Risk adaptation: A continuous learning process in the context of unrepeatable phenomena

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Abstract
Humanity is periodically affected by natural disasters, medical, environmental or military crises with an impact on large sections of the population. The reality observed by the population and the intervention modalities have influenced the way in which the notion of "risk" is perceived. Many everyday events are not taken into account by people, as the negative consequences are less likely to occur. Therefore, the subjectively perceived gravity of the consequences of certain events increases the attention paid to the presumed risks. Situations in which the causal relationship is directly perceptible, such as natural disasters, are usually appreciated. Suspicion and ignorance of risks increase with the imperceptibility of causal relationships or where understanding requires a high level of expertise. In the case of the current coronavirus pandemic, we are dealing with the situation of feeling effects directly (through personal infection or from someone we know) and indirectly through the information collected through the media, without knowing the generating causes. The explanations are heterogeneous, from various sources, unverifiable, often unsupported and scientifically unfounded. The explanations from the scientific world are complex, resulting from the interpretation of a multitude of scientific aspects, each of which is the subject of complex research, and the explanatory mechanisms are not accessible to the general masses due to lack of medical knowledge. If we add to the complexity of medical explanations the explanations provided by media channels by sensory-oriented public sources, manipulation, representation of foreign interests to some states, we find that the current picture of the structure of astounding and disturbing public information is created for a large part of the population. it becomes suspicious under the influence of destabilizing messages. This article aims to initiate an approach to know how risks drive the creation of protection strategies in the context of unique or rare phenomena.

Keywords*: Coronavirus; risk management; pandemic; public communication; manipulation; risk reduction strategy; medical crisis.*

1. Introduction

The current coronavirus pandemic has put all the governments of today's states in difficulty. The COVID -19 virus has proven to be highly contagious and the suffering it carries has spread around the world. The threat has become global and the pandemic has been felt in all contemporary societies. The response to such a phenomenon was specific to each society, either by adopting strategies specific to each state or by imitation. Depending

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on the responsiveness of each government, major investments have been made in ensuring effective healthcare while imposing numerous restrictions on public spaces.

The prolongation of the pandemic and the fluctuating results proved that there were no infallible strategies, regardless of the administrative capacity and the level of development of the national health systems. The pandemic has spread and affected a large number of people and the asynchronous application of intervention strategies has reduced the potential impact of health control. Thus, we find that a phenomenon that has taken place constantly, depending on the natural conditions that ensure its perpetuation has been contrasted with fragmented and limited measures at the physical borders of each country according to the explanatory paradigms provided by epidemiologists in each state. The consequences are measured in the persistence of coronavirus, health care costs, medicines, medical supplies and, in the most unfortunate cases, in the loss of human lives. At stake in this procedural inconsistency are the very lives of citizens and the public health of the population.

This article comprises concerns about different approaches to the context of the medical crisis, the influence of the pandemic on people and the convergence of views on infection control that should turn into a synchronous cross-border intervention strategy. We also find that the pandemic is a complex phenomenon that has surprised with its high contagion and will probably be unrepeatable in this form, just as knowledge of the history of epidemics or pandemics is not valid today to an extent that helps to develop effective strategies.

2. The characteristic's complexity of the coronavirus pandemic

The rapid spread of the coronavirus pandemic has shown that humanity is not prepared to respond uniformly to such challenges. The surprising and atypical evolution of the pandemic surprised the rulers of all the affected countries. A possible explanation is provided by reference to the complexity theory (Angeli and Montefusco 2020: pp.1-4), in which the geometric progression of multiplication of the number of infections is the main effect of the lack of social distancing.

The confusion generated by the coronavirus pandemic is due to the rapidity of infections and the lack of reaction from the authorities, who did not have effective control procedures. Also, local efforts, principles of action and paradigms underlying intervention strategies have revealed more cultural and political differences without a real impact on the coronavirus pandemic, which is spreading and affecting many people.

The lack of effective standard procedures is perpetuated by the impossibility of accurately measuring the dynamics of infections. Several methods are used that generate different results, and the measurement of COVID-19 reproduction is dependent on the approach preferred by researchers. One of the current references is the one provided by the WHO which indicated the value of 1.95, but which some researchers consider to be affected by a very high margin of error (Liu et. al. 2020: pp. 1-4). Depending on the geographical area, the method of analysis and values were set between 1.4-6.49, with an average of 3.23.

These differences illustrate the need for time and the accumulation of sufficient data to understand the specifics of the coronavirus pandemic (Angeli and Montefusco 2020: pp.1-4). Only after the methods of analysis and estimation have become standardized is an effective intervention strategy with global coverage possible.

