

Babies born with low birth weights are more likely to have poor cardiorespiratory fitness

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Babies born with low birth weights are more likely to have poor cardiorespiratory fitness later in life than their normal-weight peers, according to a study by researchers at Karolinska Institutet in Sweden and published in the *Journal of the American Heart Association*. The findings underscore the importance of prevention strategies to reduce low birth weights, even among those carried to at-term delivery.

Good [cardiorespiratory](#) fitness—the ability of the body to supply oxygen to the muscles during sustained [physical activity](#)—is important for staying healthy, and can reduce the risk of numerous diseases and premature death. Cardiorespiratory fitness is declining globally, both for youths and adults. A recent study showed that the proportion of Swedish adults with low cardiorespiratory fitness almost doubled from 27 percent in 1995 to 46 percent in 2017.

Given its implications for public health, there has been a growing interest in understanding the underlying causes of poor cardiorespiratory fitness. Researchers have identified both physical inactivity and genetic factors as important determinants.

Preterm delivery, and the [low birth weight](#) associated with it, has also been linked to low cardiorespiratory fitness later in life. In this study, the researchers wanted to examine if low birth weights played a role for cardiorespiratory fitness in individuals born after pregnancy of 37-41 weeks.

They followed more than 280,000 males from birth to military conscription at age 17 to 24 using Swedish population-based registers. At conscription, the men underwent a physical examination that included an evaluation of their maximal aerobic performance on a bicycle ergometer. The researchers found that those born with higher birth weights performed significantly better on the cardiorespiratory fitness test. For every 450 grams of extra [weight](#) at birth, in a baby born at 40 weeks, the maximum work capacity on the bicycle increased by an average of 7.9 watts.

The association was stable across all categories of body mass index (BMI) in young adulthood and was largely similar in a subset analysis of more than 52,000 siblings, suggesting that BMI and shared genetic and environmental factors alone cannot explain the link between birth weight and cardiorespiratory fitness.

"The magnitude of the difference we observed is alarming," says Daniel Berglind, researcher at the Department of Global Public Health at Karolinska Institutet and corresponding author. "The observed 7.9 watts increase for each 450 grams of extra weight at birth, in a baby born at 40 weeks, translates into approximately 1.34 increase in metabolic equivalent (MET) which has been associated with a 13 percent difference in the risk of premature death and a 15 percent difference in the risk of developing cardiovascular disease. Such differences in mortality are similar to the effect of a 7-centimeter reduction in waist circumference."

The researchers believe the findings are of significance to [public health](#), seeing as about 15

percent of babies born globally weigh less than 2.5 kilos at birth and as cardiorespiratory fitness have important implications for adult health.

"Providing adequate prenatal care may be an effective means of improving adult [health](#) not only through prevention of established harms associated with low [birth](#) weight but also via improved cardiorespiratory [fitness](#)," says Viktor H. Ahlqvist, researcher at the Department of Global Public Health and another of the study's authors.

More information: "Birth weight and cardiorespiratory fitness among young men born at term: the role of genetic and environmental factors," Viktor H. Ahlqvist, Margareta Persson, Francisco B. Ortega, Per Tynelius, Cecilia Magnusson, Daniel Berglind, *JAMA*, online Jan. 31, 2020, [DOI: 10.1161/JAHA.119.014290](#)

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