


Quarantines: Between Precaution and Necessity. A Look at COVID-19

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The events surrounding COVID-19, combined with the mandatory quarantines widely imposed in Asia and Europe since the virus outbreak, have reignited discussion of the balance between individual rights and liberties and public health during epidemics and pandemics. This article analyses this issue from the perspectives of precaution and necessity. There is a difficult relationship between these two seemingly opposite principles, both of which are frequently invoked in this domain. Although the precautionary principle (PP) encourages the use of quarantines, including mandatory quarantines, and associated restrictive measures, the principle of necessity (PN) puts a break on such measures. The COVID-19 pandemic reveals once again the different interrelations between these two principles. However, the alleged conflict between the PN and the PP is based on a superficial analysis. The relation between these two principles is far more complex, as this article will demonstrate.

Epidemics/Pandemics and Human Rights

Epidemics and pandemics have a long history. Measures, such as quarantines, border controls and limitations on the circulation of citizens, have been commonly used to delay the transmission of contagious diseases.

Quarantines can take place at hospitals or even at patients' private homes, enforced by cameras installed there and monitored by the authorities (Tognotti, 2013). A distinction should also be made between quarantines in which healthy people are geographically restricted (based on specific criteria, such as geographical location or effective or presumed contact with infected people) and isolation, i.e., the separation of infected people during the period in which the disease is considered transmissible (Gostin, 2003).

In the face of COVID-19, several countries have resorted to different types of quarantines and other disruptive measures.¹ Quarantines were the solution implemented in many European countries during the first wave of the pandemic. Spain and Italy were some of the most paradigmatic examples (McMurtry and Zampano, 2020). During the second wave most countries opted for less stringent measures—something in between quarantines and social distancing—since the fear of an economic disaster imposed many exceptions to the 'stay at home rule' (The Guardian, 2020). Still,

quarantines for travellers are a measure in place in many jurisdictions (Centers for Disease Control and Prevention, 2020; European Commission 2020). From all the cases involving quarantines, one stands out: China was, by far, the one imposing one of the most severe quarantines ever seen on Wuhan residents.

Some doubts have been raised over the utility of such quarantines. Parmet and Sinha (2020) argued that '[s]uch measures may also have limited efficacy with a highly contagious disease such as Covid-19' because quarantines are unable to prevent the transmission of the virus (though the authors do not provide specific examples of their inability to achieve that goal).

Nonetheless, most scholars agree that quarantines are a very useful, perhaps even indispensable, tool during epidemics (Tang *et al.*, 2020). Past experiences have shown how effective they can be in containing virus transmission (Hsieh, 2005; Tognotti, 2013). Quarantines cannot stop epidemics/pandemics immediately, but they can slow down their progression. This can provide precious time to learn more about the disease and hopefully develop a vaccine able to contain the virus.

Although quarantines are an important way to contain global health threats, they can lead to human rights violations. The most drastic quarantines in modern history have occurred in countries known for their 'difficult relationship' with human rights, as it was the case of the

quarantines imposed on HIV carriers in Cuba (Anderson, 2009). Mandatory quarantines restrict physical liberty. Thus, as with any other deprivation of liberty (jail sentence, for instance) a proper justification is required. Isolation is more easily justified, because isolated individuals are actually ill. Quarantines are more controversial, because they restrict the liberty of all individuals, many of them infected. In a 2018 paper, Giubilini *et al.* (2018: 183), stated that ‘quarantine and isolation can be justified, and indeed morally mandatory, when the expected benefit to others and to society, in terms of infectious disease prevention or limitation, outweighs the expected costs, including the moral costs of coercion and compulsion, and satisfies three further constraints’ (the paper will come back to these constraints). The authors imposed some requisites for this measure to be implemented namely that the costs suffered by people under quarantine should be small. Major human rights documents include derogations based on public health reasons (Verweij and Dawson, 2007). Articles 8 (right to respect for private and family life), 9 (freedom of thought, conscience and religion), 10 (freedom of expression) and 11 (freedom of assembly and association) of the European Convention of Human Rights allow interferences on those rights by public authorities, provided the interventions are aimed to protect specific values, health among them (the concept ‘health’ invoked by the norms also refers to public health (Pugh, 2020)). In spite of the aim to protect an arguably higher value, such measures must be proportional and necessary (Martin, 2005).² However, the legal boundaries are frequently contravened.

