Sustainability in Covid-19 Times: A Human Development Perspective

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Abstract The COVID-19 pandemic can be divided into two waves: the first is associated with health problems, and the second with economic and environmental problems. However, it is necessary to analyze the existence of a third wave that, in the long run, can have a deeper impact on people's lives. This wave emerged from the virus capacity to accentuate social, economic, political, and cultural inequalities. In this sense, the novel coronavirus has profoundly affected efforts to achieve the 17 Sustainable Development Goals (SDGs), established in the 2030 Agenda, especially with regard to SDG 3, SDG 10, SDG 12 and SDG 16. In that spectrum, this chapter aims to demonstrate how the impacts of the COVID-19 pandemic affect compliance with the SDGs. The impact of this pandemic had been such that it is possible that it will mean the beginning of a new era, based on the need for global solidarity and the desire to pursue sustainable development paths. The COVID-19 pandemic provides an opportunity to propose new actions for a more sustainable world, drafting a recovery from economic and social crises that finds comprehensive solutions.

Keywords Social inequalities · economic and political inequalities · COVID-19 · sustainable development goals · just and inclusive societies

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1 Introduction

The Covid-19 pandemic has had profound and impacts on humanity over the past two years. The rapid transmission pattern with the wide geographical spread of the novel coronavirus (SARS-CoV-2) has seriously impacted different matrices of society in its three main pillars: economic, political and social. In addition to impacts on physical and mental health, societies are facing several environmental and economic challenges in areas ranging from quality of water, air, soil, biodiversity [1, 2] to public debt, quality of life, employability and waste management [3, 4].

The pandemic also pushes society to look to the past to analyze pandemics' economic impacts on socioeconomic inequality [5]. In this sense, the author highlights the Plague of Justinian (541–544) and Black Death (1347–1353) and presents evidence that demonstrates that previous pandemics have reduced inequality rather than increased it. However, he argues that in both cases, at least a quarter or even half of Europe's population may have perished—data on other continents is scarce. These conclusions, however, contradict the direction of most studies on inequalities linked to the COVID-19 pandemic, which points to a trend of increased inequality.

Reference [6] argue that pandemics have historically led to profound social transformations in societies, however, such transformations are not inevitable. The authors argue that previous pandemics led to reforms, pointing at examples such as the improvement in living and working conditions in Europe after the Black Death in the fourteenth century and improvements in British health systems after the cholera epidemic in 1832. However, such a system has not survived other epidemics of cholera in the following centuries.

The COVID-19 pandemic brings to light complex interconnected dilemmas of globalization, health equity, economic security, environmental justice, waste management, democracy and collective trauma, with a more significant impact the most vulnerable groups [7]. The pandemic has also highlighted existing infrastructure problems in areas such as healthcare, sanitation, housing, and access to essential items such as water, energy, and food. Such problems require government action to protect populations, especially in Latin America. Such processes increase the importance of understanding fundamental rights in decision-making [8].

In 2020, inequality has reached its highest level in the United States, with 1% of the population holding twice of the wealth of 90% of the population [9]. In this context, the literature points that, in contrast to what happened in previous pandemics, the COVID-19 crisis is increasing inequality instead of reducing it.

The COVID-19 pandemic provides an opportunity to propose new actions for a more sustainable world, drafting a recovery from economic and social crises that finds comprehensive solutions, using the Sustainable Development Goals (SDGs) as a framework—especially in order to avoid the stigmatization of already marginalized groups [10, 11].

In this objective, it is worth highlighting SDG3, set by the United Nations in 2015. SDG 3 establishes the health and well-being of humanity as its main focus and priority. To achieve this goal, 13 targets were set to measure progress.

SDG 3 stands out among the goals by directly connecting with groups of people who are vulnerable to the impacts of the COVID-19 pandemic, mainly in targets 3.8 and 3.d, which refer to the search for the well-being and health of all human beings. According to Ref. [12], the current pandemic overloads health systems and has had several adverse factors impacting the various goals of SDG 3 differently. Besides, the first four goals of SDG 10 should be emphasized, as they advocate the reduction of inequalities in the world, which are currently being intensified.

In short, all of these goals propose universal health coverage; early preparation for possible global health risks; increase in the income of the poor population; social, economic and political inclusion; promoting standards that reduce inequality; and the adoption of policies to achieve greater equality among all.

In the environmental sphere, changes in behavior and consumption are necessary to achieve sustainability, including less resource consumption and guaranteeing spaces for future generations [13]. On the COVID-19 pandemic, residential and hospital waste production has increased, hindering efforts to comply with SDG 12 by creating new points of pollution on air and sea [14].

There is an opportunity for that transition in a post-COVID-19 world. The Ref. [15] has called for solidarity, not stigmatization. However, the organization has submitted no substantive guidance on how countries can take public health measures that achieve health protection while respecting human rights. This is mainly due to two factors. First, there is still not enough information on the best way to contain this pandemic. Second, factors such as sex, race, class, disabilities, ethnicity, and other axes of identity are still relevant to determine inclusion in society and, by extension, vulnerability to a pandemic [8].

Therefore, the COVID-19 pandemic and measures taken to fight it can have serious long-term consequences that would affect compliance with the SDGs [16]. McNeely [17] adds that sustained economic growth and the globalization of human movement, interconnections, finances, trade, and economic investments are linked with the completion of the SDGs by 2030. In the face of the COVID-19 pandemic, sustainable actions are being severely limited, failing to include all and affecting specifically isolated populations.

In that context, joint action between all social actors is necessary to achieve a fair and equalitarian society. The SDGs provide a fundamental framework in which jobs, social equality and economic concerns will be addressed in the coming recovery [18]. In this context, the structural violence existing in Brazil and in the world becomes increasingly evident, which, according to Elavarasan and Pugazhendhi [19], is an avoidable deficiency of fundamental human needs, which is based on a conjuncture of extreme social inequalities, where part the population is excluded and does not have access to rights, which makes room for the devaluation of life and the trivialization of death and impunity.

In this perspective, Ref. [20] argues that diseases, in general, are not democratic, as their incidences are determined by income, housing, age, gender, and race. In the case of this pandemic, that is no different due to the vulnerable populations that are already in the risk group.

This chapter aims to demonstrate how the impacts of the COVID-19 pandemic imply compliance with the SDGs, represented in Fig. 1. In addition, we prove that the response to such an emergency must be a constant construction in order to make society more egalitarian, primarily through cooperation resources, technologies, transparency in the dissemination of data, the responsibility of decision-makers, entrepreneurs and civil society, high investments in health services and political-economic intentions of governments [21].

The following sections will address the impacts of Covid-19 on the global health of the world population, with repercussions on health (SDG 3), social inequalities (SDG 10), the promotion of just, peaceful and inclusive societies (SDG 16) and, finally, the influence of the generation of waste by the novel coronavirus on responsible consumption and production and the balance of the environment (SDG 13).

Fig. 1 Representation of the purpose of the chapter (*Source* Own elaboration)

2 Methodology

The integrative review method employed in this research consists in synthesizing knowledge from primary findings, obtained from indexed databases, such as Scopus, ScienceDirect, Emerald, Web of Science and Google Scholar, representing underground literature. The steps developed to unfold this chapter are represented in Fig. 2.

The period used as a research filter in the databases was 2017–2021 and the terms used for this research were: "global health" AND Covid-19; "SDG 3" AND Covid-19; Sexual AND "reproductive health" AND "family planning" AND "Covid"; "tobacco control" AND Covid 19; Covid 19 AND "social inequality" AND "economic inequality" AND political inequality; "Covid 19" AND "social inequality" AND "Economic inequality" AND "political inequality"; Covid 19 AND "social inequality" AND "economic inequality" AND "political inequality"; Covid-19 AND people AND justice; Covid-19 AND consumption AND Waste AND production AND environment ".

