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Lessons from the Pandemic: Technology and Protection for Human Rights in the New Normal Era

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Abstract

*With millions of people diagnosed with Coronavirus disease (**"COVID-19"**) till date, state governments have turned to using technologies such as contact tracing systems, high-tech camera sensors, or even information surveillance to control the spread of the pandemic. Despite the numerous advantages these technologies have produced, for example, swiftly flattening the infection curve and enforcing health protocols, the implications of maintaining such use of technologies in upholding fundamental human rights going into the post-pandemic 'new normal' era is not clear. Experts have debated the compliance of technologies to respect one's right to privacy and right to freedom of expression when achieving their protective purposes to uphold societies' right to the enjoyment of health during the pandemic. However, knowing the continuous improvement of technology, and mindful of the absence of the absolute certainty of its usage in the new normal era, whether it relates to the mechanism or the temporal length of its employment, this paper will further delve into such debate in the context of a pandemic-free environment. After considering the different forms and usages of technologies during the pandemic, analyzing the advantages of using technologies in the future, and critically assessing such usages from the perspective of international human rights law (**"IHRL"**), this paper claims that the technologies which are used during the pandemic must be properly maintained coming into the new normal era. However, several parameters; mainly the functionality of the technology, participation from the general public, and the formation of an appropriate legal framework, will have to become the main focus of governments to ensure the compliance of technologies with IHRL standards.*

IHRL *vis-à-vis* COVID-19 Pandemic: An Introduction

The protection of human rights has always been one of the most fundamental cornerstones of international law. Such was especially the case when human rights conventions such as the International Covenant on Economic and Social Rights (**"ICESCR"**) and International Covenant on Civil and Political Rights ("ICCPR") were promulgated. When the COVID-19 pandemic began, the significance of Article 12 of

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ICESCR came to light, obligating states parties to uphold their citizens' right to health through the prevention, treatment, and control of 'epidemic, endemic, occupational and other diseases.[1] In relation to the nature of the issue, state parties shall also adhere to the International Health Regulations ("**IHR**"), which ensures that states must fulfil and respect IHRL standards in responding to the international spread of diseases.[2]

Throughout the pandemic, organizations such as the World Health Organization ("**WHO**") heavily recommended states to conduct social distancing to mitigate infection rates.[3] Consequently, the recommendation raised further issues on how fulfilling the right to the enjoyment of health overlaps with citizens' civil and political rights, such as the right to liberty of movement in early instances.[4] After numerous states enforced quarantine measures,[5] it may seem that social distancing protocols reflect the fulfillment of Article 12 of the ICESCR while simultaneously lawfully limiting the right to freedom of movement to protect public health interests.[6] However, would quarantining citizens be justifiable in the long run? As an example of assessments related to the right of liberty of movement, the European Court of Human Rights ("**ECtHR**") stated that the justification of the limitation of liberty of movement is not only limited to situations when there is a threat to public safety but also when the citizens' interest 'may necessitate their detention'.[7] As a result, a 'pandemic-free environment' would not support the notion of employing quarantine as a last resort measure to protect public health interests. If quarantine leads to socio-economic disruption,[8] maintaining such in the long run would render it a highly restrictive measure, hence incompatible with IHRL.[9]

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1 *International Covenant on Economic, Social and Cultural Rights*, 3 January 1976, 999 UNTS 171, New York City, 16 December 1966, art. 12.

2 *International Health Regulations*, 15 June 2007, 2509 UNTS 79, Geneva, 23 May 2005, arts. 3, 32.

3 Tedros Adhanom, 'WHO Director-General's opening remarks at the media briefing on COVID-19 – 18 March 2020', *World Health Organization*, Geneva, 18 March 2020, available at https://www.who.int/dg/speeches/detail/who-director-general-s-opening-remarks-at-the-media-briefing-on-covid-19---18-march-2020, accessed on 1 August 2020.

4 *International Covenant on Civil and Political Rights*, 23 March 1976, 999 UNTS 171, New York City, 19 December 1966, art. 12.

5 See *Decree of the President of the Council of Ministers*, 2020, Italian Republic, art. 1; Gabriel Crossley, 'Wuhan lockdown 'unprecedented', shows commitment to contain virus: WHO representative in China', *Reuters*, Beijing, 23 January 2020, available at https://www.reuters.com/article/us-china-health-who-idUSKBN1ZM1G9, accessed on 7 July 2020.

6 UN Human Rights Committee, 'CCPR General Comment No. 27: Article 12 (Freedom of Movement)', *UN Doc. CCPR/C/21/Rev.1/Add.9*, 1999, paras. 14-17.

7 *Enhorn v Sweden*, European Court of Human Rights, Judgment on Merits and Just Satisfaction, 2005, 1 European Court of Human Rights: Reports of Judgments and Decisions, 25 January 2005, Application no. 56529/00, para. 44.

8 See James P. Bean, 'Indonesia's 'new normal' a disaster in the making', *Asia Times*, Indonesia, 11 June 2020, available at https://asiatimes.com/2020/06/indonesias-new-normal-a-disaster-in-the-making/, accessed on 10 July 2020.

9 Juan Pablo Bohoslavsky, 'COVID-19: Urgent appeal for a human rights response to the economic recession', *United Nations Human Rights Special Procedures*, 2020, Geneva, p. 9, available at https://www.ohchr.org/Documents/Issues/Development/IEDebt/20200414_IEDebt_urgent_appeal_COVID19_EN.pdf, accessed on 3 August 2020.

Having said that, the only way to effectively cope with future disease outbreaks is to rely on sophisticated technologies.[10] As there are several controversial views regarding technologies and their compatibility with IHRL standards, this paper further analyzes the implications of using technologies outside a pandemic environment. In doing so, the first part of the paper explores the different kinds of technologies that are native to public health emergency management in two sections. The first section briefly highlights several capabilities of technologies used during the COVID-19 pandemic, and the second section examines the different factors that urge the maintenance of the use of technologies post COVID-19 pandemic. This leads to the second part of the paper which critically analyzes the compatibility of the use of technologies with IHRL. This analysis evaluates state practices throughout the COVID-19 pandemic with relevant IHRL standards and case law, and discusses the potential implications of present practices outside a pandemic environment. More specifically, the scope of analysis is limited to the issues of the right to privacy and the right to freedom of expression. The former addresses how authorities can better monitor developments of future disease outbreaks using technologies, while the latter addresses how authorities can better utilize technologies in surveilling information sharing to inform the public of the potential public health crisis.

