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SELF-PERCEPTION OF RISK FOR COVID-19: BEHAVIOR PATTERNS IN THE POPULATION OF SETTLERS IN TWO MUNICIPALITIES IN MATO GROSSO, BRAZIL

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ABSTRACT

The COVID-19 pandemic has recorded numerous cases and deaths since its beginning. The disease initially affected the upper social classes, but spread quickly among vulnerable populations, with a greater impact in areas with poor basic sanitation and access to health services. Studies show a higher incidence of hospitalizations and deaths among these groups due to differentiated exposure to the virus. This study aimed to evaluate the self-perception of risk related to COVID-19 in settled people and their associations, and to verify adherence to the protective measures adopted by this population to mitigate the risks of COVID-19 infection, in the municipalities of Sinop and Juara in Mato Grosso. 101 residents of settlements were interviewed using the COVID-19 Social Thermometer instrument. The data were tabulated in Microsoft Office Excel 2010 spreadsheets and imported for analysis using SPSS version 22 for descriptive analysis and RStudio version 4.1.1 for binary logistic regression. It was possible to observe that the interviewed population had good adherence to protective measures, including vaccination. It was also possible to observe which portions of this population have a high self-perception of risk of developing severe disease in case of being affected by COVID-19, where most of the characteristics are related to issues of social vulnerability.

Keywords: Social vulnerability. Risk. Self-perception.

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INTRODUCTION

COVID-19 is a respiratory disease caused by the SARS-CoV-2 coronavirus, which can range from asymptomatic to severe complications, and can lead to death. The United Nations (UN) declared the disease a pandemic in March 2020 and, in the same month, its community transmission was announced in Brazil. The spread of the virus occurs through respiratory secretions, which makes hygiene and social distancing measures essential for prevention and control (LIMA *et al*., 2020; BIRTH; ADAM; OLIVEIRA SILVA, 2020; BRAZIL, 2021; MOREIRA, 2021).

According to data from the Unified Health System, in Brazil, as of November 10, 2023, 37,994,356 confirmed cases of the disease and a total of 706,986 deaths from COVID-19 were reported (DATA SUS, 2023). Among this total, 896,111 cases of the disease and 15,453 deaths were recorded in the state of Mato Grosso. In Sinop, a municipality in the northern region of Mato Grosso, 41,271 cases of the disease and 514 deaths were registered. In Juara, a municipality in the northwest region of the state of Mato Grosso, 7,627 confirmed cases of the disease and 107 deaths were recorded (SECRETARIA DE ESTADO DE SAÚDE DE MATO GROSSO, 2023).

In Brazil, at first, the spread of the disease occurred among the highest social classes, but quickly reached the population in situations of social vulnerability, most of whom live in places with precarious conditions of basic sanitation and access to health services (CHIORO *et al*., 2020). Studies have shown a discrepancy in the way the pandemic has affected people, showing a higher number of hospitalizations and deaths among those in situations of social vulnerability, due to different levels of exposure to the virus (PASSOS *et al*., 2021; SATHLER; LEIVA, 2022).

In addition to the health impacts, the containment measures adopted by governments, such as social distancing and the closure of non-essential businesses and services, have generated significant socioeconomic impacts, such as reduced economic activity, a drop in employment, reduced income and demand, increased poverty, inequality, food insecurity, and social exclusion. The pandemic has especially affected the most vulnerable populations, in addition to having negative effects on financial markets. Recent studies indicate that groups such as the elderly, people with chronic diseases, residents of favelas, peripheries, and informal workers were more affected by the pandemic and faced greater challenges to face it (AQUINO *et al*., 2020).

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In addition, a study carried out in Rio de Janeiro showed a higher rate of fatal cases in subnormal agglomerations (favelas), higher cumulative incidence rates, mortality in poorer neighborhoods and with a larger number of inhabitants (MARTINS *et al*., 2022). A study carried out in Bahia reports the same discrepancy in the behavior of the pandemic, which highlights the disproportionate impact of the pandemic on socially disadvantaged population groups (DE SOUZA; CARMO; MACHADO, 2020).

