

Review Article:

## COVID-19 in Ecuador: potential impacts on food security and nutrition

### *COVID-19 en Ecuador: potenciales impactos en la seguridad alimentaria y la nutrición*

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Citation

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Abstract

**Introduction:** COVID-19 is a disease caused by the SARS-CoV-2 virus, which has affected countries and continents, causing an exceptional level of anguish, social unrest and economic damage. The primary objective of this review is to identify potential impacts of the COVID-19 pandemic on food security and nutrition in the Ecuadorian population. Methodology: a descriptive and retrospective systematic review was carried out that circumscribes original works and scientific articles referring to the topic of potential impacts on food security and nutrition. Documents and articles included in databases (Scopus, Pubmed, Redalyc, SciELO) from the years 2018 to 2021 are referred to. Results: In Ecuador, the main indicators of social impacts were the increase in poverty rates, the persistence of inequalities and actions of the central government in the face of COVID-19. The food insecurity that occurs in the context of the COVID-19 pandemic has a direct impact on an increase in hunger and poverty in Ecuador. In particular, there is evidence of a vicious circle between the pandemic and malnutrition in Ecuador. Indeed, the confinement scenario, in addition to predisposing the population to malnutrition, overweight and obesity, increases the risk of contracting infections, particularly respiratory infections.

**Conclusion:** the measures taken on the scene of the COVID-19 pandemic reveal the increase in poverty and the affliction of food security as one of the <sup>1</sup> essential challenges to safeguard the health of the population. In addition, it reflects an important alert for the health system, as well as the need to implement public health policies to combat the effects of the double nutritional load.

**Keywords:** COVID-19 Epidemic, Food Security, Nutritional Status.

## Resumen

**Introducción:** la COVID-19 es una enfermedad originada por el virus SARS-CoV-2, que ha afectado países y continentes, ocasionando un nivel excepcional de angustia, agitación social y perjuicio económico. El objetivo primordial de esta revisión es identificar potenciales impactos de la pandemia COVID-19 en la seguridad alimentaria y la nutrición en la población ecuatoriana. Metodología: se efectuó una revisión sistemática descriptiva y retrospectiva que circunscribe trabajos originales y artículos científicos referentes a la temática de potenciales impactos en la seguridad alimentaria y la nutrición. Se refieren documentos y artículos incluidos en bases de datos (Scopus, Pubmed, Redalyc, SciELO) de los años 2018 a 2021. Resultados: se constató en Ecuador como principales indicadores de impactos sociales, el aumento de los índices de pobreza, la persistencia de las desigualdades y acciones del Gobierno central frente a la COVID-19. La inseguridad alimentaria que se presenta en el contexto pandemia COVID-19 repercute de manera directa a un incremento de hambre y pobreza en Ecuador. En particular se evidencia un círculo vicioso entre la pandemia y la malnutrición en Ecuador. En efecto, el escenario del confinamiento además de predisponer a la población a la desnutrición, sobrepeso y la obesidad, aumenta el riesgo para contraer infecciones, particularmente respiratorias.

**Conclusión:** las medidas adoptadas en el escenario de la pandemia de COVID-19 revelan el aumento de la pobreza y la afección de la seguridad alimentaria como uno de los retos esenciales para salvaguardar la salud de la población. Además, se refleja una alerta importante para el sistema de salud, así como la necesidad de implementación de políticas de salud pública para combatir los efectos de la doble carga nutricional.

**2 Palabras clave:** Epidemia por COVID-19, Seguridad alimentaria, Estado nutricional.

## Introduction

COVID-19 is a disease caused by the SARS-CoV-2 virus, which has hit countries and continents causing an unusual level of social unrest and economic damage<sup>1</sup>. The vertiginous spread of COVID-19 in the countries of Latin America and the Caribbean exhibits general consequences in the health, economic and humanitarian fields. For contain the advance of the pandemic, several countries implemented

various restrictive measures<sup>2</sup>. In effect, citizens' freedom of movement was limited and certain productive activities were temporarily limited<sup>3</sup>.

