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COVID-19 DISSEMINATION: LATE CONTACT IN LOCAL CENTERS IN SOUTHEASTERN TOCANTINS

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Abstract

In 2020, the world was overwhelmed by COVID-19, which produced a severe pathology with high mortality rates. National policies to control the pandemic clashed with Brazil's precarious health structure. While the Brazilian state of Tocantins, along with the rest of the world, saw its main cities suffer from high contamination rates, certain other localities remained free from these dynamics for a much longer period. Thus, this study set out to investigate five municipalities, all located in the southeastern corner of the state, and which were the last to be affected by the pandemic. The aim was to reflect upon the factors that delayed the arrival of the virus. A descriptive analysis was conducted, with a bibliographical review and the use of secondary data from theInstituto Brasileiro de Geografia e Estatística (IBGE) database, the State Department of Planning and Budget, epidemiological bulletins from the Department of Health, indices from the agribusiness production chain and the industrial profile, produced by the Tocantins State Federation of Industries. It was concluded that certain factors contributed to this process, such as a low level of influence from urban centers, a lack of major highways and the low purchasing power of the population, which avoided greater flows resulting from the low economic attractiveness.

Keywords

COVID-19; Tocantins; Southeast of Tocantins; Local centers; Municipal outbreak.

DISSEMINAÇÃO DA COVID-19: CONTÁGIO TARDIO EM CENTROS LOCAIS NO SUDESTE DO TOCANTINS

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Resumo

O mundo foi assolado em 2020 pela Covid-19, geradora de patologia grave com alta mortalidade. As políticas nacionais de controle da pandemia esbarraram na precária estrutura sanitária do país. O Tocantins, acompanhando o restante do mundo, viu suas principais cidades sofrerem com índices de contaminação; contudo, determinadas localidades se viram livres dessa dinâmica por um período maior. É sobre o estudo de cinco municípios, localizados no sudeste do estado, os últimos a serem atingidas pela pandemia, que esse trabalho versa, com o objetivo de refletir sobre fatores que retardaram a chegada do vírus. Foi realizada pesquisa descritivo-analítica, com revisão bibliográfica e o uso de dados secundários em bases do Instituto Brasileiro de Geografia e Estatística (IBGE), da Secretaria do Planejamento e Orçamento do estado, bem como de boletins epidemiológicos da Secretaria da Saúde, índices da cadeia produtiva do agronegócio e perfil da indústria, produzidos pela Federação das Indústrias do Estado do Tocantins. Concluiu-se que alguns fatores contribuíram para esse processo, como a baixa influência de centros urbanos, a não incidência de grandes rodovias e o baixo poder aquisitivo da população, o que evitou maiores fluxos resultantes da baixa atratividade econômica.

Palavras-chave

Covid-19; Tocantins; Sudeste do Tocantins; Centros Locais; Surto Municipalista.

THE DISSEMINATION OF COVID-19: DELAYED CONTAGION IN LOCAL CENTERS IN SOUTHEASTERN TOCANTINS[1]

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Introduction

The year 2020 was marked by the COVID-19 pandemic, and its rapid spread across the globe. The lack of knowledge regarding the mechanisms of this disease and its forms of treatment was further aggravated in Brazil due to the enormous social inequalities and, for a substantial portion of the population, a lack of basic survival infrastructure, such as basic sanitation and housing (WERNECK; CARVALHO, 2020). The FIOCRUZ[2] technical report, entitled *A gestão de risco e governança na pandemia por COVID-19 no Brasil* [Risk management and governance in the COVID-19 pandemic in Brazil], demonstrates that, a few months after the virus arrived in Brazil, the political and social measures instituted in an attempt to reduce uncertainties materialized in a tangle of circumstances that compromised both the control and reduction of the disease, mainly due to the lack of coherence within the federal government, "which eroded trust and increased the risks and impacts of the pandemic"[3] (FREITAS et al., 2020, p. 7).

COVID-19 has affected populations all over the world, some of whom have been protected by better conditions of sanitation, healthcare provision and

1. This article is an extended, modified version of a study presented at the V Seminar on Regional Development, State and Society (Sedres), from March 24 to 26, 2021, in Taubaté (SP).

2. The Oswaldo Cruz Foundation, which aims: to promote health and social development, to generate and disseminate scientific and technological knowledge, and to be an agent of citizenship.

3. This and all non-English citations hereafter have been translated by the authors.

economic status; others, however, are more vulnerable. Researchers dedicated to urban and regional studies have proposed approaches related to the possibility of conducting an epistemological review of the area due to the unfolding events caused by the pandemic and others referred to in cross-sections of territorial specificities in countries widely affected by the spread of COVID, such as the United States, Italy and India. The variables that have structured these studies are related to the ways in which policies, of a national scale, have been received in the various locations in which their effects are felt, resulting in disparate responses in the fight against the spread of the virus. The characteristics of specific spatial cross-sections linked to demography, which take into account the different age groups, employment rates, unemployment and income, are factors that, together with georeferencing tools, enable the flows and forecasts of the dissemination of the pandemic to be demonstrated (FERRARESI et al., 2021; FEACHEM; SANDERS; BARKER, 2021; HAFFAJE; MELLO, 2020; KUMAR; SAHOO; BHARTI; WALKER, 2020). This ensemble of possibilities observed on a global scale enables the formulation of questions referring to the episteme of the area. Thus, Martin (2021, p. 151) revealed the need to rethink regional studies, taking into account the possibilities of rebuilding economies after the crisis had set in. In view of this, the author asks: "Do we need to (re)examine what we are doing in regional studies, why are we doing it, and for whom?". Regional disparities, the flows of people and goods, health care structures, the various modes of transport and the interaction between urban spaces make up the list of factors seen as central to understanding the spread of the pandemic.

The regional focus contained within studies concerning the dissemination of COVID-19 encounters interpretive parallels in studies on the spread of diseases. Thus, Albuquerque and Ribeiro (2020, p. 2) state that it is "important to reflect on how the socio-spatial dimension of inequalities both conditions and is conditioned by the COVID-19 pandemic throughout Brazil". Mobility and the relations of social proximity are some of the characteristics that make up current contemporary societies, significantly circumscribed to urban spaces. Such characteristics are defended by Sposito and Guimarães (2020) in order to support the proposition that the spread of COVID-19 refers to the urban network and its respective social interactions.

