

The world after Covid-19: vulnerabilities, uncertainties, and socio-environmental challenges¹²

O mundo pós covid-19: vulnerabilidades, incertezas e mudanças socioambientais

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Abstract

The text brings reflections on the challenges posed to the world due to the pandemic, both for its face of fear, amplified by the cacophony of political decisions, but also from the perspective of mutual aid and hope for a better future. The analysis of the pandemic impact on society is based on vulnerability framework. Three angles of analysis are adopted: "Exposure" is approached from the blocks to displacement and lockdown; "Sensitivity" is treated from the

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point of view of social inequalities, the weakened Welfare State, and strategies of herd immunity; The "capacity of response" is addressed by the role of science and democracies in the face of the crisis. The pandemic vulnerability analysis is based on examples mainly from Brazil, France, and Poland. Based on this vulnerability, it is proposed to rethink sustainable development and the environment: what lessons for the future can we learn from the crisis?

Keywords: Brazil; Democracy; Europe; Social inequalities; The role of Science.

Resumo

O texto traz reflexões sobre os desafios postos ao mundo face à pandemia, tanto pela sua face do medo, amplificado diante da cacofonia das decisões políticas, mas também pelo lado da ajuda mútua e esperança de um futuro melhor. Utiliza-se como quadro referencial a análise de vulnerabilidade da sociedade ao vírus. Três ângulos de análise são adotados: A "exposição" é abordada a partir dos bloqueios ao deslocamento e do confinamento; A "sensibilidade" é tratada sob o ponto de vista das desigualdades sociais, o enfraquecimento do Estado de Bem-Estar, e estratégias de imunidade coletiva; A "capacidade de resposta" é abordada pelo papel da ciência e das democracias diante da crise. A análise de vulnerabilidade à pandemia é baseada em exemplos principalmente do Brasil, França e Polônia. A partir dessa vulnerabilidade, propõe-se repensar o desenvolvimento sustentável e o meio ambiente: que lições para o futuro podemos tirar da crise?

Palavras-chave: Brasil; Democracia; Desigualdades sociais; Europa; O Papel da Ciência.

Introduction

When this text is published, perhaps the peak of the crisis has passed in many countries, or perhaps we are still experiencing new stages of the global pandemic. The World Health Organization (WHO) declared the coronavirus epidemic to be an international public health emergency on January 30, 2020, and they recognized the status of a pandemic on March 11, 2020 when the world counted more than 118,000 infections in 114 countries and over 4,000 deaths.

On April 7, 2020, when this text began to be written, the world already counted more than 1,350,000 cases, 209 countries and territories and more than 75,000 deaths. The unprecedented escalation of the disease led to the

decree of a series of measures of social distancing, lockdown, and control, which caused a sudden halt in the world economy.

From this new global situation, many people started to reflect on the consequences, while others desperately sought to save lives, whether in hospitals or research laboratories, in a collective effort to find effective drugs or the development of vaccines.

The Covid-19 pandemic is a concrete evidence of an increase in global health risk, in line with the trends recorded across the globe in recent years for re-emerging and newly emerging infectious diseases^{6 7}. In view of this, it is important to ask what made us so vulnerable? First, we need to refocus research on a global approach in order to address new challenges on a global scale like this pandemic. Secondly, to address as a whole the complexity of interactions involved, as a socio-ecological system. And third, begin to anchor vulnerability analyses to this socioecological system⁸. And this vulnerability analysis should be done by articulating the global, regional, national and local scales in order to come out stronger from the crisis.

In this sense, considering the different realities close to us (Brazil, France and Poland), as well as the respective status and history of social, economic and political development, and the regional insertion in which we are immersed (Mercosur and European Union), we propose here to reflect on the emergence of the pandemic, the vulnerability of our society to this, and the reflections inspired by these analyses to understand the re-construction of the world after the crisis.

The vulnerability framework has served to assess how the characteristics of a social group and its situation influence its ability to anticipate, withstand, resist and recover from disasters, considered as damaging events such as

⁶ CLIFF, A. D. **Infectious Diseases: Emergence and Re-Emergence**, A Geographical Analysis. Oxford: Oxford University Press, 2009.

⁷ BELAY, E. et al. Zoonotic Disease Programs for Enhancing Global Health Security. **Emerging infectious diseases**, v. 23, n. 13, p. S65–S70, 2017. Available at: <https://doi.org/10.3201/eid2313.170544>. Accessed on: 5 jul. 2020.

⁸ YOUNG, O. R. et al. The globalization of socio-ecological systems: An agenda for scientific research. **Global Environmental change**, v. 16, n. 3, 304-316, ago. 2006. Available at: <https://doi.org/10.1016/j.gloenvcha.2006.03.004>. Accessed on: 5 jul. 2020.

earthquakes, tsunamis, floods or extreme droughts⁹. The choice of the vulnerability framework allows us to reframe the analysis of this pandemic within a structured systemic viewpoint, capable of identifying to what extent we become more or less vulnerable. The vulnerability in this case can be a result of the combination of our exposure to the virus, the sensitivity of our social system that makes us more or less prone to the manifestation of serious forms of the disease, and how our social system is more or less prepared to respond to the pandemic so that the disaster can be contained. Understanding such vulnerability within the context of disaster risk is foreseen in the first priority of the 2015-2030 Sendai Framework for Disaster Risk Reduction which guides the United Nations International Strategy for Disaster Reduction¹⁰.

In this paper, we consider vulnerability as the degree to which a system, or part of it (in this case, the socioecological system) is likely to suffer harm due to exposure to a hazard, disorder or stress¹¹. Vulnerability is analyzed as a function of exposure, sensitivity and capacity of response¹², and which particularly has a social face evidenced in disasters¹³. Exposure corresponds to the degree and duration at which the system comes into contact or is subjected to the disturbance; sensitivity is related to the degree to which the system is impacted; and capacity of response is the ability to adjust to the disturbance, moderate the potential damage, or deal with the consequences of the resulting changes^{14 15}.

⁹ DE SILVA, M. M. G. T.; KAWASAKI, A. Socioeconomic Vulnerability to Disaster Risk: A Case Study of Flood and Drought Impact in a Rural Sri Lankan Community. **Ecological Economics**, v. 152: p. 131-140, out. 2018. Available at : <https://doi.org/10.1016/j.ecolecon.2018.05.010>. Accessed on: 5 jul. 2020.

¹⁰ UNSDR. **Sendai Framework for Disaster Risk Reduction 2015 - 2030**. Genebra: UNISDR, 2015. Available at: <https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030>. Accessed on 5 jul. 2020.

¹¹ TURNER II, B.L. et al. A framework for vulnerability analysis in sustainability science. **PNAS**, v. 100, n. 14: 8074-8079, jul. 2003. Available at: <https://doi.org/10.1073/pnas.1231335100>. Accessed on: 5 jul. 2020.

¹² LINDOSO, D. P. **Vulnerabilidade e Adaptação da Vida às Secas: desafios à sustentabilidade rural familiar nos semiáridos nordestinos**. 2013. 519 f. Tese (Doutorado em Desenvolvimento Sustentável) - Centro de Desenvolvimento Sustentável, Universidade de Brasília, Brasília.

¹³ BECK, U. Living in the world risk society. **Economy and Society**, v. 35, n. 3, p. 329-345, 2006. Available at: <https://doi.org/10.1080/03085140600844902>. Accessed on: 5 jul. 2020.

¹⁴ ADGER, W. N. Vulnerability. **Global Environmental Change**, v. 16, n. 3, p. 268-281, ago. 2006. Available at : <https://doi.org/10.1016/j.gloenvcha.2006.02.006>. Accessed on: 5 jul. 2020.

To develop the reflection, we propose to address some issues that seem crucial to the coming of this new era of uncertainty, organizing them within the components of vulnerability: movement restrictions, quarantine and lockdown as factors related to exposure; social inequalities, the welfare state and the strategy of herd immunity as factors that help us understand sensitivity; and regional and global integration, democracy and control, and the role of science as part of capacity of response. We will also present some analysis of the interaction between the aspects of exposure, sensitivity and capacity of response, highlighting the synergies, and finally, we will present our reflections on sustainable development and the environment as topics that allow us to draw lessons for the future.

1. Exposure

Different diseases that are linked to coronaviruses, such as SARS-CoV-2 and Middle East respiratory syndrome - MERS, have their origin in the anthropization of the environment and the intensification of contact between humans and wild pathogens, intermediated by vectors and intermediate hosts¹⁶. The same phenomenon of environmental degradation exposing human populations to increased contact with wild animals also has an influence on other diseases, such as hantavirus¹⁷. It is estimated that 75% of diseases are of zoonotic origin¹⁸. In spite of the unpredictability and stochasticity of the emergence of a new virus, we should consider that modified landscapes favor

¹⁵ GALLOPÍN, G. C. Linkages between vulnerability, resilience, and adaptive capacity. **Global Environmental change**, v. 16, n. 3, p. 293-303, ago. 2006. Available at: <https://doi.org/10.1016/j.gloenvcha.2006.02.004>. Accessed on: 5 jul. 2020.

¹⁶ AFELT, A.; FRUTOS, R.; DEVAUX, C. Bats, Coronaviruses, and Deforestation: Toward the Emergence of Novel Infectious Diseases? **Frontiers in Microbiology**, v. 9, artigo 702, abr. 2018. Available at: <https://doi.org/10.3389/fmicb.2018.00702>. Accessed on: 5 jul. 2020.

¹⁷ SANTOS, J. P. et al. Análise da distribuição espacial da hantavirose no Distrito Federal, Brasil, 2004-2010. **Hygeia - Revista Brasileira de Geografia Médica e da Saúde**, v. 10, n. 18: p. 98-109, 2014. Available at: <http://www.seer.ufu.br/index.php/hygeia/article/view/23482/14914>. Accessed on: 5 jul. 2020.

¹⁸ BELAY, E. et al. Zoonotic Disease Programs for Enhancing Global Health Security.

the creation of niches that enhance this contact and transmission¹⁹²⁰, i.e., this accelerated anthropization increases the risk of exposure.

Therefore, once the exposure of humans to the virus in nature, to attenuate the transmission among humans the component of exposure was initially answered by the countries with the border closures, seeking to reduce the contact of its population with carriers of the virus coming from other parts of the world. Likewise, the lockdown imposed on the city of Wuhan at the beginning of the pandemic by the Chinese government also represented, within this model, an opportunity to reduce the exposure of the rest of the world to the virus coming from that location.

Internally, within countries, isolated initiatives of administrations in sub-national territories (states and municipalities in Brazil, *départements* and *villas in France*, *Voivodeships and gminas* in Poland), establishing roadblocks, access to cities or beaches and other regions of tourist appeal, sporting and cultural events, fit into the same context of trying to reduce exposure.

The internal measures of social distancing, home quarantine and lockdown also aimed at reducing individual exposure and producing a local collective effect.

Based on the measures taken by the different countries, it is interesting to analyze the relationship granted to the protection of human life in the face of economic challenges and according to the means each country had. For example, in France, lockdown was chosen because it was the only possible measure to limit the spread of the virus in the absence of protective masks and screening tests. Furthermore, the country, like many others, delayed the installation of the lockdown of its population because it meant paralysis of the economy. At the beginning of the crisis, while the Ministry of Health advocated lockdown, the productive sector encouraged the population to go to the workplace in order to limit the closure of factories, companies and certain

¹⁹ AFELT, A.; FRUTOS, R.; DEVAUX, C. Bats, Coronaviruses, and Deforestation: Toward the Emergence of Novel Infectious Diseases?.

²⁰ AFELT, A. et al. Bats, Bat-Borne Viruses, and Environmental Changes. In: MIKKOLA, H. (Org.). **Bats**. London: InTech Open Access, 2018. p. 113-132. Available at: <http://dx.doi.org/10.5772/intechopen.74377>. Accessed on: 5 jul. 2020.

businesses, even if it exposed people to the virus. The first two cases of Covid-19 were detected on 24 January, the first death on 14 February. The very restrictive national lockdown began on March 16 and a gradual and progressive lifting the lockdown is being planned in France from May 11. On 18 March, the French government banned all foreigners from countries that are not members of the European Union, the Schengen area or the United Kingdom, without convincing reasons. This means that there was no blockade within the European Union and the borders remained open regionally.

In Poland the government acted in the opposite way, more quickly. Testing began in February 2020, and eight days after the "0" patient was officially found (March 4), the Ministry of Health announced an epidemiological emergency. Home quarantine is the first action for people who have come from regions at risk; on 8 March all public events are banned and on 11 March the prime minister decides to close schools. The country's border was closed on 13 March, one day after the first death. But, at the same time, there were no restricted actions to cool off the economy. Officially, the industry is working without drastic disturbances. Offices and service activities in public spaces have been closed, but for a long period (almost until the end of March) shopping malls were still open. The extensive and effective lockdown only began at the end of March, but mainly for non-industrial activities. The Ministry of Health was in charge of decisions regarding social and labor activities. The government action against the quarantine break was one of the toughest in Europe: the fine was up to 7,000 euros (30,000 Polish zlotys). As Poland is admittedly a Catholic country, one of the most difficult aspects of lockdown was the limitation to attending church mass, and at the beginning of the epidemic, church authorities in Poland opposed government policies of restricted lockdown. The governmental face of the epidemic was more autocratic than authoritarian or protective.

In Brazil, the first case initially detected was on February 26, but subsequent investigations indicated that on January 23 the first death by Covid-19 had occurred. Belatedly, foreigners from neighboring South America were blocked from entering on March 19 and from other continents on March 23.

However, there was no national strategy to lock down the population, unlike France and Poland, which adopted this strategy on a national scale, decided from the central power. In this South American country, in the absence of a national policy in favor of lockdown, and more than that, a clear position of the central government against it, states and municipalities autonomously decided on strategies of lockdown or road closures, inaugurating judicial battles with the federal government for the right to dictate policies in their sub-national territory.

The reflection on the component of the exposure raises the question of the complex relationship between populations and their governments, and the role of cultural aspects of socialization and religious aspects in the realization of social distance²¹. Additionally, besides the established procedures to combat the virus, it is necessary to analyze the discourses announcing the collective protection measures to be taken, the choice of information disclosed, the tone and words used, which ultimately reveal the vision of power, life and death that is associated with politics.

This relationship between power, life and death requires us to reflect on the ethical dilemma that was established during the pandemic, from the moment that some national presidents positioned themselves contrary to the lockdown and defended that the economy could not stop. They also called for workers to be present so that economic activities could be carried out, otherwise it could have mass unemployment. They were not worried about increased exposure, which brings an increase in vulnerability to disease. To justify this choice, they called for the denial of the pandemic's dangerousness at first, and then they began to compare numerically the number of deaths that would be insignificant compared to the number of possible unemployed.

