

Conjunctural hunger and structural obesity in the global scenario: reflections on what Covid-19 masks reveal

Fome conjuntural e obesidade estrutural no cenário global: reflexões sobre o que revelam as máscaras da Covid-19

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ABSTRACT

This essay is a reflection on the interconnection of the Covid-19 pandemic, social inequality, food insecurity and obesity in the global scenario. The pandemic health crisis is bound to an economic and social crisis marked by an increase in unemployment and a decrease in income with a consequent growth of food and nutritional insecurity. The impacts are felt worldwide, although the situation in each country, with regard to the conditions of social inequality and access to food, influences the magnitude of the pandemic consequences. At the same time, we are aware that food and nutritional insecurity is associated with low food quality and higher rates of obesity, which impairs the immune response and predisposes to worse prognosis. Thus, more economically vulnerable populations must face poorer disease outcome, besides the worsening of the economic situation and food and nutritional insecurity and the increase in obesity rates.

Keywords: Covid-19. Food and nutritional insecurity. Obesity. Pandemic.

RESUMO

Este ensaio traz uma reflexão sobre a inter-relação da pandemia da doença causada pelo novo coronavírus com a desigualdade social, a insegurança alimentar e a obesidade no cenário global. A crise sanitária oriunda da pandemia está atrelada a uma crise econômica e social, marcada pelo aumento do desemprego e pela diminuição da renda, com consequente acréscimo da insegurança alimentar e nutricional. Os impactos devem ser sentidos em todo o mundo, embora a situação de cada país, no que diz respeito às condições de desigualdade social e acesso à alimentação, influencie na magnitude dos efeitos da pandemia. Paralelamente, sabe-se que a insegurança alimentar e nutricional está associada à baixa qualidade alimentar e a maiores índices de obesidade, o que prejudica a resposta imunológica e predispõe a piores prognósticos. Dessa forma, populações mais economicamente vulneráveis devem encarar piores desfechos da doença, além do agravamento da situação econômica, da piora da IAN e do aumento dos índices de obesidade.

Palavras-chave: Covid-19. Insegurança alimentar e nutricional. Obesidade. Pandemia.

INTRODUCTION

Within the global framework, the Coronavirus Disease 2019 (Covid-19) pandemic has been devastating a number of sectors, strongly impacting the economy and exacerbating social inequalities among countries and people [1-3].

According to the United Nations (UN), it was estimated that 34.3 million people would fall below the extreme poverty line in 2020 (per capita income less than US\$ 1.90 per day). The health crisis generated by the pandemic affects the most vulnerable populations, a condition that exposes them to Food and Nutritional Insecurity (FNI) and to Covid-19 infection susceptibility [4].

In the array of problems that stand behind the risk of complications from Covid-19, the following can be evidenced: (i) the vulnerability of socioeconomic situations that cause impacts on the quality of life and food, as well as of the stress conditions related to uncertainties and poverty [5,6]; (ii) the impairment of food quality, directly affected by impoverishment, fostering the consumption of cheaper, ultra-processed foods with low nutrient quality [7]; (iii) the conditions for the increase in the prevalence of obesity due to the poor quality of food, stress and limitations generated by emerging social problems associated with social confinement, such as sedentary lifestyle [8,9].

In the global scenario, up to April 19, 2021, 141,057,106 confirmed cases and 3,015,043 deaths from Covid-19 have been recorded, with the five highest mortality rates affecting the United States of America, Brazil, Mexico, India and the United Kingdom [10].

The purpose of this essay is to reflect on the interrelationship between the Covid-19 pandemic, social inequality, food insecurity and obesity in the global scenario.

METHODS

This is an essay carried out based on the review of public official data, technical documents and non-systematic bibliographic review, with the collection period from June 1, 2020 to April 19, 2021. Exploratory searches were carried out in databases such as PubMed and SciELO, as well as in the official pages of national and international organizations and institutions, and also in news from newspapers and other media. Comparative analyses of sociodemographic and health indicators between specifically selected countries like Brazil, China, the United States of America, Italy and Sweden were carried out. Due to the current, contemporary and dynamic subject investigated, this study did not mean to be exhaustive; it was sought only as a brief approximation that would spur reflections and debates in the academic fields involved.