In the pandemic scenario, key elements that generate social impact stand out, such as the decrease in the supply of labor, social distancing, increase in the cost of logistics in food and other supply chains, changes in the demand for services that involve close contact; and declines in savings and investments.

In general terms, the increase in poverty at the global level continues to rise, but in particular the increases in poverty are concentrated above all in South Asia and Sub-Saharan Africa, with impacts more severe in urban areas than in rural areas<sup>4</sup>.

Estimates point to a considerable global recession caused by COVID-19, in effect around 150 million people will fall into extreme poverty and food insecurity<sup>4</sup>.

At the center of the COVID-19 pandemic, nutrition represents one of the main priorities of the World Health Organization, since it triggers an increase in food diseases such as malnutrition, overweight and obesity<sup>5</sup>. Consequently, there is an increase in the consumption of canned, packaged and non-perishable products, due to the fact that they are kept for long periods, their lower cost and greater accessibility. Characteristics that place them as food of first choice for the population affected by the crisis caused by COVID-19. In general terms, the consumption of ultra-processed non-perishable products is rebounding, with high levels of sugars, saturated fat, sodium and calories<sup>6</sup>.

As the impact of the COVID-19 crisis widens, the problems of malnutrition increase and health vulnerability to the disease spreads. In addition to the lack of food, overweight, obesity and chronic diseases associated with these conditions, increase the chances that, in case of being infected with COVID-19, the severity of the disease will increase<sup>7</sup>.

Ecuador, like other countries, experiences a scenario that specialists call the double burden of malnutrition; on the one hand, there is evidence of 24% of chronic child malnutrition and at the same time 60% of its adult population between overweight and morbid obesity. In fact, poverty rose to 24% at the national level and in rural areas it exceeds 43%<sup>8</sup>.

This study assesses the impact of COVID-19 on food security, diets and malnutrition problems. In addition, the state reached by overfeeding due to excess calorie consumption, obesity, as opposed to malnutrition, which is the result of calorie deficit, is considered. If a combination of factors is carried out, individuals with obesity, overweight and malnutrition can be observed even in the same family, community or geographical area.

### Methodology

A descriptive systematic bibliographic review of documents and articles included in databases (Scopus, Pubmed, Redalyc, SciELO) from the years 2018 to 2021. For the search, the algorithms “or”, “and”, “not” were used, and the variables were “food safety”, “COVID- 19 ”and“ nutrition ”.An exploration was generated in Google Scholar, documents and guides published by different professional associations and scientific societies dedicated to researching the state of local and international food security and nutrition. Regarding the search strategies, it carried out the evaluation of the titles, abstracts, contents and reading of each document, extracting transcendental data.

### COVID-19 and increasing poverty

In Latin America and the Caribbean, the increase in poverty increases the risk of hunger, a trend that has been marked since the 2014-2015 period, which was accentuated in 2020 9 . Figure 1. It should be noted that poverty is defined as the situation that prevents

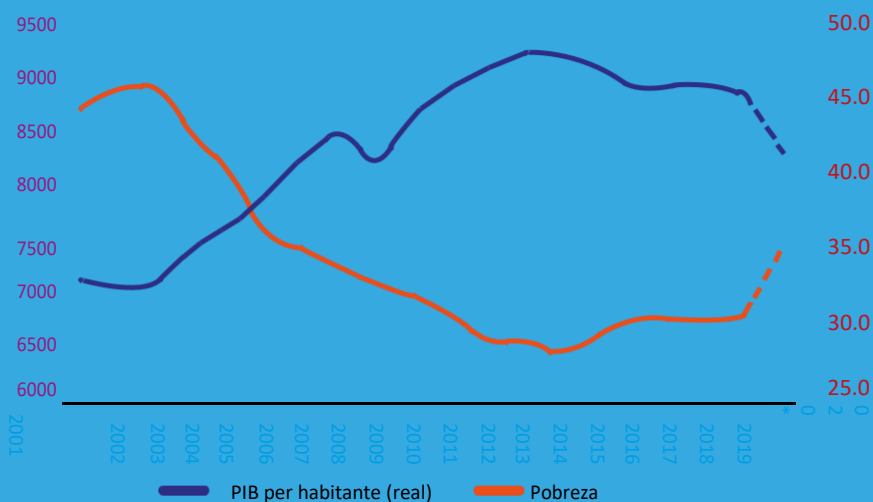
satisfying the basic physical and psychological needs of a person, due to lack of resources, such as food, housing, education, health and basic services, in addition, is considered a condition of deprivation or deprivation<sup>10</sup>. The person is considered poor by income, if their per capita family income is below the food basket, so it is impossible for them to acquire it<sup>(eleven)</sup>. In fact, in January 2020 the cost of the Basic Family Basket (CFB) was USD 716.14 <sup>12</sup>. While in June 2020 the CFB presented a cost of USD 719.03<sup>13</sup>.

