

COVID-19 in Cuban children and adolescents. Fourth report. Epidemiological weeks from 41 to 6. From October 4, 2020 to February 13, 2021.

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This report is a continuation of the study of epidemiological characteristics and spatial epidemiology of COVID-19 in children and adolescents. In the previous report, the third in the series (until week 40/2020), the presence of a then-developing second wave, started in week 31, was argued. This fourth report refers to developments between week 41/2020 and week 6 of the current year, a period that has conventionally been divided into three phases, according to epidemiological weeks; EW 41-48/2020, EW 49-53/2020 and EW 1-6/2021.

From mid-March 2020, the date of first confirmation, to week 40 analyzed in the third report, there were a total of 640 cases. Between weeks 40 and 6 of the current year, 3548 were reported, which demonstrates an increase in the virus's transmission in children and adolescents.

The descriptive cross-sectional study shows particularities of the propagation of the epidemic according to individual characteristics such as the sex and age of the infected children and adolescents. It also describes and analyzes the dispersion by municipality of cases, and through a few examples, the occurrence of community and institutional epidemic outbreaks.

The main sources for the study, as with the previous reports, are the database of the Health Watch Office of the Ministry of Public Health, other databases of the National Statistics and Information Office (ONEI), as

well as cartographic resources from the GeoCuba Business Group. Similarly, the data used for the analysis may have been modified and updated after the date of this report.

1.1 Evolution and general characteristics of COVID-19 in children and adolescents. Epidemiological weeks from 41/2020 to 6/2021

Although a drop in case detection can be observed in weeks 41 and 42, it rises again in the two following weeks, decreases between weeks 45 and 47 to about 30 cases, and finally increases in week 48 to about 50. The rise and fall in the number of confirmed cases is justified, essentially, due to the occurrence of several epidemic outbreaks in some of the country's localities and municipalities.

This proves the continuity of the second epidemic wave between weeks 31 and 48, matching the Ministry of Public Health's consideration of it as a second evolutionary period of the pandemic in the country.

The cases confirmed in the so-called pediatric ages rise from week 49, and in the following four weeks remain between 76 and 87 cases, the highest numbers in the course of the epidemic in this age range. This increase between weeks 49 and 53 is of little consideration when the evolution of the epidemic is observed in the total period being studied.

From the last week of the year, the detection of cases rises in the country, which would indicate the beginning of a third epidemic wave that until week 6/2021 shows the continuance of an elevated transmission of COVID-19 in children and adolescents. (Figures 1 and 2).

Cases by date of confirmation

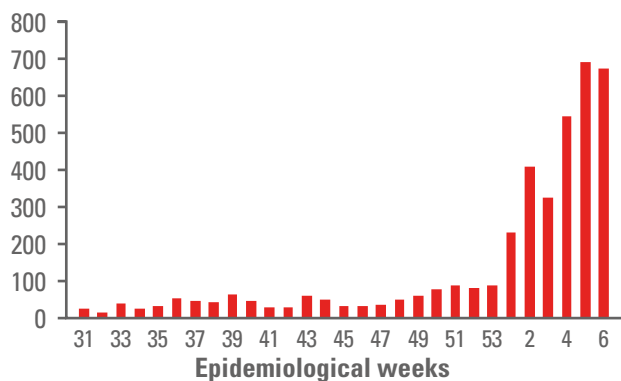


Figure 1. Cuba. Confirmed cases in children and adolescents. Weeks 31/2020 to 6/2021.

Source: Daily MINSAP reports. Database of the Health Watch Office.

Cases by date of confirmation

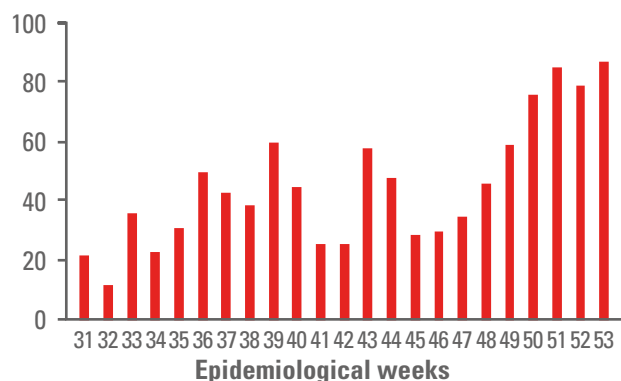


Figure 2. Cuba. Confirmed cases in children and adolescents. Weeks 31/2020 to 53/2020.

Source: Daily MINSAP reports. Database of the Health Watch Office.

The detection rates show values around one in 10,000 between weeks 41 and 48, are generally above 2 in 10,000 between weeks 49 and 53, and rise notably between weeks 1 and 6/2021, reaching more than 20 in 10,000 children and adolescents in the last three weeks. Between weeks 1 and 6 are 81% of all cases of children and adolescents in the period being studied.

The observed increase includes imported cases, which reach values close to and above 40% of total cases confirmed in weeks 52 and 53, and decrease in the following weeks. (Figures 3 and 4).

Cases by date of confirmation

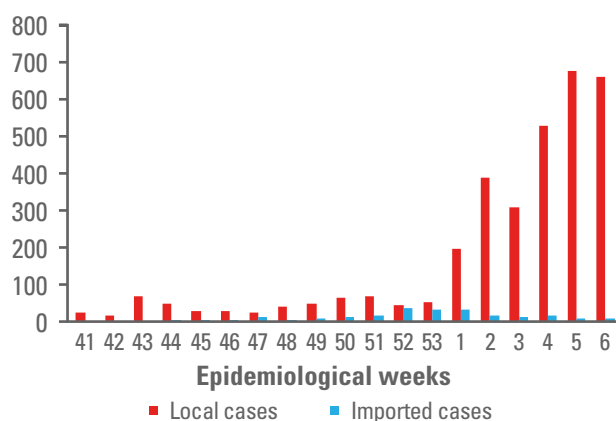


Figure 3. Local and imported COVID-19 cases in children and adolescents. Weeks 41/2020 to 6/2021.

Source: Daily MINSAP reports. Database of the Health Watch Office.

Cases by date of confirmation

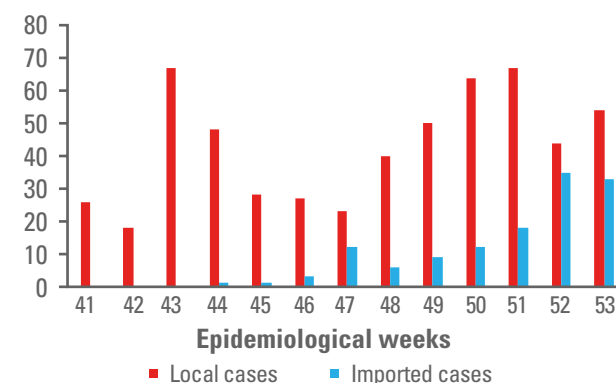


Figure 4. Local and imported COVID-19 cases in children and adolescents. Weeks 41/2020 to 53/2020.

Source: Daily MINSAP reports. Database of the Health Watch Office.

The detection of cases in children and adolescents from the total confirmed cases in 40 weeks of evolution was approximately 11%.¹ Between weeks 41 and 53, it was 10.34%, and between weeks 1 and 6/2021 the most intense transmission of the period occurred and the percentage of cases in children and adolescents from the total detected cases increased slightly to more than 11%. In 16 of the 19 weeks covered in the period being studied, the relative frequency of cases in pediatric ages from the total detected cases in the country exceeded 10%, and in two of them it even reached 15%. (Figure 5).

