Twenty-Four-Year Trends in the Incidence of Ischemic Stroke in Sweden From 1987 to 2010

Annika Rosengren, MD; Kok Wai Giang, MSc; Georgios Lappas, MSc; Christina Jern, MD; Kjell Torén, MD; Lena Björck, PhD

Background and Purpose—The incidence of stroke in Sweden increased between 1989 and 2000 among people aged ≤65 years, but more recent data on those aged >65 years are lacking.

Methods—Through the Swedish Hospital Discharge and Cause of Death registries, we identified all cases of nonfatal and fatal ischemic stroke (IS) among people aged 18 to 84 years during 1987–2010 in Sweden.

Results—Of the 391,081 stroke cases identified, 1.6% were 18 to 44 years, 16.7% were 45 to 64 years, and 81.7% were 65 to 84 years. Among people aged 18 to 44 years, there was a continuous increase in the incidence of stroke of 1.3% (95% confidence interval, 0.8%–1.8%) per year for men and 1.6% (1.0%–2.3%) per year for women. Among men and women aged 45 to 64 years, slightly declining rates were observed from the late 1990s, with a mean annual decrease of 0.4% (0.1%–0.7%) among men and 0.6% (0.2%–1.0%) among women. Among men aged 65 to 84 years, a decrease of 3.7% in IS (3.4%–4.0%) per year was observed from the late 1990s. This was more marked in women, where an initial decrease of 2.5% (2.1%–2.9%) per year was followed by an accelerated decrease of 5.1% (4.4%–5.8%) after 2005. Mortality from IS decreased markedly in all age groups.

Conclusions—The incidence of IS in elderly people in Sweden is now decreasing, whereas the decline in IS incidence in the middle-aged population is much less steep. The increasing incidence of stroke in the young, particularly if carried forward to an older age, is concerning. (Stroke. 2013;44:2388-2393.)

Key Words: epidemiology incidence ischemic mortality stroke

Stroke is one of the most common causes of disability among adults worldwide. The distribution of stroke greatly varies among countries and over time, for reasons that are not well understood. A systematic review of population-based studies from 1970 to 2008 showed a 42% decrease in stroke incidence in high-income countries and >100% increase in stroke incidence in low- to middle-income countries, but incidence trends in Europe have not been uniform. In Sweden, hospitalization for stroke increased between 1989 and 2000 among people aged 30 to 65 years. A recent study from the Netherlands demonstrated a marked decline in ischemic stroke (IS) mortality from 1987 to 2005, but a stable or slightly increased incidence of stroke. Trends toward increasing stroke incidence at younger ages in the United States have also been reported. This study aimed to investigate continuing trends in the incidence of stroke in Sweden until 2010, to extend investigations to subjects aged >65 years and ≤84 years, and specifically investigate trends for IS.

Methods

Study Setting

Sweden has a universal healthcare system, with some healthcare facilities privately run, but still fully integrated into the healthcare system. The Swedish National Inpatient Register (IPR), established in 1964, has complete national coverage since 1987. Diagnoses in the IPR are coded according to the Swedish International Classification of Diseases (ICD) system (ICD 8th revision until 1986, ICD 9th revision until 1996, and ICD 10th revision thereafter). For the purpose of the present study, data from the IPR and the cause-specific death register were linked through personal identity numbers, unique for all Swedish citizens. Current data suggest that the overall positive predictive values of diagnoses in the register are ≥85% to 95%.