Application of Technology for Public Health Emergency Management

A. During the COVID-19 pandemic

The United Nations ("**UN**") Human Rights Committee requires state parties to utilize technologies to guarantee one's right to health through public health surveillance,[11] which has been realized by numerous states. Arguably one of the most popular strategies, contact tracing demonstrates a highly effective measure to control the spread of the pandemic that involves 'identifying, assessing, and managing people' suspected to have interacted with an infected individual.[12] With contact tracing, authorities can track the whereabouts of their citizens through reviewing surveillance footages, pinpoint geolocations transmitted from mobile devices, and even gain arrays of personal information such as credit card usage. The employment of contact tracing strategies during the COVID-19 pandemic reveals a change in preference regarding how governments are executing such tracking, which was usually conducted manually.

Technologies that employ motion sensor camera are also prominent during the COVID-19 pandemic, most notably infrared thermal image screening systems, and

[10] Aaron Holmes, 'South Korea is relying on technology to contain COVID-19, including measures that would break privacy laws in the US – and so far, it's working', *Business Insider*, New York City, 2 May 2020, available at https://www.businessinsider.com/coronavirus-south-korea-tech-contact-tracing-testing-fight-covid-19-2020-5?r=US&IR=T, accessed on 1 August 2020.

[11] UN Human Rights Committee, 'General Comment No. 14: The Right to the Highest Attainable Standard of Health (Art. 12)', *UN Doc. E/C.12/2000/4*, 2000, para. 16.

[12] 'Contact tracing in the context of COVID-19: Interim guidance', *World Health Organization*, Geneva, 2020, p. 1.

facial recognition technology. Through the implementation of artificial intelligence (**"AI"**),[13] cameras can detect one's physical appearance with minimal guidance from operators and analyze that information under its programming; including measuring one's body temperature,[14] or even detecting certain behaviors in the midst of a large crowd to enforce basic health protocols.[15] As these technologies are mainly used in public spaces, data are most likely to be collected and stored by the central server operated by authorized personnel or even the government. This may potentially generate an issue that will be analyzed subsequently in relation to the IHRL standards. Furthermore, Big Data or the systematic analysis of large sets of data,[16] plays a crucial role in assisting authorities to continuously predict and monitor the spread of diseases.[17] Through the analysis of social media trends, Big Data enables authorities to investigate how the spread of infectious diseases started and developed.[18] The aforementioned examples are nevertheless non-exhaustive, as even social media platforms play a role in relaying crucial information to the general public.[19]

B. The Future?

Many human rights activists and groups have stressed the importance of public health surveillance to be temporary, specifically only conducted during a pandemic,[20] to safeguard human rights. Although there may be risks associated with the prolonged use of technologies in respecting fundamental rights such as storing and analyzing one's data for contact tracing,[21] it would seem that harnessing the versatility of technologies itself must be continuously maintained in the future to monitor future disease

13 Gabrielle Berman et al., 'Digital contact tracing and surveillance during COVID-19: General and Child-specific Ethical Issues', *Working Paper No. 1*, United Nations Children's Fund, 2020, p. 11.

14 Matthew Gillman, 'How Taiwan Used AI and IoT Technologies to Combat COVID-19', *Readwrite*, 11 June 2020, available at https://readwrite.com/2020/06/11/how-taiwan-used-ai-and-iot-technologies-to-combat-covid-19/, accessed on 8 July 2020.

15 Jane Li, 'China's facial-recognition giant says it can crack masked faces during the coronavirus', *Quartz*, Beijing, 18 February 2020, available at https://qz.com/1803737/chinas-facial-recognition-tech-can-crack-masked-faces-amid-coronavirus/, accessed 10 July 2020.

16 Ifeyinwa Angela Ajah & Henry Friday Nweke, 'Big Data and Business Analytics: Trends, Platforms, Success Factors and Applications', *Big Data Cogn. Comput* p. 1, volume 3:32, 2019, p. 5, available at https://www.mdpi.com/2504-2289/3/2/32, accessed on 2 August 2020.

17 Zoie S.Y. Wong, Jiaqi Zhou & Qingpeng Zhang, 'Artificial Intelligence for infectious disease Big Data Analytics', *Infectious, Disease & Health* p. 44, volume 24:1, 2018, p. 45, available at https://www.sciencedirect.com/science/article/abs/pii/S2468045118301445, accessed on 1 August 2020.

18 Nicola Luigi Bragazzi et al., 'How Big Data and Artificial Intelligence Can Help Better Manage the COVID-19 Pandemic', *Int. J. Environ. Res. Public Health* p. 1, volume 17:19, 2020, p. 2, available at https://www.mdpi.com/1660-4601/17/9/3176, accessed on 2 August 2020.

19 'Viral Lies: Misinformation and the Coronavirus', *Article 19*, 2020, London, p. 14, available at https://www.article19.org/wp-content/uploads/2020/03/Coronavirus-briefing.pdf, accessed on 28 July 2020.

20 Joint civil society statement: State use of digital surveillance technologies to fight pandemic must respect human rights, *Amnesty International,* 2 April 2020, available at https://www.amnesty.org/download/Documents/POL3020812020ENGLISH.pdf, accessed on 23 July 2020.

21 'Ethical considerations to guide the use of digital proximity tracking technologies for COVID-19 contract tracing: Interim guidance', *World Health Organization*, 2020, Geneva, p. 4; See *General Data Protection Regulation*, 2016, European Union, art. 39.

outbreaks. According to Oxford University's Big Data Institute, if the execution of health measures were to be delayed by 'even a day', there can be a huge difference in whether the state has succeeded or has failed to conduct successful public health management.[22] In practice, researches made by the University of Southampton even hypothesized that had the government responded to the outbreak earlier, China could have prevented 95% of the cases.[23] Following WHO's statement that COVID-19 may never disappear completely,[24] the author thus believes that maintaining the technologies which are used to date can, in the future, significantly contribute to ensuring the safety of society promptly during the post-pandemic era. Two reasons can be rationalized.

