VULNERABILITY OF RURAL WORKERS IN TIMES OF THE COVID-19 PANDEMIC

VULNERABILIDADE DO TRABALHADOR RURAL EM TEMPOS DE PANDEMIA DA COVID-19

VULNERABILIDAD DE LOS TRABAJADORES RURALES EN TIEMPOS DE PANDEMIA DE COVID-19

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ABSTRACT

Objective: To approach the content in the literature regarding the vulnerability of rural workers in times of the COVID-19 pandemic. Method: This qualitative analysis was developed as an integrative review carried out in May 2020, based on the following research question: “How vulnerable are rural workers in times of the pandemic?”. We searched the databases of the Latin American and Caribbean Health Sciences Literature (LILACS), Medical Literature Analysis and Retrieval System Online (MEDLINE), and Scientific Electronic Library Online (SciELO). Results: We found 129 articles, but only eight were relevant to the study. Family farming, along with fishing, was one of the most affected sectors by social distancing. Conclusion: Social distancing is an indispensable public health measure. However, it affects the health determinants and conditioning factors related to small-scale farmers, fishers, and shellfishers, as their family income is drastically reduced or altogether lost. Therefore, there is a need for public policies to aid this population.

Descriptors: Farmers; Coronavirus Infections; Pandemics; Occupational Health; Rural Workers; Social Vulnerability.

RESUMO

Objetivo: Abordar, frente à literatura, a vulnerabilidade do trabalhador rural em tempos de pandemia da COVID-19. Método: trata-se de uma análise qualitativa, através de revisão integrativa realizada no período de maio de 2020, a partir da seguinte questão norteadora: “Quão vulneráveis estão os trabalhadores rurais em tempos de pandemia?”. A pesquisa foi realizada nas bases de dados
Literatura Latino-americana e do Caribe em Ciências da Saúde (LILACS), Medical Literature Analysis and Retrieval System Online (MEDLINE) e Scientific Electronic Library Online (SciELO). **Resultados:** foram encontrados 129 artigos, mas apenas oito foram pertinentes ao estudo. Um dos setores mais afetados com o distanciamento social foi a agricultura familiar, assim como o setor pesqueiro. **Conclusão:** o distanciamento social é uma medida de saúde pública indispensável, mas afeta os determinantes e condicionantes de saúde atrelados aos pequenos agricultores, pescadores e marisqueiros, uma vez que ocorre drástica redução ou nulidade de obtenção de renda das famílias. Portanto, são necessárias políticas públicas de assistência para essa população.

**Descritores:** Agricultores; COVID-19; Pandemias; Saúde do Trabalhador; Trabalhadores Rurais; Vulnerabilidade Social.

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**RESUMEN**

**Objetivo:** abordar la vulnerabilidad de los trabajadores rurales en tiempos de la pandemia COVID-19 en la literatura. **Método:** se trata de un análisis cualitativo, a través de una revisión integradora realizada en el período de mayo de 2020, a partir de la siguiente pregunta orientadora: “¿Hubo un aumento de la vulnerabilidad de los trabajadores rurales en tiempos de pandemia”? La búsqueda se realizó en las bases de datos Medical Literature Analysis and Retrieval System Online (MEDLINE) y Scientific Electronic Library Online (SciELO). **Resultados:** se encontraron catorce artículos, pero solo cuatro fueron relevantes para el estudio. Uno de los sectores más afectados por el distanciamiento social fue la agricultura familiar, así como el sector pesquero. **Conclusión:** el distanciamiento social es una medida de salud pública indispensable, pero afecta los determinantes y condiciones de salud vinculados a los pequeños agricultores, pescadores y marisqueiros, ya que existe una drástica reducción o nulidad en la obtención de ingresos para las familias, requiriendo de políticas públicas asistenciales para esa población.