Mandatory quarantines, in particular, are prone to abuse (Criddle and Fox-Decent, 2012). Thus, mandatory quarantines—either 14 days quarantines of specific individuals either extended quarantines of entire populations or even countries—are the object of this analysis. Mandatory quarantines will be discussed in the context of the precautionary principle (PP) and the principle of necessity (PN), having as background the relations between public health and individual rights and liberties.³

PP Versus PN

Precautionary principle

Epidemics and pandemics are, by their nature, within the domain of the unknown. Thus, for the PP, there is a natural field of action (Martuzzi and Bertollini, 2004; Pearce, 2004).

It is commonly argued that this principle operates in domains of scientific uncertainty, as a mechanism to

identify possible risks (Degeling *et al.*, 2020: 70). In the end, all fields are characterised by scientific uncertainty, since science rarely provides full scientific certitude (Steel, 2014: 95–119). ‘Very few decisions in life are decisions under certainty; most human decisions involve some degree of uncertainty, ranging from risk to ignorance’ (Resnik, 2003: 332). Thus, it is more accurate to state that the ‘PP is intended to be applicable to cases in which the extent of scientific uncertainty is sufficiently great to make quantitative risk assessments meaningless’ (Steel, 2014: 96).

Although frequently invoked, the PP is, in itself, characterised by some uncertainty, since scholars do not agree on a univocal definition of this principle, on its assumptions and on how it works. The purpose of this paper is not to analyse every single version of the PP—they are simply too many (Sandin, 1999)—but to highlight some of their main understandings. Following the analysis of Wiener (Wiener, 2002; Wiener and Rogers, 2002) the paper will highlight three main perspectives on the PP.

In the first one, it is stated that ‘uncertainty does not justify inaction’ (Wiener, 2002: 1514–1515; Wiener and Rogers, 2002: 320, 321), that is, even in the absence of scientific certainty (about the nature and dimension of the risks) actions can be taken (it is a mere possibility). In the end, this version of the PP does not say much: it provides a ground for the action to be implemented, but there is no guidance on the exact action.

Going a step further, a more radical perspective of the PP states that ‘uncertainty justifies action’ (Wiener, 2002: 1515; Wiener and Rogers, 2002: 321), and thus when faced with unknown risks proactive measures must be implemented (an encouragement, and not merely an authorization). The problem remains, though: which measures?

An even more dramatic (more precautionary) understanding of the PP is based on the idea that ‘uncertainty requires shifting the burden and standard of proof’ (Wiener, 2002: 1515–1518; Wiener and Rogers, 2002: 321). When a practice is considered risky it shall be forbidden until the ones supporting that practice manage to fill their burden of proof, by demonstrating that it is safe enough.

In any of these understandings the PP acknowledges the existence of risks with uncertain outcomes and to circumvent those risks it takes preventive measures, even in the absence of sound scientific data. The measures implemented must, therefore, assume that there may be a margin of error in the assessment made. It is a strategy of precaution rather than reaction (Pearce, 2004), so it is crucial to act in time (Richter and Laster,

2004). As Richter and Laster (2004) pointed out, in public health, not identifying a risk that should have been identified (or, I should add, not identifying it in a timely manner), equates to negligence. This recalls the proverb ‘better safe than sorry’ (Richter and Laster, 2004).

In the case of epidemics/pandemics, the authorities are required to safeguard against the occurrence of severe public health threats (which in this paper will be considered as the ones happening in the worst case scenario), even in the absence of scientific evidence, regarding elements such as ‘individual vulnerability, quality of exposure assessment and exportability of risk estimates from a population to another’ (Martuzzi and Bertolini, 2004: 43). Under this scenario, new information is constantly coming to light. For instance, a study recently in the *Lancet* concluded that patients may retain the COVID-19 pathogen in their organism for as long as 37 days (Zhou *et al.*, 2020), during which time they may continue to be infectious. This finding could change the utility of the existing 14-day quarantine for individuals considered to be a threat. It could dictate whether a quarantine should be eliminated for being useless or extended in duration, if allowed by the PN.

When faced with the unknown (and in the beginning all epidemics and pandemics are unknown), the PP is crucial (Gostin *et al.*, 2003; Royo-Bordonada and García López, 2016). It can dictate the existence, the nature and length of quarantines in cases of doubt.