¹ This is calculated using a total number of cases not counting imported ones, from the date in which all persons arriving in the country were isolated in centers created for that purpose, or in healthcare facilities.

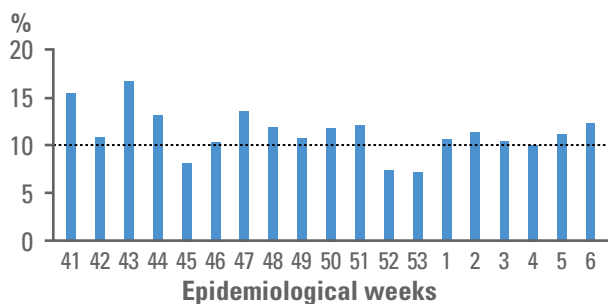


Figure 5. Percentage of cases in children and adolescents from the total confirmed cases in the country by epidemiological weeks.

Source: Daily MINSAP reports. Database of the Health Watch Office.

As a regular feature of the epidemic, differences by sex remain non-significant. A slight predominance of cases in males can be observed between weeks 41 and 53/2020, and similar frequencies between weeks 1 and 6/2021. (Figures 6 and 7).

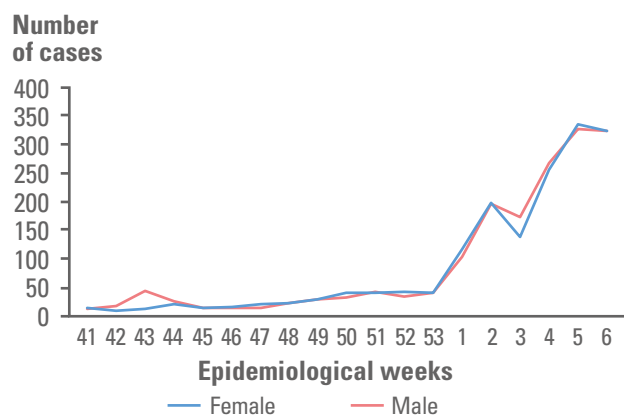


Figure 6. COVID-19 cases in children and adolescents by sex and epidemiological weeks.

Source: Daily MINSAP reports. Database of the Health Watch Office.

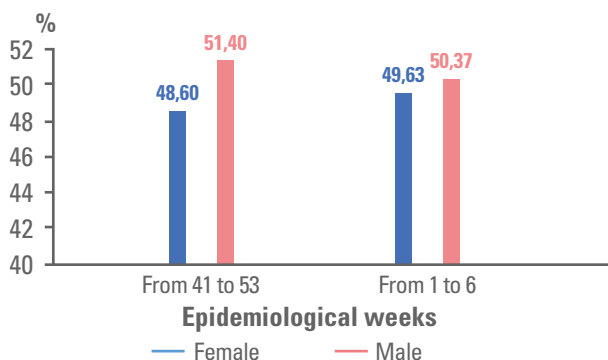
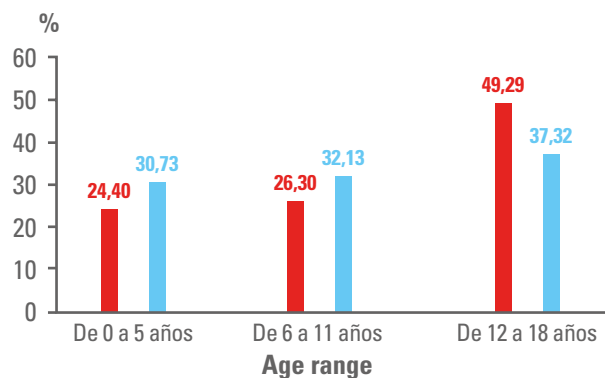


Figure 7. Relative frequency of cases by sex and phases.

Source: Daily MINSAP reports. Database of the Health Watch Office.

The 12-to-18-years age group remains the one with more detected cases, and it goes up from having 42.86% of all 0-to-18-years cases in the last report to

49.29%. According to the structure of the population between 0 and 18 years by age aggregate, detection in the 0-to-5-years and the 6-to-11-years groups remains below the proportion of the total these groups represent. The opposite happens in the 12-to-18-years group, which concentrates 49.29% of cases while representing 37.32% of this population. This shows its overrepresentation in the incidence of COVID-19 in the country. (Figures 8 and 9).



■ % of cases from 0 to 18 years ■ % of population from 0 to 18 years

Figure 8. Cases by age groups as percentage of total cases from 0 to 18 years.

Source: Daily MINSAP reports. Database of the Health Watch Office.

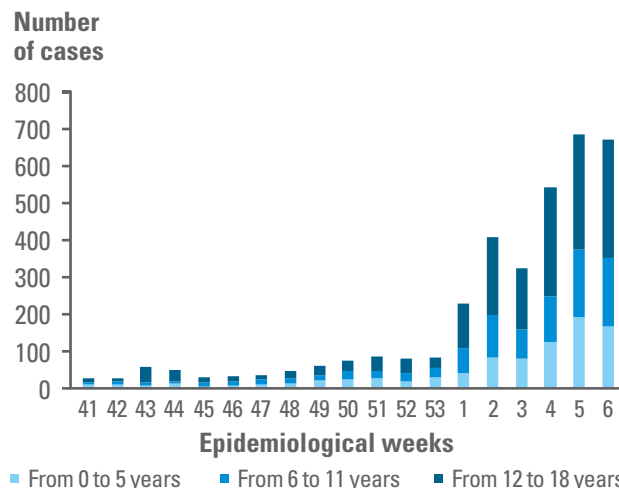


Figure 9. Confirmed cases by age groups and epidemiological weeks.

Source: Daily MINSAP reports. Database of the Health Watch Office.

Case totals show the similarity in sex distribution and the increase of incidence in the 12-to-18-years group in the last weeks of the study (Figures 10 and 11). The 0-to-5-years group remains with approximately 25% of total confirmed cases from 0 to 18 years, with this group representing 30% in the structure of the country's population from 0 to 18 years.

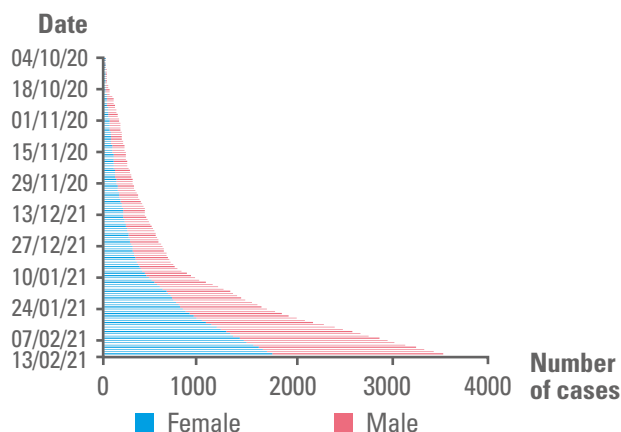


Figure 10.Total cases in children and adolescents by sex.
Source: Daily MINSAP reports. Database of the Health Watch Office.