**Descriptores:** Agricultores; Infecciones por Coronavirus; Pandemias; Salud Laboral; Trabajadores Rurales; Vulnerabilidad Social.
INTRODUCTION

Agriculture faces complex challenges worldwide, requiring broad and integrated efforts to reach efficient solutions. One of these challenges is to balance environmental sustainability with the food needs of a growing population - which is estimated to reach 9 to 10 billion people by 2050.¹ This balance is essential to achieve the United Nations Sustainable Development Goals regarding the eradication of hunger. In this context, we must also consider that family farming is the means of subsistence of more than 2.5 billion small-scale farmers.¹²

Agricultural workers, for instance, have great economic relevance because this type of production is an important segment of the Brazilian agriculture industry, responsible for most of the produce that supply the domestic market.³ Moreover, these workers are responsible for approximately 10% of the Brazilian GDP, being therefore essential to the economy of many municipalities and consequently to the country’s development.²

The changes made in the 2017 labor reform in Brazil ensured the companies more flexibility to handle labor agreements according to their needs. They also allowed adjustments to reduce the companies’ operational cost and broaden their autonomy to establish the recruitment terms, working conditions, and wages - thus diminishing the wage earners’ social protection.⁴

As a result of the process of restructuring employment relationships, this flexibilization can lead to more sick leaves due to occupational diseases (with a causal link), accidents at work (which occur more often mainly because of psychosocial working aspects), and dismissals.¹⁵

The new coronavirus (SARS-CoV-2), responsible for the clinical manifestation of COVID-19, appeared in Wuhan, China, in November 2019, and within 2 months thousands of cases and countless deaths had already occurred. On March 11, 2020, the World Health Organization (WHO) declared the new coronavirus pandemic.⁶

Previous pandemics demonstrated that quarantine and panic have an impact on human activities and economic growth. They affect agriculture as well, as an infectious disease outbreak increases hunger and malnutrition. Increasingly strict social distancing and movement restriction
norms result in a shortage of harvest workers and even difficulties for planters to take their produce to the market.7

The COVID-19 pandemic likewise caused many problems to the world economy. Family farming was particularly affected by food distribution problems, post-harvest losses for lack of buyers, and temporarily or permanently closed markets to whom they had traditionally sold. They are also more vulnerable to getting the virus, resulting in family income loss and long-term effects, including an incapacity to carry on their business in the future.8

Some types of labor, including agriculture and livestock production, are essential in times of public calamities. However, that does not mean that they are not exposed to dangers - instead, it highlights their vulnerability in a pandemic.7

Vulnerability is a multifactorial concept, not only related to absent or precarious income but also fragile affective relationships and unequal access to public services and goods.8 In this sense, rural areas are economically affected by calamities, especially with unemployment and income loss, which is particularly true in the ongoing pandemic.7-8

The vulnerability to which these workers are subject is not only social but also health-related, as they are more exposed to getting the virus and acquiring COVID-19 at work. This is further enhanced by some unhealthy workplaces, such as slaughterhouses and meatpacking companies.7-8 Therefore, we need to research the vulnerable situations to which these workers are exposed.

**OBJECTIVE**

To approach the content in the literature regarding the vulnerability of rural workers in times of the COVID-19 pandemic.

**METHOD**

This is an exploratory qualitative study whose instrument was an integrative literature review. The research, based on the methodology proposed by Caveião, Peres, and Zagonel, was developed in six stages, namely: development of the research question, search for samples in the literature, data collection, critical analysis of the studies, discussion of the results, and presentation of the integrative review.9

Hence, we began this review by developing the research question, guided by the PICO strategy10, an acronym that stands for population, intervention, comparison, and outcomes. Thus, the research question was defined as “How vulnerable are rural workers in times of the pandemic?” (Table 1). We also used the checklist of the Preferred Reporting Items for Systematic Reviews and
Meta-Analyses (PRISMA) to properly systematize the study. It comprises 27 items and a four-stage flowchart to help authors improve their report in systematic reviews and meta-analyses.11

### Table 1. Description of the PICO strategy. Maceió (Alagoas), Brazil, 2021.

<table>
<thead>
<tr>
<th>Initials</th>
<th>Description</th>
<th>Analysis</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>Patient</td>
<td>Rural workers</td>
</tr>
<tr>
<td>I</td>
<td>Intervention or indicator</td>
<td>Vulnerability of rural workers during the COVID-19 pandemic</td>
</tr>
<tr>
<td>C</td>
<td>Comparison or control</td>
<td>Not applicable</td>
</tr>
<tr>
<td>O</td>
<td>Outcomes</td>
<td>Assessment of the vulnerability of rural workers during the COVID-19 pandemic</td>
</tr>
</tbody>
</table>

Source: Authors, 2021.