Thus, in Brazil and in the United States, the mismatch between the lockdown measures adopted by the governments on the sub-national scale, by conflicting with the speeches of the respective national presidents, have launched this debate around the power over life and death: The governor of the

²¹BRUNS, D. P.; KRAGULJAC, N. V.; BRUNS, T. R. COVID-19: Facts, Cultural Considerations, and Risk of Stigmatization. **Journal of Transcultural Nursing**, on-line First, 21 abr. 2020. Available at: <https://doi.org/10.1177/1043659620917724>. Accessed on: 5 jul. 2020.

state of New York, when expressing himself about the pressure made by the US president to reopen the lockdown, said that if he received an order from the president that would put the public health of the people of his state at risk, he would not comply. Similarly, in Brazil, the mayor of the city of Belo Horizonte-MG said it was not for him to determine the relaxation of lockdown, since the measures of social isolation were decided by a commission and it followed an international protocol, contrary to the pressure exerted by the Brazilian president.

In this context, it is important to resume the conceptual construction of necropolitics²², which means the existence of socio-political controls on life and death: who will live and who will die, either because workers are thrown into a pandemic with the risk of contracting the disease, or because the necessary investments and precaution have not been made to avoid the pandemic to the point of overcrowding the hospitals. In the absence of sufficient equipment to treat patients during the pandemic, governments are forcing clinicians to make bedside choice between who to save by being admitted to an intensive care units (ICU), who will receive assisted breathing device, and who to leave to fate, as occurred in Italy, France and Brazil.

The strategy of reducing exposure therefore relates to limited capacity of response, as in the example just cited.

In summary, the elements present in the exposure component analysis are all reference parameters for reporting the society-government relationship. In addition to raising questions about the existence of a climate of trust, suspicion, distrust or transparency in the territory, the analysis of this component reveals that the decisions take into account the context of unpreparedness for the pandemic. In the language of our model, this means that the measures to reduce exposure were guided by the recognition of low capacity of response, exposing the conflicts around the maintenance of capital accumulation in the form of discourse that the economy could not stop. As

²²MBEMBE, A. Necropolítica. **Arte & Ensaios**, v. 32: p. 123-151, 2016. Available at: <https://revistas.ufrj.br/index.php/ae/article/download/8993/7169>. Accessed on: 5 jul. 2020.

vulnerability is an increasing function of exposure, measures to reduce exposure aim to reduce vulnerability.

2 Sensitivity

2.1 Social inequalities and vulnerability

According to the Brazilian Institute of Geography and Statistics (IBGE), considering the criteria of the World Bank to measure monetary poverty, Brazil showed an increase in extreme poverty in 2018, with 13.5 million people with monthly per capita income below R\$ 145, or US\$ 1.9 per day (6.5% of the population). The parcel of the Brazilian population in poverty (income below US\$ 5.50 per capita per day, approximately R\$ 420 per month) for the same year in 2018 was 52.5 million people (corresponding to 25.3% of the population)²³. These data are confirmed by the Gini²⁴ index, calculated by the World Bank (53.9 in 2018)²⁵.

According to IBGE (2019)²⁶, monetary poverty is compounded by precariousness and vulnerability in housing conditions, which have a strong correlation with each other. As an example of this correlation, it can be cited the absence of bathroom of exclusive use of the residents of the house, without sharing, that affected 2.8% of the total population in 2018, but this percentage increased to 8.5% among the poor population (per capita domiciliary income below US\$ 5.50 per day). Another example of this correlation is the excessive home crowding, i.e. the situation where in the home there are more than three residents for each room used as a dormitory (5.6% for the general population

²³ IBGE. **Síntese de Indicadores Sociais**: Uma análise das condições de vida da população brasileira 2019 (Estudos e Pesquisas Informação Demográfica e Socioeconômica número 40). Rio de Janeiro: IBGE, 2019. Available at: <https://biblioteca.ibge.gov.br/visualizacao/livros/liv101678.pdf>. Accessed on : 5 jul. 2020.

²⁴ The Gini index is a synthetic indicator that makes it possible to account for the level of inequality of a variable and of a given population. It represents the Gini coefficient multiplied by 100, that is, expressed in percentage points. The Gini coefficient is equal to 0 in a situation of perfect equality and is equal to 1 in the most unequal situation possible. Inequalities may be related to income variables, wages, standard of living, etc.

²⁵ WORLD BANK. GINI index (World Bank estimate). **World Bank Data**, 2019. Available at: <https://data.worldbank.org/indicator/SI.POV.GINI>. Accessed on: 5 jul. 2020.

²⁶ IBGE. **Síntese de Indicadores Sociais**: Uma análise das condições de vida da população brasileira 2019 (Estudos e Pesquisas Informação Demográfica e Socioeconômica número 40).

and 14.5% for the poor population with per capita household income below US\$ 5.50 per day). In addition to these two situations, the lack of domestic water supply by piped water supply system, initially affecting 15.1% of the total population, when analyzed only for the poor population we find that 25.8% of households have this precariousness. In this situation, these people start to depend on water sought in wells or other individual precarious solutions. The three situations portrayed have strong importance in the analysis of the context of combating the coronavirus pandemic in large cities: hygiene and disinfection measures in a context of precarious availability of water at home, and measures of social isolation of a supposedly contaminated person, are all completely impaired.

The young Engels already demonstrated the greater sensitivity of the less favored classes to diseases in a book published in 1845²⁷. All these situations end up fitting the concept of social overdiscrimination²⁸, which represents a double (or multiple) penalty in which the economically most disadvantaged families are still impacted by the absence or precariousness of public facilities. In face of this reality, there is a great fear about the impact of the arrival of coronavirus in the peripheries of the Brazilian metropolises, especially in the *favelas* that present great population density with great precariousness in the homes.

In metropolitan France, in 2017, according to the *Institut national de la statistique et des études économiques* (INSEE), 8.9 million people lived below the monetary poverty line, set at 60% of average income (€1,041 per month)²⁹. According to the Ipsos - *Secours Populaire Française* 2018 barometer, 21% of the population (approximately 14 million people) suffer from food insecurity and

²⁷ ENGELS, F. **The Condition of the Working-Class in England in 1844**: With Preface Written in 1892. Cambridge: Cambridge University Press, 2010.

²⁸ SAITO C. H. **Contribuição metodológica para planejamento urbano de municípios de pequeno e médio porte através de SGI e Banco de Dados Relacional**. 1996. 255 f. Tese (Doutorado em Geografia) - Instituto de Geociências, Universidade Federal do Rio de Janeiro, Rio de Janeiro.

²⁹ INSEE. **France, portrait social Édition 2019**. Montrouge: INSEE, 2019. Available at: <https://www.insee.fr/fr/statistiques/fichier/4238781/FPORSOC19.pdf>. Accessed on: 5 jul. 2020.

do not eat three balanced meals a day³⁰. Additionally, a study published by the FIFG in March 2019 showed that 3 million people in France need to restrict access to basic hygiene products³¹. These situations also confer sensitivity on the population which increases their vulnerability to the pandemic.

In Poland, 5.8 million people lived below the national poverty line in 2018, corresponding to 15.4% of the population, according to the World Bank³². Income is lower than the OECD average, which is aggravated by the fact that its tax system is not very progressive and it makes little contribution to reducing inequality³³. The economic estimate shows that the parcel corresponding to taxes in wages is inversely proportional to income. Although Poland's Gini index (29.7 in 2017) is close to that of France (31.6 in 2018) according to the World Bank's estimate³⁴, the nominal value of income is very discrepant between the two European countries. As of 2020, the minimum monthly wage in Poland has been set by the government at PLN 2600 (€610.8) while the minimum wage in France is €1539.4³⁵. Due to social and health taxes, the net minimum monthly wage in Poland is less than €250. Purchasing power is also very low and when there is no national housing system or social rent, one of the significant difficulties is the expenses of everyday life, which represent approximately 80% of income. Consequently, the percentage of young adults aged between 25 and 34 years living with their parents is 45.1%, while in France it is only 14.7% considering data for 2018³⁶. The average number of people in the household is

³⁰ IPSOS-SPF. **Baromètre de la pauvreté Edition 2018**, jun. 2018. Available at: https://www.secourspopulaire.fr/sites/default/files/atoms/files/barometre_ipsos_spf-juin_2018.pdf. Accessed on: 5 jul. 2020.

³¹ LE FIGARO. 3 millions de Français se privent de produits d'hygiène faute de ressources. **Le Figaro**. Paris, 19 mar. 2019, Seção Économie. Available at: <https://www.lefigaro.fr/flash-eco/3-millions-de-francais-se-privent-de-produits-d-hygiene-faute-de-ressources-20190319>. Accessed on: 5 jul. 2020.

³² WORLD BANK. **Poverty & Equity Brief - Poland 2020**. abr. 2020. Available at: https://databank.worldbank.org/data/download/poverty/33EF03BB-9722-4AE2-ABC7-AA2972D68AFE/Global_POVEQ_POL.pdf. Accessed on: 5 jul. 2020.

³³ OCDE. **Études économiques de l'OCDE - Pologne**. Paris: OCDE, mar. 2018. Available at: <http://www.oecd.org/fr/eco/etudes/Pologne-2018-OECD-etude-economique-synthese.pdf>. Accessed on: 5 jul. 2020.

³⁴ WORLD BANK. GINI index (World Bank estimate). **World Bank Data**, 2019

³⁵ COUNTRYECONOMY. **NMW - National Minimum Wage**. Countryeconomy, 2020. Available at: <https://countryeconomy.com/national-minimum-wage>. Accessed on: 5 jul. 2020.

³⁶ EUROSTAT. Share of young adults aged 18-34 living with their parents by age and sex - EU-SILC survey. **Eurostat**, 06 mai. 2020. Available at:

2.64 according to the Polish Central Statistical Office (*Główny Główny Statystyczny*)³⁷.

Social inequality during the pandemic also showed its racial face: in Brazil, still at an early stage of analysis, the first analyses indicate that black and brown people, although they do not constitute the majority of cases, have a higher incidence of deaths³⁸. In the United States of America, more than 70% of coronavirus deaths in Louisiana are African American, according to the governor of that state. In Chicago, the numbers are also similar. In that country, it is admitted that African Americans face a higher risk of exposure to the virus for three reasons: a) concentration in urban areas; b) work in essential industries, which leads to only 20% of black workers declaring themselves eligible to work from home; c) lack health insurance compared to their white colleagues and d) more likely to live in medically underserved areas, where primary care is scarce or expensive.

In summary, the pandemic scenario reinforces Ulrich Beck's³⁹ analysis of the society at risk: risk is socially unequal and follows the poor. The greater the social inequality and the greater the parcel of the population living in poverty, the greater is the sensitivity of that society to the pandemic. The greater the sensitivity, the greater the vulnerability, which requires States to take action on other aspects of sensitivity, and on the components of exposure or capacity of response as a compensatory measure.

2.2. The weakened welfare state

The Welfare State can be understood as the assumption of social responsibility by the State with the commitment of public institutions to the

https://ec.europa.eu/eurostat/en/web/products-datasets/-/ILC_LVPS08. Accessed on: 5 jul. 2020.

³⁷ GUS. **Demographic Yearbook of Poland** (Rocznik Demograficzny). Varsóvia: Główny Urząd Statystyczny (GUS), 2019. Available at: https://stat.gov.pl/download/gfx/portalinformacyjny/pl/defaultaktualnosci/5515/3/13/1/rocznik_demograficzny_2019.pdf. Accessed on: 5 jul. 2020.

³⁸MENA, F. Entre casos identificados, covid-19 se mostra mais mortífera entre negros no Brasil, apontam dados. **Folha de São Paulo**, São Paulo, 11 abr. 2020, Seção Cotidiano. Available at: <https://www1.folha.uol.com.br/cotidiano/2020/04/coronavirus-e-mais-letal-entre-negros-no-brasil-apontam-dados-da-saude.shtml>. Accessed on: 5 jul. 2020.

³⁹BECK, U. Living in the world risk society.

achievement of material justice for individuals and families, and to ensuring the quality of life and physical and social well-being of citizens⁴⁰.

In Brazil, dismantling the Welfare State has been vigorously implemented during the current presidential term with the suppression of social achievements in public policies and a growing reduction in the budget in sensitive areas such as Health and Social Policies: in the Ministry of Health, with the exception of the year 2018, there has been a drop in the actual allocation of resources in recent years, ranging from -9.43% in 2017 to -4.05% in 2020. The budget of the Ministry of Health in Brazil maintains the Single Health System (Sistema Único de Saúde-SUS), as well as the vaccination coverage programs, popular pharmacy and the payment of scholarships for the medical residency program. For the Ministry of Citizenship, which is responsible for social programs such as the National Program to Support Rainwater Catchment and other Social Technologies (Cisterns Program), there was a 46.5% drop in the Annual Budget Bill between 2018 and 2019⁴¹.

In France, since the end of 2018 the yellow vest movement (*Gilets Jaunes*) has been questioning the government with regard to social justice, from the end of the wealth tax to the increase in the minimum wage. In addition to this movement, in 2019 France saw health sector mobilizations called by the *Inter-Hôpitaux* collective, involving all professionals in the sector, to demand more resources and labor in health. The fact that France has a mortality rate in the Covid-19 pandemic much higher than the world average precisely demonstrates the great vulnerability of French society.

Poland is one of the Member States of the European Union with the lowest health expenditure, especially on outpatient care. Poland has only 238 doctors per 100,000 inhabitants - the lowest proportion in the European

⁴⁰FERNÁNDEZ-ÁLVAREZ, A. L. Estado de Bem-Estar, Instituições Públicas e Justiça Social. **Revista Estudos Institucionais**, v. 4, n. 2, p. 884-904, 2018. Available at: <https://doi.org/10.21783/rei.v4i2.315>. Accessed on: 5 jul. 2020.

⁴¹ COUTO, L. F. **A crise do Covid-19, regras orçamentárias e suas interpretações: mudanças necessárias?** Nota Técnica n.28. Brasília: IPEA, 2020. Available at: <http://repositorio.ipea.gov.br/handle/11058/9835>. Accessed on: 5 jul. 2020.

