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press release
INSTITUTO NACIONAL DE ESTATÍSTICA
STATISTICS PORTUGAL

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On page 7, where it was "Braga (68.8) in Cávado; Vizela (63.2) and Vila Verde (50.5) in the sub-region of Ave" it should read "Braga (68.8) and Vila Verde (50.5) in Cávado; Vizela (63.2) in the sub-region of Ave".

Context and socioeconomic impact indicators for the COVID-19 pandemic in Portugal

COVID-19: a territorial view on demographic context and socioeconomic impact indicators

The impact of the pandemic continues to be characterised by high territorial heterogeneity, both from the point of view of the cases recorded and from the point of view of socio-economic impact. Some of the results obtained in this context:

- The preliminary total number of deaths between 1 March and 7 June 2020 is 2 705 higher than the number registered in the same period in 2019. The positive variation compared to 2019 results mainly from the increase in the number of deaths in persons aged 75 and over (+ 2 488). In 171 municipalities the number of deaths registered between 11 May and 7 June was higher than the same reference value (average number of deaths in the same period in 2018 and 2019).
- In Portugal, for every 10,000 inhabitants there were 37.0 confirmed cases of COVID-19, representing an increase of 13% in relation to 3 June (12% between June 3 and 20 May). The number of confirmed cases of COVID-19 disease per 10 thousand inhabitants was above the national value in 48 municipalities.
- The evolution of the new cases of COVID-19 shows an increase in geographical concentration. On 17 June, the relationship between the number of confirmed cases and the number of new confirmed cases (last 7 days) per 10 thousand inhabitants shows seven municipalities in the Metropolitan Area of Lisboa with values above the national average in both indicators: Amadora, Loures, Sintra, Odivelas, Vila Franca de Xira, Barreiro and Lisboa.
- The pandemic also affected the housing market differently across the territory. In April 2020, in all the NUTS 2 regions, there was a decrease in the number of dwellings sales compared to the same month in the previous year, with the decreases in the Algarve and the Autonomous Region of Madeira standing out

More territorial information with daily updates on the demographic context and the socio-economic impact of the COVID-19 pandemic in Portugal is available in the application *Dashboard* | Context and Impact[1].

The first cases diagnosed with COVID-19 in Portugal were reported on March 2nd 2020 and the first death as a result of COVID-19 was recorded on March 16th 2020. The WHO (World Health Organization) declared the outbreak of COVID-19 as a pandemic on March 11th 2020.

The incidence of the pandemic in the territory has not been homogeneous, which justifies the analysis of context indicators, when possible, at NUTS 3 (Metropolitan Areas and Intermunicipal Communities in Portugal mainland, and

[1] As part of Statistics Portugal's Statslab, this press release also presents data on population mobility at the regional level provided by Facebook's "Data for Good" initiative.

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Autonomous Regions) and municipality level. In addition, socioeconomic indicators, on a monthly basis, are presented in this press release to support the analysis of the impact of the pandemic in the different regions and municipalities.

The results of overall mortality refer to deaths (all causes of death) that occurred in the national territory from March 1st up to June 7th. Information on deaths is obtained through the Civil Register collected under the Integrated Civil Registration and Identification System (SIRIC). This information was computed on June 16th, and refers to all deaths occurred from 1st March until June 7th, 2020. This time lag prevents the disclosed information from being subjected to considerable revisions. Even so, the information is preliminary and will be subject to further updates.

The number of confirmed cases with COVID-19 is based on the information released by the Directorate-General of Health. This press release includes information available up to June 18 (data of the situation up to June 17).

Socioeconomic indicators are based on information from the Statistics on house prices at local level and from the House rental statistics at local level. The number of dwellings sales and the number of new lease agreements are based on preliminary results and will be subject to further updates. Final results will be published according to the regular dissemination calendars of these statistical operations.

In Statistics Portugal website (www.ine.pt) the *Dashboard* | Context and Impact is available, gathering statistical indicators, updated daily, weekly and monthly, for a territorial analysis of the demographic context and the socio-economic impact of the COVID-19 pandemic in Portugal.

Demographic and territorial context indicators

Number of deaths between March 1st and June 7th, 2020 higher than in the same period in 2019 and 2018

The preliminary total number of deaths between March 1st and June 7th, 2020 is 2,705 higher than the number registered in the same period in 2019 and 1,495 cases higher than number of deaths registered in 2018. The positive variation in relation to 2019 is due mainly to the increase in the number of deaths of people aged 75 and over (+ 2,488).

The following figures allow the comparison of the cumulative number of deaths from the beginning of March to June 7th, 2020 with that observed in the same period in 2019 and 2018. For the total number of deaths registered, and for the age group 75 and over, two lines were added in order to identify the moment values of cumulated deaths registered in 2020 surpass those registered in 2019 and 2018.

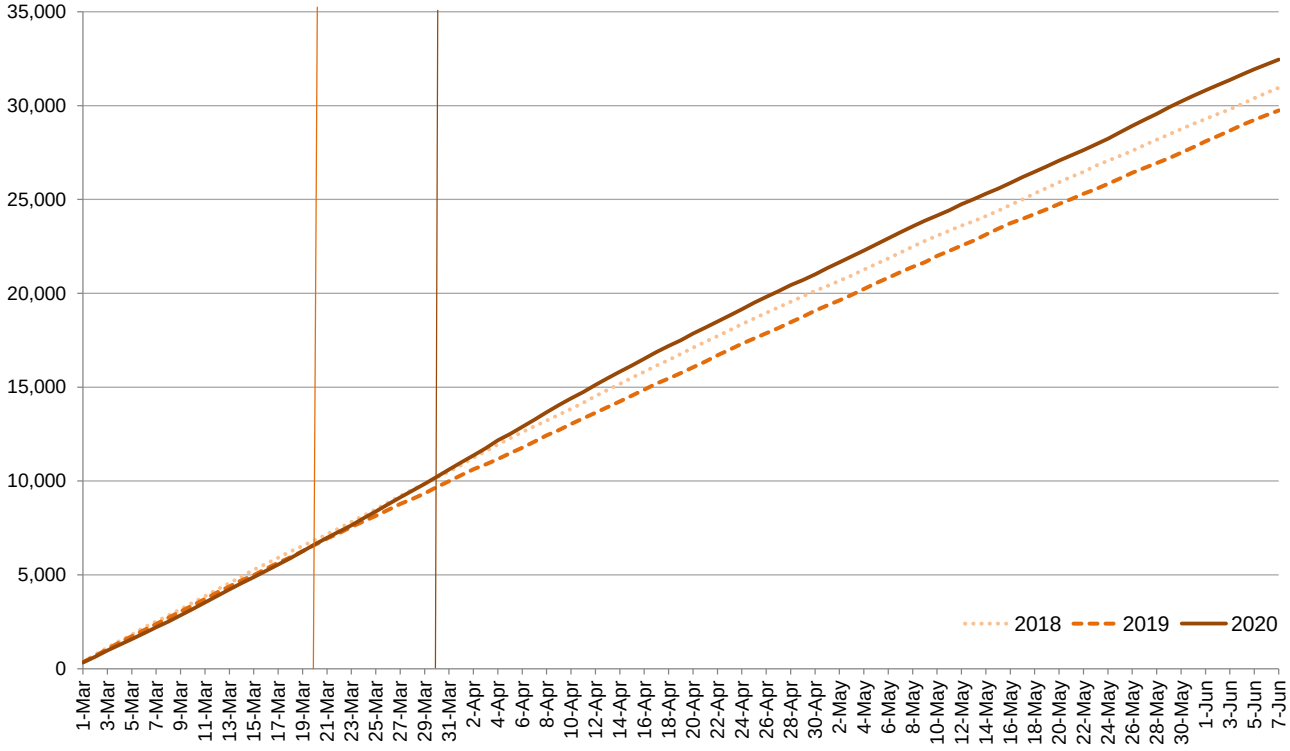
Figure 1 - Cumulative number of deaths in Portugal from March 1st to June 7th (2018-2020)