Then, we searched for samples in the literature, surveying the databases of the Latin American and Caribbean Health Sciences Literature (LILACS), Medical Literature Analysis and Retrieval System Online (MEDLINE), and Scientific Electronic Library Online (SciELO). To this end, we used advanced search with the Boolean operators “AND” and “OR”, combining descriptors found in the Health Sciences Descriptors (DeCS/MeSH): “Agriculture” OR “Farmers” AND “COVID-19”. The inclusion criteria were as follows: original articles fully available in digital platforms with clearly described research methods, without language restrictions. The exclusion criteria were articles published before 2016 and those unrelated to the topic of this study.

The authors developed a databank to better organize the data collection process. Thus, they were arranged by their title, authors, year and place of publication, type of study, level of scientific evidence, and results. The assessment was based on the investigation of levels by the Oxford Centre for Evidence-Based Medicine12. This method classifies the articles into degrees of recommendation A, B, C, and D, according to their level of efficiency (1a, 1b, 1c, 2a, 2b, 2c, 3a, 3b, 4, and 5)13 (Table 2).
<table>
<thead>
<tr>
<th>DR*</th>
<th>LE**</th>
<th>Therapy/Prevention - Etiology</th>
<th>Diagnosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>1A</td>
<td>Systematic review (with homogeneity) of randomized controlled clinical trials.</td>
<td>Systematic review (with homogeneity) of Level 1 diagnostic studies, clinical decision rule with 1B studies from different clinical centers.</td>
</tr>
<tr>
<td></td>
<td>1B</td>
<td>Randomized controlled clinical trials with narrow confidence interval.</td>
<td>Validating cohort study with good reference standards, or clinical decision rule tested within one clinical center.</td>
</tr>
<tr>
<td></td>
<td>1C</td>
<td>All-or-none.</td>
<td>Absolute sensitivity and specificity.</td>
</tr>
<tr>
<td>B</td>
<td>2A</td>
<td>Systematic review (with homogeneity) of cohort studies.</td>
<td>Systematic review (with homogeneity) of Level &gt; 2 diagnostic studies.</td>
</tr>
<tr>
<td></td>
<td>2B</td>
<td>Cohort study (including low-quality randomized controlled clinical trial)</td>
<td>Exploratory cohort study with good reference standards; clinical decision rule after derivation or validated only on split-sample or databases.</td>
</tr>
<tr>
<td></td>
<td>2C</td>
<td>Outcomes research, ecological studies.</td>
<td>Observation of clinical evolution. Ecological study.</td>
</tr>
<tr>
<td>C</td>
<td>3A</td>
<td>Systematic review (with homogeneity) of case-control studies.</td>
<td>Systematic review (with homogeneity) of 3b and better diagnostic studies.</td>
</tr>
<tr>
<td></td>
<td>3B</td>
<td>Case-control study.</td>
<td>Non-consecutive study; or without consistently applied reference standards.</td>
</tr>
<tr>
<td>D</td>
<td>4</td>
<td>Case-series (and poor-quality cohort and case-control studies).</td>
<td>Case-control study, poor or non-independent reference standard.</td>
</tr>
<tr>
<td></td>
<td>5</td>
<td>Expert opinion without explicit critical appraisal or based on “first principles” (physiological or animal study).</td>
<td></td>
</tr>
</tbody>
</table>

Source: Oxford Centre for Evidence-based Medicine: levels of evidence, 2009.*Degree of Recommendation, **Level of Evidence.

Four independent reviewers rigorously conducted the critical analysis of the results, following the methodology and verifying each study’s potential to contribute to this paper.
In the discussion stage, all the data used in the research were analyzed and compared to the current theoretical rationale, and then the aspects related to the study were conceptualized. Hence, we attained an in-depth and critical understanding of the topic, not dismissing inquiries for future research.