SOCIAL INEQUALITIES AND FOOD AND NUTRITIONAL INSECURITY DURING THE COVID-19 PANDEMIC

The effects of the Covid-19 pandemic on social inequality and the disease consequences show how social suffering can be expressed in biological (individual) manifestations. The set of problems that act synergistically, enhancing the risks and severity of Covid-19 infection, can be extended to the influence of social policies and indicators, according to the data comparison between different countries presented in Table 1 [2,11].

Observing the situations of Brazil and the United States of America (USA), for example, it is noteworthy that despite Brazil being one of the countries most affected by Covid-19 until April 19, 2021, with more than 13 million infections and more than 370,000 deaths Brazil still ranks behind the USA, which although a developed country, has already reached more than 31 million infected people and 560,000 deaths [10]. It is noteworthy that both countries initially resisted to adhere to stricter protective strategies against the pandemic. Unfortunately, after more than a year of pandemic, Brazil is in a catastrophic situation in cases of death per 100 thousand inhabitants (Table 1). In the world context, we can perceive the beneficial effect of mass vaccination and other sanitary and economic measures adopted in some countries, such as the USA in April 2021. Prioritization of vaccination by the new North American government, resulted in a sharp decline

Table 1 – Sociodemographic and health indicators of different countries affected by the Coronavirus disease pandemic 2019 (Covid-19).

Indicators	Brazil	Sweden	Italy	China	United States
Total population (inhabitants) [62]	211,049,527	10,285,453	60,297,396	1,397,715,000	328,239,523
Population ≥ 65 years old [62]	19,525,475 (9.3 %)	2,077,514 (20.2 %)	13,875,719 (23%)	160,348,563 (11.5%)	53,206,334 (16.2%)
Obese population > 18 years old (prevalence) BMI ≥ 30 kg/m ² in 2016 [22]	22.1%	20.6 %	19.9%	6.2%	36.2%
IDH (2018) [20]	0.761	0.937	0.883	0.758	0.92
Unemployment rate (2020) [62]	12%	6.7%	9.8%	4.4%	3.9%
Extreme poverty rate (<i>per capita</i> income <US\$ 1.90/day) [23]	4.4% (2018)	0.2% (2017)	1.4% (2017)	0.5% (2016)	1.0% (2016)
Undernourished people (millions) period 2015-2017 [21]	<5.2	<0.2	<1.5	124.5	<8.1
Undernourished people (prevalence of total population) period 2017-2019 [22]	<2.5 %	<2.5 %	<2.5 %	<2.5 %	<2.5 %
Total infected by confirmed Covid-19 in 04/19/2021 [10]	13,900,091	900,138	3,870,131	103,315	31,311,941
Total deaths by confirmed Covid-19 in 04/19/2021 [10]	371,678	13,788	116,927	4,856	561,616
Total deaths by confirmed Covid-19 (per 100,000 inhabitants) in 04/19/2021 [10]	174.86	133.51	196.05	0.33	169.67
Vaccine doses administered up to 04/21/2021 [10]	32,394,085	2,581,989	15,166,198	188,090,000	202,553,704

Note: ≥: Bigger or equal; >: Bigger; <: Smaller BMI: Body Mass Index; HDI: Human Development Index;

in the number of deaths from Covid-19 [10-14]. In Brazil, until now, no effective policies and actions have been adopted by the Federal Government to combat the pandemic, which has even led to the setting of a Parliamentary Investigation Commission for the Pandemic (or for Covid-19) in the Federal Senate [15]. The late adoption of the National Plan for Vaccination against Covid-19, the slow pace of the population's vaccination schedule (until April 19, 2021 only 12.59% of the population had taken one dose of vaccine and 4.78%, two doses), among other factors, have contributed to the control failure of the pandemic in the country [16-18]. In addition, the dismantling of social policies to confront the FNI stands out, such as the extinction of the *Conselho Nacional de Segurança Alimentar e Nutricional* (CONSEA, National Council for Food and Nutritional Security), one of the first acts of the current government [19]. Lastly, the scenario would be even worse if Brazil did not have the *Sistema Único de Saúde* (SUS, Unified Health System), a public and universal health system for all its inhabitants, which may have contributed positively to reduce the number of cases and deaths [12,13].