Union⁴². Expenditure on housing benefits and assistance for the socially excluded is relatively low in this country, but it is predominantly directed at families with children⁴³. Government expenditures for welfare purposes in Poland is lower than in most of the major European Union countries, below the French government's spending on this modality. In view of this, the Organization for Economic Co-operation and Development (OECD) concluded that this country is below the OECD average in terms of population health and environmental quality, and also in the assessment of subjective well-being⁴⁴. Precarious access to the national health system creates a dynamically growing private care system, where costs are fully covered by patients, as in Brazil, further compromising family income. Demographically, society is aging rapidly. The median for 2019 is 41 years, but the forecast for the next 20 years shows an increase to 49 (Poland's main statistical office). Even if the number of hospital beds per 1000 inhabitants is one of the highest in Europe (6.7/1000 inhabitants in 2019), the number of beds dedicated to geriatric care is one of the lowest in Europe - 900 beds nationwide and only 430 geriatric doctors. With 20% of society over 65 years old, there is a demand of almost 9000 people for a geriatric bed, making vulnerability greater.

The number of Intensive Care Unit (ICU) beds for France is 11.6 beds per 100,000 inhabitants⁴⁵. This author indicates for Poland, 6.9 beds per 100,000 inhabitants, which is considered a wrong figure because it corresponds to the number of regular beds in hospital. In addition, what needs to be emphasized is that in the last ten years, the number of ICU beds in Poland has decreased by about 30%. Although so far the number of Covid-19 patients is

⁴² KALAN, D. Poland's Shortchanged Health Care System Is Already Straining. **Foreign Policy**, Washington, 06 abr. 2020. Available at: <https://foreignpolicy.com/2020/04/06/poland-underfunded-health-care-system-straining-unprepared-coronavirus-pis/>. Accessed on: 5 jul. 2020.

⁴³ SAWULSKI, J. Is Poland a Welfare State? **IBS Policy Paper Series**, v. 2/2017, out. 2017 Varsaw: IBS. Available at: https://ibs.org.pl/app/uploads/2017/10/IBS_Policy_Paper_02_2017_en.pdf. Accessed on: 5 jul. 2020.

⁴⁴ OCDE. **Études économiques de l'OCDE - Pologne**

⁴⁵ RHODES, A. et al. The variability of critical care bed numbers in Europe. **Intensive Care Medicine**, v. 38, n. 10: p. 1647-1653, 2012. Available at: <https://doi.org/10.1007/s00134-012-2627-8>. Accessed on: 5 jul. 2020.

less than the number of facilities prepared for the epidemic, the predicted problem in this country is the lack of medical staff when contamination in the health system reaches its highest level.

In Brazil, according to the Brazilian Intensive Care Medicine Association (AMIB), the number of ICU beds is 20.3 per 100,000 inhabitants, but less than half is available for SUS. The fact that the supply of ICU beds in SUS is smaller than that of the private sector shows the fragility of the Welfare State. Moreover, there is great disparity among the country's regions: while the northern region has 0.75 and the northeastern region 0.88 SUS ICU beds, the southeastern region has 1.69 and the southern region 1.71 SUS ICU beds, against a national average of 1.30 SUS ICU beds per 100,000 inhabitants⁴⁶.

The weakened Welfare State represents the result of the hegemony of neoliberal thought and practice of downsizing the State. But more than a mere downsizing of the State, it is the shrinking of its social public functions, to put it at the service of private interests. Suplicy⁴⁷, when analyzing the works of John Kenneth Galbraith, indicated that this thinker had already denounced this mechanism in one of his publications⁴⁸, pointing out that both in the conduct of war and peace, the private becomes the public sector: the former meddled governments to contribute to sustaining the processes of capital accumulation, including the health sector, privatized to a large extent.

For David Harvey⁴⁹, forty years of neoliberalism across American and European continents have left countries and their societies totally exposed and ill-prepared to face a pandemic as a global disaster. This is because at different levels of the government hierarchy, the front line of defense in health emergencies had its budget diminished due to a policy of austerity: public

⁴⁶AMIB. **Censo AMIB 2016**. São Paulo: AMIB, 2016. Available at: https://www.amib.org.br/fileadmin/user_upload/amib/2018/marco/19/Analise_de_Dados_UTI_Final.pdf. Accessed on: 5 jul. 2020.

⁴⁷SUPLICY, E. M. Sobre o legado de John Kenneth Galbraith. **Revista de Economia Política**, v. 26, n. 4: p. 619-626, 2006. Available at: <http://dx.doi.org/10.1590/S0101-31572006000400009>. Accessed on: 5 jul. 2020.

⁴⁸GALBRAITH, J. K. **A Economia das Fraudes Inocentes**. São Paulo: Companhia das Letras, 2004.

⁴⁹HARVEY, D. **Anti-Capitalist Politics in the Time of COVID-19**, 20 mar. 2020. Available at: <https://jacobinmag.com/2020/03/david-harvey-coronavirus-political-economy-disruptions>. Accessed on: 5 jul. 2020.

health, like other public functions of the state were monetized as expenditures to be wiped out.

In the face of the pandemic, when countries like Germany and others abandoned the austerity policy to inject money into the economy⁵⁰, the presence of the alternative thinking formulated by Keynes was shown. Keynes advocated the centrality of the role of the State as an inducer of economic growth to confront the great economic depression of 1929, and his ideas were also present in confronting the economic crisis of 2008. In taking steps to resume the role of the post-Pandemic Welfare State, we moved from the field of sensitivity to that of capacity of response.

In short, sensitivity is an increasing function of vulnerability. Both social inequality and the dismantling the Welfare State represent elements of sensitivity directly related to vulnerability to the pandemic. The cited examples show that when exposure occurs, sensitivity ends up making explicit the weaknesses in the social fabric (social inequality and poverty) and the public policy (whether or not there is the dismantling of the Welfare State). Unfortunately, sensitivity cannot be strengthened overnight, and like soil prepared for planting, when sensitivity is increased, the roots of the pandemic are harvested with painful fruits. Punctual responses to strengthen the role of the State as an inducer of the economy at a time of crisis configure a form of capacity of response, connecting the two elements through the issue of the role of the Welfare State.

2.3. Herd immunity

The strategy of herd immunity (*imunização coletiva* in Portuguese, *groepsimmuniteit* in Dutch) initially implemented in the United Kingdom (later abandoned by the latter) and in the Netherlands (already relaxed) directly confronts the proposal of lockdown, as decreed in countries such as Italy,

⁵⁰ VALOR ECONÔMICO. **Alemanha aprova pacote de mais de 750 bi de euros contra coronavírus.** 23 mar. 2020, Seção Mundo. Available at: <https://valor.globo.com/mundo/noticia/2020/03/23/alemanha-aprova-pacote-de-mais-de-750-bi-de-euros-contra-coronavirus.ghml>. Accessed on: 5 jul. 2020.

France, Portugal, Spain and Poland. The principle behind the herd immunity strategy is to create the conditions for more people to naturally develop antibodies to Covid-19^{51 52}. It is believed that if a person develops immunity, he or she will not transmit the disease, because what usually happens when the person who contracts the disease and is not immunized is to transmit at least to another person. Broadening the scale for society, it is assumed that if transmission does not happen by immunization, the infection will progressively disappear from the population following the decline in the average rate of infection as more and more members of that population are immunized. Behind this strategy there is also the assumption that the virus will continue to circulate beyond the duration of the crisis, so the best defense for a new pandemic would be to have the highest possible rate of immunized people.

The discussion about herd immunity is old. Fine⁵³, in a review article attributed the use of the term for the first time in the literature to Topley and Wilson⁵⁴. For Fine⁵⁵, the concept of herd immunity has been arousing interest throughout history on the fact that one can think about the extension of immunization conferred by a vaccination program beyond the vaccinated individuals, reaching also the unvaccinated individuals, as long as a very large portion of the population is actually immunized.

In the cases analyzed in the past, herd immunity has occurred progressively as individuals have received vaccines as a means to develop their immunity, in a context of massive population adherence and collective

⁵¹ COHEN, J. Caught Between Herd Immunity And National Lockdown, The Netherlands Hit Hard By Covid-19 (Update). **Forbes**, New York, 27 mar. 2020, Seção Innovation. Available at: <https://www.forbes.com/sites/joshuacohen/2020/03/27/caught-between-herd-immunity-and-national-lockdown-holland-hit-hard-by-covid-19/#111d92383557>. Accessed on: 5 jul. 2020.

⁵² EBRAHIM, Z. What is 'herd immunity' and can it really solve the coronavirus pandemic? **Health24**, Cidade do Cabo, 06 abr. 2020, Seção Medical. Available at: <https://www.health24.com/Medical/Infectious-diseases/Coronavirus/what-is-herd-immunity-and-can-it-really-solve-the-coronavirus-pandemic-20200402>. Accessed on: 5 jul. 2020.

⁵³ FINE, P. E. M. Herd Immunity: History, Theory, Practice. **Epidemiologic Reviews**, v. 15, n. 2: p. 265-302, 1993. Available at: <https://doi.org/10.1093/oxfordjournals.epirev.a036121>. Accessed on: 5 jul. 2020.

⁵⁴ TOPLEY, W. W. C.; WILSON, G. S. The spread of bacterial infection. The problem of herd immunity. **Journal of Hygiene**, v. 21 n.3: p. 243-249, 1923. Available at: <https://doi.org/10.1017/s0022172400031478>. Accessed on: 5 jul. 2020.

⁵⁵ FINE, P. E. M. Herd Immunity: History, Theory, Practice. **Epidemiologic Reviews**.

responsibility to contribute to herd immunity⁵⁶. In the case of the present Covid-19 pandemic, at this stage, this is not the case. There is no vaccine developed, nor recognition of the efficacy of a specific treatment. The idea of herd immunity for Covid-19 lies in the assumption that surviving individuals will be carrying antibodies, and that the immunity developed in the individuals is persistent, i.e., that the antibodies are widely developed, and have long duration. In addition, there are doubts about the time needed to reach the thresholds (% of the immunized population) to set up a herd immunity. In this respect, there are still many doubts⁵⁷. At the moment, in order to implement the strategy, it is necessary not to carry out the lockdown to expose the population to the virus. Thus, people supposedly could develop the intended immunization by themselves, in the context of absence of a specific vaccine. For the strategy to move forward, governments need to be able to treat the infected so that they can develop the immunity, and countries should rely on a well-equipped health system; massive testing capacity; and a containment of the infection rate within the health system's capacity to support treatment.

In the coronavirus pandemic, being a governmental decision for the full functioning of social and economic activities, the option for the herd immunity strategy does not offer the population the opportunity to prefer the lockdown strategy. In this case, the estimation of an "acceptable" percentage of deaths in the population until herd immunity develops or is accelerated by the development of treatments and vaccines is risky. More than that, there is a moral question about the right to impose a death toll on the population, even if it is estimated to be small, on account of sacrifices to a greater cause. A relationship between power and death thus arises again⁵⁸.

In short, herd immunity attempts to reduce the vulnerability of society by acting to decrease its sensitivity by increasing immunological resistance. This

⁵⁶GIUBILINI, A. **The Ethics of Vaccination**. Durham: Palgrave, 2019. Available at: https://www.ncbi.nlm.nih.gov/books/NBK538383/pdf/Bookshelf_NBK538383.pdf. Accessed on: 5 jul. 2020.

⁵⁷ ENGELS, J. Groepsimmunitet? Die is in Nederland nog ver te zoeken. **Trouw**. Amsterdam, 16 abr. 2020, Seção Binnenland. Available at: <https://www.trouw.nl/binnenland/groepsimmunitet-die-is-in-nederland-nog-ver-te-zoeken~bd73c307/>. Accessed on: 5 jul. 2020.

⁵⁸ MBEMBE, A. Necropolítica.

choice differs from that of lockdown, which acts on exposure, seeking to decrease it to have negative results in vulnerability. In this pandemic, herd immunity also depends on a strong and rapid capacity of response to treat patients and recover them, based on what is known and what may be developed in terms of new treatments, without creating an overload in hospitals. Furthermore, it is important that the sensitivity of the population with regard to social conditions and the degree of implementation of the Welfare State is low, i.e., the country has good infrastructure, good living conditions in the population as a whole and little social inequality. Having low sensitivity would be a fundamental requirement so that herd immunity, which initially exposes the population, does not penalize it, aggravating its vulnerability.

3. Capacity of response

3.1. Weakened scientific research

Although support for scientific research is part of the functions of the State, and the reduction of funds for research or even the bureaucratisation of research may also exemplify the weakening of the Welfare State, we have decided to place this issue on the list of capacity of response. First because there was a desperate call for science to find a cure for coronavirus. And secondly, because the science denialism, is decisive for the proposed measures of social distancing and lockdown to be understood or accepted. This science denialism has been gaining expression throughout the world, whether in the social media or in government posts, and even becoming a policy of governments. And it was also determinant for the delay in making decisions about the pandemic, under the argument that it was a variant of the flu, with risk only for the elderly, which could leave the majority of the population safe.

To face science denialism, it is necessary to consolidate a culture of valuing science in our society. It is not just a question of knowing more about science, but of developing a scientific attitude that can guide decision making based on rational choices. It is this capacity that comes from scientific literacy,

and which is also fundamental to ensure democratic and participatory processes⁵⁹.

Like several other paradoxes experienced in current times of intense polarization, the March for Science was born from the confrontation with science denialism. In 2017, on the date commemorating the Earth Day, a movement began in the United States of America and spread around the world to discuss and value the role of science, and the use of scientific evidence in decision-making processes⁶⁰. More than protesting against the science denialism led at the time by the American president, and the consequent cut of funds for research, the March for Science also brought scientists to the streets, and also triggered a debate on the role of science in society⁶¹. This debate allowed the reboot of Science for the People⁶² in the 1970s, and in the midst of the pandemic, a movement for the Re-foundation of University and Research to regain control over the world and our lives emerged in France⁶³.

In Brazil, the science denialism installed in the federal government has suppressed research grants, promoted cuts in maintenance funds for universities and questioned the value of research in Human Sciences.

In France, the confrontation between researchers and the government has taken place in the field of management, due to the government's presentation of a productivist bill that promotes competition among researchers, in addition to reinforcing precariousness through fixed-term contracts⁶⁴.

⁵⁹ MILLER, J. D. Scientific Literacy: A Conceptual and Empirical Review. **Daedalus**, v. 112, n. 2: p. 29-48, 1983. Available at: <http://www.jstor.org/stable/20024852>. Accessed on: 5 jul. 2020.

⁶⁰ SAITO, C. H.; BURSZTYN, M. Tempos sombrios na relação entre a política dos políticos e a política científica. **Sustentabilidade em Debate**, v. 8, n. 2, p. 12-14, 2017. Available at: <https://doi.org/10.18472/SustDeb.v8n2.2017.26923>. Accessed on: 5 jul. 2020.

⁶¹ MUSACCHIO, S. Pourquoi les scientifiques appellent les citoyens à marcher pour la science. **CNRS Le journal**. Paris, 10 abr. 2017, Seção Sociétés. Available at: <https://lejournale.cnrs.fr/print/1546>. Accessed on: 5 jul. 2020.

