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Note of Editor-in-Chief

This is the first Special issue of the journal *Culture e Studi del Sociale-CuSSoc*. The idea behind the special issue comes from this consideration: around the world, individuals are facing a critical moment, the COVID-19 pandemic and its consequences require some reflections on many topics, often forgotten by scholars. This is the reason why many Italian and foreign scholars have been invited to give their contribution. Furthermore, now more than ever, it is crucial to share knowledge coming from multiple disciplines and that's why it was decided to write an entire issue in English.

For scientific and intellectual correctness, the contents of single articles refer to the situation as in mid-May 2020. It is necessary to clarify that because this Special issue was published when many countries were starting to reduce their emergency measures to cope with the pandemic.

Societal Vulnerability and Resilience in the COVID-19 Crisis

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Abstract

Despite the possibility of a pandemic had been seriously considered in professional circles, most governments were taken by surprise by the rapid diffusion of the SARS CoV-2, from first reports in China (December 2019) to the declaration of the COVID-19 pandemic by the WHO (11th March 2020). The same was true for the majority of citizens, unfamiliar with the word pandemic and its meaning. The nightmare scenario of a collapse of the health services and its consequences led to the adoption of measures that impacted very heavily on peoples' daily lives and required great efforts of adaptation with a high toll on the economic, social and cultural spheres. The paper focuses on some of the major vulnerabilities highlighted by the crisis, from the limited knowledge on the virus and the pandemic to the many uncertainties regarding the response of the human systems and their capacity to cope. Some positive short-term responses are identified, while long-term resilience remains doubtful, including the stability of democratic processes.

Keywords: COVID-19, Disaster, Crisis, Uncertainty, Vulnerability, Resilience.

1. Global vulnerability

Since the first report of its appearance in the Hubei province in China (December 2019) up to the declaration of the pandemics (March 11, 2020) by the WHO, and in some cases even after that date, the SARS-CoV-2 has shown the difficulty of our “advanced societies” to recognize a threat timely and consequently prepare for an adequate response.

As for many other hazards deriving from physical phenomena or human action (or a combination of the two) the possibility of a pandemic was acknowledged, and thoroughly discussed in “professional circles” (Graff, 2020), first of all at the WHO whose mandate includes monitoring of public health risks, setting international standards and guidelines and coordinating response to health emergencies. Yet, apparently a serious consideration of such eventuality was far from being a high priority on the political agenda of most countries, with a consequent lack of preparedness, let alone planning.

Of course, not even the experts can envisage in advance the specific features of a pandemic or the trajectory that leads from an outbreak to it, i.e. from the appearance of a pathogen in a specific geographical area to its uncontrollable diffusion to the whole world. Thus, even full previous awareness of a possible or even likely occurrence is embedded in many uncertainties, starting with the capacity to foresee or recognize where and when the first signals will appear. Such uncertainties illustrate the first of a series of vulnerabilities, which can be traced back to insufficient forecasting and monitoring capacities and, more broadly, a knowledge deficit at the onset of a crisis.

But even when knowledge starts to accumulate, in this case with the sequencing of the SARS-CoV-2 virus and greater availability of data and information on the COVID-19 disease, other types of uncertainties emerge regarding the institutional response from the health and political authorities at all levels, from the international to the state and local ones.

The memory of historical epidemics and the experience of recent ones should have alerted to the necessity of being precautionary and prepared, but this has hardly been the case. Previous threatening occurrences, in particular SARS (Severe Acute Respiratory Syndrome) in 2003 and MERS (Middle Eastern Respiratory Syndrome) in 2015¹ had stopped short of becoming pandemics also thanks to local effective measures of containment. Other outbreaks which struck some amongst the poorest countries didn't generate great global concern, thus leaving them almost alone to cope with the epidemics and their heavy toll in terms of loss of life, impaired health, diminished welfare, and socio-economic disruption². Instead of working as an alarm, such recent cases seem to have produced an attitude of false security among the leaders of the richer nations, with some of them dismissing the hazard as distinctive of "backward societies", thus underestimating the weaknesses of their own countries and the high interconnectedness of the world we live in. This difficulty in acknowledging the idea of being at risk can be considered as another major vulnerability, this time traceable to miscalculations of risk due to bias and failure to use available sources of information.

