

# Trends in incidence rates of acute stroke and 30-day case fatality rates in England between 1999 and 2011: a record-linkage study of over 1 million incident strokes

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## Background & Aim

Incidence rates of acute stroke have declined in high-income countries, but at a slower rate than mortality. There is only limited information on trends in stroke incidence rates, and on trends in short-term case fatality in England.

The majority of people with acute stroke in England are admitted to a National Health Service (NHS) hospital. The NHS provide a universal health care funded by central taxation since 1948.

We aimed to report on trends in hospital admission rates in England for all stroke and for individual stroke subtypes separately – ischaemic stroke, haemorrhagic stroke, and stroke cause unspecified.

## Dataset & Methods

**Design:** All-England population-based study of hospital admission rates for people with stroke using a linked Hospital Episode Statistics (HES) and national vital statistics dataset.

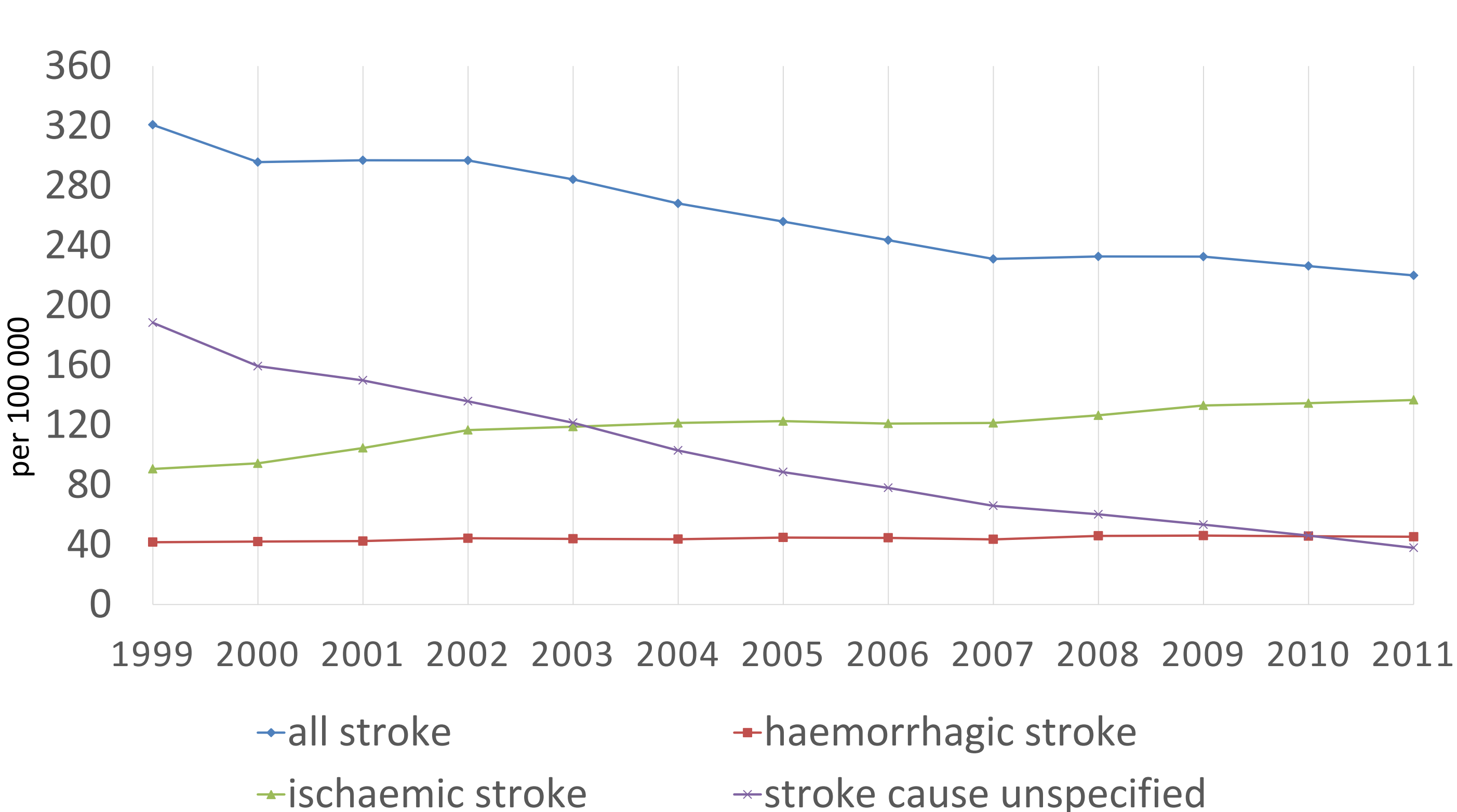
**Data:** Linked HES is a national dataset containing records of all day cases and all hospital admissions to NHS hospitals, including private patients. The linkage to national mortality statistics allows to include all patients who died from stroke out-of-hospital (at home, care facilities or in the ambulance). Strokes were defined using ICD10 codes: haemorrhagic stroke (I61-I62), ischaemic stroke (I63), stroke unspecified (I64), and total stroke (I61-I64).