⁶² MERVIS, J. As scientists prepare to march, Science for the People reboots. **Science (AAAS)**. Washington, 04 abr. 2017, Seção News. Available at: <https://www.sciencemag.org/news/2017/04/scientists-prepare-march-science-people-reboots>. Accessed on: 5 jul. 2020.

⁶³ ROGUEESR. Refonder l'Université et la Recherche pour retrouver prise sur le monde et nos vies. **RogueESR**. 31 mar. 2020. Available at: <http://rogueesr.fr/retrouver-prise/>. Accessed on: 6 jul. 2020.

⁶⁴ BLIN, S. Un projet de loi contre l'avis de la recherche. **Libération**. Paris, 04 mar. 2020, Seção France. Available at: https://www.liberation.fr/france/2020/03/04/un-projet-de-loi-contre-l-avis-de-la-recherche_1780608. Accessed on: 5 jul. 2020.

In Poland, investment in Science and Technology was well below the average of the organization's countries⁶⁵. The low pay of researchers has led to a migration of scientists to the countries of so-called Western Europe. Currently, the government is trying to push scientific activity towards an organizational model of corporate structure promoting internal competition. Short-term contracts for young researchers and promotions in a clan-like environment make research teams hermetic. To some extent, the same has been happening in Brazil and France, within the framework of a productivist and monetarist ideology, in the same way that it has weakened the Welfare State.

To the attack against science with direct effects as described in Brazil are added the indirect effects, from lower recruitment of graduate students to the lower capacity of research laboratories to respond to demands for support in the midst of the pandemic, whether with testing, production of equipment or development of drugs and vaccines.

On the other hand, are direct relations between science and power desirable in times of health crisis? Since the beginning of the pandemic, the French government has created a Scientific Council⁶⁶ composed of 12 recognized researchers in different disciplines whose mission was to inform the presidency about the various areas to be considered in order to make decisions in emergency situations. The constitution of this Council reassured the French population because it is recognized that science can bring essential knowledge to solve problems in fields not controlled by policies. In the early days of the pandemic, the President said that he took his decisions on the basis of the recommendations of the Scientific Council. Very quickly, this group of researchers was no longer systematically consulted. Each of them intervened according to his (or her) discipline and his (or her) own point of view, which contributed to expressing a diversity of positions on the choice of measures to

⁶⁵ OCDE. **Études économiques de l'OCDE - Pologne.**

⁶⁶ The Scientific Council, chaired by a specialist in infectious diseases and immunology, is composed of an anthropologist, sociologist, modelling specialist, resuscitation specialist, epidemiologist, virologist, infectologist. LASCAR, O. Coronavirus Covid-19 : qui est dans le conseil scientifique du ministre de la Santé ? **Sciences et Avenir.** Paris, 16 mar. 2020, Seção Saúde. Available at: https://www.sciencesetavenir.fr/sante/coronavirus-covid-19-qui-est-dans-le-conseil-scientifique-du-ministre-de-la-sante_142500. Accessed on: 5 jul. 2020.

be adopted, the remedies and treatment protocols to be advised, etc. These controversies scared the leaders and the population, although the diversity of positions has always been an inherent part of the research. If science needs controversy to make progress, this is not the case with policies in decision-making that, on the contrary, call for clear and precise answers to a particular problem such as the crisis generated by the pandemic, or the population that needs to be reassured. The scientist's mode of expression may often not be adequate to participate directly in decision-making in times of crisis. On the other hand, the knowledge he brings is essential to finding the right solutions to the problems posed. Edgar Morin tells us that this crisis should serve to reveal how much more complex science is than people believe. He argues that science is a human reality that is based on debates of ideas, just like democracy⁶⁷.

In a time of crisis like this pandemic, the lack of understanding about the mechanisms of science, which is a consequence of a lack of scientific literacy, leads to a range of situations varying from the reinforcement of criticism of science (more science denialism) to charging on the science of finding a cure or vaccine. The additional risk in this context is the possibility of trying to speed up the process, with simplification of research, and skipping safety steps of drug and vaccine testing to deliver a miraculous product to the market. Society and politicians are expecting results "here and now. What will happen if the vaccine doesn't become a reality? Are we really going to blame the scientists?

In short, science is not made overnight, and the development of drugs and vaccines, which would support the strategy of herd immunity, much less. Science and a scientifically literate society as a capacity of response would certainly have much to contribute at this time. And if the capacity of response on this issue were high, social isolation measures acting on exposure could be relaxed.

⁶⁷ LECOMPTE, F. Edgar Morin: Nous devons vivre avec l'incertitude (Entrevista). **CNRS Le journal**. Paris, 06 abr. 2020, Seção Sociétés. Available at: https://lejournel.cnrs.fr/articles/edgar-morin-nous-devons-vivre-avec-uncertitude?fbclid=IwAR14B5GUzF62RjwnDXoN3_efOL__iLML9xESyFWS__eikyymMX-mI4WT90. Accessed on: 5 jul. 2020.

3.2 The geopolitics of regional integration and weakened multilateralism

The lockdown imposed on the inhabitants of Wuhan by the Chinese government could have been used to gain time by the rest of the world to act quickly and synchronously, which did not happen. What was seen was an inability of multilateral organizations to act in an integrated manner, marked by discredit as a global disaster, delay in recognizing the pandemic and lack of clear recommendations for action by the WHO. In addition to WHO, the limited operability of the United Nations Office for Disaster Risk Reduction (UNDRR) was evident, although epidemics and pandemics are also part of the disasters under its remit, based on the 2015-2030 Sendai Framework for Disaster Risk Reduction⁶⁸. This connexion is a fact, so much so that Manyena⁶⁹ addressed the 2008-2009 cholera epidemic in Zimbabwe within the frameworks of the United Nations International Strategy for Disaster Reduction (UNISDR), based on the Hyogo Framework of Action 2005-2015 (HFA) that preceded the Sendai Framework. On that occasion, the African country accounted for over 98,000 cases and over 4,000 deaths from cholera.

The weakness of the UNDRR had already been detected by Branco⁷⁰, who noticed a number of weaknesses at the origin of the procedures established under the UNDRR when analyzing the level of implementation of the HFA for Brazil: for example, by accepting the adhesion of the Administrative Regions of the Federal District to the HFA based on only one completed form, it was characterized the low level of formalism in public policies required by the UNDRR. In the case of the Administrative Regions of the Federal District, because these adhesions represented individual initiatives of a manager

⁶⁸ UNSDR. **Sendai Framework for Disaster Risk Reduction 2015 - 2030**.

⁶⁹ MANYENA, S. B. Disaster event: window of opportunity to implement global disaster policies? **Jàmhá: Journal of Disaster Risk Studies**, v. 5, n. 1: p. 1-10, 2013. Available at: <http://dx.doi.org/10.4102/jamba.v5i1.99>. Accessed on: 5 jul. 2020.

⁷⁰BRANCO, M.S.L.C. **Vulnerabilidade socioambiental de cidades sujeitas a desastres de origem hidrológica**: a internalização do Quadro de Ação de Hyogo. 2015. 156f. Dissertação (Mestrado em Desenvolvimento Sustentável) - Centro de Desenvolvimento Sustentável, Universidade de Brasília, Brasília.

without legal support, in the opinion of Branco⁷¹ the UNDRR also revealed ignorance of the political organization in Brazil.

Even the Covid-19 pandemic having occurred in an era of globalization and growth of both databases and processing capacity, the lack of trust among State agents and the lack of transparency in the data, added to the discrediting of scientific alerts, led to a global inaction at first, followed by uncoordinated actions at different scales.

The lack of global coordination in combating the pandemic has also been compounded by a nationalist approach and a warlike language: the word most used by heads of the State around the world was "war". And in the name of war, they fought over possession of health facilities used to contain contagion, and especially to support and protect healthcare professionals. Germany forbids the removal of masks and equipment from its territory; Italy complains of the lack of help from France and Germany in the transfer of products for the treatment of their patients; the United States of America has been accused of a new type of practice that has been called modern piracy: redirecting to themselves a set of 200,000 masks that had Germany as their original destination, "confiscated" in Bangkok, Thailand⁷². A company producing masks on US soil was banned from exporting its medical products to other countries from March 20. On that day, the president of that country resorted to the Defense Production Act, a 1950s wartime law, claiming that he would not like others to get the masks. The same phenomena of blockade by one country for the export of breathing assisting machine bought by another also occurred in South America.

The lack of overall coordination also existed on a regional scale. In the European Union, the president of the European Commission, Ursula von der Leyen, criticized the disorder in the unilateral border closure by European

⁷¹BRANCO, M.S.L.C. **Vulnerabilidade socioambiental de cidades sujeitas a desastres de origem hidrológica**: a internalização do Quadro de Ação de Hyogo.

⁷² BBC. Coronavírus: EUA são acusados de 'pirataria' e 'desvio' de equipamentos que iriam para Alemanha, França e Brasil. **G1 - O portal de notícias da Globo**. Rio de Janeiro, 04 abr. 2020, Seção Mundo. Available at: <https://g1.globo.com/mundo/noticia/2020/04/04/coronavirus-eua-sao-acusados-de-pirataria-e-desvio-de-equipamentos-que-iriam-para-alemanha-franca-e-brasil.ghtml>. Accessed on: 5 jul. 2020.

countries⁷³. But this disorder stems from the European Union's remarkable weakness in this context. The lack of integration in health policies or the absence of a health strategy in terms of epidemics, especially in the early phase of the crisis, resulted in a situation where countries were acting independently. The growth of a "culture of commitment" in the interaction between States, and the recognition of a supranational and regional integration idea emanating from the Council of the European Union⁷⁴, and implemented by the European Commission, faded into the crisis. The European Commission, without being able to act as the main body, as the leading institution, led the members of the European Union to create an independent policy, and national interests supplanted regionalism. The collective decision to close the borders of the whole of Europe in relation to the rest of the world within the European Union was only announced on March 17, when other member countries had previously decided to unilaterally close their borders (cases of Italy, Denmark, Slovakia, Hungary, Poland and the Czech Republic), including for people from the countries of the European Union itself. This may be the first time in history that the Schengen agreement has become the object of attention. And more than simply deciding to close the country's border, in Poland it should be noted that underlying this decision there is also an interest in reducing travel between countries: for example, the administration of the Mazovia Province (*Masovian Voivodeship*) decided to close the passport offices, thus preventing the obtaining or renewal of a passport, affecting the right to travel.

In South America, Argentina was the first to take a unilateral decision to close borders, independent of collective and organized action within Mercosur. Successively, countries took unilateral decisions on border closures, creating a mosaic of border blockades in South America.

⁷³ RFI. Coronavirus: l'UE critique le désordre de la fermeture des frontières en Europe. **RFI - Radio France international**. Paris, 14 mar. 2020, Seção Europe. Available at: <https://www.rfi.fr/fr/europe/20200313-commission-europeenne-UE-critique-desordre-fermeture-frontieres>. Accessed on: 5 jul. 2020.

⁷⁴ CHRISTIANSEN, T. The European Union and Global Governance. In: A. Triandafyllidou (Org.) **Global Governance from Regional Perspectives: A Critical View**. Cambridge, Oxford University Press, 2017. p. 209-233.

The worsening of the pandemic revealed the lack of coordination of actions and the fragility of international bodies responsible for managing the crisis. The main conclusions of Manyena⁷⁵ on the escalation of the cholera epidemic as disaster in Zimbabwe from 2008-2009 were not taken into account, repeating the errors pointed out: a) inadequate allocation of human, material and financial resources to prevent, mitigate, prepare for, respond to and recover from disasters; b) inadequate legal and institutional framework, with lack of clear coordination, accountability mechanisms, resource mobilization, community participation and integration of development in relation to disaster risk reduction; and c) lack of an integrated approach, limited political will or lack of data, which weakens the recognition of evidence to advocate for disaster risk reduction.

In summary, global and regional coordination in the event of a pandemic is critical to articulate planetary capacity of response. However, the idea of war in a scenario of national unpreparedness has triggered isolated initiatives and competitions among countries, and it has served to prevent planned containment efforts, with the necessary supply of medical devices and materials in a staggered manner according to priorities defined multilaterally, based on the principle of solidarity, from spatial analysis. What we concluded was the need for international cooperation to reduce vulnerability.

3.3 Democracy, Control and Surveillance

By using this scenario of lack of global coordination and a reference framework of war, propagated as an ideology for the population, some governments have also promoted an escalation of authoritarianism taking advantage of coronavirus.

In Hungary, the government was able to approve authorization to rule by decree during the state of emergency arising from the coronavirus, including prison sentences for disseminating false or misleading information. In several parts of the world, the silence of the streets in the cities has been watched over

⁷⁵ MANYENA, S. B. Disaster event: window of opportunity to implement global disaster policies?

by drones, and worries are beginning to arise about the scope of the control measures that have been instituted, which range from controlling the location of people to monitoring compliance with social distancing and home quarantine to tracking possible interpersonal contagion.

Critics of forced lockdown argue it is an authoritarian model imported from China that has a government with the same profile. They also have used South Korea as an example of a nation that has not instituted general lockdown in the population. This country conducts extensive testing of suspicious people, and today applies some lessons learned from the epidemic caused by another coronavirus (MERS-CoV), which was first detected in Saudi Arabia in September 2012 and has spread to 27 countries, with just over 2500 cases and over 850 deaths⁷⁶. But South Korea, in contrast, uses technology for individual control, with GPS tracking of smartphones to verify compliance with restriction measures for those infected in isolation⁷⁷, and mapping the transmission chain.

The same surveillance and control strategy has also been adopted in other parts of the world. Google made available in early April 2020, the "Community Mobility Report" in 130 countries. The Israeli Prime Minister recently authorized the Israeli Security Agency to deploy surveillance technology normally reserved for terrorists to track patients with coronavirus!

In Brazil, Facebook has released three maps with the movement of Brazilians during the pandemic: about the probability of people from one area coming into contact with groups from another; about movement trends; and about social connections that can help predict the spread of the disease and identify areas that may be most affected. Similar data is sought from mobile operators in Brazil^{78 79}.

⁷⁶ NIAID. **COVID-19, MERS & SARS**. Bethesda, 6 abr. 2020, Seção Diseases & Conditions. Available at: <https://www.niaid.nih.gov/diseases-conditions/covid-19>. Accessed on: 5 jul. 2020.