	Number of deaths			Number of deaths per 100 thousand inhabitants		
	2018	2019	2020	2018	2019	2020
Total	30,953	29,743	32,448	300.8	289.4	315.2
Males	15,500	14,732	16,043	318.4	303.6	330.1
Females	15,453	15,011	16,405	284.9	276.7	301.8
Under 64 years	4,399	4,331	4,363	54.5	53.9	54.4
65 to 69 years	1,855	1,891	1,915	299.2	305.9	307.4
70 to 74 years	2,567	2,529	2,685	492.2	469.7	488.5
75 to 79 years	3,597	3,309	3,711	846.4	776.5	858.9
80 to 84 years	5,580	5,150	5,619	1,597.3	1,466.5	1,590.6
85 years and over	12,953	12,530	14,147	4,353.4	4,038.4	4,385.2
65 years and over	26,552	25,409	28,077	1,199.7	1,132.2	1,231.2
75 years and over	22,130	20,989	23,477	2,064.6	1,929.8	2,119.0

Source: Statistics Portugal, Deaths; Statistics Portugal, Annual estimates of resident population

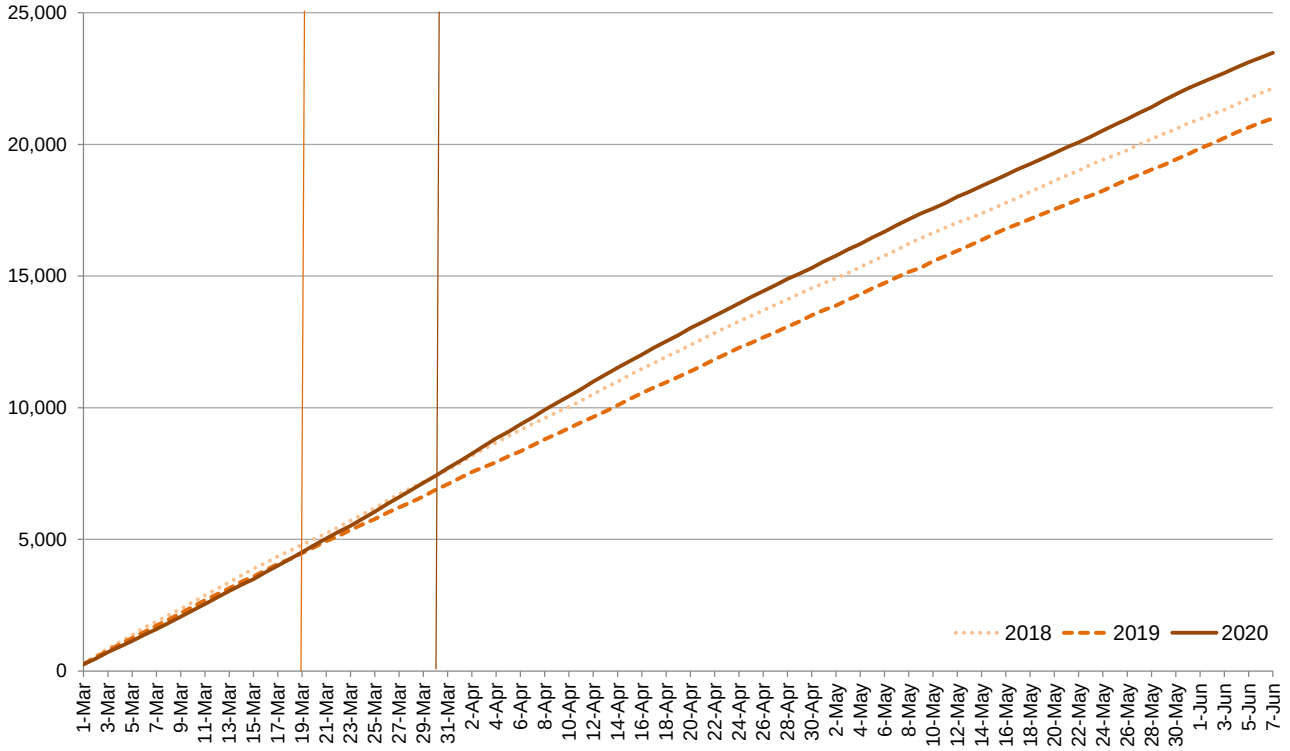
Notes:
b) 2020 data: preliminary data based on information registered by the Civil Register Offices and sent to Statistics Portugal until June 16th 2020.
a) The total number of deaths may not correspond to the sum of the partial figures due to the existence of records with unknown age.

Figure 2 - Cumulative number of deaths, by day of death, March 1st to June 7th (2018-2020)



Source: INE, I.P., Statistics on Deaths (Preliminary (2020) and Final Results (2018 and 2019)).

Figure 3 - Cumulative number of deaths aged 75 and over, by day of death, March 1st to June 7th (2018-2020)

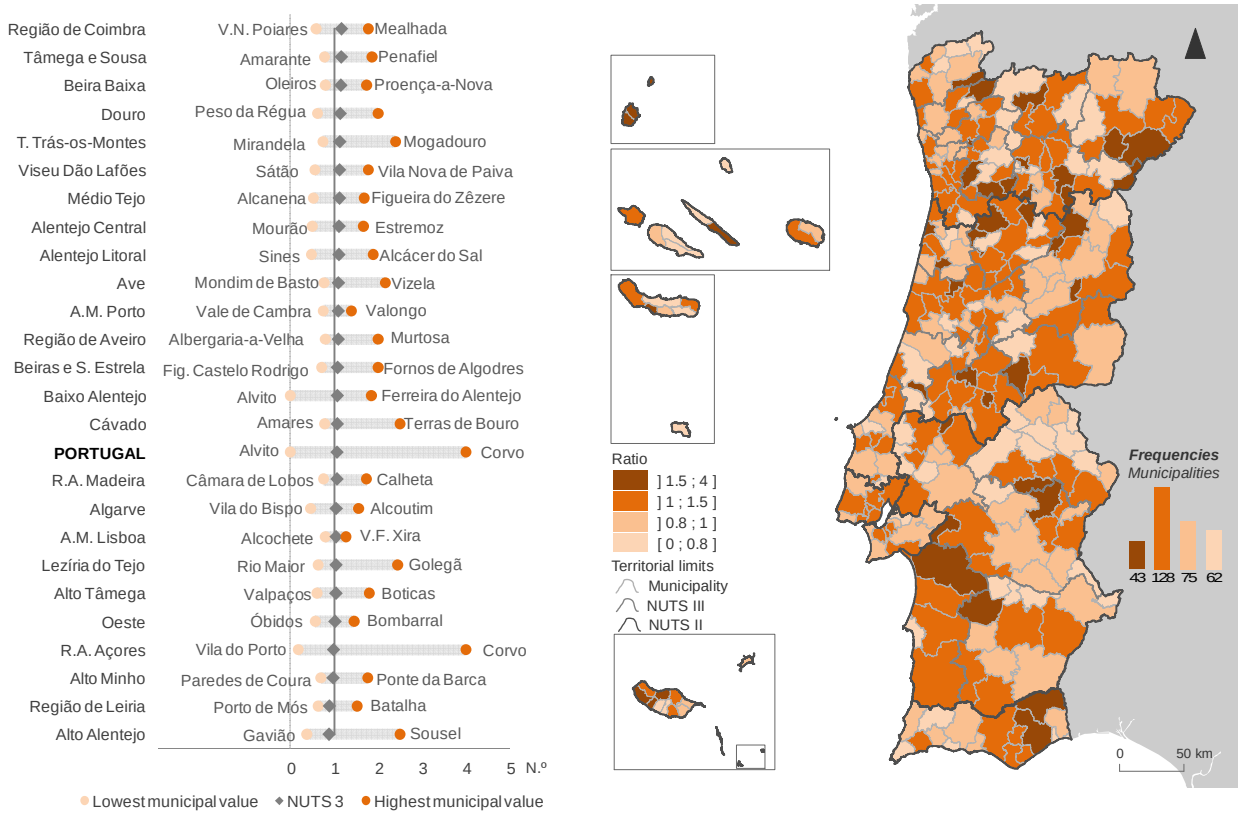


Source: INE, I.P., Statistics on Deaths (Preliminary (2020) and Final Results (2018 and 2019)).