In the State of Mato Grosso there are about 22,429 subnormal agglomerations (IBGE, 2020). In addition, data from INTERMAT (Land Institute of Mato Grosso) showed that, in 2018, there were 125 rural settlements in the state, in which about 10 thousand families were approved. Thus, it is clear that the settlements are important places of study in this state.

However, there is a lack of studies that evaluate the consequences of the pandemic period in this population, making the state an important niche for studies that aim to assess the behavior and risk patterns of COVID-19 in Mato Grosso settlements. Thus, the relevance of this study lies in the acquisition of new knowledge about the outcomes of the pandemic in the population living in settlements, seeking information that helps in the elaboration and implementation of more effective measures to control COVID-19 in this population.

Thus, the objective of this study was to evaluate the self-perception of risk related to COVID-19 among settled people and their associations, and to verify adherence to the protective measures adopted by this population to mitigate the risks of being affected by COVID-19.

METHODOLOGY

TYPE OF STUDY

This is a descriptive, analytical, cross-sectional, quantitative study. (FRONTEIRA, 2013).

PLACE OF STUDY

The research was developed in two municipalities located in the north and northwest of the State of Mato Grosso; Sinop and Juara. The municipality of Sinop is located in the north of the state, its territorial extension is 3,990.870 km² and its population is 196,067 inhabitants, with a demographic density of 49.13 inhabitants/km2, with a Municipal Human

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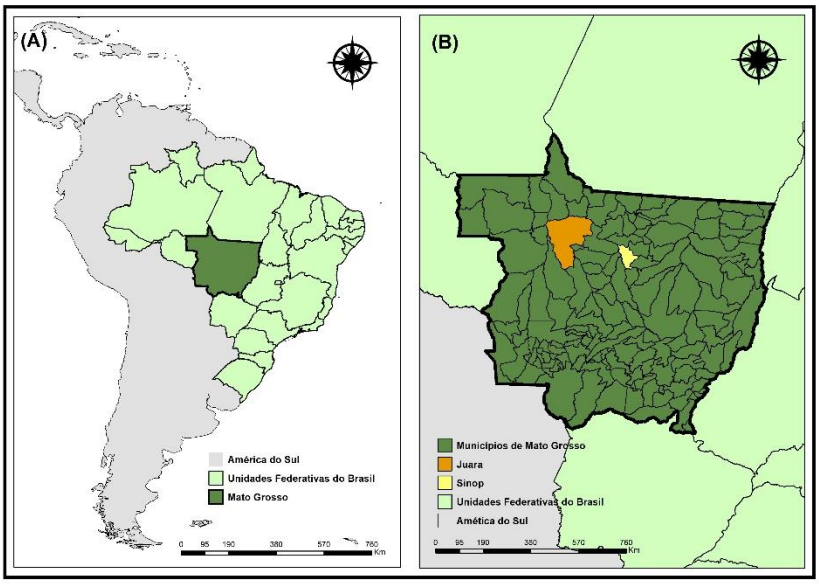
Development Index (MHDI) of 0.754 (IBGE, 2022). The city's economy is based on agriculture, livestock, logging, and human services such as health care and education. It is located in a geographical transition zone between the Amazon rainforest and the Cerrado. The municipality of Juara is located in the northwest of the state, its territorial extension is 22,632.713 km², with a population of 34,906 inhabitants and a demographic density of 1.54 inhabitants/km2 and its MHDI is 0.682 (IBGE, 2022). Located in the Amazon biome, the city's economy is based on timber extraction, livestock and agriculture. Figure 1 shows the map of the location of the municipalities.

Figure 1: A) Map of South America, showing Brazil and the State of Mato Grosso. B) Map of the State of Mato Grosso showing the municipalities of Sinop (yellow) and Juara (orange).



Source: prepared by the author, 2023.

In the municipality of Sinop, the Gleba Mercedes V Rural Settlement and the São Cristóvão Leisure Farms Urban Settlement were visited. In the municipality of Juara, three rural settlements were visited: Água Boa Community, Casulo Project and Barbosa Community. Figure 2 shows the map of each municipality and the points where data were collected.

