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Viral surveillance: Governing social isolation in São Paulo, Brazil, during the COVID-19 Pandemic

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ABSTRACT

In the context of COVID-19 pandemics, Brazilian cities implemented social isolation policies and deployed digital systems to monitor urban mobility. This article addresses the setting of two digital technologies based on massive cell-phone data collection by private companies in São Paulo state. We relied on secondary data from multiple sources (press conferences, interviews, newspaper articles, public documents), complemented by primary data from the authors' ongoing research. In our analysis of heterogeneous and contingent techniques of pandemic control, we found that although these monitoring technologies seem to be effective in assisting public services and informing society, they also raise issues about performativity and transparency, with relevant consequences for their adoption in sanitary emergencies, and their potential legacy to São Paulo's public safety management.

1. Introduction

The COVID-19 pandemic imposes extraordinary challenges on governments and societies. At the time of writing, it has killed nearly 1.5 million people worldwide and affected global production chains, causing an upsurge in unemployment rates and as yet incalculable economic losses. Before it is over, the pandemic will kill thousands more and most likely it will deepen global recession and social unrest. In response to the virus, most epidemiologists and policymakers seem to agree on the need to restrict freedom of movement, invest in personal protective equipment (PPEs) and hospital resources (tests, drugs, ventilators), and build up virus-tracing capacities to identify clusters of infections, anticipate contagion, and contain further outbreaks.

In this context, while robust public policies have been vital to tackle the pandemic, travel restrictions, strict quarantine rules, and surveillance measures have also been popular solutions. The World Health Organization (WHO) issued a flattering report on China's ability to contain the initial outbreaks, exhorting other governments to adopt similar actions and, specifically, to ramp up their monitoring capacities to "expand surveillance to detect COVID-19 transmission chains" (WHO, 2020a, p. 21). Interestingly, the pandemic has elicited both solidarity and widespread suspicion, combining practices of care, calculations of risk, and disciplinary population control techniques.

Initial approaches to the matter have emphasized the ambiguous aspects of current policy responses. Many scholars have expressed fears of "surveillance creep" (Lyon, 2007), where techno-totalitarian states would keep powers and techniques to monitor people indefinitely (Morozov, 2020). Others have advanced revolutionary readings of the current crisis, claiming neoliberal dogmas might be witnessing their last days (Zizek, 2020). Accordingly, the coronavirus "laid bare the exploitative structures that govern our social and political lives" (Goldenfein et al., 2020), opening gaps for solidarity-based systems in which markets are fettered and the common good, including the green economy, becomes mainstream politics (Latour, 2020).

We engage with such debates by advancing a different perspective of contemporary security practices and disciplinary healthcare policies. Looking into governmental responses to COVID-19 in São Paulo, Brazil, we trace the adoption and reconfiguration of surveillance technologies as multiple devices are developed or repurposed to enhance pandemic control. Specifically, we focus on two main projects, the Smart Monitoring System (SIMI-SP) and the Social Isolation Index (SII). SIMI-SP collects cell phone positioning data to feed mass gathering heatmaps, indicating where authorities need to enhance patrols and social isolation recommendations. SII was designed by Inloco, a data-savvy media/

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advertising company, to measure aggregate data on the movement of people and issue daily rates of social distancing across the urban landscape. These tools were employed by state officials in March 2020 to better assess and efficiently manage local responses to the health crisis.[1]

In this article, we present evidence of the rearticulation of "surveillant assemblages" in São Paulo (Haggerty & Ericson, 2000). The monitoring techniques and social sorting algorithms used to tackle the pandemic are not exactly new. Similar tools have already been deployed by the police, media companies, and health professionals. But we argue that the changing composition of the assemblage produces relevant effects. Emerging technologies combine public and private players, biometric information, commercial databases, digital infrastructures, mathematical models, epidemiologists, and data scientists, which were previously dispersed. In this process, body surveillance and urban monitoring practices effectively coalesce, juxtaposing notions of disciplinary power, governmentality, and self-care (Foucault, 2015).

Thus, we investigate the biopolitics of local responses to the virus, stressing the integration of medical, political, security, and technological knowledge and practices.[2] The production of transmission patterns is inherently connected both to the deployment of population monitoring systems and police repression. Arguably, São Paulo is going through a "medicalization of security" (Elbe, 2011), as epidemiologists, physicians, and sanitary authorities become relevant voices in the definition of deviant profiles, in designing monitoring techniques and enforcing control practices.[3] In this sense, public health measures would not be disassociated from public security measures, while virology discourses support the arrest of those who break the lockdown and justify stricter surveillance of urban flows (Wright, 2020). While policymakers and health professionals often claim that COVID-19 monitoring systems are indispensable for effective response strategies, this article addresses the dilemmas raised by the implementation of surveillance tools in São Paulo. In short, we discuss the need for transparency and accountability, which are essential to establish clear boundaries for public-private monitoring assemblages (including rules about when to stop emergency monitoring practices).

To develop this analysis, the first section presents a brief overview of current debates on security practices during the pandemic. Secondly, we describe how monitoring tools have been developed and deployed in São Paulo, and, most importantly, how they are linked to disciplinary practices (including heavy fines and summary arrests) to enforce social isolation recommendations. The third section explores the social and political concerns regarding the emergence of surveillant assemblages, analyzing how data protection activists are reacting to unregulated pandemic control strategies. Technologies might mitigate the spread of the virus but, as we argue in this section, there needs to be more transparency and accountability around their implementation, use, and ramifications. Promises of techno-solutions to the pandemic must be balanced with public awareness about their accuracy, biases, and limits.

2. The apparatus of social isolation and self-care

The state of São Paulo registered its first COVID-19 infection on February 26th, roughly three months after the disease was identified in Wuhan, China. The 61-year-old man was isolated while authorities attempted to track his previous contacts and monitor potential contagions. Initial efforts, however, proved insufficient to prevent local spread of the virus. Four weeks after "patient zero", the state had already registered about fourteen thousand cases in 228 cities and more than one thousand deaths. The capital of São Paulo alone, a metropolis with a population of 12 million people, is responsible for 68% of infections, making it the epicenter of the pandemic in Brazil (Governo do Estado de São Paulo, 2020).[4] In response to the widespread disease, João Dória Jr., the governor, declared a state of public calamity, expanding executive powers over state budget and centralizing public information and decisions in a crisis cabinet under his authority.

