

Early detection of type 1 diabetes in children

February 15 2022



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It only takes a blood test to detect the autoimmune disease type 1 diabetes in children at an early stage and, thus, prevent severe metabolic derailments. A research team from Helmholtz Munich and the Technical University of Munich (TUM) has now calculated that introducing screening into standard care would probably cost the health care system

in Germany just 22 euros per child examined.

Worldwide, four in thousand people under the age of 20 have type 1 [diabetes](#). It is the most common metabolic disease in [children](#) and adolescents. Only about one in ten of those affected has a close relative with the disease. This means that type 1 diabetes can affect any child.

If detected early, doctors can monitor and treat the diseases effectively. However, in many cases, the disease does not become known until a severe to life-threatening metabolic derailment occurs. This often leads to intensive medical treatment, a longer hospitalization, a poorer blood sugar control resulting in an increased risk of secondary diseases, and very [high costs](#) for the healthcare system.

Screening as standard care

"We want to protect as many children as possible from serious metabolic derailments. This is only possible with type 1 diabetes screenings. Therefore, we strongly support to include early-detection tests in standard medical care," says Prof. Peter Achenbach, one of the study leaders at Helmholtz Munich and research associate at the Chair of Pediatrics and Adolescent Medicine at TUM.

To date, only very few studies have performed a population-wide screening for early stages of type 1 diabetes. The Fr1da study led by Helmholtz Munich, the world's largest population-based screening for type 1 diabetes in children, closes this gap.

Since 2015, children aged 2–5 years in Bavaria, Germany, could have their blood tested for so-called islet autoantibodies. The antibodies are signs of an inflammation and destruction of the insulin-producing beta cells of the pancreas. This way, researchers can detect an early stage of type 1 diabetes years before insulin deficiency and elevated blood sugar

levels occur with symptoms of the disease.

In collaboration with 682 pediatricians and 16 pediatric diabetes clinics in Bavaria, 90,632 children were tested within the first four years of the Fr1da study; 280 children (0.31 percent) were diagnosed with an early stage of type 1 diabetes.

Potential costs for the healthcare system

In the current analysis, the researchers estimate the costs of the screening. Within the Fr1da study, the costs per child was around 28 euros. If screenings were to be included in standard medical care, the researchers assume that the amount could reduce to about 22 euros per child screened.

The cost analysis covers the procurement, processing and analysis of the blood samples, as well as the communication of the results. It also includes expenses for tests to assess the beta cell function and blood sugar level, as well as for prevention training and counseling for affected children and their families.

"Although our analyses are subject to some level of uncertainty, they provide a benchmark for the expected implementation cost of screening," explains Michael Laxy, professor for Public Health und Prevention at TUM and also a study leader at Helmholtz Munich.

"Next, we aim to evaluate the long-term ratio of screening costs, potential cost savings through the prevention of metabolic derailment and its consequences, and potentially increased quality of life with a type 1 diabetes screening compared to the [costs](#) and quality of life without a [screening](#)," says Michael Laxy.

More information: Florian M. Karl et al, Costs of Public Health

Screening of Children for Presymptomatic Type 1 Diabetes in Bavaria, Germany, *Diabetes Care* (2022). [DOI: 10.2337/dc21-1648](https://doi.org/10.2337/dc21-1648)

Provided by Technical University Munich

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