Despite the fact that some countries were faster and more efficient than others in putting in place effective measures of containment, the widespread delay in admitting the idea that the crisis was very serious and global triggered a chain reaction of delays. The result was the amplification of the overall vulnerability of the global system under stress, and required the adoption of more restrictive measures than those which would have been necessary with better preparedness and planning. All of the sudden, with the number of affected people growing exponentially in many countries, the possibility of the collapse of national health services became a very tangible nightmare scenario. Thus, the necessity to reinforce hospitals, in particular intensive care units, and to increase the availability of devices in short supply, in particular ventilators, became paramount together with the urgency of protecting medical personnel.

It was soon recognized that people's vulnerability to the virus and the national health service's vulnerability to the increased demands of the infection fed on each other, and together they amplified the vulnerability of the whole social system with a cascading effect. Consequently, lockdown became a measure widely adopted even by those countries which had first resisted it. Differences remained and measures were enforced in a mode consistent with each country's political culture, traditions and idiosyncrasies: command and control, technocratic management, nudging, patronizing, appealing to one's responsibility, in different combinations. Italian politicians and bureaucrats, for example, showed how ingrained is their predilection for forms, self-certifications, convoluted rules followed by even more incomprehensible explanations.

¹ The present pandemic as well as the 2003 and 2015 crises are caused by different coronaviruses, all of zoonotic origin.

² This is the case, e.g., with repeated Ebola outbreaks in Central and Western Africa since 1976. The name Ebola is taken from that of a tributary of the Congo river in Central Africa, despite the WHO recommends not to identify viruses and epidemics with geographical connotations.

As to the bulk of the general population, it is a fair guess that not only the possibility, but the very idea of a pandemic was a remote one. For the majority, even the word was an unfamiliar one, possibly recognized only through popular works of fiction with the usual script of a dreadful threat coming from a mysterious malicious agent uncovered and defeated thanks to the bravery and endurance of a bunch of extraordinary heroes rescuing humanity from a destiny of destruction and despair.

Although several countries had already adopted some measures to contain the spread of the virus, the official (and late according to some) declaration of a pandemic from the part of the WHO came as a game changer. At risk were no longer specific geographical areas or clearly identified populations, but the whole world and all its inhabitants. So, it was first necessary, similarly to what had been the case for the national authorities, to make space for a new, disturbing fact into the landscape of familiar ideas. Even before reacting in terms of acceptance, denial or any intermediate stage, the understanding of what a pandemic meant became paramount, in particular in terms of how it affected individual and collective daily lives.

Most emergencies and disasters are announced or accompanied by physical signs which, though occasionally of ambiguous significance, are perceived by our senses and alert our attention. This crisis instead was at first experienced – at least for those not yet directly affected – as a “second-hand reality” (De Marchi & Tesarini, 1991). Different from an earthquake, a flood, a fire in a chemical plant, at first the indicators of the COVID-19 pandemic consisted primarily of verbal declarations, announcements and warnings. In this respect the experience was similar to that of the industrial accidents of Seveso (De Marchi et al., 1996) and Manfredonia (Malavasi, 2020), both occurred in Italy in 1976 with the release of dioxin and arsenic respectively or the Chernobyl nuclear accident (Alexievic, 2015) in the then Socialist Republic of Ukraine (part of the former Soviet Union) in 1986, causing a radioactive fallout reaching out to very distant areas. In the case of a threatening agent that is not immediately perceived by our senses - a potentially deadly virus in this case - the instant reaction tends to be of astonishment, incredulity, even denial. In the accidents mentioned above, such attitudes were favored and even encouraged by those in charge. Indeed, both political authorities and technical operators downplayed the severity of the situation as long as possible, i.e. until even non-experts were able to detect some unequivocal signs of danger.