In 171 municipalities the number of deaths registered in the last four weeks (between 11 May and 7 June, 2020) was higher than the corresponding reference value

In 171 out of the 308 Portuguese municipalities the number of deaths registered in the last four weeks (between 11 May and 7 June, 2020) was higher than the corresponding reference value (average number of deaths in the same period in 2018 and 2019). Of this total, 43 municipalities registered a number of deaths 1.5 times higher than in the same period of reference. For the remaining 137 municipalities the number of deaths registered in the last four weeks was equal or lower than the number observed in the reference period.

Figure 4- Number of deaths in the last four weeks (11 May to 7 June) per deaths in the same period of reference, Portugal, NUTS 3 and municipality



Source: INE, I.P., Statistics on Deaths (Preliminary (2020) and Final Results (2018 and 2019)).
Note: In the Douro sub-region the highest municipal value corresponds to the municipalities of Penedono, Tarouca and São João da Pesqueira.

48 municipalities with confirmed cases of COVID-19 disease per 10 thousand inhabitants above the national value

On June 17, 2020, in Portugal, for every 10 thousand inhabitants there were 37.0 confirmed cases of COVID-19, which represents an increase of 13% compared to June 3, the reference date of the last press release. Between May 3 and May 20 and between May 6 and 20 there was an increase of 12% in both periods. Between May 6 and April 22 a 20% increase was registered and between April 22 and 7 (reference date of the first press release) there was a 70% increase.

The number of confirmed cases of COVID-19 disease per 10 thousand inhabitants was above the national value in 48 municipalities. In the Norte region, 27 municipalities registered a value above the national average, and a set of contiguous municipalities in the Metropolitan Area of Porto stood out, with more than 50 confirmed cases per 10 thousand inhabitants: Valongo, Matosinhos, Maia, Gondomar, Porto, Santo Tirso and Vila Nova de Gaia. Some municipalities in the Centro (11), Metropolitan Area of Lisboa (Amadora, Loures, Lisboa, Sintra, Odivelas, Vila Franca de Xira and Barreiro), Alentejo (the municipalities of Moura and Azambuja) and Região Autónoma dos Açores (the municipality of Nordeste) also scored values above the national value [Figure 5].

Despite this differentiation, the estimated location coefficient[2] for March 25 and June 17 suggests a decrease in territorial concentration of cases, i.e., a progressive spatial dissemination throughout the country. The location curves graphically reflect this trend by the approximation to the straight line of equal distribution between the number of confirmed cases and the resident population in the municipalities [Figure 6].

Figure 5 - Number of confirmed cases of COVID-19 disease per 10 thousand inhabitants until June 17 , 2020, by municipality

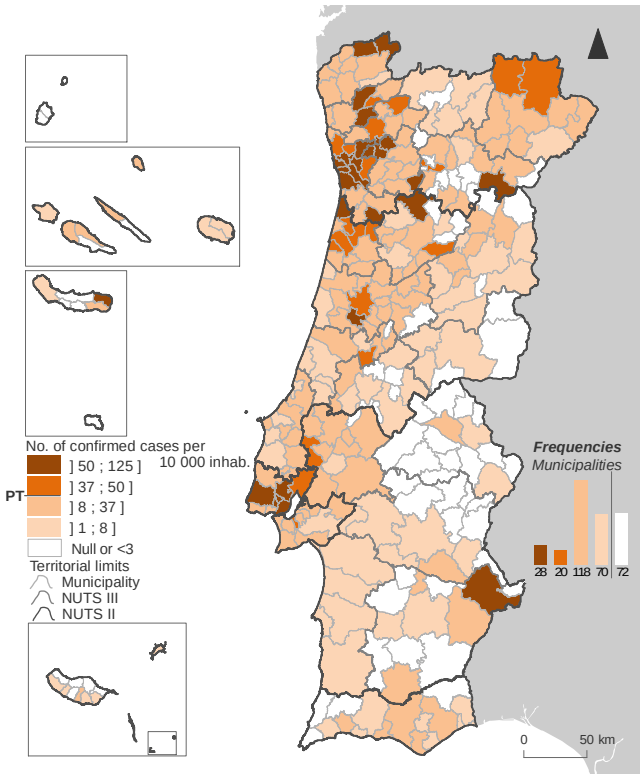
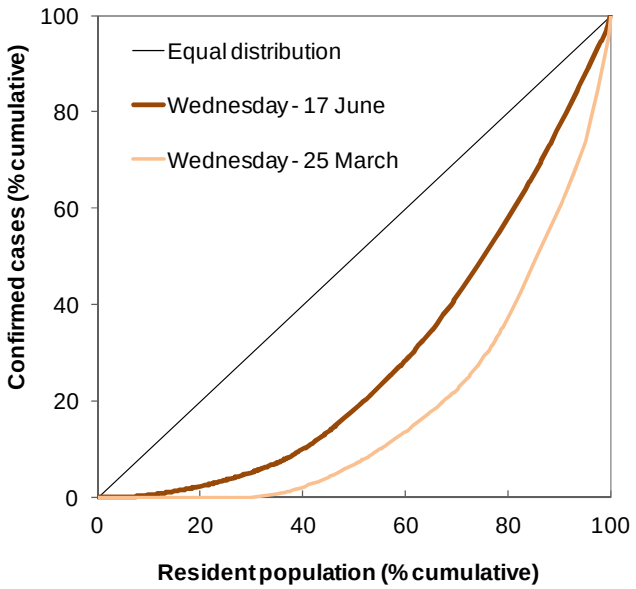


Figure 6 - Territorial concentration of COVID-19 confirmed cases until March 25 and until June 17 in relation to the resident population, based on the distribution by municipality

Location Curve



Location coefficient	
Wednesday – June 17	32,0
Wednesday - March 25	47,6

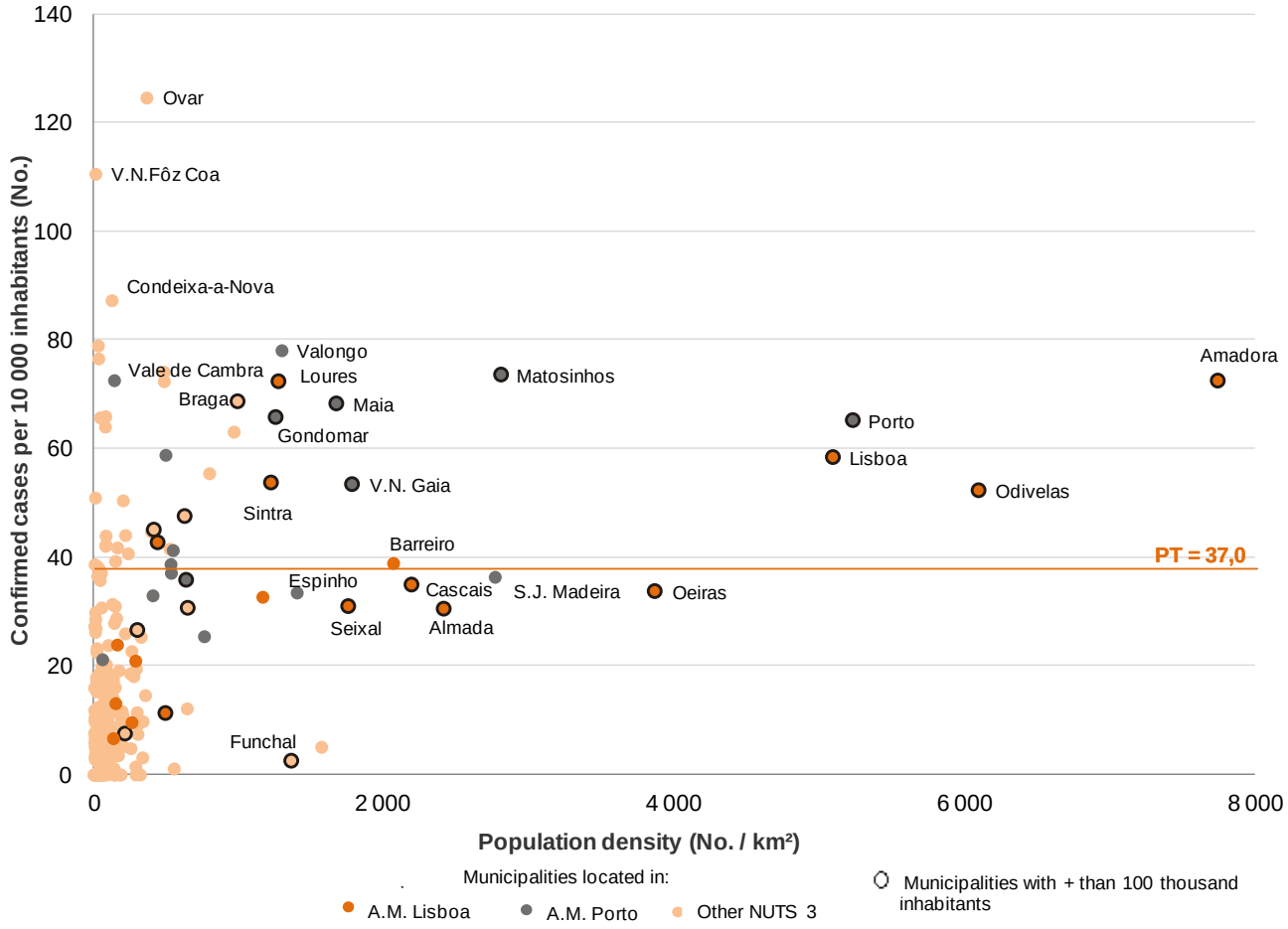
Source: Directorate-General of Health, Daily COVID-19 Status Report (released on June 18); INE, I.P., Annual estimates of resident population, 31 December 2019. Note: For the calculation of the location coefficients zero cases were considered for the municipalities with no value in the Directorate-General of Health report (0 or < 3 cases).