In these first searches in the databases, we found 2,820 primary findings and the used sample resulted in 133 scientific articles, distributed as follows: Scopus (39%); Sciencedirect (23%); Web of Science (11.5%); Emerald Insight (6.5%); Google Scholar (20%), in 56 indexed journals, the most cited journals were:: Environmental Research; Science of the Total Environment; International Journal of Sociology and Social Policy; The Lancet; Plos Medicine; The American journal of tropical medicine and hygiene; Sustainability; Journal of Pharmaceutical Policy and Practice; BMJ global health; Economies; Journal of global health; Public Health Nursing; Journal of Hospice & Palliative Nursing; Social Sciences; Research in Social and Administrative Pharmacy.

In the following section we will explore four important topics for this chapter: The impacts of Covid-19 on the global health of the world population, with repercussions

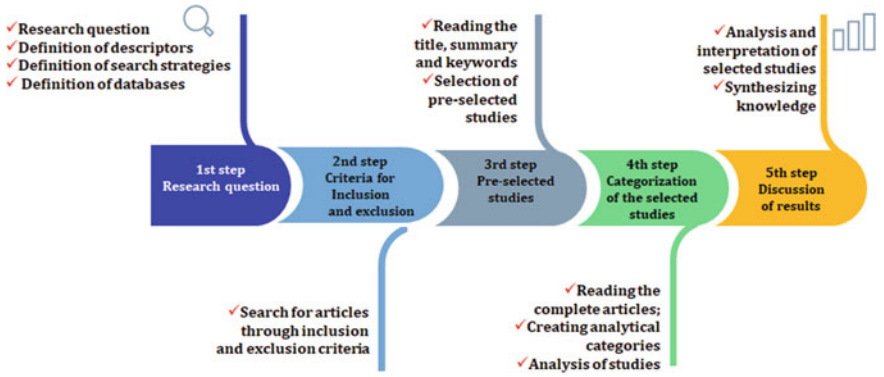

Fig. 2 The methodological steps (*Source* Own elaboration)

on SDG 3; Covid-19 and its impacts on the social, economic and political inequalities of the world populations; the spread of COVID-19 around the world and the promotion of fair, peaceful and inclusive societies; the influence of waste generation by Covid-19 on responsible consumption and production and on the balance of the environment.

3 Results

3.1 The Impacts of Covid-19 on the Global Health of the World Population, with Repercussions on SDG 3

The Covid-19 pandemic has had profound impacts on humankind over the past two years. The emergence of the COVID-19 has tested public health systems globally, impacted the core of neoliberal ideology, alerted to the issue of climate change with the temporary interruption of human activities, and caused health systems to be rethought in several countries. Reference [22] highlights that washing hands, practicing social distance and staying at home are the preventive measures implemented to contain the spread of COVID-19. However, although easy to follow, these measures highlight the tip of a socioeconomic iceberg and a socio-technological imbalance. Reference [23] argues that unsustainability had facilitated the spread of the SARS-Cov-2 in aspects such as harmful interactions between ecologic and socioeconomic systems and human invasions of natural habitats.

Reference [24] predicted that the overload of health systems caused by the pandemic would have the potential to cause up to 1.2 million children's deaths and 600.000 mothers' deaths that impacts the SDG 3 and its targets 3.1 (referring to infant mortality) and 3.2 (maternal mortality). Those scenarios might change depending on how long this pandemic scenario lasts, which is still unclear at the time of writing.

According to Ref. [25], the COVID-19 pandemic can be characterized as Syndemic since it affects different geopolitical contexts in a specific fashion and does not act alone, but it is compatible with other diseases [26]. The strategies to fight the COVID-19 pandemic have varied dramatically among different nations, and some developing countries in Sub-Saharan Africa have dealt with it much better than governments of developed countries, such as the United States.

In the case of target 3.3, attention should be paid to the health of marginalized and stigmatized populations, such as LGBTQI + and female workers, who end up encountering additional difficulties. Reference [27] highlight that these groups are often outside the State's social protection and were sometimes unprotected even before the COVID-19 pandemic. This is the case of some countries in Africa where prejudice was already a social problem even before the pandemic.

In turn, the research by Ref. [28] punctuates a wide range of impacts from the COVID-19 pandemic, including impacts on mental health and the treatment of non-communicable diseases, including the agenda for target 3.4. With regards to mental

health, Clay and Parker [29] point out that periods of social isolation can have several impacts on health, leading to an increase in alcohol misuse, relapse and, potentially, the development of alcohol use disorder, putting even more pressure on addiction and drug and alcohol services, and health services in general, during and after the pandemic, a concern highlighted in target 3.5. Reference [30] point out that the increase in alcohol use was widely documented during other crises, particularly among people with anxiety and depression. Target 3.6, which deals with deaths and injuries from road accidents, Refs. [31] argue that social isolation has led to reducing minor traffic accidents, however, fatalities are still significant.

Target 3.7, which aims to ensure universal access to sexual and reproductive health services, including family planning, can be overwhelming and local and national measures imposed by countries in an attempt to control the spread of Covid-19 have also affected sexual and reproductive health services. Reference [32] argues that such changes will increase the needs for modern contraceptives, unwanted pregnancies, unsafe abortions, maternal and neonatal deaths and might incentive other harmful practices, such as female genital mutilation and child marriages in developing countries.

The need for contraception and reproductive planning during the COVID-19 pandemic is fundamental. Reference [33] claims that sexual and reproductive health (SRH), especially contraception, is an essential service. Besides, women, health professionals, legislators and society should be encouraged to consider SRH services as a priority.

Reference [34] argues that family planning has become even more important in light of the pandemic since COVID-19 has impacts on individuals and couples' rights. Furthermore, family planning is closely associated with fundamental human rights, such as equity, equality and universality. There is a need for continued national commitment and investments in family planning, especially during these difficult times when the vital economy is compromised due to the global crisis caused by the pandemic.

Still in relation to target 3.7, it is worth noting that sexual and reproductive health (SRH) pose a significant public health challenge problem during epidemics. A recent survey conducted in Tunisia revealed that up to 50% of SRH clinics in the country have been reduced or suspended activities since the emergence of COVID-19 [35]. Reference [36] points out the impacts of the pandemic on the health system with interruptions in the regular provision of SRH services, such as prenatal and postnatal examinations, safe abortions, contraception, HIV/AIDS and sexually transmitted infections, highlighting the need urgency of the scientific community to generate solid clinical, epidemiological and psychosocial behavioral links between COVID-19 and SRH [37]. In this pandemic scenario, Ref. [38] recommend that countries include family planning and reproductive health services in the essential service package and develop strategies to ensure that women and couples can exercise their reproductive rights COVID-19 crisis.

Another possible point of concern that impacts directly target 3.7 is the possible impacts of SARS-CoV-2 on fertility. Reference [39] explain that while, based on the current evidence, the probability of transmission of SARS-CoV-2 through the

seminal fluid is very low, the data are still very limited to be sure of the impacts of SARS-CoV-2 infection on male reproductive hormones and in the semen parameters.

Social isolation measures designed to slow the spread of COVID-19 and reduce risk to medical staff also limit customers' involvement with SRH services. Several international agencies have estimated that the pandemic's long-term consequences will include a negative impact on the sexual and reproductive health needs of women and girls in vulnerable communities [40]. After experimental studies, Ref. [41], demonstrated that the pandemic had caused an increasing desire to postpone or prevent pregnancy while creating barriers to contraceptive services. This can lead to an increase in unwanted pregnancies, particularly among people who had difficulty buying food, transportation and/or housing during the pandemic.

