

# Low birth weight combined with unhealthy adult lifestyle may increase type 2 diabetes risk

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People who are a low weight at birth and have unhealthy habits as adults, such as eating nutritionally poor diets or smoking, may have a greater risk of developing type 2 diabetes than people born at an average weight who live similar lifestyles, according to a new study led by researchers from Harvard T.H. Chan School of Public Health. In the first study to comprehensively assess how early development interacts with adult behavior to influence type 2 diabetes risk, the researchers found that 18% of cases were attributable to the combined effect of low birth weight and unhealthy adult lifestyles.

"Most cases of [type 2 diabetes](#) could be prevented by the adoption of a healthier lifestyle, but these findings suggest that efforts focused on early life development, such as improving nutrition for pregnant women, could prevent additional cases," said Lu Qi, associate professor in the Department of Nutrition at Harvard Chan School and Channing Division of Network Medicine, Brigham and Women's Hospital, and the study's senior author.

The study appears online July 21, 2015 in *BMJ*.

Diabetes has become a worldwide epidemic, with 4.9 million attributable deaths in 2014 and an estimated 387 million people living with the disease, according to the International Diabetes Federation. Type 2 [diabetes](#), which represents 85-95% of all cases, has been linked to both

unhealthy lifestyles and negative early life development factors, including low [birth weight](#) (defined as less than 5.5 pounds for this study) and prenatal exposure to malnutrition.

While previous studies have looked at how adult lifestyles may modify early life risks, few have analyzed the joint effects of early life and unhealthy lifestyle factors on type 2 diabetes risk.

Qi and colleagues studied health data collected from 149,794 healthy men and women tracked by three large ongoing trials (Health Professionals Follow-up Study, Nurses' Health Study, and Nurses' Health Study II) for 20-30 years. Participants were scored on five lifestyle factors: diet, smoking, physical activity, alcohol consumption, and body mass index. Those who did not provide their birth weight were excluded from this analysis.

The researchers documented 11,709 new cases of type 2 diabetes during the study period. They found that 22% of these cases could be attributed to a lower birth weight alone, 59% to unhealthy lifestyle alone, and 18% to the interaction between both factors.

The researchers suggest that if a pregnant woman is poorly nourished it may cause the fetus to prepare for survival in a resource-scarce environment. When the adaptive response to prenatal starvation is mismatched with exposure to an affluent environment later in life, it can increase the risk of type 2 diabetes in adulthood.

"Our findings suggest that the public health consequences of unhealthy lifestyles would be larger in low birth weight populations," said Yanping Li, lead author and research scientist in the Department of Nutrition. "This is of critical importance in the developing countries undergoing rapid epidemiologic transition from traditional to Western lifestyles, such as China and India, where the prevalence of the Western dietary

pattern, cigarette smoking, sedentary activities, obesity, and diabetes has been increasing dramatically, and low birth weight is still highly prevalent (around 17% in developing countries)."

Provided by Harvard School of Public Health

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