

Mothers' lifestyle predicts when offspring will have first heart attack or stroke

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Offspring of mothers with heart healthy lifestyles live nearly a decade longer without cardiovascular disease than those whose mothers have unhealthy lifestyles. That's the finding of a study published today in the *European Journal of Preventive Cardiology*, a journal of the European Society of Cardiology (ESC).

"Our study suggests that [mothers](#) are the primary gatekeepers of their children's health," said study author Dr. James Muchira of Vanderbilt University, Nashville and the University of Massachusetts, Boston. "This maternal influence persists into the adulthood of their [offspring](#)."

Previous research has shown that parents pass on health to their offspring through both genes and shared environment/lifestyle. This was the first study to examine whether parents' heart health was associated with the age at which offspring develop [cardiovascular disease](#). In addition, it investigated the influence of each parent separately.

The study was conducted in offspring-mother-father trios from the Framingham Heart Study—a total of 1,989 offspring, 1,989 mothers, and 1,989 fathers. Offspring were enrolled at an average age of 32 years and followed over 46 years (1971-2017) for the development of cardiovascular events. "Crucially, the study followed offspring into most of their [adult life](#) when heart attacks and strokes actually occur," explained Dr. Muchira.

Cardiovascular health of mothers and fathers was rated according to their attainment of seven factors: not smoking, healthy diet, physically active, and normal body mass index, blood pressure, blood cholesterol, and blood glucose. The three categories of cardiovascular health were: poor (0 to 2 factors achieved), intermediate (3 to 4), and ideal (5 to 7).

The researchers assessed the association between parental cardiovascular health and how long their offspring lived without cardiovascular disease. Links between each pair were assessed, i.e. mother-daughter, mother-son, father-daughter, and father-son.

Offspring of mothers with ideal cardiovascular health lived nine more years free of cardiovascular disease than offspring of mothers with poor cardiovascular health (27 versus 18 years, respectively). Poor maternal

cardiovascular health was linked with twice the hazard of early onset cardiovascular disease compared with ideal maternal cardiovascular health. Fathers' [heart health](#) did not have a statistically significant effect on the length of time offspring lived without cardiovascular disease.

Dr. Muchira said the strong contribution of mothers was likely a combination of health status during pregnancy and environment in early life. He said: "If mothers have diabetes or hypertension during pregnancy, those [risk factors](#) get imprinted in their children at a very early age. In addition, women are often the primary caregivers and the main role model for behaviours."

Sons were more affected than daughters by the mother's unhealthy lifestyle. Dr. Muchira said: "This was because sons had more unfavourable lifestyle habits than daughters, making the situation even worse. It shows that individuals can take charge of their own health. People who inherit a high risk from their mother can reduce that risk by exercising and eating well. If they don't, the risk will be multiplied."

The authors state that optimising cardiovascular health among women of reproductive age and mothers with young children has the potential to break the intergenerational cycle of preventable cardiovascular [disease](#).

"Family-based interventions should occur during pregnancy and very early in the child's life, so that the real impact of protective cardiovascular [health](#) tracks into adulthood," said Dr. Muchira. "For example, pairing mothers and young children in an exercise or diet improvement programme. If children grow into healthy adults, they will not acquire the same cardiovascular risk as their parents, a situation that will raise the chances of having even healthier grandchildren."

More information: Muchira JM, Gona PN, Mogos MF, et al. Parental cardiovascular health predicts time to onset of cardiovascular disease in

offspring. Eur J Prev Cardiol. 2020. [DOI: 10.1093/eurjpc/zwaa072](https://doi.org/10.1093/eurjpc/zwaa072)

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