IEAI Technical University of Munich
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Research Brief – August 2021

Culture is "Tight" with Technology Adoption: Cultural and governance factors involved in the acceptance of AI-powered surveillance technology deployed to manage Covid-19

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On the 11th of March 2020, the World Health Organization (WHO, 2020) characterized the Covid-19 virus outbreak as a pandemic. Since then, countries around the world have been implementing strategies to prevent the spread of the disease. Artificial Intelligence (AI) has become a major component of such strategies. While discussing the ethics and impacts behind AI-powered tools put into action in different countries, a crucial issue was identified: the acceptance of AI initiatives (The Future Society et al., 2020; IEAI, 2020). In this brief, we will discuss the societal and cultural moderating factors that may play a role in countries' technology acceptance, and how the ethics behind the use of surveillance technologies depends on cultural and political context.

On the 11th of March 2020, the World Health Organization (WHO, 2020) characterized the Covid-19 virus outbreak as a pandemic. Since then, countries around the world have been implementing strategies to prevent the spread of the disease. Artificial Intelligence (AI) became a major component of such strategies. While discussing the ethics and impacts behind AI-powered tools put into action in different countries, a crucial issue was identified: the acceptance of AI initiatives (The Future Society et al., 2020; IEAI, 2020). This factor's significance is made obvious when referring to AI technologies employed in the societal domain, such as contact tracing applications and surveillance strategies to support public health efforts in understanding and reducing the spread of the virus. Indeed, if the tracing apps are useful from all levels of uptake to reduce the spread of the infection, their effectiveness is linked to their adoption rate (O'Neill, 2020b).

In this brief, we will first discuss the different technologies seen around the world to mitigate human behaviors during the pandemic. We will then discuss the role of societal and cultural influences, introducing the notion of cultural tightness and looseness, governments' openness, and how governments' styles link to privacy laws and surveillance, to finally investigate how all are correlated with different countries' adoption rate of the tracing apps. Finally, we will discuss the moderating factors which might have played a role in countries' technology acceptance, and how the ethics behind the use of surveillance technologies depends on cultural and political context.

1. The Use of AI during the Pandemic

The various AI-powered tools developed and implemented worldwide to fight the virus have been catalogued throughout three main domains of action: Biological, Clinical, and Societal (The Future Society et al., 2020). The biological realm refers to the initiatives studying molecular structures and biochemical processes with the intention of drug/vaccine development. The clinical concerns technologies aimed at supporting diagnosis and predicting patient outcomes. Finally, the societal sphere relates to AI-powered actions centered on large-scale epistemic matters, epidemic modeling, decision-making, and operational management. This last domain is of particular interest when considering societal acceptance as it examines tools that have been used broadly for public health purposes, outside of a clinical or research laboratory environment. Building on existing AI-powered technology, some tools have been repurposed to fight the pandemic.[1]

A practical example is the use of automated drone technology (Greenwood, 2021) for major disinfection of public places, such as the Atlanta Stadium in the USA (Porter, 2020). Being able to carry objects, the drone Zipline's flying containers have a history of being employed for medical tools and resources transportation in Rwanda. During the pandemic, the company helped Ghana procure vaccines through the same technology (Vincent, 2021). In China, drones have been used to monitor social distancing, and "talk" to people, especially when behaving in disregard to the social distancing and mask wearing regulations (D'amore, 2020). This same technology has been considered for deployment in the western world, but received a negative welcome. Finally, the South Korean government has announced drones will be used soon to monitor people's body temperature on the beach (Crumley, 2021). The aim would be to identify initial symptoms of the disease to prevent its spread.

If drones are a good example of the variety of opportunities available through repurposing existing technologies, it is important to notify other types of technologies that have been put into action. The Kigali International Airport in Rwanda welcomed five human-sized robots in July 2020 (WHO, 2020). The machines are meant to screen individuals' temperature, deliver video messages, and detect people not wearing masks to then instruct them to wear masks properly. In case of abnormalities, the robots report to officers on duty.