With the SARS-CoV-2 the situation was the opposite. The warning of an impending danger, and the invitation to act fast and in a precautionary manner came from the top international health authority and – despite criticisms, confrontation and delays – were acknowledged by states and regional authorities which laid down regulations and restrictions impacting heavily on citizens’ lifestyles. Thus, from a certain stage on, there was no alternative but to realize that a phase change had occurred, and that behaviors and habits perfectly normal and acceptable only a few days before, had suddenly become subject to sanction and stigmatized for putting oneself and others at risk. As to be expected, the reactions were quite diverse, ranging from preoccupation, fear, anxiety, dread to anger, outrage, protest and even cynicism and disbelief, in different combinations and temporal sequences. Yet, the great majority did comply based on a number of reasons: recognition of the appropriateness of the norms and the right of the political power to dictate them, willingness to show solidarity for those on the frontline (first and foremost medical personnel), concern about others’ judgment, fear of sanctions, again in different possible combinations and order of prevalence.

Recognition of the new state of affairs doesn't imply consensus, and indeed not only the measures adopted but the very urgency of the situation was and continues to be contested by many. This can be out of incredulity, skepticism, selfishness, naiveté or even fantasies about eccentric conspiracy theories. However, in many quarters there is a genuine preoccupation for the erosion of democratic rights when the power of the state pervades and penetrates the most private spheres of the lives of its citizens (Tallacchini, 2017). Thus, legitimate requests are made for openness and transparency on policy decisions and their rationale, be it scientific or other.

2. Much more than just a health emergency

At its onset the COVID-19 pandemic was addressed predominantly as a medical emergency: indeed, the spread of the infection and the resulting pressure on the health services were the main and most urgent problems to be addressed. With the notable exception of Germany, members of the advisory committees set up by most governments were selected almost exclusively from disciplines pertaining strictly to that type or problem framing³. Virtually everywhere, politicians claim that their decisions are based on scientific evidence and advice, usually equated with the bio-medical sector: virology, molecular biology, immunology, epidemiology, infectiology, public health, and similar. Indeed, legions of researchers have been mobilized in the present predicament, but while some light is gradually being shed on a few "known unknowns" (e.g. the complete genome sequence of the SARS-CoV-2 and its most likely source), deep uncertainties remain on key issues. Among other, the role of asymptomatic cases in the spread of the virus, its propagation speed, the degree to which those infected develop immunity, the time needed to produce an effective vaccine or cure and to make them available to the global population. Until then, and despite advancements in diagnostic capacity and treatment, the measures adopted are quite similar to those of historical pandemics: confinement, distancing, quarantine.

A key challenge for researchers is that the behaviour of the virus has to be studied in its interactions with humans, in their double nature of physical-biological and socio-cultural entities. In other words, it is necessary to discover and address not only the vulnerability of the human body to the pathogen, but also the capacity of response of individuals and entire societies to the pandemic. If the former is a problem difficult to solve, the latter is a puzzle with a huge number of pieces. Borrowing the fortunate metaphor that David Guston (2012) applied to emergent technologies, the question is: how many pieces will have to fit together before knowing whether the final image is a pumpkin or a tiger? The strategies adopted in assembling the different pieces will influence the rhythm of advancement toward the completion of the puzzle, but the picture that will finally appear remains outside our control and possibly beyond our imagination. Abandoning the metaphor, only the massive social experiment we are all involved in will provide a reality check for the effectiveness of the strategies to defeat the virus and overcome the pandemic without catastrophic losses or generalized collapse. Success will depend on the

³ In many countries, advisors were predominantly men, despite the presence of many accredited female scientists in the consulted disciplines, let alone on the frontline in the capacity of doctors, anaesthesiologists *in primis*, and nurses. In Italy, the PM seemed to notice only after several complaints, interrogations and even a petition. See: <https://bit.ly/3dzOTrI> See also: <https://bit.ly/3bvW0Vo> (both in Italian).

ability to design effective measures of containment combined with the individual and collective capacity and willingness to comply until the game can change thanks to a vaccine.

No doubt, mathematical models are useful tools for monitoring and forecast, but their limitations are significant for a number of technical and other reasons, not least the unawareness of such limitations or the unwillingness to acknowledge them (Pilkey & Pilkey-Jarvis, 2007; Saltelli & Funtowicz, 2015). Inescapably, modelers select certain parameters and leave out others, thus obtaining one of the many possible representations of the system they want to investigate. An ever increasing computational power has allowed the multiplication of parameters which can be taken into account but some theoretical and logical problems remain unsolved even with the increased availability of data on infections, recoveries, death rates etc., relating to different geographical areas and social settings.

