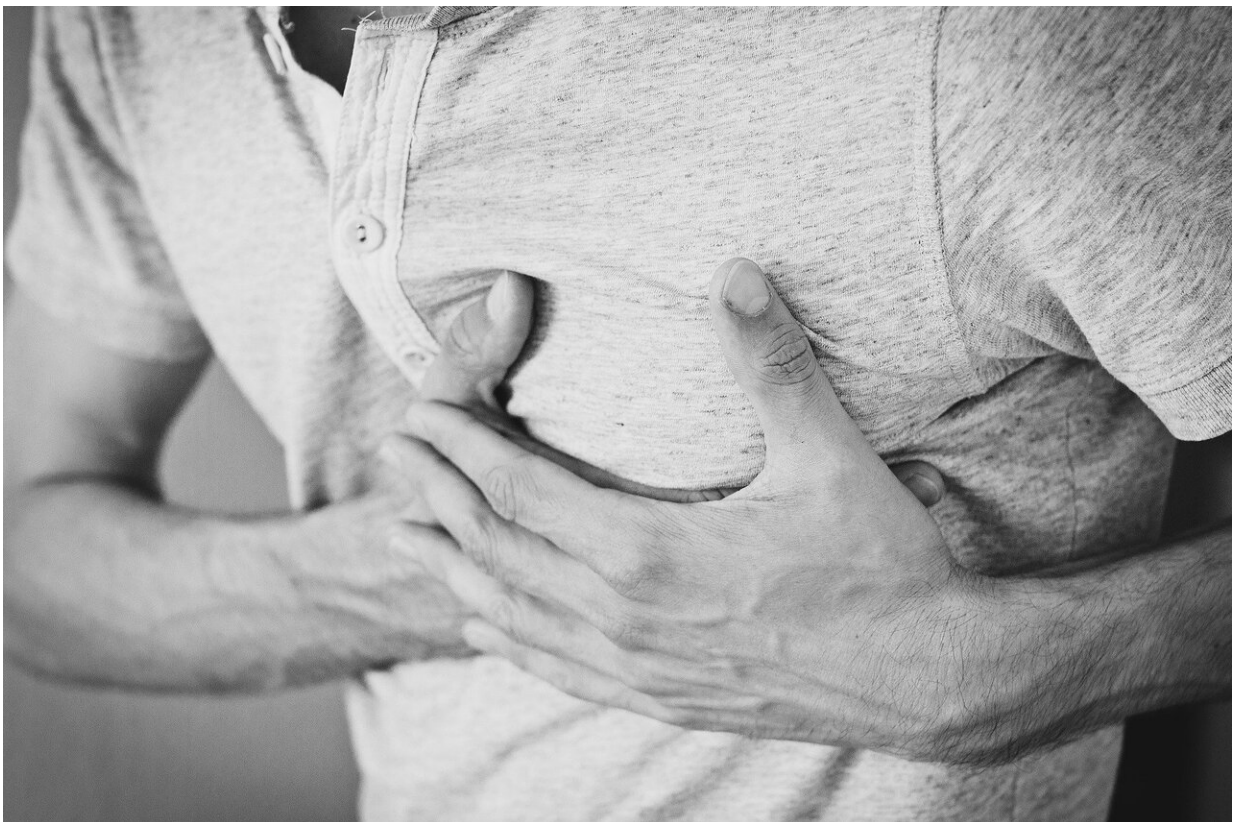


# Adding genetic information to health checks improves identification of people at risk of heart attacks and strokes

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Researchers have discovered a better way of identifying those at high risk of potential heart attacks and strokes and other major cardiovascular

disease (CVD) events.

Currently health assessments, such as the NHS Health Check, try to identify those at increased risk of cardiovascular disease in the next 10-years by assessing clinical risk factors, such as [blood pressure](#), cholesterol level, diabetes status and body mass index, to create a Clinical Risk Score, such as the QRISK2 score. However, such scores do not identify everyone who is at increased risk.

New research led by the University of Leicester, which has been published in the [European Heart Journal](#), shows that adding a polygenic risk score—a measure of risk based on an individual's genetic make-up—significantly improves the identification of those at high risk when combined with their clinical risk score into an Integrated Risk Tool (IRT), developed and implemented by Genomics plc.

The study recruited over 44,000 participants aged between 40 and 74 years attending an NHS Health Check in one of 147 General Practices in Leicestershire and Northamptonshire, between 2012–2020 and monitored their subsequent health status.

It found that the QRISK2 score identified 61.5% of individuals who went onto develop a [heart attack](#), stroke or another major CVD event as being at high risk at the time of their health check.

However, QRISK2 + IRT identified 68.7% as high risk at the time of the Health Check—a relative increase of 11.7% (the proportion of individuals identified).

In younger individuals aged 40–54 years, where clinical scores are less sensitive, the QRISK2 score only identified 26% of individuals who went onto have a major CVD event as being at high risk at the time of their health check. The addition of the IRT increased this to 38.4%, a

relative increase of 47.7%.

About half of the study participants were female and about 14% were from ethnic minority communities, predominantly South Asian. The study found that the addition of [genetic information](#) worked equally well in men and women and across all ethnicities in the study.

Professor Sir Nilesh Samani, Professor of Cardiology at the University of Leicester and Honorary Consultant Cardiologist at the Cardiac Center, Glenfield Hospital, who led the study said, "Heart attacks and stroke can be prevented by identifying those at increased risk and giving them tailored help including lifestyle advice around food, drink, exercise, as well as medication. The key is to identify those at high risk.

"Our study shows that adding genetic information, which is now not expensive to obtain and can be easily integrated into the current assessment carried out by GPs and other [health care professionals](#), can significantly improve the identification of those at high risk, especially among younger people where the impact of having a [heart](#) attack or stroke can be even more devastating for the individual and their family.

"The study provides crucial evidence in a real-world setting of the benefits of incorporating genetic information into [clinical practice](#) in the NHS and other health systems to reduce the burden of heart attacks and strokes."

Professor Sir Peter Donnelly, from Genomics plc, who developed the Integrated Risk Tool, said, "A really important aspect of this research with Professor Samani and his colleagues is the diversity of the study population. Crucially, the work provides real world evidence that combining genetics with the current clinical risk tools works well, and provides benefit for all the ethnicities in the study."

**More information:** Nilesh J Samani et al, Polygenic risk score adds to a clinical risk score in the prediction of cardiovascular disease in a clinical setting, *European Heart Journal* (2024). [DOI: 10.1093/eurheartj/ehae342](https://doi.org/10.1093/eurheartj/ehae342)

Provided by University of Leicester

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