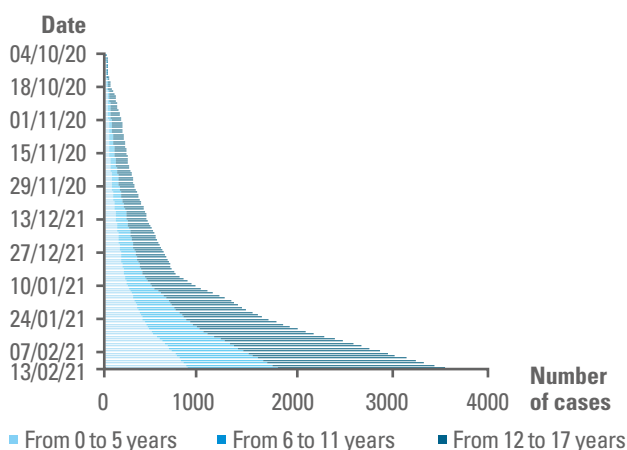


Figure 11.Total cases in children and adolescents by age groups.
Source: Daily MINSAP reports. Database of the Health Watch Office.

In correspondence with what has happened in the general population, and in the population between 0 and 18 years, confirmed cases in the population under one year of age rose notably from the last few weeks of 2020 and particularly from week 1/2021 (January 3 to 9). It illustrates the seriousness of this situation that in 40 weeks of evolution of the epidemic, 16% of total cases were reported between weeks 12 and 40/2020 and the following 19 weeks (the period covered in this report - week 41/2020 to week 6/2021) concentrate 84% of total children under one year of age infected with COVID-19 in the country.

As in the weeks previous to this report, asymptomatic children and adolescents predominate, and in the symptomatic group, there's a predominance of those with respiratory symptoms such as nasal congestion and secretion, sore throat, otitis and respiratory distress deriving in pneumonia. (López 2021). Between

weeks 41 and 53, 72% of confirmed cases in pediatric ages had this condition, which was reduced to slightly over 52% of the total between weeks 1 and 6.

I.2 Distribution by province of children and adolescents (from 0 to 18 years) confirmed with COVID-19

The detection of COVID-19 cases in children and adolescents maintains its high heterogeneity regarding units of political-administrative division, as should be expected, given the complex set of causes that explain its territorial spreading.

The confirmed cases in the country's provinces, according to the three phases in which the period being studied has been conventionally divided, show the greatest concentration in the province of La Habana. This province concentrates 35% of the total recorded cases in children and adolescents during that period.

In general, all provinces show an increase in the number of confirmed cases and in the incidence through the three defined phases, with the exception of the provinces of Pinar del Río and Sancti Spíritus, which have a higher number between weeks 41 and 48 as a result of relatively intense community outbreaks occurring in that period, as well as in Mayabeque and Las Tunas between weeks 49 and 53.

In the country's provinces, the number of cases rises notably in the third phase (weeks 1 to 6) with the sole exception of Las Tunas. (Figures 12 and 13).

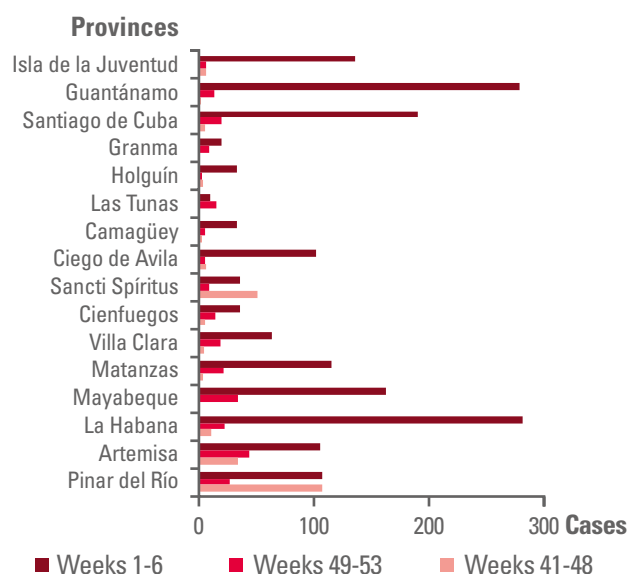


Figure 12.COVID-19 cases in children and adolescents by aggregates of epidemiological weeks.
Source: Daily MINSAP reports. Database of the Health Watch Office.

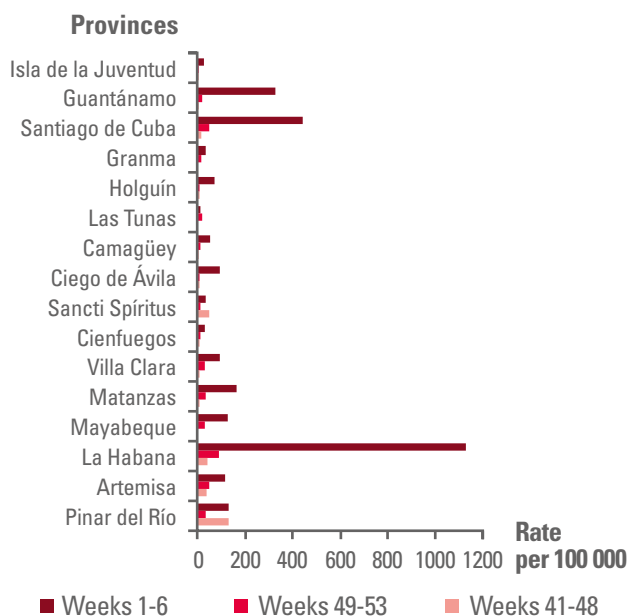


Figure 13. Incidence rates of COVID-19 in children and adolescents by aggregates of epidemiological weeks. **Source:** Daily MINSAP reports. Database of the Health Watch Office.

One characteristic to be highlighted in the evolution of the epidemic in children and adolescents is the reduction of cases in the province of La Habana between weeks 42 and 48. This province concentrated merely 10.48% of the total confirmed cases in pediatric ages in the five weeks from October 18 to November 21. Meanwhile, the highest number was recorded in the western province of Pinar del Río, with 51% of the total confirmed cases in those ages. In the following weeks, case detection increased in La Habana once again, with figures close to the aggregate of detected cases in the rest of the provinces during the last weeks of the study. (Figure 14).

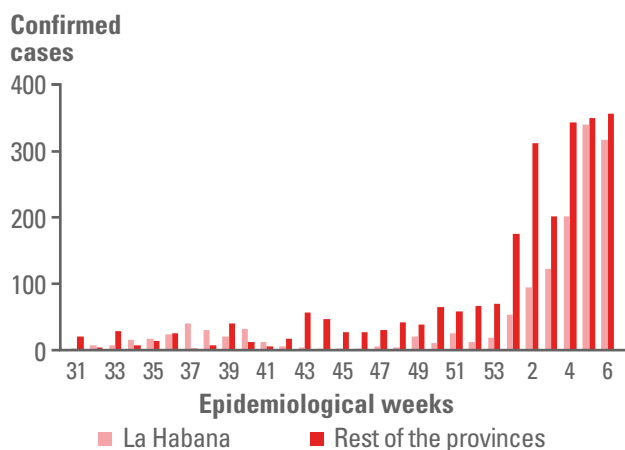


Figure 14. Cuba. Confirmed cases in children and adolescents in La Habana and in the rest of the provinces. **Source:** Daily MINSAP reports. Database of the Health Watch Office.

