needed to develop platforms for vaccines and potential treatments. A market-driven approach that relies only on private pharmaceutical companies simply cannot work, because vaccines or treatments for diseases such as COVID-19 have virtually no market until the situation is already out of hand.

Developing a new vaccine is extremely challenging, and producing a safe and effective one even more so. But creating a vaccine is only the first step; ultimately billions of doses must be produced and transported safely to be administered on a large scale. Doing so during a pandemic requires unprecedented local, national, and global effort. Without a production and delivery infrastructure in place, and sufficient resources on the ground, a viable vaccine cannot effectively be utilised to immunise a population. Scientific solutions are not separate from the social, policy and infrastructure issues; they have to be integrated for end-to-end synergy, from development to delivery at the frontline. This is the hallmark of military-level planning.

Preparedness further requires anticipating and preparing for the potential surge in the demand for medical requirements, while facing disruptions in supply chains and possible closure of manufacturing facilities due to lockdowns resulting from such outbreaks, and severe competition, since every nation will vie for the same limited stock of critical drugs and medical supplies. This is evident in the scramble for PPE kits, masks, ventilators, medicines, and oxygen supply amidst the COVID-19 outbreak.



Finally, as any war veteran will attest, it is always better to prevent wars than to win them. In the fight against infectious diseases, nations need robust basic health infrastructure on the ground, capable of early detection, communication, and local containment. Uncontrolled, a local outbreak can become a global pandemic within a matter of weeks.

Sharing and Solidarity

The COVID-19 pandemic has brought the entire world to its knees. To bring the pandemic to an end, knowledge, know-hows, guidelines, vaccines and technology must be recognised as global public goods.⁴¹ Neither domestic agendas nor profit should be allowed to drive the effort for vaccine deployment, because no one is safe until *everyone* is safe.⁴² Every infectious or re-infection is a chance for the virus to mutate, increasing the probability of the development of mutants that are able to escape the cloak of vaccines, and potentially sparking a new and more devastating wave of infections and deaths.^{43,44}

As WHO Director-General Tedros Adhanom Ghebreyesus said at the Paris Peace Forum Panel in November 2020, "This is not just a moral imperative and a public health imperative, it's also an economic imperative. In our interconnected world, if people in low- and middle-income countries miss out on vaccines, the virus will continue to spread and the economic recovery globally will be delayed. Equitable access is in the national interest of each and every country." ⁴⁵

Addressing Apathy in Developed Nations

As discussed in the previous section, infectious outbreaks are often treated with a degree of exoticisation when they are restricted to a single nation or region. A question often posed in the developed world is, "Do we have a risk here?" The answer is obvious. Any place with a port, airport, or even roadways, is at risk when it comes to the spread of infectious diseases. With increased global interconnectedness, the question becomes even less relevant, if not entirely pointless. Even Antarctica, which had remained untouched by COVID-19 for most of 2020, reported its first cases in December.

The real question, then, is how to align the self-interest of developed countries and LMICs, so that they work together towards better collective action. Without that self-interest, no nation will be willing to walk the walk, or take collective action. To this end, framing of health crises as security threats is critical and will also empower the UN, WHO and other multilateral organisations to enforce compliance.



he commonly held notion of a global security threat, especially since the Second World War, has been that of a nuclear holocaust – with its images of the mushroom cloud, followed by grey, cold, sunless barren landscapes. This threat perception was further exacerbated after 9/11, and countries have spent hundreds of billions of dollars on upgrading their security and counterterrorism efforts. Yet, terrorists do not have the capacity to bring life to a complete halt, something that the COVID-19 pandemic accomplished in a matter of weeks. 46 Moreover, the effects of nuclear attacks are usually limited in terms of geography and duration, but a pandemic, by definition, is a global crisis and has been historically seen to last for years. The Spanish Flu, for instance, lasted for approximately two years, occurring in three waves. A battle against a pandemic is a race against time. While they are classified in the public health category, treating them as such is less than effective. Pandemics must be raised to the level of national security, commensurate to the threat they pose to global security and stability.

The COVID-19 pandemic is not the first one, nor will it be the last; the world is likely to witness worse outbreaks of deadlier infections in the future. The current crisis is expected to end when a substantial proportion of the global population has developed immunity through vaccinations or natural infection; this, however, is a best-case scenario contingent on the possibility of lasting immunity against the virus. Moreover, successive waves and variants remain a critical threat, as evident from the emerging new strains, and the subsequent waves many countries are witnessing. Thus, the end of the COVID-19 pandemic will not be easily reached, and the human and economic toll will be high.