Local pandemic control measures encompassed redirecting emergency funds to the purchase of PPEs, assembling three makeshift hospitals for COVID-19 patients, importing tests, and suspending every non-essential service, effectively closing most commerce, parks, and schools. In parallel, public authorities also invested in massive public health campaigns advising people to avoid social activities, stay at home, and adopt meticulous personal hygiene routines. Such measures were in accordance with WHO's list of best health emergency preparedness practices, which advocated physical isolation to disrupt transmission chains. As Michael Ryan, WHO's director of the Health Emergencies Programme, explained:

> "[T]here are a toolkit of measures that can be taken to deal with this virus. […] [But] when the disease has reached a certain level, especially in community transmission, and it's no longer possible to identify all the cases or all of the contacts then you move to separating everybody from everybody else. You create physical distance between everybody because you don't know exactly who might have the virus" (WHO, 2020b).

Multiple countries adopted similar recommendations on social distancing and contact tracing, imposing emergency social isolation laws and developing a myriad of digital devices to monitor people's interactions. In São Paulo, health authorities have turned to private companies to collect data and establish virus transmission chains, to track individuals who might have been infected, to identify mass gatherings, and, finally, to design predictive models of future outbreaks.

Not surprisingly, controversies over privacy rights and bio-surveillance followed government attempts to scale up social control amid the pandemic. Agamben (2020), for one, warned of the perils of authoritarian oppression stemming from "frantic, irrational, and absolutely unwarranted emergency measures adopted for a supposed epidemic of coronavirus". Byung-Chul Han (2020) pointed out that decisions to close borders and ramp up digital surveillance were based on disproportionate fears of the virus. Naomi Klein (2020) also addressed the issue through the prism of exception and rupture. For her, we are currently living under a "pandemic shock doctrine", which will catalyze radical free market policies. David Harvey (2020) contributed with a similar note, raising awareness to the risk of sitting leaders declaring "imperial presidencies to save capital". In short, many authors described

[1] State responses to the pandemic have since changed. In June, the government launched a plan to move from contagion suppression measures to a strategy of mitigation, which meant that the monitoring of agglomerations and the social isolation index became decentralized. However, both tools remained active, raising concerns about the long-lasting effects of Covid-19 surveillance practices.

[2] Biopolitics can be understood as a political action that aims to regulate and direct the life processes of populations (Lemke 2018, p. 2). Arising from health and technoscientific knowledge, it can be conceived as "the entry of phenomena peculiar to the life of the human species into the order of knowledge and power, into the sphere of political techniques" (Foucault 1978, pp. 141–142). Life, thus, becomes an intelligible and commensurable object, related to population management.

[3] While the field of critical health security has emphasized the problems of securitizing pandemic control strategies (see Wenham, 2019), Elbe (2011) advanced a Foucauldian approach to security in which he claims that the influence of militarized discourses and practices in medical contexts is only one side of the process. That is, security has also been medicalized. From his perspective, medicalization supports the underlying rationale of government, whose goal is "the conduct of conducts" or the power to act on the actions of others (i.e. inducing healthy habits and disease-prevention policies), filtering out those who pose risks (the infected, the criminal, the abnormal) and producing social order.

[4] On December 14, 2020, the state of São Paulo registered nearly 1.4 million infections and more than 44 thousand deaths. Official statistics are available at: https://www.seade.gov.br/coronavirus/.

state responses to COVID-19 as attempts to frame health emergencies as existential threats, thus gathering support for draconian reactions. As different as they might be, these standpoints share a perception that liberty and freedom are at risk since "wartime" responses to the pandemic jeopardize well-being and democracy (Mudde, 2020).

Against the "state of exception" argument, many commentators have contextualized initially feeble responses to the virus, especially in the US, Brazil and the UK, as enactments of neoliberal necropolitics, claiming that economically vulnerable populations, those on the fringes of capitalism, would also be the most affected by the disease (Diniz & Carino, 2020; Purnell, 2020). In this context, to act normally and avoid extreme reactions were not real options, at least not for those willing to flatten the infection curve. As Panagiotis Sotiris (2020) puts it, bare life is "closer to the pensioner on a waiting list for a respirator or an ICU bed, because of a collapsed health system, than the intellectual having to do with the practicalities of quarantine measures".

Although critical scholars have been prolific in raising awareness of the securitized politics of pandemic eradication, contemporary practices of population control are much more ambivalent and entangled than the above debates might indicate. State responses are not limited to lockdowns and mobility control; they also comprise massive investments in public health infrastructure and prophylactic attempts at disrupting transmission chains. As we will discuss below, individual conduct and preventive social control policies have effectively coalesced, forming a hybrid pandemic-response assemblage, which also comprises health professionals, security agents, surveillance devices, private companies, international institutions, and local policy makers.

As Foucault (2015), Murphy and Whitty (2009), Elbe (2011), and others have shown this heterogeneous apparatus is hardly an exception. The birth of modern medicine in the 19th century already encompassed articulations between police, sanitary and demographic registries, and statistics. Public health policies and security practices were intertwined in the strategies to control growing urban populations. Also, "health emergency preparedness", as promoted by the WHO for decades, already involved both techniques of body surveillance and collective forms of intervention and regulatory controls (Sanford, Polzer & McDonough, 2016). However, while many scholars have taken up Foucault's much cited analysis on leprosy and the plague to discuss present responses to the virus in terms of the power to exclude or to confine and discipline,[5] we argue that social isolation policies in São Paulo do not equate to a securitized dystopia in which "governments, advised by physicians, impose pandemic dictatorship on entire populations" (Sarasin, 2020).

Following the executive decree of a state of public calamity, non-essential services were obliged to shut doors and major gatherings were prohibited. However, social distancing, despite being closely monitored, remained mostly voluntary. There were very few cases of police repression and, to date, local authorities seem to prefer media campaigns about personal care to the use of force. In this sense, São Paulo witnessed an unstable and contingent juxtaposition of different social control techniques, which might better be described as a governmentality of the pandemic, in which the police takes part but the main "instruments of government […] become diverse tactics rather than laws" (Foucault, 2007, p. 99). In parallel to threats of repression and actual surveillance, responses to COVID-19 were aimed at developing self-care awareness and collective solidarity, as well as educating people to identify symptoms of infection and make informed decisions about whether to leave their homes or not.