The dynamics of the spread of disease in both space and time may be understood based on a concatenation of factors such as genetics, demography, and sociocultural and environmental variables, which are geographically superimposed, according to the proposals of Werneck and Struchiner (1997). The discussion on place as an explanatory vector for epidemiological studies was

addressed by Czeresnia and Ribeiro (1997, p. 596), who stated that "the elements of space incorporated in the epidemiological explanation are integrated with those that explain how the disease occurs in the body". Catão (2016) and Santana (2018) based their work on spatial diffusion in order to seek similarities between the movement of materials and goods and the dengue and chikungunya epidemics.

While the pandemic afflicts everyone, the established inequalities determine the fate of one part of the population. Furthermore, it also enables discussion on health justice, based on Amartya Sen's (2010) axiom on equity. Although Brazil has an integrated health system, known as SUS, which was a constitutional advance, we nonetheless are dealing with a lack of access to supplies and services. In 2018, Matos published an editorial entitled "The next pandemic: are we prepared?". In his text, he offers a vision of what occurred during the Spanish flu crisis, demonstrating that there had been no preparation in three essential points of confrontation: i) improvements in health surveillance; ii) clinical research networks for drugs and vaccines and training researchers and, lastly, iii) a laboratory structure for producing raw materials and biological supplies. The FIOCRUZ report (FREITAS et al., 2020) demonstrated that we have been unable to reach a level of governance or to combat the risks, which is capable of dealing with the situation, which is why the question posed by Matos (2018) is answered in the practical evidence of the struggle against COVID-19 in Brazil.

With all the problems imposed by the coronavirus and by those inherited through social inequalities, some specificities become relevant for social analysis., Since the pandemic began, the state of Tocantins has suffered from the dissemination of the virus: in Araguaína, located to the north, and in Palmas, the state capital, the growth of cases has been proportional to that of the country and, at times, above average. However, what drew our attention, and constitutes the focus of this article, is the fact that it took more than a hundred days for certain cities to become affected by the pandemic, counting from the first official case registered in the state capital. In specific terms, this paper studies five cities in the state of Tocantins, all located in the southeastern region of the state, and aims to reflect upon factors that delayed the arrival of the virus in these locations and its consequences.

By means of a descriptive analysis, we have proposed a number of explanations as to why contamination was delayed in certain cities. To this end, we undertook a bibliographical review and used secondary data available in the Brazilian Institute of Geography and Statistics (IBGE) database, the Tocantins State Department of Planning and Budget (SEPLAN-TO), in addition to epidemiological bulletins from the state Department of Health (SESAU-TO), and indexes related to the agribusiness production chain and industrial profile produced by the Tocantins State Federation of Industries (FIETO).

The presentation of the text has been structured as follows: following this introduction, we offer an understanding on the dynamics of how the virus disseminated, starting from a large metropolis such as São Paulo, until reaching the main cities of Tocantins. In the second part, we discuss the manner in which the outbreak took place on a municipal level and how it affected the constitution of small towns and the southeastern region of Tocantins, with a view to understanding why it took longer for some municipalities to become affected by the pandemic. In the third part, the studied localities are characterized, in order to demonstrate their specificities in terms of health and social inequities. This comprehensive analysis has been threaded together throughout all the parts of the text, which closes with the final considerations.

1. COVID-19: From the metropolis to the interior of Legal Amazon[4]

According to the Ministry of Health, the first officially confirmed case of COVID-19 in Brazil was recorded on February 26, 2020, in São Paulo. In Tocantins, the first case was registered on March 18, 2020, in the state capital, Palmas. Nine days later, Araguaína, the second largest city in the state, and located 380 km north of the capital, announced the first case recorded in the interior of the state.

On observing the differences in parameters used by both the World Bank and the United Nations (UN), we consider the ranking published by the UN in 2010, in which São Paulo ranks as the fifth most populous metropolitan region in the world, with 19.5 million inhabitants. Therefore, it took thirty days for COVID-19 to confirm its cycle of contagion on a trajectory of displacement between one of the most populous regions in the world and Araguaína, in the interior of Legal Amazon, which in 2020 had an estimated population of 183,381.

In view of the temporal chain exposed until July 2020, just ten municipalities reported no confirmed cases in Tocantins. We then certified the following timeline: it was necessary for 21 days to elapse for the dissemination to travel the distance between São Paulo and the city of Palmas, and exactly 30 days for it to reach the first city in the interior of Tocantins. However, 109 days after the first case was notified outside the state capital, a group of ten towns had still not presented one single case of contamination. Of those municipalities in Tocantins with no record of COVID-19 cases on that date, five were located in the southeastern region of the state: Combinado, with an estimated population of 4,861 for 2020; Conceição

4. Legal Amazon is an area formed by the Brazilian states of Acre, Amapá, Amazonas, Pará, Rondônia, Roraima, Tocantins and Mato Grosso, and also by municipalities in the state of Maranhão. It has an approximate area of 5 217 423 km^2, which corresponds to about 61% of the Brazilian territory (IBGE, 2020).

do Tocantins, with 4,087; Laundress; with 1954; Novo Jardim, with 2,745; and Porto Alegre do Tocantins, with 3,170 (IBGE, 2020). This characteristic leads us to our working research question: which variables affected these towns in order to slow down the rate of contagion observed among the mentioned municipalities, since 50% of them are located within the same region? As a working hypothesis, we adopted the relationship established between the Brazilian urban network, dynamized by the so-called hierarchy of cities.

It has been taken as a "fact" that the questions in this article have been triggered by the dissemination dynamics of COVID, as proposed by Durkheim (2007) – i.e., that which acts on individuals based on three vectors: generality, coercivity and externality. Thus, in accordance with Vares (2016, p. 114):

> [...] dealing with facts of a certain order as things does not signify classifying them into this or that category of what is real, but rather employing a certain mental attitude toward them in order to understand their essential properties, their most unknown causes, in short, everything that we generally ignore when, only through introspection, we seek to understand them.