**Population:** All residents of England admitted to the NHS hospitals with stroke between 1999-2011.

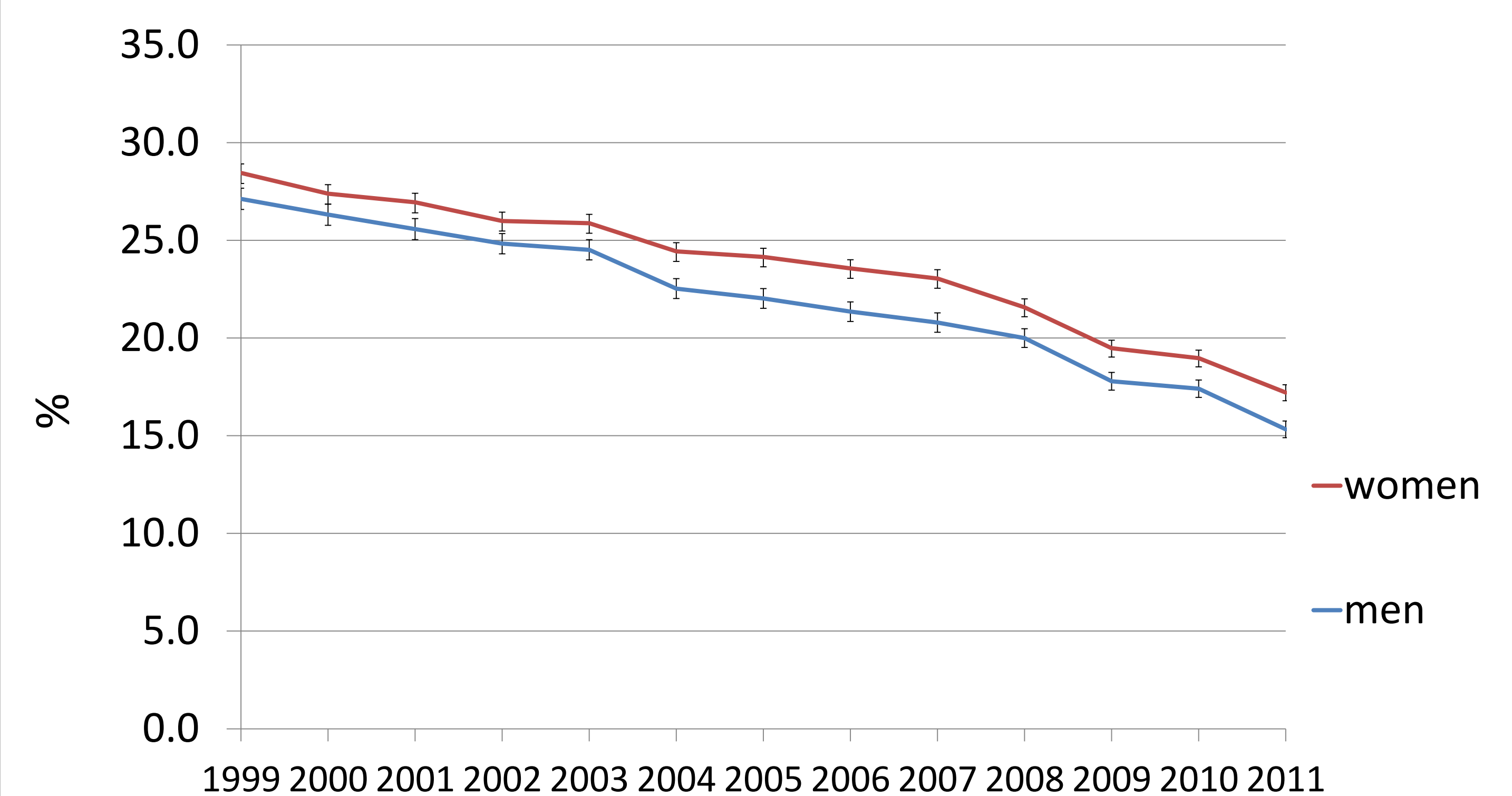
**Analysis:** Trends in age and sex-standardised annual incidence rates of stroke and stroke subtypes - ischaemic, haemorrhagic and stroke of unspecified type expressed per 100 000 population.