For Foucault, governmentality is a form of population management, based on statistics, economic rules, and discourses of health, which targets people's interactions and mobilities. In this sense, governmentality acts in the interstices of the government of self and the government of others, in which the orientation of personal conduct and knowledge about the human body are mobilized as techniques for population control. Foucault explains this process as follows:

"the principle of care of oneself became rather general in scope. The precept according to which one must give attention to oneself was in any case an imperative that circulated among a number of different doctrines. It also took the form of an attitude, a mode of behavior; it became instilled in ways of living; it evolved into procedures, practices, and formulas that people reflected on, developed, perfected, and taught. It thus came to constitute a social practice, giving rise to relationships between individuals, to exchanges and communications, and at times even to institutions. And it gave rise, finally, to a certain mode of knowledge and to the elaboration of a science" (Foucault, 1986, pp. 44/45).

Personal conducts, then, are inscribed in the broader governmental strategy of population control. Individual behaviors are constituted by "technologies of the self", or "techniques that permit individuals to affect a certain number of operations on their bodies, souls, thoughts, and so on, to transform themselves in order to attain a certain desired state" (Lemke, 2012). These technologies enable more pervasive, yet smooth and adaptable, exercises of control, which face much less resistance than outright coercion. Thus, the notion of governmentality, by articulating notions of risk management, security, individual conduct, aims to tutor and organize groups of people and personal behaviors.

By that reasoning, social isolation policies in São Paulo can be thought of as governmental techniques. They introduce precautionary rationalities in which self-care is generalized as a safety device within the social body. Since physical interactions are the cause of contagion, individuals' mobility and hygiene routines produce collective effects on public health security. In response, viral suppression measures juxtaposed disciplinary practices (individualized, normative) with the biopolitics of population control (crowd management and surveillance).

Next, we engage with two techniques of control that have been central to São Paulo's governmentality of the pandemic: the creation of a social isolation index and the sociotechnical surveillance devices used by state authorities to monitor people's adherence to lockdown recommendations. Such techniques brought together public and private players and mobilized medical and security knowledge around governing conducts and mobilities. As we will see, the governmentality of the pandemic encompassed threats of repressive actions, campaigns of persuasion, political disputes, and controversies over privacy and intrusiveness. Given this context, we argue that the social isolation index mediates between disciplinary and biopolitical practices.

3. In pursuit of metrics: The public-private assemblages for monitoring isolation

Local authorities had been monitoring risks of COVID-19 infections in São Paulo since January, but contingency plans were only made public in late February, when initial outbreaks were confirmed. The state government then imposed a lockdown and assembled a crisis cabinet composed of technical departments, security agencies, and municipal authorities. The cabinet occupies a well-appointed control room close to the governor's office and has since become the main source of information for both state officials and the media. Equipped with scanning software, multiple communication devices, and digital platforms, the cabinet gathers data from public and private institutions in order to build situational awareness about the pandemic. Projected in a line-up of screens, several dashboards aggregate information about the number of infections, ICU occupancy rates, test distribution, critical infrastructure, real-time camera feeds, and contagion forecasts (Ghirotto, 2020). In this multi-stakeholder operational environment, authorities aim to break the chains of contagion with more efficient resource management. In practice, this means monitoring social adherence to health security measures.

[5] Foucault (2003) describes disciplinary medical measures for social control, differentiating isolation against leprosy (a preventive form based on total exclusion) from confinement practices during the plague (where even if restrictive circulation is mandatory, it is portrayed as an inclusion, meaning that it allows permanent monitoring of individual health and relationships among residents).

In this context, state officials approached private companies to develop social distancing indicators and maps of urban mobility and variation in demographic densities. These partnerships resulted in two main surveillance tools, the Smart Monitoring System (SIMI-SP) and Inloco's Social Isolation Index (SII).[6] Both digital platforms allow task forces to check whether risk groups follow lockdown policies and to flag outbreak hotspots. As such, they are valuable tools to assess government actions on a daily basis. Most importantly, they guide resource allocation by indicating where the police and sanitary authorities need to focus next.

SIMI-SP was designed by local cell phone providers and relies on the regular collection of data by telecom antennas to produce structured databases of urban flows and heat maps of mass gatherings. As people move around the city, their cell phones connect to various broadcast spots, leaving records of data transmission in different neighborhoods. Specifically, the system geo-references every cell phone position between 10 p.m. and 2 a.m. to infer where individuals spent the night. The next day, if any data was captured by antennas more than 200 m away from the initial site, SIMI-SP assumes the individual did not follow lockdown rules (Gomes, 2020a). The government says that it only accesses anonymized data and cannot visualize heat maps in real-time. Telecom antennas aggregate information collected on the previous day and erase the actual time frames before feeding the system, so the digital maps only display average rates of mobility and isolation in different neighborhoods, as demonstrated in Fig. 1 below.

Inloco's solution has a different architecture. SII collects data through a code embedded in the smartphone applications of partner companies, which mostly consist of banks, retail stores, telecoms, and fintechs.[7] By accepting the terms of service of the applications, customers agree to have their geolocation information used for other purposes, such as digital address validation, target advertising, and population mobility indices. According to Inloco, its database comprises about 60 million smartphones (four million in the city of São Paulo) (Inloco, 2020). In order to build its mapping service, data is extracted from different sensors, including GPS, Wi-Fi connections, Bluetooth-LE, cell phone signals, and activity recognition. Whereas other companies stick to GPS signals or cell phone antennas, Inloco's myriad sources allegedly enable them to provide more precise geolocations. The social isolation index is calculated by tracking individual users' mobility data, which are later anonymized and aggregated, so public authorities are only presented a percentage of lockdown abiders in different neighborhoods, as represented in Fig. 2 below.[8]

Health authorities struggle to convince citizens of the need to respect social distancing, so SIMI-SP's and Inloco's heatmaps not only guide their responses but help in performing the pandemic to the public (Lynch, 1985). Digital interfaces provide valuable illustrations of infection risks. Maps, diagrams, and graphs make the hitherto invisible virus easily accessible, so the palpable consequences of the disease become suitable for state intervention. Furthermore, indices, as social measurement processes, have the attribute of simplifying observed facts by transforming qualities into quantities, and differences into comparable magnitudes (Espeland and Stevens, 1998, p. 316). In short, these representations are objects as well as tools of power relations. By abstracting and reducing complexities, both heatmaps and indices turn social isolation into a continuum, which contributes to depict mass gatherings and spatial mobility as unwelcome/undesirable behaviors to be socially (and potentially normatively) sanctioned. While these technologies indicate the effectiveness of social isolation and the possibility of loosening lockdown rules, they also act upon the population's fear, stimulating self-preservation as a means of collective care and solidarity. As Porter notes:

> "Numbers alone never provide enough information to make detailed decisions […]. Their highest purpose is to instill an ethic. Measures of […] achievement in general succeed to the degree they become […] 'technologies of the soul.' They provide legitimacy for administrative actions, in large part because they provide standards against which people judge themselves" (Porter, 1998, p. 45).