On the other hand, a person is considered poor due to unsatisfied basic needs if they belong to a household that lacks the satisfaction of at least one of their basic needs represented in five components: quality of housing, overcrowding, access to basic services, access to education and economic capacity. It should be noted that the poor by consumption are those who cannot satisfy their daily nutritional needs according to age, physiological state, sex and, at the same time, are prevented from covering the cost of the non-food component<sup>11</sup>.

In Ecuador in September 2019, national income poverty stood at 23.9% and extreme poverty at 8.7% <sup>14</sup>. Even before the declaration of a health emergency caused by the COVID-19 pandemic in December 2019, poverty rose to 25.0% and extreme poverty rose to 8.9%. In urban areas, poverty reached 17.2% and extreme poverty 4.3%. Finally, in rural areas poverty reached 41.8% and extreme poverty 18.7% <sup>15</sup>.

While income poverty in December 2020

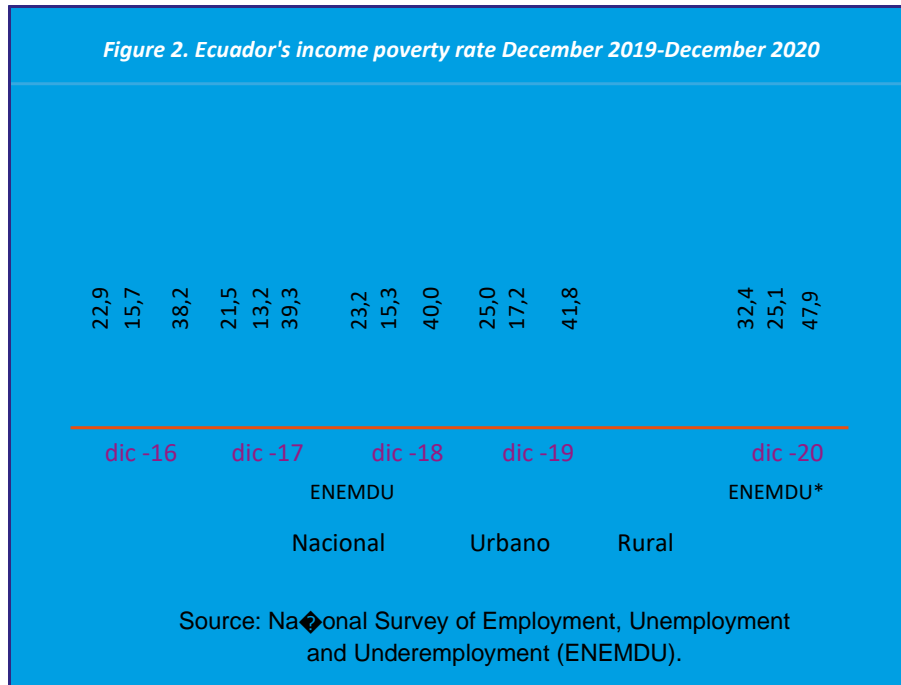
Figure 1. GDP per capita (constant 2010 dollars) and poverty (%) in Latin America and the Caribbean.