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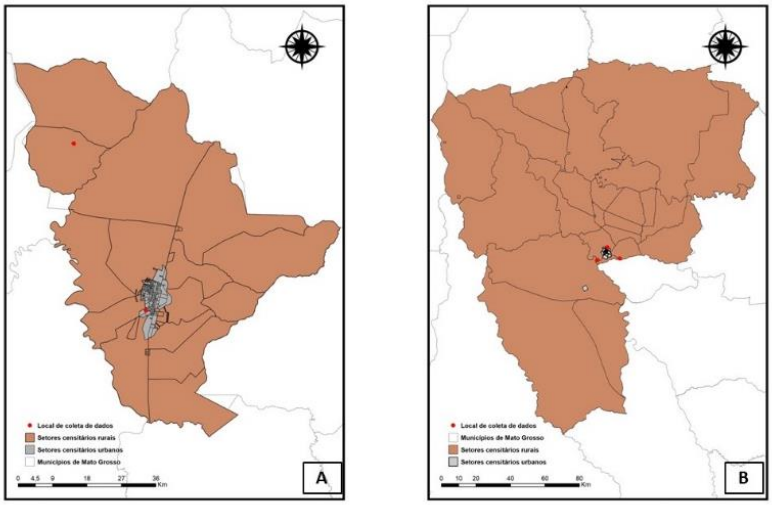
Figure 1: A) Map of the municipality of Sinop with marking of the data collection points. B) Map of the municipality of Juara with marking of the data collection points.



Source: prepared by the author, 2023.

POPULATION AND DATA COLLECTION

Data collection took place from September 2022 to April 2023. A total of 101 interviews were conducted with residents of rural and urban settlements in the municipalities of Sinop and Juara – MT. The calculation of the sample size (n) was based on the formula proposed by Medronho *et al.*, 2007:

$$n = Z^2 \frac{\alpha}{2} \frac{P(1-P)}{\varepsilon^2}$$

The number of 10 thousand settled families (considering one member per family) counted by INTERMAT in 2018, and considering an error of 10%, was used as the expected population. Therefore, the sample size was 96 participants. Only people over 18 years of age who had been in settlements for at least six months were included. Data collection was carried out through interviews conducted by a previously trained team, approaching people in their homes, without prior scheduling.

For data collection, the instrument "COVID-19 Social Thermometer – Social Opinion" was used. This instrument was developed and validated by researchers from the National School of Public Health - Portugal (ENSPUNL) in Portugal and published in studies that evaluated risk perception (LAIRES *et al.*, 2021), behavior patterns (PEDRO *et al.*, 2020) and adherence to health measures to protect the Portuguese population

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(SOARES *et al*., 2021); and at the national level, a study was published to assess the level of trust in health services.

STATISTICAL ANALYSIS

To assess adherence to protective measures, descriptive analyses were used in SPSS software version 22. To identify the factors associated with the outcomes of interest, binary logistic regression (RStudio software version 4.1.1) was used based on the variables present in the "*COVID-19 Social Thermometer: Social Opinion"* instrument.

The following were considered as independent variables: age (18 to 40 years, more than 41 years); sex/gender; color/race (white, black/brown); marital status; current occupation; rural or urban area; residence; schooling; family income; receipt of government aid; use of health insurance or health plan; use of SUS; presence of a health center in the community or neighborhood; presence of chronic disease; living with people aged 60 or over; living with person(s) who have chronic disease(s); use of protective mask; support from their family members, acquaintances or community to buy food, medicine (support network); temporary loss of income due to the COVID-19 pandemic; financial difficulty in acquiring food compared to the period before COVID-19; predominant feelings most of the time (more agitated, anxious, or tense; more irritable; sadder, more discouraged, or crying more easily; more lonely; thinking about COVID-19; more difficulty sleeping); increased or initiated use of medications due to COVID-19; increased or initiated use of tranquilizers or antidepressants due to the COVID-19 pandemic; mental health status; need for medical care not related to COVID-19 (dental consultation, outpatient care, UPA/urgency and emergency care; care by specialty); is part of a group of workers exposed to the risk of contracting COVID-19; lives/lives with someone who is part of a group of workers exposed to the risk of contracting COVID-19; professional activity with public contact and confirmed diagnosis of COVID-19.