⁷⁷ KIM, M. S. South Korea is watching quarantined citizens with a smartphone app. **MIT Technology Review**. Cambridge (Massachusetts), 6 mar. 2020, Seção Biotechnology. Available at: <https://www.technologyreview.com/2020/03/06/905459/coronavirus-south-korea-smartphone-app-quarantine/>. Accessed on: 5 jul. 2020.

⁷⁸ MAGENTA, M. Coronavírus: governo brasileiro vai monitorar celulares para conter pandemia. **BBC News Brasil**. 03 abr. 2020, Seção Brasil. Available at: <https://www.bbc.com/portuguese/brasil-52154128>. Accessed on: 5 jul. 2020.

In this context, what is discussed is not the effectiveness of control, but mainly the social danger of control. Initiatives such as Pan-European Privacy-Preserving Proximity Tracing (PEPP-PT) try to respond to the challenge of providing a technological solution that helps to face the crisis but strongly adopts the European laws and principles of privacy and data protection. The question that arises is that none of us know exactly how we are being watched and what the coming years may bring. Can data control over personal behavior also pose a threat to freedom, fueling the exercise of authoritarian control by the state? Professor Stan Matwin, director of Dal's Institute for Big Data Analytics, has demonstrated his concern and the need to debate the ethical issues surrounding the applications for tracking the Covid-19 cases, particularly with regard to the protection of privacy in relation to the government⁸⁰.

These reflections are particularly important when analysing data on the panorama of democracy in the world. The 2020 Report on Democracy in the World, produced by the V-DEM Institute, linked to the University of Gothenburg in Sweden, denounces that there is a "wave of autocratization" that is accelerating and deepening: democratization declined in 26 countries during 2019, compared to 18 in 2017, configuring, for the first time since 2001, a world situation in which democracies are no longer the majority⁸¹. The same report indicates that the countries which have autocratized (losing their democratic character) the most over the last 10 years are Hungary, Turkey, Poland, Serbia, Brazil and India. On the characteristics of this process, the analysis of the situation in Hungary, Poland, Brazil, and India suggests that the first steps of this phenomenon of autocratization correspond to the elimination of media freedom and the narrowing of civil society's spaces. According to the V-DEM

⁷⁹ VENTURA, F. Google e Facebook medem quarentena no Brasil em cada estado. **Tecnoblog**, 06 abr. 2020. Available at: <https://tecnoblog.net/332913/google-e-facebook-medem-quarentena-no-brasil-em-cada-estado/>. Acesso: 5 jul. 2020.

⁸⁰ MATWIN, S. The Privacy Factor in Ending the Lockdown [PROJECT SYNDICATE]. **Wyborcza.pl**, 03.mai. 2020, Seção News from Poland. Available at: <https://wyborcza.pl/7,173236,25915429,the-privacy-factor-in-ending-the-lockdown-project-syndicate.html>. Accessed on: 5 jul. 2020.

⁸¹ V-DEM. **Democracy Report 2020: Autocratization Surges – Resistance Grows**. Gothenburg: V-DEM Institute, mar. 2020. Available at: https://www.v-dem.net/media/filer_public/f0/5d/f05d46d8-626f-4b20-8e4e-53d4b134bfc/democracy_report_2020_low.pdf. Accessed on: 5 jul. 2020.

Institute, early warnings include Poland's media laws of 2015/2016, and the fall in press freedom simultaneously with the increased repression of civil society in India associated with the current national-Hindu regime⁸².

In Brazil, the government of the current President of the Republic revoked the National Policy on Social Participation through Federal Decree 9759, on April 11, 2019. In addition to restricting spaces for social participation in politics, the current president's discourse of hatred and radicalism incites prejudice and violence against indigenous people⁸³, and several cases of death threats to journalists and intellectuals, before and after his election: Examples include the cancellation of the participation of journalist Miriam Leitão and sociologist Sérgio Abranches in the 13th Jaraguá do Sul (SC) Book Fair, and the exile of professor Débora Diniz, from the University of Brasília⁸⁴, researcher and activist in the defense of women's sexual and reproductive rights, recognized by the U.S. magazine Foreign Policy as one of the 100 greatest global thinkers⁸⁵.

The explicit processes of autocratization, and the processes of control of individuals from the onset of the pandemic, raise two questions about the capacity of response to disaster: a) the correct application of resources for the protection of all citizens, not just a portion of society; b) the ability to share information, knowledge and doubts, in order to make better decisions from a broader, plural view on the problem.

States with autocratic governments tend to hide information that allows for criticism of government management, to restrict the dissemination of data by the press, and to make mistaken decisions because the universe of debate and

⁸² V-DEM. **Democracy Report 2020: Autocratization Surges – Resistance Grows**. p.16-17

⁸³FÓRUM. **Discurso de ódio de Bolsonaro incita preconceito e violência contra indígenas, alerta bispo**. Santos, 16 dez. 2019, Seção Brasil. Available at: <https://revistaforum.com.br/brasil/discurso-de-odio-de-bolsonaro-incita-preconceito-e-violencia-contra-indigenas-alerta-bispo/>. Accessed on: 5 jul. 2020.

⁸⁴ BLOG DA CIDADANIA. **Antropóloga brasileira teve que se exilar por ameaças de bolsonaristas**. 26 nov. 2018. Available at: <https://blogdacidadania.com.br/2018/11/antropologa-brasileira-teve-que-se-exilar-por-ameacas-de-bolsonaristas/>. Accessed on: 5 jul. 2020.

⁸⁵ FOREIGN POLICY. **FP The global thinkers 2016 - the advocates**. Foreign Policy. 2016. Available at: <https://2016globalthinkers.foreignpolicy.com/2016/?3fa4cfa909=>. Accessed on: 5 jul. 2020.

consultation is limited. A long time under autocratic government generally ends by dissolving institutional structures for information storage and undermines the tradition of national dialogue and cooperation, shrinking the public sphere and ultimately weakening the capacity to respond and thus increasing vulnerability to the pandemic.

States should not constitute barriers to gestures of solidarity nor obstacles to collective intelligence. This pandemic teaches us that we are brothers and sisters in solidarity, in a common humanity, with no political boundaries.

4. Synergies among the elements of vulnerability

We have analyzed how the different socio-political aspects relate to the pandemic and how they can be better understood when framed within the structuring elements of the concept of vulnerability, namely: exposure, sensitivity, and capacity of response. It is now a question of understanding the place of each of them in the diagram presented in Figure 1

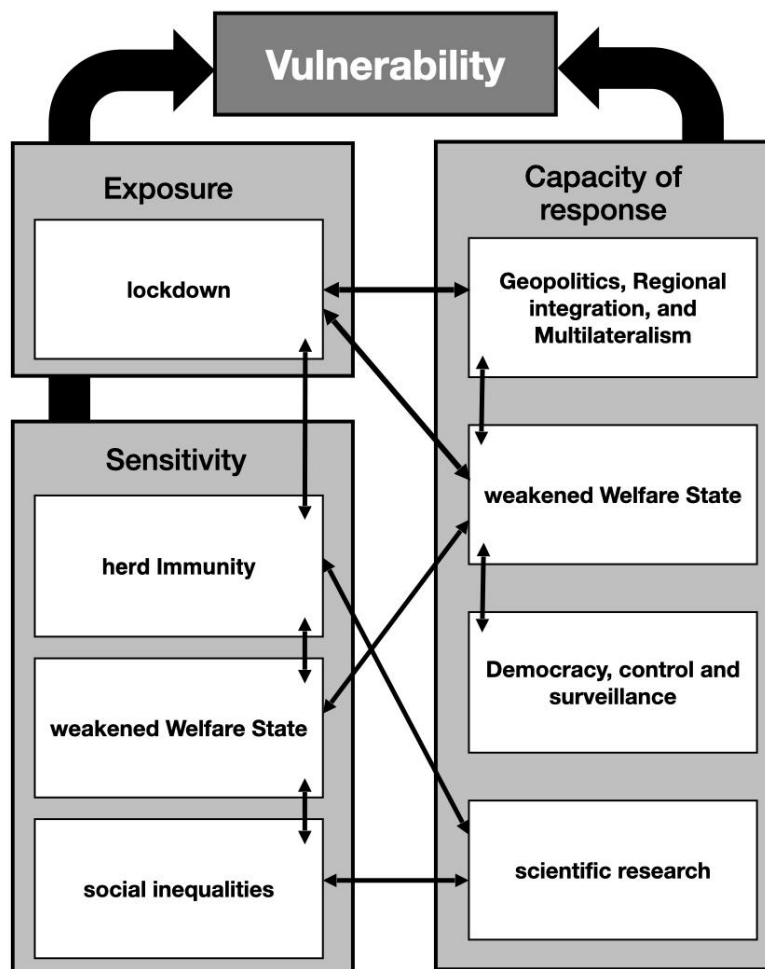


Figure 1: Model of interactions in the conceptual vulnerability framework applied to the Covid-19 pandemic.

According to what we have seen so far, the main mechanism for confronting the exposure, seeking its attenuation, was the lockdown. This strategy of lockdown is opposed to the strategy of herd immunity advocated in some countries, which in turn depends both on the advancement of scientific research and the capacity to respond in terms of health infrastructure, as part of the Welfare State.

Among the constituent factors of sensitivity, social inequalities weaken society, making it susceptible to contracting viral disease or manifesting it in the most serious forms. As risk is socially selective in Beck's⁸⁶ view, the greater the

⁸⁶ BECK, U. Living in the world risk society. **Economy and Society**.

social inequality and the greater is the part of the population in the poverty belt, the greater the sensitivity and therefore the vulnerability to the pandemic. The fragility of the Welfare State, especially in the provision of public basic sanitation and health services, also configures an increase in sensitivity. This last sensitivity factor, when the pandemic is in course, also becomes a factor of capacity of response, capable of effectively treating the sick and recovering them, as well as acting in favor of the economic security of families and economic activities. The Welfare State, weakened by neoliberal policies of State minimization, also responds to the education sector, which promotes the development of a scientifically literate collectivity, and values scientific research, which in the pandemic is seen that this support is an essential function of the State.

Among the factors that make up the capacity of response, the geopolitics of regional integration and multilateralism have proved to be necessary for proactive coordination in times of crisis, a fact that no longer occurs, significantly compromising the effort to contain exposure. The Welfare State must also be seen on a regional and global scale, based on coordinated actions to support the most economically fragile countries and regions, a support not only financial but also material, with planned sharing of health care resources, supplies, and equipment to combat the pandemic. Among the factors of capacity of response, the consolidation of democracy appears with its importance, both for the strengthening of social policies that guarantee the Welfare State as well as the transparency of information, the sharing of data, also at regional and global levels. Additionally, this democratic environment favors the plural debate in the search for solutions both to the fight against Covid-19 and to the social and economic impacts arising from the pandemic.

Scientific research has occupied a prominent place in the fight against Covid-19, as it has been called upon to seek a cure for the disease. Science represents one of the world's capacity to respond to the crisis. However, for scientific research to develop, investment by the State is needed, and research results for vaccines and drugs take time. Moreover, scientific research occupies another place: it can sustain a way of approaching information and of dealing

with crises in rational terms, which means establishing in society an understanding of the mechanisms of propagation of the pandemic and the effectiveness of the proposed means of combating it. At this point, like research results, a scientific attitude, as a result of a scientific literacy, is not built overnight, and depends mainly on State support for education in general as part of sustaining the Welfare State.

Comparing the situations of the three countries, we observe that the governments of France, Brazil and Poland had distinct behaviors regarding pandemic, coping strategies with different facets of their vulnerabilities: the interaction of exposure, sensitivity and capacity of response of each country shed light on the lived time of the pandemic in their respective territories. However, we would like to point out that the complexity of the subject suggests that the global context, and also the time scale, should be analyzed. It is important to recognize that what matters are not only the outcome of the number of cases, the number of deaths and the speed of recovery of the patients, but also the implications of the strategies adopted for the socio-political future of these countries, and the relations between society and the State.

In this way, we hope to have been able to demonstrate the complexity surrounding the analysis of vulnerability to the pandemic, from the point of view of its structuring elements (exposure, sensitivity and capacity of response), and how the factors acting on these elements interact with each other.

5. First reflections on the world after the crisis to put into perspective

To this integrative analysis we add a cross-cutting analysis, starting with questions about the relationship among society, nature and ethics, provoked by the pandemic, at the level of the individual and at the level of the State, so that we can draw lessons that allow us to look towards a healthier and safer future for all.

Considering that the modified landscapes favor the creation of niches that enhance the contact of human beings with new zoonotic diseases⁸⁷, we must reflect on how to reduce the possibilities of exposure.

Besides rethinking the practices of capital accumulation that have promoted the unbridled destruction of natural habitats, whether through the search for mineral extraction or commodity production, we should also value landscape studies, such as those of Dérioiz, Béringuier and Laques⁸⁸, since we should seek to better understand how the interactions between fragments in a mosaic of complexity can contribute to this contact process that potentiates exposure to new viruses.

On the other hand, Tischer et al.⁸⁹ in a study on the relationship between green areas and respectful diseases, showed that exposure to forest and agricultural areas was inversely related to atopic sensitization in children and adolescents up to 20 years old, and that they also observed a protective association between the green spaces of the residential environment and the wheezing within the less urban Euro-Siberian region of Spain. They propose a reflection that the loss of the natural environment and its biodiversity, with the consequent decline in microbiological diversity, may be partly responsible for the overall increase in the prevalence of respiratory inflammatory diseases such as asthma and allergy in residential surrounding greyness, of accelerated urbanization. According to these authors, being exposed to a less microbiologically diverse environment in childhood can lead to a weakened immune response and lower tolerance to harmful allergens ubiquitous in the environment. The debate proposed by these authors goes in the direction of a greater diversification of exposure, which perhaps, instead of counteracting the reasoning proposed here, precisely charges us with a holistic view and the

⁸⁷ AFELT, A.; FRUTOS, R.; DEVAUX, C. Bats, Coronaviruses, and Deforestation: Toward the Emergence of Novel Infectious Diseases?

⁸⁸ DÉRIOZ, P.; BÉRINGUIER, P.; LAQUES, A.-E. Mobiliser le paysage pour observer les territoires : quelles démarches, pour quelle participation des acteurs ? **Développement durable et territoires**, v. 1, n. 2: 1-27, set. 2010. Available at : <https://journals.openedition.org/developpementdurable/8682>. Accessed on : 5 jul. 2020.

⁸⁹ TISCHER C. et al. Urban green and grey space in relation to respiratory health in children. **European Respiratory Journal**, v. 49, n. 6: artigo 1502112, 2017. Available at: <https://doi.org/10.1183/13993003.02112-2015>. Accessed on: 5 jul. 2020.

defense of a balance in the man-nature relationship, launching reflections on the exposure-sensitivity interaction as a way of rethinking vulnerability.