[2] The Location coefficient varies between 0 and 100, with values closer to 100 reflecting greater inequality in the distribution of confirmed cases of COVID-19 against the total resident population.

34 municipalities registered both a number of confirmed cases per 10 thousand inhabitants and population density values above the national reference

The following figure illustrates the relationship between population density and the number of confirmed cases per 10 thousand inhabitants. Of the 48 municipalities with a number of confirmed cases per 10 thousand inhabitants above the value for Portugal, 34 also had population density values above the national average. From this set of 34 municipalities, the municipalities of Ovar (124.8), in Região de Aveiro; Condeixa-a-Nova (87.4) in Região de Coimbra; Valongo (78.2), Matosinhos (73.7), Vale de Cambra (72.7), Maia (68.4), Gondomar (65.8), Porto (65.3), Santo Tirso (58.9) and Vila Nova de Gaia (53.5), in the Metropolitan Area of Porto; Lousada (74.2), Felgueiras (72.5) and Paços de Ferreira (55.5) in Tâmega e Sousa; Braga (68.8) and Vila Verde (50.5) in Cávado; Vizela (63.2) in the sub-region of Ave; and Amadora (72.6), Loures (72.4), Lisboa (58.5), Sintra (53.8) and Odivelas (52.4) in the Metropolitan Area of Lisboa, stood out with more than 50 confirmed cases per 10 thousand inhabitants. It should also be noted that 182 of the 308 municipalities in the country had a number of confirmed cases per 10 thousand inhabitants and population density below the national reference.

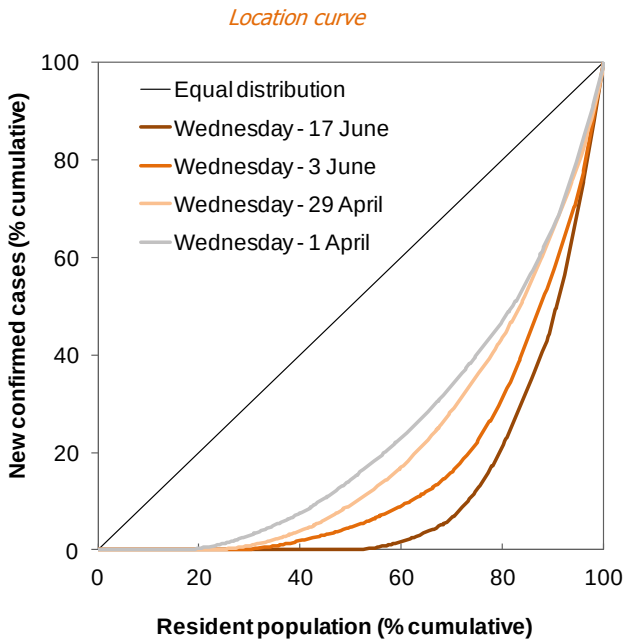
Figure 7 - Number of confirmed cases per 10 thousand inhabitants on June 17, 2020 and Population density, by municipality



Source: Directorate-General of Health, Daily COVID-19 Status Report (released on June 18); INE, I.P., Annual estimates of resident population, 31 December 2019.

The calculation of the location coefficient considering the new confirmed cases (last 7 days) for April 1 and 29 and June 3 and 17 suggests an increase in the territorial concentration of the new confirmed cases of COVID-19. The location curves graphically reflect this trend by the progressively moving away from the straight line of equal distribution between the number of new confirmed cases and the resident population in the municipalities [Figure 8].

Figure 8 – Territorial concentration of COVID-19 new confirmed cases (last 7 days) for April 1, April 29, June 3 and June 17 in relation to the resident population, based on the distribution by municipality



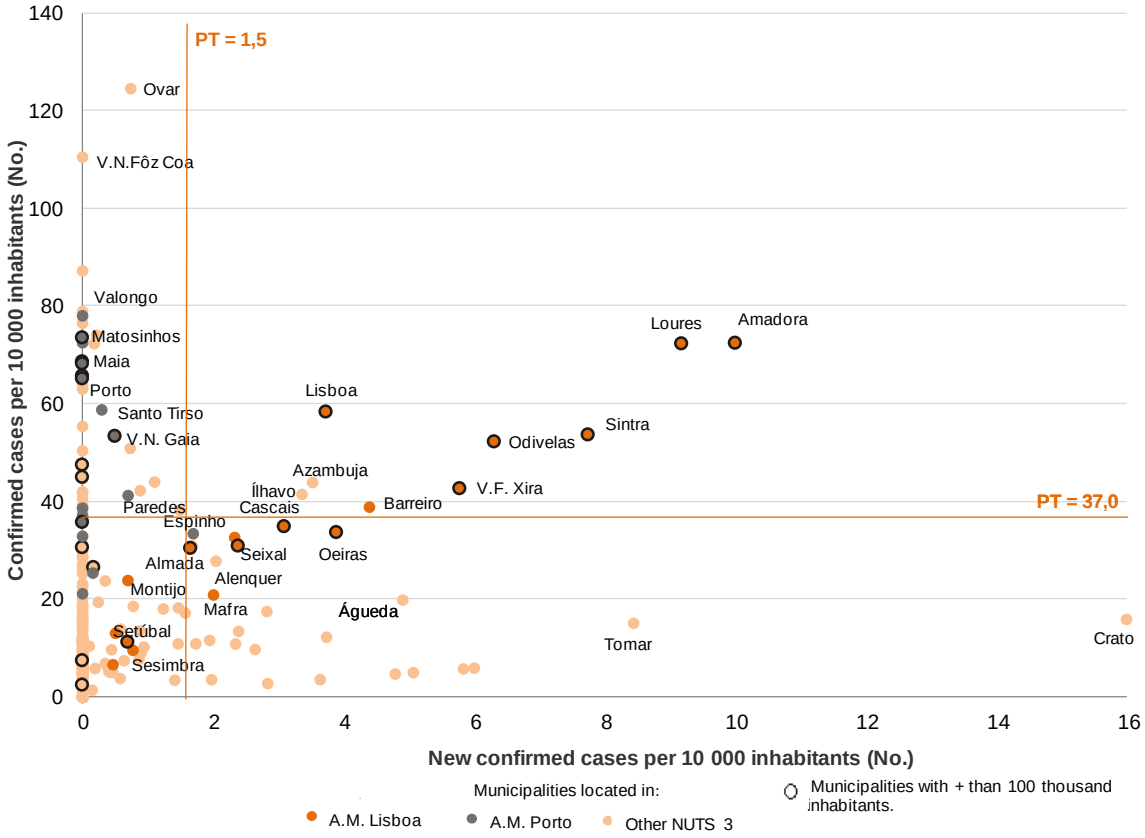
Location coefficient	
Wednesday – June 17	63,5
Wednesday – June 3	54.1
Wednesday – April 29	43.1
Wednesday – April 1	37.1

Source: Directorate-General of Health, Daily COVID-19 Status Report (released on June 18); INE, I.P., Annual estimates of resident population, 31 December 2019.
Note: For the calculation of the location coefficients zero cases were considered for the municipalities with no value in the Directorate-General of Health report (null or less than 3 cases).

