

# New Type 1 Diabetes in Children in The Dominican Republic During the COVID-19 Pandemic.

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Received: : February 28<sup>th</sup>, 2024; Accepted: March 02<sup>nd</sup>, 2024; Published: March 14<sup>th</sup>, 2024

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## Abstract

### Background

The Dominican Republic is a country of about 10 million habitants that occupies the eastern part of the island. La Hispaniola in the Caribbean. The incidence of type 1 diabetes mellitus in the country is 4.1 per 100,000. Children and adolescents with diabetes receive care in specialized pediatric endocrinology services in public institutions. As in the entire universe, the covid-19 epidemic affected our diabetic children and we analyzed the behavior in the appearance of new cases given the different reports in other countries in relation to the effect of covid-19 on type1 diabetes.

### Method

We evaluated the appearance of new cases of type 1 diabetes in children under 15 years of age during the period of the covid-19 epidemic in 2020, 2021, 2022 and related them to the previous year's already studied. A t- test was conducted

### Results

For the year 2020, 117 new cases were identified (incidence 3.84), in 2021 about 155 cases (incidence 5.09) and for 2022 about 158 cases (incidence 5.19).

During the period 2000-2019 our incidence was 4.1. There is NO statistically significant difference in relation to the different periods of study according with the T-test.

**Keywords:** COVID-19, Diabetes, Children, Epidemiology, Dominican Republic.

## Introduction

The Dominican Republic occupies the eastern part of the island of Hispaniola in the Caribbean with a population of about 11 million [1] and was one of the first countries to control the COVID-19 pandemic according to the WHO. The incidence of Type 1 diabetes mellitus in the country is 4.1 cases per 100,000 habitants [2].

Viral infections can increase the risk of developing Type 1 diabetes, and recent reports suggest that the Coronavirus 2019 (COVID-19) epidemic could increase the incidence of Type 1 diabetes in children as well as ketoacidosis [3].

Children and adolescents diagnosed with Type 1 diabetes during the pandemic displayed a more severe disease at diagnosis [4] but with a better prognosis and low mortality. Complications of COVID-19 in children include multisystemic inflammatory syndrome, myo-pericarditis and less frequent COVID of the longer lasting kind [5].

Although diabetes mellitus in children presents the same characteristics everywhere, its insulin dependence among others,

we were interested in determining what it had been like in a developing country such as the Dominican Republic during the COVID-19 pandemic, since the literature that is usually reported comes from countries with better organization of their healthcare system and socioeconomic development [6].

## Method

The records of the centers that care for diabetics under 15 years of age in the country were reviewed, identifying those new cases diagnosed during the years of the covid-19 pandemic (2020,2021,2022). The diagnosis of diabetes mellitus was made by pediatric endocrinologists. Consistent with ADA criteria. The population of children under 15 years of age was determined during the years of study in accordance with the country's population pyramid and, based on this information, the incidence of new cases of type 1 diabetes mellitus per year was analyzed.

The incidence rate of the years 2020, 2021 and 2022 was compared using a t-test. With the annual incidence established for the period 2010-2019 in a national study that was 4.1/100,000.

## Results

Year	Population	Population <15 years	Cases	Incidence Rate
2020	10999663	3046906	117	3.84
2021	11117873	3046297	155	5.09
2022	11228821	3043010	158	5.19