And indeed, there is a big debate about the validity of models, starting from the quality of the data fed into them, leading to harsh confrontations even among members of the scientific establishment. These no longer occur behind closed doors but are aired publicly, shedding light on the real workings of science but in the meantime increasing the public's confusion. Particularly puzzled will be those with scarce scientific literacy or nourished with the dominant narrative of science as synonym of value-free and respectful debate among peers leading to consensus on the true and unique nature of reality. Those who demand "indisputable scientific certainties", be they anonymous members of the public or people in a political office⁴, are destined to be disappointed. Diverse assumptions, hypotheses and tentative explanations are part of the scientific endeavor, and even more evidently so in the present situation which perfectly fits the mantra of Post-normal science (PNS): "facts are uncertain, values in dispute, decision stakes high and decisions urgent" (Funtowicz & Ravetz, 1993).

This leaves room for honest dissent but also malicious attempts of manipulation or concealment, which are not always easy to tell apart from the former, while both accredited and self-appointed experts invade the communication arena, and while advisory groups, consultant committees and task-forces proliferate. Also, hubris, vanity and selfishness are not absent in the race to arrive first. In the pursuit of political gain or publicity, premature announcements are made not supported by adequate research, and without considering the often-uncritical resonance they have in the mass and social media (or perhaps precisely because of that). In any case, even leaving aside lack of integrity, the reasons why numbers are never certain are sound, manifold and plural. Ed Yong has thoroughly explored them acknowledging that "[T]he precise magnitude of the virus's fatality rate is a matter of academic debate. The reality of what it can do to hospitals is not" (Yong, 2020b).

Thus, while the experience of disease and death is no longer a "second-hand reality" (De Marchi & Tessarin, 1991), the need to understand what is happening, and where it will take us triggers a spasmodic and often chaotic search or information. An honest response should include a listing and clarification of the uncertainties of the present predicament, and a reasonable estimate of the possibility to overcome them: if, when, how. Further, it should acknowledge that new research and

⁴ On April 14, in an interview to the daily paper *Corriere della Sera*, the Italian Minister of regional affairs Francesco Boccia answered a question about the possible easing of the lockdown measures with the following statement: "Without any polemical intent, I ask the scientific community to provide us with indisputable certainties, and not three or four options for each theme". <https://bit.ly/3fKQNru> [translation mine].

additional experience may dispel some doubts whilst at the same time challenging previous certainties about known unknowns. The possibility of surprises should also be taken into account i.e. the encounter with unknown unknowns, to which the “black swan” label, inappropriately applied to COVID-19 pandemics, really belongs⁵.

Uncertainty and ignorance are impossible to eliminate precisely because reality doesn't stand still and the future that we try to foresee doesn't exist out there to be discovered, but is constantly shaped and reshaped by the combination of events totally out of our control. As mentioned above, models are powerful instruments but cannot take into consideration all the relevant parameters and their possible interactions, no matter how powerful they are. Moreover, and apart from that, they are of limited use when it comes to addressing some fundamental questions. Indeed, it is not the virus alone that decides the fate of those exposed. Decision makers, but ultimately the whole humanity, are faced with ethical choices which cannot be taken or justified by numbers alone, as they will determine who shall live and who shall die (Waltner-Toews et al., 2020).

With time, advice was sought for also from specialties other than medical ones, in particular economic and financial ones, while little space continued to be granted to the social sciences and the humanities and most notably ethics (Reisz, 2020). It would seem appropriate to look at the issue through multiple lenses but apparently it is difficult to accept that different perspectives must be combined to provide an overall picture. In other words, not all disciplinary groupings have the same remit, and each one seems to work intramoenia, i.e. with little exchange with the others.

In the national governments' list of urgent interventions, the economic sector comes next to the health sector with the urgency of designing measures to support companies and workers in distress and to reconvert some production lines in order to meet new needs, thus limiting the damage of the crisis. However, even if economic support reached all those in need, which of course is not the case, the crisis generated and amplified a series of demands which can only partially be met by loans, subsidies, bonuses, etc. Indeed, the measures of containment are such as to require immediate and considerable changes in lifestyles everywhere and for everyone. In the cases of complete lockdown, a total rearrangement of habits had to be accomplished virtually overnight, with practical as well as psychological and social costs, the most painful deriving from physical distancing which prevented the sharing of consolidated routines, customs, ceremonies, including lay habits and religious services for welcoming newborns and saying good-bye to deceased loved-ones.

