

# Social determinants of health linked with youth-onset prediabetes

June 11 2024

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Food insecurity, low household income and not having private health insurance are associated with higher rates of prediabetes in adolescents, independent of race and ethnicity, according to a [\*JAMA Network Open\*](#)

study by University of Pittsburgh and UPMC researchers.

The findings suggest that screening for social determinants of health—the non-medical factors that influence a person's health and risk of disease—may help identify youth at risk of prediabetes, which could ultimately improve early interventions that prevent progression to type 2 diabetes.

"This study underscores the importance of using social factors, which are modifiable—meaning that we can address them—to understand and reduce [diabetes risk](#) in adolescents as opposed to personal, non-modifiable characteristics like race and ethnicity," said senior author Mary Ellen Vajravelu, M.D., M.S.H.P., assistant professor of pediatrics at Pitt and pediatric endocrinologist at UPMC Children's Hospital of Pittsburgh.

"Many medical guidelines are moving away from the use of race and ethnicity to determine care and screening practices because it can exacerbate disparities instead of reducing them."

Prediabetes is defined by higher-than-normal blood sugar, which can progress to type 2 diabetes if not addressed with lifestyle changes such as diet and exercise.

"In our clinic we see a lot of adolescents with type 2 diabetes, which is a very serious condition when it starts in childhood," said Vajravelu.

"Current guidelines for identifying children at high risk for type 2 diabetes and prediabetes use characteristics such as [body size](#), race, ethnicity and [family history](#), but those risk factors still don't fully explain who presents with type 2 diabetes in childhood."

According to Vajravelu, type 2 diabetes and prediabetes are more prevalent among youth who identify as Native American, Alaska Native,

Asian, Black and Hispanic than their white counterparts. However, because these minoritized groups are also more likely to experience adverse social determinants of health, it is likely these social factors, rather than race itself, that influence disease risk.

To better understand the role of social determinants of health in youth-onset prediabetes, Vajravelu and her team used a large national database to identify 1,563 participants aged 12 to 18 years and with obesity, 8.5% of whom had elevated blood glucose, or hemoglobin A1c, indicating prediabetes. Then, they looked at three social determinants of health related to diabetes management: [food security](#), health insurance and household income.

Adverse scores for all three were linked with prediabetes risk. Prevalence of prediabetes was 4.1% higher among participants from households with food insecurity compared to those with food security, 5.3% higher in youths with public compared to private insurance, and 5.7% higher in youths with household income at less than 130% of the [federal poverty level](#) compared to those with higher incomes.

The associations of these risk factors with prediabetes also differed within racial and [ethnic groups](#), underscoring the importance of considering social determinants of health when understanding type 2 diabetes risk.

For example, in [white children](#), who are traditionally considered at lower risk for prediabetes, going from having one to two or three adverse social determinants of health quadrupled the prevalence of prediabetes.

"If we use race and ethnicity to guide us in identifying children at risk of prediabetes, it could steer us away from screening children who do not fall into a higher risk race or ethnicity category," said Vajravelu.

"Instead, if we tailor our screenings based on exposure to risk factors,

not race, we might be able to pick up additional children who are at risk for diabetes."

Adverse social determinants of health could influence diabetes risk in several ways. For example, families experiencing food insecurity are less likely to have access to healthy foods to prevent diabetes and those without private insurance may have more limited access to health care.

There are many more social factors that could also impact diabetes risk that the researchers did not look at in this study, including diet quality and healthy lifestyle factors. Including additional factors could improve identification of children at risk for prediabetes in the future.

A limitation of the study is that hemoglobin A1c levels were from just one snapshot in time and the researchers were not able to track whether children went on to develop diabetes or not.

In follow-up research, Vajravelu and co-author Maya Ragavan, M.D., M.P.H., M.S., assistant professor of pediatrics at Pitt, plan to collaborate with community partners to investigate how addressing [food insecurity](#), housing instability and other health-related social needs could improve clinical outcomes for patients with [diabetes](#).

**More information:** Prediabetes Prevalence by Adverse Social Determinants of Health in Adolescents, *JAMA Network Open* (2024). [DOI: 10.1001/jamanetworkopen.2024.16088](https://doi.org/10.1001/jamanetworkopen.2024.16088).  
[jamanetwork.com/journals/jamanetworkopen.2024.16088](https://jamanetwork.com/journals/jamanetworkopen.2024.16088)

Provided by University of Pittsburgh

Citation: Social determinants of health linked with youth-onset prediabetes (2024, June 11)

retrieved 6 August 2024 from

<https://medicalxpress.com/news/2024-06-social-health-linked-youth-onset.html>

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