Firstly, technologies may further assist health authorities and the government to learn, predict and anticipate the possible emergence of an infectious disease outbreak in the future.[25] To put into comparison, it took health authorities four months to identify the existence of the SARS virus during its outbreak between 2002-2004,[26] while it only took the Canadian company 'Blue Dot' several hours to identify and detect the emergence of COVID-19 using Big Data analysis.[27] This implies that Blue Dot's capabilities during the COVID-19 pandemic can be used to detect another disease outbreak should it occur again in the future.[28] More importantly, such capabilities also demonstrate that authorities can conduct surveillance more efficiently with less manpower unlike conducting manual surveillance.[29] This proves that if advanced technologies are to be employed appropriately and continuously, technologies can influence the degree of preparedness by states.

Secondly, technology may significantly mitigate the virus' effects upon the citizens' quality of life, especially in major settlements. Such responsibility can be reflected under Goal 11 of the UN Sustainable Development Goals. This Goal stresses the

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22 Leo Kelion, 'Coronavirus: NHS contact tracing app to target 80% of smartphone users', *BBC News*, London, 16 April 2020, available at https://www.bbc.com/news/technology-52294896, accessed on 30 July 2020.

23 Sophia Yan, 'Wuhan's whistleblowers', *International Bar Association*, Beijing, 9 April 2020, available at https://www.ibanet.org/Article/NewDetail.aspx?ArticleUid=d0e01d66-e92a-419a-b0e0-2a1732341fad, accessed on 13 January 2021.

24 Christopher Brito, 'Coronavirus "may never go away," World Health Organization warns', *CBS News*, New York City, 15 May 2020, available at https://www.cbsnews.com/news/coronavirus-may-never-go-away-world-health-organization-endemic-virus/, accessed on 6 July 2020.

25 Joseph A. Cannataci, Special Rapporteur of the Human Rights Council on the right to privacy, *Report of the Special Rapporteur on the right to privacy*, 2020, UN Doc. A/75/147, para. 37.

26 Zaheer Allam, Gourav Dey & David S. Jones, 'Artificial Intelligence (AI) Provided Early Detection of the Coronavirus (COVID-19) in China and Will Influence Future Urban Health Policy Internationally', *AI* p. 156, volume 1:2, 2020, p. 157, available at https://www.mdpi.com/2673-2688/1/2/9, accessed on 8 July 2020.

27 Bragazzi (n 18), p. 2.

28 See Michelle Roberts, 'Flu virus with 'pandemic potential' found in China', *BBC News*, London, 30 June 2020, available at https://www.bbc.com/news/health-53218704, accessed on 15 July 2020.

29 See Ministry of Land, Infrastructure and Transportation, 'Smart city technology makes corona19 procure movements faster and more accurate', *Ministry of Land, Infrastructure and Transportation Press Release*, South Korea, 25 March 2020, available at http://www.molit.go.kr/USR/NEWS/m_71/dtl.jsp?id=95083710, accessed on 29 July 2020.

need to 'make cities and human settlements inclusive, safe, resilient and sustainable',[30] which can be influenced by the extent of the enjoyment of right to health by citizens. As an illustration, the South Korean government launched a technology called the 'City Data Hub' to control the spread of the virus through contact tracing in major cities.[31] With such technology, the government notably succeeded in holding physical national elections without producing any infections during the height of the pandemic.[32] Being said, this particular initiative is of high importance in demonstrating how the use of technology can maintain a sustainable and safe city with or without disease outbreaks. As measures involving city-wide quarantine would be ineffective in the long run, using technology to swiftly detect and prompt authorities to take actions is crucial to maintain compliance with health protocols and public order within a populated urban area without severely limiting citizens' liberty rights.

(Potential) Issues regarding Technology in the New Normal Era

With the employment of technology to mitigate the effects and monitor developments of future disease outbreak proving to be worthy, how can we ensure that the use of these technologies will not impede fundamental human rights during the post-pandemic era? Under the IHRL regime, there are three essential prerequisites when a state's action of limiting its citizens' right to privacy, as well as other fundamental rights, may be permitted.[33] Firstly, the limitation conducted by the state must be based on a legal ground. Secondly, the limitation must be necessary to achieve a legitimate objective, for example, to protect public health interests.[34] Thirdly, the limitation shall be proportionate in the sense that the measure employed must be the least-restrictive; one that does not outweigh the limitation of the fundamental right with the pursuit of achieving its legitimate objective. These prerequisites are discussed in the context of a pandemic-free environment, where technologies are used to anticipate the next disease outbreak as well as to monitor developments on what may be left from the COVID-19 pandemic.

A. The Struggle with Citizens' Data Privacy

There have been numerous debates on the compliance of measures involving contact

30 United Nations, 'Goal 11: Make cities inclusive, safe, resilient and sustainable', *United Nations*, Geneva, 2015, available at https://www.un.org/sustainabledevelopment/cities/, accessed on 15 July 2020.

31 South Korea Minister of Land, Infrastructure and Transport, 'Korean Smart City', *Smart City Korea*, South Korea, August 2019, available at https://smartcity.go.kr/wp-content/uploads/2019/08/Smart-city-broschureENGLISH.pdf, accessed on 19 July 2020.

32 Lessa Lin & Zhiyuan Hou, 'Combat COVID-19 with artificial intelligence and big data', *Journal of Travel Medicine* p. 1, volume 27:5, 2020, p. 2, available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7313798/, accessed on 20 July 2020.

33 UN Human Rights Committee, 'General Comment No. 16: Article 17 (The right to respect of privacy, family, home and correspondence, and protection of honor and reputation)', 1988, UN Doc. HRI/GEN/1/Rev.9 (Vol. 1), para. 23; *Toonen v. Australia*, Human Rights Committee, 1994, Communication No. 488/1992, UN Doc. CCPR/C/50/D488/1992, para. 8.3.

34 Maria Pia Sacco et al., 'Digital contact tracing for the Covid-19 epidemic: a business and human rights perspective', *International Bar Association*, 2020, London, p. 6, available at https://www.ibanet.org/Article/NewDetail.aspx?ArticleUid=4b11819d-c580-47fe-b680-19bdbc201328, accessed on 30 July 2020.

tracing or facial recognition technology towards one's enjoyment of privacy from unlawful and arbitrary interference during the COVID-19 pandemic.[35] However, what does the future look like for the use of technology in relation to contact tracing or other measures that require the collection of citizens' data? The first part of the discussion regarding the right to privacy often points towards the manner in which governments conduct public health surveillance. This is best exemplified by South Korea's Infectious Diseases Control and Prevention Act ("**IDCP Act**") that gives the South Korean government legal grounds to implement contact tracing technologies.[36] Under the IDCP Act, authorities are empowered to interfere with citizens' data under their discretion 'if necessary, to prevent infectious disease and block the spread of infection'.[37] This would fulfill the necessary standard in terms of when they should exercise their powers. As the IDCP Act also mandates the government to disclose information to the public to raise awareness on potential virus hotspots,[38] the collection of personal data is indeed proportionate to realize the government's legitimate aim to reduce infection rates.