Other studies reinforced the issue of universal health coverage, such as those developed by Ref. [12], on the role of pharmaceutical assistance in the midst of the COVID-19 pandemic. References [42] and [43] addressed health spending, and Ref. [44] focused on the study of a universal social protection system.

Reinforcing this literature, Ref. [45] studied the responsiveness of health systems, presenting four main propositions: integration, financing, resilience and equity. These proposals took into account the non-alignment between the rates of preparedness to respond to pandemics that predicted great response capacities for countries such as the United States, which ended up having markedly poor crisis management compared to other countries. Although the United States has an impressive range of public and private laboratories, innovative pharmaceutical and technology companies, high-capacity institutes in the field of public health, among other facilities, the country has a highly fragmented public health system. Furthermore, Ref. [46] propose the need to create a global fund with the objective of strengthening health systems, so that they are able to face new global pandemics, at the same time that such a fund would contribute to achieving the SDG 3.

Target 3.9 addresses two important points: deaths and diseases due to the use of dangerous chemicals, contamination and pollution of air, water and soil. Rume and Islam [47] indicate that in the current context, there has been an improvement in air quality in different cities around the world, a reduction in greenhouse gas (GHG) emissions, and a reduction in water and noise pollution, helping to balance the ecological system. However, Dharmaraj et al. [48] point out that despite the positive aspects, it is important to highlight the negative consequences of COVID-19, such as increased hospital waste (effluents, masks, and gloves).

In addition to the discussions made in the previous paragraphs about the repercussions of Covid-19 on global health and SDG 3, regarding targets 3.1 to 3.9, we will now dedicate ourselves to establishing relationships with the complementary goals, which are 3.a, 3.b, 3.c, 3.d. With regard to smoking, studies have shown the correlation between the prevalence of tobacco use in adults and mortality from COVID-19 worldwide and, according to Ref. [49], factors such as low immunity and a history of respiratory conditions lead to decreased lung capacity, which makes smokers a risk group for the novel coronavirus [50]. Diseases caused by the use of tobacco, such as cancer and cardiovascular diseases, act as comorbidities, aggravating symptoms in COVID-19 infection. Reference [51] highlight that nicotine exposure is linked

to cardiopulmonary vulnerability to COVID-19 and tobacco use may be a potential risk factor for contracting viral infection and manifesting more serious symptoms. Another aggravating factor is the increase in infections due to the sharing of smoke and the release of droplets of steam and smoke, putting the community at risk [49].

The correlation between the prevalence of smoking in adult men and mortality from COVID-19 is higher in low-middle income countries. Reference [52] also highlight the importance of strengthening smoking control policies to reduce the impact of the COVID-19 pandemic in these locations. Reference [53] underlines that with public health priorities aimed at controlling the pandemic, there is a concern that tobacco control will be set aside, despite the fact that it causes millions of deaths per year. Reference [51] also suggest taking advantage of this pandemic moment to break the nicotine dependence cycle and accelerate national tobacco control programs to achieve a tobacco-free world. Tobacco control is a greater challenge than ever in the context of the pandemic COVID-19. Reference [54] emphasize that decision-makers must be vigilant to ensure that public health practices are consistent and compatible with the principles of the World Health Organization (WHO) Framework Convention and the SDGs for Tobacco Control.

There is also interest in creating teams that will help create a better understanding of disasters and health-related risks, aiming to strengthen local decision-making. Authors such as [55] show how these teams could help create a deeper understanding of the behavior of COVID-19 [56]. Osingada and Porta [57] also emphasize the importance of proper training of health professionals so that their formation will include a holistic approach, addressing concerns expressed in the SDGs. Reference [58] address gender equity to strengthen the workforce and the role of nursing in facing the crisis caused by COVID-19 [59].

3.2 COVID-19 and Its Impacts on the Social, Economic and Political Inequalities

In addition to all of its impacts on health, the COVID-19 pandemic has also significantly impacted social, economic, and political issues worldwide, especially in developing countries. The global economy has slowed as most companies have been affected. This situation is made worse by some countries' policies in response to this pandemic, from social distancing to blockade policies [60].

This social shock is increased when companies are forced to reduce their production to save their costs [61]. In this sense, Ref. [62] believe that poverty and food security can grow as the Covid-19 outbreak progresses. Reference [63] state that the virus has increased pre-existing inequality levels and has hit socially vulnerable people harder. In the same vein, Ref. [64] highlight that billions of lives worldwide were directly or indirectly impacted by the pandemic COVID-19, revealing and aggravating the social and economic inequalities that have emerged in recent decades.

This situation has expanded existing divisions by income, age, gender and ethnicity, exacerbating many existing inequalities and opening up new fissures, especially among those whose jobs cannot be done from home, which are often correlated with existing inequalities (for example, by income). Younger and low-income workers are much more likely to lose their jobs and suffer a reduction in earnings during a lockdown. Self-employed workers and workers with less secure employment contracts are also more likely to report negative impacts. Key workers, who generally face more health risks, are more likely to receive lower wages, be women, and belong to some minority ethnic groups.

In general, health impacts have been uneven, with higher mortality rates among certain occupations, ethnic minority groups and more inferior locations. Children in more impoverished families were more deeply affected as schools closed, and those who would have joined the labor market in 2020 face the potential for long-term negative implications due to the collapse of the labor market. In contrast, individuals with a higher level of education and higher income are more likely to work from home, homeschool their children and have savings to cover unforeseen expenses [65].

Governments must play a central role in leading all response preparations, coordinating efforts to avoid creating a vacuum to be filled by competing political parties. Most importantly, decision-makers need to address social inequalities and provide social protection and health systems for all, especially for disadvantaged populations, to mitigate economic vulnerabilities [66]. For [67], the COVID-19 pandemic intensified the economic and social problems that society had faced for decades, but the crisis also presents a unique circumstance of social cooperation opportunities.

In countries where trust in the public sector and the state was already weakened, the spread of misinformation related to a public health problem becomes more prominent and faster with the global proliferation of social media. That behavior was observed during the COVID-19 pandemic, accompanied by an unprecedented wave of disinformation described as damaging as the pandemic itself. Misinformation is understood as false information that is disseminated regardless of its intention to deceive [68].

Reference [66] also warn about false statements made by politicians, high-level elected officials, celebrities, prominent public persons and the general public about the spread of diseases and medicines, such as the ideas that saunas, hairdryers and exposure to the sun could prevent contamination from COVID- 19.

At this point, it is vital to highlight the relationship between COVID-10 and SDG 16, which, for [69] occurs mainly in the face of political polarization, which is a cultural barrier to coordinated action within countries. The polarization between citizens occurs in two forms: attitude polarization, which concerns supporters who take extremely opposite positions,and affective polarization refers to supporters who do not like and distrust those who present extremely opposite opinions. Affective polarization has political consequences such as decreased confidence, the privilege of party labels over political information, and the belief in false information, which can undermine social and economic relations and harm public health. Reference

[70] also claim that political polarization can be exacerbated by individuals' different news sources with different political inclinations.

Reference [71] show evidence that COVID-19 impacts different populations in widely varying ways: the poor, elderly, black and indigenous populations, as well as those who live with comorbidities, tend to fall ill and die at the highest rates. The social detachment guidelines changed millions of people to work from home and millions more lost their jobs, even when domestic workers, predominantly women, blacks, indigenous people and people of color, were asked to put the lives of their loved ones on the front lines.

