

# Incidence of serious diabetes complication may be increasing among youth in US

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The incidence of a potentially life-threatening complication of diabetes, diabetic ketoacidosis, in youth in Colorado at the time of diagnosis of type 1 diabetes increased by 55 percent between 1998 and 2012, suggesting a growing number of youth may experience delays in diagnosis and treatment, according to a study in the April 21 issue of *JAMA*, a theme issue on child health.

Diabetic ketoacidosis (DKA) at the time of [type 1 diabetes](#) (T1D) diagnosis has detrimental long-term effects and is characterized by dangerously high blood sugar and the presence of substances in the blood known as ketones. It may reflect delayed access to health care, lower quality of care, or income inequality. Little is known about long-term trends of DKA in the United States, according to background information in the article.

Arleta Rewers, M.D., Ph.D., of the University of Colorado School of Medicine, Aurora, and colleagues examined trends in DKA at T1D diagnosis between 1998 and 2012 in Colorado and factors associated with DKA. Between this time period, [youth](#) diagnosed with T1D before age 18 years at any medical facility were included in the study if a Colorado resident and followed up at the Barbara Davis Center for Diabetes in Denver, which serves more than 80 percent of youth with diabetes in Colorado. Standard criteria were used to define DKA. Data were extracted from medical records.

Diabetic ketoacidosis was present in 1,339 of 3,439 youth (39 percent)

at T1D diagnosis. Youth with DKA had a median age of 9.4 years, 54 percent were male, and 76 percent were white. The proportions with DKA increased significantly, especially after 2007 (30 percent in 1998; 35 percent in 2007; 46 percent in 2012). The only characteristic that changed over time was insurance, with those covered by public insurance increasing from 17.1 percent in 2007 to 37.5 percent in 2012. Younger age and African American race were associated with higher risk, whereas private insurance and history of T1D in a first-degree relative were associated with lower risk.

The authors note that the incidence of DKA found in this study is consistent with incidences in countries with poor access to [health care](#) and low community and physician awareness of [diabetes](#), and is much higher than incidences reported in Canada or the United Kingdom.

"Some of the factors associated with DKA at diagnosis are potentially modifiable. For example, the association with family history suggests the importance of awareness of diabetic symptoms. However, economic factors are more difficult to modify. Increasing incidence of DKA correlated temporally with an increase in Colorado child poverty prevalence from 10 percent in 2000 to 18 percent in 2012. The recent increase of DKA incidence among youth with [private insurance](#) may be related to proliferation of high-deductible health plans."

"To our knowledge, this is the only report of increasing incidence of DKA in the developed world. Further research on the reasons for the increase and interventions to decrease the incidence are warranted."

**More information:** *JAMA*, [DOI: 10.1001/jama.2015.1414](https://doi.org/10.1001/jama.2015.1414)

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