In a world where the pandemic has relatively dispersed, however, the author agrees that in order for the government to control disease outbreaks in accordance with IHRL standards, much scrutiny must be made on how these technologies are designed and utilized. This shall cover the issues of the scope of information collection, users' control over their data, and participation from the public.

a. Narrowing the Scope of Information Collection

The first issue with public health surveillance using technology concerns the type of information collected by authorities. The UN General Assembly commented that when the government collects a handful of information, surveillance activities may become unreasonably broad and may become disproportionate with respecting the right to privacy.[39] To address such concern, article 45 of the IHR states that the processing of personal data for public health management shall be 'adequate, relevant and not be excessive to that purpose', and information collected shall be 'processed anonymously'.

With the absence of consensus on the exact types of information that can be lawfully collected, one can refer to the ECtHR's decision in *L.H. v. Latvia*. Similar to article 45 of the IHR, the ECtHR concluded that the collection of one's personal data without assessing its relevance or importance, despite being necessary to achieve a lawful aim,

35 *ICCPR* (n 4) art. 17.

36 Brian Kim, 'Lessons for America: How South Korean Authorities Used Law to Fight the Coronavirus', *Lawfare*, Washington, DC, 16 March 2020, available at https://www.lawfareblog.com/lessons-america-how-south-korean-authorities-used-law-fight-coronavirus, accessed on 20 July 2020.

37 *Infectious Disease Control and Prevention Act*, 2016, South Korea, art. 76-2.

38 Ibid, arts. 3, 32-4.

39 UN General Assembly, 'Promotion and protection of human rights and fundamental freedoms while countering terrorism (Note by the Secretary-General)', 2014, UN Doc. A/69/397, para. 37.

may breach one's right to privacy.[40] Hence, even though the collection of data may be necessary for the interest of public health, excessive collection of data may not fulfill the proportionality assessment. Drawing an analogy, collecting information through facial recognition, for example, can be disproportionate to the goal of monitoring the spread of diseases outside a pandemic environment. Such may be the case considering that facial recognition is capable of recording anyone's physical characteristics that raises more concern on anonymity than preventing infections.[41] This also applies to intrusive contact tracing measures, to which storing information such as GPS coordinates, one's gender, nationality, or credit card usage can cause social stigma due to minimal anonymity.[42] As the invasion of privacy by sophisticated technologies may outweigh the lawfulness of public health surveillance,[43] states must harmonize these conflicting obligations.

It is thus recommended for governments to employ less intrusive technologies; one that does not gather excessive and irrelevant data in the new normal era. This is demonstrated by Singapore's 'TraceTogether', a Bluetooth-based application that is intended to conduct proximity tracking – the monitoring of the interaction of individuals' phones when they are in close range. As part of its mechanism, identifications recorded are pseudonymous which prevents both parties to accurately identify each other. The information recorded is also limited to the user's mobile number, identification details, and an anonymized ID.[44] This application thus exemplifies the fulfillment of the proportionality standard, whereby the collection of limited and anonymized information effectively protects one's privacy and is not outweighed by the primary goal of contact tracing. As the use of the application is also necessary to fulfill the government's long-term goal to monitor the spread of infectious diseases, applications similar to 'TraceTogether' can set a standard on how contact tracing should be done in a pandemic-free environment. Nevertheless, the intention to implement these types of technology to the public should also be regulated by national law, as exemplified previously by South Korea's IDCP Act.

b. **Increasing Users' Autonomy through the Decentralization of Data Storage**

Governments shall also focus on how to lawfully process the collected data. Experts often point to the centralization and decentralization of data storage; centralization

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40 *L.H. v Latvia*, European Court of Human Rights, Judgment on Merits and Just Satisfaction, 2014, Application no. 52019/07, paras. 56-58.

41 Lindsey O'Donnell, 'Covid-19 Spurs Facial Recognition Tracking, Privacy Fears', *Threatpost*, 20 March 2020, available at https://threatpost.com/covid-19-spurs-facial-recognition-tracking-privacy-fears/153953/, accessed on 4 August 2020.

42 Stuart A. Thompson & Charlie Warzel, 'Twelve Million Phones, One Dataset, Zero Privacy', *The New York Times*, New York City, 19 December 2019, available at https://www.nytimes.com/interactive/2019/12/19/opinion/location-tracking-cell-phone.html, accessed on 29 July 2020.

43 See *Gaughran v the United Kingdom*, European Court of Human Rights, Judgment on Merits and Just Satisfaction, 2020, Application no. 45245/15, para. 86.

44 Government of Singapore, 'How TraceTogether works', *TraceTogether*, Singapore, 1 June 2020, available at https://www.tracetogether.gov.sg/, accessed on 25 July 2020.

refers to the storage of data by the central server or government, while decentralization refers to the storage of data within the user's device.[45] Although numerous states who have succeeded to mitigate the pandemic's effect uses a centralized approach, assessments made by Human Rights Watch reveal that a centralized system may infringe one's right to privacy. In particular, data are prone to risks by different parties resulting from the central government's full autonomy over the collected data,[46] such as being leaked to the public,[47] or being retained for an excessive period.[48] As an illustration, contact tracing by Israel's state intelligence agency was conducted without the consent of its citizens and was occasionally misused to enforce quarantine measures,[49] while data collected and displayed on public domains by the South Korean government had been negatively exploited by 'Internet mobs'.[50] Hence, it can be inferred that government-controlled surveillance may not be the least intrusive approach to limit one's privacy in a pandemic-free environment.