In the United States, these biological, social and economic crises were punctuated by civil unrest, as millions took to the streets for racial justice, observing the unequal impacts of the pandemic. [72] state that the District of Columbia's food insecurity reveals a history of unequal access to food that was only amplified by the vulnerability of food supply chains during the COVID-19 pandemic. New opportunities for food access are being presented by advances in urban agriculture and other innovations in food production. These techniques could offer urban communities sustainable alternatives to access to food that simultaneously meet local food security and green infrastructure needs. But they also bring persistent socio-political barriers into greater focus.

The COVID-19 pandemic and the policies of social isolation it entails have exacerbated these barriers, making conventional solutions for access to food inadequate to meet its well-intentioned objectives. The ability to order groceries and household products on mobile devices, for example, is still unknown for a large part of the population. The profound disadvantages of marginalized populations and the isolating nature of structural racism. Contrary to the market-centered focus of traditional food access policies, such as public–private partnerships, disparities in access to food and resulting inequalities in food security are persistent problems in cities in the United States [73], [72].

With the arrival of COVID-19 in Brazil, a crisis scenario that incorporated economic, social and political aspects became quite visible. This scenario generated unemployment, poverty, and hunger and exposed several vulnerabilities that were worsening in recent years before the pandemic, making it easy for COVID-19 to find fertile ground in Brazil for its dissemination and community transmission. The impacts of the suspension of many commercial activities and other economic sectors were quickly felt socially and economically.

Some of the actions carried out by the Brazilian government included the payment of emergency aid (US$120/month for five months) and exemption from the payment of the energy bill for vulnerable people, the release of funds for programs of direct purchase of food from family farming, delivery of school feeding kits directly to students despite the closing of schools and publication of sanitary rules for the operation of restaurants [74]. The study carried out by UNICEF and the Brazilian Institute of Public Opinion and Statistics (IBOPE) from July 3 to 18, 2020 showed that during the pandemic, one in every five Brazilians aged 18 or over (33 million) experienced an episode of not having money to buy food when their income was over. This study

also reports that about nine million Brazilians were unable to have a meal because there was no food or money to buy it [75].

In Indonesia, a large part of the population was unable to survive and meet their basic needs in the larger cities and returned to the small villages where they used to live, creating new problems such as the threat of virus transmission in addition to social and economic problems. With unemployment, they suffered an additional burden: the lack of natural resources, competing with local populations to use natural resources to satisfy their life needs [61].

In Greece, economic problems have greatly influenced the structure and resources of the country's health system. In addition to economic challenges, the country faces a refugee crisis, characterized by many critical points of overcrowding and tensions with neighboring Turkey. From an economic point of view, the impact of the COVID-19 outbreak can be worrying. As tourism is one of the country's main industries, prolonged travel restrictions during the summer can significantly affect the economy. On the other hand, the praise that Greece receives at the international level for the country's response to the outbreak and for the protection of public health is expected to preserve its reputation and attract tourists as soon as measures are lifted. Besides, the government-financed small and medium-sized enterprises that were affected by the pandemic and subsidized dismissed workers [76].

South Korea's reaction to COVID-19 represents a positive alternative to the dominant form of oligarchic government that prevails in Euro-American societies. The ruling elite implanted state power in ways that used this environment to continue previous patterns of domination that continually expanded surveillance, extending vital data extraction techniques for commercial and political purposes [77]

The state of Bangladesh has proved unable to implement policies of isolation or a fair and effective aid program. As a test of the state of Bangladesh, the pandemic served to highlight not only its institutional weaknesses but the contingency of citizens' compliance with policies seen as unfair and unfeasible; in such a context, the state could have acted more coercively but preferred to be tolerant before discreetly abandoning such policies. Both non-compliance and indulgence only make sense in light of the power of moral economy constructions of the state's role in subsistence crises. A vital challenge remains the ability to control political clientelism in the public interest [78].

According to [79], the debate about the pandemic highlighted the logic of the discourse that guided the various voices in Italy. There are two main perspectives guiding the public debate: the biomedical and the economic. The first defended biological life as the ultimate element of truth and legitimacy of government action. The second view is based on the justification of a careful cost–benefit calculation and the protection of the interests of the *homo oeconomicus*. However, the debate lacked a social perspective capable of placing dignity and human rights as a compass of intervention. Behind an apparent impartial universalism that would boost the biomedical and economic logic, there is a form of discrimination and lack of protection for specific sectors of society, particularly the marginal ones.

In Latin America, Ref. [80] criticize neoliberal economic postulates and the policy of fiscal austerity, which according to these authors provides privileges to elites at

the expense of immense social damage that would have been exacerbated and accentuated during COVID-19. In Chile, Ref. [81] confirm the hypothesis that regional inequalities within countries impact the effects of the COVID-19 crisis. Furthermore, they reinforce other studies that point to the socioeconomic issue as a crucial problem exacerbated by the pandemic's challenge.

In India, Ref. [82] affirm that the health system can be harmed if there is an excessive hospitalization, due to the lack of adequate infrastructure and specialist doctors in relation to the high number of potential patients in need of intensive care, given the already low expenditure with the public system healthcare, which is 1.28% of total government revenue. In addition, the catastrophic cost of testing and treatment for patients who are not entitled to government insurance and subsidies will further increase debt and poverty in the country. The COVID-19 pandemic is likely to cause an economic crisis in India, as around 4% of GDP is expected to be lost during the management and recovery phase.

According to Dutta and Fischer (2020), as a low-income country, India also relies moderately on aid and funding from international organizations to control the spread of the disease. And the continued loss of jobs and the influx of migrant workers after the blockade phase reflected the government's lack of sustainability of civilian employment. This shows that an adequate emergency and preparedness plan is essential to avoid catastrophic losses in the financial sector and in the already needy health sector, which India must integrate into its basic public health program.

In the European Union (EU), the outbreak of the COVID-19 pandemic put intense pressure on providing a timely and coordinated response, capable of containing the disastrous economic and social effects of the pandemic in EU member states. In this situation, supranational institutions and their models of action were under pressure, seeming unable to make a decision for the ongoing crisis [83]. In the review carried out by [84], it is stated that the EU has implemented numerous strategies to answer emerging questions. Member States have taken measures such as closing borders and significantly limiting people's mobility to mitigate the virus's spread. An unprecedented effort to coordinate crises between Member States has facilitated the purchase of equipment and other medical supplies. Attention has also been focused on providing substantial research money to find a vaccine and promote effective treatment therapies. Financial support was made available to protect workers' wages and businesses to help facilitate a return to a functional economy.

In Palestine despite the serious social, health, political and economic impacts of the COVID-19 outbreak on Palestinians, Ref. [85] claim that a positive aspect of this pandemic is that it has revealed the dangers and shortcomings of traditional education centered on in the teacher who colonizes the students' minds, compromises their analytical skills and, paradoxically, puts them in a system of oppression that audits their ideas, limits their freedoms and restricts their creativity. Although the Israeli occupation proved to be an obstacle in the face of the Palestinian government's attempt to combat and contain the COVID-19 crisis, online education, the only arena that escapes this colonial system, has forced many instructors to give up their grip on the education process and to create a more collaborative educational environment that is based on dialogue, research and flexibility of curriculum content.

Although the number of COVID-19 cases in Africa is relatively limited for the time being, the pandemic and restrictive measures to reduce the virus can have important implications for the level of human security. They can cause economic decline and increased poverty, authoritarianism, urban violence and increased social inequalities [86].