The dependent variable was considered: self-perception of risk in case of COVID-19 involvement, with its response alternatives (no risk; low risk; moderate risk; high risk; I don't know) recoded in dichotomous responses (0 = no risk/low or moderate risk and 1 = high risk).

An exploratory analysis was conducted regarding the collinearity between the independent variables tested by means of the Variance Inflation Factor (VIF), and those with values greater than 10 were removed from the statistical modeling (13 variables had a

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VIF greater than 10). The Backward step-by-step selection method was used to build the model, starting with a complete model (with all the variables) and removing the variables one at a time to check the behavior of the model. The best model was selected based on the lowest Akaike *Information Criterion* (AIC) value. It is also noteworthy that, for the final model, the *Odds Ratio* (OR) was calculated with their respective 95% Confidence Intervals (95%CI).

After exhausting all possibilities of analysis and choice of the final model, the Hosmer-Lemeshow, likelihood ratio, CoxSnell, Nagelkerke and McFadden tests were performed to validate the final model. In addition, the predictive capacity and accuracy of the model were verified based on the area under the ROC (*Receiver Operating Characteristic*) curve and their respective 95% CI values. The analysis referring to binary logistic regression and the validation tests were performed using the RStudio software, version 4.1.1.

ETHICAL ASPECTS

The research was approved by the Research Ethics Committee (REC) of the University of São Paulo at Ribeirão Preto College of Nursing (EERP), CAAE: 57933622.4.1001.5393. The entire conduct of the investigation is in line with Resolution No. 466, of December 12, 2012 of the National Health Council, taking into account the pertinent ethical and scientific foundations.

All participants signed the Informed Consent Form, available on the first page of the electronic questionnaire. The confidentiality of the information and the data of the participants are ensured and will be used only for academic and research purposes.

RESULTS

Regarding adherence to protective measures against COVID-19, the most adopted by respondents were: i) Wearing a mask covering nose and mouth, 90.1% adherence; ii) Washing hands with soap and water or using alcohol (70%) with 84.2% adherence; iii) Leaving home only in cases of need 76.2% adherence. Only 5.9% of respondents reported not having adopted any protective recommendation. Table 1 presents the protective measures listed at the time of the interview and their respective percentages of adherence.

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Table 1: Adherence to protective measures against COVID-19 by residents of settlements in the municipalities of Sinop and Juara in Mato Grosso. Sinop-MT, May/2023.

Variable	Frequency	Percentage
Leave home only in cases of necessity		
No	24	23,8
Yes	77	76,2
Avoid touching objects or surfaces that others have touched		
No	59	58,4
Yes	42	41,6
Wash your hands regularly with soap and water or 70% alcohol		
No	16	15,8
Yes	85	84,2
Wear a mask that covers your mouth and nose whenever you leave the house		
No	10	9,9
Yes	91	90,1
Cover your mouth and nose when you sneeze or cough		
No	58	57,4
Yes	43	42,6
Avoid close contact with anyone with fever, cough, and/or difficulty breathing		
No	54	53,5
Yes	47	46,5
Avoid touching your face with your hands		
No	63	62,4
Yes	38	37,6
Avoid sharing personal items or food you've touched		
No	56	55,4
Yes	45	44,6
Cleaning shopping or objects that come from outside the home		
No	47	46,5
Yes	54	53,5
Avoid closed spaces with a concentration of people		
No	44	43,6
Yes	57	56,4
I didn't adopt any recommendations		
No	95	94,1
Yes	6	5,9
Total Interviewees		101

Source: prepared by the author, 2023.

With regard to vaccination, most respondents were vaccinated against COVID-19 (88.1%). In addition, 70.3% of survey participants claimed to be confident in the effectiveness of the COVID-19 vaccine, and the majority (59.4%) believed that the COVID-19 vaccine should be mandatory. Also, most participants agreed with the mandatory nature

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of the vaccine passport (57.4%). However, when asked about firing workers who refused to take the COVID-19 vaccine, the majority were against it (60.4%).