The following figure illustrates the relationship between the total number of confirmed cases per 10,000 inhabitants by June 17 and the number of new cases registered per 10,000 inhabitants on June 17 (last 7 days). Of the 48 municipalities with a number of confirmed cases per 10,000 inhabitants above the figure for Portugal, nine also scored a number of new confirmed cases per 10,000 inhabitants above the national average. Of these nine municipalities, seven were located in the Metropolitan Area of Lisboa - Amadora (10.0 new cases per 10 thousand inhabitants), Loures (9.2), Sintra (7.7), Odivelas (6.3), Vila Franca de Xira (5.8), Barreiro (4.4) and Lisboa (3.7) – and the remaining corresponded to the municipality of the municipality of Azambuja (3.5) in Lezíria do Tejo, and the municipality of Ílhavo (3.4) in Região de Aveiro.

In addition, the municipalities with more than 100 thousand inhabitants - Oeiras, Cascais and Seixal -, where the number of new cases confirmed per 10 thousand inhabitants was above the national value, should be highlighted.

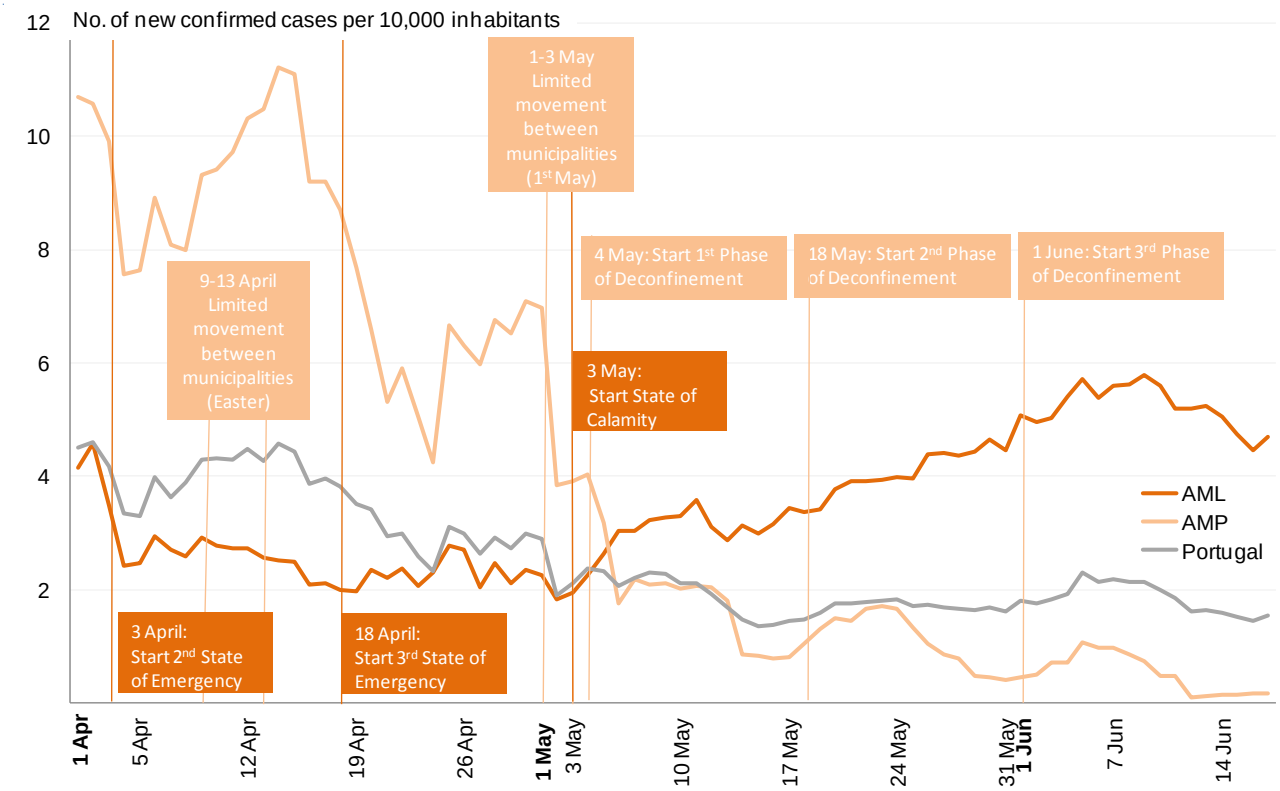
Figure 9 – Number of confirmed cases per 10 thousand inhabitants on June 17, 2020 and Number of new confirmed cases per 10 thousand inhabitants on June 17 2020 (last 7 days), by municipality



Source: Directorate-General of Health, Daily COVID-19 Status Report (released on June 18); INE, I.P., Annual estimates of resident population, 31 December 2019.

Given the high population density that characterizes the two metropolitan areas, an analysis focusing on the dynamics of new confirmed cases of COVID-19 in these territories is particularly relevant. The following figure shows the number of new cases registered in the last seven days per 10 thousand inhabitants for the total of the country and for the metropolitan areas of Porto and Lisboa for the period from April 1st to June 17th. In this context, it should be highlighted the progressive slowdown in the number of new cases registered in the Metropolitan Area of Porto and, in turn, the progressive increase in the number of new cases in the Metropolitan Area of Lisboa, with this region registering figures above the national average since May 5.

Figure 10 – New confirmed cases in the last seven days per 10 thousand inhabitants, by day, Portugal, metropolitan areas of Lisboa (AML) and Porto (AMP)



Source: Directorate-General of Health, Daily COVID-19 Status Report (released on June 18); INE, I.P., Annual estimates of resident population, 31 December 2019.
Note: The dates marked on the graph axis correspond to the first days of the month and Sundays.

Socioeconomic impact indicators

In April 2020, in all the NUTS 2 regions, there was a decrease in the number of dwellings sales compared to the same month in the previous year, with the decreases in the Algarve and the Autonomous Region of Madeira standing out

In April 2020, there were 2.2 new lease agreements per one thousand conventional dwellings in Portugal, representing a decrease of -50% compared to the previous month and -13% compared to the same period in the previous year. At regional level, with the exception of the Metropolitan Area of Lisboa (2.9 new lease agreements per one thousand conventional dwellings), the other NUTS 2 regions presented a lower number of new lease agreements per one thousand conventional dwellings than the national reference. In April 2020, in Portugal and in the seven NUTS 2 regions, there was a decrease in the number of new lease agreements per one thousand conventional dwellings compared to the same month in the previous year, with Região Autónoma dos Açores (-18.4%) and Algarve (-17.7%) standing out with decreases higher than 15% [Figure 11].

In April 2020, 5.1 dwellings were sold per one thousand conventional dwellings in Portugal, representing a decrease of -19% compared to the previous month and -17% compared to the same period in the previous year. At regional level, with the exception of the Metropolitan Area of Lisboa (7.1) and the Algarve (6.7), the remaining NUTS 2 regions showed a lower number of sales per one thousand conventional dwellings than the national reference value, the region of Centro standing out with the lowest value among the seven NUTS 2 regions: 3.8 dwellings sales per one thousand conventional dwellings. In April 2020, in Portugal and in the seven NUTS 2 regions, there was a decrease in the number of dwellings sales per one thousand conventional dwellings compared to the same month in the previous year, standing out, with decreases higher than 20%, the region of Algarve (-24.3%) and the Região Autónoma da Madeira (-20.5%) [Figure 12].