According to [87], in Africa, the COVID-19 pandemic is responsible for a health crisis in frontline health professionals' victimization and the growing number of cases and deaths. At the same time, it causes a social crisis with the violation of human rights, the murder of citizens by the security forces and an increase in crime. This, in turn, exacerbates social inequalities, the breakdown of families, cases of social unrest and general impoverishment. An economic crisis also emerges, manifested by a decline in GDP and mass unemployment. A political crisis is demonstrated on the implementation of measures that may not be appropriate for Africa.

Concerning the issue of inequalities, [88] maintain the need to empower the poorest to face the richest lobby. For those authors, a series of dismantling social policies during the pandemic highlighted the fragility of the poorest, and the authors believe that the discipline of law can offer means to respond to these inequalities. Also, it should be noted that, as argued by the authors mentioned earlier in this study, not all groups are affected equally by the pandemic. In this sense, it is crucial to observe the impacts of COVID-19 on each of the most vulnerable socioeconomic groups.

The database research also presented chapters with contributions on these issues. Reference [89] discussed especially the effect of COVID-19 on undocumented immigrants. This group is especially vulnerable in some countries because they are reluctant and fearful when seeking specialized health services as they are in an illegal condition. From a social and political standpoint, the issue of gender is also affected by the COVID-19 pandemic. Reference [90] carried out a case study in Gambia on the impacts of the pandemic in the field of women's education, concluding that restrictions on the functioning of educational institutions had a disproportionate weight on the vulnerability of women in that society, which the authors portrayed as traditionalist and patriarchal.

Staying in a socio-political perspective, Ref. [91] consider that in addition to all the issues raised by the virus, misinformation, distrust and denialism emerged as a social situation in the same way as they did in the AIDS epidemic of the 1980s. Reference [68] corroborate this concern through a case study referring to Lebanon.

In Canada, Ref. [92] observed the existence of patterns of discriminatory behavior related to COVID-19 and noted that non-whites, younger people and health workers were more likely to face this type of behavior. However, on the other hand, less than a fifth of the study participants reported this type of behavior. Reference [93], in turn, addresses concerns about the situation of children and adolescents by stating "that they have had their current lives and their imaginary futures changed beyond recognition as a result of the virus." According to the author, more than 1.5 billion children and young people, or 87% of the world's student population, have stayed away from universities and schools. However, this group would be much more

vulnerable to austerity policies. Young workers with precarious jobs also did suffer disproportionately from the effects of the interruption of economic activity.

3.3 The Spread of COVID-19 Around the World and the Promotion of just, Peaceful and Inclusive Societies

As we have previously states, the crisis generated by COVID-19 has accentuated the immense inequalities that exist in the world, which has affected and affects more intensely the historically most vulnerable and under-valued social groups, such as the elderly, women, indigenous peoples, homeless people and people living in impoverished areas or without access to the conditions necessary to face the disease, as well as small and medium-sized companies and the informal sector [94], [10].

In short, the novel coronavirus has damaged lives and livelihoods around the world. The impact of the pandemic on human lives is evident, but the effects on the global economy and sustainable development are also a concern [95]. In the first three months of 2020 alone, the [11] revealed that 5–25 million jobs were lost.

With the multipolarity of the globalized world, where different cultures, policies and socioeconomic realities coexist, the skills to deal with the present crisis are still lacking [96], which makes it difficult to contain the disease globally. In underdeveloped countries the impact is even more intense. That is why simple actions such as hand washing with soap and water, together with social distancing—measures widely advocated as a way to prevent the spread of COVID-19—become almost impossible for a considerable portion of the population, especially for the homeless or people living in impoverished locations, who lack basic sanitation [97]. The number of people belonging to vulnerable groups is increasing as job losses increase [98].

Thus, the COVID-19 pandemic increases the structural violence that exists in the world, because some people will have its right to protection from the virus guaranteed and others not, directly affecting SDG 11 (sustainable cities and communities) and SDG 10 (social inequalities in and between countries) [99].

In the world taken hostage by COVID-19, therefore, the importance of a systemic logic to solve the sustainability challenges arises. The transmission of the virus from animals to humans occurred through environmental degradation [100], while the spread of the virus among humans is closely linked to inequality: people living in poverty and those with underlying health problems - which are correlated - are the most vulnerable [101].

In addition, [13] argue that the virus is even more potent in the age group of 60 years or more, in countries where the population is already exposed to pollution and in countries that host the majority of international travelers in a global perspective. This is because the pandemic is no longer local but worldwide and requires more planned global cooperation, big data technologies and networks for decision making,

transparency for data dissemination, responsibility of decision makers, businessmen and civil society, high investments in health services and economic intentions of governments, with the aim of lowering the cost of health and recovering the post-pandemic world economy of COVID-19 [10].

Regarding refugees, the pandemic has also made migrant workers more vulnerable to discrimination and xenophobia. In the same sense, Ref. [100] point out that overcrowding in the fields, settlements and shelters of this group is more prone to crowding people—a factor that considerably increases the level of infection.

Like any other disease, the first effects are felt in health systems, threatening SDG 3 (Good health and well-being). Hospitals and other health facilities in many countries are overburdened, leading to a lack of beds for medical care. The lack of equipment and infrastructure in weak health systems implies high mortality rates, especially in emerging economies, as in Brazil [102]. In this context, SDG 9 (Building resilient infrastructures, promoting inclusive and sustainable industrialization and fostering innovation) becomes an effective guide to safeguarding public and private institutions in preventing crises and systems collapse.

From another perspective, in the field of sciences there are unprecedented levels of collaboration in health research, a fact that touches SDG 3. Medicines and vaccines have never been developed so fast—giving a clear indication of human capacities to manage and develop innovative solutions in times of pressure with agility and international cooperation. In this way, increased North–South and South-South cooperation at various levels, together with a global technology facilitation and coordination mechanism to contain and find a cure for COVID-19—benefiting SDG 17—will provide learning for the years to come [97].

It is undeniable that the pandemic has reinforced the connections between health, environment and economy in developed and developing countries alike, in the same way that the SDGs apply for all countries [103]. Therefore, the response to the pandemic cannot be separated from the SDGs. In fact, achieving these goals will put us on a firm path to address global health risks and make us better prepared to face new emerging infectious diseases [104]

Still, it cannot be neglected that COVID-19 increases the likelihood of conflict (both within and outside borders) and, therefore, undermines the goal of global peace and justice (SDG 16: Peace, justice and strong institutions). The pandemic highlights the links between SDGs, especially between drinking water and health. in a scenario where a large percentage of the global population does not have access to adequate sanitation (SDG 11) and drinking water (SDG 6), and still face situations of poverty (SDG 1), hunger (SDG2) and inequalities (SDG10).

SDG 4 (Quality Education for All) was also affected, since COVID-19 demanded the closure of schools in order to prevent the spread of the virus, denying access to education, especially people in rural areas and populations in developing countries, which do not have access to basic technologies such as computers, cell phones and the internet, preventing studying from home [105].

Furthermore, since the impacts of the COVID-19 crises are more extreme to the most socioeconomically vulnerable populations, in addition to those located in

regions with low or no access to basic needs, such as peripheral residents, indigenous people, women and children, the importance of intersectional thinking for gender equality is highlighted (SDG 5). There was already a large context of gender inequality and abuse before the pandemic crisis, but it is possible that lockdowns have worsened the problem [106].

At this point, it should be noted that the health labor market is also characterized by gender roles, with women representing around 70% of the health workforce [101, 106]. Nurses are more prone to exposure to the COVID-19 than doctors, since nurses and nursing technicians are in direct contact with secretions that spread of COVID-19 such as saliva, phlegm and feces.