Even though the PP seems the best way to protect against risks and ultimately against harm, it is not immune to negative consequences due to the so-called ‘false positives’ (cases in which the conduct is firstly deemed risky, but than it is proven that it is not) and ‘false negatives’ (initially there seems to be no harm, but that assertion turns out to be wrong) (Page, 1978; Wiener, 2002: 1518–1521). *Prima facie*, it seems that false positives would be less concerning, under the assumption that is better to protect too much than to protect too little. This statement is based on the assumption that false positives only carry financial cost, whereas false negatives can lead to actual harm (Page, 1978: 291–202). However, false positive can also carry losses that surpass the economic domain. For instance, suppose a quarantine is imposed under the belief that a virus is a severe threat to public health, imposing strict home confinement, which in turn prevents people from doing their normal life: attending schools and jobs, visiting the hospital for routine medical appointments and even for more serious health complains, socialize with friends. Such constrictions were imposed because they were considered legitimate means to achieve an arguably higher purpose: to safeguard public health. If later on it is

concluded that the threat to public health was null or very low, one cannot simply say that there was no loss besides an economic downsize (Wiener, 2002: 1518; Wiener and Rogers, 2002: 321). Children have lost in their education and in their development as citizens; families lost incomes that in turn might have severe consequences for filling their basic needs (food, health, shelter); medical conditions went undiagnosed or unmonitored and might have developed to lethal stages; social isolation affected mental health, eventually generating domestic violence and even suicides. Therefore, in false positives it is not all about the money.

Principle of necessity

The PN is a mechanism for controlling measures able to restrict rights and liberties. This principle is a sub-dimension of the broader principle of proportionality, which can be subdivided into necessity, suitability and proportionality *stricto sensu* (Alexy, 2014; Cianciardo, 2010). Alexy (2014: 53) explained PN as follows: ‘This principle requires . . . two means [of] promoting P1 that are, broadly speaking, equally suitable. The one that interferes less intensively with P2 has to be chosen. If there exists a less intensively interfering and equally suitable means, one position can be improved at no cost to the other. Under this condition, P1 and P2, taken together, require the less intensively interfering means [to] be applied’.

The leading study of Childress *et al.* applied these principles to public health and created a guiding framework for public health measures (the so-called ‘justificatory conditions’ (Childress *et al.*, 2002: 173)):

- i. Effectiveness: it must be demonstrated that the intrusive measure will probably protect public health;
- ii. Proportionality: it is required that the public health benefits expected to be brought by the intrusive measure surpass the limitations imposed on the rights and liberties (Childress *et al.* refer to moral considerations instead, but this paper focus its analysis on rights and liberties);
- iii. Necessity: even if the measure is effective and proportionate, it must be demonstrated that a less stringent measure is not possible;
- iv. Least infringement (other authors, as Saghai (2014) talk about the ‘least restrictive measure’): it shall be established that the measure being taken is the one that causes a minor constriction to the rights potentially affected;
- v. Public justification: health care officials must provide to the general public and to the especially affected individuals the reasons motivating the

adoption of the restrictive measure. Thus, the agent imposing such measures (usually the state) has the burden of proving compliance with this principle. Childress *et al.* see the relation between ‘necessity’ and ‘least infringement’ as one of logical derivation, in the sense that the latter follows from the former (‘least infringement could plausibly be interpreted as a corollary of necessity’ (Childress *et al.*, 2002: 173)). This paper agrees with that vision. However, in the definitions provided by the authors it is difficult to see the difference between the two concepts (Allen and Selgelid, 2017). The ‘least restrictive measure’, as used by Childress *et al.*, corresponds to the concept of necessity.⁴ Likewise, in the work of Giubilini *et al.* (2018), ‘necessity’ equates to the ‘least restrictive measure’. According to the authors, three constraints must be complied with by public health measures of compulsive and coercive nature (Giubilini *et al.*, 2018: 185): (i) existence of a significant harm to be prevented or contained; (ii) preference for the least restrictive measure to achieve the purposed aim instead of more constraining measures; (iii) proportionality between the constraint caused by the public health measure and the expected benefit.

The two concepts, though correlated, are not the same. Necessity considers whether a measure is required to achieve a goal, whereas the least restrictive measure demands that the measure in place is the one that employs less coercive methods and thus has preference over the ones carrying more coercive methods.