Figure 11 – Number of new lease agreements per one thousand conventional dwellings, monthly (last 3 months), Portugal and NUTS 2

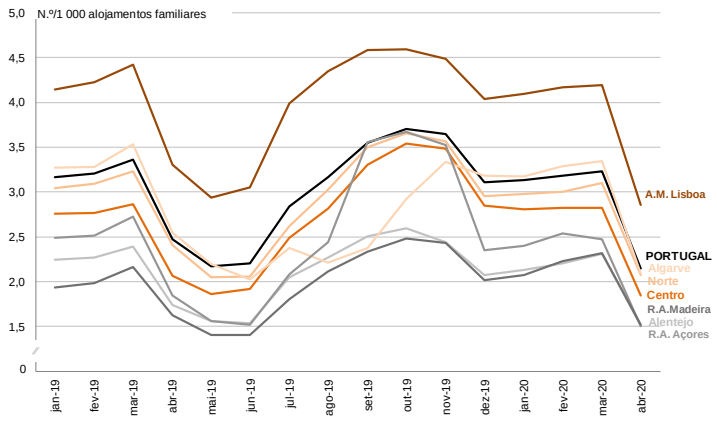
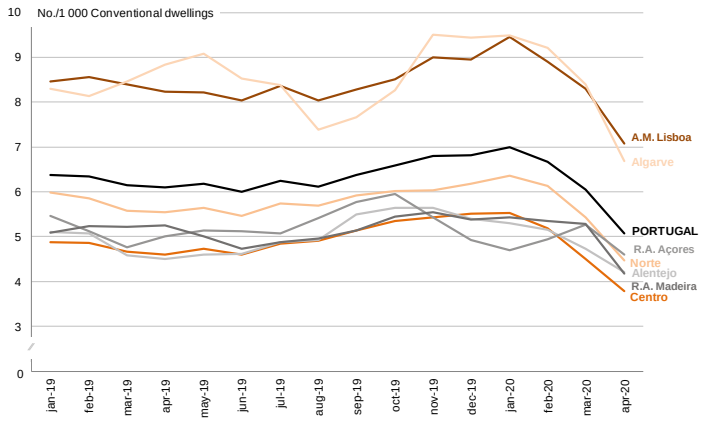


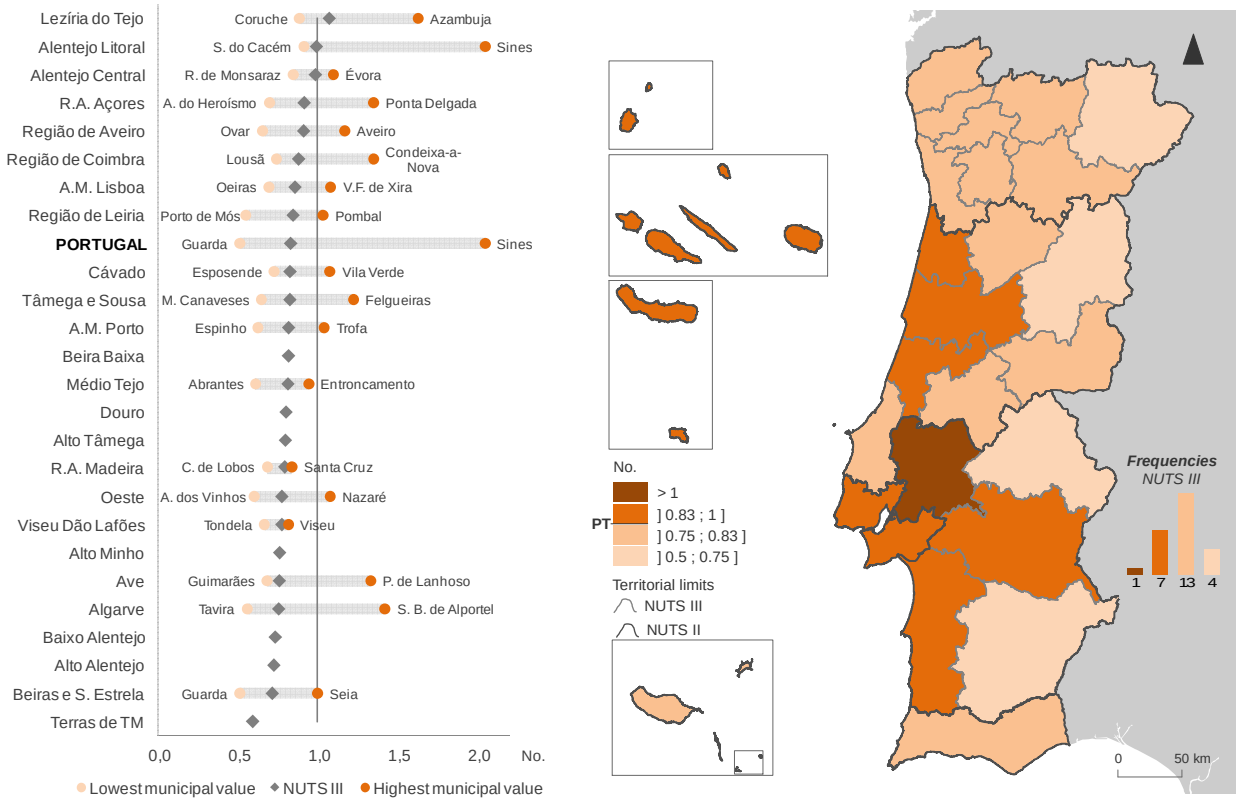
Figure 12 – Number of dwellings sales per one thousand conventional dwellings, monthly (last 3 months), Portugal and NUTS 2



Source: Statistics Portugal, House rental statistics at local level. Statistics Portugal,Statistics on house prices at local level.

In April 2020, in 24 out of the 25 Portuguese NUTS 3 sub-regions, the number of dwellings sales was lower than the in same period. Of this group, the sub-region of Terras de Trás-os-Montes stood out for having the lowest ratio: 0.59 [Figure 13].

Figure 13 – Relation between the number of dwellings sales in April 2020 (last 3 months) and sales in the same reference period, Portugal and NUTS 3



Source: Statistics Portugal, Statistics on house prices at local level.
Note: The lowest and highest municipal values are based on the municipalities with data available (number of sales equal or higher than 33): 134 municipalities.

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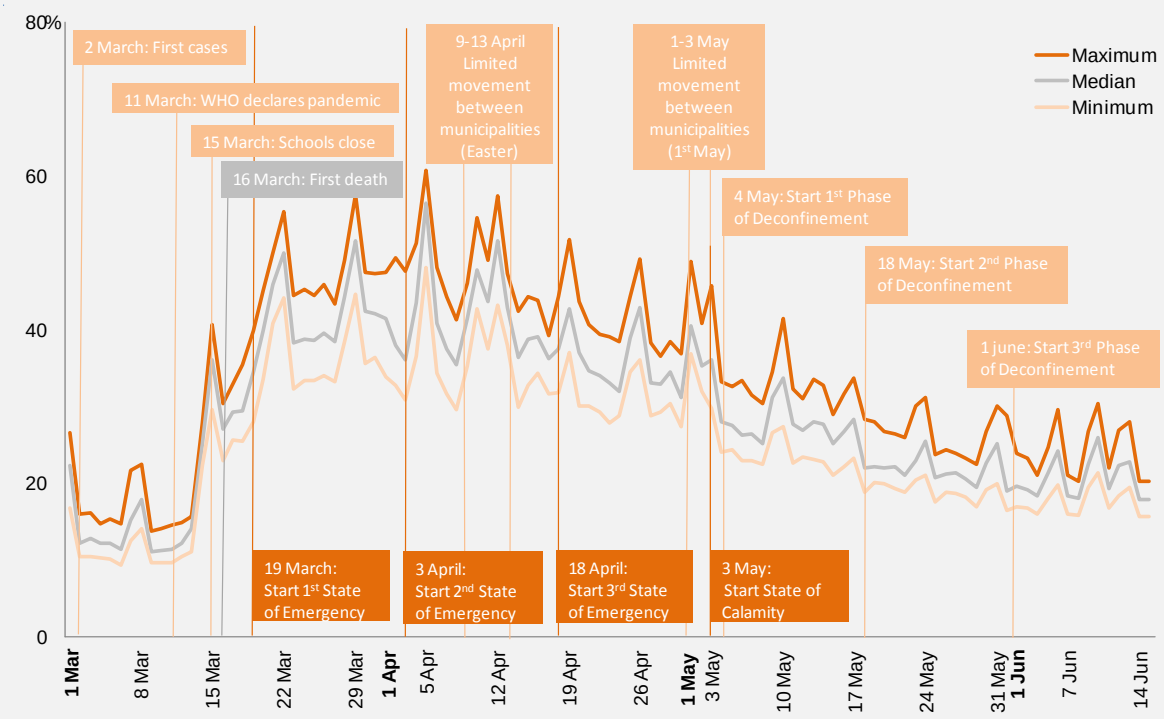
Population mobility indicators at regional level: an analysis based on information from Facebook's "Data for Good" Initiative

In this box, taking advantage of Facebook's "Data for Good" Initiative, population mobility indicators at NUTS 3 level in the national territory are released.