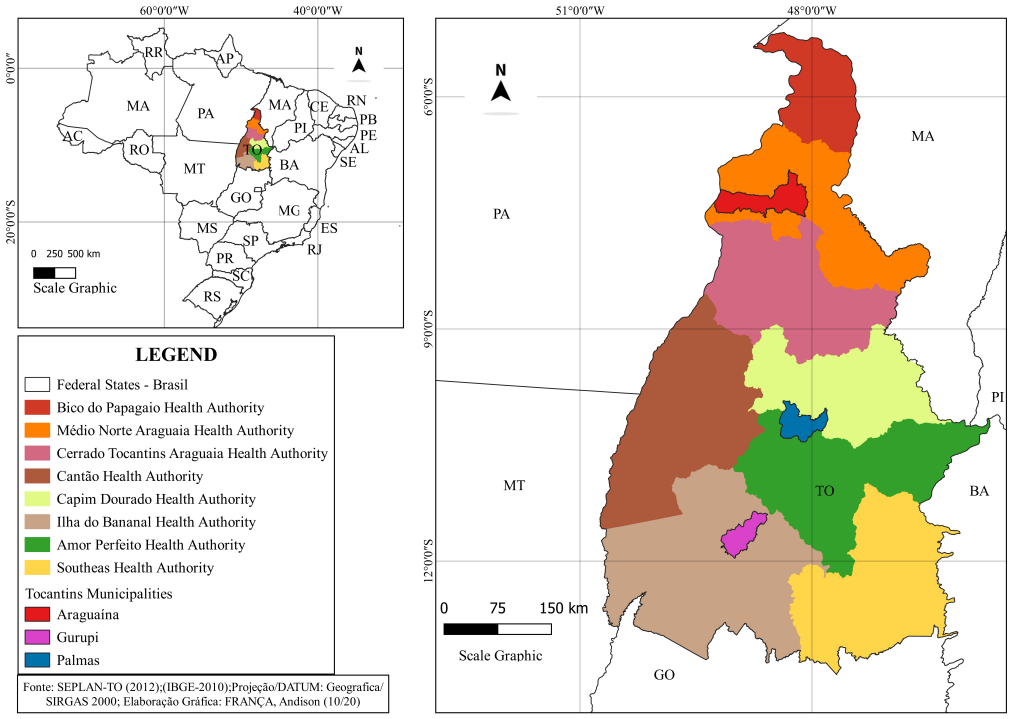
Therefore, it should be emphasized that, for other Brazilian regions and contexts, a hypothesis similar to that which we have proposed for the investigation has also been considered by researchers in the search for essential evidence to understand the dissemination of COVID-19. Thus, there has been some outstanding work published by the Observatório do Litoral Paranaense [the Coastal Observatory of the State of Paraná] at the Universidade Federal do Paraná (UFPR) and by Radar COVID-19 at the Universidade Estadual Paulista (UNESP) in Presidente Prudente. In the specific case of Tocantins, the cartographic production of the Geoprocessing Laboratory of the Universidade Federal do Tocantins/Porto Nacional demonstrates the relationship between cities and towns as one of the vectors of dissemination.[5]

The hierarchical relationships between Brazilian cities are part of a field of study in Brazil that takes its starting point from both the so-called Central Place Theory (CHRISTALLER, 1966) and from its critique, formulated by Milton Santos (2014). Thus, work has been developed that demonstrates the various state policies for urban and regional planning, as well as the specificities of the typologies of Brazilian urban centers in their metropolitan, medium and small dimensions.

5. These studies are available at the Observatório Socioespacial do COVID-19 [The Socio-spatial Observatory for COVID-19], in the state of Tocantins.

It should be noted that, at different moments, these discussions have provided support for regulating public policies in order to reference and delimit the areas of influence in Brazilian cities. Since the late 1970s, such discussions have been exemplified in the following work: Andrade and Lodder (1979), Motta (2001), Steinberger and Bruna (2001), Sposito (2010), Vieira *et al.* (2011) and Scherer and Amaral (2020).

In order to classify the group of municipalities selected for study, two spatial-normative references were taken: the *Regional Division of Brazil into immediate and intermediate geographic regions* (IBGE, 2017) and the *Decentralization of healthcare in the state of Tocantins* (SESAU-TO, 2015). Map 1 presents the location of the health authorities in Tocantins, highlighting the three most populous cities in the state: the capital Palmas, Araguaína to the north and Gurupi to the south.



Map 1. Tocantins, the health authorities and the three most populous cities
Source: SEPLAN-TO (2012).

It may be observed on the map that the Southeast health authority is situated at a distance from the three main highlighted urban centers. The distance from the municipalities that offer more services and a better infrastructure also represents a factor that may have influenced the delayed arrival of the virus in the studied locations.

2. Small cities, municipal outbreaks, local centers and the southeastern region of Tocantins

The demographic configuration of our sample enables us to visualize a particularity inherent to all of them: none of these towns has a population greater than 5 thousand (IBGE, 2020). The literature that problematizes small towns indicates that: i) based on population references, it is important not to make the mistake of standardizing urban structures with certain possible dynamics; ii) urban centers with low population concentrations, given their specificities, may behave like medium-sized towns, polarizing their surroundings due to the supply of services, job creation and other factors that stimulate local or regional economies. Thus, Veiga (2007), Fresca (2010), Fresca and Veiga (2011) and Moreira Júnior (2014) proposed that, with methodological and conceptual rigor, small towns and local towns should not be confused, thereby managing to avoid equating cities with different characteristics. These authors reaffirmed the need to contextualize the urban network that they integrate, demonstrating unique attributes and the presence of vectors of economic dynamism typical of metropolitan parameters. The synthesis of this interpretative perspective may be observed in Moreira Júnior (2014, p. 117): "[...] thus, it is not possible to generalize and assume the premise that all small cities have less expressive urban roles, predominantly political-administrative, with commercial and agrarian functions".

In order not to conduct an equivocal assessment of the delimited cities and, thus consequently weaken our interpretation of the reasons that led to a delayed dissemination of COVID-19 in the aforementioned locations, it is necessary to provide an answer to the following questions: observing the common characteristic, of populations with less than 5 thousand inhabitants, are there any particularities that may be capable of marking heterogeneity? As a result of the offer of products and services, would these places be able to dynamize their surroundings, and behave with the characteristics of polarizing cities? Or, on the other hand, would such cities be the affirmation of what the research The Areas of Influence of Cities 2018 (REGIC) (IBGE, 2020, p. 13) designates as local centers? In other words:

> [...] cities that exert influence restricted to their own territorial limits, and that are able to attract some resident population from other cities for specific topics, but that are not the main destination from any other City. [...] Simultaneously, Local Centers present a weak centrality in their business and public management activities, and generally have other higher hierarchical urban centers as a reference for the daily activities of the purchases and services of their population, as well as access to the activities of the public authorities and business dynamics.