Despite all scientific advances, it is impossible to successfully prevent all disease outbreaks. However, with sufficient will, resources, commitment, and leadership, it is possible to mitigate their magnitude and minimise deaths and socioeconomic disruption. In preparation for global health crises in the future, governments must foster greater resilience and geopolitics of value, viewing such crises not as battles to be won but as challenges to be weathered.⁴⁷ ©RF

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- 1 "Coronavirus: One year on from the WHO's pandemic declaration", *DW.com*, March 11, 2021.
- WHO COVID-19 Dashboard. https://covid19.who.int/ (accessed 27 Apr 2021).
- Joshua Kraindler et al, "Understanding changes to mortality during the pandemic- Non-COVID-19 excess deaths in England and Wales", The Health Foundation, August 17, 2020, https://www.health.org.uk/news-and-comment/charts-and-infographics/understanding-changes-to-all-mortality-during-the-pandemic
- 4 Graham Lawton, "Hybrid coronaviruses from merged variants are spreading between people", *New Scientist*, Mar 18, 2021, https://www.newscientist.com/article/2271838 [
- 5 Ministry of Health & Family Welfare, Government of India, Mar 24, 2021, "Genome Sequencing by INSACOG shows variants of concern and a Novel variant in India",https://www.pib.gov.in/PressReleasePage.aspx?PRID=1707177
- Robin N Thompson et al, "SARS Cov-2 incidence and **vaccine escape",** *The Lancet*, April 13, 2021, DOI:https://doi.org/10.1016/S1473-3099(21)00202-4
- 7 "The 1918 Flu Pandemic: Why It Matters 100 Years Later", *CDC Blog*. May 14, 2018 https://blogs.cdc.gov/publichealthmatters/2018/05/1918-flu/
- 8 Lekan Oguntoyinbo, "COVID-19 May Cause Decrease in Life Expectancy This Year", Healthline.com, Sept 22, 2020. https://www.healthline.com/health-news/covid-19-may-cause-decrease-in-life-expectancy-this-year
- 9 "Older adults at greater risk of hospitalization or dying if diagnosed with Covid-19", CDC(USA), March 17, 2021. https://www.cdc.gov/coronavirus/2019-ncov/need-extraprecautions/older-adults.html
- "Supporting older people during the COVID-19 pandemic is everyone's business", WHO Europe, April 03, 2020. https://www.euro.who.int/en/health-topics/health-emergencies/coronavirus-covid-19/news/news/2020/4/supporting-older-people-during-the-covid-19-pandemic-is-everyones-business
- Rebecca Sohn, "U.S. life expectancy fell by a year in the first half of 2020, CDC report finds", *Statnews.com*, Feb 18, 2021.
- 12 Theresa Andrasfay and Noreen Goldman, "Reductions in 2020 US life expectancy due to COVID-19 and the disproportionate impact on the Black and Latino populations", *Proceedings of the National Academy of Sciences USA*, Feb 2021, 118 (5). https://doi.org/10.1073/pnas.2014746118
- National Center for Health Statistics, CDC(USA), "Provisional Life Expectancy Estimates for January through June, 2020", Elizabeth Arias et al, Vital Statistics rapid Release Report no. 010, Feb 2021.. https://www.cdc.gov/nchs/data/vsrr/VSRR10-508.pdf



- Robert Preidt, "COVID Shortened U.S. Life Expectancy by Over a Year", *Web MD website*, Jan 15, 2021. https://www.webmd.com/lung/news/20210115/covid-pandemic-shortened-us-life-expectancy-by-more-than-a-year#2
- Guillaume Marois et al, "Assessing the potential impact of COVID-19 on life expectancy". *PLoS ONE* 15(9), Sept 17, 2020. Doi: 10.1371/journal.pone.0238678
- Robert Glatter, "Covid-19 Could Lead To Declines In Life Expectancy", *Forbes*, Sept 20, 2020. https://www.forbes.com/sites/robertglatter/2020/09/20/covid-19-could-lead-to-declines-in-life-expectancy
- 17 CP Chandrasekhar and Jayati Ghosh, "Irrational exuberance: The rise and rise of stock markets", *The Hindu Business Line*, Feb 08, 2021 https://www.thehindubusinessline.com/opinion/columns/c-p-chandrasekhar/irrational-exuberance-the-rise-and-rise-of-stock-markets/article33784964.ece
- Sayali Deshpande, "Impact of Covid-19 on Indian economy", Times of India, Oct 04, 2020. https://timesofindia.indiatimes.com/readersblog/midweekread/impact-of-covid-19-on-indian-economy-26770/
- Lora Jones, Daniele Palumbo and David Brown, "Coronavirus: How the pandemic has changed the world economy", *BBC News*, Jan 24, 2021. https://www.bbc.com/news/business-51706225
- 20 UN- Department of Economic and Social Affairs, "Everyone Included: Social Impact of COVID-19", April 6, 2020. https://www.un.org/development/desa/dspd/everyone-included-covid-19.html
- WHO News release, "COVID-19 disrupting mental health services in most countries, WHO Survey", Oct 05, 2020, https://www.who.int/news/item/05-10-2020-covid-19-disrupting-mental-health-services-in-most-countries-who-survey
- N Panchal, R Kamal, C Cox, R Garfield., "The Implications of COVID-19 for Mental Health and Substance Use", Issue Brief, *Kaiser Family Foundation* (KFF.org) Feb 10, 2021. https://www.kff.org/coronavirus-covid-19/issue-brief/the-implications-of-covid-19-for-mental-health-and-substance-use/
- Protiva Kundu, Shivani Sonawane, "Impact of COVID-19 on School Education in India", Policy Brief 2020, *Centre for Governance & Budget Accountability*. https://www.cbgaindia.org/policy-brief/impact-covid-19-school-education-india-budgetary-implications/
- 24 Kaushik Deka, "Covid-19 fallout: The impact on education in India", *India Today*, Jan 11, 2021. https://www.indiatoday.in/magazine/news-makers/story/20210111-school-of-hard-knocks-1755078-2021-01-03
- 25 Robert E. Hamilton, "COVID-19 and Pandemics: The Greatest National Security Threat of 2020 and Beyond", Foreign Policy Research Institute, USA, , July 9, 2020.
- 26 Laurie Garrett, "The Return of Infectious Disease", Foreign Affairs, Jan 1996...
- 27 Ronald Barrett et al, "Emerging and re-emerging infectious diseases: The Third Epidemiologic Transition", *Annual Review of Anthropology*, Oct 1998 Vol 27, pp 247-271. https://doi.org/10.1146/annurev.anthro.27.1.247