Among the countries analyzed, according to the data in Table 1, Brazil stands close to the Human Development Index (HDI) of China, 0.761 and 0.758 respectively [20]. Between 2015 and 2017 there was a difference in the prevalence of malnourishment in the total population of these countries, <2.5% in Brazil and 8.7% in China [21]. In more recent data, from 2017 to 2019, both countries had a prevalence <2.5% of the total undernourished population [22]. In contrast, the number of infected people in China was 103,315 confirmed cases, with only 4,856 deaths (0.33 deaths per 100 thousand inhabitants), much lower than in Brazil, with 174.86 deaths per 100 thousand inhabitants, until 19 April 2021 [10]. Additionally, Brazil had a higher rate of extreme poverty and unemployment when compared to the other countries analyzed [23]. It should be noted that most of the indicators presented in Table 1 seek to portray the pre-pandemic situation across countries. In the case of the indicator "prevalence of malnourished people", for example, it expresses the context of structural hunger (that type of endemic, chronic or permanent hunger, resulting from unfair and unequal economic, social and political structures) already existing in those countries, to which was added the contingent of people affected by short-term hunger (a type of acute or transient hunger that can occur due to droughts, floods, wars and catastrophes in general) caused by the Covid-19 pandemic [24-27].

Apart from the differences between countries, the global situation with the pandemic is of concern. The United Nations Development Program (UNDP) estimated that, four months after the beginning of Covid-19 pandemic, there would be a substantial slump in family income in many countries, with global human development declining for the first time since 1990 [28]. The World Food Program also estimated for November 2020, the existence of 200,000 individuals in FNI and that such number would rise between 750,000 and 2.3 million by March 2021 with the persistence of Covid-19 [22]. The International Labor Organization (ILO) has warned of an increase in inequality and poverty in Latin America and the Caribbean, with a sharp increase in unemployment rates. Such an unemployment rate, which would tend to rise between 4 and 5 percentage points, could result in millions of unemployed people, disrupting the countries' economic and social stability [29]. According to the World Bank there would be a 7.2% drop in economic growth, leading to an unemployment rate of up to 12.3%. This would imply a growth of 26 million people (before the pandemic) to 41 million people in 2020 who would be looking for a job without success. Thus, there would be deterioration in the quality of jobs and a reduction of family income [29].

The social and economic damages unleashed by the pandemic contribute together to aggravate the FNI's situation. In fact, the population increase of the FNI population has been growing dramatically since the beginning of the pandemic in Brazil and in the world [30-32]. In the USA, the pandemic caused a crisis of food insecurity never seen in that country. According to data of the Department of Agriculture, in the last five years, food insecurity has fluctuated around 11% to 12%; however, in March and April 2020, food insecurity estimates rose to 38% in the USA [33].

It is observed, therefore, that the scenario involves many nuances to explain the figures presented, but the social inequalities due to the FNI are clearly associated with the risk of infection by Covid-19, exhibiting the biological vulnerability of an unequal human society.

FOOD AND NUTRITION INSECURITY AND OBESITY IN THE COVID-19 PANDEMIC

In Brazil, the right of everyone to regular and permanent access to quality food, a constitutional guarantee of the National Food and Nutritional Security Policy, has been strongly affected by this pandemic, favoring FNI conditions [34-37].

Data from the *Rede Brasileira de Pesquisa em Soberania e Segurança Alimentar* (PENSSAN, Brazilian Research Network on Sovereignty and Food Security Network) show that, by the end of 2020, 55.2% of the Brazilian population faced food insecurity conditions; 9% were in conditions of severe food insecurity, that is, hunger. These rates would be even higher in homes where some of the residents lost their jobs or got into debt due to the pandemic, causing a boost in the growth of the FNI observed in recent years in the country [38].