Source: Economic Commission for Latin America and the Caribbean (ECLAC). Jun. 2020



increased to 32.4%, urban poverty to 25.1% and poverty in rural areas to 47.9%. Figure 2. In December 2020, extreme poverty at the national level stood at 14.9%. In urban areas, extreme poverty was 9.0% and in rural areas, 27.5%<sup>16</sup>.



In Ecuador, poverty due to unsatisfied basic needs (UBN) at the national level in December 2020 was 32.6%, in urban areas it was 21.8% and in rural areas it was 55.7%. It should be noted that the multidimensional extreme poverty rate was 17.8%, at the urban level this indicator stood at 5.9%, while at the rural level it was 43.3%. In addition, the Gini coefficient was located in December 2020 at 0.500 at the national level, 0.485 in the urban area and 0.474 in the rural area.<sup>16</sup>

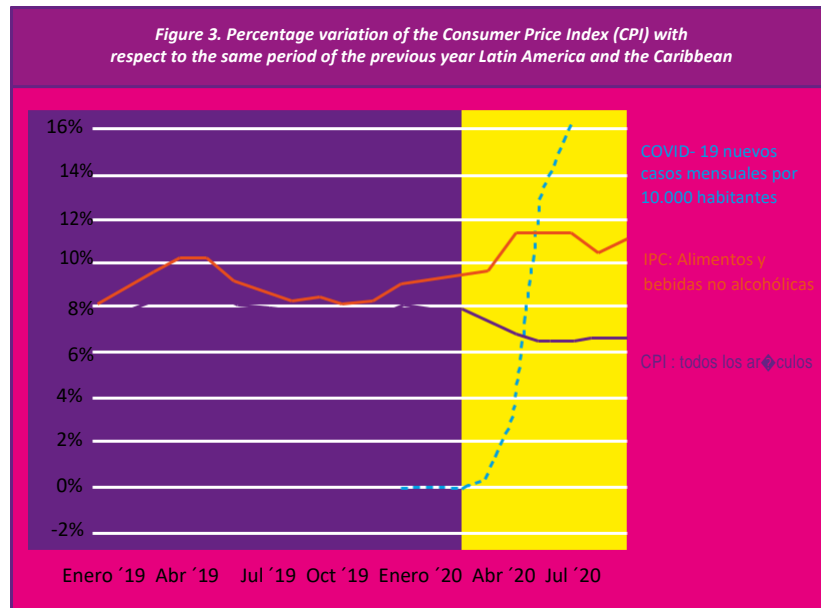
#### Food insecurity during COVID-19 lockdown

Due to the COVID-19 pandemic, food security in

4 Ecuador has been threatened. In effect, access to sufficient, safe and nutritious food is difficult<sup>17</sup>. Like many Latin American countries, Ecuador responded to COVID-19 by limiting trade and movement, provisions that restricted the current model of trade integration in the region. As a result, prospects for revitalizing smallholder production are particularly limited by a legacy of land inequality and pressure from local market traders to lower selling prices.<sup>18</sup> In Ecuador, far from revitalizing small-scale agriculture, the pandemic seems to have further consolidated

an economic model to support agribusiness at the expense of family farms and migrant labor<sup>18</sup>.

An imbalance between supply and demand in agriculture is evident, due to the fact that in the first months of the pandemic the uncertainty that has caused the interruption of the food supply chain governed. Consequently, the World Bank and the Food and Agriculture Organization of the United Nations (FAO) provided a wake-up call to the entire world for the possible disproportionate impact of COVID-19 on food security. In particular, the blocking measures have affected the supply and demand of certain products and, therefore, their prices.<sup>19,20</sup> Figure 3.



The COVID-19 outbreak was declared a pandemic on March 11 (in light blue). It was previously declared a Public Health Emergency of International Concern on January 30 (in a lighter shade of blue). COVID-19 cases were calculated per 10,000 to 100,000 population and coded at the top for illustrative purposes and are not intended for cross-region comparisons.