3. Short- and long-term resilience

Decades of sociology of disaster research⁶ have shown the invaluable importance of pre-existing and emerging social networks in providing mutual support of

⁵ Many commentators applied Taleb's influential metaphor of the black swan (Taleb, 2007) to the pandemic, but the author repeatedly insisted (notably in his tweets) that it is not correct. Indeed, by no means can the pandemic be considered a totally unexpected or unpredictable event.

⁶ The sociology of disasters started to develop in the post-WWII years, but there were some notable precedents such as the pioneering PhD dissertation of Prince (1920) and Sorokin's (1942) seminal work (see Mangone, 2018). It would be impossible to recall even just the most important contributions here. Suffice it to mention some influential works that are not affected by the passing of time: Dynes (1974), Quarantelli (1987), Quarantelli (1998), Dynes & Tierney (1994), Mileti (1999), Perry,

both practical and emotional type in the immediate aftermath of a disaster. We can take the lockdown, rather than the declaration of the pandemic, as the time-equivalent of it, i.e. the time when something radically new occurs which imposes a rapid adjustment to a totally new situation, previously difficult even to imagine. But in this case, the blow came along with the restrictions of access to the resources of human solidarity which normally assist in absorbing it or at least limit its most devastating effects. Indeed, the norms devised for fighting the infection ran exactly in the opposite direction. Moreover, they were likely to deprive of necessary support precisely those most in need, such as disabled, sick or elderly people living alone, the homeless, and those trapped in precarious or even violent households.

Even apart from these “extreme situations”, new burdens were imposed on families, heavier still in overcrowded dwellings. Having children and teenagers permanently at home proved particularly challenging for couples and more so for single parents, most often women. Those with small children and working from home, even if in the liberal professions, had to rearrange their agendas, revise their priorities and, last but not least, adjust their sleeping schedules (Fazackerley, 2020; Minello, 2020).

Despite all difficulties, a very common response to physical distancing was social closeness, thus reviving the mechanisms of mutual help and solidarity described above for other types of disasters, by new means and through new communication channels also exploiting the possibilities offered by digital technology. Since the first days of the lockdown, creativity exploded generating a myriad of spontaneous initiatives: singing together from windows and balconies, arranging collective applause dedicated to those on the front line, rearranging spaces, inventing or converting devices to novel uses, sharing whatever knowledge, skills, competences, resources one could offer. Also, there flourished a number of individual and collective initiatives by artists, musicians, comedians, cartoonists as well as institutional endeavors by museums, theatres, orchestras sending signals of optimism and endurance from the world of culture, art and leisure. There were of course differences between countries, yet there were amazing “cultural contaminations” in the ways to manifest solidarity and support.

Never was label more misleading than “social distancing”, adopted in official jargon and uncritically taken up and diffused by the media to actually mean physical distancing⁷.

Public and private initiatives of support can be regarded as short-term palliatives to reduce fear, concern and anxiety, but they are not sufficient to dispel dread of a doomsday possibly approaching. Paradoxically negative feelings are somewhat necessary to maintain the alert on the seriousness of the situation, while premature optimism may lead to abandon early precautionary behaviours and increase the risk of a second wave of the infection. At the time of writing (mid-May 2020) this is the main concern in the countries that are starting to ease some restrictions regarding confinement and mobility.

Lindell & Tierney (2001), Dynes (2006). And of course, a long tradition of research on the human aspects of emergencies, disasters and crises exists in other disciplines as well including anthropology, economics, ethics, geography, history, law, political science, and psychology.

⁷ The expression “social distance” as originally used in psychology and sociology refers to parting (and possibly dislike) between groups based on education, income, sex preferences, ethnicity, etc. In my view, “social distancing” is an ambiguous and unfortunate label, which might suggest interpretations leaning on the one above.