Also, practices around technologies do not necessarily follow the script. They are creatively and situationally redefined. In this sense, they comprise a contingent and heterogeneous governmentality of the pandemic which consists of three emerging (and overlapping) techniques of control: educational campaigns for improved personal hygiene, incentives for individuals to inform authorities on others' undesirable behavior, and straightforward police repression.

In spatializing and communicating threats, the government expects to educate the population on the need to change everyday habits. In addition to media campaigns, local authorities send SMS messages on potential outbreaks to residents of neighborhoods where people are not upholding social distancing. Those who live in risky areas (where infections are concentrated) also receive customized messages about hygiene precautions. State and municipal authorities have even used cars with sound systems to make announcements about personal safety in urban peripheries. As Patrícia Ellen, state secretary for economic development, science and technology, declared, government containment strategies are ineffective without people's cooperation, so SIMI-SP and SII are key political tools of persuasion. In her words, "we must have at least a 60% isolation rate so we can control the curve [of the spread] of the virus. The government cannot cope with it alone, and we have lives on the line. This technology is at the people's service. The data that we have is also accessible for you [the media] to follow the results and evaluate our actions" (Balanço Geral, 2020, [Translation]).

How citizens inform authorities about flagrant cases of disrespect for lockdown rules is another expression of the normalizing apparatus. In 2017, the municipal department of public safety developed a platform so people could notify public services of cases of urban disorder. SP + Segura, as the mobile application was named, registers different sorts of incidents, ranging from security issues to fallen trees.[9] During the pandemic, however, the platform became a mediator for horizontal surveillance of undesirable/unhealthy behaviors. In other words, citizens have been exercising their normalizing gaze through SP + Segura. We observed that it has been used to alert authorities about public gatherings, markets that do not follow hygiene recommendations (i.e. employees without masks and gloves), non-essential commerce that insists on keeping doors open, bars that deceive sanitary authorities by claiming to be markets, private parties, and all sorts of unwelcome behaviors that might put society at risk.

Finally, the third control technique is police repression. After experiencing high isolation rates in the first weeks of the lockdown, the SII and SIMI-SP began to alert of increasing mobility and gatherings. In response, the state government acted on another aspect of the

[6] Inloco is a Recife-based technology company focused on location data analysis as a means for targeted advertising and consumer profiling.

[7] Analyzing the data sources, it is highly probable that their data sample is biased towards mid- and high income consumers (Queiroz et al., 2020).

[8] It is not yet clear whether the data analyzed is compared on a longitudinal basis (such as patterns of user mobility before and after the lockdown or just by relative signal immobility. Regarding its pandemic-specific products, Inloco offers the public sector a wide range of mapping and tracking programs: a) integrating its code to office services applications to generate input for social isolation metrics, monitor "risk areas", and provide a direct communication channel with its users; b) mobility analysis through health and essential services; c) mobility index by neighborhood/state; d) social isolation index per residence (clustered by neighborhood); e) social isolation and mobility indices for academic research; f) journey analysis; and g) mass gathering heatmaps (Moura and Ferraz, 2020).

[9] Its name can be roughly translated as São Paulo + Safe. For a longer description of its functions and a debate on its impacts on the São Paulo security assemblage, see Peron and Alvarez (2019).

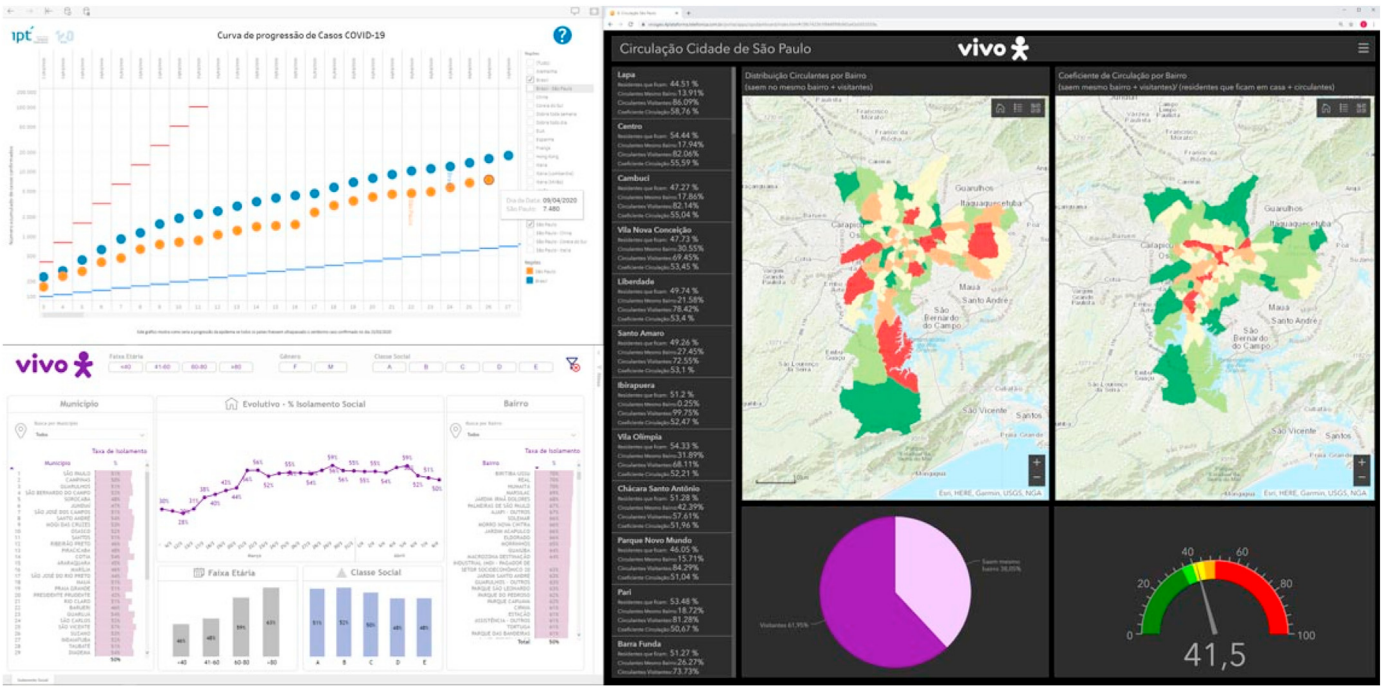

Fig. 1. SIMI-SP's dashboard, including curves of infections and mobility rates in different neighbourhoods (source: Tunes, 2020).

