

Sudden cardiac arrest kills 1 in 5 people, but cannot yet be reliably predicted

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An analysis of more than 10,000 individuals has failed to produce a model that accurately predicts sudden cardiac arrest. The results from the ESCAPE-NET project are presented at EHRA 2022, a scientific congress of the European Society of Cardiology (ESC).

Dr. Hanno Tan, ESCAPE-NET project leader and cardiologist,

Amsterdam University Medical Centre AMC, the Netherlands says that their "study found that a [risk model](#) which includes clinical characteristics such as use of medications to lower [blood lipids](#) and [blood pressure](#) allowed us to identify people who would not suffer a sudden [cardiac arrest](#) over the next 10 years. However, this analysis did not allow us to identify individuals who did suffer a cardiac arrest, meaning that these indicators are not specific enough for population-based prevention programs."

Most sudden cardiac arrests occur in the community and in individuals not previously known to have increased risk. A [cardiac arrhythmia](#), called [ventricular fibrillation](#), causes the heart to cease pumping and [blood flow](#) stops. If blood flow is not restored in time, the individual passes out and dies within 10 to 20 minutes.

The ESCAPE-NET research project aims to develop a risk prediction model to identify people in the general population at increased likelihood of [sudden cardiac arrest](#). Dr. Tan explained that "if you can predict who is going to suffer from this event and when, then you can take [preventative measures](#) such as an implantable cardioverter defibrillator (ICD)."

The study included 10,100 participants from the Copenhagen City Heart Study, of which 56% were women. The average age was 59 years. During a follow-up of 10 years, there were 425 sudden cardiac arrests. Validation of the results was performed in 2,464 participants of the Hoorn Studies.

The investigators found that a previously established model for predicting the 10-year risk of sudden cardiac death in US communities could also predict the 10-year risk of sudden cardiac arrest in the Copenhagen and Hoorn cohorts. Variables in the model included baseline age, sex, total cholesterol, lipid-lowering medication use,

hypertension medication use, blood pressure, smoking status, diabetes and body mass index.

The researchers found that, although the model identified participants who had a sudden cardiac arrest 10 years later with great sensitivity (92%), it had only modest specificity (63%).

Dr. Tan says that "in view of the low specificity, this model serves primarily to screen, at an early stage, individuals who may have raised risk and require more detailed cardiac examination, rather than providing a direct means to use preventive measures such as ICD implants."

Dr. Tan concluded that "the findings indicate that people in the community may be too heterogeneous to make accurate risk prediction with clinical characteristics alone an attainable goal. This is because while sudden cardiac arrest victims share a final common pathway (ventricular fibrillation), there are many roads leading to it with multiple underlying causes of the arrhythmia. Our consortium is currently examining whether other factors such as genetic variants are associated with elevated risk of sudden cardiac arrest in the general population. This information could then be added to the clinical model and tested for sensitivity and specificity."

More information: Previous model: Brittany M. Bogle et al, A Simple Community-Based Risk-Prediction Score for Sudden Cardiac Death, *The American Journal of Medicine* (2017). [DOI: 10.1016/j.amjmed.2017.12.002](https://doi.org/10.1016/j.amjmed.2017.12.002)

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