The assessment of necessity can assume two modalities, one more demanding than the other (Grill and Dawson, 2017: 298). The more demanding one considers the restrictive measure necessary only when it is essential (in the sense that no other measure could do it) to fulfil the aim. A measure is the less intrusive one when it is not possible to take any action that would be less damaging to the rights at stake (because the alternative measure could not be implemented or would not be effective). The more flexible interpretation of the PN allows the restrictive measure to be carried out when it is more effective (even if marginally) than a less constraining alternative.

Any assessment of how restrictive a given measure is must consider the effects and duration of that measure and the ways it would affect the endangered rights (Barak, 2012). In simple terms, when several measures are available and are equally efficient to reach the target goal (in our case, to protect public health), the one chosen should be the least restrictive to individual rights and liberties (Saghai, 2014: 350).

In epidemics/pandemics, the PN intervenes from the very beginning, starting with the decision on whether to impose a quarantine (Gostin, 2001; Parmet, 2018). Despite the laudable objectives of quarantines, there are restrictions on rights to be considered. Freedom of movement is severely limited. People under quarantine may become isolated from the outside world, deprived of proper medical care, medical supplies and even necessity goods (unless a continuous flow of goods and services is guaranteed) (Sundwall, 2019). Therefore, when alternative measures can achieve the intended goal (to safeguard public health) and/or the quarantine would not achieve the intended goal, it should not be carried out. For instance, quarantines are not required for diseases whose transmission only takes place after symptoms appear. In contrast, for diseases with asymptomatic transmission, quarantines are critical (Day *et al.*, 2006). However, other authors (Parmet and Sinha, 2020) have stated that even in the latter case, if the likelihood of infection is exceedingly high, quarantines are not efficient. In sum, quarantines must be effective and indispensable.

Gostin, a reputed global health law scholar, frequently stressed the PN in his several studies of quarantines: ‘Public health authorities should resort to isolation or quarantine only if it is the least restrictive/intrusive alternative. During the first SARS outbreak, broad quarantines were justifiable because of the uncertainties of risk. If careful examination of that experience reveals that more circumscribed measures would serve the public good, more narrowly drawn quarantines would be appropriate’ (Gostin *et al.*, 2003: 3235).

Even when quarantines comply with the PN, there are other aspects to consider. They should be justified (requiring the state to clearly and transparently explain why the measure is being used). Further, the people affected by the quarantine measures should be notified (informed of the content, duration and expected effects of the measures) and able to contest the measures (the affected individuals must have legal means at their disposal to react) (Criddle and Fox-Decent, 2012).

Can Precaution Co-Exist with Necessity?

Both the PP and the PN are guiding principles in epidemics and pandemics. ‘When taken together, the precautionary principle, the least intrusive/restrictive alternative, justice and transparency, underscore the importance of using voluntary rather than coercive measures whenever possible’ (Gostin *et al.*, 2003: 3232). However, coordinating them may be challenging.

Under the PP, governments are obligated to take preventive measures to protect the health of their citizens, even if they do not have reliable evidence regarding the seriousness of the health threat, and even if many data are missing. However, they can act only insofar as necessary, to avoid placing unjustified restrictions on individual rights. Assessing necessity involves strictly considering the ability of each measure to achieve the intended goal and it requires a certain level of certainty, in the absence of which no measure can be taken. Necessity cannot be properly evaluated if the decider lacks information. Here, we face a problem, because in epidemics and pandemics there are many unknown data (leading to the PP), making it difficult to assess the necessity of the measures. The two assessments seem to be incompatible. The PP requires that actions be taken without the scientific data needed to ground them, whereas the PN limits the taking of action under the same scenario.

A way to resolve this conflict is by assessing the PN in light of the worst-case scenario considered viable given the (limited) available data (Baekkeskov, 2016; Degeling *et al.*, 2020: 76). Under this reasoning, the legitimacy (in light of the PN) of each measure must be assessed within what is expected to be the worst-case scenario, based on the (scarce) existing data at the time of the decision. When even in the worst-case scenario the PN would still advocate against taking any action, including the less restrictive one, then, no action should be taken.