However, there is by now a general awareness that a prolonged lockdown cannot be maintained without serious and possibly irreversible harm to the economy and society. Already at present, there is evidence that patients other than COVID-19 ones are not being treated properly, be it for overwork and pressure of the health services or even for fear from the part of patients themselves to request care, especially in hospitals. Precise quantification of premature deaths and worsening health conditions is difficult for physical illnesses and even more so for mental disorders, let alone pathological social phenomena such as domestic abuse, sexual exploitation, drug addiction, etc. which tend to remain hidden even “in peacetime”.

All this for the short-term, while long-term consequences are very difficult to predict and will remain very hard to assess. Undoubtedly, the idea that disasters make people more equal is totally misconceived, as the vulnerability to the hazard and the ability to cope are strongly dependent on socio-demographic and economic features. This has been confirmed to be the case by extensive social science research on all kinds of crises.⁸ The present one will be no exception, as some preliminary findings are already showing (see for example Prainsack et al., 2020)

The concept of resilience, largely utilized by social scientists, is derived from ecology and refers to the capacity of an (eco)system to respond to a perturbation by limiting damage and recovering quickly (Holling, 1973). It must be noted that recovery is not equivalent to a return at exactly the same state antecedent to the disturbance. Rather, as suggested by the associated concept of adaptive management, it implies the need for adjustment and change necessary to navigate the crisis while at the same time maintaining the key structures and functions which guarantee the system’s survival.

When applied to ecosystems, recovery may involve the selective sacrifice of parts of the population but, fortunately, such an idea arouses widespread outrage when hinted at – openly or subtly - as a strategy applicable to human systems (Hanage, 2020). In the current post-normal situation (Funtowicz & Ravetz, 1993; Waltner-Toews et al., 2020) the most sensible option is adaptive management (Holling, 1973), which consists in learning by doing, eliciting all resources and forms of knowledge available, acknowledging diversity of values and continually monitoring the results of decisions that cannot be postponed but may affect unequally the different components of the social system. Feedback is imperative in order to introduce the rectifications necessary to correct the unfair distribution of privileges and disadvantages.

An emergency situation almost inevitably shifts the balance of power and control in favour of the executive branch of the state. Governments expect citizens to trust their intentions and actions as being inspired by the interest for the common good. But to be trustful is not the same as granting a blank cheque. Governments must earn trust and be transparent about their decisions and related justifications. “They should not just be trusted but also be trustworthy” (Archard, 2020). Conversely, citizens must stay alert that democratic institutions remain accountable and that authoritarian temptations are rejected. Among other, caution is required about gadgets and digital applications which, presented as silver bullets for tracing the virus, may be more effective in tracking people instead, enabling a pervasive surveillance from the part of a restricted clique over the rest of the population. More generally and most importantly, alertness must remain high that provisional acceptance of limitations to one’s rights and freedoms doesn’t become critical acquies-

⁸ See note 5.

cence out of habit or fatigue, once the acute phase of the crisis is over. Similarly, discouraging and reporting irresponsible behaviour must not be transformed into a habit of spying on one's neighbours and look at all fellow citizens as potential villains.

If in the short-term top-down decisions can be temporarily justified, in the longer term the full involvement of the whole society is essential. Contributions must be extended to a variety of disciplinary fields and go also beyond research including practical knowledge and wisdom from those in the field, such as hospital staff, family doctors, nurses and care givers, volunteers helping homeless people, workers employed in the essential services of cleaning, garbage collection, and so on and on. Not less important will be records of previous pandemics (de Waal, 2020) and accounts of other types of disasters which can be provided also by witnesses who lived through them. In this respect, old people are a reservoir of knowledge and wisdom: hearing their personal stories can help anticipating which types of behaviours and social phenomena are likely to emerge during and after a crisis and be prepared to either encourage or contrast them.

In summary, in the present predicament nobody is just a spectator, and everyone must have the opportunity to contribute to the design and implementation of plans to enhance the resilience of individuals, communities and whole societies in the face of the present crisis as well as any possible future one, including the dreadful possibility of a new wave of the infection.