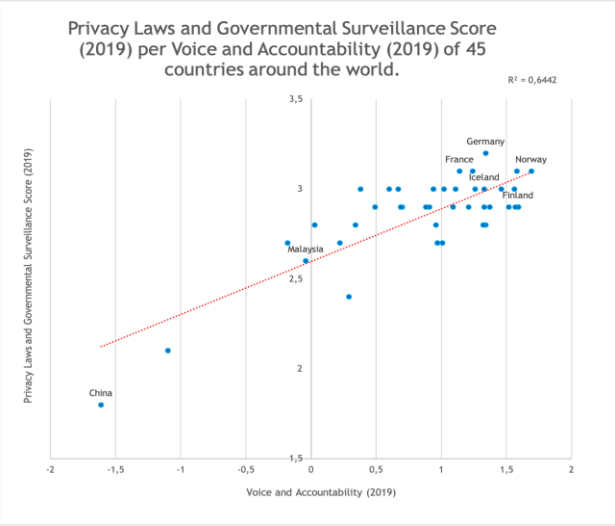
Additionally, supporting the contact tracing effort was, early in the pandemic, a major motivator for the production of new technologies. Contact

[1] see Piccialli et al. (2021) for an extended review.

tracing apps[2] and related data-driven strategies were designed and enforced. These tools' main objective is to inform the user when at risk of infection through contact with a Covid-positive individual. To do so, three steps are required. The app or institutions in charge should (1) have the knowledge of the Covid-positive cases, (2) detect which individuals have met in the same physical space, (3) motivate at risk of infection persons to self-isolate and get tested (Ferguson, 2021). Interestingly, not all countries reacted similarly to the new AI-powered and data-driven tracing solutions. Culture and government styles seemed to play a big role in such acceptance, and adoption (IEAI, 2020).

2. Factors of Acceptance

In our previous research (IEAI, 2020) on development and use of Covid-19 contact tracing applications and strategies, various approaches regarding those technologies have been identified from one country to another. Indeed, in our initial work, we identified a trend: countries with low levels of political openness tend to have more experience with intrusive technologies. Building on that, we investigate here the link between political openness[3] and the Privacy Law and Government Surveillance Index (Bischoff, 2019) as displayed in Figure 1.



Notes: Details of the data used can be found in Appendix A. The higher the voice and accountability score, the more democratic the country. The higher the Privacy Laws and Governmental Surveillance Score, the stronger the privacy for the populations.

As figure 1 indicates, political openness is positively related to data and surveillance protection around the world.[4]

This relationship between political openness and data/surveillance protection is exemplified in various important cases. China, for example, a country with low political openness, is considered by Shaw et al. (2020) as having displayed strong governmental control of their population as early as when the disease's high transmission rate was first confirmed. Indeed, colored QR codes were given to citizens, depending on their Covid-19 related health situation: red for 14 days in quarantine, yellow for 7 days in quarantine, green for no quarantine and a need to access public spaces. If the quarantine was breached, the authorities were alerted. Additionally, the governments re-used existing surveillance technologies such as CCTV and credit card history for population tracing (Chaturvedi et al., 2020). On the other hand, South Korea, a country with relatively high political openness, is considered as having deployed a 'transparency and democracy' strategy through disclosure of relevant information with the World Health Organization (WHO), and disclosing all steps of their response to their population.

The South Korean government did, nevertheless, use intrusive technologies such as electronic transaction data tracing, mobile phone location logs scraping, and surveillance camera footage analyzing (Fendos, 2020). Openness of a government can therefore not be the only explanation for the deployment of strong surveillance technologies.
In this comparison, for instance, while the governments have different levels of political openness,, they share a common past with sanitary crises in this century (Bicker, 2020) including the Severe Acute Respiratory Syndrome (SARS) epidemic in China, in 2003, and the Middle East Respiratory Syndrome (MERS) in South

[2] For more details on the topic, please refer to the IEAI June 2020 brief on the topic (IEAI, 2020).
[3] Numbers taken from 2019 Voice and Accountability indicators from Kaufmann et al. (2010).
[4] An important note is that only five countries seem to meet the privacy requirement to be considered as having "adequate privacy safeguards" with a score over three in Privacy Laws and Governmental Surveillance: Ireland, France, Portugal, Denmark and Norway (Bischoff, 2019). This is probably linked to the implementation of the General Data Protection Regulation (EUC, 2020), however it can't be solely explained by it.

Korea in 2012 (Felter, 2020). Thus, we theorize that past experience with a societal crisis is also related to acceptance of invasive technologies to fight a new crisis.

