Neuroepidemiology 2012;38:274
DOI: [10.1159/000338707](https://doi.org/10.1159/000338707)

Epidemiological Prediction: A Futile Pastime?

Gudrun Boysen

Bispebjerg Hospital, Copenhagen, Denmark

We see it every day in economics and politics: predictions are unreliable. Now, the study by Thrift et al. [1] demonstrates that predictions within stroke epidemiology likewise are unreliable. Predictions of an increase in the number of stroke hospitalizations were based on the assumptions of an unchanged incidence of stroke in the different age groups, continued population growth and an increase in life expectancy. The authors predicted that hospitalizations for stroke in Australia would increase from 1996 to 2007. They based these calculations on the NEMESIS study [2], and compared the results with actual data of hospitalizations derived from the National Hospital Morbidity Database. It turned out that the number of hospitalizations remained fairly stable over the decade, suggesting that the incidence of stroke was not stable but actually decreasing. A decline in stroke incidence in Western countries was shown by Feigin et al. [3] and corresponds well with the findings from Australia.

Stroke mortality, defined as deaths for which stroke was recorded as the underlying cause, also decreased from 1997 to 2007, contrary to predictions. This corresponds with Kunst et al. [4], who showed a decline in stroke mortality in 7 Western European countries. In 2011, stroke declined from the 3rd to the 4th leading cause of death in the US [5]. Evidence from these different sources confirms a decrease in stroke incidence in the Western world. This may, however, not be the case in the rest of the world [3].

The authors cautiously mention that it may be that primary prevention works. It seems as if we can be sure that primary prevention works. This is already suggested by the difference in stroke incidence in different socioeconomic classes, where pre-

ventive measures such as healthy diet, non-smoking and physical activity are more readily accepted and adhered to as the level of socioeconomic status increases.

A contributor to the falling incidence of stroke is the falling prevalence of smoking. In Australia, the rate of smoking decreased from about 26 to 19% of the population from 1996 to 2007. Another player is the increased focus on the benefits of physical activity. In addition, better treatment of hypertension, an area which still needs much attention since only about half of the patients adhere to treatment after half a year [6], has also contributed. Treatment of hypercholesterolemia also plays a role in the reduced incidence of stroke. On the other hand, the increase in overweight, obesity and diabetes, now and in the future, creates a pull in the opposite direction.

The desire to predict the future is widespread in the medical world. Based on the above data, it seems as if the near future will see a fairly stable number of stroke patients, albeit the mean age of stroke patients is likely to increase.

References

- 1 Thrift AG, Tong B, Senes S, Waters AM, Lalor E: No evidence for an epidemic of stroke with the ageing of the population. *Neuroepidemiology* 2012;38:268–273.
- 2 Thrift AG, Dewey HM, Sturm JW, Paul S, Gilligan AK, Srikanth VK, et al: Greater incidence of both fatal and non-fatal strokes in disadvantaged areas: the Northeast Melbourne Stroke Incidence Study. *Stroke* 2006;37:877–882.
- 3 Feigin VL, Lawes CM, Bennett DA, Barker-Collo SL, Parag V: Worldwide stroke incidence and early case fatality reported in 56 population-based studies: a systematic review. *Lancet Neurol* 2009;8:355–369.
- 4 Kunst AE, Amiri M, Janssen F: The decline in stroke mortality: exploration of future trends in 7 Western European countries. *Stroke* 2011;42:2126–2130.
- 5 Towfighi A, Saver JL: Stroke declines from third to fourth leading cause of death in the United States: historical perspective and challenges ahead. *Stroke* 2011;42:2351–2355.
- 6 Ho PM, Bryson CL, Rumsfeld JS: Medication adherence: its importance in cardiovascular outcomes. *Circulation* 2009;119:3028–3035.