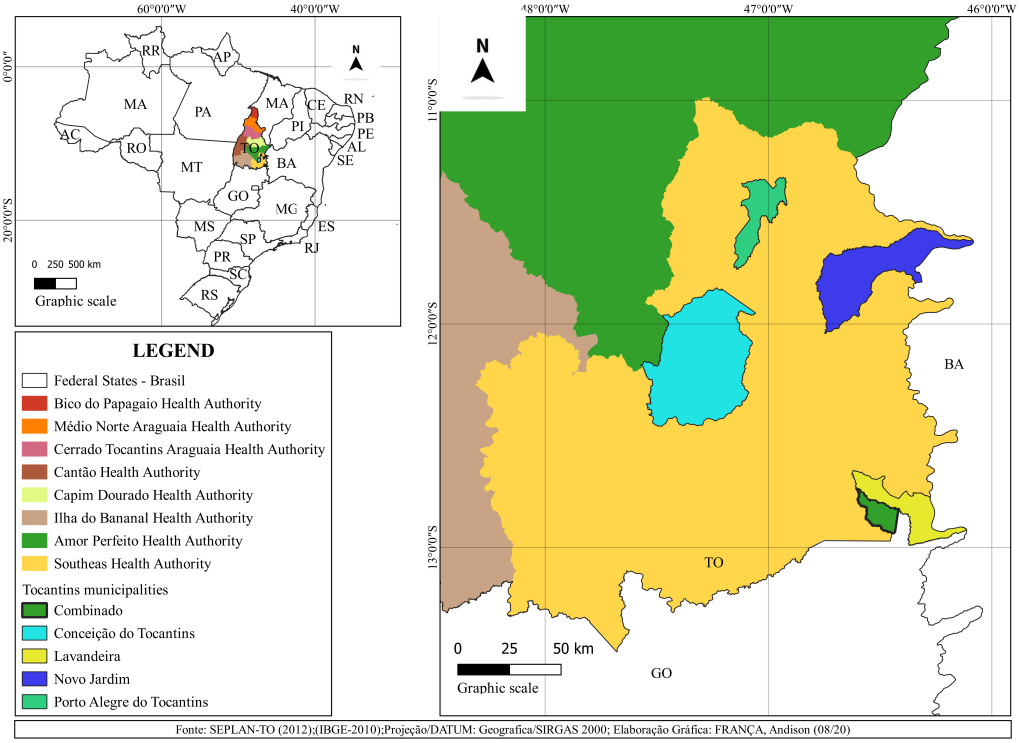
In order to affirm the nature of these cities and establish an explanatory link for the dynamics of delayed contamination, it is necessary to contextualize them.

Given the fact that the state of Tocantins is the most recently formed federative entity, created in 1988, it is necessary to insert it into what Tomio (2002), Oliveira (2007) and Wanderley (2008) observed to be a process of political decentralization in Brazil resulting from the 1988 Federal Constitution. The emancipation of new municipalities occurred significantly and the expressions "emancipationist outbreak" or "municipalist outbreak" are used to designate this movement. Between 1993 and 2001, the number of municipalities in Tocantins grew from 79 to 139.

It should be emphasized that, between 1988 and 2000, Tocantins was the Brazilian state that presented the highest average growth of municipalities: 2,217%. The level of growth becomes even more outstanding when the second and third places are considered, Amapá and Rondônia, with 220% and 189%, respectively (TOMIO, 2002). By way of comparison, the two lowest percentages were observed in Sergipe, with 1%, and in Amazonas, 5% (TOMIO, 2002). Another data is the fact that, of the 83 municipalities created in Tocantins, 62% corresponded to locations with less than 5 thousand inhabitants.

The selected municipalities were founded in the following years: Combinado in 1989, Conceição do Tocantins in 1963, Lavandeira in 1997, Novo Jardim in 1993 and Porto Alegre do Tocantins in 1989. It may be noted that, all except one, Conceição do Tocantins, correspond to the so-called emancipationist outbreak. However, with specific reference to the aspect of health, Oliveira (2007, p. 103), when studying the municipal dynamics in Brazil and the local provision of public health support policies, revealed: "[...] we propose that the institutional design of policies, by maintaining the universal characteristic of SUS, should expand transfers in a homogeneous manner, without focusing on the neediest municipalities and regions, and, therefore, failing to combat health inequalities [...]".

The emancipation of the municipalities, which occurred as a result of the 1988 Constitution, brought with it significant fragilities in terms of support for public health policies. At this point, it is necessary to demonstrate the location of the delimited cities and verify the scale of availability of this type of equipment in the mentioned municipalities. Map 2 presents five cities defined the southeastern health authority of Tocantins.



Map 2. Southeast Health Authority of Tocantins
Source: SEPLAN-TO (2012).

According to SEPLAN-TO (2017), within the five locations there is only one basic health unit and one health surveillance unit. For moderately complex procedures, the population needs to travel to other urban centers; the nearest location is the municipality of Dianópolis, which has a hospital. In cases that require ICU facilities, it is necessary to travel more than 300 km to the municipalities of Porto Nacional or Gurupi.

In our analysis, we have also resorted to two studies produced by the Postgraduate Program in Regional Development of the Universidade Federal do Tocantins/Palmas, for which the objective is to demonstrate the socioeconomic dynamics of the state through the study of its regional poles; the indices of the agribusiness production chain and the industrial profile produced by FIETO, as well as discussions linked to the Matopiba region (Cerrado areas present in the states of MAranhão, TOcantins, PIauí and BAhia), which are related to a certain territorial cross-section presented by the federal government as one of the world's last agricultural frontiers. In the first of these studies, Barbosa *et al.* (2019) proposed a regionalization for Tocantins unlike that conceived by the IBGE and based strictly on economic criteria. The starting point that was used was Christaller's Central Place Theory (1966), added to what these authors referred to as the Outsourcing Index (TI); this, in synthesis, is made up of the capacity of the centers to offer services