It would be simplistic to say that this conclusion overrules the value of the common good (public health) in favour of private good. Public health is certainly a major value to protect, but its predominance must be assessed on a case by case basis and it might happen that the benefit from a public health perspective is not enough to justify the major costs for individual rights and liberties.

It should be recognised that there are limitations and challenges in this assessment. A major problem relates with the concept of ‘worst case scenario’. First of all, what is considered the ‘worst case scenario’ is not necessarily self-evident and it varies according with the specific experiences and values of the ones doing the assessment (Degeling *et al.*, 2020: 76).

Secondly, it also requires calculations of probabilities about the chances of such a scenario’s occurring in each particular setting (Baud *et al.*, 2020), a prediction not always easy to make. The worst-case scenario must be reasonably possible, not merely theoretically possible. That it, it must refer to an outcome whose occurrence can be demonstrated by scientific studies. Potential consequences cannot be disregarded just because there is no

certainty about their occurrence (Steele, 2006: 21). However, one thing is to have them in consideration when assessing the entire situation,⁵ another thing is to ground restrictive measures in purely theoretical hypothesis (Sandin *et al.*, 2002: 291–292). This would equate to the catastrophe principle (Sunstein, 2007). This author presents an understanding of the PP all based in the aversion of catastrophic harm, the Catastrophic Harm PP. This paper does not follow Sunstein’s thesis, but it does recover the concept of ‘worst case scenario’, thought in different terms than it was originally conceived by its supporters. Sunstein accepts ‘worst case scenarios’ with very low chances of occurrence. Instead, this paper restricts the ‘worst case scenario’ to situations considered viable (which is more than theoretically possible) based on scientific evidences (recognising that the scientific evidences available are necessarily scarce because this is a domain of scientific uncertainty). In a way, very few events have zero per cent scientific chances of occurrence (Steele, 2006: 22). For instance, even thought is very unplausible that the COVID-19 virus spreads through food (World Health Organization, 2020a), science cannot completely rule out that possibility with scientific certainty, so, it is an element to be considered in the launching of health policies. Nonetheless, such a remote hypothesis cannot serve as legitimate ground to impose a prohibition on the distribution of food products coming from areas particularly affected by the virus. Such a restrictive measure could disturb trade, undermine the economic stability of the affected area and its populations (with all the negative consequences therein derived) and deprive some people from basic food resources. As stressed by Steele (2006: 22), there must be ‘discretion in terms of which potential outcomes of an action should be taken into account’, because ‘the incorporation of far-fetched possibilities within a decision framework, in the name of representing scientific uncertainty, does not make for efficient decision making’. In the absence of a defined measure to establish the threshold below which the probability of occurrence (but see Sandin *et al.*, 2002: 292) can base restrictive measures, it all depends on the circumspection and common sense of the appraiser.

Thirdly, within the ‘worst case scenario’ difficulties may still exist in making the PP and the PN compatible. The PP is undoubtedly well-matched with the requirement of adequacy (it only cover measures deemed efficient to achieve the purposed target, otherwise the preventive aim would be lost).⁶ This paper also sustains that the PP is well-matched with the requirement of the least intrusive measure (from all the preventive policies to be adopted, the chosen one should be the less

intrusive). However, the fact remains that in light of the PP a preventive measure (the less restrictive) must be put in place. In cases where the PN allows public health interventions both principles will agree on the specific measure (the less restrictive), but there might be cases in which the PN opposes to any measure (necessity), while the PP still requires a measure (least restrictive measure).⁷ In this second hypothesis one of the principles will prevail. The point is that this should not be seen as a clash where one of the principles is sacrificed because of the other, but as a case where a weighted assessments of both principles in light of the worst-case scenario results in an ‘agreement’ by which one principle recognises that the other should take the lead.

Quarantines, Necessity and Precaution

The Decision to Impose a Quarantine

The burden of justifying a quarantine belongs to the state, which is required to prove that there is a compelling state interest (Gostin *et al.*, 1999). Needless quarantines can undermine public health by making use of scarce resources (police surveillance, for instance), required for other tasks. Moreover, it may force people to run away to escape the measure, thereby spreading the infection (Parmet, 2018) and weakening the public’s trust in the authorities.