Reference [107] remark that there is another vulnerable group that is even more affected by COVID-19: people with disabilities. This is because they have more intense care needs than others who fall ill with COVID-19, including longer hospital stays and more intensive nursing care. In addition, this group may need more sedation to deal with the hospital environment and, therefore, potentially have increased needs for intubation, which, for the most part, have not been met.

Regarding public security, some researchers like [104] point out that the moment marked by COVID-19 will cause surges in some types of criminal violence, while delaying others (for example, residential theft due to increased presence and domestic protection). In addition, the increase in domestic violence will ostensibly reflect the limits of social isolation, and that the justice apparatus will be challenged.

Regarding the prison population, Ref. [108] point out that these people are neglected in the COVID-19 scenario, even though it is known that overcrowding, poor hygiene and inadequate access to medical care make correctional facilities particularly vulnerable to the spread of the virus, many of the prevention strategies recommended by WHO are impossible to put in place. Infection control measures, such as social distancing, hand washing and lockdowns are limited in densely populated prisons, where most prisoners share cells and other community spaces. These places are also notoriously unhealthy, lack adequate ventilation or cleaning materials, and prisoners often have restricted access to soap and running water [109].

On the other hand, the pandemic presents an opportunity to accelerate the criminal justice reform that is already underway [110]. An urgent national response is needed, since prison staff and incarcerated populations are disproportionately infected by COVID-19 and because populations involved in justice face additional disparities that make them more vulnerable [104].

In the same sense, Ref. [82] argue that the 2030 Agenda presents the best possible approach to manage COVID-19 with the aim of ensuring that, now and in the future, human well-being is achieved and, at the same time, ecological and economic sustainability is preserved.

In addition, Ref. [13] point out that state and municipal governments in Brazil, within the scope of their constitutionally guaranteed competence in health matters, have addressed normative and administrative acts to restrict the movement of people, establish the mandatory isolation of individuals, and make determinations to perform diagnostic tests on individuals.

However, widespread discontent over current social arrangements—even among smaller population groups—can lead to a boycott and sabotage of implemented health measures and distrust of government officials. Therefore, it is crucial to adopt a broader understanding of pandemic preparedness as a public good and build social cohesion by meeting the demands of cooperative justice to encourage widespread cooperation and thus improve resilience to public health emergencies [111]. In this sense, Ref. [20] argues that due to the exponential multiplication of the virus, communities will remain vulnerable if they do not guarantee access to basic health and sanitation infrastructure for all.

Even before the pandemic, the world was far from meeting the SDGs [112], either because few efforts were being made to do so, or because in order to comply with the SDGs, the whole of society must be involved. That is, public policies are needed to connect areas such as environment, economy, politics, health, infrastructure, technology, gender equality, among others, so that the SDGs, in fact, are met [98].

In Brazil, associations such as the PAHO—the Pan American Health [113]—have supported the actions of the Ministry of Health of the Brazil in response to COVID-19 since January 2020, including the aforementioned emergency program that provided to vulnerable populations a monthly aid of R$ 600 (six hundred reais). In March 2020, PAHO conducted training for public health specialists in Brazil in the use of Go.Data, a tool that seeks to facilitate the investigation of outbreaks and epidemics, such as the disease caused by the novel coronavirus. In addition, PAHO has purchased more than 10 million RT-PCR tests, which detect whether a person is infected with the novel coronavirus. Above all, PAHO has conducted a series of virtual seminars with specialists from different countries—including China, Spain, Italy and Japan—to support Brazil in the development of protocols, as well as to inform public health authorities.

Despite these efforts, the measures determined in Brazil and in the world were insufficient to curb the disease [109]. Furthermore, it is indisputable that COVID-19 and social isolation measures, by forcing families to stay at home to save lives and prevent the spread of the disease, exposed social inequalities and revealed not only the structural and historical inequality in the world, but the fragility of families with regard to access to current income and drinking water, which guarantees the consumption of essential goods [104, 114].

The future of post-pandemic humanity is still uncertain, either because there is no forecast of ending or decreasing the peak of the disease, or because there is no close precedent in recent history capable of drawing a parallel or even drawing similar ideas. This COVID-19 phenomenon is totally unique [98]. In the current context, falling income and rising unemployment, associated with insufficient emergency programs, will lead thousands of Brazilians to suffer from this crisis. Furthermore, the absence of more robust programs to protect families on the part of the Brazilian government and the flattening of the working class, associated with the increase in the extent of poverty, may imply an even longer way to achieve a more just society in post-pandemic times [109].

3.4 The Influence of Waste Generation by Covid-19 on Responsible Consumption and Production and on the Balance of the Environment

According to [17] COVID-19 was not a surprise, because new emerging infectious diseases were expected, mainly driven by the growth of human populations that increasingly disturb natural ecosystems. In addition, climate change is affecting factors such as the increased demand for animal protein, which is accompanied by viruses, bacteria and other pathogens that increase the likelihood of contracting zoonotic diseases, such as swine flu and avian flu.

Despite the great focus on health research, in the goal of mitigating the effects of the novel coronavirus, the impacts of this pandemic transcend the issues of body and mind [17, 115]. Through restrictions in Pandemic, such as social distancing, the behaviors of organizations, consumers, politicians and leaders in general have undergone major adaptations [4]. Commercial, manufacturing and mobility activities were limited [116], [117], many companies moved to the virtual work environment using the home office model, and unemployment rates increased. Such changes can contribute decisively to the construction of new social models, as well as to the organizations to manage risks and opportunities in this and in contexts of volatility and future uncertainties.

Some new practices and standards have promoted positive impacts, particularly on the environment [13]. Chinese researchers reaffirm the rapid decline in the levels of air pollution, accentuated in NO2, given the lower recurrence of industrial production [118], in addition to the improvement in biodiversity and in tourist places. However, the challenging aspect of these changes lies in environmental sustainability practices. This new and complex moment has also significantly affected waste management [119].

The capitalist economic system causes society to present a posture of excessive, irresponsible and unsustainable consumption [4]. As a result, hospital and household waste ends up being disposed of in a way that is harmful to the environment. The volume of waste in the quarantine is exponentially increased, since people spend more time at home, and the face of an unexpected situation led to the intensification of the powers of consumption of energy, food and water [72], [117]. The Brazilian Association of Public Cleaning and Special Waste Companies (2021) reports that there was an increase of 15%–25% in the amount of residential waste, such as food, toilet paper, face masks, gloves, cleaning products and hand sanitizers [47, 117]. As for hospitals, the estimate is for a growth of 10–20 times in these materials.

Such products, such as facemasks and plastics, pose serious threats for the environment, given their lasting consequences for the planet—some of these products will last for about 450 years in nature. In Africa alone, in a study with a sample of 15 countries, 586,833,053 masks are discarded per day [120]. In Hong Kong there are reports that masks have accumulated on nature trails and beaches due to improper disposal in water courses directly affecting the biodiversity of the marine ecosystem [117].

A high volume of waste generation of hospital materials—such as gloves, aprons, masks and other protective clothing and equipment—contradicts the tendencies for environmental improvements, since the disposal of this waste is often being led to burning in the sky open air and incineration, a fact that can affect air quality and health implications due to exposure to toxins [121]. In addition, the COVID-19 pandemic generated unprecedented and worrying contamination in the oceans [14].

Several NGOs such as Oceans Asia; WWF and OpérationMerPropre have denounced the impact of this new type of waste on marine ecosystems. The destination of this waste to rivers and oceans is disruptive to marine life. Non-biodegradable plastics (polypropylene), present in masks for example, can be ingested by water animals and consequently cause acidification of the oceans.