Past experience with a societal crisis leads to a culture of tightness, as presented by Kritz (2020): « Tight cultures tend to have had a lot of threat in their histories from Mother Nature, like disasters, famine and pathogen outbreaks, and non-natural threats such as invasions on their territory ». They are defined as:
"a homogeneous social group whose members (…) tend toward a rigid adherence to the collective norms of their group" (APA Psychology Dictionary, 2015b).
In contrast, loose cultures are defined as:
"a heterogeneous social group whose diverse members tend to value originality, risk taking, and a flexible adherence to the collective norms of their culture or group" (APA Psychology Dictionary, 2015a).
Thus, tight cultures would present higher acceptance of intrusive technology if it was proposed by credible and trustable leaders, and it helped to secure the group. These cultures have also been found to have less deaths from Covid-19 (Gelfand et al., 2021).

Countries with tighter cultures and lower political openness would be expected to have accepted more intrusive technology at a higher rate to manage the pandemic

3. Accepting Contact Tracing technologies and strategies – Countries comparisons

Given the factors presented above, we would expect tighter cultures to accept, and therefore adopt, intrusive technologies at a higher rate. Additionally, we would expect higher voice and accountability, or government openness, to be related to higher privacy protection and less use of population surveillance. We would expect this to impact the uptake of such surveillance technology deployed in crisis negatively, as populations would not be used to such infringements on privacy. In other words, countries with tighter cultures and lower political openness would be expected to have accepted more intrusive technology at a higher rate to manage the pandemic. Building on Gelfand et al. (2011) and Uz (2015) index of tightness / looseness per country, and the levels of political openness, we propose here a table (table 1.) categorizing over 70 countries per characteristic.

Table 1. Countries Categorized by Tightness/Looseness and Openness.

	Tight	Tight Moderate	Loose Moderate	Loose
High Voice and Accountability (V/A)	Norway, Malta	Czech Republic, Japan, Estonia, Australia, **Iceland*****, New Zealand, USA, Slovenia, Lithuania, Greece, Slovakia, Latvia	Italy, UK, Austria,Ireland, Germany, Denmark, **Finland*****, Canada, Sweden, Chile, Spain, Portugal, Netherlands	France, Belgium, Luxembourg
Moderate High V/A	Indonesia,Israel, South Korea	Poland, Bulgaria, India, Hungary, Philippines, Croatia, Brazil, Peru, Albania, Ukraine	South Africa, Mexico, Argentina, Puerto Rico, Serbia, North Macedonia	x
Moderate Low V/A	Turkey, Bangladesh, Nigeria, Morocco, Jordan	**Singapore******, Moldova, Bosnia and Herzegovia, Kyrgyz Republic, Tanzania, Uganda	x	Malaysia, Pakistan
Low V/A	Saudi Arabia, Algeria, Zimbabwe, Egypt	Vietnam, Russia, Iran, Belarus, China	x	x

Notes: According to O'Neill (2020a) report on contact tracing app penetration rates around the world. ***Over 35% penetration of contact tracing app and voluntary. ****80% penetration of contact tracing app and mandatory. In blue, the case countries discussed. Details of the data used can be found in Appendix B.

From this analysis, we were able to choose key countries to compare on their approach to employing technology to manage the COVID-19 pandemic. We will present countries with similar initial conditions in regard to culture and political openness, and the factors involved in similar or dissimilar behaviours towards technology adoption. We thus look at additional factors that have impacted acceptance of tracing strategies or tools that were not initially taken into account in the presented table.

a. Iceland & Norway – Tight and Highly Democratic Governments

Iceland, due to its geography, is used to dealing with multiple disasters including earthquakes and volcanic eruptions (Mackenzie, 2021). This situation helps to explain the country's cultural tightness. The government decided to take a step back during the Covid-19 crisis, and to let the scientists handle the situation, successfully so. Iceland counts to this day only 30 deaths of the disease. Their strategy was following a trace, test and isolate path, which was helped by the launch of the Rakning C-19 app in April 2020. GPS data of the users are compiled on their handset and looked over by contact tracing human investigators, if the individual tests positive, and allows it (Johnson, 2020). In August 2021, the adoption rate was one of the highest in the world, especially for voluntary uptake technologies, reaching 38.45% (O'Neill, 2020a).