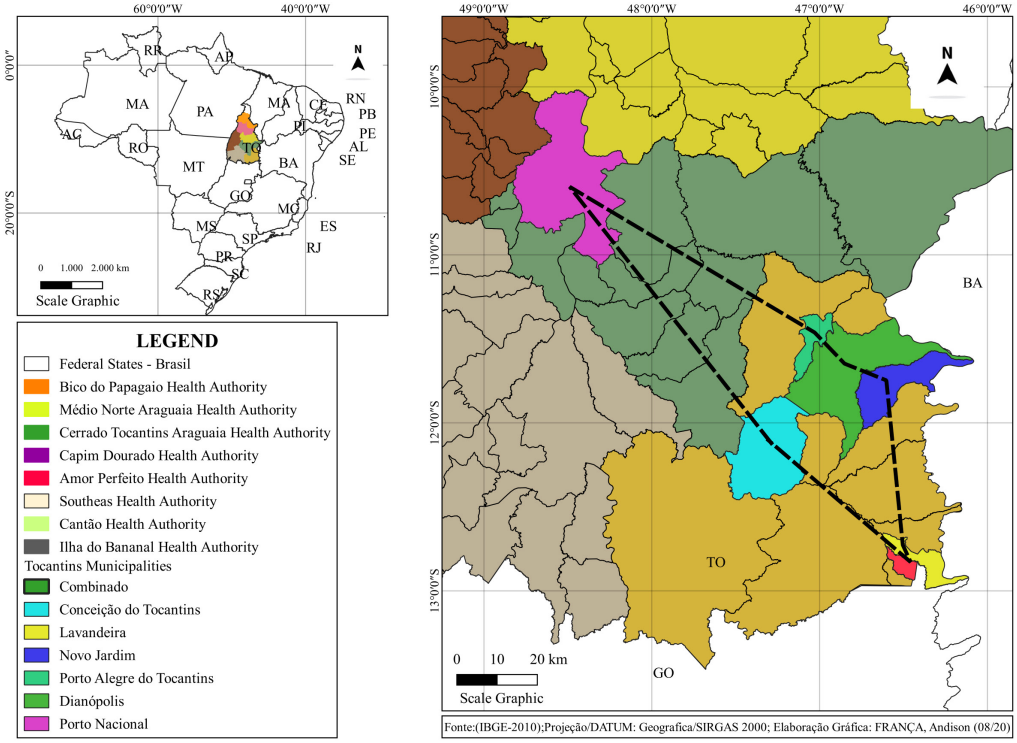
both to themselves and to other locations. The conclusion reached by Barbosa et al. (2019, p. 13), and which is of direct interest herein, concerns an observation of the following dynamics for the cities and region studied:

> [...] there were municipalities that presented no interaction index with any pole, i.e., they did not become polarized, such as Almas, Arraias, Aurora do Tocantins, Chapada de Natividade, Combinado, Conceição do Tocantins, Dianópolis. It was only after considering qualitative aspects, in addition to an analysis of the degree of interaction, that it was decided that these municipalities should be included in the economic region of Porto Nacional. According to [sic] Lemos and Garcia [Lemos and Guerra] (1999), the fact that a given region polarizes a vast geographic area may simply reflect the economic void of its surroundings, which seems to occur with Porto Nacional and with the southeastern region of Tocantins.

Low polarization is observed for the region and the municipalities studied – the expression "economic vacuum" is even mentioned. This finding is close to the notion of local centers, as proposed by the IBGE.

In the second study, specifically with regard to the southeastern region of Tocantins, Rodrigues et al. (2012) sought to establish the relationship between social capital and local economic development, by arguing that just economic variables are not strong enough to generate this understanding. Referenced in the social capital theory, as a method for creating the social capital index (ICS) in three axes, the authors proposed: i) the participation of the public authorities; ii) the participation of civil society and iii) literacy rate. The conclusions obtained resulted in perceptions similar to those observed in the work by Barbosa *et al.* (2019): "[...] in short, the southeastern region of Tocantins is a region with a low level of economic and social development, a high level of poverty and continuingly precarious health conditions" (RODRIGUES et al., 2012, p. 238).

The following data reinforce the perspective of low activity and economic centrality, in addition to fragile social indicators in an ensemble that may be considered as vectors for establishing and maintaining low regional dynamism. Map 3 presents the five municipalities defined in polarization dynamics with Porto Nacional and Dianópolis. According to Barbosa *et al.* (2019) and Rodrigues *et al.* (2012), the polarization with urban centers that occupy a secondary place in the Tocantins urban hierarchy enables us to understand the existence of low intra-regional dynamics.



Map 3. An absence of municipal polarization in the southeastern region of Tocantins
Source: SEPLAN-TO (2012).

In Map 3, it is possible to observe that the closest urban centers that serve as a reference are Porto Nacional and Dianópolis, both representative of their own fragilities. It is important to mention that Palmas and Araguaína are the cities most affected by the pandemic in the state and exert no influence over this region. It should also be noted that the locations listed here are located in a state situated in the north region of the country, which, for Pochmann and Silva (2019), is plagued by social inequalities due, among other factors, to the concentration of production in the South and Southeast regions of Brazil.

The relationship that is established between agribusiness in Tocantins and the cities addressed also exposes low dynamics. FIETO (2018a; 2018b; 2018c; 2018d; 2018e) prepared the strategic planning for the beef, fish, soybean, corn and poultry production chains (2018-2027 period). Figure 1, below, demonstrates the spatialization of production throughout the state.

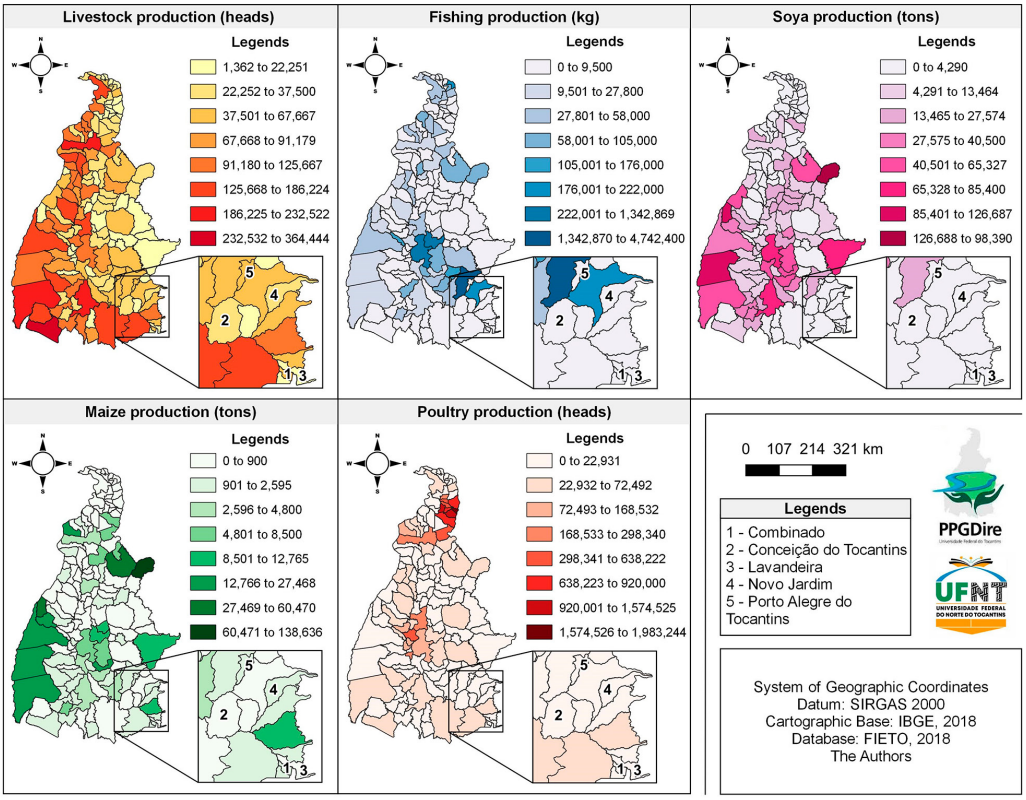


Figure 1. Production of grain and animal protein per municipality

Source: Produced by the authors based on FIETO (2018a; 2018b; 2018c; 2018d; 2018e).