To suggest a solution, governments should rely more on technologies that feature a decentralized data storage mechanism in the new normal era. Such is based on the notion that the need for consent is highly stressed by the WHO as part of the guiding principles to ethically employ contact tracing technologies.[51] This is again demonstrated by 'TraceTogether', where exchanged anonymous identification gathered up from other phones is exclusively stored within the users' phone instead of being uploaded to the central server. Similarly, the Massachusetts Institute of Technology also invented the Private Kit: Safe Paths, a contact tracing application that requires individuals to manually log information such as location trails in the event they come into contact with a potential patient.[52] What can be deduced from the examples are that both 'TraceTogether' and Private Kit adopts the inform consent approach; information sharing between users and the government can only be conducted if users consented to do so. From these examples, not only does decentralized-based applications give users more discretion on what to do with the information, privacy is also ensured

45 Berman (n 13), p. 9.

46 Human Rights Watch, 'Mobile Data and Covid-19: QnA', *Human Rights Watch*, New York City, 13 May 2020, available at https://www.hrw.org/news/2020/05/13/mobile-location-data-and-covid-19-qa, accessed on 24 July 2020.

47 *M.M v the United Kingdom*, European Court of Human Rights, Judgment on Merits and Just Satisfaction, 2012, 4 European Court of Human Rights: Reports of Judgments and Decisions, Application no. 24029/07, paras. 102, 188.

48 *Gaughran* (n 43), para. 96.

49 Special Rapporteur Cannataci (n 25), para. 78.

50 Natasha Singer & Choe Sang-Hun, 'As Coronavirus Surveillance Escalates, Personal Privacy Plummets', *The New York Times*, New York City, 23 March 2020, available at https://www.nytimes.com/2020/03/23/technology/coronavirus-surveillance-tracking-privacy.html, accessed on 27 July 2020.

51 WHO Ethical Considerations (n 21), p. 4; See Yojana Sharma, 'COVID-19 apps – Are there enough ethical safeguards?', *University World News*, London, 4 July 2020, available at https://www.universityworldnews.com/post.php?story=20200703135954443, accessed on 25 July 2020.

52 Ramesh Raskar et al., 'Apps Gone Rogue: Maintaining Personal Privacy in an Epidemic', *Massachusetts Institute of Technology*, Boston, 2020, p. 6, available at https://arxiv.org/abs/2003.08567, accessed on 27 July 2020.

on how governments and health authorities get their hands on the information.[53] As a result, implementing consent-based technology would entail the fulfillment of the necessity and proportionality standards; information that can assist authorities to conduct contact tracing can only be shared by users if they deem it necessary for the government to be aware of, that is when they are infected.

c. Establishing Public Participation and Awareness

Since proximity tracking technologies can uphold one's right to privacy, it would be valid to argue that the public's participation in public health management must be developed. In transitioning to the new normal era, the Indonesian government, for instance, established five rules for its citizens to contribute in preventing further spread of the virus such as using masks or avoid crowded spaces.[54] What can be grasped from this example is that changing how the public behaves is possible, which may include encouraging the public to rely on advanced technology as part of the new norm in the future. Such, however, would need to address the UN's concern on 'the extent to which consumers are truly aware of what data they are sharing, how and with whom, and to what use they will put'.[55] This is where a challenge could arise; how can governments ensure that the public understands the importance to use technologies to anticipate future disease outbreaks, as well as ensuring the public that their privacy will be guaranteed? To put into perspective, less than 20% of Singapore's population had downloaded the 'TraceTogether' app during the beginning of the pandemic,[56] which shows that the app did not gain significant public attention and its usage was not widespread. To stimulate cooperation from the public,[57] two approaches can be suggested.

The first approach would involve increasing and maintaining the role of public bodies such as ombudsman to oversee public health surveillance activities.[58] Studies

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53 Yuan Yang et al., 'China, coronavirus and surveillance: the messy reality of personal data', *Financial Times*, Beijing/Hong Kong/Shenzhen, 2 April 2020, available at https://www.ft.com/content/760142e6-740e-11ea-95fe-fcd274e920ca, accessed on 5 August 2020.

54 Fajar WH, 'Mengenal Konsep New Normal', *Indonesia.GO.ID*, Indonesia, 31 May 2020, available at https://indonesia.go.id/ragam/komoditas/ekonomi/mengenal-konsep-new-normal, accessed on 23 July 2020.

55 UN Human Rights Council, 'The right to privacy in the digital age (Report of the Office of the United Nations High Commissioner for Human Rights)', 2014, UN Doc. A/27/37, para. 18.

56 Roba Abbas & Katina Michael, 'The coronavirus contact tracing app won't log your location, but it will reveal who you hang out with', *The Conversation*, Australia, 16 April 2020, available at https://theconversation.com/the-coronavirus-contact-tracing-app-wont-log-your-location-but-it-will-reveal-who-you-hang-out-with-136387, accessed on 26 July 2020.

57 See Aradhana Aravindan & Sankalp Phariyal, 'Bluetooth phone apps for tracking COVID-19 show modest early results', *Reuters*, Singapore/New Delhi, 21 April 2020, available at https://www.reuters.com/article/us-health-coronavirus-apps/bluetooth-phone-apps-for-tracking-covid-19-show-modest-early-results-idUSKCN2232A0, accessed on 23 July 2020; See *IDPC Act* (n 38), art. 6.

58 See Croatia Ombudsmen, 'It is important to precisely determine whose data will be collected and to envisage monitoring', *Office of the Ombudsmen*, Croatia, 30 March 2020, available at https://www.ombudsman.hr/en/it-is-important-to-precisely-determine-whose-data-will-be-collected-and-to-monitor-the-procedure/, accessed on 4 August 2020.

from Brazil demonstrates that the many functions of the ombudsman of facilitating complaints, monitoring the state's public health system and relaying information to the public received critical support.[59] Mindful that government may be authorized by the law to exercise extraordinary powers to combat public health issues as seen in the case of South Korea, such functions of an ombudsman or other similar public bodies would be able to oversee the government's surveillance activities and may establish the government's accountability if one's privacy is infringed outside a pandemic environment. This would in turn create transparency as to how the state is conducting public health surveillance to the citizens as envisioned under Article 49 of the IHR. Hence, governments and private developers will then have to ensure the existence of public trust and confidence in its public health surveillance mechanism to boost the productivity of contact tracing applications in the future.[60] To do such, involved parties must be able to give a clear and rational explanation on the purpose of the usage of the technology, how the technology works, and assuring that one's privacy will not be compromised.