Contrastingly, Norway's Smittestop failed to seduce the public. After their first try at implementing the app which concluded in an objection to the amount of GPS localization data initially collected (Amnesty International, 2020), the app was pulled in June 2020. The second version of the app now offers a similar data collection as many other European countries: the Google/Apple decentralized Bluetooth solution (O'Neill, 2020a). Regardless, the adoption rate stays low, with less than 3% of Norwegians currently using the app against close to 10% for the first one (O'Neill, 2020a).

b. Germany and Finland – Highly Democratic and Loose Populations

The Open-Source Corona-Warn-App was released in June 2020. Motivated by the country's high political openness and societal animosity to surveillance technology, the German government displayed full transparency and stressed the importance of the users' privacy when using the tool (IEAI, 2020). The "loose" German population has an current uptake of 21,68% (O'Neill, 2020a). Despite this not being a relatively low rate when compared to other countries, it shows a reluctance towards surveillance instruments regardless of their data privacy security.

On the other hand, in August 2020, Finland launched Koronavilkku, a similarly conscious-of-data-privacy app. In contrast with the German situation, the Finish population followed their governments recommendations and greatly adopted the app. When asked their motivation to do so, the majority of answers are "social pressure" and "civic duty" which can relate to tightness factors even though the country is considered loose, making the situation an interesting case. This raises the question of developing tightness when in a context of crisis. Moreover, the country showed strong prioritization of personal privacy, and individual control over own's data which have been presented as major factors of adoption (McDonnell, 2020). To this day, 45,31% of the population is using the app, which is one of the highest voluntary uptake rates known (O'Neill, 2020a; Clausnitzer, 2021).

China and Saudi Arabia employed similar approaches, imposing a certain amount of surveillance, building on existing technologies

c. France & Malaysia – Loose countries, different governance, same concern.

From the StopCovid app launched in June 2020, to the TousAntiCovid app proposed in October of the same year, the French government undertook a re-branding of their contact tracing app in the hope to engage their population in taking up the technology. Both AI-systems present a centralized data collection (Mageit, 2020). In other words, data is encrypted and brought to central servers where they are accessible by government officials only. In the second version, a few extra features were implemented, providing easy access to other tools, including "DepistageCovid", a map of nearby testing centers and waiting times, and "MesConseilsCovid", which provides personalized advice on how to protect oneself and others (Martin et al., 2020). The main reason that seems to impede populations' approval of the tool is data privacy. Regardless of the French and EU laws on the subject protecting them highly, the population does not seem to trust that their data will not be used for other purposes than the one on the table. To this day, the app's uptake is at the low rate of 3,58% (O'Neill, 2020a).

In Malaysia, MyTrace is an app that was proposed with no transparency, and no planned data destruction. In other words, the population was given no information on how the app works technically and what will happen to the personal information they agree to share through it, but download is voluntary. Although the country is used to strong surveillance, with more than 90 drones active as the Royal Malaysian Police (PDRM)'s eyes in the sky, the population did not engage with the app as expected. The same reason as for France is brought up, Malaysian citizens have strong concerns in regard to data privacy (Malay Mail, 2020). The uptake to this day is of 0,32% (O'Neill, 2020a).

If both France and Malaysia have noticeable different levels of political openness, they share the looseness of their culture, which coincides with a similar concern for personal data privacy impact contact tracing apps' adoption.

d. China and Saudi Arabia – Authoritarian and Highly Tight

China deployed a strong surveillance strategy in regard to tracing, building on technologies routinely used to monitor citizens. Tracing was operated through location data supplied to the authorities by cellular providers, and AI-powered facial recognition systems linked to surveillance cameras in public areas (Shwartz Altshuler & Aridor Herschkovitz, 2020). Additionally, the e-commerce company Alibaba, in cooperation with the Chinese government, developed the AliPay HealthCode app presented earlier, which is voluntary to install, but necessary to enter public spaces (Chaturvedi et al, 2020). Moreover, the app serves as enforcer of strict quarantine through limited transactions permitted for users deemed at risk (Gamvros et al., 2020). The past experience of this country is to be taken into account as they faced multiple epidemics in the last century: the Asian Flu in 1957, the Hong Kong Flu in 1968, the Bird Flu in 1997, and the SARS in 2003 (Staff, S. X., 2020). This past common experience with epidemics may contribute to the tightness of the culture and, when coupled with their authoritarian governance, helps to explain the majorly passive acceptance of such invasive technologies by the Chinese population during the Covid-19 pandemic.