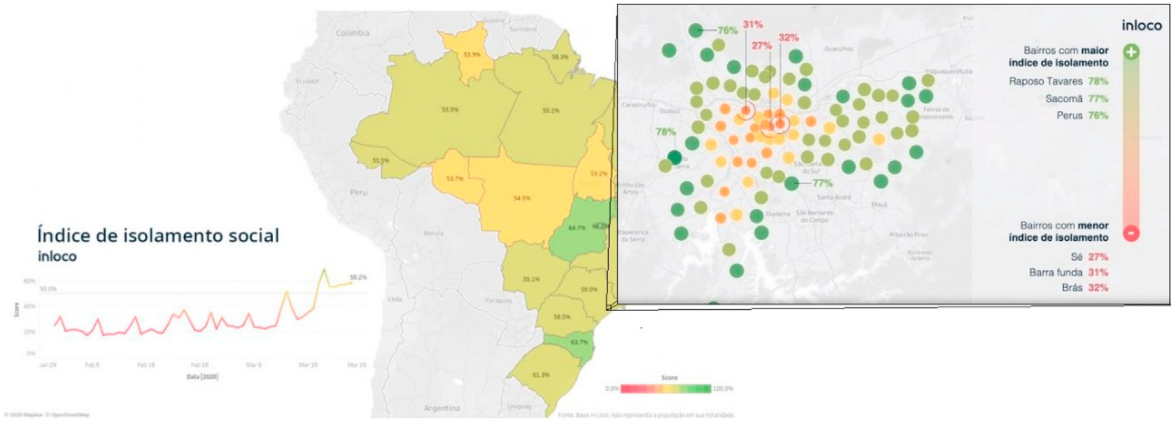

Fig. 2. InLoco's social isolation index (graph and map) (source:R7, 2020).

governmentality of the pandemic and informed that severe measures would be taken against those who broke the rules, which meant heavy fines and up to 18-month prison sentences. In the governor's words:

> "If we don't take isolation rates from 50% to more than 60%, and move towards 70% in the next week, […] [public authorities] will take more rigid measures. I wanted to avoid that, because it means people will receive official warnings, fines, and may even be arrested. People must be conscious about the situation we're in. […] People must be responsible and we're monitoring that with the cell phones. [..] I hope we don't need to reach that level [of repression], but if we have to do it we'll do it in defense of life" (Pauluze & Trindade, 2020 [Translation]).

These disciplinary measures are provided for by the state decree of calamity, which lists a few instruments to enforce social isolation. Indeed, the police were already being used to disperse parties in public places and to close non-essential commerce, but arrests were few and far between. It was not yet clear, however, what the governor's threats would entail. Although data on lockdown-related police operations is not available, the media has not reported an upsurge in arrests and the news is limited to occasional altercations between police officers and individuals who resist requests to leave public parks or to close local bars (Chagas, 2020). As we will see below, the governor's statement was also met with skepticism by the police.

Despite claims that the pandemic surveillance apparatus is essential to manage public resources and effectively control the virus, local authorities and private companies have been criticized for stepping up their monitoring capacities. Anticipating controversies about customer privacy, the cell phone companies that designed SIMI-SP argued that their database is "non-intrusive" since it cannot be used to identify and track individuals. According to Sinditelebrasil, a syndicate of private media companies, public authorities cannot reverse the anonymization process, so they have no access to the customer's gender, name, or phone number: "It's only statistics. It's like you go to a metro turnstile. People will see you passing through and the turnstile will only register the number of people. At the end of each day, station managers check the turnstile and know how many people passed through. […] It's impossible to reverse [i.e. deanonymize]. There's no way to see who passed through the

turnstile; you only know that someone did" (Gomes, 2020c [Translation]). Furthermore, the databases offered to local authorities under a pro-bono agreement are not unprecedented. On the contrary, the companies already collect aggregate data on cell phone positions in order to improve their services and make profit selling them in the data market, as confirmed by one of the telecoms' vice president for data and AI: "In the past five years we have invested in big data and artificial intelligence to improve customer experience. So, when the pandemic came, we built applications to help in the fight" (Mello, 2020 [Translation]).

Inloco also dismissed accusations of privacy breaches and emphasized that São Paulo is going through a crisis, which requires coordination between public and private players so health professionals may have the best technology and information at their disposal. Inloco's head of data privacy stressed that the company could protect individuals' identity while also providing public authorities with statistics, maps, and other helpful representations of urban mobility. The company adopts a "privacy by design" approach, which means that neither their programmers nor public officials have access to identifiable personal information. Identifiers in each smartphone (IMEI and MAC codes) and customer accounts or documents (e-mail, phone number, ID registers, etc.) are not collected. Inloco also ensures that, even during the pandemic, it has not integrated different databases nor triangulated information to identify individual users. So, there is no need to be caught in the privacy vs. security trade-off. As the company explained:

"During a calamity, many rights are relativized, norms become more flexible and all the efforts must be directed to saving as many lives as we can. However, the 'Sophie's choice' should not be about 'pandemic control vs. privacy', with the risk of inducting arbitrary governments. More than ever, discussions about privacy, widely debated before the pandemic, should stay under the spotlight" (Moura and Ferraz, 2020, p. 5 [Translation]).