Research has shown that the phenomenon is nonlinear, a feature that hinders people's ability to understand (Angeli and Montefusco 2020: pp.1-4). The dynamics of nonlinear phenomena are faster than the procedures that underpin decision-making, as learning is hindered and "mental repetition is distorted." People's decisions are based on

experience and compensation for lack of experience is made by intuition which, in fact, works properly in the conditions of an phenomena with a linear development. People are not used to nonlinear thinking, they often identify phenomena with nonlinear evolution and apply measures specific to linear phenomena, based on their own experiences. Thus, the variation of long-term causes will generate a small variation of short-term effects, but which in the long term have or may have unexpected consequences. For example, school closures have been applied in most countries without knowing the "role of children in the spread of the virus". (Angeli and Montefusco 2020: pp.1-4). Such a measure may have consequences with possible short-term positive effects, but which in the long run may have unpredictable consequences due to the disruption of the education system. Only in the future will it be possible to estimate the effectiveness of the current measures by comparing the costs of the long-term consequences with those targeted at the time of the decision.

The link between linear thinking and learning can be discovered through another approach, related to the interpretation of the specifics of the economic environment. Researchers of business behaviors, such as Gaveti et. al. (2012: pp. 1-40) they emphasized that in the case of causal links we must also analyze the feedback relationship. Thus, if "X is the cause of Y", then "the influence of Y on X" must be considered, from the perspective of feedback. Thus, isolation measures are "complex interventions in complex social systems, dependent on their initial conditions" (Angeli and Montefusco 2020: pp.1-4). Adaptive measures represent a large number of interactions between agents that have their own "behavioral patterns", which change slowly and over a long period of time, which requires a complex effort based on the cultural specifics of each society (Niță and Ilie Goga 2017: p. 9).

The conclusions of the study conducted by Angeli and Montefusco reveal the need to focus the theoretical approach to knowing and understanding the complexity of the crisis generated by the pandemic. The learning process should be permanent and in parallel with measures to control the effects of the pandemic. New data must be collected and analyzed in order to regularly correct public policies, and the acceptance of weaknesses or ineffective measures must be taken into account at every stage of the pandemic.

The effects of a nonlinear phenomenon are due to the activation of some risks revealed by Angeli and Montefusco (2020: pp. 1-4):

- It must be borne in mind that political measures offer a local optimum and are valid for a certain period of time, there are substantial risks through which unexpected consequences or slight changes in the causes will be overturned by the decisions taken at a given time.
- Decision-makers need to be aware of the non-linear nature of immeasurable processes and intermediate situations that can have unpredictable and disproportionate consequences.
- The high dependence of the systems on the initial conditions and the behavior of the agents will make the results obtained in one area not repeatable in the same form in other areas, requiring corrections depending on the local specificity. Also, it should be taken into account the conflict risk between successful local policies with systemic objectives that involves national or international decision-making.
- The inherent complexity of decisions can generate, due to the different amplitude of the pandemic, situations of "guilt or shame". The mentality resulting will mask both the causes and the results. Thus, useful information will be excluded from their integration into pandemic control policies.

Control measures involve the collection of information at the international level, as the level of success of public policies is dependent on international cooperation in developing strategies with simultaneous applicability in several societies, beyond fragmented approaches.

3. Natural reservoirs of pathogens, viruses and bacteria: a continuing threat to the population

In the literature dedicated to knowing the risks of the spread of medical diseases among humans we find that there are many reservoirs of pathogens, viruses and bacteria on the planet (Bruinen de Bruin et. al. 2020: p. 1).

At the declarative level and of the national or international institutional structures, the biological risks that can have multiple causes due to the natural environment were revealed. Thus, some authors have reported the risks posed by climate change caused by melting glaciers. Climate change research shows that ice is one of the main repositories of pathogens (Smith et. al. 2004: pp. 560-566). Bacteria and fungi have been discovered in permafrost and ice, which signals the permanence of the risks of new epidemics or pandemics.

Another permanent threat comes from the practice of intensive and extensive agriculture that reduces the distance between humans and animals carrying dangerous viruses and bacteria, such as SARS, bird and swine flu, etc. (Mills et. al. 2010: pp. 1507-1514).

The permanent existence of natural or man-made threats implies the adoption of prevention and intervention measures if the risks materialize. But the reality revealed that the reaction force is different from state to state. The prioritization of public spending has ignored in many countries the prevention and creation of an infrastructure for epidemiological control. Thus, the response capacity is unequal, depending on the strength of each state or the investments made. The permanence of threats also implies a permanence of prevention measures and investments in infrastructure.

The experience of the coronavirus pandemic that humanity is currently going through shows that there are unforeseen risks. Although epidemiologists know the evolutionary dynamics and can calculate, even with a high margin of error, the dynamics of infections, there were no methods to block the multiplication of cases of coronavirus infection. This dynamic is ongoing in both developed and least developed countries. Differences remain in the quality of health care and the ability of developed countries to treat more patients, so that the rate of deaths and side effects is lower than in poor countries.