The data represented in the figure below correspond to the proportion of population "staying put" between March 1st and June 15th, namely minimum, median and maximum values obtained from the 25 NUTS 3 sub-regions of the country. For a better contextualization of the information, the figure includes the main key moments associated with the COVID-19 pandemic in Portugal.

Figure 14: Proportion of the population "staying put" between March 1st and June 15th – minimum, median and maximum values of NUTS 3



Source: Facebook's "Data for Good" Initiative. Data provided by Carnegie Mellon University.
Note: The dates marked on the graph axis correspond to the first days of the month and Sundays.

The following figures show this indicator at NUTS 3 level for the days corresponding to Sundays [Figure 15] and Mondays [Figure 16], since the beginning of March. It can be seen that the days corresponding to Sundays indicate, overall, less mobility of the population than the days corresponding to Mondays. In particular, there is a reduction in mobility levels with the beginning of the State of Emergency on March 19 (maps of March 22 and 23). On the contrary, a progressive increase in mobility has been registered with the transition from the State of Emergency to the State of Calamity on May 3, followed by the first phase of implementation of the deconfinement measures (maps on May 3 and 4), and by the second phase of deconfinement on May 18 (maps on May 18, 24, 25 and 31 and June 1), and with the beginning of the third phase of deconfinement on June 1 (maps on June 1, 7, 8, 14 and 15).

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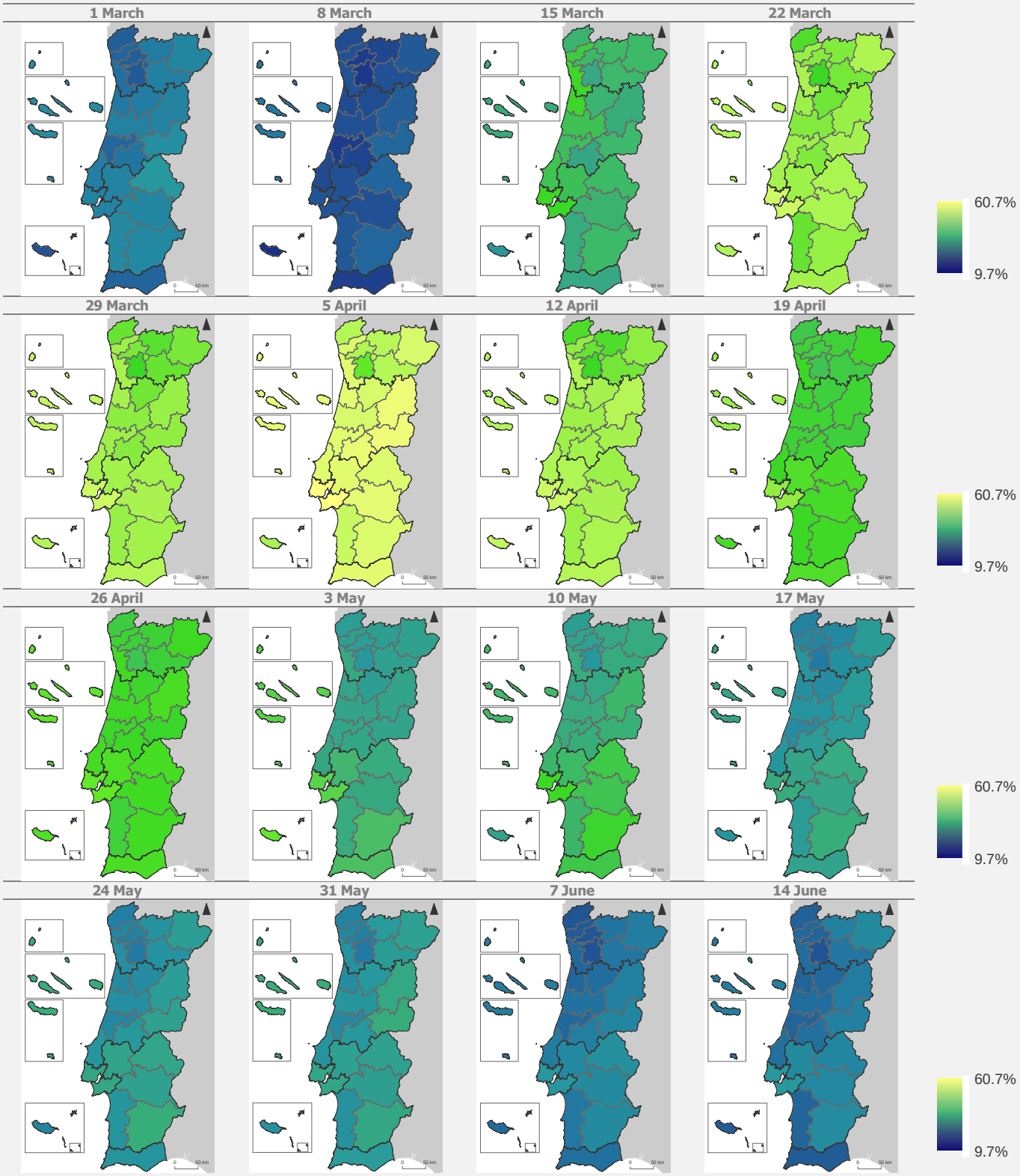
Figure 15: Proportion of the population "staying put" on Sundays between March 1st and June 14th by NUTS 3



Source: Facebook's "Data for Good" Initiative. Data provided by Carnegie Mellon University.

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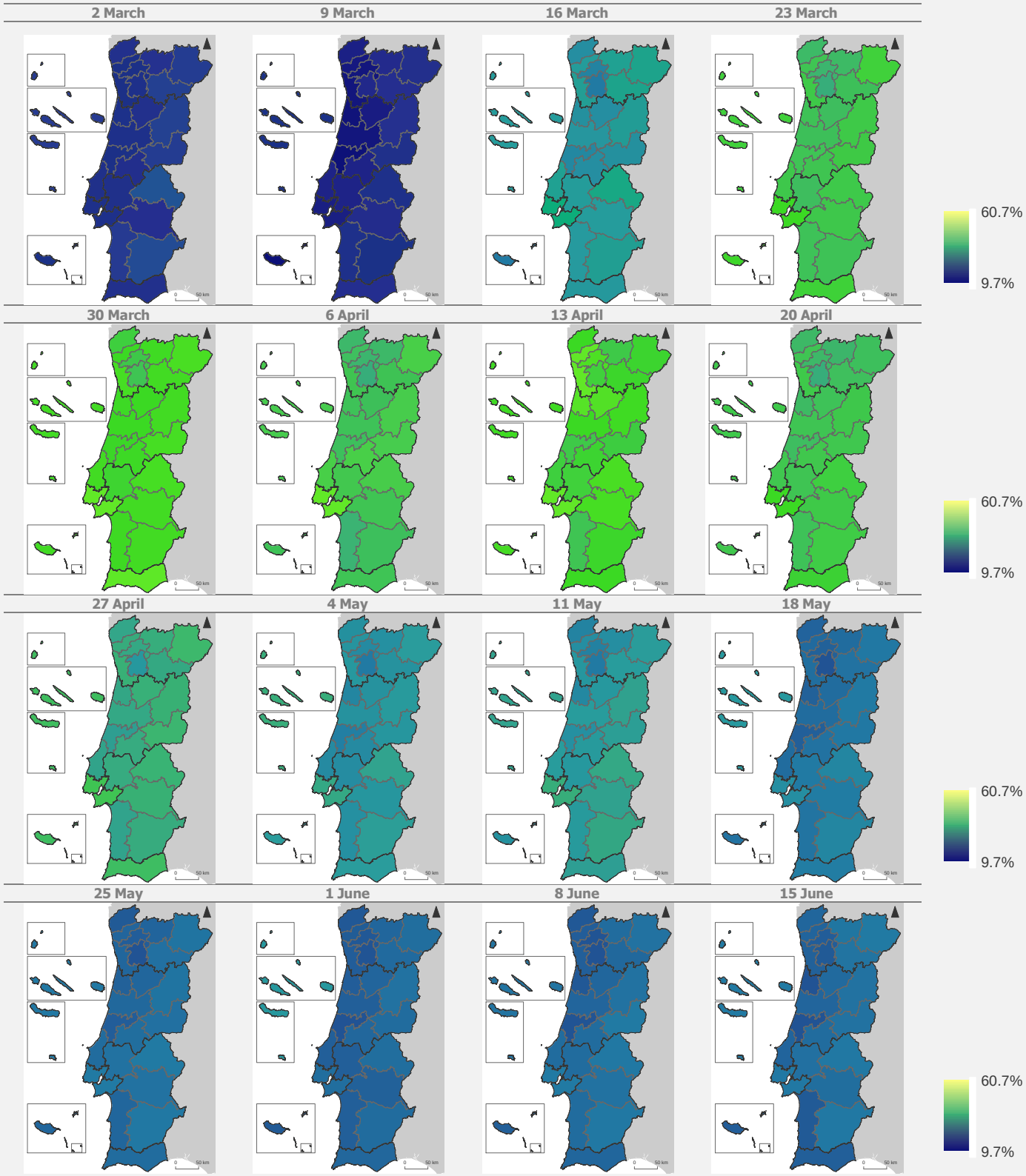
Figure 16: Proportion of the population "staying put" on Mondays between March 2nd and June 15th by NUTS 3