## Results & Conclusions

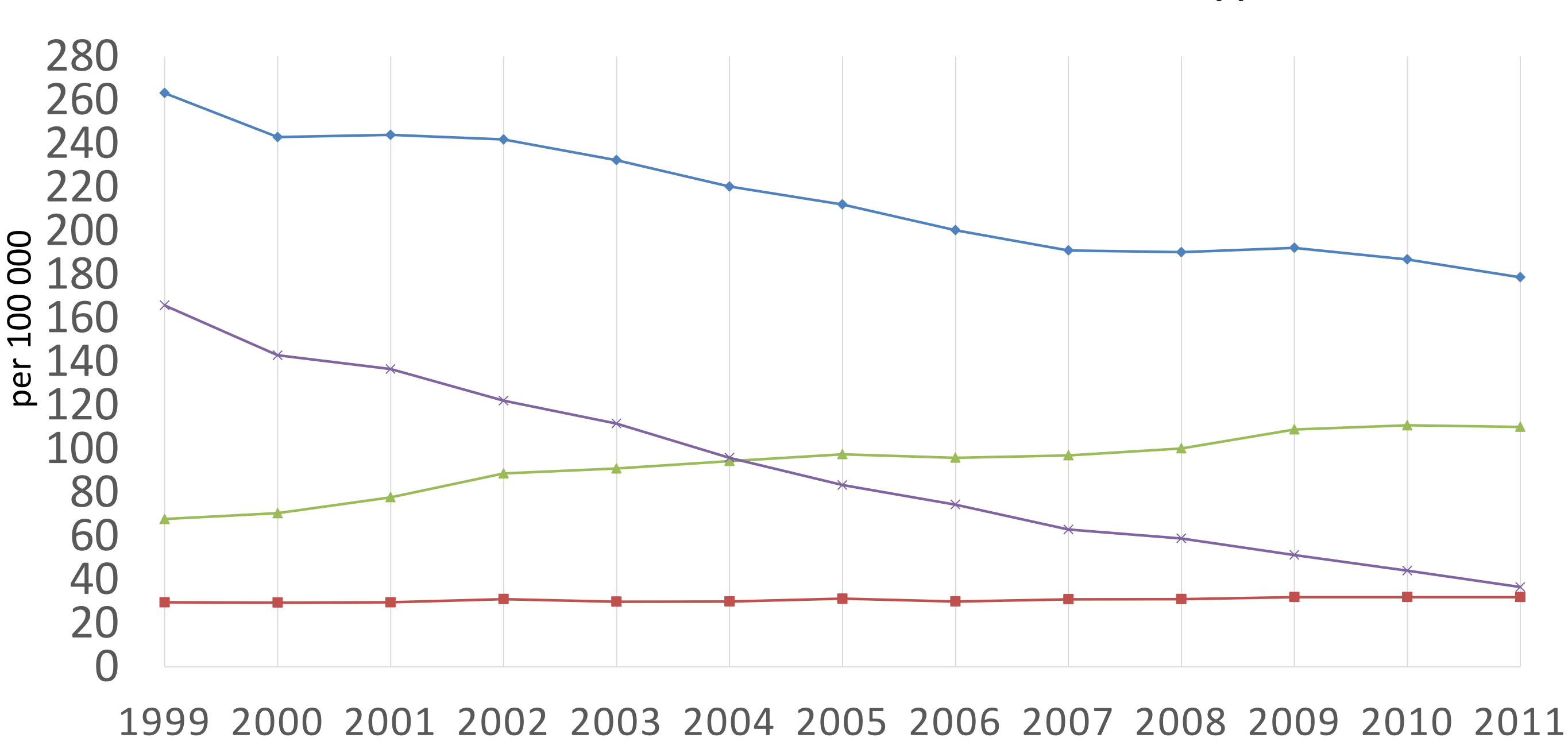
Trends in incidence rates for all stroke and stroke subtypes, men