**Source:** ILO estimates based on ILOSTAT database for the CPI and Our World In Data for COVID-19 cases and population.

Estimates reveal that the COVID-19 lockdowns trigger a 7.2% decline in global GDP. These changes lead to an increase in the number of food insecure people in 2020 of 211 million (an increase of 27.8%)<sup>19</sup>

In Ecuador, a research work revealed that 77.3% of households presented mild and moderate food insecurity, compared to 13.2% with severe insecurity. In general terms, one of the main concerns in 73.5% of households was running out of food. 39.9% of households maintain a little varied diet, without healthy and nutritious foods in their diet<sup>17</sup>. In terms of gender, women living in rural areas are the ones who experience the greatest food insecurity.<sup>17</sup>

The food insecurity observed in the context of the COVID-19 pandemic causes an increase in hunger and poverty in the migrant population. A study describes that the totality of migrants from Venezuela in the north of Ecuador is in a level of undernourishment of 100% in kilocalories, proteins and fats. While in carbohydrates there is a level of undernourishment of 98.5% and only 1.5% of the studied population is within the daily dietary adequacy recommendations. Regarding the

level of food insecurity, through the application of the ELCSA, it was determined that 54.0% of the total value present severe food insecurity<sup>21</sup>.

### Malnutrition and the COVID-19 pandemic

In the Ecuadorian economy, the confinement of people in their homes, the stoppage of activities and the decrease in formal and informal trade have caused a serious economic crisis that also entails a change in eating habits.

For most individuals, without underlying pathologies, energy needs are between 25-35 kilocalories (kcal) per kilogram (kg) of body weight (CP) per day. Indeed, at least 1 g of protein / kg of CP per day must be guaranteed<sup>22</sup>. By not meeting the calorie requirements, changes in nutritional status can be observed. In all its forms, malnutrition encompasses malnutrition (wasting, stunting, and underweight), vitamin or mineral imbalances, overweight, obesity, <sup>5</sup> and diet-related noncommunicable diseases<sup>23</sup>.     

In Ecuador, a research work revealed that 25.2% of adults and 11.9% of those under 18 years of age omit some food during the day (breakfast, lunch, snack). Indeed, in Ecuadorian households

between 20% and 30% of young people or adults suffer from hunger<sup>17</sup>. In addition, it is detailed that women presented greater changes in habitual food consumption compared to men, and people between 18 and 40 years of age decreased their food consumption in relation to people > 40 years<sup>24</sup>.

On the other hand, it is reported that overweight and obese people are found in a higher percentage in developing countries. Generally speaking, low-income individuals do not purchase healthy food, but ultra-processed products, cheaper and more accessible.

The reference of eating behavior associated with exposure to stress is added, which is related to an increase in the frequency of food intake in the absence of hunger, especially for hyperpalatable foods, such as processed products with hyperlipidic, hyperglucidic and hypercaloric content.<sup>25</sup>

An investigation carried out in Ecuador determined in the context of the health emergency due to COVID-19 in adults with a history of overweight and obesity (11.7%), that simple carbohydrates were the first option to satisfy energy needs. In addition, in this population group, 38.3% do not perform physical activity. In addition to the problem, 53% drink alcohol and 13.3% consume cigarettes, harmful substances that make them a vulnerable group to exposure to the virus.<sup>26</sup>

Similarly, in Peru it was observed in a study in which hospital care and administrative personnel participated, during the COVID-19 emergency, that 46% were overweight and 21%, obesity<sup>27</sup>.

## Discussion

Among the findings of the investigation of publications on food security and nutrition in Ecuador, few investigations related to food security and nutritional assessment in the scenario of the

6 COVID-19 emergency stand out. These results were obtained as evidenced above all in documents and

guides published by different scientific societies dedicated to researching the state of local and international food security and nutrition. There were few publications in indexed journals on the problem in general. Descriptive investigations of a theoretical nature were mostly observed.

In general, the volume of individuals affected by the COVID-19 pandemic is not limited to just infected people. The repercussions extend to the population, both economically, physically and mentally<sup>28</sup>.

Understanding the phenomenon of poverty helps to identify the circle and the relationship between nutrition and poverty, since they are interdependent.