Despite the justifications noted above and government claims about the relevance of surveillance platforms to the virus containment strategy, privacy watchdogs insist that companies should have asked users whether they were willing to surrender personal data to the government before implementing the systems (Bioni et al., 2020). We did not find judicial claims mentioning Inloco, but many customers opened litigations against the telecoms and managed to get their numbers out of SIMI-SP's monitoring list (Gomes, 2020a). At least one lawyer had a request for collective *habeas corpus*, which would stall monitoring and prevent private companies from further transferring personal data to public authorities, denied by federal courts (Gomes, 2020a). Others developed and shared inventive ways to elude surveillance and to avoid tracking on social media. A similar solution for monitoring social isolation rates on a national level was blocked by the president, who criticized São Paulo's attempts to reduce individual freedom and claimed privacy risks should be better assessed before setting up such systems.

Federal and state governments have adopted radically different stances towards the pandemic. While the governor of São Paulo blamed President Bolsonaro for "politicizing the virus" (Dória, 2020), the president has taken sides with local businessmen who claim lockdowns cause severe economic damage. Despite the growing death toll, Bolsonaro has repeatedly downplayed the consequences of COVID-19, which he calls "just a minor flu", and he advised governor Dória that "the treatment should not be worse than the disease" (Bolsonaro, 2020). Interestingly, his position resonates within the São Paulo police. The Association of Military Police Officers of São Paulo (Defenda PM), for example, has publicly antagonized the governor. From their perspective, social isolation is a suggestion, not an order, so the police should not be deployed to arrest citizens who choose not to follow the lockdown. Furthermore, retired police colonel Elias Miler, the president of Defenda PM, declared state attempts to prevent people's mobility to be against the constitution. For him, the governor's threats were "truculent, arbitrary and configure misfeasance" (Miler, 2020). As the reduced number of arrests might indicate, these disputes have jeopardized the capacity of the state to enforce social isolation and seem to have contributed to undermine further disciplinary measures.

While the governor maintains that current monitoring practices are in accordance with national laws on telecommunications, the Civil Rights Framework for the Internet and criminal law, there are at least three issues to be raised. The first concern is transparency. São Paulo follows the spread of the virus from within the crisis cabinet, which has direct contact with the media to broadcast relevant information. However, to date, transparency has been synonymous with official statistics and not much more. Scholars have limited access to control rooms and struggle to understand their surveillance architecture. Since most devices were designed by private companies, even members of public security institutions have restricted access to digital platforms and limited knowledge about how infection rates and other statistics are produced. We contacted many professionals placed in public institutions with experience in digital technologies and georeferencing (including the police), but none of them could tell us much about what happens inside the crisis cabinet.

The second concern refers to practices of anonymization. Cyber security specialists often argue that there is no anonymous data per se, only a successful or unsuccessful process of anonymization in which specific information is generalized and a few data entries are discarded. Although anonymization is hardly an irreversible process, public and private data holders can make this a lengthy and costly endeavor for those trying to identify individuals in a database. So, it is not enough to erase names and phone numbers, as Inloco seems to suggest. Data analysts must ensure that other data sources cannot be used to triangulate personal information and deanonymize individuals. This is exactly what an investigative reporter did with the supposedly anonymous data collected by telecoms (Dias, 2020). Using information from social media, the reporter managed to identify a few names in a database that is similar to the one used in SIMI-SP. Interestingly, none of these individuals knew their data was collected and used for purposes other than telecom service.

The last issue is that recently introduced monitoring capabilities were not developed from a blank slate, but rather built on previous surveillance practices and rationales. For example, in 2014 state authorities launched a digital platform aimed at mapping crimes in São Paulo in order to improve police patrols and investigations and to provide information to crime control strategies in general. The platform was called the "intelligent monitoring system" and offered security professionals detailed representations of aggregated crime data, so police officers could identify crime patterns in specific neighborhoods and react accordingly. This system was later connected to video-monitoring devices, which allowed operators to trace suspects and produce real-time alerts about potential crimes. Despite claims that SIMI-SP and SII will be discontinued after the pandemic, the recent history of surveillance teaches us that society should be alert to future articulations between data on urban mobility, gatherings, and other security monitoring systems. The governmentality of the pandemic might have durable effects on surveillance assemblages.

4. Equating privacy and proportionality under the pandemic

The control of circulation in the pandemic operates from the articulation between safety protocols and recommendations, medical knowledge, and fundamentally, surveillance and monitoring systems, which can prove to be highly intrusive. Isolation monitoring and contact tracing projects similar to SIMI have been adopted worldwide. In the United Kingdom and the USA, cellular data collection systems previously used for commercial purposes have been reactivated to monitor the circulation of people (Kelion, 2020). In mid-March of this year, Google made a platform available making it possible to evaluate the degree of isolation and the dynamics of the mobility of people in numerous cities in various countries. Known as the Google COVID-19 Mobility Report, it pinpoints the trajectory of people in points of interest, such as home, work, school, leisure areas, etc., based on the collection of GPS data from cellular applications. Thus, although quite effective as a social isolation monitoring

system, the platform shows the extent and breadth of the data collected from individuals. Also, in April, Google and Apple announced the development of a contact tracing application via Bluetooth that captures contact networks and alerts the user if they have been with someone infected by the coronavirus (Romm et al., 2020). However, examples like that of Israel call attention to the potential for arbitrary uses of these monitoring systems. At the beginning of the pandemic, the Israel Security Agency (Shin Bet) developed a system to monitor agglomerations in the streets, which was capable of measuring the duration of contacts between people and was supposed to assist in managing isolation and distancing, but, as experts pointed out, would have a potential future use for acting on demonstrations and for the persecution of alleged terrorists (Bateman, 2020; Privacy, 2020).

In this sense, not only in Brazil, but in the rest of the world as well, a dilemma arises concerning the monitoring practices that underlie isolation and mobility control policies. Although effective and decisive for ensuring circulation monitoring, preventing the spread of the disease, these systems are extremely intrusive and enable the abrupt expansion of state and private capabilities for the collection of individual data. These practices, if not adequately supported by legal safeguards and duly observed by civil organizations, could end up equipping security forces to promote intrusive forms of policing and control. This, by the way, is Han's (2020) argument, which, in evaluating how, in the absence of a critical perspective on data protection and privacy, China used a series of extremely intrusive surveillance and monitoring devices, foresees the possibility of several other countries adopting such technologies without safeguards and configuring true police states.[10]

Recently, researchers at the Swiss Federal Institute of Technology published an article in the Lancet that lists the various ethical dilemmas arising from the use of systems comprising different digital tools for data collection, processing, and monitoring during the pandemic. In the study, the authors recognize the importance of big data apparatus for pandemic control, but also understand that they incur a series of risks (to security, precision, etc.) if not properly safeguarded. For example, the authors understand that technologies described as "Flow Modeling", which analyze the movements of people in defined regions using mechanics close to those of SIMI, must be evaluated based on principles of non-discrimination and prevention of digital inequality, in addition to being susceptible to ethical principles of privacy, such as transparency, and consent to data collection (Gasser et al., 2020, p. 427).