This is due to the impossibility of anticipating when natural reservoirs of pathogens and human activities will produce consequences. Also, the immediate severity and magnitude of the consequences cannot be identified. From this perspective we deduce the idea of including in the prevention activities some measures destined to dynamize the learning process simultaneously with the occurrence of the crisis and their development.

An analysis of the current situation summarizes some conclusions that must be taken into account: access to information, measures taken, the effects of the measures implemented is difficult. To this is added the fact that every day more and more research on the coronavirus pandemic appears. It is clear that the world was not prepared for such a challenge, and the response capacity is different in the countries of the world. Scientific activity was ignored and warnings were treated superficially. The effects appeared quickly in accordance with the factual situation (Bruinen de Bruin et. al. 2020: p. 7). We must not

forget that in many cases the lack of trust has been perpetuated and the virus has been considered a "simple cold".

There are also two categories of measures to be implemented: the first refers to restrictions on social distancing and the adoption of measures related to behavior change such as wearing a mask, frequent hand washing, banning public meetings with many participants, avoiding crowded places etc., and on the other hand, there is the second dimension, regarding the performance of the medical system. The onset of COVID-19 and its rapid spread, followed by devastating consequences due to the association with comorbidities and the high death rate, were due to a lack of adequate treatment and a vaccine that could have stopped the spread. Thus, first-class measures should help slow the spread of the infection until a vaccine and effective treatment are available.

The lack of public confidence in the measures taken and in the good intentions of the rulers is due to the confusion, contradictory communications and indecision of the rulers. It is recommended to develop coherent and well-oriented communication strategies to increase public confidence in the measures adopted (Bruinen de Bruin et. al. 2020: p. 7). Also, the intensification of international cooperation will have a beneficial effect on the measures adopted and their effectiveness (Bruinen de Bruin et. al. 2020: p. 7). In the sense of the cited paper, obtaining the involvement of citizens in compliance with the rules is an objective of the measures that will increase the efficiency of risk mitigation strategies.

It is noted that the most appropriate vision at this time is the result of the complementarity of the two categories of measures. The population will have to accept the temporary nature of the restrictions which will not directly contribute to the elimination of COVID-19, but only in combination with medical treatment and a future vaccine. But until the emergence of a vaccine that proves effective, this first category of measures is the one that helps to limit the disastrous effects on each society, public health and the economic system.

The permanence of threats involves public education on the measures that can be taken by accepting the idea by citizens: hand hygiene, wearing masks, social distancing, limiting social contacts to the bare necessities, responsible behavior when suspected of infection, non-dissemination of false information, verification of information received and the rational filtering of information received in terms of mature behavior are just a few examples of a number of factors that make citizens partners in public institutions and the health system in the transition period that will run until the discovery of effective treatment.

4. Can the costs of the coronavirus pandemic be calculated?

The economic effects of the coronavirus pandemic are serious and affect modern societies from a medical and economic point of view. Moreover, discouraging the population fueled insecurity and unleashed fears about the future. A number of economic activities were affected by the measures taken, unemployment increased and the difficulty of obtaining a job. As a result of the support measures, some of the employees received financial support during the period of unemployment imposed by quarantine, but the income obtained was lower, which means a reduction in the quality of life. Individual stress due to the uncertainty of the future and the prolongation of the pandemic for a long period of time also has consequences that in one way or another involve costs.

In the analyzes performed under the aegis of CEPS (Gros 2020: p.11) attention is drawn to the approaches taken in calculating the costs of the health crisis. Most of them are structured by sector and focused on certain areas considered a priority. However, the calculation of the impact on the economy and the need for investment implies a paradigm

shift in the calculation of the costs of treatments for those affected by COVID-19. The quoted source found that the emphasis was on the probable number of deaths that can be caused by the virus, although the calculation must include the medical costs of hospitalization. For the purposes of these statements, it should be noted that the economic balance achieved by the quarantine imposed by the authorities appears to have higher costs from an economic point of view than medical costs. In reality, this inequality is due to the non-inclusion in the calculation of all costs incurred with medical care. The uncontrolled spread of the virus would have increased medical costs to a much higher level than the economic losses generated by the restrictions imposed. Daniel Gros states that stopping the pandemic "is not only a matter of preventable deaths, but also a matter of saving resources".

Another study draws attention to the complication of the international situation by endangering national economies (Barua 2020), where demand and supply in equilibrium in the pre-pandemic period will become unbalanced by focusing on the purchase of essential products at the expense of non-essential ones. This orientation generated by the pandemic will have long-term consequences due to the fact that most international trade is based on non-essential products. As a result, the international markets will be reconfigured and the market shares held by different agents will change. New agreements, new barriers and blockages will most likely appear, national economies will be reconfigured by focusing on the domestic production of essential goods out of a desire to reduce dependence.