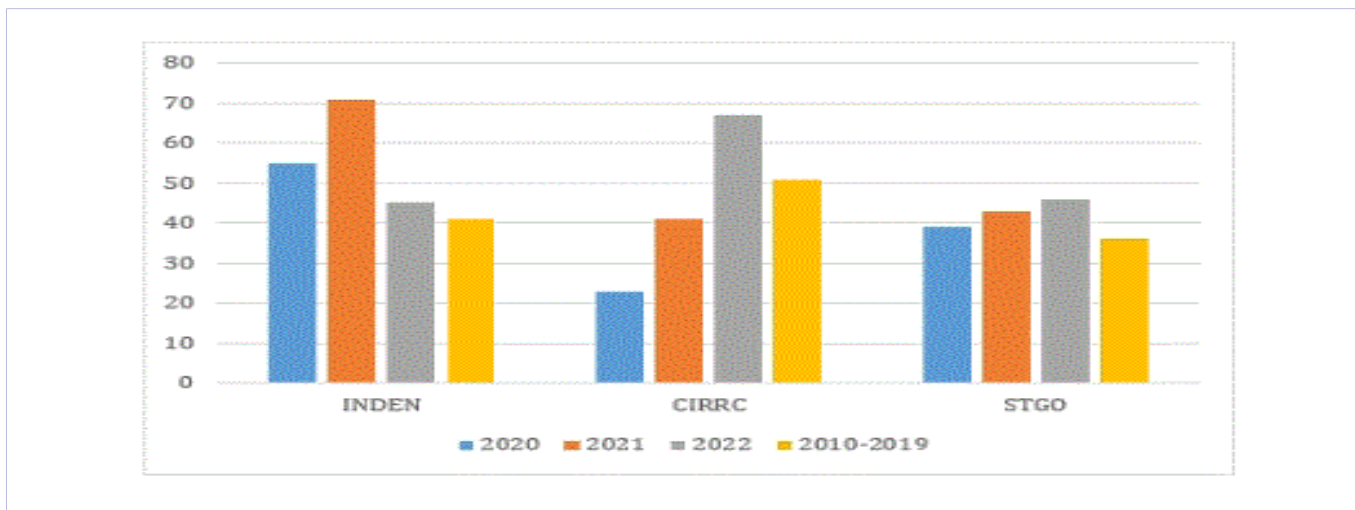


Figure 1: Cases by year's different hospitals.

Rate/100000 in the different period of study

Year	Rate
2010-2019	4.1
2020	3.84
2021	5.09
2022	5.19

There was not enough statistical evidence to conclude that the mean differs from 4.1 at the 0.05 level of significance. ( $t = -0.03$ ,  $p = 0.978$ ).

It can be concluded that there is NO statistically significant difference between the incidence of the reference period 2010-2019 and the incident rate of the years 2020, 2021 and 2022, at the significance level of alpha 0.05.

## Discussion

Most studies on the incidence of newly diagnosed Type 1 diabetes during the ongoing pandemic presented conflicting results. Some report an increase in incidence (United Kingdom) [7], while in others decreased (Finland) [8] or the incidence remained unchanged before and during the pandemic (Germany) [9].

In our study we did not find significant differences when analyzing the incidence of new cases of Type 1 diabetes in children under 15 years of age before and after the COVID-19 pandemic.

In another study (Canada) [10], based on data from the Canadian Diabetes Registry that included 2,700,178 children and adolescents from 1 to 17 years old, during the years 2017-2021, it was found that, in general, during the pandemic, there was no difference in the observed versus expected relative rates (RR) of new presentations of diabetes (RR, 1.09 [95% CI, 0.91-1.30]).

The study from Germany included data from 217 pediatric centers, from March 2020 to May 2020. The results revealed that the prevalence of newly diagnosed DM1 during the first wave of the pandemic in patients <18 years of age was 23.4/100,000 patients per year, which did not differ significantly from the predicted incidence (22.1/100,000 patients per year).

The SWEET Study Group analyzed data on 17,280 cases of T1D diagnosed during 2018-2021 from 92 worldwide centers participating in the SWEET registry using hierarchic linear regression models. They found that the slope of the rise in pediatric new-onset T1D in SWEET centers remained unchanged during the COVID-19 pandemic, but a change in the seasonality at onset became apparent. (11)

The pandemic has contributed to the increased frequency and severity of DKA during T1D diagnosis. [12,13,14,15,16,17]. The risk of DKA among T1D patients with established T1D was not

significantly different during the pandemic, [18]. We did not study KAD during COVID pandemic.

## Acknowledgments

The authors acknowledge Dr. Jorge Sansary who organized the data and statistical analysis.

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