

Clear link between income and survival after cardiac surgery

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The higher a patient's income, the better are his or her chances of surviving cardiac surgery in both the short and long term. This is the finding of a new registry study by researchers from Sweden's Karolinska Institutet published in the *Journal of the American College of Cardiology (JACC)*.

It has long been known that socioeconomic factors such as income are linked to the risk of cardiovascular disease; what is less researched, however, is the role these factors play in post-cardiac surgery prognoses. Now, researchers at Karolinska Institutet have conducted a registry study showing that household disposable income is closely linked to long-term survival after cardiac surgery in Sweden.

The study included 100,000 patients from the Swedeheart registry who had undergone cardiac surgery at some time between 1999 and 2012. The patients' data were then cross-referenced with other registries, including the National Board of Health and Welfare's cause of death and patient registries and Statistics Sweden's LISA (Longitudinal integration database for health insurance and [labour market studies](#)) database, which contains such personal data as income, level of education and civil status.

The patients were then divided into five equal-sized groups of approximately 20,000 individuals on the basis of household income, and tracked via the registries for an average of just over seven years. By the end of the follow-up time, a total of 29 per cent of the patients had died; amongst them, 43 per cent of the lowest income group and only 14 per

cent of the highest. After factoring in other known risk-factors, the risk of dying after cardiac surgery was about 30 per cent lower in the group with the highest income than in the group with the lowest.

"We can see a strong correlation between income and survival after cardiac surgery, but because of how the study was designed, we can't say if it's a direct causal relation, and other factors might play a part," says Dr Ulrik Sartipy, associate professor at Karolinska Institutet's Department of Molecular Medicine and Surgery, and a cardiac surgeon at Karolinska University Hospital's Department of Cardiothoracic Surgery. "But with the right action, it should be possible to improve the prognosis for [patients](#) with lower incomes. The difficulty is deciding on the right action to take, which should be the subject of future studies."

There are other factors that are known to increase the post-cardiac surgery mortality rate. These include age (the higher the age, the higher the risk), sex, kidney disease, diabetes and other cardiovascular diseases. Such factors are quantifiable, and the researchers adjusted their figures accordingly to neutralise their influence.

However, they did not take into account factors such as smoking, diet, physical activity or adherence to drug regimen, which also affect the survival rate. One reason for this is that such data were not available on an individual level to the study. The study is one of several making up a larger project.

"That is one of the study's weaknesses," says Dr Magnus Dalén, PhD student at Karolinska Institutet's Department of Molecular Medicine and Surgery, and a [cardiac surgery](#) registrar at Karolinska University Hospital's Department of Cardiothoracic Surgery. "These factors are linked to socioeconomic status and might well go some way to explaining the better survival record of the higher [income](#) groups, but this needs further investigation."

More information: 'Household Disposable Income and Long-Term Survival After Cardiac Surgery', Magnus Dalén, Torbjörn Ivert, Martin J. Holzmann and Ulrik Sartipy, *JACC - Journal of the American College of Cardiology*, online 19 October 2015.

Provided by Karolinska Institutet

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