

Spontaneous subarachnoid hemorrhage epidemiology

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Incidence

Global incidence: ~6–10 cases per 100,000 person-years.

Higher incidence in:

Japan and Finland (~20 per 100,000),

Lower in North America and some parts of Europe.

Declining trend in many high-income countries over the past decades, possibly due to reduced smoking and better hypertension control.

Age and Gender

Peak incidence: 50–60 years of age.

Gender distribution: More common in women (female-to-male ratio $\approx 1.5:1$).

Increased risk with age, though aneurysmal SAH can occur in younger adults.

Risk Factors

Modifiable:

Smoking (the strongest independent risk factor),

Hypertension,

Excessive alcohol consumption,

Cocaine use.

Non-modifiable:

Female sex,

Family history of SAH or aneurysms,

Certain genetic syndromes (e.g., polycystic kidney disease, Ehlers-Danlos type IV).

Mortality and Morbidity

Case fatality rate: ~30–40% within the first month.

Sudden death: ~10–15% die before reaching hospital.

Survivors: Up to 50% have long-term neurological or cognitive deficits.

Rebleeding: High risk in the first 24–48 hours if the aneurysm is not secured.

Regional Differences

High-income countries: Better outcomes due to timely diagnosis, endovascular/surgical treatment, and intensive care.

Low- and middle-income countries: Underdiagnosis and lack of resources may lead to underestimation of incidence and worse outcomes.

Recent Trends

Increasing use of non-invasive imaging (e.g., CT angiography) improves early detection.

Shift toward endovascular coiling over clipping in many centers.

Descriptive Epidemiological Studies

In a Descriptive Epidemiological Study, the GBD 2021 Global Subarachnoid Hemorrhage Risk Factors Collaborators estimated the worldwide burden of SAH.

Design, setting, and participants: The repeated cross-sectional Global Burden of Disease (GBD) 2021

study estimated the global burden of SAH from 1990 to 2021. The SAH burden was compared with other diseases, and its associations with 14 individual risk factors were investigated with available data in the GBD 2021 study. The GBD study included the burden estimates of nontraumatic SAH among all ages in 204 countries and territories between 1990 and 2021.

Exposures: SAH and 14 modifiable risk factors.

Main outcomes and measures: Absolute numbers and age-standardized rates with 95% uncertainty intervals (UIs) of SAH incidence, prevalence, mortality, and disability-adjusted life-years (DALYs), as well as risk factor-specific population attributable fractions (PAFs).

Results: In 2021, the global age-standardized SAH incidence was 8.3 (95% UI, 7.3-9.5), prevalence was 92.2 (95% UI, 84.1-100.6), mortality was 4.2 (95% UI, 3.7-4.8), and DALY rate was 125.2 (95% UI, 110.5-142.6) per 100 000 people. The highest burden estimates were found in Latin America, the Caribbean, Oceania, and high-income Asia Pacific. Although the absolute number of SAH cases increased, especially in regions with a low sociodemographic index, all age-standardized burden rates decreased between 1990 and 2021: the incidence by 28.8% (95% UI, 25.7%-31.6%), prevalence by 16.1% (95% UI, 14.8%-17.7%), mortality by 56.1% (95% UI, 40.7%-64.3%), and DALY rate by 54.6% (95% UI, 42.8%-61.9%). Of 300 diseases, SAH ranked as the 36th most common cause of death and the 59th most common cause of DALY in the world. Of all worldwide SAH-related DALYs, 71.6% (95% UI, 63.8%-78.6%) were associated with the 14 modeled risk factors of which high systolic blood pressure (population attributable fraction [PAF] = 51.6%; 95% UI, 38.0%-62.6%) and smoking (PAF = 14.4%; 95% UI, 12.4%-16.5%) had the highest attribution.

Although the global age-standardized burden rates of SAH more than halved over the last 3 decades, SAH remained one of the most common cardiovascular and neurological causes of death and disabilities in the world, with increasing absolute case numbers. These findings suggest evidence for the potential health benefits of proactive public health planning and resource allocation toward the prevention of SAH ¹⁾.

Spontaneous subarachnoid hemorrhage (SAH) is usually caused by a **ruptured intracranial aneurysm**, but in some patients, no source of hemorrhage can be detected.

Ruptured intracranial aneurysms: 75-50% of **spontaneous subarachnoid hemorrhage**.

The **anterior communicating artery aneurysm** causes **aneurysmal subarachnoid hemorrhage**, about 21.0%~25.5% of percent of **spontaneous subarachnoid hemorrhage**.

Data showed increasing numbers of cases of spontaneous **Spontaneous nonaneurysmal subarachnoid hemorrhage**.

Accounts for only 5% of **strokes**, but occurs at a fairly young age.

The overall incidence of SAH is approximately 9 per 100,000 person-years. Rates are higher in Japan and Finland and increase with age. The preponderance of women starts only in the sixth decade. The decline in the incidence of SAH over the past 45 years is relatively moderate compared with that for stroke in general ²⁾.

¹⁾

GBD 2021 Global Subarachnoid Hemorrhage Risk Factors Collaborators; Rautalin I, Volovici V, Stark BA, Johnson CO, Kaprio J, Korja M, Krishnamurthi RV, Nair BS, Ranta A, Rinkel GJE, Vergouwen MDI,

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