In 2018, before the pandemic, the oceans and marine life had received about 13 million tonnes of plastic [122]. In the same period, Brazil was affected by the destruction of species and ecosystems to support human demand for animal protein, such as the deforestation of biologically rich Amazonian forests and the tropical savannah of the Cerrado in Brazil to graze cattle.

The explosive spread of the virus has not given countries enough time to adapt to this new situation. The lack of preparation of adequate protocols, the incorrect handling of increasing volumes of medical waste and deficiencies in the management of medical and domestic waste collection services can increase the medium and long-term levels of plastic pollution on beaches, coasts and rivers South America [82].

The new "normal" requires new theoretical approaches to action planning in situations of uncertainty, for the public, private and civil society [119]. Deficiencies in management systems must be addressed as a primary objective to achieve sustainable development and reduce the environmental impact caused by waste on the coasts and seas. In addition, it is extremely important to apply strategies and policies to achieve more sustainable and responsible coastal tourism, strengthening care and respect for the environment [82].

Although the focus is the environmental concern about the increase in the generation of waste, this indicator directly impacts the health of the population and indirectly the economy [82]. The greater number deaths has also meant less contributions to socioeconomic development. Waste management is also a priority for guaranteeing human well-being during the pandemic.

In the same vein, Ref. [121] highlight that given the high costs of sustainable solid waste management (SWM), governments are increasingly associating themselves with the private sector through public–private partnerships to find sustainable solutions, which can be an outlet for implementing joint post-pandemic recovery policies.

In addition, the socioeconomic crisis reshaped investment in energy and affected the sector significantly with disruptions due to mobility restrictions [103]. With energy, health, food, and economic insecurity, it remains a challenge for countries to intertwine in practice plans corresponding to the goals of the SDGs of an urgent nature.

As such, several countries have instituted policies to ensure sustainable waste management, protecting the safety of handlers of these materials as well as diminishing air, soil and water pollution. Although, COVID-19 has distracted governments and the public from many other environmental problems, those are still getting worse, especially the loss of biodiversity and the damaging ecological impacts of climate change. These interconnected problems inevitably intensified, unless a serious policy of care generates effective actions to solve them [17].

Some private organizations see this issue as an opportunity to generate income [103]. In Brazil, a startup that provided services for collecting residential and business organic leftovers for composting and organic fertilizers had a 25% increase in income.

The period marked by COVID-19 will serve as an example of a crisis that has raised unprecedented challenges for the loss and waste of food in the global food supply system, therefore testing our commitment to the principles adopted by Agenda 2030 by demonstrating that the food system that we built and as we know it today is flawed and vulnerable. Although the SDGs do not specifically state that there is a human right to food, SDG 2 envisions a better and more just world that is based on the sufficiency of the global food supply, environmental sustainability and food security for all [72].

SDG 12 addresses sustainable production and consumption, with a focus on global (12.1) and local actions, such as achieving efficient use of natural resources (12.2). In addition to that, the targets aim to reduce food waste (12.3), handling chemical waste responsibly (12.4), above all, managina solid waste (12.5) and reducing pollutant emissions (12.4). We need to rebalance the ecosystem, in all of its relations: with nature, in human relations, in the economy, in the productive processes and in their value chains (Institute of Applied Economic Research, 2021).

The main strategies in line with sustainable consumption in response to the pandemic are aimed at reducing consumption and strengthening and encouraging responsible production in the face of the prospect of a crisis in production and supply. On the other hand, less circulation of people can reduce superfluous consumption and disposal [18]. The goals and parameters of responsible consumption and production can guide the plans and protocols for protection and economic recovery from the crisis. One example is the concern of countries to maintain the provision of basic urban services—including collection and management of waste that is becoming a growing challenge for cities struggling with the consequences of COVID-19 [121].

Furthermore, the reduction of waste in the food logistics chains and the targeting of their surpluses, as well as in the health sector are also challenging [72]. Finally, incentives for recycling cooperatives are also necessary, as in Brazil, where they are responsible for a high rate of aluminum recycling in the country, and where it was verified that during the pandemic, recycling programs suffered falls [121].

The development of the COVID-19 pandemic is a consequence of urbanization and aggravated by some existing social and environmental problems: environmental degradation, flow of pathogens between humans and animals, inequalities and a lack of preventive social and public health measures [16]).

Although COVID-19 emerged from reservoirs of wild animals linked to environmental disturbances, transmission occurred through humans and facilitated by

economic globalization [17]. While COVID-19 brought economic, environmental and social challenges, it also brought an opportunity to bring transformational changes to the structure and functioning of the global economy [100].

The essential links between human health, well-being, biodiversity and climate change can inspire a new generation of innovators to provide green solutions to enable humans to live in a healthy balance with nature, leading to a resilient future. The pandemic also shows itself as a unique opportunity in a generation to rethink how we grow our economies in a way that does not put the global environment at risk as we have done in recent decades [99]. The downsizing of the consumer economy and fundamental changes in global production networks and supply chains [115] will prompt a search for a new world economy with strategies to safeguard biodiversity and human well-being [4].

Finally, the systematization of the knowledge obtained in this study is represented in Table 1, establishing relationships between the SDGs and mitigating solutions for the impacts of this pandemic on sustainability.

4 Conclusions

The purpose of this chapter was to demonstrate how the impacts of the COVID-19 pandemic imply compliance with the SDGs. For this, we have used a literature review to support our arguments and categorize indicators of the relationships we aspire for. In this context, we identified the impacts of the novel coronavirus widespread in all spheres of sustainable development, with environmental, social, economic and governance aspects, as explained below.

Regarding sustainability in the governance sphere, COVID-19 showed the world that most countries were not prepared to deal with the virus's spread. Surprisingly, not even the most economically developed countries were able to implement efficient strategies to prevent contaminated people from entering and leaving the country, spread the virus, and collapse of health systems. In a globalized and highly connected world, institutions have failed to join forces to control COVID-19. At this point, the global partnership is essential to control the spread of the virus, research and technology for the development of vaccines, human trafficking.

While SDGs 16 and 17 are stimulating guides for promoting peace, justice, and cooperation between nations and institutions, we have identified critical social justice issues that need to be addressed to increase citizens' volunteerism and compliance with prevention and mitigation measures. In this context, the COVID-19 pandemic crisis may offer a rare and invaluable opportunity to rethink and redefine the economy towards a better and more sustainable future.

Humankind is facing an unprecedented crisis in terms of social sustainability that needs to cultivate global solidarity and concern for the well-being of all. Therefore, we highlight the importance of the social dimension of SDG2, SDG3, SDG4, SDG5 and SDG10, as they help to reshape our relationship with the natural environment. The integrative literature review conducted with a focus on COVID-19 and its

Table 1 SDGs, mitigating solutions for impacts on sustainability based on human actions

Impact	Negative implications	Mitigating solutions	Links with SDGs	Authors
Environmental	A—Increase in waste production; B—Increase in hospital waste; C—Reduction of recycling programs; D—Pollution of the seas; E—Air pollution F—Compromise of marine and terrestrial biodiversity;	1—Waste management; 2—Hygiene plan; 3—Responsible and conscious consumption; 4—Preservation of ecosystems based on the control of waste, mainly plastic; 5—Control of greenhouse gas emissions; 6—Awareness of water consumption		[1–4, 12–14, 45, 1, 17, 2, 23, 72, 3, 4, 47, 100, 115–119, 118]
Economic	A—Decrease in GDP; B—Unemployment C—Closingindustries and businesses; D—Increase in the consumption of residential energy; E—Economic stress for formal and informal microentrepreneurs; F—Decrease in urban mobility; G—Economic decline; H—Increase in poverty, I—Authoritarianism, J—Increase in urban violence and crime K—Increase in social inequalities	1—Joint action between public and private; 2—Formulation of policies that best apply approaches combining economic recovery and sustainability; 3—Subsidies to low-income populations; 4—Aid and exemptions for small and medium-sized companies; 5—Investment in ICT for business adaptations; 6—Plans for displacement of people with intelligent mobility; 7—International cooperation between all international agents; 8—Better policies on labor rights; 9—Energy distribution		[116, 10, 70, 112, 95, 79, 99, 123, 19, 46, 84, 86, 94, 98, 97, 97–99, 83, 117, 20, 69]