Regarding self-perception of risk, when respondents were asked what risk they believed they had to develop severe disease or complications if they were infected with COVID-19, 26.7% believed they had a low risk (Table 2).

Table 2: Results of the descriptive analysis on self-perception of risk of developing severe disease or complication in case of COVID-19 involvement in residents of settlements in the cities of Sinop and Juara in Mato Grosso. Sinop-MT, May/2023.

How do you assess your risk of developing severe illness or complications if you become infected with COVID-19?	Frequency	Percentage
I don't know	7	6,9
Low risk	27	26,7
High risk	25	24,8
Moderate risk	23	22,8
No risk	14	13,9
Total number of interviewees	101	

Source: prepared by the author, 2023.

Still on self-perception of risk, a binary logistic regression was performed in order to verify which characteristics of the interviewees were more likely to believe they were at high risk of developing severe disease or complications from COVID-19. The results were obtained from the following variables: formal employment; monthly income of less than one minimum wage; feeling more agitated, anxious or tense; feeling more irritable; having increased or started using medications because of COVID-19; have needed non-COVID-19 care (care by specialty). The values of *Oddis Ratio*, confidence interval and P value are available in Table 3. Regarding the model validation tests, the CoxSnell test was 0.35, Nargelkerke was 0.52 and the McFadden was 0.38 and the result of the ROC curve was 0.89.

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Table 3: Binary logistic regression analysis on self-perception of risk and associated risk factors on the development of severe disease or complication in case of COVID-19 involvement in residents of settlements in the cities of Sinop and Juara in Mato Grosso/ May 2023.

Variables	OR	IC (95%)	P-value
Married/common-law partnership	9,29	0,99-1,77	0,08
Formal Employment	7,57	1,38-5,19	0,02*
Rented House	2,41	0,24-2,04	0,41
Income >1 minimum wage	2,22	2,16-3,06	0,01*
Have a support network	5,71	0,89-6,16	0,09
Feeling more agitated, anxious, or tense	9,14	0,007-6,97	0,03*
Feeling more irritable	3,59	2,00-1,23	0,02*
Feeling sadder, discouraged, crying easily	1,03	0,48-3,62	0,15
Feeling lonelier	1,74	0,009-1,84	0,17
Have increased or started taking medication because of COVID-19	2,78	3,77-3,06	0,002*
Have required non-COVID-19 care (dental visit)	1,30	NA-2.98	0,99
Have required non-COVID-19 care (outpatient visit)	2,51	0,02-1,46	0,16
Have needed non-COVID-19 related (UPA, urgency/emergency)	1,16	0,002-1,71	0,18
Have needed non-COVID-19 related (care by specialty)	8,01	1,31-6,84	0,03*
Be part of a group of workers who are at risk of contracting COVID-19	1,72	0,017-1,54	0,09
Living/living with someone who is part of a group of workers who are exposed to the risk of contracting COVID-19	1,87	0,017-1,54	0,13

OR: Oddis Ratio; CI: Confidence Interval; * P value below 0.05. Source: prepared by the author, 2023.

DISCUSSION

The findings of this study demonstrated that the interviewed population showed good adherence to protective measures that interfere in the fight against and prevention of COVID-19 (Table 1), corroborating an *online survey* conducted in Brazil, in which 74.2% of the participants claimed to adhere intensely to the protective measures (SZWARCWALD, 2020). This same study showed that the Central-West region was the one with the lowest rate of adherence to protection measures (12.3%).

In the present study, the majority of the population was 60 years of age or older (30.7%). In a study carried out with the elderly, *online* (snowball data collection), it was observed that 56.9% of the interviewees adhered intensely to protective measures against COVID-19 (ROMERO *et al.*, 2021). The fact that the majority of the interviewed population is 60 years of age or older may explain the difference between adherence to the protection measures of the people interviewed and the data on adherence in the Midwest region.