In the last stage, we presented the integrative review with a summary of the evidence, along with considerations based on the scientific findings related to the paper. This study did not require approval by the Research Ethics Committee. Those responsible for the research report no conflict of interest. No funding was obtained to conduct this paper.

RESULTS

With the strategy used for the search, we retrieved 129 studies, one of which was a duplicate. After the primary analysis, 25 articles were selected to verify their eligibility, resulting in eight articles for the review - two of them retrieved from SciELO and six, from MEDLINE. Figure 1 presents in detail the selection process.

Figure 1. PRISMA flowchart with the selection of studies to be included in the sample, 2021.

Table 3, below, provides information on the eight studies selected to answer the research question defined with the PICO strategy. The following are presented: title of the article, authors, year of publication, type of study, research method, and main findings - in which we point out
Table 3. Characterization of the studies.

<table>
<thead>
<tr>
<th>ID*</th>
<th>Title of the article</th>
<th>Authors/Year</th>
<th>Type of study/Level of evidence</th>
<th>Main findings</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Impact of the COVID-19 pandemic on agricultural production, livelihoods, and food security in India: baseline results of a phone survey</td>
<td>Jaacks, L. M.; Veluguri, D.; Serupally, R.; Roy, A.; Prabhakaran, P.; Ramanjaneyulu, G. /2021</td>
<td>Case-control study/3B</td>
<td>The farmers reported difficulties selling their produce and animal products due to the social distancing measures taken to fight COVID-19, which reduced their usual wages and impacted their socioeconomic condition.</td>
</tr>
<tr>
<td>A2</td>
<td>Farmer and farm worker illnesses and deaths from COVID-19 and impacts on agricultural output</td>
<td>Lusk, J. L.; Chandra, R. /2021</td>
<td>Cohort study/2B</td>
<td>The COVID-19 pandemic revealed the vulnerability of food supply resulting from losses in agricultural workers, who are considered essential and therefore are more exposed to the risk of contamination.</td>
</tr>
<tr>
<td>A3</td>
<td>Smallholder farmer perceptions about the impact of COVID-19 on agriculture and livelihoods in Senegal</td>
<td>Middendorf, B. J.; Faye, A.; Middendorf, G.; Stewart, Z. P.; Jha, P. K.; Prasad, P. V. V. /2021</td>
<td>Case-control study/3B</td>
<td>The COVID-19 pandemic will impact not only the biophysical (such as both producing and having access to supplies) and the social aspects (such as being able to work and sell in the market or facing quick changes in demand). This raises clear concerns about food security (hunger), social well-being, access to financial services, job openings, unemployment, and potential poverty.</td>
</tr>
<tr>
<td>A4</td>
<td>Essential and Vulnerable: Implications of COVID-19 for Farmers in Ireland</td>
<td>Meredith, D.; McNamara, J.; Doorn, D. V.; Richardson, N. /2020</td>
<td>Ecological study/2C</td>
<td>Since farmers are classified as essential workers, they cannot afford to keep social distancing, which puts them and their families at greater risk of exposure to the COVID-19 virus. Some agricultural families, particularly those who live alone or have small children, are susceptible to adverse impacts also on their well-being, respectively associated with distancing and severe time restrictions.</td>
</tr>
<tr>
<td>A5</td>
<td>Without food, there can be no exit from the pandemic</td>
<td>Torero, M. /2020</td>
<td>Case report/4C</td>
<td>The study pointed out that various aspects in agriculture may be affected by COVID-19 - from work and decreased demand due to income loss to increased exchange rates and inflation.</td>
</tr>
<tr>
<td>A6</td>
<td>The Novel Coronavirus and Undocumented Farmworkers in the United States</td>
<td>Matthew, O. O.; Monaghan, P. F.; Luque, J. S. /2021</td>
<td>Opinion article based on first principles/5D</td>
<td>The risk of COVID-19 propagation among rural workers, especially the migrants – i.e., coming from distant places to work - can be aggravated by their living and working conditions.</td>
</tr>
</tbody>
</table>
conditions. They often commute in crowded buses from their temporary homes to work and are allocated in tight and poorly ventilated accommodations, such as motel rooms, increasing the possibility of virus transmission.