Nevertheless, participation shall be realized to the extent that it doesn't require the downloading of such technology mandatory in accordance with the instruction from the government. This stems from WHO's assessment that the principle of voluntariness renders contact tracing strategies ethical.[61] Instead, persuasion through confidence building initiated by the government and oversight by public bodies should in the alternative be conducted to allow the effective usage of technology by the public without coercion from the government. Information sharing, an issue that will be discussed subsequently, may also contribute to influencing the citizens' awareness of the need to assist authorities to conduct contact tracing. This may in turn stimulate the feeling of urgency on the side of the citizens to mitigate infection rates, which may trigger the phenomenon where citizens develop their initiative to employ these types of technologies in their daily lives.[62]

The discussion above reveals that the capabilities of technologies in controlling the pandemic will have a different implication to human rights in the new normal era. As sacrificing privacy, to a certain extent, must be made to effectively combat any health hazards,[63] participation by the public represents the few factors that would render

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59 Rita de Cássia Costa da Silva, Marcelo Caldeira Pedroso & Paola Zucchi, 'Ombudsman in health care: case study of a municipal health ombudsman', *Rev Saúde Pública* p. 134, volume 48:1, 2014, pp. 137-138, available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4206117/, accessed on 1 August 2020.

60 See Laszlo Horvath, Susan Banducci & Oliver James, 'Citizens' Attitudes to Contact Tracing Apps', *Journal of Experimental Political Science* p. 1, 2020, pp. 10-11, available at https://www.cambridge.org/core/journals/journal-of-experimental-political-science/article/citizens-attitudes-to-contact-tracing-apps/F9B8B8CFE051E6D89C3C9ADD6DF76019, accessed on 16 January 2021.

61 WHO Ethical Considerations (n 21), p. 3.

62 See Chiara Farronato et al., 'How to Get People to Actually Use Contact-Tracing Apps', *Harvard Business Review*, Massachusetts, 15 July 2020, available at https://hbr.org/2020/07/how-to-get-people-to-actually-use-contact-tracing-apps, accessed on 18 January 2021.

63 Gilbert W. Beebe, 'Long-Term Follow-Up is a Problem', *American Journal of Public Health* p. 245, volume 73:3, 1983, p. 246, available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1650576/, accessed on 19 July 2020.

public health surveillance effective and ethical. Furthermore, an assessment through the perspective of IHRL on one's right to privacy demonstrate that technologies that are heavily controlled by the government prove to be incompatible outside a pandemic environment. Conclusively, authorities shall implement technologies such as proximity tracking applications that give the citizens more privacy and power on disclosing information vital to control the spread of infectious diseases post COVID-19 pandemic.

B. The Surveillance of Information Sharing

According to Article 19 of the ICCPR, the right to freedom of expression or speech encompasses the right to be able to communicate and receive information and ideas freely through different forms, including any kinds of media.[64] Similar to other provisions under the ICCPR, the right to freedom of expression can nevertheless be limited in light of the protection of public order or for public health purposes.[65] While the latter is straightforward, former UN Special Rapporteur Manfred Nowak defined 'public order' as encompassing the 'absence of public disorder, public safety and all universally accepted fundamental principles, consistent with respect for human rights'.[66] The limitation must also be necessary and proportionate; there should be a well-defined threat and the existence of a measure that would carry out the protective objective against the threat.[67] With the prominent usage of the Internet throughout the pandemic, how shall censorship and the lawful limitation of one's freedom of expression be regulated during the new normal era?

The incident of the whistleblowers in China is a prime example of the issue between freedom of expression and technology during the beginning of the pandemic.[68] In this case, individuals were silenced by the police after sharing crucial information about COVID-19 through social media platforms. Although China's law stipulates that no one shall use the Internet for, among others, 'spreading rumors and disturbing public order',[69] the reprehension of these whistleblowers represents the limitation of one's right to share information through the Internet for good cause.[70] From the assessment of the necessity and proportionality standards, silencing the whistleblowers

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64 Manfred Nowak, *U.N. Covenant on Civil and Political Rights: CCPR Commentary*, N.P. Engel, Germany, 2ndedition, 2005, p. 445. [**Nowak**]

65 *ICCPR* (n 4), art. 19(3)(b).

66 Nowak (n 64), p. 212.

67 UN Human Rights Committee, 'General Comment No. 34 – Article 19: Freedom of opinion and expression', 2011, UN Doc. CCPR/C/GC/34, p. 34.

68 See Cissy Zhou, 'Coronavirus: Whistle-blower Dr. Li Wenliang confirmed dead of the disease at 34, after hours of chaotic messaging from hospital', *South China Morning Post*, Hong Kong, 7 February 2020, available at https://www.scmp.com/news/china/society/article/3049411/coronavirus-li-wenliang-doctor-who-alerted-authorities-outbreak, accessed on 15 July 2020.

69 *Regulations for the Protection and Management of the International Networking of Computer Information Networks*, 1997, People's Republic of China, art. 5.

70 David Kaye, Special Rapporteur on the promotion and protection of the right to freedom of opinion and expression, *Report of the Special Rapporteur on the promotion and protection of the right to freedom of opinion and expression, David Kaye*, 2015, UN Doc. A/HRC/29/32, para. 11.

was unnecessary in the sense that the whistleblowers did not relay the information to instigate public disorder, but rather to raise awareness on the development of the virus. Furthermore, even if the information relayed may potentially disturb public order, the measure was also disproportionate as censoring information hindered the public's right to receive information and be aware of the seriousness of the virus.[71] Hypothetically, there can be an increase in cases if the lack of behavior from the society in treating the severity of the virus persists,[72] hence, will eventually contradict the government's aim to prevent public disorder and protect public health interests.[73] Therefore, the government should focus more on how social media and other Internet platforms tackle sensitive issues such as misinformation about future pandemics,[74] and thoroughly provide legal protection for such acts.

a. Harnessing the Positive Benefits from Technological Features

The first issue that needs to be addressed is how social media or other online platforms can ensure that its mechanisms do not limit the users' freedom of expression in raising awareness about infectious diseases. As an illustration, the incident of the whistleblowers promoted platforms such as WeChat to implement mechanisms that restrict specific topics from being posted on that platform.[75] Researchers from the University of Toronto discovered that this was achieved by censoring keywords, where censored words such as 'coronavirus' would result in the inability of messengers to receive any messages or information discussing 'coronavirus' or other certain keywords. Surprisingly, this example was not the first in the context of Internet censorship as demonstrated under the ECtHR case of *Vladimir Kharitonov v. Russia* ("***Kharitonov***"). Here, the Russian telecommunication regulator was able to derogate the applicant's right to freedom of expression by coincidently blocking access to the website without considering the legality of its contents.[76] As the issue concerns which information is true or false through censorship, government and private developers should instead focus more on dealing with sensitive information that would prevent misunderstandings and raise public awareness regarding future public health emergencies.[77] As an example, AI-enhanced algorithms allows Facebook to censor inappropriate contents almost 90%

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71 Ibid, para. 23; General Comment No. 34 (n 67), para. 11.