The case of the nurse Kaci Hickox (*Kaci Hickox v. Christopher James Christie et al.*, 2:2015 cv 07647 (D N J 2015)) illustrates the tension between the PP and the PN (Miles, 2015; Gatter, 2016). The plaintiff contested the quarantine imposed on her immediately after she returned from Sierra Leone, where she had been working to combat Ebola. The defendants (the ones who ordered the quarantine) based their defence on two main arguments: (i) on some occasions the plaintiff had a fever, an indicator that she had been infected with Ebola; and (ii) even if she had not been infected, asymptomatic transmission could not be completely ruled out. This last argument was based on the PP. Gatter (2016: 7) called this an ‘abundance of caution’. Scientific studies could not entirely exclude the possibility of asymptomatic transmission (Den Boon, *et al.*, 2019; Diallo *et al.*, 2019: 219). The court considered that ‘[a] reasonable officer could have determined that, as a practical matter, no less restrictive alternatives exist[ed] in this case’ (p. 500). Thus, the Court concluded there was no violation of the PN. Nonetheless, how many times can science completely rule out a possibility? If that was the level of scientific

certainty required to base decisions on, it could hardly be achieved. In theory, the possibility of someone infecting another with Ebola while asymptomatic cannot be seen as an actual worst-case scenario (something whose occurrence is beyond doubt) in light of science and medicine. Curiously, in this ruling, the court did not mention scientific findings. The information quoted on Ebola was referred to as ‘administrative findings’ (p. 587). This decision prioritised the PP over the PN. However, if the PN had acted as it should have, the ruling would have been different. There were no sound scientific grounds for imposing a quarantine, not even using the ‘worst case scenario’ criterion.

Let us now analyse how these two principles operate in the context of COVID-19. According to the latest scientific evidences, ‘[t]he virus can spread from an infected person’s mouth or nose in small liquid particles when they cough, sneeze, speak, sing or breathe heavily. These liquid particles are different sizes, ranging from larger “respiratory droplets” to smaller “aerosols”’ (World Health Organization, 2020b). This virus is more contagious than other coronaviruses, such as SARS or MERS (Wang *et al.*, 2020), because ‘[t]he median serial interval is shorter than the median incubation period, suggesting a substantial proportion of pre-symptomatic transmission’ (Nishiura *et al.*, 2020). The average incubation period is somewhere between 6.4 days (Nishiura *et al.*, 2020) and 5.1 days (Lauer *et al.*, 2020) (studies have reported different results), but it can last from 0 to 24 days (Nishiura *et al.*, 2020). Most infected individuals show symptoms on around the 12th day of infection (Lauer *et al.*, 2020). However, the virus can be transmitted by asymptomatic carriers (Yuen *et al.*, 2020). The fatality rate varies across regions and it is not static in time (Oke and Heneghan, 2020). Studies reached different conclusions: some studies refer a fatality rate of 2.3% (Wu and McGoogan, 2020), others 3.6% (Baud, *et al.*, 2020) of the infected population. They differ because they use data of different communities and each community has its own particularities. Moreover, these death rates might not be accurate, since they depend on the number of confirmed deaths from the disease and the number of confirmed cases, not the real cases of deaths and infections, which we do not know. Let us assume the latter—3.6 per cent—is the worst-case scenario in that community (still, a lower rate than SARS and MERS) (Wang *et al.*, 2020). These are some of the findings we have identified, still susceptible to rectification because research is ongoing). In light of these data, and based on the consideration above, a quarantine can be considered a necessary measure for a given community (Gostin and Hodge, 2020).

The question is what type of quarantine should be imposed in terms of its geographical and temporal scope. These features depend on the particularities of each scenario, namely the dimension of the area/population affected by the virus and the moment within the evolution of the pandemic at which the quarantine is put in place. In any case, the PN is a key principle that determines the type of quarantine.

The PN also determines who must submit to the quarantine. In China, the decision to quarantine someone is being made by an app (Alipay Health Code), based on big data (the app assigned citizens a QR code that identified them by a colour code to determine whether they would undergo quarantine). It is uncertain whether the artificial intelligence designed to impose this measure also took the PN into consideration.

In terms of temporal scope, quarantines should be imposed for strict periods of time and periodically reassessed in light of new scientific findings. During COVID-19, specific individuals coming from risky areas have been quarantined for 14 days based on scientific evidence showing that most symptoms would manifest within that period (Lauer *et al.*, 2020) (although this can also occur later). However, quarantines affecting entire populations (China, Italy, Spain have been the most drastic ones) have tended to be maintained for longer.