Regarding vaccination against COVID-19, 88.1% of the settlers said they had been vaccinated, while 11.9% had not been vaccinated. In the study by Santos (2022), most respondents were also vaccinated (93.7%). In addition, 70.3% of the people interviewed in

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the settlements of the municipalities of Sinop and Juara said they trusted the effectiveness of the vaccine.

In the work carried out by Araújo *et al*. (2021), observed that 79.5% of the participants were in favor of vaccination against COVID-19 and that they were more likely to be health professionals, to have been tested for COVID-19, to seek information about the vaccine.

When questioning participants about their self-perception of the risk of developing serious complications if they were infected with COVID-19, most respondents (26.7%) believed that they would have only mild symptoms. This data corroborates the work carried out by Moura (2022) in Brazil, in which 72.8% of participants judged that they did not develop severe cases of the disease.

By analyzing the data from the present study, it was possible to observe that people with a self-perception of high risk of developing severe disease or complications if infected with COVID-19 are more likely to have a formal occupation, have an income of less than 1 minimum wage, feel more agitated, anxious or tense, feel more irritable, have increased or started using medications during the pandemic and have needed specialized care during this period.

It is known that the perception of risk is influenced by individual experiences and the social environment in which the individual is inserted (MOURA, 2022). Among these characteristics, the one that stood out the most was feeling more agitated, anxious or tense 9,14 more likely to report self-perception of high risk of developing severe disease or complications if infected with COVID-19 (95%CI = 0.007-6.97), in general, adults tend to be more anxious about the possibility of being affected by COVID-19, due to the understanding of the impacts that the disease can bring to health, family, in addition to the financial impacts (MONIZ *et al*., 2022). In addition, the characteristic of feeling more irritable during the COVID-19 pandemic was associated with perceiving the risk of severe involvement or complications from the disease.

Also, in a study conducted online in Brazil, researchers evaluated the effect of social isolation on the emotional and eating aspects of participants, a positive association was observed between complying with social isolation and increased anxiety and stress (DE OLIVEIRA *et al*., 2022).

Regarding the variable "income below one minimum wage" (OR=2.22; CI=2.16-3.06), it is known that the COVID-19 pandemic has brought several economic damages to

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the population, such as: increased unemployment, increased informal jobs, and decreased income (DE ARAÚJO; BRANDÃO; GRANDA, 2021). This fact increases the perception of risk of becoming seriously ill with COVID-19 due to insecurities regarding access to medical treatments and acquisition of medicines.

When it comes to the variable "formal employment" (OR=7.57; CI=1.38-5.19), the higher perception of risk may be linked to the fact that in Mato Grosso there was a low adherence to social isolation, causing workers to continue to be exposed to the risk of contagion by the disease, increasing the perception of risk of falling ill (RODRIGUES; SES, 2021).

As for the variable "having started or increased the use of medications because of COVID-19" (OR=2.78, CI=0.007-6.97), during the pandemic, misinformation was disseminated about medications that would help prevent the disease (Azithromycin, Chloroquine, Hydroxycloquine, and Ivermectin). This fact encouraged people most afflicted with the risk of getting sick to practice self-medication, a study carried out in Bahia showed an increase in the dispensation of 62.2% in the dispensation of these medications (MATOS *et al*., 2022).

Regarding the variable "having needed specialized care not related to COVID-19" (OR=8.01; CI= 1.31-6.84), the fact of going to the hospital during the COVID-19 pandemic caused anguish in many people, due to the large number of sick people in hospitals, which makes hospitals places where the disease is easily spread, and specialized care may be associated with some comorbidity, another factor that would possibly aggravate the condition in case of being affected by the disease.

Among the limitations of the study, the difficulty of the population in accepting to participate in the interview stands out, since during the period of data collection the country faced many political tensions, causing the population to associate the interviewers with political opinion surveys. Also, in some collections, difficulty in accessing the settlements was faced, for example, roads with quagmires.

CONCLUSION

It was observed that the population of settlers in the municipalities of Sinop and Juara in Mato Grosso had a good adherence to protective measures, including vaccination. In addition, it was possible to observe which portions of this population have a high self-

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perception of developing severe disease in case of being affected by COVID-19, where most of the characteristics are related to issues of social vulnerability.

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