Approximately 8% of the total confirmed cases between weeks 41/2020 and 6/2021 were imported, and concentrated in the provinces of La Habana, Ciego de Ávila and Matanzas. 18% of imported cases were recorded between weeks 41 and 53, the majority of them in Cuban nationals residing in the country, with a lower frequency in foreign nationals at tourist areas or in foreign residents, of which close to 80% correspond to weeks 48 to 53, associated with the period of family gatherings at the end of the year. Between weeks 1 and 6, imported cases were reduced to 3% of the period's total

I.3 Distribution by municipality of children and adolescents (from 0 to 18 years) confirmed with COVID-19

The territorial spreading of COVID-19 shows a higher dispersion in the municipalities of the western provinces and the central province of Sancti Spiritus, where all of the municipalities confirmed infection in the period being studied. The number of municipalities with confirmed cases in the central region of the country was reduced, and it particularly dropped in the eastern region. In the province of Camagüey, 53% of its municipalities had not detected cases in children and adolescents, and this number rose to 72% of all municipalities in the province of Las Tunas. This holds a close relation with the lower transmission these provinces recorded in their general population. (Figure 15).

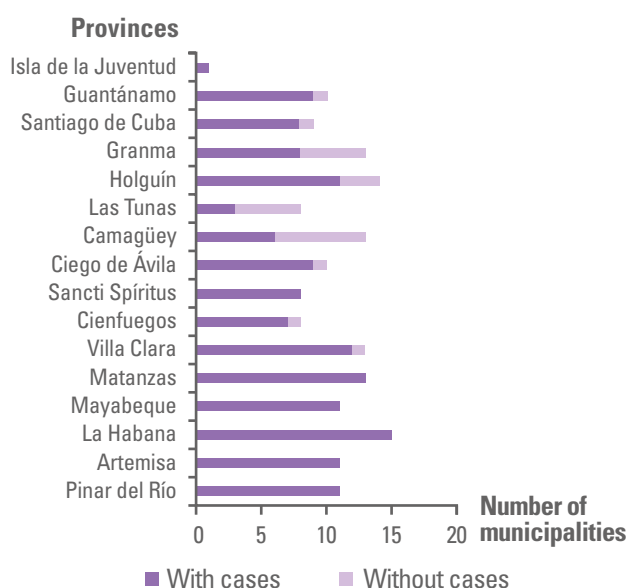


Figure 15. Amount of municipalities by province and special municipality by case detection between weeks 41/2020 and 6/2021.

Source: Daily MINSAP reports. Database of the Health Watch Office.

In the distribution of confirmed cases by municipalities, as it commonly occurs, the heterogeneity of detection grows. Between weeks 41 and 48/2020, 53 municipalities reported cases (31.54% of the total). The highest incidence is observed in municipalities of the western province of Pinar del Río, and in the province of Mayabeque's municipality of Caimito, due to the intense transmission at an institution in the territory. Between weeks 49 and 53/2020, the number of municipalities with diagnosed cases of COVID-19 grew to 77

(54% of the total). Compared with the previous period, the number of cases shows a slight increase.

From week 1 to week 6/2021, close to 80% of municipalities reported cases (133). Although there was a notable increase in the number of confirmed cases in the country, these are concentrated in two municipalities in the eastern region (Guantánamo and Santiago de Cuba), in municipalities of the country's capital and in others where provincial capitals and second cities are located. (Figure 16, maps 1, 2 and 3).

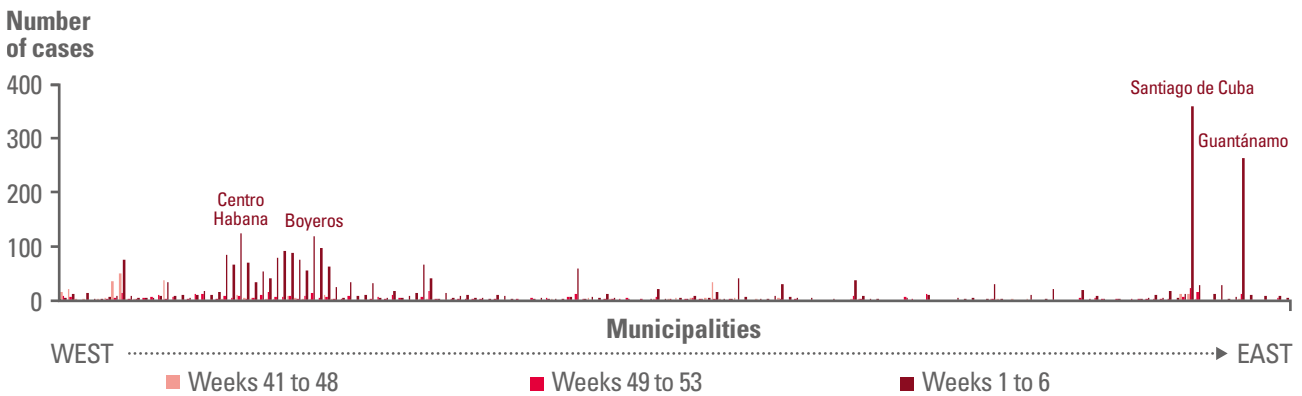
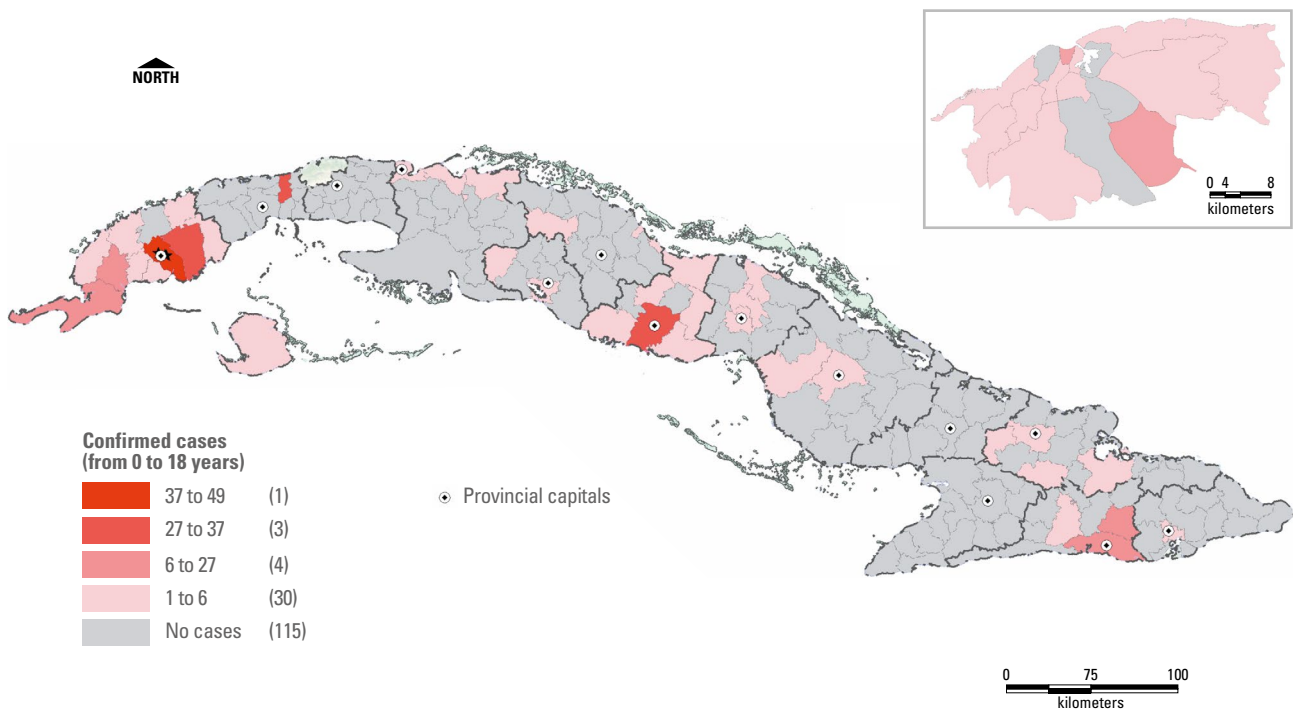


Figure 16. COVID-19 cases in children and adolescents by municipalities EW 41-48, EW 49-53, EW 1-6 of 2021. Each bar represents a municipality in one of the phases.