To comply with the PN, the quarantine must be effective. The pick of effectiveness is when there is 90% compliance (Rothstein and Talbott, 2007: S49). The result might be difficult to achieve, even using force. It can be particularly tricky for some categories of citizens: homeless people, unauthorised immigrants, mentally ill individuals and drug addicts (Rollinson, 2015). Compliance also declines when more people are included and the time is extended. More severe control measures could be added, which in turn, must be assessed also in light of the PN.

From the perspective of the PN, quarantines should be carried out in the most 'rights friendly' way. Not that the PP is indifferent to rights, but its main aim in this domain is to protect public health, whereas the PN's target is to protect individual rights. Citizens must be assured that during the quarantine they and their families will have access to essential goods (food, water and medical supplies must be provided, and waste must be collected to ensure hygiene), that they will not be discriminated against and that they will not suffer financial loss (for instance, by assuring that they will not lose their job or salary). According to reports from the Human Rights Watch (2020), the quarantine imposed in Wuhan during COVID-19 failed to satisfy basic human needs.

Control Measures During Quarantine

Even if a quarantine is considered necessary, in light of the PN, the measures required to guarantee compliance must still be assessed. When a quarantine is mandatory, compliance is monitored by closing roads, conducting spot checks, surveillance and contact tracing and patrols carried out by the police or armed forces. In Singapore during the SARS epidemic, telephone calls were made day and night and in-house cameras were used to ensure that quarantined individuals remained at home. In Hong Kong, police detectives were used to track patients' movements and the people they contacted (Gostin *et al.*, 2003). Those who violated the quarantine were required to wear an electronic tag to control their movements (Rothstein, 2003). In China, the *modus operandi* was very similar. The police constructed check points on roads, and cameras were installed in private houses. Those who failed to comply with these measures could be severely punished, including by the death penalty (Palmer, 2003; Tognotti, 2013).⁸ The same proceedings were repeated in China during the COVID-19 pandemic (Jakhar, 2020), with the additional help of high-tech surveillance. China already had a massive system of surveillance in place, with millions of cameras spread out in major cities for facial recognition. This 'Big Brother' mechanism helped to control people during the quarantine (Abhivardhan and Agarwal, 2019; Jakhar, 2020; Qu and Zhang, 2020; Raposo, 2020) (for instance, by spotting people not wearing masks to receive penalties).

Assessing the need for these measures is different from assessing the need for a quarantine, but the former might depend on the latter. If a mandatory quarantine is considered necessary, then measures to assure its compliance are also necessary. Nonetheless, not all available measures are necessary. Some might not be required because they are too intrusive (e.g. the use of domestic cameras to control movements), thus they do not comply with the least intrusive measure. Other measures might be useless (e.g. controlling private messages, which was done in China during COVID-19), because their contribution to controlling the infection is null (Human Rights Watch, 2020), leading to a violation of the principle of efficiency. All these dimensions must be considered when assessing the use of such measures.

Refusal to Submit to Mandatory Quarantine

Currently, most jurisdictions recognise a patient's right to refuse medical interventions (Raposo, 2012), except in cases of infectious disease, which are limited by the need to protect public health (Selinger, 2009). If this reasoning is applied to the obligation to submit to

quarantine, the answer is simple: there can be no refusal. However, the analogy is misleading because in the latter cases patients are effectively ill. Thus, in case of infectious diseases infecting others is a real possibility (even a very likely possibility). In quarantines, individuals are not necessarily infected, so the assessment is not exactly the same. Nonetheless, if we assume that mandatory quarantines are imposed in compliance with the PN (as they should be), it means they are based on the lawful decisions of the public authorities. As such, there is a legal obligation to comply, as part of the general obligation to comply with orders from the authorities.

Having said that, proper mechanisms (judicial review, due process) should be available to challenge the decision to quarantine (Gostin *et al.*, 2003). It is up to the court to analyse the risk a person presents to the community and, based on the PN, decide in a timely manner whether the quarantine should be enforced. This process must be as speedy as possible. However, until a final decision is made, the individual should remain in quarantine, based on the PP, or even on the harm principle (Faden and Shebaya, 2019). Despite the guarantees provided for such proceedings, decisions imposing quarantines are usually taken during periods of ‘great fear’ (Parmet, 2018: 20), which might distort the judicial assessment.