- 28 Loh EH et al, "Targeting Transmission Pathways for Emerging Zoonotic Disease Surveillance and Control", Vector Borne Zoonotic Diseases, Jul 2015, Vol 15(7), pp 432-7. DOI: 10.1089/ vbz.2013.1563
- Alexander KA et al, "The Ecology of Pathogen Spillover and Disease Emergence at the Human-Wildlife-Environment Interface", The Connections Between Ecology and Infectious Disease, Apr 2018, Vol 5, pp 267-298. doi: 10.1007/978-3-319-92373-4 8.
- 30 Mummah, R.O., Hoff, N.A., Rimoin, A.W. et al. "Controlling emerging zoonoses at the animal-human interface. One Health". *Outlook* 2, 17 (2020).
- Rohleder P, ("Othering". In: Teo T. (eds) Encyclopedia of Critical Psychology (2014 ed), (Springer, New York, NY). DOI: https://doi.org/10.1007/978-1-4614-5583-7_414
- 32 Lederberg J, "Medical science, infectious disease, and the unity of humankind", *Journal of American Medical Association*, Aug 5, 1988, Vol 260(5), pp 684–5. doi:10.1001/jama.1988.03410050104039
- RJ Kim-Farley, "A healthier America, a healthier world", *American Journal of Public Health*, April, 2010, Vol. 100(4), p585. doi:10.1001/jama.1988.03410050104039
- Mackenzie JS et al, "The WHO response to SARS and preparations for the future". *Institute of Medicine (US) Forum on Microbial Threats*, Knobler S, Mahmoud A et al (eds) Learning from SARS: Preparing for the Next Disease Outbreak: Workshop Summary. [Washington (DC), National Academies Press (US), 2004]. https://www.ncbi.nlm.nih.gov/books/NBK92476/
- Helen Davidson, "First Covid-19 case happened in November, China government records show", *The Guardian (UK)*, Mar 13, 2020. https://www.theguardian.com/world/2020/mar/13/first-covid-19-case-happened-in-november-china-government-records-show-report (accessed 24 Apr, 2021)
- WHO (Int)/ News, "WHO Statement on the second meeting of the International Health Regulations (2005) Emergency Committee regarding the outbreak of novel coronavirus (2019-nCoV)", Jan 30, 2020. https://www.who.int/news/item/30-01-2020
- 37 "WHO declares Covid-19 outbreak a pandemic", March 12, 2020. https://www.pharmaceutical-technology.com/news/who-declares-covid-19-pandemic/
- Monaco Lisa, "Pandemic disease is a threat to national security", *Foreign Affairs*, March 03, 2020.
- 39 Sara E Davies, "National security and pandemics", *UN blog*. https://www.un.org/en/chronicle/article/
- 40 Ibid, 38
- 41 "Are vaccines a global public good?", Global Alliance for Vaccines and Immunizations (*GAVI*), Sept 11, 2020.
- 42 "Our viral world", Raisina Dialogue 2021, Observer Research Foundation, https://www.orfonline.org/raisina-dialogue-2021-our-viral-world/ (accessed 22 Apr 2021)



- Wilfredo F. Garcia-Beltran et al, "Multiple SARS-CoV-2 variants escape neutralization by vaccine-induced humoral immunity", *Cell* (2021), Vol 184(9), pp2372-89.e9. https://doi.org/10.1016/j.cell.2021.03.013
- 44 Chris Baraniuk, "Will Delaying Vaccine Doses Cause a Coronavirus Escape Mutant?", *The Scientist*, Feb 4, 2021
- WHO DG's speech at the Paris Peace Forum Panel: "ACT-A: Covid-19 Vaccines, Tests and Therapies, the Global public good Solution", *WHO(Int)*, November 12, 2020. https://www.who.int/director-general/speeches/detail/who-director-general-s-speech-at-the-paris-peace-forum-strengthening-the-multilateral-health-architecture-and-fighting-against-infodemics--12-november-2020
- 46 Osterholm M andOlshaker M, "Chronicle-of-a-pandemic-foretold". Foreign Affairs, Jul-Aug 2020.
- 47 Ganesh Sitaraman, "A grand strategy for resilience", Foreign Affairs, Sept 2020.

