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everal studies using different study designs and various definitions of socioeconomic status have shown that stroke incidence increases with decreasing socioeconomic status.\(^1\)\(^-\)\(^8\) A low socioeconomic status predicts stroke not only in poor countries but also in well-developed countries with a high standard of medical care.\(^1\)\(^,\)\(^4\)\(^,\)\(^8\) The mechanisms by which socioeconomic status influences stroke risk are not entirely understood. Potential explanations include differences in major stroke risk factors, in psychosocial factors, and in access to and use of medical care.\(^1\)\(^,\)\(^5\)

In this issue of *Stroke*, Kuper and colleagues evaluate the association between socioeconomic status, as measured by years of education, and the risk of stroke in a large prospective study of Swedish women.\(^9\) In age-adjusted analyses, years of education were inversely associated with stroke risk, indicating that women in the lowest education group had an \(~2\)-fold increased risk of total stroke. Furthermore, Kuper and colleagues evaluated whether the association between socioeconomic status and stroke could be explained by established stroke risk factors as well as by psychosocial factors. The increased risk of stroke in the lower socioeconomic class attenuated to a relative risk of 1.5 (95% CI, 1.0 to 2.2) after adjustment for age, smoking status, body mass index, alcohol consumption, diabetes, elevated blood pressure, and exercise. This attenuation is in line with other studies that showed reduction of the relative risk estimate after adjusting for traditional stroke risk factors, particularly behavioral factors.\(^1\)\(^,\)\(^8\) Because information on lifestyle factors can only be measured imperfectly and information on some factors may not have been recorded, one might hypothesize that the association between socioeconomic status and stroke vanishes if perfect information about lifestyle factors were available. In contrast, after adjustments for job demands, job control, social support at work, overall social support, and self-rated health, the association between socioeconomic status and stroke remained largely unchanged. The rather young and narrow age range (30 to 50 years), the inclusion of women within similar social networks, and the moderate response of 51% in this study might have contributed to this, at first glance surprising result.

Do the results of this study indicate that risk-factor profiles, rather than socioeconomic status, should be assessed in studies of stroke risk? First, it is important to remember that the term “socioeconomic status” is a framework of concepts and resources ordered in at least 3 levels: material, behavioral and psychosocial.\(^1\) Within the framework of socioeconomic status, single concepts will influence health status differentially throughout an individual’s life. In early childhood, classic risk factors will be less important than poor living circumstances and the parents’ social class. In middle-aged adults, the well-known concept of behavior-dependent risk factors like smoking, hypertension, physical inactivity, or increased relative body weight will strongly influence the effect of socioeconomic status on health. In old age, components like access to medical care, social support, and resilience might explain the largest proportion of the effect of socioeconomic status on the risk of stroke. The influence of single concepts within the framework will not only differ throughout the life span but also show regional variability within a country, between and even within states, or smaller geographic units. Furthermore, individual social circumstances may interact with specific neighborhood contexts.\(^10\) Thus, the multifaceted framework of socioeconomic status is built up by many different puzzle pieces that, at best, can be ordered by different concepts.

The downside, as in any puzzle, is to assess all the pieces simultaneously. The strength of this framework, however, is that the use of well-established, easy-to-assess proxy measures like education, occupation, or income can validly be used to estimate the effect of the entire framework. Second, the study by Kuper as well as other studies show that socioeconomic measures are powerful markers to identify individuals and groups but also geographic areas at increased stroke risk. Thus, knowledge of individual, group, and regional differences in socioeconomic status helps public health authorities and policymakers to better target programs to reduce risk factors, improve the awareness for stroke signs, and distribute resources for stroke treatments. Third, the inverse relation between socioeconomic status and stroke is not only present in primary prevention but continues after the occurrence of a stroke event. If a stroke is survived, low socioeconomic status is related to higher risk of nursing home placement and less care in noninstitutional settings as well as higher mortality rates.\(^1\)

Understanding the mechanisms of how socioeconomic status influences health is one challenge, but influencing the perception and motivation to change behavior-dependent risk factors is even a larger one. This challenge can only be addressed by interdisciplinary efforts that actively target specific groups and go far beyond stroke medicine. To successfully implement
strategies to change risk-related life styles, policymakers must be made aware of how socioeconomic status influences stroke and other disease risk and use this information to target these easily identifiable groups.

**Disclosures**

None.

**References**


**Key Words:** epidemiology ■ risk factors ■ socioeconomic status ■ stroke
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