Similarly building on their past experience with disease outbreaks (Pétriat, 2020) and intrusive technology, Saudi Arabia's leadership deployed up to 19 apps and platforms to support the health care service (Hassounah et al., 2020).The Tawakkalna app is, for instance, the only way for Saudi Arabia citizens to obtain movement permissions during lockdown to be allowed outside of their home, including for essential needs. It's uptake is registered at 20.77% to this day (O'Neill, 2020). Similar tools were developed regarding entry to the Grand Mosque. Both tools mentioned are linked to the contact tracing effort data wise (Alhudhaif, 2020).

China and Saudi Arabia thus employed similar approaches technology wise, imposing a certain amount of surveillance, building on existing technologies. Interestingly, both cultures present high tightness scores, which might explain acceptance of strong tracing and data sharing with their governments as the population has a tendency to align with group norms. Moreover, both countries appeared to handle the crisis well, which might support credibility of their leadership, and therefore support possible populations' acceptance of such practices.

From the closer analysis of these key cases presented above, we would argue that the level of tightness of a culture is related positively to the acceptance of tracing and surveillance technologies. The level of tightness in the population can be explained, among other things, by a common past experience with crisis. However, the impact of cultural tightness is mediated by the level of political openness of the government in question, and expectations for data privacy by a population. These two factors in combination, moderated by privacy concerns, can help explain population technology uptake in specific contexts.

4. Ethical Considerations

Given the variation in when and how governments have employed AI-based technologies in the pandemic discovered in our analysis, it is important to discuss the ethical concerns and possible consequences of implementing such technologies with regard to the role of cultural and societal context. The aim here is to provide an ethical

analysis that adds cultural and population expectations to the conversation surrounding surveillance around the world. We built this reflection based on the AI4People's work (Floridi et al. 2018), which offers five basic principles to guide AI ethics: Beneficence, Non-Maleficence, Autonomy, Justice, and Explicability.

Beneficence can be explained as promoting well-being, preserving dignity and sustaining the planet, in other words, "do good". During the Covid-19 crisis, technologies have been implemented around the world with the aim of supporting the effort of fighting the virus. Whether it is for medical research purposes such as the development of a vaccine, or breaking groups and enforcing social distancing with drones alerts, the intentions presented behind implementation was for the greater good, in the hope to save lives. On the other hand, such technologies usually come at the cost of personal data.

Another side of beneficence is to preserve dignity through respect of a population. In this context, respect might be understood as considering their choices, and thus linking to the principle of Autonomy. The imposition of new tools on the population, disrespecting peoples' possible will for total privacy, as particularly seen in highly democratic and loose countries such as France, might be a deviation from this core principle of beneficence.

The aim here is to provide an ethical analysis that adds cultural and population expectations to the conversation surrounding surveillance around the world

Moreover, to enforce beneficence of implementing certain technologies, the decision making process of deploying intrusive technologies would ideally be made building on strong knowledge and empirical proof that the cost of privacy will be met with efficiency of an AI-system aiming at reducing the spread of the virus. Considering the singular situation the Covid-19 worldwide pandemic created, many countries, governments and regional unions could not build on past experience or known efficacy of technology. Here, our aim is to highlight the importance for the crisis to come to consider the privacy vs. health protection trade-off. In these unprecedented times, this establishment seems to not have been met on the individual level of contact tracing apps adoption in multiple countries recording low endorsement rate of the apps, regardless of the amount of personal data collected.

Non-Maleficence implies 'do no harm'. Relating to privacy again, populations might be agreeing to share personal data for a specific purpose. Sharing said data in other contexts without their consent, leading to possible mass surveillance in countries where such practices are viewed as unacceptable, is deceiving, and therefore maleficent. An illustration of such actions could be seen in Singapore, where the police received access to the digital contact tracing records (Illmer, 2021). The technocratic's population reacted strongly to the news, losing their trust in the way their government uses the technology (Han, 2021). The Australian State police also got access to QR code scan records in the context of two investigations relating to highly punishable crimes (Wilson, 2021). If the reasons were deemed acceptable by the government at first, afraid to lose the trust of the people, new laws are being drafted to avoid such situations in the future ("WA Police"..., 2021). In general, the relevant fear linked to data privacy, especially in highly democratic and loose countries is the fear of mass surveillance. Therefore, it is of major importance to mention the need for accountability. The creation of specific laws and regulatory bodies regarding the misuse of personal data collected during a crisis seems relevant to the matter, and would help each and every country not having such dispositions in place already to deal with the matter at hand. While doing so, populations would be more protected, and thus trust and adoption of technologies proposed by governments might be positively impacted.