The COVID-19 pandemic had a multidimensional negative impact on small-scale farmers: health, production, sale of their produce, income, and means of communication. Many farmers and their families and friends were infected with the Sars-CoV-2, some of whom died from the disease, and suffered post-harvest losses, with decreased sales and income - however, none of the farmers completely lost their production and sales.

The mobility restriction measures taken internationally to contain COVID-19 are necessary to control the spread of the pandemic; however, they may have a negative effect on the production and distribution of food, also decreasing rural workers’ family income and increasing their socioeconomic vulnerability.

Source: Research data, Maceió (Alagoas), Brazil, 2021. *Identification.

The levels of evidence of the papers we analyzed encompassed case-control studies (3), cohort study (1), ecological study (1), case report (1), and opinion articles (2). Three of them were published in 2020 and five, in 2021.

As for the main findings, the studies raise questions in common related to rural workers and the impacts on this sector of the economy. All of them point out the family farmers’ importance to the market, as they raise income and supply food, and restate the need for greater investments in this sector.

Also, the identification of farmers as essential workers stood out in face of the pandemic because they and their families are more exposed to COVID-19. Such exposure can be further aggravated by their living and working conditions.

Moreover, the studies often highlight the workers’ concern with income loss due to the COVID-19 control measures (social distancing, closing borders, etc.), because of both the family income and their job security.

DISCUSSION
The studies approach the family farmers’ importance to the market and point out some vulnerabilities they face in the COVID-19 pandemic. However, no study was found involving health care specifically to this population in the current scenario, except for health determinants and conditioning factors.

During the present pandemic, some activities in the country were restricted to essential services, such as medical care and food supply. Regarding food supply, the main protagonists are the agricultural families, who are responsible for about 80% of the food production in the country.\textsuperscript{21}

Analyzing the studies, we found that family agriculture was one of the sectors severely impacted by the social distancing measures - which was observed worldwide - because the main distribution channels had been drastically affected, such as the street markets and school cafeterias. This led to the loss of produce ready for consumption and hindered the investment in the subsequent crop, increasing the impact on local agricultural food systems.\textsuperscript{22-23}

Hence, study A1\textsuperscript{13} points out that farmers reported difficulties selling their agriculture and animal products because of the social distancing measures taken to fight COVID-19, causing a reduction in their usual income and impacting their socioeconomic condition. Paper A5\textsuperscript{17} highlights that various aspects in agriculture can be affected by COVID-19 - from work and decreased demand due to income loss to increased exchange rate and inflation.

Moreover, according to article A7\textsuperscript{19}, the COVID-19 pandemic had a multidimensional negative impact on small-scale farmers: health, production, sales of their produce, income, and means of communication. Many farmers and their families and friends were infected with the Sars-CoV-2, some of whom died from the disease, and suffered post-harvest losses, with decreased sales and income - however, none of the farmers completely lost their production and sales.

Due to the pandemic, many farmers faced discontinued selling opportunities because of temporarily closed restaurants, reduced or suspended street markets, or measures taken to diminish inter-municipal traveling and public transportation.\textsuperscript{24}

The Food and Agriculture Organization (FAO) mentioned that small farmers and fishers may have difficulties selling their products, which in turn decreases income and purchasing power.\textsuperscript{25} The already existing food insecurity in Brazilian homes tends to increase with the COVID-19 pandemic, greatly affecting poorer and more vulnerable parts of the population.\textsuperscript{24} Food security is the availability of and accessibility to enough amounts of nutritious food.\textsuperscript{25-26}

According to article A2\textsuperscript{14}, the COVID-19 pandemic made notorious the vulnerability of food supply due to the loss of agricultural workers. In line with that, study A1\textsuperscript{13} states that one out of every three farmers participating in the study were worried about the lack of food and many of them
were at risk of severe forms of food insecurity, such as skipping meals and spending a whole day without eating.