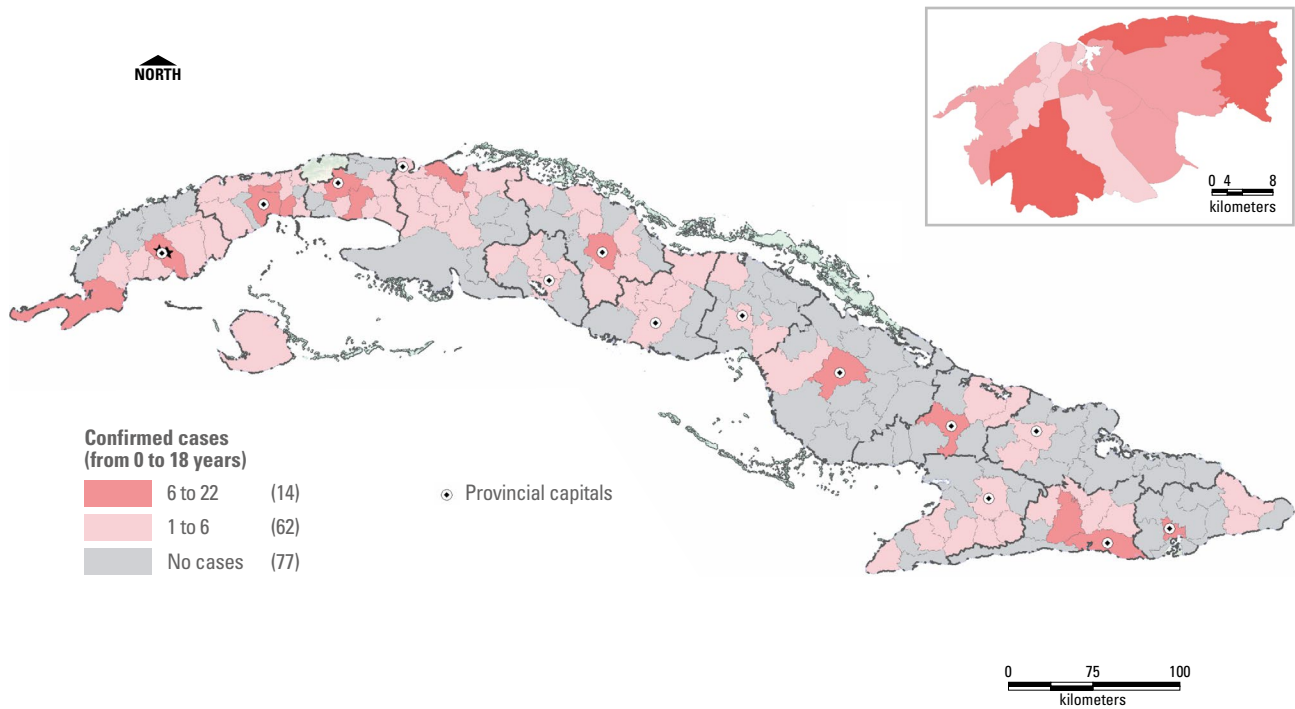
Source: Daily MINSAP reports. Database of the Health Watch Office.

Map 1. Cuba. COVID-19 cases in children and adolescents. Weeks 41 to 48 (from October 4 to November 28, 2020).



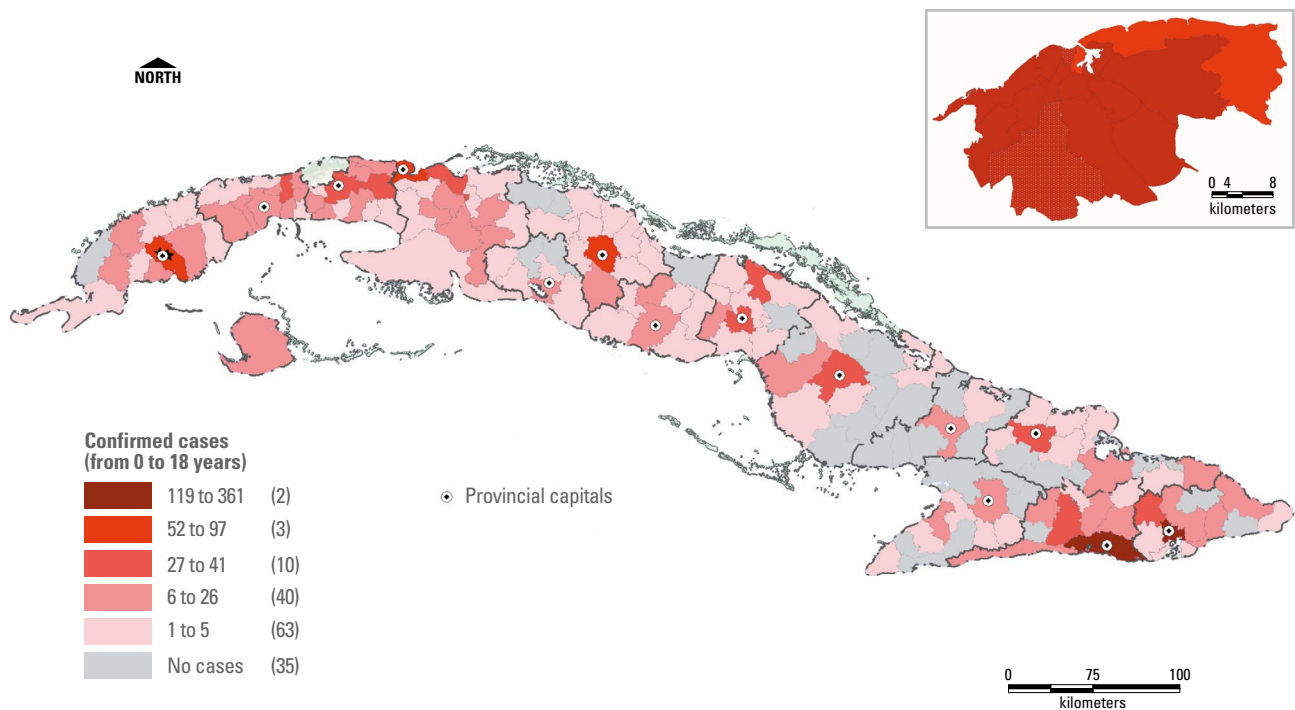
Source: Daily MINSAP reports. <https://salud.msp.gov.cu/>
Digital Cartographic base 1:1 000 000 GeoCuba.
Author: Luisa Íñiguez Rojas, Flacso, University of Havana
Ángel Miguel Germán Almeida. IPK. Minsap

Map 2. Cuba. COVID-19 cases in children and adolescents. Weeks 49 to 53 (from November 29, 2020 to January 2, 2021).