Study Cohort

We included all patients aged 18 to 84 years who were discharged with a first-time discharge diagnosis of IS during 1987–2010 or who died outside hospital with a diagnosis of IS. All admissions or deaths associated with a primary diagnosis of 434 or 436 (ICD-8 and -9) and I63 or I64 (ICD-10) were defined as IS. Neuroimaging (computed tomographic scans) was standard in suspected stroke cases throughout the study period. To avoid possible underdetection bias for the first years of the study, an IS 7 years after a prior IS was treated as a first stroke to ensure that data on hospitalizations for each separate year from 1987 to 2010 were treated as uniformly as possible. Data from 1980 to 1986 were available for ≥80% of the population. Comorbidities were defined by the following discharge codes during the preceding 7 years and included the index of hospitalization as follows: diabetes mellitus: 250 (ICD-8 and ICD-9), E10, E11, E14 (ICD-10); hypertension: 401 to 405 (ICD-8 and 9), I10 to I15 (ICD-10);
acute myocardial infarction: 410 (ICD-8 and 9), 121 (ICD-10); ischemic heart disease: 410 to 414 (ICD-8 and 9), I20 to I25 (ICD-10); atrial fibrillation: 427.93 (ICD-8), 427D (ICD-9), I48 (ICD-10); and cancer: 140 to 239 (ICD-8 and ICD-9), C00 to D48 (ICD-10).

Ethics
For confidentiality, all personal identity numbers were replaced by codes. The protocol was approved by the regional Ethics Board of Gothenburg.

Statistical Analyses
Age-standardized incidence rates per 100,000 person-years and 95% confidence intervals were calculated using direct standardization, with the 2010 Swedish population used as the standard. Descriptive statistics were applied to summarize the prevalence of comorbidity within the identified population. Cochran-Armitage trend tests were used to assess trends in 1-year mortality. We used joinpoint regression to analyze changes in incidence and mortality over time. This method estimates trends for rates expressed as annual percentage changes (APCs) over time intervals and then attempts to identify the specific time points where significant changes in these trends (APCs) occurred (Joinpoint Regression Program, version 3.3.1; Statistical Research and Applications Branch, National Cancer Institute). The age-standardized annual rates were fitted in a log-linear autoregressive model, and the number of possible joinpoints was set between 0 and 3. The variance of the standardized rates was estimated according to the fact that these are the weighted sum of Poisson variables. For each estimate of mean APC, 95% confidence intervals were calculated.

Results
Demographics and Comorbidities
Of the 391,081 incident cases of IS in people aged between 18 and 84 years that we identified, 46.6% were women, and the mean age was 72.5 years, with 1.6% aged 18 to 44 years, 16.7% aged 45 to 64 years, and 81.7% aged 65 to 84 years (Table 1; Table I in the online-only Data Supplement). The mean age decreased from 73.0 years in 1987–1992 to 71.7 years in 2005–2010 (P < 0.0001). Although changes were highly significant because of the large number of cases, the overall change in the percentage of patients with acute myocardial infarction (overall, 13.2%) or any ischemic heart disease (23.7%) was small. The proportion of patients with diabetes mellitus slightly increased from 16.9% to 19.0% from the first to the last 6-year period, whereas the proportion of those with a registered diagnosis of hypertension markedly increased from 19.1% to 50.7%. Atrial fibrillation and malignancy increased by ≈40% and were registered as 21.9% for men and 12.4% for malignancy in the last 6-year period. Age-specific comorbidities are shown in Table I in the online-only Data Supplement.

Trends in the Incidence of IS During 1987–2010
Table 2 shows the trends in incidence and 1-year case-fatality of IS during four 6-year periods by 5 age groups in men and women. In people aged 18 to 44 years, there was a continuous increase in the incidence of IS from the first to the last 6-year period for men and women. For those aged 45 to 54 years, the incidence of IS increased from 51.3 to 61.4 per 100,000 person-years from the first to the second 6-year period and plateaued through the next period, with a slight decrease through the last period. The same pattern was evident among those aged 55 to 64 years, but among those aged ≥65 years, there was a distinct peak in the second period, in 1993–1998, after which rates started to markedly fall. The crude relative yearly changes are shown in Figure 1. One-year case-fatality decreased markedly in all age groups, similar for men and women (Table II in the online-only Data Supplement).