Significant inequalities were observed with regard to the concentration of production, a configuration that corroborates discussions surrounding Matopiba, as defined by Favareto (2019, p. 21):

> [...] a vast portion of the Brazilian Cerrado and part of Legal Amazon, which involves the entire state of Tocantins, plus western Bahia, southern Maranhão and Piauí. This is where the main frontier of expansion of Brazilian agriculture is encountered, beyond the Amazon. There are 337 municipalities in a total area of 73 million hectares [...] Production is, however, quite concentrated: only seven of the thirty-one microregions made up half of the regional GDP.

The contradictions of the agribusiness production chain in Tocantins are highlighted among beacons that comprise "importance for the economy of Tocantins, but contribute to aggravating economic and social problems, such as land concentration, environmental degradation and the expulsion of small producers and traditional populations from rural areas" (FEITOSA, 2019, p. 1). Such contradictions are also accentuated when we observe the records related to

"conflicts over land in Tocantins, which show an increase in the number of families involved in territorial conflicts, especially after 2015, the year that MATOPIBA was formalized by the federal government" (FELICIANO; ROCHA, 2019, p. 240).

Spatial inequalities across the territory of Tocantins may also be observed when considering the profile of industry (FIETO, 2018e). Figure 2 presents the spatialization of companies and the number of formal jobs, references that, when compared to the delimited municipalities, reinforce the perception of low dynamics.

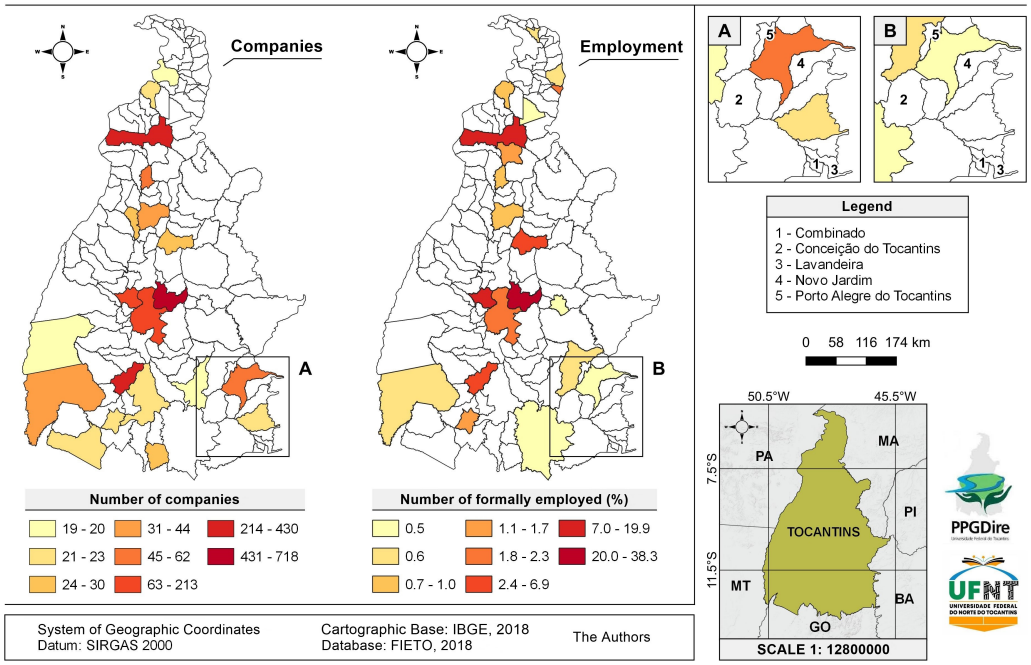


Figure 2. The concentration of companies and jobs per municipality
Source: Produced by the authors based on FIETO (2018e).

Observing the grain and animal protein production chains, combined with the business dynamics and the occurrence of formal employment, fragility in several biases may be observed as a common denominator in the municipalities located in the southeastern region of Tocantins. Although the entire territorial extension of the state is included within the so-called Matopiba, it is characterized by internal contradictions and inequalities, which are presented as variables of interference in the dissemination of COVID-19.

The two border regions to the southeast of Tocantins, the northeastern portion of the state of Goiás and the western part of the state of Bahia, respectively, present characteristics that accentuate significant socioeconomic inequalities. Campos *et al.* (2021), when analyzing the planning regions of the state of Goiás,

taking into account the variables of GDP per capita, the fluctuation of employment and unemployment markers, the collection of VAT on sales and services (ICMS) and the Firjan (Industrial Federation of the State of Rio de Janeiro) Index of Municipal Development, concluded that both the northeastern and southwestern regions of Goiás present the most fragile indicators, which results in low regional dynamics. Santos and Oliveira (2021, p. 175) described the demarcation process of the so-called Territories of Identity in Bahia and observed that, in the western region of that state, identified as the Rio Grande Basin Territory of Identity, there are "spaces of populational density, infrastructure and services, in addition to the concentration of income, to the detriment of spaces devoid of basic public services, [which] reveals the deepening of inequalities along the trajectory of agricultural modernization". The context of the region, in this specific case, makes it clear that the Central Places Theory may not be considered.

The five municipalities studied are located in a region of the state marked by a context of productive fragilities; their surroundings have similar characteristics resulting from inequality in the processes of agricultural modernization. Low flows of goods and, consequently, of people, are significant variables for observing the dissemination of COVID-19.

3. The characteristics of the cities and the behavior of the virus

The crisis instituted by the pandemic brought about problems that extrapolate the focus of an epidemic and demonstrated that COVID-19 became configured as a multifaceted object of research. The perception that there are cities in Tocantins that, due to their location and fragilization in terms of flows along the highways and from the capital, have hindered the spread of the virus, has demonstrated that the social and urban structure of such locations is vulnerable. The observed vulnerabilities reveal that social advances are still far from being able to guarantee any quality of life. The assumption is that the propulsion of social development, as thought by Sen (2010), could generate a dampening effect on the pandemic by guaranteeing conditions of survival as a result of freedoms.

