

Introduction Diabetes is a common chronic disease in children.^{1,2} Several studies have reported an increased incidence of types 1 and 2 diabetes in children since the COVID-19 pandemic.^{3,4} Some studies reported an association between SARS-CoV-2 infection and new-onset diabetes.^{5,6} However, given the challenges of ascertaining a SARS-CoV-2 infection, there are concerns about the validity of these studies. Furthermore, there is no clear mechanism by which COVID-19 could directly or indirectly lead to new-onset type 1 or 2 diabetes.⁷ The pathophysiology of types 1 and 2 diabetes are distinct, as are the theoretical pathways by which COVID-19 might cause them⁸; therefore, it is important to determine whether there has been an increased incidence rate of 1 or both types of diabetes. The examination of diabetes incidence rates during the pandemic is nuanced because there was a preexisting increase of 3% to 4% in the annual incidence rate of type 1 diabetes reported in European countries,⁹ seasonality to diabetes incidence,^{10,11} and variability in the reported incidence rates between early and later months during the pandemic.^{12,13} It is important to establish whether the reported increased incidence rates of new-onset diabetes in children are overall higher and sustained or a result of a catch-up effect from a lower incidence rate early in the pandemic likely due to delays in diagnoses.^{7,14} A recent review and meta-analysis⁴ that pooled results of 8 studies reported that the incidence rate of type 1 diabetes was higher during the pandemic in 2020 (32.39 per 100000 children) compared with the same period prior to the pandemic in 2019 (19.73 per 100000 children). An important limitation of that meta-analysis is that it only included studies conducted during the first wave of the pandemic. There may have been a lower incidence rate early in the pandemic and a higher incidence rate later in the pandemic due, in part, to the absence of an expected seasonal decline in summer months.¹² Importantly, the meta-analysis⁴ only examined the incidence rate of type 1 diabetes in children. It is plausible that the increase in sedentary behavior observed during the COVID-19 pandemic due to school closures and lockdown measures was associated with the increased prevalence of childhood obesity, a known risk factor for type 2 diabetes.^{15,16} In addition to reports of an increased incidence rate of diabetes, there have also been consistent reports of an increased risk of diabetic ketoacidosis (DKA), a preventable and life-threatening condition, at diabetes onset in children during the pandemic.^{4,17,18} It is critical to know whether there was a sustained change in the incidence rates of both type 1 and type 2 diabetes in children because there are important implications for health resource planning for pediatric diabetes care, COVID-19-related and future pandemic-related public health measures, and immunization strategies. The primary objective of this systematic review and meta-analysis was to investigate whether there was a change in the incidence rate of types 1 and 2 diabetes in children and adolescents during the COVID-19 pandemic compared with before the pandemic. The secondary objective was to assess whether there was a change in the incidence rate of DKA among youths with new-onset diabetes during the COVID-19 pandemic.