The effect of the double nutritional burden on the population, malnutrition and obesity occurs more frequently among poor individuals or communities<sup>29</sup>. The poor are included in terms of income, consumption and multidimensional unmet needs<sup>8</sup>. The latter live in an unfavorable environment for their integral development, with the component of low schooling or incomplete education, which could determine food selection. Thus, high-calorie and industrialized foods could be purchased under the criterion that this type of food, in addition to being "healthy", belongs to an ideal social rank to which one wants to access.

The blocking measures, referring to COVID-19, show as a result the problem concerning the collapse in production and alteration in food consumption habits in the population<sup>4</sup>.

Indeed, in Ecuadorian households between 20% and 30% of young people or adults suffer from hunger<sup>17</sup>. As in countries of Latin America and the Caribbean<sup>30</sup>. As a result of the delicate situation, Ecuador faces challenges and needs that involve the food industry in reference to the changes of the new normal<sup>31</sup>.

Overweight and obesity are considered dominant components in the international epidemiological landscape in recent decades<sup>32</sup>. Situation aggravated in Ecuador by the COVID-19 pandemic that, in addition to predisposing the population to overweight and obesity<sup>26</sup>, increases the risk of contracting infections, particularly respiratory infections, as well as an increased risk of mortality<sup>32</sup>. In general terms, a large part of individuals with obesity show nutritional patterns and polypharmacy that can limit the course and clinical approach of COVID-19, substantially if it coexists with other comorbidities.<sup>33</sup>

In particular, the mechanisms supported by exposing the association between COVID-19 and obesity have not been fully clarified. But chronic inflammation has been detailed as a fundamental mechanism in this context.<sup>34</sup>. Indeed, obesity constitutes a low-grade inflammatory state, with incessant secretion of numerous signaling molecules derived from hypertrophic or hyperplastic adipose tissue<sup>35</sup>.

The persistence of this inflammatory process promotes the appearance of related conditions, such as insulin resistance, type 2 diabetes mellitus,

hypertension and dyslipidemias. At the same time, these pathologies have been recognized as risk indicators in patients with COVID-19<sup>36</sup>. In addition, stress, added to insomnia, is accompanied by a predominantly nocturnal food consumption pattern, related to increased adiposity and serum triglyceride levels, as well as increased insulin and leptin secretion<sup>37-38-39</sup>. The addition of hyperphagia with a predominantly nocturnal eating schedule, together with the preference for high-calorie foods, powerfully promotes the development of metabolic disorders<sup>7</sup>.

In relation to diet, it is necessary the calculation of energy requirements, as well as proteins, micronutrients and pharmacological nutrients in consideration of the presence and severity of the disease and comorbidities<sup>33</sup>.

A study carried out in Lima, Peru, showed a high consumption of ultra-processed foods during the period of mandatory confinement due to COVID-19<sup>40</sup>. A reality that also affects infants, who actually consume sugary foods and drinks 2 or more times a week<sup>41</sup>. Therefore, it is necessary to integrate healthy recommendations for the diet and care of children and adolescents<sup>42-43</sup>.

On the other hand, among adults, university teachers, between the ages of 40 to 64 years, in Ecuador, 13.33% of them had a personal pathological history of obesity in terms of health status<sup>44</sup>. In fact, in Ecuador an investigation about nutrition in the sedentary lifestyle of the elderly in times of COVID-19 in gerontological centers justifies the proposal to carry out a guide to physical activity and nutrition for the elderly<sup>45</sup>.

Among the limitations, because of the quarantines adopted, the suspension of non-essential State jobs was evidenced, measures that represented a major inconvenience when assessing the impacts and drawing up mitigation policies for the health crisis<sup>3</sup>. On the other hand, we need empowered, conscious and connected consumers to take actions in favor of a healthy diet<sup>6</sup>.

## Conclusions

The measures taken on the scene of the COVID-19 pandemic reveal the increase in poverty and the affliction of food security as one of the essential challenges to safeguard the health of the population. The proper functioning of the food supply chain is required, with an emphasis on small and medium producers, who are the main suppliers of fresh and healthy food. In addition, it reflects

an important alert for the health system, as well as the need to implement public health policies to combat the effects of the double nutritional load.

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8  
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