In addition to thinking about the relationship between society and nature from the point of view of exposure and sensitivity to viruses, we must recognize that this same unbridled expansion of our society and the economic activities that sustain this social model can produce other disasters, such as large-scale extinctions of species or climate emergencies. This pandemic, causing an unimaginable paralysis of the world, has allowed us to see air quality indicators increase in metropolises around the world⁹⁰, and residents have seen the magnitude of the change even without consulting the indicators. Biodiversity occupied spaces, became visible in urban areas, and matings in captivity even occurred. One of the most notable examples recorded was the mating of giant pandas at Ocean Park Zoo in Hong Kong, after ten years without success, precisely thanks to the absence of visitors during the pandemic⁹¹.

Thus, we need to understand that the pandemic is not merely a fruit of nature, and we must admit that there is no idea of "nature" outside and separate from culture, as well as dissociated from the economy and the daily life.

Developing a broader and deeper understanding of the human-nature relations is an important lesson of this pandemic, as this understanding can help us avoid new disasters. A social justice concerned environmental education, with an interdisciplinary and complexity approaches anchored in socio-political empowerment will be fundamental in the current context of reflection on alternatives⁹².

The present look at the vulnerability that turned the pandemic into a crisis should serve to point the way to the future, analyzing different situations and alternatives. In choosing between alternatives, we must ask ourselves not only

⁹⁰ DUNFORD, D. et al. Coronavirus: The world in lockdown in maps and charts. **BBC News**, 7 abr. 2020, Seção World. Available at: <https://www.bbc.com/news/world-52103747>. Accessed on: 5 jul. 2020.

⁹¹ BARDEN, B. Coronavírus: graças a isolamento, pandas em zoológico acasalam após dez anos de tentativa. **BBC News Brasil**, 07 abr. 2020. Available at: <https://www.bbc.com/portuguese/geral-52100140>. Accessed on: 5 jul. 2020.

⁹² SAITO, C. H. Environmental education and biodiversity concern: beyond the ecological literacy. **American Journal of Agricultural and Biological Sciences**, v. 8, n. 1: p. 12-27, 2013. Available at: <https://doi.org/10.3844/ajabssp.2013.12.27>. Accessed on: 5 jul. 2020.

how to overcome the immediate threat, but also what kind of world we will inhabit when the storm passes.

What forms of food production will we accept? Will we continue to produce food based on agrochemicals and modified seeds that enrich chemical industries under the excuse that higher productivity is a necessary evil to produce abundance? Is it not time for us to reverse genetic erosion and diversity poverty in food? We need to strengthen the debates on agroecology and urban agriculture as a local and self-sustaining solution for food production, coupled with landscapes as a possibility to foster regional identities⁹³.

If the pandemic can make the global effort around Agenda 2030 suffer a severe setback in some of its sustainable development goals (SDG), most notably SDG-1, SDG-3, SDG-8, SDG-9, and SDG-10, on the other hand, SDG-13, SDG-14, and SDG-15 may end up benefiting from global paralysis. Given this other paradoxical picture, it is not a question of retaking economic activities at an accelerated pace to compensate for their paralysis when the Covid-19 crisis has passed. It is about thinking what model of society we want, and whether we should reproduce the same conditions of socioeconomic development that led the world to the pandemic, which also led before it to the formulation of SDG as a way to make the world better. It is worth pointing out that the SDG were managed in a top-down structure and within the same model that generated the imbalances, thus presenting severe transformative limitations, because it reproduced the discourse that one could not stop the way the world generated economic development. Even so, its motto of "leaving no one behind" is fully valid in this pandemic. And ensuring the achievement of its goals, such as SDG 6, targets 6.1 and 6.2 for drinking water and basic sanitation, for example, certainly reduces vulnerability to future pandemics. Water security is a key concept today.

⁹³ PETRY, C. Reverenciando o milagre do alimento. **Relicário**, v. 6, n. 11: p. 63-79, 2019.

Bruno Latour⁹⁴ proposes a reflection based on the observation that the crisis has shown that it is possible to stop everything, suddenly. If we can stop everything, overnight, is it not the time to interrupt all the activities that we consider not to go in the right direction to live better? Shouldn't the social distance (*gestes-barrières*) be extended and applied against the return to the pre-crisis mode of production?

With the pandemic, we understand that simple gestures can slow down the progression of a virus if everyone observes them (washing their hands, sneezing on their elbow, etc.). In another example, the separation of waste at the level of your individual garbage (throwing the cardboard in the yellow garbage in France) is qualified as a gesture which embodied citizenship because it promotes recycling and contributes to saving the planet. These actions have repercussions in specific areas: slowing down a virus, reducing pollution. When it comes to changing the world, making it less vulnerable, and to allow us to face the next health crises and, beyond that, to face the climate change, what actions could we propose collectively? Can someone answer this question? Can we avoid drowning in the mass of each person's complaints? Our capacity to imagine generic and universal blocking/barrier gestures (*gestes barrières*) is limited because it is faced with the complexity of the object to be reached.

Bruno Latour⁹⁵ provides a structure for everyone to participate in defining a new society, starting from the bottom up, from its base to the top of the State. For this, it would be necessary to be able to organize the sum of our individual ideas into a coherent and therefore achievable whole. An experiment has already been tried in France after the long months of demonstrations of the Yellow Vests (*Gilets Jaunes*). A major national debate was organized in 2019 by the government. Everyone was able to bring to the head of State those demands and proposals they wished to make to initiate a change towards a more egalitarian society. The process of social listening installed was based on

⁹⁴ LATOUR, B. **Imaginer les gestes-barrières contre le retour à la production d'avant-crise**. 29 mar. 2020. Available at: <http://www.bruno-latour.fr/sites/default/files/downloads/P-202-AOC-03-20.pdf>. Accessed on: 5 jun. 2020.

⁹⁵ LATOUR, B. **Imaginer les gestes-barrières contre le retour à la production d'avant-crise**.

the complaint's notebook (*cahiers de doléances*) that already existed in the period before the advent of the French Revolution. However, nothing emerged from this wonderful experience of freedom of expression offered to French society that represented the reversal of the logic of a traditional top-down public consultation approach to a bottom-up perspective. But why did it not work? The way the data was handled was not planned at the same time as the debate was being organized, and the objectives of this process were never clearly defined. It was then impossible to analyze each request because very few means were available to do so. Governments also did not want to retain certain proposals to reorganize their policy lines. The result was an immense sense of frustration for all participants.

The period of lockdown may become a second chance to relaunch the debate about the vulnerability to which our policies lead us, and especially about the actions that could be taken to move us towards individual and collective well-being. In fact, a parenthesis opens up in our lives to look outward (from conventional boxes): a look that leads us to become aware of what constitutes our daily life and our vision of the interrelationships woven with each other, from the next door neighbor to the resident of 'a distant country'. This lockdown represents an excellent opportunity for everyone to reflect on what he (or she) values in his life, what he (or she) wants to maintain, what he (or she) no longer wants to be confronted with, etc.

Bruno Latour⁹⁶ proposes to circumscribe the questioning around activities that everyone feels deprived by the current crisis and that give the feeling of an attack on their essential living conditions. For each activity, he asks to identify the underlying production chain and then to indicate whether we would like it to be retaken in an identical way (as before), better or not at all, at the end of the lockdown or the pandemic. If everyone identifies the activities they do not wish to retake based on what is desirable for them and what is no longer, it will be possible to establish the blocking/barrier gestures to protect against this, and deviate from the path. Before we want to change the world, we

⁹⁶ LATOUR, B. **Imaginer les gestes-barrières contre le retour à la production d'avant-crise.**

must be able to formulate what we want to maintain and what we no longer want.

This period of lockdown is conducive to this first stage of reflection: to state clearly what is important in our lives and in our relationship with the world. If we begin, each on our own, to ask these questions about all aspects of our production system, we will become effective switches of the new globalization - as effective, says Bruno Latour, as the famous coronavirus in its way of globalizing the planet. From the recognition of what the virus gets for its mode of dissemination, which is the suspension of the global economy, we can think of doing the same with our little insignificant gestures, from end to end. Each one of us must begin to imagine blocking/barrier gestures, but not only against the virus: against each element of a mode of production that we do not want to retake. From our ability to express ourselves in precise points, the actions that will influence economic and social policies will emerge more easily.

We will no longer be individuals who express their disagreement in a general discourse against an ideology, a type of society, lifestyles or events, but people capable of designating what they want and what they refuse and, therefore, support the implementation of government policies to achieve these goals. For example, if we are a large majority wanting to eat healthy products and seeking to treat health in good condition, it becomes easy to select actions, policies that will help to achieve these goals. In any case, it is easier to implement than to seek to define the contours of a more equal society.

Therefore, it is a question of recognizing that the capitalist accumulation model has been put into check. Beyond the level of the individual, we also have to look at the level of the State, at what is important, at the valuable acts, which cannot be judged from a monetarist point of view, as numbers or costs as advocated by neoliberalism.

During this pandemic, a statement by the French president made on 12/03/2020 should be highlighted, when the decision to establish compulsory lockdown throughout the country was announced as one of the strategies to combat the spread of Covid-19:

What this pandemic is already revealing is that free health care, without conditions of income, career or profession, our Welfare State, are not costs or burdens, but precious goods, essential goods when the destiny happens. That is what this pandemic is revealing. This is because there are goods and services that must be placed outside the laws of the market. Delegating to others our food, our protection, our ability to care, our way of life ultimately, is madness. We must regain control, build even more than we already do, a France and a sovereign Europe, a France and an Europe that hold its destiny firmly in its own hands ⁹⁷.

We must then demand that these ideas be fulfilled, we must wait for them to spread. In this way, we will be decreasing the sensitivity of our population, and at the same time, increasing our capacity to respond to a new epidemic event.

In addition to confronting neoliberalism, we must also focus on the search for greater global cooperation and solidarity. Both the epidemic itself and the resulting economic crisis are global problems and must be addressed by global cooperation.

The scientific cooperation put in place to seek the best ways to treat the affected patients shows our ability to work together, even if at a distance⁹⁸. Cooperation is strengthened by trust in each other and the ability to share data.

Moving more in the direction of global solidarity, Pope Francis, at the celebration of Easter in the midst of the pandemic, exhorted creditor countries to forgive the debts of poor countries.

Sectorially, solidarity practices between nations have also begun to emerge: transfer of patients across borders and admission of French and Italians to neighboring countries. When the northern and eastern regions of France were suffocated by the number of cases of seriously ill patients, the hospital sector in that region reacted by transferring its patients to hospitals with beds available for intensive care. The map in Figure 2 shows that the reception sites are distributed between the south and west of the country (below a

⁹⁷ MACRON, E. Adresse aux Français, 12 mars 2020. **Palais de l'Élysée**. Paris, 12 mar. 2020. Available at: <https://www.elysee.fr/emmanuel-macron/2020/03/12/adresse-aux-francais>. Accessed on: 5 jul. 2020.

⁹⁸ BURSZTYN et al. Annus Horribilis - 2020 (Editorial). **Sustentabilidade em Debate**, v. 11, n. 1, p. 6-9, abr. 2020. Available at: <https://doi.org/10.18472/SustDeb.v11n1.2020.30982>. Accessed on: 5 jul. 2020.

Cherbourg-Nice diagonal), but also in Germany, Austria, Switzerland, and Luxembourg.

In a survey conducted in the first week of April, more than 250 French patients were translocated, and the geographical pattern of the cases of origin and the localities that received the patients from France reveals the spirit of solidarity between regions of the same country, and between countries, confirming the need for collaboration between regions more and less affected by the virus, regardless of national origin.

Doctors and other health professionals such as nurses and paramedics from Romania, Poland and Norway went to Italy. Equipment and protective materials were sent from different countries such as Latvia, Austria, Czech Republic, Slovakia, to help the neighboring nations, benefiting Italy, Spain, Croatia, Estonia⁹⁹.

International solidarity follows many solidarity initiatives at national level. In Brazil, social networks have promoted actions that combined the resumption of small businesses with solidarity actions for vulnerable groups, just as there have been efforts to ensure that employers continue to pay day and monthly housekeepers even leaving them home in the confinement. In France, restaurants decided to organize food donations to the neediest after the decree to close this modality of commerce. In the scope of industries, both in Brazil and France, we have seen vehicle manufacturers to convert assembly lines to manufacture breathing machines, perfume manufacturers producing Alcohol Hand Sanitiser Gel for donation to hospitals, clothing manufacturers involved in the production of masks and protective clothing for healthcare professionals who are working to face the pandemic.

It will be these elements such as trust, solidarity and scientific literacy, guided by ethics in favor of life, that will provide the link to consolidate a better prepared global network with the capacity to respond quickly and effectively to future disasters. Rather than react to disasters, we must be able to avoid them.

⁹⁹ EUROPEAN COMMISSION. **Coronavirus**: European Solidarity in action. Bruxelas, 24 abr. 2020 (última atualização). Available at: https://ec.europa.eu/info/live-work-travel-eu/health/coronavirus-response/coronavirus-european-solidarity-action_en. Accessed on: 5 jul. 2020.

We must be less vulnerable, building a healthier, safer world with less social and global inequalities.