Source: Daily MINSAP reports. <https://salud.msp.gov.cu/>
 Digital Cartographic base 1:1 000 000 GeoCuba.
 Author: Luisa Íñiguez Rojas, Flacso, University of Havana
 Ángel Miguel Germán Almeida. IPK. Minsap

Map 3. Cuba. COVID-19 cases in children and adolescents. Weeks 1 to 6 (from January 3 to February 13, 2021).



Source: Daily MINSAP reports. <https://salud.msp.gov.cu/>
 Digital Cartographic base 1:1 000 000 GeoCuba.
 Author: Luisa Íñiguez Rojas, Flacso, University of Havana
 Ángel Miguel Germán Almeida. IPK. Minsap

The territorial heterogeneity of detection remains, as has been a characteristic of the spreading of the epidemic in Cuba and within countries. In the period covered in this report, 25 municipalities had not confirmed cases, the majority of them in the country's eastern region and in the eastern-central province of Camagüey. Although half of them have less than 30,000 inhabitants, some are included with more than 40,000 and a few are close to 60,000 inhabitants.

The distribution of cases by population size of the municipalities shows that 65% of total cases were recorded in the most populous ones (those having more than 100,000 inhabitants), which are overrepresented in the epidemic in the country. This situation puts them at a clear disadvantage in comparison with the rest of municipalities according to their size (by number of inhabitants), which are underrepresented, since the percentage the total 0-to-18-years population makes out of the total population is higher than the percentage of cases detected in them. (Figure 17).

In correspondence with the heterogeneity of confirmed cases and the differences in the amount of population from 0 to 18 years, the total incidence rates show variation by municipalities that range from less than one in 10,000 to slightly over 60 in 10,000 in the period

between weeks 41 and 6 of the current year. The rise in the detection of COVID-19 cases in pediatric ages is joined by the increase in affected municipalities.

Between weeks 41 and 48/2020, cases were confirmed in 26% of the country's municipalities, rising to 32% between weeks 49 and 53/2020, and reaching 79% between weeks 1 and 6/2021. This demonstrates the high territorial spreading of infection in children and adolescents, in correspondence with the rising number of cases in the general population. (Figures 18, 19 and 20).

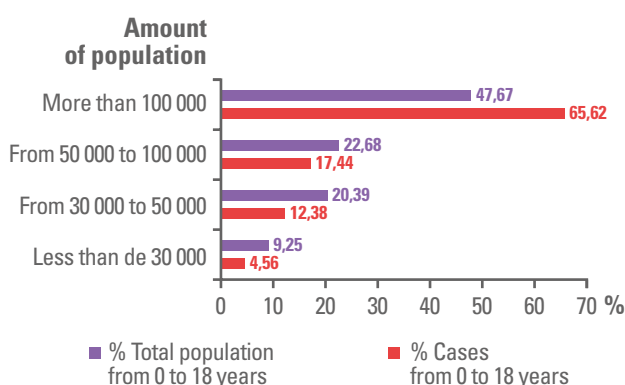


Figure 17. Distribution of confirmed cases by aggregate of municipalities grouped by population size. Weeks 41 of 2020 to 6 of 2021.

Source: Daily MINSAP reports. Database of the Health Watch Office.

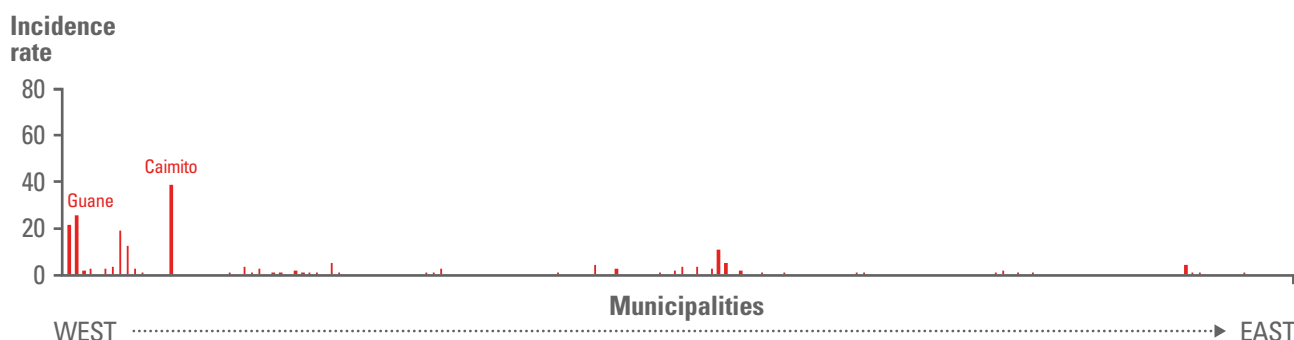


Figure 18. Incidence rates of COVID-19 in children and adolescents by municipalities. Weeks 41 to 48.

Source: Daily MINSAP reports. Database of the Health Watch Office.

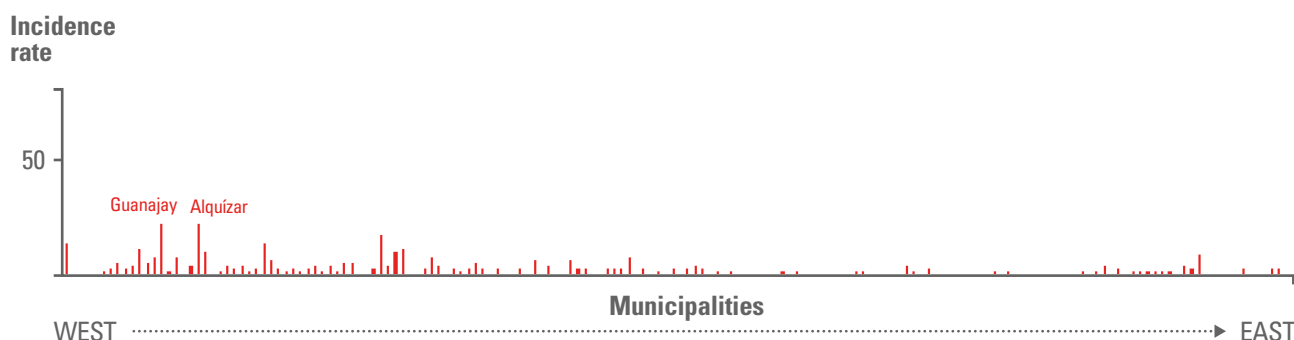


Figure 19. Incidence rates of COVID-19 in children and adolescents by municipalities. Weeks 49 to 53 of 2020.

Source: Daily MINSAP reports. Database of the Health Watch Office.

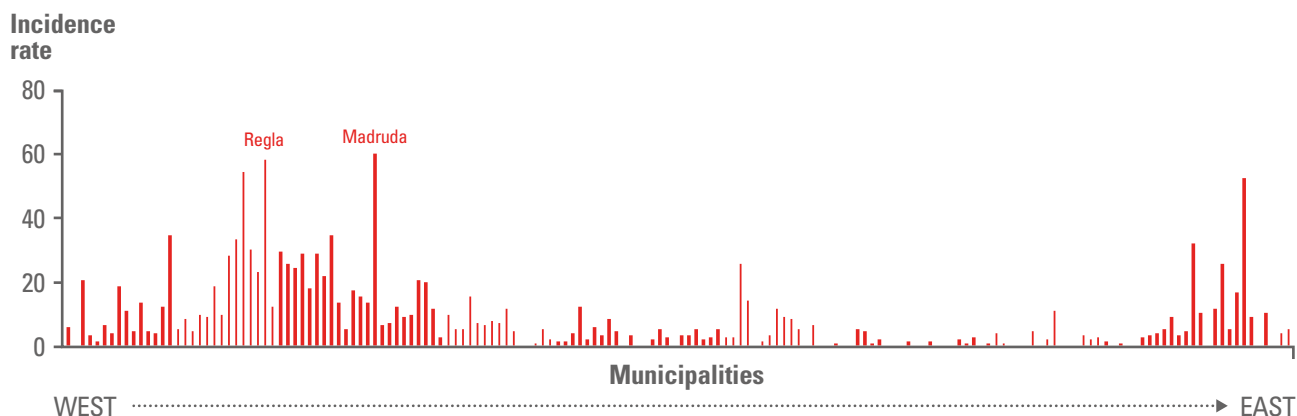


Figure 20. Incidence rates of COVID-19 in children and adolescents by municipalities. Weeks 1 to 6 of 2021.