72 Farid Rahimi & Amin Talebi Bezmin Abadi, 'Transparency and information sharing could abate the COVID-19 pandemic', *Infection Control & Hospital Epidemiology* p. 1366, volume 41:11, 2020, p. 2, available at https://pubmed.ncbi.nlm.nih.gov/32319880/, accessed on 26 July 2020.

73 General Comment No. 14 (n 11), para. 12(b).

74 See Nowak (n 64), p. 466.

75 Lotus Ruan, Jeffrey Knockel & Masahi Crete-Nishihata, 'Censored Contagion: How Information on the Coronavirus is Managed on Chinese Social Media', *The Citizen Lab*, Toronto, 3 March 2020, available at https://citizenlab.ca/2020/03/censored-contagion-how-information-on-the-coronavirus-is-managed-on-chinese-social-media/, accessed on 17 July 2020.

76 *Vladimir Kharitonov v Russia*, European Court of Human Rights, Judgment on Merits and Just Satisfaction, 2020, Application no. 10795/14, paras. 6-7.

77 David Kaye, Special Rapporteur on the promotion and protection of the right to freedom of opinion and expression, *Report of the Special Rapporteur on the promotion and protection of the right to freedom of opinion and expression*, 2018, UN Doc. A/HRC/38/35, para. 31.

of the time,[78] and that Facebook is able to correct or verify any misinformation posted through fact-checkers.[79]

Considering the relationship between a person's right to privacy and the right to freedom of expression, UN Special Rapporteur David Kaye also recommended technologies to be equipped with encryption and anonymity system. Such a system would ensure that any media contents shared between users can only be shared with involved parties,[80] which protects information from intrusive surveillance and arbitrary interference. That said, these different avenues of harnessing the positive benefits technologies would represent several advantages in the post-pandemic era; on one hand, citizens would have the opportunity to receive crucial information that would raise their awareness on any developments of disease outbreaks; and on the other hand advanced technological features is necessary to maintain public order and protect public health interest through its capabilities of deterring misleading information, thus preventing unjustified restrictions of one's right to freedom of expression. Despite the non-exhaustive examples, these benefits illustrated above gives a glimpse of the role of technology in improving how social media and the Internet works to protect public interests, which fulfills the necessity and proportionality standards. With this in mind, the concern on safeguarding individual rights and protecting public health interests will have to be balanced to lawfully surveil information sharing.

b. Formulation of a Comprehensive Legal Framework

Another approach that is needed to lawfully address issues on the freedom of expression starts from the promulgation of a legal framework that is not vague. In its 2020 report, the UN Human Rights Council emphasized that vague laws may provide an escape route for governments to easily justify the limitation of fundamental rights under their discretion.[81] If China's censorship law is taken as an example, the law simply mentioned that any use of the Internet to disturb public order is illegal without elaborating other factors that can cause public disorder. Through that narrow interpretation, any critical information, such as information regarding COVID-19 or future infectious diseases, can be considered as potentially disturbing public order without the government considering the gravity of the situation in reality. This leaves enough room for the

78 Chris Marsden & Trisha Meyer, 'Regulating disinformation with artificial intelligence: effects of disinformation initiatives on freedom of expression and media pluralism', *European Parliamentary Research Service*, 2019, Brussels, p. 17, available at https://op.europa.eu/en/publication-detail/-/publication/b8722bec-81be-11e9-9f05-01aa75ed71a1, accessed on 20 July 2020.

79 Billy Perrigo, 'Facebook is Notifying Users Who Have Shared Coronavirus Misinformation. Could It Do the Same for Politics?', *Time*, New York City, 16 April 2020, available at https://time.com/5822372/facebook-coronavirus-misinformation/, accessed on 24 July 2020.

80 Kaye 2015 Report (n 70), para. 7.

81 David Kaye, Special Rapporteur on the promotion and protection of the right to freedom of opinion and expression, *Disease pandemics and the freedom of opinion and expression (Report of the Special Rapporteur on the promotion and protection of the right to freedom of opinion and expression)*, 2020, UN Doc. A/HRC/44/49, para. 14; Frank La Rue, Special Rapporteur on the promotion and protection of the right to freedom of opinion and expression, *Report of the Special Rapporteur on the promotion and protection of the right to freedom of opinion and expression, Frank La Rue*, 2013, UN Doc. A/HRC/23/40, paras. 44, 50.

government to exercise their powers which may jeopardize one's fundamental right.

Such analysis of the application of China's censorship law with respect to social media platforms may again draw a rather similar comparison with the *Kharitonov* case. Here, the ECtHR ruled that Russia's Information Act did not adequately protect the applicant's right to freedom of expression when blocking certain websites that the government deemed illegal. [82] As the applicant's website did not breach the law in retrospect, the Court noted that there must be certain safeguards 'against arbitrary interferences by public authorities'. This is something that the law has failed to do so by instead allowing authorities to block websites without considering the legality of their contents.[83] Although contextually different from the setting of the current analysis, the case shows similarities on how governments must consider the circumstances that would influence their decision in interfering with information sharing. In order to safeguard these rights, it can be argued that governments should adjust their national laws by codifying certain procedures that need to be taken before exercising their powers to lawfully tackle misinformation.

With a comprehensive law as the basis, cooperation between social media operators and the government with the state's health task force specialized to handle disease outbreaks should be established. By corroborating facts and findings made by the state's task force, authorities responsible for the digital sector can analyze and establish the accuracy of any information posted online.[84] This would encourage lawful censorship to realize citizens' right to health in the context of information sharing.[85] However, a challenge may arise in determining whether the facts acquired by the government themselves are objectively valid in accordance with the basic understanding of the issue that they are dealing with. That is why cooperation between the government with the public, most notably those who work in the medical field, may further strengthen the validity of facts and findings on the public health issue with comprehensive scientific evidence obtained from their medical practices.[86] Through this avenue, authorities can ensure that the information being collected is objectively valid and accurate in accordance with the most up-to-date knowledge before being shared with the public. This would prevent the government from crossing their limits, pursuant to their powers prescribed by the law, by arbitrarily limiting one's freedom of expression.[87]

Being said, the broad capabilities that technologies possess in the field of Internet

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82 *Kharitonov* (n 76), paras. 46.