In this wake, the five locations occupy very fragile social positions in a state located in one of the poorest regions of Brazil. Table 1 demonstrates their median level of development. The HDI of Brazil is 0.759, and that of Tocantins is 0.743. It is considered that express a level of high development, which in turn illustrates that these cities are below expectations, both in terms of the state and of the country as a whole. With regard to the GDP ranking of the five studied municipalities in

Tocantins, with the exception of Lavandeira, which moved up from the 135th to 71st position, it may be observed that all the others moved down several positions. Furthermore, the locations also face serious difficulties in being able to maintain themselves, since between 93% and 96% of their budget resources come from sources outside the municipality (IBGE, 2020), i.e., the described cities are unable to sustain themselves and are probably dependent on the federal government transfer fund.

City	HDI-M (2010)	Bolsa Família Development 2008-2016	GDP Development 2008-2014
Combinado	0.697	498-598	76-85
Conceição do Tocantins	0.592	517-535	96-103
Porto Alegre do Tocantins	0.645	251-337	123-130
Novo Jardim	0.596	0-336	122-124
Lavandeira	0.66	196-188	135-171

Table 1. Socioeconomic profile of municipalities: the HDI–M (2010), and the development of the *Bolsa Família*[6] and the GDP

Source: Adapted from SEPLAN-TO (2017).

In Table 2, it may be observed that less than 10% of the population are in employment and almost half the population has a monthly per capita income of up to half the minimum salary. This reiterates the historically established conditions of social vulnerability. Thus, the necessary framework is constructed in order to understand why the COVID-19 virus took so long to arrive in such locations, in view of their low attractiveness and the confrontation conditions with which to deal with it.

	Combinado	Conceição do Tocantins	Porto Alegre do Tocantins	Novo Jardim	Lavandeira
Monthly salary minimum (SM) formal employment (2018)	1.7 SM	1.5 SM	1.5 SM	1.8 SM	1.3 SM
People in employment (2018)	445 people	304 people	269 people	259 people	188 people
Percentage of population in employment (2018)	9.20%	7.40%	8.70%	9.60%	9.90%
Population with a Monthly income per capita of up to half a minimum salary (2010)	41.50%	47.10%	49.70%	44.30%	44.20%

Table 2. Work and income

Source: Produced by the authors based on IBGE data (2020).

6. A conditional cash transfer program.

The presented data have significant repercussions on other factors. In these locations, the urbanization of roadways stands between 0% and 1%; basic sanitation varies from 5% to 29%, and infant mortality data are extremely serious when compared to those for Tocantins and Brazil, as illustrated in Table 3.

	Combinado	Conceição do Tocantins	Porto Alegre do Tocantins	Novo Jardim	Lavandeira
Infant mortality (deaths per thousand live births 2017)	28.17	66.67	25.64	Sem dados	90.91
Adequate sewage and sanitation (2010)	11.80%	9%	5.90%	28.70%	25.50%
Urbanization of public roadways (2010)	0%	0%	1%	0%	0%

Table 3. Data on urbanization, sewage and sanitation, and infant mortality
Source: Produced by the authors based on IBGE data (2020).

While the state of Tocantins registered 12.39 deaths per thousand births, and Brazil, 12.4, in the city of Lavandeira this number was 90.91 and, in Conceição do Tocantins, 66.67 – which reveals the low efficiency of public authorities in resolving such an alarming situation. Infant mortality is considered to be relevant data by the World Health Organization (UNICEF *et al.*, 2020) since it represents the importance that a location gives to the health of women and children, to the quality of health, basic sanitation and education. Therefore, information of this nature establishes how far production still has to go in order to achieve social development and quality of life. It should also be noted that to reach the Sustainable Development Goals (SDGs) determined by the UN 2030 Agenda, it is necessary to reduce inequalities and work to reduce preventable deaths. The SDG target is to reach twelve neonatal deaths per thousand births by 2030 (UNICEF *et al.*, 2020).

According to data from SESAU-TO (2021), the southeastern region of the state was the least affected by COVID-19, i.e., the virus took a longer period of time to arrive. In comparison with the three main municipalities in Tocantins, it may be observed that the pace of its proliferation was low and, when compared in the proportion of 100 thousand inhabitants, it is detected that the incidence in the southeast region is the lowest in the state. The data also demonstrate that dissemination within this region is three times lower than that observed in the two main regions, as presented in Figure 3.