Autonomy indicates individuals' right to make decisions for themselves, about their own life. When considering the implementation of tracing and intrusive technologies, the main argument from all nations was the trade-off between surveillance and freedom of movement. But how populations weigh this trade off will be dependent on culture and governance. Indeed, if populations

were to share their personal data such as location and health state, tracing of the virus and enforcement of quarantine for infected or at-risk-to-be patients would be easier, therefore reducing the spread of Covid-19 in a population, bringing back regulated freedom of movement and the end of lockdowns. A successful good example of this logic was successful practice while using intrusive technology and transparency with their population is South Korea (Zastrow, 2020).

Transparency here is of main importance when considering the trade-offs and autonomy. Transparency as it will allow for people to make enlightened decisions concerning data sharing, and movement restrictions, increasing their feeling of autonomy. In the context of South Korea, questions need to be asked regarding the introduction of such technologies on their population's autonomy. On the other hand, For successful deployment of technology in South Korea (Zastrow, 2020), past experience led the country to implement emergency laws allowing for strong surveillance, while still considering data privacy of the citizens through anonymization of the data shared with the public. When this privacy was at risk in the past year, the population reacted negatively to it by reducing testing practices, and the government re-assessed their procedure to fit with population expectations (IEAI, 2020). Therefore, autonomy was maintained as adjustments were made to fit with the cultural context.

Additionally, looser cultures might expect more privacy, but agree to more movement restrictions. In Malaysia, the lack of transparency regarding the contact tracing app cost the non-adoption of the technology by the populations. Thus, cultural context, transparency, and population expectations need to be at the center of the implementation of such technologies, as they will allow for autonomous decisions by the population when it comes to technology adoption.

Moreover, when considering contact tracing, only high acceptance from a population will make it as effective as can be. Therefore, if the trade-off presented earlier might be true on the general level of a country, it is not when considering the individual level. In other words, if a small community of a country adopts the tool, they will not receive more movement rights if the global population did not do similarly. Finally, each country, building on past experience, cultural setting, and government style should find where the trade-off between privacy and effectiveness of surveillance or tracing technologies should be set in order to reach the general and individual autonomy rights of their population. This question is raised in Edelman's (2020) survey. Their findings revealed that the relative acceptance of two measures ((1) restrictions on movement and (2) increased use of health data and location data) are markedly different across countries.[5]

The relevant fear linked to data privacy, especially in highly democratic and loose countries is the fear of mass surveillance

Justice deals with shared benefits and shared prosperity and relates to the distribution of resources and eliminating discrimination based on factors such as geographical location or socio-economic context. Regarding technology acceptance, a major point of concern is accessibility. This accessibility notion can be understood from two angles. The first is allowing accessibility through specific devices. Rwanda and Ghana implemented such technologies through the ZipLine drones delivering medications and vaccines in their land. On the other hand, accessibility of technology can be understood on a geographical level, or individual level. On the geographical level, if AI-powered tools rely on the internet to support the Covid-19 fight, the lack of internet access in some regions will have a negative impact on accessibility. On the individual level, the lack of devices able to support the AI proposed solution such as digital contact tracing has been a strong issue in the debate relating to its

[5] Interestingly, in countries where people agreed highly with one type of restriction, they tended to disagree with the other. For instance, respondents in China agreed moderately (63%) with the movement restrictions, but an amazing 91% of the Chinese respondents would agree to give up more data. In contrast, respondents in Japan were more willing to give up movement (82%) than data (44%). Both countries are on the opposite side of the Voice and Accountability spectrum, but share a common tendency towards tightness.

implementation around the world. Singapore proposed a free wearable device solution accessible on a voluntary basis (Ascher, 2020), reducing age and socio-economic background inequity to access the technology. Many countries did not show such considerations.