83 Ibid, paras. 37-38.

84 Aimi Nadia Mohd Yusof et al., 'Sharing Information on COVID-19: the ethical challenges in the Malaysian setting', *Asian Bioethics Review* p. 1, volume 12:4, 2020, pp. 6, 9, available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7315401/, accessed on 9 January 2021.

85 See General Comment No. 14 (n 11), paras. 55-56.

86 Edward Gu & Lantian Li, 'Crippled community governance and suppressed scientific/professional communities: a critical assessment of failed early warning for the COVID-19 outbreak in China', *Journal of Chinese Governance* p. 160, volume 5:2, 2020, pp. 165-166, available at https://www.tandfonline.com/doi/full/10.1080/23812346.2020.1740468, accessed on 17 January 2021.

87 Special Rapporteur Rue (n 81), para. 51.

censorship requires scrutiny over matters concerning the limitation of information that should be factually and objectively assessed. Such can be achieved by the promulgation of laws that would accommodate the interest of the society in accordance with the use of technologies as means to conduct lawful Internet censorship in the post-pandemic environment. This would affect how the exploitation of technology to alert the awareness of society towards future disease outbreaks do not impair its citizens' fundamental rights.

Long-Term Recurring Challenges

Despite the arrays of strategies that authorities can adopt to conform with IHRL standards during the post-pandemic era, there will be recurring challenges in realizing these approaches. These challenges, nevertheless, shall not be addressed without the presence of the citizens' opportunity to access legal remedy if their rights are infringed. As a paramount importance under IHRL,[88] an effective legal remedy should prevent governments from escaping their human rights obligations, whether it is related to the realization of the measures or in addressing long-term challenges, and should be accessible without delay.[89]

Firstly, the accessibility of these contact tracing applications to citizens as well as the government's capability to provide its citizens with such may become a hurdle, whether economically or logically. Failure to address these specific hurdles would not only prevent states from creating an effective public health system but also consequently prevent states from guaranteeing their citizens' right to health.[90] Mindful of its costly nature, these challenges may be resolved through the international cooperation between states to fulfill their respective obligations within their territories. This is best exemplified by the current international cooperation in the distribution of COVID-19 vaccines.[91] This phenomenon, although aligned with the expectations set forth under Article 2(1) of the ICESCR, shall be continuously observed in accordance with the recent developments of technologies that may raise the bar even higher for governments to be prepared for the next disease outbreak whilst maintaining their human rights obligations.

Secondly, challenges concerning how the government treats the behavior of its citizens in calling the "first shots" of a public health threat should not be undermined. Reflecting, again, on the incident of the whistleblowers in China, one reason that could be rationalized by governments to justify similar actions is to merely protect the interests of the nation that could have been harmed from the disclosure of information on the emergence of COVID-19.[92] Even though it is important to maintain one's reputation

88 *ICCPR* (n 4), art. 2

89 Gu & Li (n 86), p. 166.

90 *ICESCR* (n 1), art. 12.

91 Tom Randall et al., 'More Than 39.7 Million Shots Given: Covid-19 Vaccine Tracker', *Bloomberg*, United States, 2021, available at https://www.bloomberg.com/graphics/covid-vaccine-tracker-global-distribution/, accessed on 17 January 2021.

92 Jing-Bao Nie & Carl Elliott, 'Humiliating Whistle-Blowers: Li Wenliang, the Response to Covid-19, and the

for international relations, ignoring grave issues that may jeopardize other states would contradict such an agenda. For instance, potential legal consequences are surrounding China for its failure to contain the COVID-19 virus in due time in accordance with international law,[93] as well as public backlash toward the state's domestic affairs. In light of the uncertainty that future disease outbreaks may pose, the involvement of non-governmental public bodies such as ombudsman and medical responders may act as a safeguard to prevent governments from arbitrarily limiting one's fundamental freedom for raising the public's awareness.[94] It is thus the case that governments should distinguish between when it is appropriate or inappropriate to take strict measures to protect its national or public interests in relation to the interests of the whole international community.[95]

Conclusion

It can be agreed that technological advancement during the COVID-19 pandemic can bring huge benefits for the new normal era, especially to ensure public awareness to prepare for the next pandemic. Nevertheless, certain factors in the context of the usage of technology must be taken into account in maintaining one's enjoyment of human rights. Regarding issues concerning public health surveillance, governments must ensure that technologies are used in the least intrusive manner with respect to one's right to privacy. Such can be realized by not only revisiting how these technologies were invented to accommodate such goals but also through stimulating participation from citizens as well as non-governmental bodies. This is because the realization of IHRL standards is a two-way street; both the government and the public must do their respective role to create a functioning public health system. The same goes for the usage of technology to guarantee one's right to freedom of expression. In this case, the issues of excessive exploitation of the technology's capabilities without a comprehensive legal framework relating to the protection of fundamental rights must be addressed to prevent arbitrary oppression of citizens' rights during the new normal era.

These conclusions, however, shall also take into consideration of the possible challenges that might repeat in realizing the expectations discussed above. Socio-economic issues that relate to how the public can participate in public health surveillance as well as issues regarding the government's decision on when it is appropriate to exercise their extraordinary powers must be taken into account. Nevertheless, one certain thing is

Call for a Decent Society', *Journal of Bioethical Inquiry* p. 543, volume 17:4, 2020, p. 547, available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7445730/, accessed on 14 January 2021; Yan (n 23).

93 See Valerio de Oliveira Mazzuoli, 'International Responsibility of States for Transnational Epidemics and Pandemics: the case of COVID-19 from the People's Republic of China', *Revista de Direito Civil Contemporâneo* p. 1, volume 23, p. 33, available at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3584944, accessed on 20 January 2021.

94 See Vigjilenca Abazi, 'Truth Distancing? Whistleblowing as Remedy to Censorship during COVID-19', *European Journal of Risk Regulation* p. 375, volume 11:2, 2020, p. 379, available at https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7242766/, accessed on 10 January 2021; Gu & Li (n 86), p. 163.

95 See Kaye 2015 Report (n 70), para. 32; See Gu & Li (n 86), p. 166.

that there is enough room for the international community to fully comprehend and closely study the capabilities of technological developments in the future to combat infectious disease outbreaks. Then again, the underlying essence of the protection of human rights should not be ignored, rather it must be improved to achieve an ideal balance with the existence of technology.