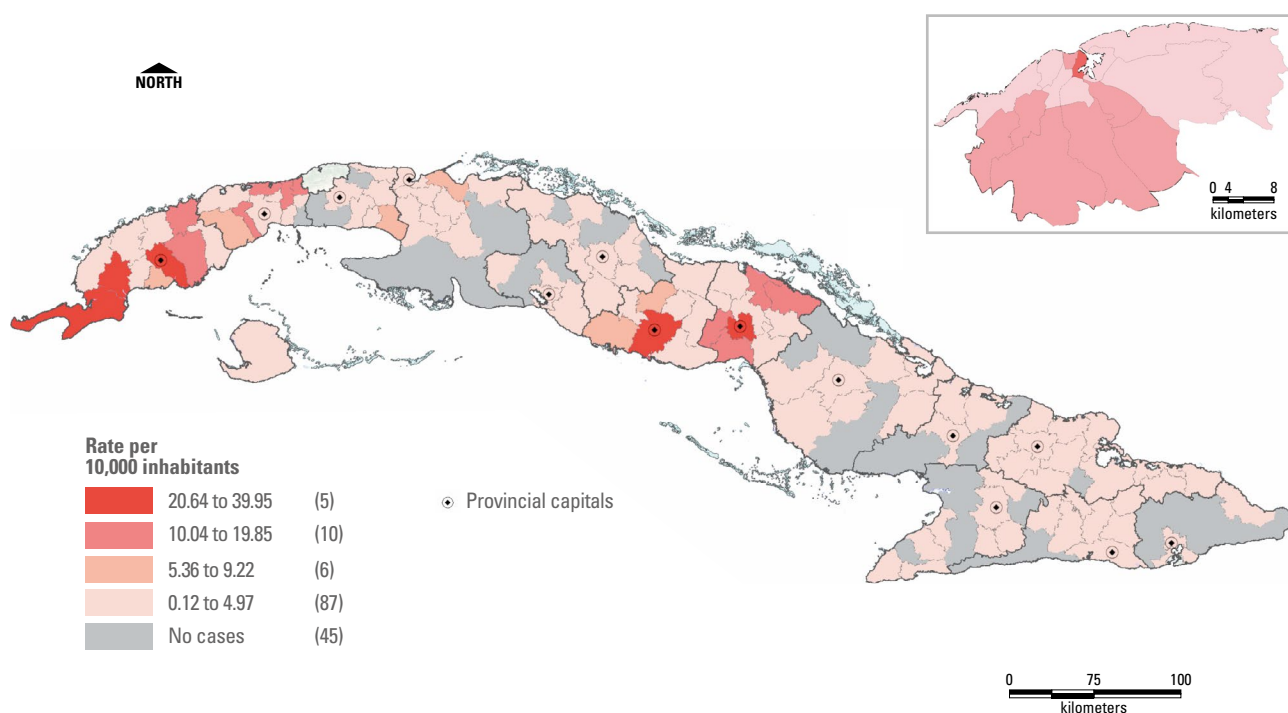
Source: Daily MINSAP reports. Database of the Health Watch Office.

Nevertheless, no cases had been detected in children and adolescents in twenty-five municipalities between week 12 of 2020 (date of first confirmation) and week 6/2021 (the last week covered by this report). The distribution of these municipalities is the following: three in the central region of the country, seven in the province of Camagüey (out of a total of 13), five in the province of Las Tunas (out of a total of 8), five in the province of Granma (out of a total of 13), three in Holguín

and one each in the provinces of Santiago de Cuba and Guantánamo.

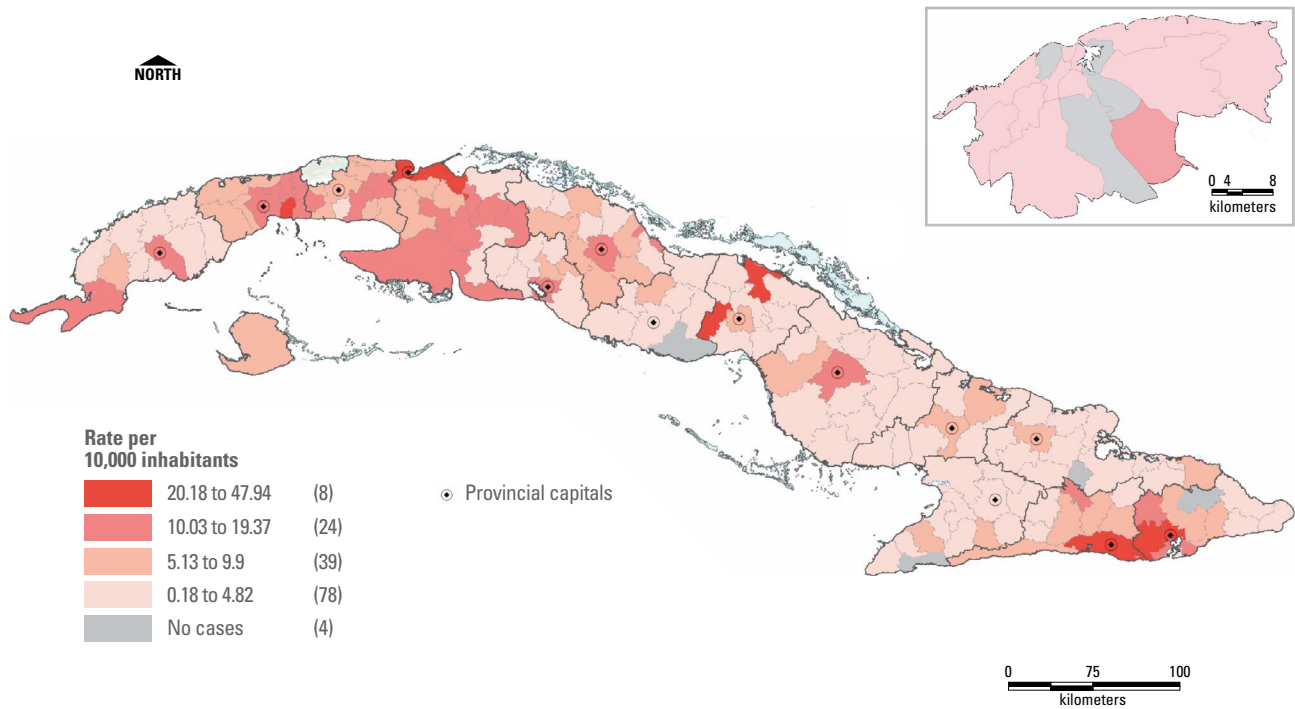
In the period covered by this report, these 25 municipalities also have low incidence rates in the population over 18. In 16 of them, less than 10 cases were detected, in seven of them between 10 and 16 and only one reported 21 cases (Amancio). The municipality of Yateras had not reported any cases.