From another angle, it is important to consider the environmental impact of the development and implementation of so many AI-powered technologies around the world (Griffin, 2020). Indeed, creating, and especially storing data has a CO2 cost for the environment. The question raised here is the acceptable trade-off to be considered in the context of the current climate crisis affecting the Earth. A solution might be the promise and implementation of green-storage and sustainable technology development by governments involved in such practices. These considerations are already taken into account in countries involved in international accords such as the Green New Deal (H.R. Congress, 2019) and the European Green Deal (European Commission, 2019) which both have been presented by looser regions of the world, but higher democracies.

It is important to consider the environmental impact of the development and implementation of so many AI-powered technologies around the world

Finally, when considering the deployment of AI-powered technologies to fight a crisis, the principle of proportionality should be considered. This standard holds that "actions should not be more severe than is necessary" (Collins English Dictionary, 2021). In this context, it would translate in the deployment of only required technologies, building on the knowledge of usefulness, and efficacy of such systems. The application of proportionality would thus allow for populations' protection, supporting the initial principle of beneficence, and ensuring only benefit is being brought to the situation at hand. Cultural factors will be of importance when considering what is proportional, as accepted technologies only would be relevant to be implemented. As seen through the example of the contact tracing app, adoption relates to cultural and political context, and might impact efficiency of a given technology.

Explicability focuses on enabling the other principles through making explicit the need to understand how systems are operating around us and on which levels they affect our everyday life. Indeed, by following this key principle, the beneficence, non-maleficence, justice and autonomy of an AI-system can be assessed. In the context of the Covid-19 crisis, the implementation of emergency AI-powered solutions occurred with varying degrees of transparency. Some countries, such as South Korea and Taiwan, decided to go with full transparency of their actions (Shwartz Altshuler & Aridor Herschkovitz, 2020), and therefore encouraged their communities' trust in the possible effectiveness of the strategy deployed, and their autonomy to decide. It is important to highlight here that the populations mentioned are considered to be tight cultures based on past experience assessment, which might impact populations and governments decisions alike. Nevertheless, both principles of explainability and autonomy are here considered strongly linked. Moreover, as shown through a survey in looser culture (Touzani et al.,2021), populations would be more inclined to accept technologies when able to predict it as being useful. This virtuous cycle starts with strong presentation and an explanation of how a tool works, and proof of its efficiency in the past, or later on if implemented for the first time. As the main trade-off considered here is privacy versus health, this notion is made even more important than basic right to self-decision.

5. Final Thoughts

In the context of this pandemic, technologies were implemented worldwide that are respectful of populations' privacy to varying degrees. From CCTV facial recognition, to drones and digital contact tracing, concerns remain when considering the after Covid-19 life, also called the "New Normal". Indeed, experts raise concerns regarding "backing down" from such access to surveillance and tracing data (Kharpal, 2020). Populations, especially tight cultured ones, might have accepted more intrusive technologies based on their culture, and therefore past experience, but

regulatory changes put in place during crises need to go back to normal as the emergency situation comes to an end.
This principle has a name: the crisis effect (Enria et al., 2021). It is defined as populations agreeing to governments changing the usual boundaries and imposing stronger regulations due to a crisis situation. Populations would accept such modifications due to higher trust in said governments in the first months of crisis circumstances, thus altering boundaries of what should be acceptable in normal times. A concrete example of this effect is the United States counter-terrorism legislation implemented after the 11th of September 2001 attacks, showing that a 'state of emergency' can affect the perception of legitimacy of measures that cut short civil liberties in a climate of fear and heavy sense of risk (Enria et al., 2021). Regulations implemented then are still in place now. To avoid such long term changes in the future, and protect populations around the world, strong regulatory bodies need to ensure all data collected in the Covid-19 context are erased, and all non-justified intrusive technologies are removed in countries hosting populations wishing for such, following the non-maleficence principle.

Strong regulatory bodies need to ensure all data collected in the Covid-19 context are erased, and all non-justified intrusive technologies are removed in countries hosting populations wishing for such, following the non-maleficence principle

We here proposed an ethical evaluation that focuses on the role of culture and society in understanding ethical considerations for technology deployed to manage crises. Our aim is to contribute to the conversation and give key questions to be asked prior and during their implementation of said AI-systems. The major take away from this discussion is that there is an important requirement to respect cultural norms and political context that needs to be addressed when deploying new technologies, so that these tools can be effectively accepted and adopted by the populations in question. To do this, developers and implementers need to consider the need for such instruments, and the accountability of all actors involved in creating, implementing, and enforcing said tools.

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