Source: Facebook's "Data for Good" Initiative. Data provided by Carnegie Mellon University.

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Technical Note:

The mobility data from Facebook's "Data for Good" Initiative correspond to location updates collected from mobile devices of Facebook application users that have the "location history" option turned on. Only location accuracy (GPS) data of less than 200 meters is considered and if a user has multiple locations resulting from more than one associated mobile device, Facebook only considers the data with the highest location accuracy. Obtaining results for the NUTS 3 level implies a minimum of 300 unique users per sub-region.

The proportion of the population "staying put" is measured by the number of Facebook users associated with a single 600mx600m reference grid during 8am and 8pm on day x, requiring at least three occurrences during that time period. The reference grid, as a "residence" proxy, is measured daily based on the largest number of locations observed between 8pm and midnight on day x-1 and between 0 am and 8 am on day x, requiring at least three occurrences during that time period.

The information associated with the 600mx600m grids is allocated to the respective NUTS 3 sub-region. Since a grid can intercept more than one sub-region, 9 sample points are generated in each grid, assigning 1/9 of the grid population to each point in the sample.

Facebook's "Data for Good" initiative aims to provide data for research on humanitarian issues and has allowed results to be published in scientific articles particularly in the United States. Obviously, Statistics Portugal's use of this data source in the Statslab domain is not motivated by any publicity motive, but by the public interest of the information. Statistics Portugal thanks researcher Miguel Godinho Matos[1] for his support in the analytical preparation of this information

[1] Associate Professor at Católica Lisbon School of Business & Economics and visiting research scholar at the Carnegie Mellon University.

Technical note

Data sources

Data on **Deaths** correspond to general deaths (all causes of death) occurring in the national territory since March 1st, 2020 and until the Tuesday of the week prior to publication. The information is preliminary and is obtained from statistical operations of direct and exhaustive collection on deaths occurring in Portuguese territory using facts that are subject to compulsory civil registration (death) in the *Sistema Integrado do Registo e Identificação Civil* (SIRIC). In addition to administrative information obtained from Civil Register Offices, Statistics Portugal collects an additional set of variables identified as statistically relevant to the National Statistical System (NSS) and the European Statistical System (EES). Data are recorded and sent electronically, in compliance with the requirements set out by Statistics Portugal and laid down in liaison with the *Instituto de Registos e Notariado* (IRN) and the *Instituto de Gestão Financeira e Equipamentos da Justiça* (IGFEJ).

Data on the number of confirmed cases are based on those published daily in the **Directorate-General of Health COVID-19 Status Report** for the entire country and by municipality. The confirmed cases are referenced to the municipality of occurrence and correspond to the total of clinical notifications in the SINAVE (National System of Epidemiological Surveillance) system. For the reference dates considered in this press release –June 17 – data by municipality corresponded, respectively, to 90% of confirmed cases in the national territory. This proportion reflects data confidentiality by municipality, but also limitations in the process of spatial referencing of information. In fact, when the confirmed cases by municipality are fewer than 3, for confidentiality reasons, data are not disclosed by the Directorate-General of Health.

Data on dwellings sales are based on the use of administrative procedures, namely from anonymised administrative tax data obtained from the Portuguese Tax and Customs Authority (AT) under an agreement signed with Statistics Portugal, on the Municipal Property Transfer Tax (IMT) and the Municipal Property Tax (IMI). The calculation is based on the linking of information from IMT with that from IMI and only sales where the IMT destination code is "Housing" are used and the associated information from IMI is defined as "Housing". The calculations follow the methodology described in the Methodological Document "**House Price Statistics at Local Level**". As part of the monitoring of the impact of the COVID - 19 pandemic, Statistics Portugal anticipates the dissemination calendar and calculates the indicator of the number of dwellings sales for each month, preliminary estimates, corresponding to the information recorded in the reference month and the two previous months, i.e. with a reference period of 3 months.

Also, data on new lease agreements are based on administrative procedures, namely from anonymised administrative tax data provided by the Portuguese Tax and Customs Authority (AT) under an agreement signed with Statistics Portugal, on the Statement of Stamp Duty Model 2 - Communication of lease agreements (Model 2) and the Municipal Property Tax (IMI). The calculation is based on the linking between Model 2 information with that of IMI. The first declarations and declarations of substitution of new lease agreements for urban buildings, with a monthly rent period, for which the purpose is permanent housing, and the associated information from IMI is defined as "Housing", are used. The calculations follow the methodology described in the Methodological Document of "**House Rental Statistics at Local Level**". As part of the monitoring of the impact of the COVID - 19 pandemic, Statistics Portugal anticipates the dissemination calendar and calculates the indicator of the number of new lease agreements for each month, preliminary estimates, corresponding to the information on the new lease agreements registered in the reference month and the two previous months, i.e. with a reference period of 3 months. In this context of preliminary estimates, an error in the calculation of the information disseminated in the press lease of 22 May took place, leading to an underestimation of the number of new lease agreements for the months of January, February and March 2020. The image that resulted from this calculation, in general, did not affect the relative position of the NUTS 2 regions or the trend in the period from January to March 2020.

This press release includes the resident population data as of December 31, 2019 released on June 15.

Disseminated Indicators

Number of total deaths, by sex or age group

Number of deaths in the last 4 weeks per deaths in the same reference period

Number of confirmed cases of COVID-19 disease per 10 thousand inhabitants

Population density

Number of new confirmed cases of COVID-19 disease in the last 7 days per 10 thousand inhabitants

Proportion of resident population with 75 or more years old

Number of new lease agreements per one thousand conventional dwellings

Number of dwellings sales per one thousand conventional dwellings

Relation between the number of dwellings sales in April 2020 (last 3 months) and sales in the same reference period

Location coefficient

The location coefficient (LC) is obtained using the following formula:

$$LC = \left(\frac{1}{2} \sum_{j=1}^{n} \left| x_j - y_j \right| \right) \times 100$$ where:

x_j corresponds to the ratio of the number of confirmed cases of COVID-19 in each municipality *j* to the number of confirmed cases of COVID-19 for the total country;

y_j corresponds to the ratio between the resident population in each municipality *j* and the total resident population in the country.

The Location coefficient varies between 0 and 100, with values closer to 100 reflecting greater inequality in the distribution of confirmed cases of COVID-19 against the total resident population and, in this sense, indicates situations of greater territorial concentration.

The location curve (or Lorenz concentration curve) corresponds to a graphical representation that relates the cumulative distribution of two variables. This representation also includes the straight line of equal distribution, and the greater the distance from it, the greater is the concentration of the variable represented in the ordinate axis (in this analysis, the confirmed cases of COVID-19, by period of reference) versus the variable represented in the abscissa axis (in this analysis, the total resident population).