Structural hunger lasted for centuries in Brazil, but was overcome when undernourished people dropped from 10.7% to less than 5% in the first decade of this century [39]. In this connection, in 2014 a UN report was published attesting to the country's exclusion from the so-called Hunger Map, indicating that 3% of the population ingested fewer calories than recommended by the Food and Agriculture Organization (FAO) [40]. On the other hand, according to the Household Budget Surveys (HBS), in the 34 years from 1974-1975 to 2008-2009, the prevalence of obesity increased more than four times for men (from 2.8% to 12.4%) and more than twice for women (from 8.0% to 16.9%) [41]. More recent data from Vigitel (Surveillance of risk and protective factors for chronic diseases by telephone survey) indicate that obesity frequency in the Brazilian adults population (≥ 18 years old, both genders) in the 26 capitals and in the Federal District between the years from 2006 to 2018 increased from 11.8% to 19.8% [42]. Therefore, FNI, previously characterized by a quantitative food shortage (59.7% in 2004), has become associated with obesity, related to higher energy consumption and lower micronutrients consumption, which reflected on the high rates of nutritional deficiencies presented by obese individuals [6,43-45].

We use the term structural obesity, to match the term structural hunger, generated by social inequality, misery and poverty and to be overcome demands fundamental economic, political and social changes [24-27]. In this sense, obesity cannot be reduced to its biomedical definition of body fat accumulation harmful to health, as recommended by the World Health Organization (WHO) [46]. Just like hunger/malnutrition, obesity is generated by broader social and political complex factors associated with changes in the global food production system, aimed at increasing production and consumption of affordable and low nutritional quality food, also involving environmental issues [47-50].

There is evidence that the current pandemic break-down will substantially increase the FNI and obesity rates in the world [51]. However, this projected scenario will develop on different bases, depending on the prevalence, the degree of poverty and the support policies of the different nations. Obesity resulting from the increase in FNI, can be explained by the tendency to increase the consumption of processed and ultra-processed foods, as they are more accessible and practical, to the detriment of fresh (minimally processed) and regional foods [52,53]. It is noteworthy that, in Brazil, between the periods of the Household Budget Surveys (HBS) 2008-2009 and 2017-2018, prepared foods and industrial mixtures showed an increase of 56% in their average per capita quantities purchased. On the other hand, the flour, starch and pasta groups; cereals and pulses and dairy products showed the largest decreases in the acquisitions average among the three waves of HBSs (48%, 43%, and 36%, respectively), covering the years 1974 to 2018. As to food acquisition according to the household situation, there was a greater share of fresh and minimally processed foods (57.9% against 47.7% of total calories) and processed culinary ingredients (25.3% against 21.7%) in rural areas compared to urban areas. On the other hand, the share of processed and ultra-processed foods was higher in urban areas (11.3% and 19.8%, respectively) than in rural areas (5.5% and 10.7%, respectively) [54].

This condition can contribute to insulin resistance, obesity and the metabolic syndrome, which, associated with reduced physical activity in the pandemic and depression, provide immune dysfunction with less defense against infections [3,7,55]. Kamyari *et al.* (2021), with the objective of evaluating the effect of diet, nutrition, obesity and their implications on Covid-19 mortality, in a study involving 188 countries, observed that populations that consumed more eggs and cereals had higher rates of patients recovery. On the other hand, the effect of sugar consumption on mortality was considerable, with lower recovery rates in populations with higher sugar consumption [56]. In addition, low-grade chronic systemic inflammation, common in people with obesity, is associated, among others, with the development of type 2 diabetes mellitus, hypertension, cardiovascular disease and atherosclerosis, comorbidities that adversely affect patients with Covid-19 [1.11]. In fact, overweight and obesity were associated with an unfavorable early prognosis in patients with diabetes mellitus 2 (under the age of 75 years) hospitalized with Covid-19 in a French multicenter study ("*Coronado study*") [57]. In another study carried out in Italy, in the Tuscany region, obesity was associated with an increased risk of hospitalization in patients with Covid-19, especially in individuals under 70 years of age [58].