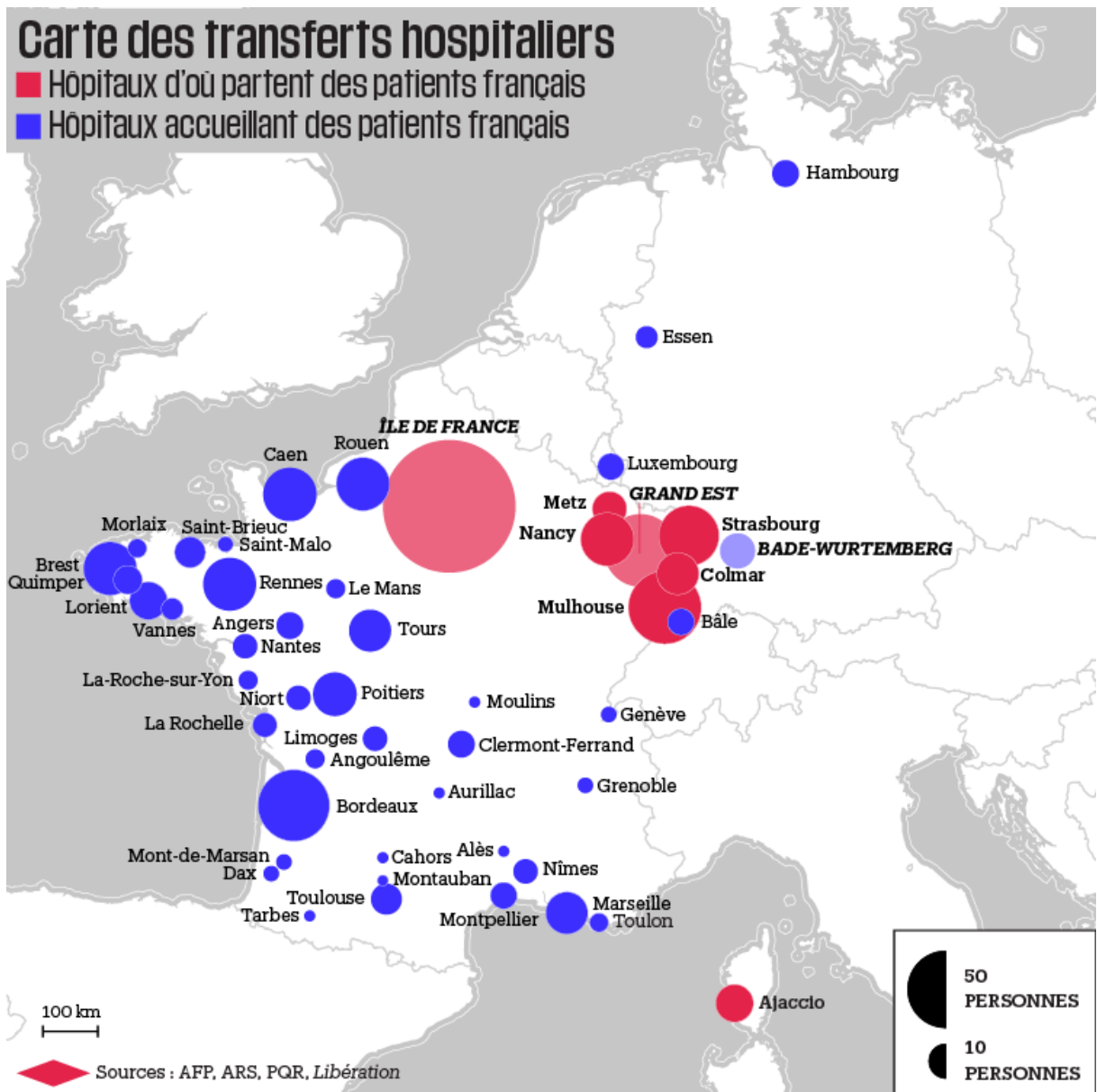


Figure 2: Hospital transfers of French patients. In red, hospitals from which French patients left. In blue, the hospitals that welcomed the French patients. The size of the circles informs the number of patients involved in the translocation, circles with references to 10 people (10 personnes) and 50 people (50 people). Source: Bouthier; Perrin (2020)¹⁰⁰.

¹⁰⁰ BOUTHIER, B.; PERRIN, C. Le transfert médicalisé de patients, une autre carte de France du coronavirus. **Libération**, Paris, 07 abr. 2020, Seção France. Available at: https://www.liberation.fr/france/2020/04/07/le-transfert-medicalise-de-patients-une-autre-carte-de-france-du-coronavirus_1784478. Accessed on: 5 jul. 2020.

Edgar Morin tells us, by the hands of Lecompte¹⁰¹ who interviewed him, that we must learn to accept and live with uncertainty, while our civilization has instilled in us the need for ever more certainties about the future. Our frenetic recourse to insurance proves this to us. They exist for everything, about everything. The resulting sense of false security finds us helpless when the unpredictable presents itself. This pandemic should remind us that uncertainty remains an intrinsic element of the human condition. And the recognition of the unpredictability and stochasticity of the emergence of a new virus reinforces this uncertainty. You need to prepare yourself for the unexpected and know how to react to the most dangerous situations. To do so, let's move away from dogmatic thoughts that normalize our reaction capabilities. We will nurture our resilience capabilities that arise when collective intelligence comes into play in crisis situations. But we must ensure that obstacles to the emergence of this collective intelligence are removed: autocracy, social inequalities, necropolitics.

While today, from Brazil, France, and Poland, we are all confined, we are very aware of our community of destinations. This is our strength for tomorrow.

Conclusion

The questions of ethics in relationships among human beings themselves, and in human-nature relations, bring the question of social solidarity and a new utopia. The building of a more solidary and secure future must involve reducing our vulnerability to new pandemics and other disasters in general. Solidarity must be strengthened not only in interpersonal relationships within a nation, they must be cultivated among nations, and above all among rulers.

Technological development has created the conditions for greater integration between people around the world. In order to take advantage of this integration, social inequalities within nations, and between nations, must be fought, and the strengthening of science, culture and education must be

¹⁰¹ LECOMPTE, F. Edgar Morin: «Nous devons vivre avec l'incertitude» (Entrevista).

promoted as foundations of tolerant societies. Furthermore, these societies need to be anchored in rationality, based not only on access to knowledge but also on the development of a rational attitude, with the skills to criticize, ponder, reflect, in order to understand the risks and promote choices in favor of the planet's sustainability. This is a scientific literacy, capable of illuminating obscurantism and promoting a new rebirth, free, creative, resilient, that values respect and integration of humanity with nature.

After the coronavirus crisis, the idea of a new world can replace that of the end of the world often generated by the expectation of climate change. Paradoxically, this pandemic, by showing the fragility of humanity, has awakened our will to believe that the future can be better than the present and the past, and that the future is in our hands. It is only necessary to devote time and concrete attitude to this.

References

- ADGER, W. N. Vulnerability. **Global Environmental Change**, v. 16, n. 3, p. 268-281, ago. 2006. Disponível em: <https://doi.org/10.1016/j.gloenvcha.2006.02.006>. Acesso em: 5 jul. 2020.
- AFELT, A. et al. Bats, Bat-Borne Viruses, and Environmental Changes. In: MIKKOLA, H. (Org.). **Bats**. London: InTech Open Access, 2018. p. 113-132. Disponível em: <http://dx.doi.org/10.5772/intechopen.74377>. Acesso em: 5 jul. 2020.
- AFELT, A.; FRUTOS, R.; DEVAUX, C. Bats, Coronaviruses, and Deforestation: Toward the Emergence of Novel Infectious Diseases? **Frontiers in Microbiology**, v. 9, artigo 702, abr. 2018. Disponível em: <https://doi.org/10.3389/fmicb.2018.00702>. Acesso em: 5 jul. 2020.
- AMIB. **Censo AMIB 2016**. São Paulo: AMIB, 2016. Disponível em: https://www.amib.org.br/fileadmin/user_upload/amib/2018/marco/19/Analise_de_Dados_UTI_Final.pdf. Acesso em: 5 jul. 2020.
- BARDEN, B. Coronavírus: graças a isolamento, pandas em zoológico acasalam após dez anos de tentativa. **BBC News Brasil**, 07 abr. 2020. Disponível em: <https://www.bbc.com/portuguese/geral-52100140>. Acesso em: 5 jul. 2020.
- BBC. Coronavírus: EUA são acusados de 'pirataria' e 'desvio' de equipamentos que iriam para Alemanha, França e Brasil. **G1 - O portal de notícias da Globo**. Rio de Janeiro, 04 abr. 2020, Seção Mundo. Disponível em: <https://g1.globo.com/mundo/noticia/2020/04/04/coronavirus-eua-sao-acusados-de-pirataria-e-desvio-de-equipamentos-que-iriam-para-alemanha-franca-e-brasil.ghtml>. Acesso em: 5 jul. 2020.
- BECK, U. Living in the world risk society. **Economy and Society**, v. 35, n. 3, p. 329-345, 2006. Disponível em: <https://doi.org/10.1080/03085140600844902>. Acesso em: 5 jul. 2020.
- BELAY, E. et al. Zoonotic Disease Programs for Enhancing Global Health Security. **Emerging infectious diseases**, v. 23, n. 13, p. S65–S70, 2017. Disponível em: <https://doi.org/10.3201/eid2313.170544>. Acesso em: 5 jul. 2020.
- BLIN, S. Un projet de loi contre l'avis de la recherche. **Libération**. Paris, 04 mar. 2020, Seção France. Disponível em: https://www.liberation.fr/france/2020/03/04/un-projet-de-loi-contre-l-avis-de-la-recherche_1780608. Acesso em: 5 jul 2020.
- BLOG DA CIDADANIA. **Antropóloga brasileira teve que se exilar por ameaças de bolsonaristas**. 26 nov. 2018. Disponível em:

<https://blogdacidadania.com.br/2018/11/antropologa-brasileira-teve-que-se-exilar-por-ameacas-de-bolsonaristas/>. Acesso em: 5 jul. 2020.

BOUTHIER, B.; PERRIN, C. Le transfert médicalisé de patients, une autre carte de France du coronavirus. **Libération**, Paris, 07 abr. 2020, Seção France. Disponível em: https://www.liberation.fr/france/2020/04/07/le-transfert-medicalise-de-patients-une-autre-carte-de-france-du-coronavirus_1784478. Acesso em: 5 jul. 2020.

BRANCO, M.S.L.C. **Vulnerabilidade socioambiental de cidades sujeitas a desastres de origem hidrológica**: a internalização do Quadro de Ação de Hyogo. 2015. 156f. Dissertação (Mestrado em Desenvolvimento Sustentável) - Centro de Desenvolvimento Sustentável, Universidade de Brasília, Brasília.

BRUNS, D. P.; KRAGULJAC, N. V.; BRUNS, T. R. COVID-19: Facts, Cultural Considerations, and Risk of Stigmatization. **Journal of Transcultural Nursing**, on-line First, 21 abr. 2020. Disponível em: <https://doi.org/10.1177/1043659620917724>. Acesso em: 5 jul. 2020.

BURSZTYN et al. Annus Horribilis - 2020 (Editorial). **Sustentabilidade em Debate**, v. 11, n. 1, p. 6-9, abr. 2020. Disponível em: <https://doi.org/10.18472/SustDeb.v11n1.2020.30982>. Acesso em: 5 jul. 2020.

CHRISTIANSEN, T. The European Union and Global Governance. In: A. Triandafyllidou (Org.) **Global Governance from Regional Perspectives: A Critical View**. Cambridge, Oxford University Press, 2017. p. 209-233

CLIFF, A. D. **Infectious Diseases: Emergence and Re-Emergence**, A Geographical Analysis. Oxford: Oxford University Press, 2009.

COHEN, J. Caught Between Herd Immunity And National Lockdown, The Netherlands Hit Hard By Covid-19 (Update). **Forbes**, New York, 27 mar. 2020, Seção Innovation. Disponível em: <https://www.forbes.com/sites/joshuacohen/2020/03/27/caught-between-herd-immunity-and-national-lockdown-holland-hit-hard-by-covid-19/#111d92383557>. Acesso em: 5 jul. 2020.

COUNTRYECONOMY. **NMW - National Minimum Wage**. Countryeconomy, 2020. Disponível em: <https://countryeconomy.com/national-minimum-wage>. Acesso em: 5 jul. 2020.

COUTO, L. F. **A crise do Covid-19, regras orçamentárias e suas interpretações**: mudanças necessárias? Nota Técnica n.28. Brasília: IPEA, 2020. Disponível em: <http://repositorio.ipea.gov.br/handle/11058/9835>. Acesso em: 5 jul. 2020.

DE SILVA, M. M. G. T.; KAWASAKI, A. Socioeconomic Vulnerability to Disaster Risk: A Case Study of Flood and Drought Impact in a Rural Sri Lankan

Community. **Ecological Economics**, v. 152: p. 131-140, out. 2018. Disponível em : <https://doi.org/10.1016/j.ecolecon.2018.05.010>. Acesso em: 5 jul. 2020.

DÉRIOZ, P.; BÉRINGUIER, P.; LAQUES, A.-E. Mobiliser le paysage pour observer les territoires : quelles démarches, pour quelle participation des acteurs ? **Développement durable et territoires**, v. 1, n. 2: 1-27, set. 2010. Disponível em : <https://journals.openedition.org/developpementdurable/8682>. Acesso em : 5 jul. 2020.

DUNFORD, D. et al. Coronavirus: The world in lockdown in maps and charts. **BBC News**, 7 abr. 2020, Seção World. Disponível em: <https://www.bbc.com/news/world-52103747>. Acesso em: 5 jul. 2020.

EBRAHIM, Z. What is 'herd immunity' and can it really solve the coronavirus pandemic? **Health24**, Cidade do Cabo, 06 abr. 2020, Seção Medical. Disponível em: <https://www.health24.com/Medical/Infectious-diseases/Coronavirus/what-is-herd-immunity-and-can-it-really-solve-the-coronavirus-pandemic-20200402>. Acesso em: 5 jul. 2020.

ENGELS, F. **The Condition of the Working-Class in England in 1844**: With Preface Written in 1892. Cambridge: Cambridge University Press, 2010.

ENGELS, J. Groepsimmunititeit? Die is in Nederland nog ver te zoeken. **Trouw**. Amsterdam, 16 abr. 2020, Seção Binnenland. Disponível em: <https://www.trouw.nl/binnenland/groepsimmunititeit-die-is-in-nederland-nog-ver-te-zoeken~bd73c307/>. Acesso em: 5 jul. 2020.

EUROPEAN COMMISSION. **Coronavirus**: European Solidarity in action. Bruxelas, 24 abr. 2020 (última atualização). Disponível em: https://ec.europa.eu/info/live-work-travel-eu/health/coronavirus-response/coronavirus-european-solidarity-action_en. Acesso em: 5 jul. 2020.

EUROSTAT. Share of young adults aged 18-34 living with their parents by age and sex - EU-SILC survey. **Eurostat**, 06 mai. 2020. Disponível em: https://ec.europa.eu/eurostat/en/web/products-datasets/-/ILC_LVPS08. Acesso em: 5 jul. 2020.

FERNÁNDEZ-ÁLVAREZ, A. L. Estado de Bem-Estar, Instituições Públicas e Justiça Social. **Revista Estudos Institucionais**, v. 4, n. 2, p. 884-904, 2018. Disponível em: <https://doi.org/10.21783/rei.v4i2.315>. Acesso em : 5 jul. 2020.

FINE, P. E. M. Herd Immunity: History, Theory, Practice. **Epidemiologic Reviews**, v. 15, n. 2: p. 265-302, 1993. Disponível em: <https://doi.org/10.1093/oxfordjournals.epirev.a036121>. Acesso em: 5 jul. 2020.

FOREIGN POLICY. **FP The global thinkers 2016 - the advocates**. Foreign Policy. 2016. Disponível em:

<https://2016globalthinkers.foreignpolicy.com/2016/?3fa4cfa909=>. Acesso em: 5 jul. 2020.