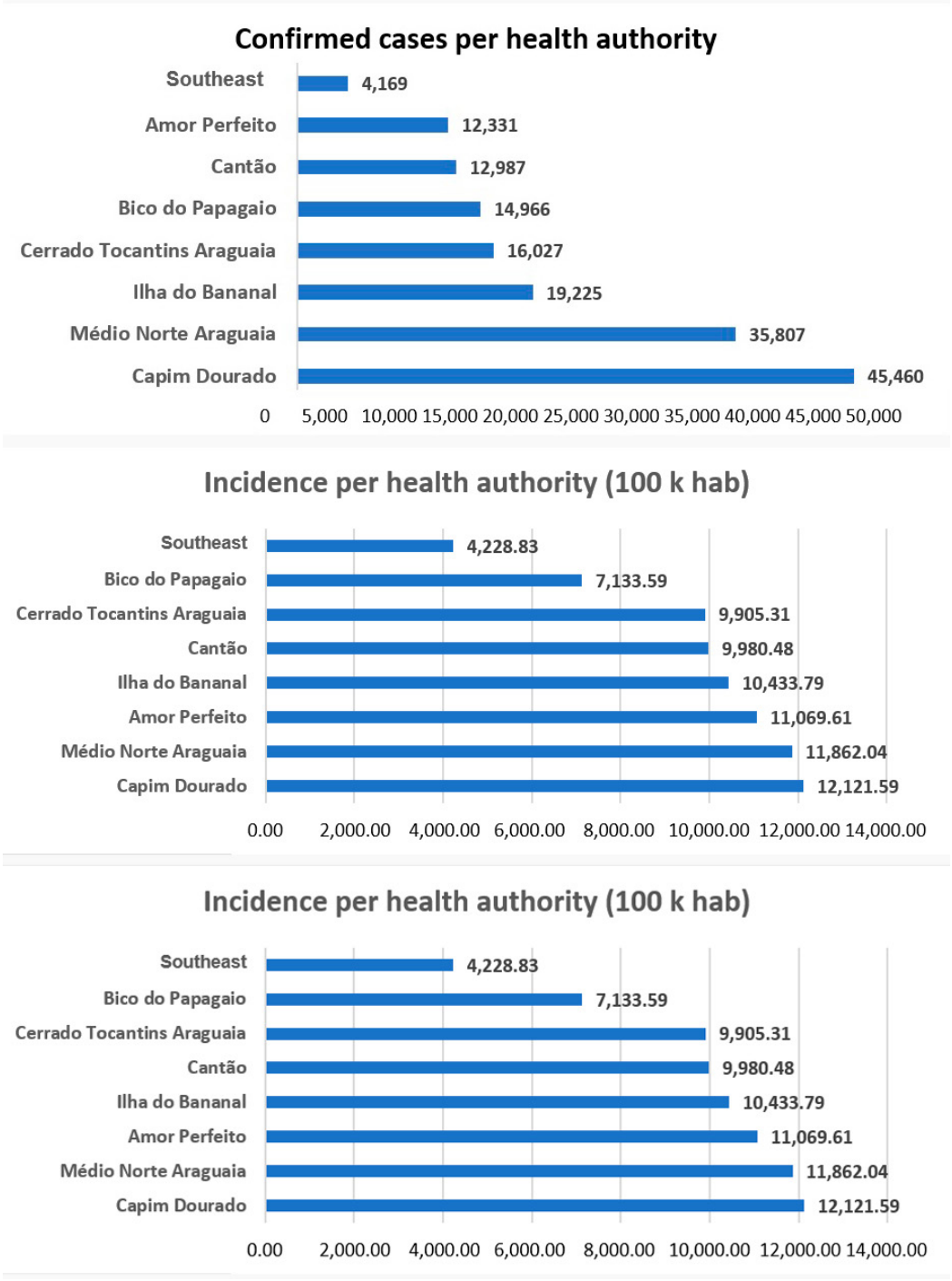


Figure 3. Incidence of COVID-19 per health authority

Source: Produced by the authors based on SESAU-TO data (2021), up to May 2, 2021.

On the one hand, the slowness with which the virus arrived in this region, initially seemed to be an advantage in the face of the pandemic. On the other hand, once local transmission had been identified, it became clear that the municipal government, due to its fragilities, was unable to control its proliferation or to offer

appropriate health conditions to combat its severity. This has led to more tragic outcomes than in larger locations. Although the southeast region has the lowest proportion of infection, when addressing mortality, it is way ahead of the Capim Dourado region, which includes the capital Palmas, and ahead of the Médio Norte Araguaia region, which is home to the second city with more cases of COVID-19. In other words, if the lack of flow via highways and people and from the state capital had protected the region, by delaying the arrival of the virus, at the moment it took hold, the social and health conditions proved to be insufficient in order to provide adequate care to overcome the disease.

Of the total of 160,972 cases in Tocantins, only 4,169 were recorded in the southeast, which is equivalent to approximately 2.59% of the total. In Table 4, the evolution of the dissemination of COVID-19 may be observed in comparison to the two most affected cities in Tocantins.

Cities	01/04/2020	01/08/2020	01/12/2020	01/04/2021	01/05/2021	Population incidence
Araguaína	3	7.165	16.649	24.268	27.099	14.77%
Palmas	9	5.504	19.191	35.696	38.744	12.65%
Combinado	0	5	226	381	504	10.36%
Conceição do Tocantins	0	6	34	76	108	2.64%
Porto Alegre do Tocantins	0	2	6	80	94	3.40%
Novo Jardim	0	16	59	153	167	3.93%
Lavandeira	0	3	37	75	81	4.14%

Table 4. Accumulated cases of COVID-19 per period

Source: Produced by the authors based on the epidemiological bulletin from SESAU-TO (2021).

The bulletin from April 1, 2020, is the initial milestone of contamination in the state, while on August 1 of the same year, referring to the month of July, cases appear for the first time in the five focus cities. While Araguaína and Palmas presented 14.77% and 12.65%, respectively, the others, with the exception of Combinado (10.36%), presented a local incidence of between 2.64% and 4.14%, thereby demonstrating a low occurrence of contamination. When comparing cases per 100 thousand/inhabitants, and by taking Palmas as a reference with approximately 15,800 cases, Porto Alegre and Novo Jardim had 4,700 cases, and Conceição and Lavandeira had 8 thousand, indicating that, even after more than one year of the pandemic, the incidence in these municipalities was still proportionally lower.

Final considerations: Southeastern Tocantins off course from the state capital

In recalling Durkheim (2007), and the notion of social fact, emphasizing that it should not be considered only as a category of social control or as an element of adaptation to social norms; it is necessary to dwell on one fact in order to apprehend it in its various facets. Thus, we start from the idea that the southeastern region of Tocantins, with the dissemination of COVID-19, faced factors that both slowed down and delayed the process. Moreover, in addition to naturalizing the circumstance, we have sought to answer the following question: Which elements produced this situation?

Evidently, when weaving together a descriptive analysis, we have been unable to offer categories of answers for the entire process. However, this has allowed us to consider proposals that need to be studied and expanded upon as a way of contributing to the debate involving the profusions of a pandemic. It is necessary to pay attention to the characteristics of certain localities, which, because they are fragile and distant from economically attractive regions, have certain characteristics, listed as follows: i) the pandemic took a longer period of time to become installed in certain cities precisely because they are situated in regions that receive little influence from stronger urban centers; ii) the locations have no tourist, economic, cultural and/or service attractions that promote the flow of people; iii) the economic and social power of local residents is low, which also reduces the flow to other locations; iv) with the delayed arrival of the virus, cities demonstrated that they had no containment or protection structure, with a low level of urbanization and basic sanitation and with no medium or high complexity healthcare; and v) the local government is economically lacking in external resources, which prevents any action to mitigate the disease.

The characterization of the studied locations not only demonstrates their regional isolation, but also their fragility in terms of providing public policies for social welfare, thereby culminating in multiple factors that cause a lack of access to instrumental and substantive freedoms, which could generate social development. Post-constitutional municipal policies have been concerned with the autonomy of municipalities, without, however, creating policies and putting actions into practice so that they could elevate their urbanities in order to become places with quality of life.

Indeed, smaller cities provide more humanizing elements, such as collectivity, a sense of community, a social and emotional support network, even protection from the pandemic, due to the low human agglomeration. Unfortunately, all this becomes lost with the ills imposed by the lack of urban structure and access to substantive freedoms. It is essential to think of a state and federal pact, so that future

generations feel supported in their own hometowns, in order not to overpopulate already swollen urban centers. Such issues must be considered when assimilating lessons that the pandemic has offered us so as to face similar situations more effectively in the future.

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