Obesity, considered a global epidemic by the WHO since 2000, has different prevalence among the countries analyzed in this study (Table 1) [59]. In the pre-pandemic Covid-19 scenario, obesity prevalence data in 2016 (% of adults >18 years of age with Body Mass Index BMI \geq 30kg/m²) were higher in the USA and Brazil. Interestingly, these same countries also had the highest rates of infection and death by Covid-19 in their populations. It is noteworthy that, although the number of obese people in China (using BMI as a parameter) is not as significant as in most countries analyzed (Table 1), it should be considered that individuals of Asian descent are prone to visceral fat storage, predisposing them to type 2 diabetes mellitus [60]. Despite this vulnerability, China's mortality data were low (Table 1).

It is likely that the greater food and nutritional vulnerability, especially in countries with greater social inequality, can make economically underprivileged population groups even more vulnerable from the immunological stand point [3,52]. Stress, in turn, can affect body weight status through biological, psychological and behavioral mechanisms, such as ingestion of more palatable and energy-dense foods, sleep disorders and decreased physical activity [8,9]. HBS data of 2017-2018 show significant differences between the classes with the lowest and highest total family income and the quantities of food purchased, with the highest-income group having higher averages in relation to the purchase of dairy products (176% higher), vegetables (187% higher) and fruits (313% higher) [54].

Although still scarce, there is evidence that the immune function is impaired both by food shortages and the intake of high-energy and low-quality foods, represented by micronutrient deficiencies [2,3,6]. Thus, although there are differences in dietary patterns, unbalanced diets are a threat to global health and affect not only mortality rates, but also quality of life [56].

In the Covid-19 progression phase, immune and inflammatory responses particularly affect the lungs and immune organs, and the interaction of adipose tissue and the immune system can lead to disease severity and lethality [2,3]. In a recent systematic review with meta-analysis, obesity was considered a significant risk factor for admission to Intensive Care Units, and particularly for the need of invasive mechanical ventilation, in patients with Covid-19 [61].

Obesity may be, at least in part, a reflection of an individual's relationship with his/her environment. It can be associated with unemployment, social disadvantages and reduced socioeconomic productivity; it should be considered that people recovered from Covid-19 will need an adequate quality of life and may require a greater health care [5,8].

According to the above, the health disparities observed in vulnerable individuals may explain, in part, the differences in the health situation in coping with Covid-19 [52].

As this study deals with reflections on aspects related to a pandemic that is still ongoing and with dynamic evolution, this paper has limitations. Due to the lack of conclusive data on different outcomes, estimated or indirect data were used, such as the number of unemployed individuals living below the poverty line as a result of the pandemic. The analysis exercise carried out, albeit burgeoning, intends to show what facial masks cannot hide: FNI and social inequalities, aggravated by this pandemic, in addition to the damage caused by the disease itself, expose the social ailments with biological consequences both regarding the risk of infection as well as an aggravating factor of its onset.

CONCLUSION

Social and biological vulnerability in the condition of poverty are synergistic and can condemn segments of the population to the worsening of inequalities with regard to exposure, risk and severity of the disease. A vicious circle providing feed-back: FNI jeopardizes the individual's nutritional status and health, which in turn makes individuals vulnerable to worse prognoses, while the spreading of the pandemic aggravates FNI conditions. In this scenario, the need for immediate Food and Nutritional Security (FNS) actions at different governmental levels is urgent, in order to mitigate the impact and reduce the consequences of the Covid pandemic [19].

CONTRIBUTORS

AM ABREU, CC PALAZZO, BP BARBOZA, E WAZLAWIK, RW DIEZ-GARCIA and FAG VASCONCELOS contributed at all stages: conception and design of the study; participation in the bibliographic search; collection and interpretation of data; writing of the manuscript and approval of the final version.

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