Map 4. Cuba. Incidence rate of COVID-19 in children and adolescents by municipalities. Weeks 41 to 48 (from October 4 to November 28, 2020).



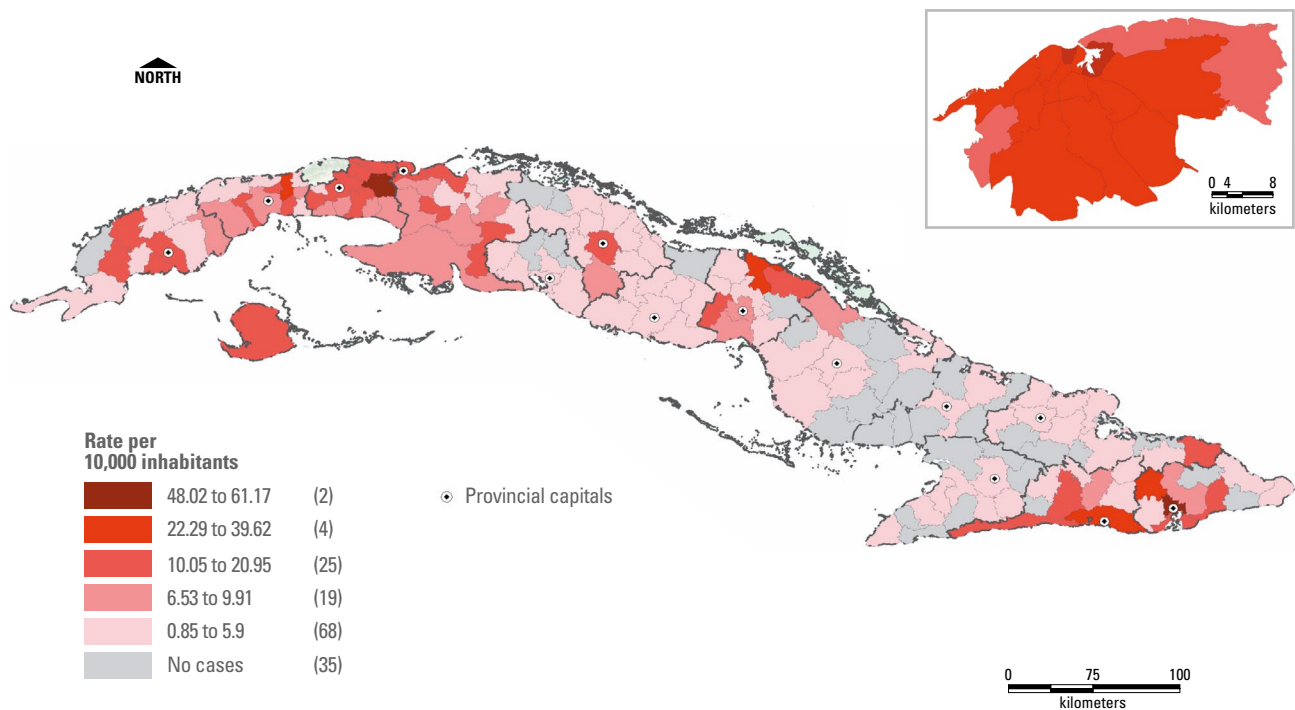
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Map 5. Cuba. Incidence rate of COVID-19 in children and adolescents by municipalities. Weeks 49 to 53 (from November 29, 2020 to January 2, 2021).



Source: Daily MINSAP reports. <https://salud.msp.gob.cu/>
 Digital Cartographic base 1:1 000 000 GeoCuba.
 Author: Luisa Íñiguez Rojas, Flacso, University of Havana
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Map 6. Cuba. Incidence rate of COVID-19 in children and adolescents by municipalities. Weeks 1 to 6 (from January 3 to February 13, 2021).



Source: Daily MINSAP reports. <https://salud.msp.gob.cu/>
 Digital Cartographic base 1:1 000 000 GeoCuba.
 Author: Luisa Íñiguez Rojas, Flacso, University of Havana
 Ángel Miguel Germán Almeida. IPK. Minsap

Conclusions:

Between weeks 41/2020 and 6/2021, a notable increase can be observed in the intensity of transmission and territorial spreading of COVID-19 in Cuban children and adolescents.

The amount of cases by epidemiological week leads to the distinction of three periods. A first period where the progression stage beginning in week 31 (July 26, 2020) continues until week 48 (from November 22 to 28, 2020) with a relative rise in transmission in comparison with previous weeks. The second one goes from week 49 to week 53 (from November 29, 2020 to January 2, 2021) with a low transmission and limited territorial spreading. And a final period with a notable rise in the number of cases in the general population –and in pediatric ages in particular– and territorial spreading.

Among children and adolescents, the number of cases rose along with that of other age groups, and was higher for all age groups during the final phase of the total period being studied. These increases consistently follow the rise in cases in adults. As in the previous report, incidence is higher in the 12-to-18-years group, and it generally records the highest weekly incidence of the selected age groups. Nevertheless, attention has been drawn to the rise in cases in children under 1 year of age since the start of 2021.

As in previous reports, no significant differences by sex have been recorded.

The progression of transmission in children and adolescents in the country shows a heterogeneous territorial distribution, with the highest intensity of infection in the western region of the country, in the national capital, provincial capitals and second cities.

25 municipalities remain having detected no cases in children and adolescents since the start of confirmations in March 2020, fifteen in the eastern region, 8 in the eastern-central region and two in the central region.

Undoubtedly, the rise in transmission is associated to the one in the adult population. The group of processes that have facilitated the progression of COVID-19 include the entry and circulation of new strains; some oversights in epidemiological watch, particularly related to control protocols; non-compliance with these protocols by persons and institutions, which is associated with a reduction of risk perception, and would explain the lack of discipline and irresponsible behaviors.

Other complex processes are involved in the increased transmission if the analysis is shifted from the individual to the social sphere. There are multiple forms in which new social dynamics have been organized, both in family and neighborhood settings, which either favor or block transmission, depending on cultural, economic, family and even geographical contexts related with connections to regional centers offering services.

On the other hand, adolescents organize their daily activities with a certain independence from others in their households. In this group, there's a higher frequency of contemporaries as a source of infection and of out-of-household contacts. In the lower-age groups, families are always decisive in transmission. The sources are usually parents and household members, so in-household contacts predominate (Íñiguez Rojas et al., 2020).

In this regard, and to illustrate the complexity of the transmission processes, the study group may have parents or some household member with a greater risk of infection, since they continue to attend their workplace, or, on the other hand, reside in a family environment where the parents remain at home teleworking, a more frequent scenario in urban spaces and less widespread in small towns, settlements or rural settings, or where the organization of daily life decides the same person always leaves the home in search for essential services.

In particular, more frequent infection is expected when there is a high number of household members and reduced living quarters, or when older adults or

younger siblings must care for children, with a higher probability of inattentions, which can happen at any moment.

The next report will go more deeply into matters of *where, how and why* there's a complex and heterogeneous transmission of COVID-19 in children and adolescents in the country.

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FOURTH REPORT BY THE PROJECT "COVID-19 IN
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SOCIAL SCIENCES AND HEALTH ISSUES. FLACSO-CUBA.
UNIVERSITY OF HAVANA

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