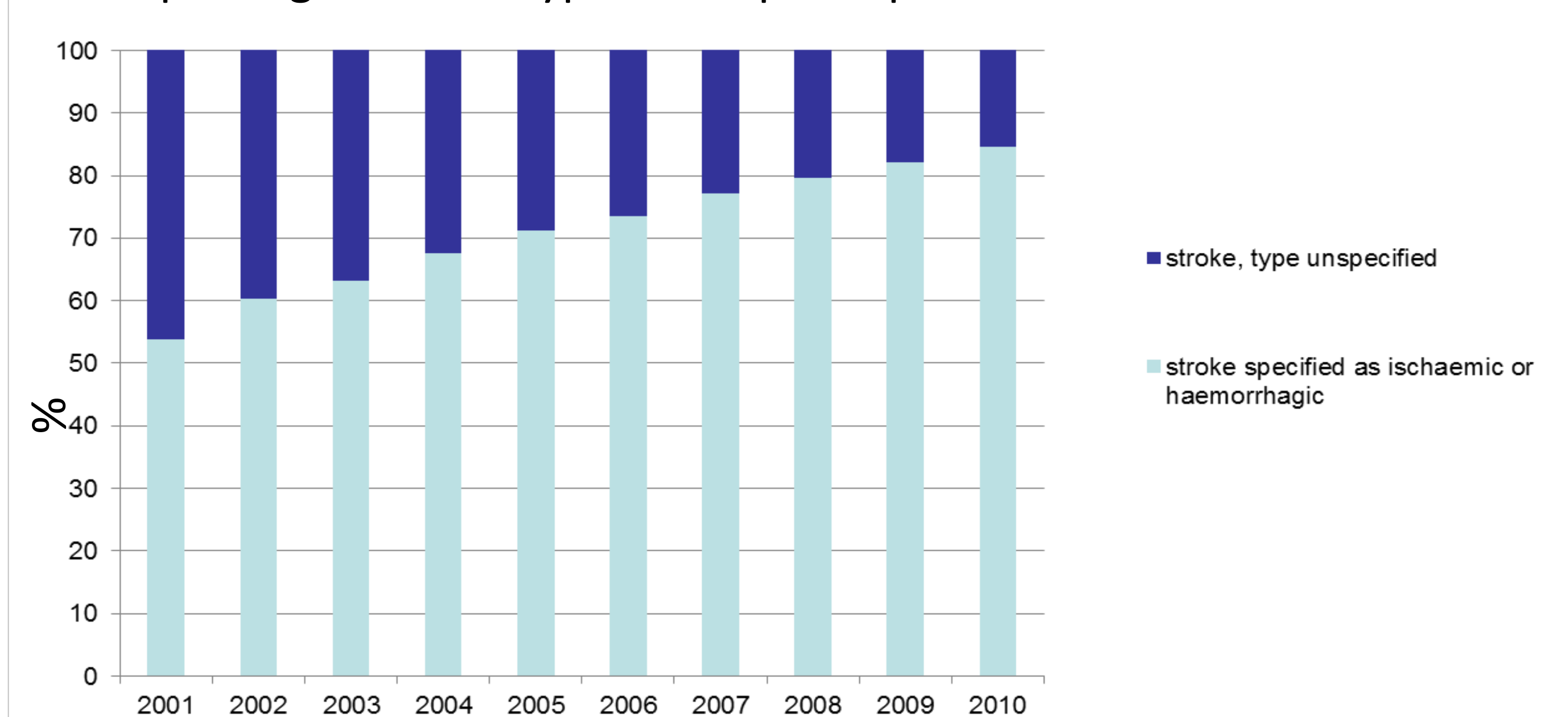
Trends in 30-day case fatality rates in men and women hospitalised with stroke



Trends in incidence rates for all stroke and stroke subtypes, women



Reporting of stroke type in Hospital Episode Statistics



**Conclusions:** There were 1 030 319 acute stroke, 55% were in women. In the first decade of the 21<sup>st</sup> century hospitalised incidence rates from stroke decreased by a third. There was a reduction in short-term mortality from 27% to 13% in men and from 28% to 17% in women at 30 days after hospitalisation for stroke. The observed increase in ischaemic stroke rates, contrasting to the overall reduction, is an artefact due to the improved recording of type of stroke. The increase in ischaemic stroke rates is mirrored by a fall in stroke of unspecified type, and is a result of increasing access to brain imaging. Long-term trends in admission rates for a particular subtype of stroke should not be considered on its own, but presented alongside total stroke, as changes in diagnostics, and preferences for diagnostic terminology, are likely to affect the rates.