Furthermore, study A3 reports that the COVID-19 pandemic will impact not only the biophysical (such as both producing and having access to supplies) but also the socioeconomic aspects (such as being able to work and sell in the market or facing quick changes in demand). This raises clear concerns about food security (hunger), social well-being, access to financial services, job openings, unemployment, and potential poverty. These conclusions corroborate the findings in paper A8, which highlights that the measures taken to contain COVID-19 may sharpen the socioeconomic vulnerability of rural workers and their families.

Employment informality and flexibility were intensified by the pandemic. Moreover, with the aggravation of the ongoing economic crisis in Brazil and other countries, countless activities were halted, leaving the workers helpless. Hence, most of them lost their means of subsistence, including food. These workers' increased socioeconomic vulnerability may have negative social implications, especially related to physical and mental health, as pointed out in article A4.

Given the above, there is a need to reassess the public measures that grant more than 70% of the agriculture credit to large-scale farming, focused on producing commodities. We must turn our attention to family farming, which has a better geographical distribution (as their diversified produce enables local supply), employs more than 80% of the rural workers, and have more sustainable farming practices. The rural workers belong to a context of social vulnerability due to misdirected public policies because legislators prioritize the production of goods and exportation. In such a crisis scenario like the one the whole world is experiencing, agribusiness is one of the sectors that have remained productive. Agriculture has been achieving continuous commercial surplus, which is significant to maintain the country’s foreign conditions, particularly in face of the slowdown in domestic activity.

On the other hand, paper A4 highlights that classifying farmers as essential workers means they cannot afford to keep social distancing, which puts them and their families at greater risk of exposure to the COVID-19 virus. Some agricultural families, particularly those who live alone or have small children, are susceptible to adverse impacts also on their well-being, respectively associated with distancing and severe time restrictions. Research A6 highlights that the risk of COVID-19 propagation among rural workers, especially the migrants - i.e., coming from distant places to work - can be aggravated by their living and working conditions. They often commute in crowded buses from their temporary homes to work and are allocated in tight and poorly ventilated accommodations, such as motel rooms, increasing the possibility of virus transmission.
This population is multidimensionally vulnerable, due not only to low-income levels because of social distancing but also to situations that interfere with the migrant farmers’ quality-of-life determinants and conditioning factors, as well as their overall exposure.  

Furthermore, family farming is carried out mostly by people who live in poverty, making them doubly victims of COVID-19. Hence, they need to be helped and protected.

Another point of vulnerability in this scenario is the significant profile of older adults among family farmers - therefore belonging to the group most vulnerable to COVID-19. Some municipalities have tried to ease the situation with efforts to establish policies that ensure food and nutrition security based on the public purchase of food from family agriculture to distribute it to people in social vulnerability. Thus, they both supply food and provide income to these farmers.

**CONCLUSION**

The studies analyzed in this review point out that the main vulnerabilities of rural workers during the epidemic scenario are socioeconomic because social distancing brought about a drastic decrease in sales. Moreover, they faced the loss of produce and unfeasibility to invest in subsequent crops, with a partial or total income loss. This has significant multifactorial impacts, interfering directly with the quality of life of these workers and their families, which are inherently related to their health.

On the other hand, migratory rural workers who carry out essential activities are more exposed to the risk of contamination. Furthermore, they oftentimes perform their duties in unhealthy, uninspected environments, such as slaughterhouses.

Therefore, public policies need to be aimed at these workers. Instead of prioritizing investments in the production of large-scale goods and exportation, they must turn to family farming, which faces multidimensional poverty, making these workers even more vulnerable in the pandemic. Studies on this topic should be broadened to identify and enable assertive measures to address the preexisting challenges, related to rural workers’ vulnerability, as well as the new ones, resulting from the COVID-19 pandemic.

**CONTRIBUTIONS**

The authors report that all of them equally contributed to the conceptualization of the research project, the data collection, analysis, and discussion, the writing and critical revision of the content with intellectual contribution, and the approval of the final version of the study.
Informa-se que todos os autores contribuíram igualmente na concepção do projeto de pesquisa, coleta, análise e discussão dos dados, bem como na redação e revisão crítica do conteúdo, com contribuição intelectual e na aprovação da versão final do estudo.

CONFLICT OF INTERESTS

None to declare.

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