Public Health versus Individual Rights

Quarantines might be very useful during epidemics and pandemics, but only when they are indispensable and effective, based on scientific findings and not panic (Markey *et al.*, 2016) or excessive precaution.⁹ This is difficult to achieve because the two principles at stake—the PN and the PP—seem to pull in different directions. Likewise, the values at stake—public health and individual rights and liberties—seem to be in conflict.

Precaution imposes the speedy implementation of measures aimed to protect public health, even in the absence of sound scientific evidence. Necessity requires rigorous assessment of the utility of the restrictive measures. Public health crises appear to bring out the conflict between the public good (i.e. public health) and individual rights (Thomas, 2003). Some scholars believe that in this conflict public health should prevail. This would be the outcome of the solidarity proclaimed by Dawson (Dawson and Jennings, 2012; Ortmann *et al.*, 2016; Wilson and Dawson, 2010) even if the author states that all values are equivalent (Grill and Dawson, 2017).

Some other authors have a presumption in favour of liberties (Childress and Bernheim, 2013) and consequently in favour of individual rights.

The conflict might be more apparent than real because it would be an ‘oversimplification to believe that public health does not have equally critical obligations in regard to individual rights’ (Wynia, 2005: 6), including the right to protect individual autonomy. Only by respecting individual liberties can prevention be promoted and the common good achieved (Wynia, 2005). The optimal solution is a delicate balance between the two. Likewise, the achievement of interests connected with public health implies the concomitant achievement of individual rights and liberties. The real concept of ‘public health’ cannot be isolated from rights and liberties.

Applying this reasoning to the COVID-19 pandemic, we conclude that because reliable data are scarce, the PP requires that actions be taken to prevent previously identified risk. From all of the available actions considered suitable to achieving that aim (mandatory quarantine in public facilities, mandatory quarantine at home, voluntary quarantine, social distancing without quarantine), the one chosen must fill two conditions. First, it must be able to prevent the most serious outcome considered reasonably viable in light of the scientific findings, which corresponds to the highest mortality rate found in existing studies. Secondly, it must be the one imposing fewer restrictions on the rights and liberties to be affected (the least restrictive measure) (Gostin *et al.*, 1999), in accordance with the PN. A mandatory quarantine must be implemented only if it is considered to be the least restrictive measure to prevent the worst-case scenario.

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Notes

1. Meßerschmidt (2020: 5) mentions a ‘spirit of disruption’ in COVID-19 pandemic.
2. This idea has been systematically stated by the European Court of Human Rights, See, for instance, the case *Enhorn v. Sweden* (2005), par. 36 and 44.
3. Two prior clarifications are important to understand this paper. First, quarantines are not the only measures to be considered in a health crisis, but this paper will only focus on them. Second, the assessment of the legitimacy of quarantines involves a larger set of values besides public health and individual rights and

- liberties, such as justice, well-being, among others, however, this paper will only consider that binomial.
4. However, in a later work of Childress, this time with Bernheim (Childress and Bernheim, 2013: 160, 161), both concepts are presented in a more differentiated way.
 5. ‘Dangers that are distant in time and space and the low probability of occurrence must also be considered with likelihood and severity of harm in inverse relation’ (Meßerschmidt, 2020: 7). A similar idea can be found in the case law of the EU courts (Meßerschmidt, 2020).
 6. It is not that clear whether this principle is also compatible with the requirements of proportionality and less intrusiveness. It can be stated that in a scenario of extreme uncertainty the principle justifies the use of more severe, and even disproportionate, measures to ensure that the objective envisaged is achieved. However, this paper will assume otherwise.
 7. Advocating for the prevalence of the PP when public health is at stake, see ECJ Case C-15/10 Etimine [2011] ECR I-6681, para 128 and 129.
 8. It is not clear whether death penalty was actually applied for breaking quarantines, but the Chinese Executive threatened people with this sanction.
 9. As Gostin et al. explained, ‘[i]n emerging crises, when the science is uncertain, adoption of the “precautionary principle” is reasonable to ensure public safety. Yet, health emergencies do not warrant coercion that is indiscriminate, overbroad, excessive or without evidentiary support’ (Gostin and Hodge, 2020).

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