FÓRUM. Discurso de ódio de Bolsonaro incita preconceito e violência contra indígenas, alerta bispo. Santos, 16 dez. 2019, Seção Brasil. Disponível em: <https://revistaforum.com.br/brasil/discurso-de-odio-de-bolsonaro-incita-preconceito-e-violencia-contra-indigenas-alerta-bispo/>. Acesso em: 5 jul. 2020.

GALBRAITH, J. K. A Economia das Fraudes Inocentes. São Paulo: Companhia das Letras, 2004.

GALLOPÍN, G. C. Linkages between vulnerability, resilience, and adaptive capacity. **Global Environmental change**, v. 16, n. 3, p. 293-303, ago. 2006. Disponível em: <https://doi.org/10.1016/j.gloenvcha.2006.02.004>. Acesso em: 5 jul. 2020.

GIUBILINI, A. The Ethics of Vaccination. Durham: Palgrave, 2019. Disponível em: https://www.ncbi.nlm.nih.gov/books/NBK538383/pdf/Bookshelf_NBK538383.pdf. Acesso em: 5 jul. 2020.

GUS. Demographic Yearbook of Poland (Rocznik Demograficzny). Varsóvia: Główny Urząd Statystyczny (GUS), 2019. Disponível em: https://stat.gov.pl/download/gfx/portalinformacyjny/pl/defaultaktualnosci/5515/3/13/1/rocznik_demograficzny_2019.pdf. Acesso em: 5 jul. 2020.

HARVEY, D. Anti-Capitalist Politics in the Time of COVID-19, 20 mar. 2020. Disponível em: <https://jacobinmag.com/2020/03/david-harvey-coronavirus-political-economy-disruptions>. Acesso em: 5 jul. 2020.

IBGE. Síntese de Indicadores Sociais: Uma análise das condições de vida da população brasileira 2019 (Estudos e Pesquisas Informação Demográfica e Socioeconômica número 40). Rio de Janeiro: IBGE, 2019. Disponível em: <https://biblioteca.ibge.gov.br/visualizacao/livros/liv101678.pdf>. Acesso em : 5 jul. 2020.

INSEE. France, portrait social Édition 2019. Montrouge: INSEE, 2019. Disponível em: <https://www.insee.fr/fr/statistiques/fichier/4238781/FPORSOC19.pdf>. Acesso em: 5 jul. 2020.

IPSOS-SPF. Baromètre de la pauvreté Edition 2018, jun. 2018. Disponível em: https://www.secourspopulaire.fr/sites/default/files/atoms/files/barometre_ipsos_spf-juin_2018.pdf. Acesso em: 5 jul. 2020.

KALAN, D. Poland's Shortchanged Health Care System Is Already Straining. **Foreign Policy**, Washington, 06 abr. 2020. Disponível em: <https://foreignpolicy.com/2020/04/06/poland-underfunded-health-care-system-straining-unprepared-coronavirus-pis/>. Acesso em: 5 jul. 2020.

KIM, M. S. South Korea is watching quarantined citizens with a smartphone app. **MIT Technology Review**. Cambridge (Massachusetts), 6 mar. 2020, Seção Biotechnology. Disponível em: <https://www.technologyreview.com/2020/03/06/905459/coronavirus-south-korea-smartphone-app-quarantine/>. Acesso em: 5 jul. 2020.

LASCAR, O. Coronavirus Covid-19 : qui est dans le conseil scientifique du ministre de la Santé ?. **Sciences et Avenir**. Paris, 16 mar. 2020, Seção Santé. Disponível em: https://www.sciencesetavenir.fr/sante/coronavirus-covid-19-qui-est-dans-le-conseil-scientifique-du-ministre-de-la-sante_142500. Acesso em: 5 jul. 2020.

LATOURE, B. **Imaginer les gestes-barrières contre le retour à la production d'avant-crise**. 29 mar. 2020. Disponível em: <http://www.bruno-latour.fr/sites/default/files/downloads/P-202-AOC-03-20.pdf>. Acesso em: 5 jun. 2020.

LE FIGARO. 3 millions de Français se privent de produits d'hygiène faute de ressources. **Le Figaro**. Paris, 19 mar. 2019, Seção Économie. Disponível em: <https://www.lefigaro.fr/flash-eco/3-millions-de-francais-se-privent-de-produits-d-hygiene-faute-de-ressources-20190319>. Acesso em: 5 jul. 2020.

LECOMPTE, F. Edgar Morin: «Nous devons vivre avec l'incertitude» (Entrevista). **CNRS Le journal**. Paris, 06 abr. 2020, Seção Sociétés. Disponível em: https://lejournel.cnrs.fr/articles/edgar-morin-nous-devons-vivre-avec-lincertitude?fbclid=IwAR14B5G-UzF62RjwnDXoN3_efOL__iLML9xESyFWS__eikyymMX-ml4WT90. Acesso em: 5 jul. 2020.

LINDOSO, D. P. **Vulnerabilidade e Adaptação da Vida às Secas: desafios à sustentabilidade rural familiar nos semiáridos nordestinos**. 2013. 519 f. Tese (Doutorado em Desenvolvimento Sustentável) - Centro de Desenvolvimento Sustentável, Universidade de Brasília, Brasília.

MACRON, E. Adresse aux Français, 12 mars 2020. **Palais de l'Élysée**. Paris, 12 mar. 2020. Disponível em: <https://www.elysee.fr/emmanuel-macron/2020/03/12/adresse-aux-francais>. Acesso em: 5 jul. 2020.

MAGENTA, M. Coronavírus: governo brasileiro vai monitorar celulares para conter pandemia. **BBC News Brasil**. 03 abr. 2020, Seção Brasil. Disponível em: <https://www.bbc.com/portuguese/brasil-52154128>. Acesso em: 5 jul. 2020.

MANYENA, S. B. Disaster event: window of opportunity to implement global disaster policies? **Jàmbá: Journal of Disaster Risk Studies**, v. 5, n. 1: p. 1-10, 2013. Disponível em: <http://dx.doi.org/10.4102/jamba.v5i1.99>. Acesso em: 5 jul. 2020.

MATWIN, S. The Privacy Factor in Ending the Lockdown [PROJECT SYNDICATE]. **Wyborcza.pl**, 03.mai. 2020, Seção News from Poland. Disponível em: <https://wyborcza.pl/7,173236,25915429,the-privacy-factor-in-ending-the-lockdown-project-syndicate.html>. Acesso em: 5 jul. 2020.

MBEMBE, A. Necropolítica. **Arte & Ensaios**, v. 32: p. 123-151, 2016. Disponível em: <https://revistas.ufrj.br/index.php/ae/article/download/8993/7169>. Acesso em: 5 jul. 2020.

MENA, F. Entre casos identificados, covid-19 se mostra mais mortífera entre negros no Brasil, apontam dados. **Folha de São Paulo**, São Paulo, 11 abr. 2020, Seção Cotidiano. Disponível em: <https://www1.folha.uol.com.br/cotidiano/2020/04/coronavirus-e-mais-letal-entre-negros-no-brasil-apontam-dados-da-saude.shtml>. Acesso em: 5 jul. 2020.

MERVIS, J. As scientists prepare to march, Science for the People reboots. **Science (AAAS)**. Washington, 04 abr. 2017, Seção News. Disponível em: <https://www.sciencemag.org/news/2017/04/scientists-prepare-march-science-people-reboots>. Acesso em: 5 jul. 2020.

MILLER, J. D. Scientific Literacy: A Conceptual and Empirical Review. **Daedalus**, v. 112, n. 2: p. 29-48, 1983. Disponível em: <http://www.jstor.org/stable/20024852>. Acesso em: 5 jul. 2020.

MUSACCHIO, S. Pourquoi les scientifiques appellent les citoyens à marcher pour la science. **CNRS Le journal**. Paris, 10 abr. 2017, Seção Sociétés. Disponível em: <https://lejournel.cnrs.fr/print/1546>. Acesso em: 5 jul. 2020.

NIAID. **COVID-19, MERS & SARS**. Bethesda, 6 abr. 2020, Seção Diseases & Conditions. Disponível em: <https://www.niaid.nih.gov/diseases-conditions/covid-19>. Acesso em: 5 jul. 2020.

OCDE. **Études économiques de l'OCDE - Pologne**. Paris: OCDE, mar. 2018. Disponível em: <http://www.oecd.org/fr/eco/etudes/Pologne-2018-OECD-etude-economique-synthese.pdf>. Acesso em: 5 jul. 2020.

PETRY, C. Reverenciando o milagre do alimento. **Relicário**, v. 6, n. 11: p. 63-79, 2019.

RFI. Coronavirus: l'UE critique le désordre de la fermeture des frontières en Europe. **RFI - Radio France international**. Paris, 14 mar. 2020, Seção Europe. Disponível em: <https://www.rfi.fr/fr/europe/20200313-commission-europeenne-UE-critique-desordre-fermeture-frontieres>. Acesso em: 5 jul. 2020.

RHODES, A. et al. The variability of critical care bed numbers in Europe. **Intensive Care Medicine**, v. 38, n. 10: p. 1647-1653, 2012. Disponível em: <https://doi.org/10.1007/s00134-012-2627-8>. Acesso em: 5 jul. 2020.

RODRÍGUEZ, A. Coronavirus: une épidémie mortelle. **Cartooning for Peace**. 01 abr. 2020., Coronavirus : une épidémie mortelle - Rodríguez (Mexique / Mexico). Disponível em: <https://www.cartooningforpeace.org/editos/coronavirus-une-epidemie-mortelle/>. Acesso em: 5 jul. 2020.

ROGUEESR. Refonder l'Université et la Recherche pour retrouver prise sur le monde et nos vies. **RogueESR**. 31 mar. 2020. Disponível em: <http://roqueesr.fr/retrouver-prise/>. Acesso em: 6 jul. 2020.

SAITO C. H. **Contribuição metodológica para planejamento urbano de municípios de pequeno e médio porte através de SGI e Banco de Dados Relacional**. 1996. 255 f. Tese (Doutorado em Geografia) - Instituto de Geociências, Universidade Federal do Rio de Janeiro, Rio de Janeiro.

SAITO, C. H. Environmental education and biodiversity concern: beyond the ecological literacy. **American Journal of Agricultural and Biological Sciences**, v. 8, n. 1: p. 12-27, 2013. Disponível em: <https://doi.org/10.3844/ajabssp.2013.12.27>. Acesso em: 5 jul. 2020.

SAITO, C. H.; BURSZTYN, M. Tempos sombrios na relação entre a política dos políticos e a política científica. **Sustentabilidade em Debate**, v. 8, n. 2, p. 12-14, 2017. Disponível em: <https://doi.org/10.18472/SustDeb.v8n2.2017.26923>. Acesso em: 5 jul. 2020.

SANTOS, J. P. et al. Análise da distribuição espacial da hantavirose no Distrito Federal, Brasil, 2004-2010. **Hygeia - Revista Brasileira de Geografia Médica e da Saúde**, v. 10, n. 18: p. 98-109, 2014. Disponível em: <http://www.seer.ufu.br/index.php/hygeia/article/view/23482/14914>. Acesso em: 5 jul. 2020.

SAWULSKI, J. Is Poland a Welfare State? **IBS Policy Paper Series**, v. 2/2017, out. 2017 Warsaw: IBS. Disponível em: https://ibs.org.pl/app/uploads/2017/10/IBS_Policy_Paper_02_2017_en.pdf. Acesso em: 5 jul. 2020.

SUPLICY, E. M. Sobre o legado de John Kenneth Galbraith. **Revista de Economia Política**, v. 26, n. 4: p. 619-626, 2006. Disponível em: <http://dx.doi.org/10.1590/S0101-31572006000400009>. Acesso em: 5 jul. 2020.

TISCHER C. et al. Urban green and grey space in relation to respiratory health in children. **European Respiratory Journal**, v. 49, n. 6: artigo 1502112, 2017. Disponível em: <https://doi.org/10.1183/13993003.02112-2015>. Acesso em: 5 jul. 2020.

TOPLEY, W. W. C.; WILSON, G. S. The spread of bacterial infection. The problem of herd immunity. **Journal of Hygiene**, v. 21 n.3: p. 243-249, 1923. Disponível em: <https://doi.org/10.1017/s0022172400031478>. Acesso em: 5 jul. 2020.

TURNER II, B.L. et al. A framework for vulnerability analysis in sustainability science. **PNAS**, v. 100, n. 14: 8074-8079, jul. 2003. Disponível em: <https://doi.org/10.1073/pnas.1231335100>. Acesso em: 5 jul. 2020.

UNSDR. **Sendai Framework for Disaster Risk Reduction 2015 - 2030**. Genebra: UNISDR, 2015. Disponível em: <https://www.undrr.org/publication/sendai-framework-disaster-risk-reduction-2015-2030>. Acesso em 5 jul. 2020.

VALOR ECONÔMICO. **Alemanha aprova pacote de mais de 750 bi de euros contra coronavírus**. 23 mar. 2020, Seção Mundo. Disponível em: <https://valor.globo.com/mundo/noticia/2020/03/23/alemanha-aprova-pacote-de-mais-de-750-bi-de-euros-contr-coronavirus.ghtml>. Acesso em: 5 jul. 2020.

V-DEM. **Democracy Report 2020: Autocratization Surges – Resistance Grows**. Gothenburg: V-DEM Institute, mar. 2020. Disponível em: https://www.v-dem.net/media/filer_public/f0/5d/f05d46d8-626f-4b20-8e4e-53d4b134bfc/democracy_report_2020_low.pdf. Acesso em: 5 jul. 2020.

VENTURA, F. Google e Facebook medem quarentena no Brasil em cada estado. **Tecnoblog**, 06 abr. 2020. Disponível em: <https://tecnoblog.net/332913/google-e-facebook-medem-quarentena-no-brasil-em-cada-estado/>. Acesso: 5 jul. 2020.

WORLD BANK. GINI index (World Bank estimate). **World Bank Data**, 2019. Disponível em: <https://data.worldbank.org/indicator/SI.POV.GINI>. Acesso em: 5 jul. 2020.

WORLD BANK. **Poverty & Equity Brief - Poland 2020**. abr. 2020. Disponível em: https://databank.worldbank.org/data/download/poverty/33EF03BB-9722-4AE2-ABC7-AA2972D68AFE/Global_POVEQ_POL.pdf. Acesso em: 5 jul. 2020.

YOUNG, O. R. et al. The globalization of socio-ecological systems: An agenda for scientific research. **Global Environmental change**, v. 16, n. 3, 304-316, ago. 2006. Disponível em: <https://doi.org/10.1016/j.gloenvcha.2006.03.004>. Acesso em: 5 jul. 2020.