Far from being an excessive concern, several entities and researchers have pointed out the harmful effects of surveillance and monitoring systems on security management at a global level. On the one hand, these studies indicate that monitoring and surveillance systems based on mass data collection can legitimize over-policing of certain groups, sustain forms of segregation, and promote racial bias in police actions (Garvie et al., 2016; Benjamin, 2019; Peron and Alvarez, 2019). This dilemma is aggravated, since pandemic management goes beyond ordinary monitoring, and once declared, it often requires rapid and exceptional measures from political elites (Prescott, 2007). They elude the traditional democratic decision-making process. Thus, an epidemic outbreak should be met with legal preparedness for a public health emergency, which "is all about having the right laws in place and then using them in the right way in a time of public health emergency (…) it is both proactive and reactive" (Murphy and Whitty, 2009, p. 220). Which means that, in the context of a pandemic like COVID-19, which spreads rapidly, legal measures, safeguards, and civil society itself may not have been adequately mobilized to observe these systems and ensure their use in a competent and organized manner. Here, for example is the alert issued by the United Nations Human Rights office, "(…) we are aware of growing use of tools of surveillance technology to track the spread of the coronavirus. While we understand and support the need for active efforts to confront the pandemic, it is also crucial that such tools be limited in use, both in terms of purpose and time, and that individual rights to privacy, non-discrimination, the protection of journalistic sources and other freedoms be rigorously protected" (UNHR, 2020).

In this sense, seeking to mitigate surveillance creep and prevent intrusive monitoring practices from taking hold after the crisis, several organizations around the world have written manifestos and debated legal alternatives. A joint statement from several civil society organizations noted that "the COVID-19 pandemic is a global public health emergency that requires a coordinated and large-scale response by governments worldwide. However, States' efforts to contain the virus must not be used as a cover to usher in a new era of greatly expanded systems of invasive digital surveillance" (amleh, Access Now, African Declaration on Internet Rights and Freedoms Coalition, AI Now, Algorithm Watch, Alternatif Bilisim, Amnesty Internationa, 2020). Several institutions, inter-/transnational organisms, and research institutes have resorted to data protection regulations in the USA and in Europe to regulate the use of these technologies, pointing out privacy and security issues (McClellan et al., 2020, p. 09) and the importance of ensuring the observance of all data protection measures (Fortuna, 2020).

Strictly speaking, these civil society and governmental sector movements can be seen as ways to produce resistance. When Foucault describes the mechanics and techniques through which power flows, it must be said that every form of the exercise of power corresponds to the production of resistance by those who become subject to it. As the author makes clear, the correlations of power do not exist without a multiplicity of points of friction, that is, of several points of refusal that can take the most varied forms, violent, mild, open to compromise or irreconcilable. They may not even be marked as something negative, but as a kind of relentless interlocutor; almost never as a radical break, but as moving and transitory points that are inscribed in bodies and in positions as points of non-subjugation (Foucault, 1978, pp. 95–96). This is, therefore, a notion that encompasses the dynamics of the control, monitoring, and governing of circulation during the pandemic.

In the case of power relations built by the establishing the pandemic government that we analyzed, several civil organizations act as resistance in different social spheres.[11] Choosing the legal field as the stage for dispute and the production of clarifications, these organizations resist the perpetuation and amplification of the control model that is established, producing alerts and notifications about the risks of indiscriminate surveillance and monitoring, more detailed research on these risks, and developing legal principles that guide the authorities in making decisions about the use of these systems. In Brazil, organizations such as Data Privacy, Internet Lab and the Internet Steering Committee (Comitê Gestor da Internet, CGI) pioneered the clarification of some principles to which the owners of these data technologies must adhere in order to prevent improper, prolonged and excessive use (Bioni et al., 2020). These organizations resisted through consensus building and proposed principles for managing limits on the use of these surveillance and monitoring systems, which were derived from the recently approved Law 13, 709/2018, the General Data Protection Law (LGPD). To a large extent, their action was not based on the denial of surveillance and monitoring

[10] This is not an exaggerated speculation. In a current example, the commissioner of the Minnesota Department of Public Safety stated that contact tracing systems were used in the arrests of demonstrators in the USA (See:https://twitter.com/NBCNews/status/1266758240018276352).

[11] There is strong organization among popular and peripheral movements and media collectives in the sense of strengthening solidarity networks to confront the pandemic, create awareness about the disease, and produce information. The poor quality of information about circulation, contamination and deaths in the peripheries and *favelas* is seen as part of a broader process of neglect and necropolitics and is the main issue raised about surveillance and the governing of populations to be considered (compiled from texts, studies, manifestos and initiatives produced by peripheral communities available on WikiFavelas: <https://wikifavelas.com.br/index.php?title=An%C3%A1lises_e_propostas_sobre_a_realidade_do_coronav%C3%ADrus_nas_favelas> Last access: December 16, 2020).

during the pandemic; on the contrary, they advocated the possibility of responsible monitoring dynamics guided by principles and limits, as we will see below.

These organizations are made up of experts and researchers who analyze, propose dialogs and solutions, and disseminate data protection information. Their activism has been decisive in the debates that led to approval of the Civil Rights Framework for the Internet (Marco Civil da Internet), Brazilian legislation that establishes jurisdiction over the internet, as well as the LGPD (that establishes principles and rules for data management in Brazil). In this way, since the onset of the pandemic in Brazil, these organizations have been mobilizing in the face of the use of surveillance and monitoring systems during the pandemic. For example, in April, "Datocracy", a podcast by Data Privacy, proposed a debate about the responsible use of data to combat the coronavirus in which they explored Inloco's activities in the city of Recife and the state of São Paulo, demanding greater transparency in the management of personal data (Data Privacy, 2020).