As discussed above, the lockdown has boosted ingenuity and inventiveness to an unprecedented degree. This is hardly surprising as experiences of participation and engagement of "lay people" in research and policy issues have by now a long-standing record in diverse areas of public interest, first and foremost in health and the environment. In the last decades, citizen science has been growing in its multiple expressions: from mere support to scientific investigation (e.g. data gathering) to full partnership with accredited experts in the definition and framing of research problems, constructions of research protocols, selection of methods of investigation, data collection and analysis (Hecker et al., 2018).

In the current state of affairs, plans for long term recovery cannot be top down but must be the result of processes of inclusive deliberation, i.e. the engagement of a wide range of societal actors, ideally all citizens. This must not be mistaken for a plea or an anticipation of harmony and generalized consensus, but is rather a claim for renewed political negotiation and compromise, the only alternative to violent confrontation. Although any crisis, including the present one is a motor for change, no palingenesis can be expected as a result.

Conclusion

Among the innumerable uncertainties, doubts and ambiguities in which the Covid-19 pandemic has plunged us all, one outcome would seem indisputable: the planet we'll land on (and possibly have already landed on) is not the same where we had been living up to now. Yet there seems to be a diffuse expectation that, once the crisis is over, we can go back to business as usual, though with some adaptations and changes, most of which had already been encouraged in response to other challenges, notably climate change and sustainability. However, the crisis has incontrovertibly shown that despite the abundance of knowledge and instruments at our disposal, prediction and control are just impossible. As Stirling has

effectively pointed out, “there really seems only one clear truth so far, [...] this truth is that *nobody knows* the historic implications of this moment” (2020).

Somewhat paradoxically, it is the simple structure of the virus, simpler than bacteria, which makes it so difficult to get the better of it given that there are “fewer vulnerabilities to exploit” (Yong, 2020a). To the contrary human systems, biological and social, are very vulnerable because of their overall complexity and the tight coupling between their components. Applying Perrow’s perspective, we can look at the pandemic as a “normal accident”, the inevitable result of “multiple and unexpected interactions of failures”. As the author specifies, the odd term “is an expression of an integral characteristic of the system, not a statement of frequency” (Perrow, 1984/1999: 5).

A new normality is “under construction” which can be neither predicted nor planned. The first important lesson to be learnt is that along our path we will encounter both gray rhinos (Wucker, 2020) and black swans (Taleb, 2007)⁹. As to the former, it will be our choice to recognize or ignore the threat, to prepare or to rely on chance. As to the latter, the only thing we can do is to acknowledge their possible existence and, so to say, be prepared to be surprised.

A second, connected lesson is that even if risk assessments can be improved with more and better data and with the aid of mathematical, statistical and economic models the ensuing predictions of the future are always “partial and conditional” because models inevitably simplify the complexity of reality and reduce it to a limited number of dimensions (Hulme, 2020). Consequently, we should invest our intellectual and physical resources not only on aspects of our experience which can be expressed numerically, but also in critically addressing key dimensions of our existence which are not so easily quantifiable and pertain to fairness, justice and ethics. This is equivalent to saying that we must be equally engaged in doing away with the pandemic and in strengthening the instruments of democratic governance, to avoid that the present state of exception becomes permanent.

Also, metaphors other than the bellicose ones dominant so far should accompany us on the path to the new normality. We need no heroes, be they scientists or health personnel, but people doing their part, as responsible citizens whatever their roles, offices and mandates. Scientists in particular have acquired high visibility in the present predicament and have been loaded with many expectations. While a few have worn the garments of omniscient prophets, very many have been transparent about the limitations of their knowledge, addressing technical, methodological and even epistemological uncertainties. It may well be the case that precisely these “precautionary” attitudes of openness and humility become the foundations of a relation of trust between peers, as opposed to uncritical subjugation on the one hand and prejudiced skepticism on the other (De Marchi, 2015; Marston et al., 2020)

Finally, for societies that attribute a disproportionate value to physical appearance, perpetuate the myth of permanent youth, health and beauty and dream of immortality, this crisis is a very timely *memento mori*, a reminder that, no matter what our private and collective achievements, the existence of any human being has a limited time-span. In addition, it is a powerful warning that the whole humankind is under threat.

⁹ Wucker (2020) chooses the metaphor of the gray rhino for threatening events that we can see coming and consequently allow preparation or defensive action. See also note 3.

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