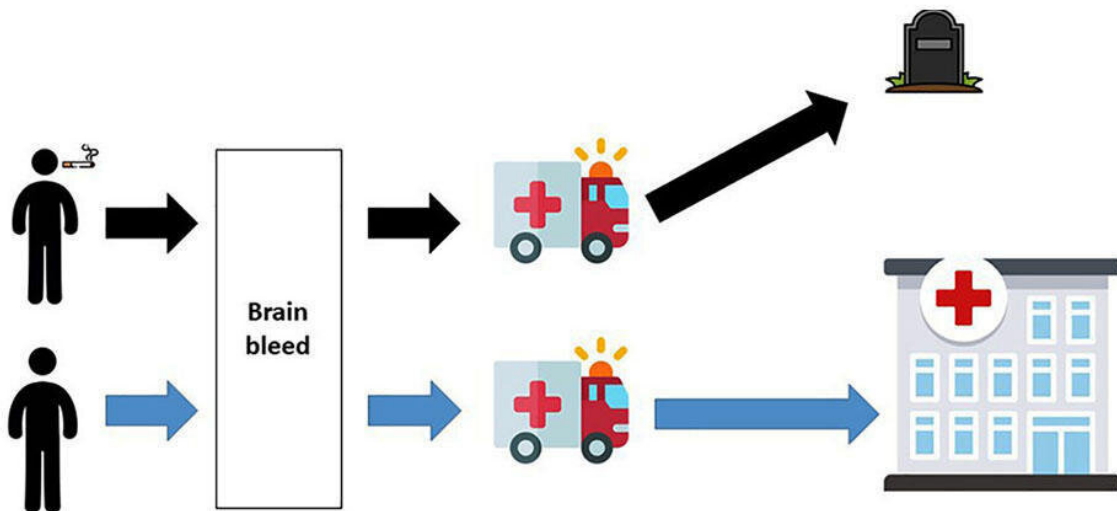


# Smokers and hypertensive individuals have higher risk of sudden death from brain bleed than previously believed

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Stop smoking and reduce the risk of sudden death from brain bleed. Credit: University of Helsinki

Contrary to the previous data, a Finnish study clarifies that smoking and high blood pressure do not protect from death in patients suffering from subarachnoid hemorrhage, the most lethal stroke subtype. In fact, subarachnoid hemorrhage kills smokers and hypertensive individuals even before they reach hospitals, and therefore, previous studies that did not include these deaths outside hospitals in their analyses may have

reached erroneous conclusions.

Subarachnoid hemorrhage is a severe stroke subtype that is caused by a rupture of a brain aneurysm, an enlargement in the brain vessel wall. Up to one in four subarachnoid hemorrhage patients die quickly after the bleed at home, on the road to a [hospital](#), or in an emergency room. These patients never reach hospital wards and are often incorrectly diagnosed. In many countries, these sudden deaths are classified as sudden cardiac deaths since routine autopsies are rarely conducted outside Nordic countries.

If studies on [risk factors](#) of subarachnoid hemorrhage include only patients who survive the initial bleed and reach hospital wards, they are very likely biased, because they are unable to consider risk factors relating to the most devastating outcome, namely sudden [death](#).

Two recent hospital-based studies that excluded patients who died before reaching hospital wards reported that smokers and hypertensive individuals have better chances to survive from subarachnoid hemorrhage than non-smokers and those with normal [blood](#) pressures.

These findings puzzled researchers and clinicians because they contradicted earlier reports. For decades, the researchers and clinicians have known that smoking and [high blood pressure](#) are the two most important risk factors for subarachnoid hemorrhage, but now, studies suggested that the same factors would paradoxically protect from subarachnoid hemorrhage-related death.

A new study, published in *Neurology*, shows that when researchers are able to include those people who die before reaching hospital wards, the paradoxical protective effect of smoking and high blood pressure is reversed. Specifically, the study showed that smokers and hypertensive individuals die more frequently before they reach hospital wards than

non-smokers and those with normal blood pressure. When these heavy smokers and hypertensive people are left out from statistical analyses, the results are misleading.

"Due to the mandatory autopsies for all sudden deaths in Finland, we were able to identify and include data on those individuals who died before reaching hospital wards. This in turn allowed us to show how results change when all people with subarachnoid hemorrhage, not only those surviving to hospitals, are included in the analyses," says physician Joni Lindbohm, the principal author of the research article.

"In practice, our results show that risk factor and survival estimates of subarachnoid hemorrhage from studies that exclude people dying quickly after the bleed are unreliable. This is important to recognize, because most subarachnoid hemorrhage studies are still hospital-based and do not include data on sudden deaths," neurosurgeon Dr. Miikka Korja states.

According to Lindbohm and Korja, the best way to minimize the risk of [sudden death](#) from subarachnoid hemorrhage is to quit smoking and lower elevated blood pressure values.

**More information:** Joni V. Lindbohm et al. Survival bias explains improved survival in smokers and hypertensive individuals after aSAH, *Neurology* (2019). [DOI: 10.1212/WNL.00000000000008537](https://doi.org/10.1212/WNL.00000000000008537)

Provided by University of Helsinki

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