Currently, being in a period of pandemic development, we can calculate the costs incurred so far. The anticipation of future costs is based on estimates exposed to unpredictable dynamics of economic phenomena under the influence of the pandemic. The way in which international markets will be reconfigured and the costs of market changes cannot be estimated from now on, given the impossibility of anticipating the duration of the health crisis and the difficulty of including all medical costs in the economic balances. We are therefore on an uncertain ground, of estimates on several levels of costs, which have a strong character of quantifying the costs incurred, without controlling the variables that may generate costs in the future.

The magnitude of the economic consequences affects both the visible and the underground economy, with costs that are difficult to estimate and with a focus on support measures only for enterprises and employees in the official area. (Willliams 2020). Especially in the service industry we are dealing with undeclared work, which is based on undeclared work, but which individually supports a category of population that manages to survive. In various ways, the undeclared industry is connected to the official one, it fulfills economic and social functions, and the financial flow is found in the declared economy. The impact of COVID-19 on these activities will exacerbate the negative consequences by increasing poverty and social vulnerability. This category includes activities performed in their own households, which can generate undeclared income such as those obtained from the sale of agricultural products, benefits performed even by people who have jobs, but who provide activities to supplement family income. Thus, people who currently have an income level that ensures their autonomy, will become vulnerable due to the impossibility of maintaining income sources. The future does not guarantee their return to the previous economic context, and this possibility will lead to an increase in the number of economically vulnerable people.

Studies on the economic consequences of the pandemic are currently recording the current situation. But the perpetuation of the pandemic forces the periodic updating of costs and the registration of this dynamic. Anticipating the total costs of the pandemic will really be possible when a time horizon emerges.

5. Conclusions

The scientific literature draws attention to the complexity of the pandemic that humanity is going through. Past experiences are not useful in developing effective strategies to combat COVID-19, which means that biological changes in sources of infection are varied, complex and difficult or even impossible to anticipate which creates the appearance of unique and unrepeatable phenomena, with consequences and treatment methods. The solution involves a learning process simultaneously with control and unrepeatable measures.

In the case of the current pandemic, the measures have been gradually applied and tightened as the population is contaminated, which indicates a reactive and non-reactive vision in relation to the pandemic. The recommendations began with simple ones, such as hand washing, wearing a mask and social distancing, followed by the application of harsher measures. But it was this slow implementation of COVID-19 control and control policies that allowed the pandemic to spread. The transmission of the infection is dependent on the establishment of biological conditions, and a brief review of the strategies and approaches of different states reveals that control measures are determined by political, economic and social, ideological considerations. Electoral cycles have played an important role in addressing the crisis, and in many cases the suffering of the population has been politicized in political interests. Fear, confusion and suspicion of the population have become factors generating public messages subsumed by the interests of different groups. The struggle between interest groups divided the population in many societies, generating an open conflict between the disciplined and the rebellious population, which assumed the risk of disease as a method of "anti-system" struggle. The duration and the feeling that the efforts so far have been in vain have contributed to the distrust of the population in the measures adopted. The undesirable economic effects of the pandemic have increased the level of fear and insecurity of many citizens who have felt unprotected and lack credible institutional benchmarks.

It is found that pandemic control strategies have been developed in society both through their own efforts and through imitation. Moreover, international collaboration has emerged in a much more visible way. The meaning of pandemic control policies tends to unite states in a global effort to limit and eradicate a global phenomenon. On the contrary, we are witnessing opposition to government measures, and the internationalization of control efforts generates protests in the spirit of localism, identity and individual freedom that, paradoxically, have the same specifics of internationalization and globalization of protests and suspicions.

From the above it is observed that a single phenomenon comprises the two perspectives of pandemic reporting: globalization.

Overcoming the paradox represented by the two facets of globalization involves the initiation of a general vision aimed at developing a process of learning to adapt to risks. For example, at present, until the discovery of the appropriate treatment and the vaccine that can stop the pandemic, we have the rules to control the contagion. The time needed for the emergence of medical solutions must be ensured as much as possible through alternative measures, even if they reverberate economically and socially.

The non-linear evolution of the pandemic makes it difficult for decision makers. The experience and knowledge that underlies the decision-making process is based on the linearity of the phenomena or their variability within limits that can be intuited. Instead, the current pandemic exceeds the limits of variability of a linear phenomenon, which involves, first of all, adapting to existing risks by learning the relationships between complex causes

and effects, given the assumption of a continuous learning process that will be models for future threats for humanity, whose specificity is that of uniqueness.

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