(continued)

Table 1 (continued)

Impact	Negative implications	Mitigating solutions	Links with SDGs	Authors
Social	A—Physical health with mortality rate and lack of beds in hospitals; B—Mental health problems due to social isolation; C—Uneven impact on women, especially those who belong to blacks and indigenous populations, who are more impacted than men by less access to quality of life; D—Increase in domestic violence E—Increase in crime; F—Increase in social inequality and access to basic needs, such as housing, health systems, hygiene, basic sanitation and food; G—Difficulties in international trade cooperation, such as vaccinations; H—Decrease in access to education in underdeveloped countries due to the lack of access to the internet; I—Overcrowding in camps, settlements and shelters for groups more prone to crowding—homeless people and refugees; J—Overloading the public machine;	1—Investment in research and vaccination; 2—Emergency basic needs subsidy plans; 3—Actions aimed at gender equality; 4—Reduce inequality through public aid and policies that enable housing, education and health for all; 5—Strengthening democracies; 6—Strengthening international cooperation; 7—Education with remote education and subsidies for technological access for students and employees; like chips, internet and videos on free platforms 8—Welcoming actions for homeless people and refugees; 9—Control the traffic of people between countries and states during and after the pandemic; 10—Inclusion of family planning and reproductive health services in the countries; essential services package; 11—Creation of a global fund with the objective of strengthening health systems, so that they are able to face new global pandemics, at the same time that such fund would contribute to the achievement of the SDG3		[56, 27, 7–9, 65, 66, 17–21, 19, 33, 46, 61, 111, 97, 87, 32, 28, 55–57, 60–66, 57, 3, 62, 4, 60, 101, 40, 101–104, 106–112, 96]; Sarricolea (2020), Lopez (2021), and Siddiqui et al. (2020)

impacts on the social, economic and political inequalities of the world's populations demonstrated that the central hypothesis accepted by the theory is that epidemic events have the effect of reducing inequalities in the face of mortality of the poorest and the consequent revaluation of work due to the scarcity of labor.

It is undeniable that individuals and groups previously harmed by the social injustice created by the uneven distribution of power, money, and resources were even more affected by the pandemic. In this respect, we highlight women—whether due to contamination or due to the increase in domestic violence and crime rates, less access to energy, water, and food; children, faced with reduced access to education in underdeveloped countries due to the lack of internet access, to refugees, due to overcrowding in camps, settlements and shelters for groups more prone to crowding; the elderly, behold, they are more likely to get the disease and; especially the poorest, behold, simple measures to prevent the spread of new coronavirus, such as frequent hand washing and social distance, are not available to millions of people worldwide, as well as because disadvantaged groups are most directly affected and disproportionate due to existing poor health.

Specifically, this research's findings demonstrate that, at least within the limitations of the defined search scope, despite the reasonable number of articles found, no studies with a focus or significant discussion on targets 3.5, 3.6, 3.7, and 3.9 and were filtered out. If it is not possible to affirm with this research alone that these SDG 3 goals have not yet been an object of significant study by the academy, it is possible to indicate that studies focused on COVID-19 impact on these specific goals will need further research.

In addition, in the case of SDG 3, in the integrative review of the literature and in the analysis of the content of the articles relating the COVID-19 outbreak to the SDG 3, the findings reported that most articles maintain that the impacts of the COVID-19 pandemic go well beyond those issues regarding health. Finally, as a suggestion for future studies, we recommend conducting research aimed at understanding the impacts of COVID-19 on each of the SDG3 targets.

On the other hand, the search for articles in the gray literature and in the databases showed as a result that the central hypothesis discussed by various authors is that the COVID-19 pandemic tends to deepen socioeconomic inequality throughout the world due mainly to effects of restrictions on economic activity, a theory that is corroborated by [124] and the other authors of the commission formed by The Lancet, perhaps the journal with the most significant impact on health issues, for COVID-19.

In this context, all the scientific articles found postulate the same hypothesis of increasing inequalities and adopting, without exception, a transversal time frame, whereby the long-term effects of the pandemic are yet to be observed. Thus, even with this amount of evidence in the literature supporting the hypothesis that the COVID-19 pandemic should widen economic inequalities, as this is still an ongoing phenomenon, it is not possible to definitively rule out the opposite hypothesis.

In 2020, the pandemic had an overwhelming influence on the decline in GDP, especially in underdeveloped countries. This is because many industries, businesses, and new investments in non-essential sectors have been forced to cease or shrink their production. This reality was reflected in the increase in unemployment rates,

falls in the stock exchanges, not to mention the economic stress suffered by formal and informal micro-entrepreneurs. On the other hand, other ventures such as supermarkets and technology companies have managed to survive. In this context, the mitigating solutions to such issues must be based on the integration of government incentive actions for poverty control and contemplating SDG1. In addition, it is necessary to remodel companies, universities, and institutions in general, focusing on innovations and in SDG 7, SDG8, SDG 9, SDG 11.

Finally, regarding environmental sustainability, the works used as references demonstrated an unprecedented impact on the environment with the increase of waste, hospital waste, reduction of recycling programs, increased pollution of the seas and air, and compromise of marine biodiversity terrestrial. These environmental problems are directly reflected in SDG 6, SDG 12, SDG 13, SDG 14 and SDG 15.

In order to minimize the impact on the environment, there was a need to rebalance the ecosystem in all its relations: with nature, in human relations, in the economy, in production processes and their value chains. In environmental terms, above all, responsible consumption and production (SDG 12) are understood to be the key to economic and environmental recovery from the crisis. Also, actions such as preserving ecosystems, controlling waste, hygiene plans, and waste management were considered mitigating solutions that can mitigate solutions for the impacts of COVID-19 on the environment.

The COVID-19 pandemic reinforces the need for social inclusion measures and guarantees the dignity of the human person. This critical moment's impacts are difficult to estimate in the medium and long-term, giving space to speculation and uncertainty. Although the origins of COVID-19 have also been discussed, the spread of this virus has highlighted the health risks that certain types of food products of animal origin present. In this sense, the coronavirus outbreak served to demonstrate, once again, the links between habitat loss and biodiversity and the increasing likelihood that infections will spread from wildlife to humans as zoonotic diseases.

The COVID-19 pandemic puts pressure on the SDGs' actions and introduces immediate needs that cannot wait until 2030 to be addressed. Therefore, the global objectives can be understood as a tool to promote actors' mobilization in societies—including government, corporate and civil society agents—to promote all its dimensions. Finally, international cooperation plays a fundamental role in development in the context of crisis, since the pandemic has shown that one can no longer think of isolated solutions, but of solutions that, respecting each country's particularity, can be sustainable. Sustainable as an interdependent goal.

In short, the chapter demonstrates that the SDGs, while suffering a severe setback with the pandemic, is a way of fighting the pandemic and, equally, of guiding the government, corporations and civil society towards the reconstruction of a genuine new normal committed to the constitutional principle of the dignity of the human person and the protection of the environment as a fundamental right of emerging generations.

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