In the same month of April, Internet Lab launched a study on the risks resulting from the use of applications developed by government authorities at several federal levels to monitor and track COVID-19, based on criteria such as user consent, necessity (if the data collected are the minimum for the functionality), transparency (if the application has a clear privacy policy), and security (if the data are kept securely). In its analysis, it was clear that those applications were open to elevated risks of unnecessary data exposure, in addition to medium severity data transparency and security issues.

The report *Privacidade e Pandemia: Recomendações para o uso legítimo de dados no combate à Covid-19* (Privacy and the Pandemic: Recommendations for the legitimate use of data in the fight against COVID-19), by Data Privacy Brasil, proposed a more consistent line of resistance to the indiscriminate use of monitoring systems. In it, the authors seek to present a series of principles and recommendations for the development of policies for the sharing of personal data between the public and private sectors, within the context of the International Health Regulations, based on the LGPD. The report presents general legal guidelines with information about the decision processes applied in the protection of personal data in technological systems used during the pandemic. Among these principles, the following stand out: a) clear motivation and evidence that proves the efficient use of personal data; b) the existence of legal provisions and a contractual instrument; c) definition of a purpose; d) minimization, i.e., a guarantee that only the data strictly necessary to accomplish the objective will be collected; e) definition of a life cycle for data disposal; f) guarantees of (pseudo)anonymization of the data; g) guaranteed data security; h) guarantees of open code and transparency of audit process and public scrutiny procedures (Bioni et al., 2020).

What is evident in this report and in the other publications listed is that transparency must be a general value governing the use of data-intensive technologies. The excerpt below shows how the intent is not to deny or ban these modes of surveillance and monitoring, but rather to suggest safeguards that ensure their effectiveness and prevent indiscriminate use. Thus, a responsible surveillance model advocated by experts worldwide is proposed (Biddle, 2020).

> "If the recommended data protection principles and best practices are internalized and well implemented, the likelihood of efficiency of these measures will increase while ensuring their legitimacy, in addition to enjoying greater trust on the part of society. The use of personal data is just one of the measures to contain the pandemic of COVID-19, which must be conceived as such so that it is, in fact, a measure of containment and not of increasing the damage experienced by such an epidemic (…) data protection does not rival this purpose, but rather allows the State to be efficient in combating the epidemic and to do so with respect to the fundamental rights and guarantees of the population" (Bioni et al., 2020, p. 27 [Translation]).

The aforementioned principles were implemented in the evaluation of the systems adopted in São Paulo to monitor social isolation. SIMI's deployment, for instance, involved several difficulties and loopholes, failing to deliver adequate transparency. Data Privacy analysts affirmed that there is no detailed deadline for the cessation of its use. Although the government assumes that they may cease the use of SIMI at the end of the pandemic, they do not clearly state what criteria define the end of the pandemic, raising concerns about surveillance creep (Gomes, 2020b). The lack of transparency was also remarkable when conducting this study, as few players from either public or private sectors were interested in providing explanations about the implementation of the technology. As mentioned previously, The Intercept Brazil argued that although telecoms and the state affirm that geolocation data cannot be individualized, numerous loopholes that allow the identification of users were registered, exposing them to prosecution risks in a hypothetical case of (disciplinary) hardening of the social isolation policies (Dias, 2020).

Therefore, it is important to note these organizations produce a knowledge set that is deeply critical of the risks of the arbitrary and unregulated use of these monitoring systems during the pandemic and generate the necessary friction and resistance to potential forms of subjugation. At the same time, they create structures and mechanisms that make the responsible and adequately controlled execution of monitoring systems possible, setting off alerts in cases of deviant use.

Thus, although Han's (2020) concerns about the intrusive potential of monitoring technologies during the pandemic are well-founded, the increasing diffusion of a body of knowledge by activist organizations concerned with the topic has been able to produce forms of resistance. In addition to the actions of Data Privacy and Internet Lab around this issue, initiatives launched by academics and investigative journalists[12] have helped enormously in identifying and understanding the uses of monitoring technologies and practices both before and during the pandemic. As a result of social opposition, the monitoring and critical observation of these devices, which are often veiled by the cloak of technical complexity, have reframed the technology and drawn a line to effectively constrain potential authoritarianism.

5. Final remarks

Pandemics are extraordinary, multifaceted events, calling for equally intricate human intervention. The propagation of the coronavirus occurred in an age of massive data collection, with widespread availability of sensors and other informational devices, which constantly interact with our social life. Thus, it is no surprise that these informational systems were put into action to address the pandemic and enhance policy making.

As discussed above, those technologies are similar to security/surveillance tools already implemented by the police and could expand the state's capacity to monitor and manage the population. From a human rights perspective, the articulation between security practices and healthcare surveillance could violate people's privacy and hurt the principle of proportionality. Also, recent innovations deepen the articulation between public and private interests and raise some important questions. How do we guarantee that much needed data will not be used for purposes other than assisting health authorities to provide better care? How do we disentangle security and public health articulations once the pandemic is over? If, on the one hand, governments do need large swaths of data on patients, urban flows, and sites of agglomeration to track outbreaks, to understand mobility patterns, and, hopefully, to break transmission chains, on the other hand, private corporations have betrayed public trust before. Personal data collected for one purpose has been used for commercial and security initiatives without clear consent,

[12] Such as *Segurança e Monitoramentos* (Security and Monitoring) bulletin from LASInTec of the Federal University of São Paulo, the Lavits Covid-19 Newsletter from the Lavits network, and investigative journalism agencies like The Intercept Brasil and the Agência Pública.

and supposedly anonymized data has again and again been easily deanonymized.

Furthermore, in a country that still lacks robust legal data protection frameworks and that has a long history of police and military abuse, there is a real risk that surveillance technologies could be indiscriminately used by security agencies to reduce political freedom. Thus, the implementation of these technologies should be closely scrutinized and audited, considering its long-lasting effects and potentially harmful impacts on society.

CRediT authorship contribution statement

Alcides Eduardo dos Reis Peron: Supervision, Conceptualization, Investigation, Writing – original draft, Writing - review & editing. **Daniel Edler Duarte:** Conceptualization, Methodology, Investigation, Writing – original draft, Writing - review & editing. **Letícia Simões-Gomes:** Methodology, Investigation, Writing – original draft, Writing - review & editing, Visualization. **Marcelo Batista Nery:** Investigation, Writing – original draft, Writing - review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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