Joinpoint Analyses
Joinpoint analyses (Table 3) confirmed the increasing IS incidence trend among those aged <45 years, with a calculated APC of +1.3% (95% confidence interval, 0.8–1.8) in men and +1.6% (95% confidence interval, 1.0–2.3) in women. A rapid fall during the first few years was observed among men and women aged 45 to 64 years, which was followed by an increase. However, after 1996, there was a slow but continuous and significant decrease of −0.4% (−0.7 to −0.1) in men and −0.6% (−1.0 to −0.2) in women. There seemed to be a rapid decrease in men aged 45 to 64 years in 2008–2010, but this was not significant. Rates in people aged 65 to 84 years decreased at first and then increased, but after 1998 (men) and 1997 (women), they decreased. In men, the APC was −3.7% (−4.0 to −3.4) until 2010 with no detectable joinpoint, but in women, an initial slower decline of −2.5% (−2.9 to −2.1) changed to a more rapid decline in 2005, with an APC of −5.1% (−5.8 to −4.4).

Mortality
Based on 64,518 deaths during the study period, age-adjusted mortality from IS was markedly decreased in men and women. In people aged 18 to 44 years, there was a continuous increase in the incidence of IS from the first to the last 6-year period for men and women. For those aged 45 to 54 years, the incidence of IS increased from 51.3 to 61.4 per 100,000 person-years from the first to the second 6-year period and plateaued through the next period, with a slight decrease through the last period. The same pattern was evident among those aged 55 to 64 years, but among those aged ≥65 years, there was a distinct peak in the second period, in 1993–1998, after which rates started to markedly fall. The crude relative yearly changes are shown in Figure 1. One-year case-fatality decreased markedly in all age groups, similar for men and women (Table II in the online-only Data Supplement).

Table 1. Characteristics of 391,081 Patients Aged 18 to 84 Years With Ischemic Stroke During 1987–2010 by Period at First Admission

<table>
<thead>
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<tbody>
<tr>
<td>Number, n (%)</td>
<td>94,681</td>
<td>108,345</td>
<td>100,318</td>
<td>87,737</td>
<td>391,081</td>
</tr>
<tr>
<td>Mean age, y (SD)</td>
<td>73.0 (9.2)</td>
<td>72.8 (9.6)</td>
<td>72.5 (10.0)</td>
<td>71.7 (10.5)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Women, n (%)</td>
<td>44,335 (46.8)</td>
<td>51,110 (47.2)</td>
<td>47,100 (46.9)</td>
<td>39,636 (45.2)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Diabetes mellitus, n (%)</td>
<td>16,040 (16.9)</td>
<td>19,070 (17.6)</td>
<td>17,608 (17.6)</td>
<td>16,651 (19.0)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Hypertension, n (%)</td>
<td>18,074 (19.1)</td>
<td>27,870 (25.7)</td>
<td>32,721 (32.6)</td>
<td>44,513 (50.7)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Prior AMI, n (%)</td>
<td>12,120 (12.8)</td>
<td>14,483 (13.4)</td>
<td>13,403 (13.4)</td>
<td>11,495 (13.1)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Any IHD, n (%)</td>
<td>21,612 (22.8)</td>
<td>26,352 (24.3)</td>
<td>24,138 (24.1)</td>
<td>20,539 (23.4)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Atrial fibrillation, n (%)</td>
<td>14,682 (15.5)</td>
<td>20,839 (19.2)</td>
<td>20,730 (20.7)</td>
<td>19,191 (21.9)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Malignancy, n (%)</td>
<td>8423 (8.9)</td>
<td>11,231 (10.4)</td>
<td>11,039 (11.0)</td>
<td>10,853 (12.4)</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

AMI indicates acute myocardial infarction; and IHD, ischemic heart disease.
and women (Figure 2). Joinpoint analyses showed a continuous decrease in IS mortality, with an APC of −3.5% (−4.8 to −2.1) throughout the study period in people aged 18 to 44 years and an APC of −4.6% (−5.5 to −3.7) from 1993 among those aged 45 to 64 years. The APC was −1.4% (−1.9 to −0.9) among people aged 65 to 84 years until 2000 and then markedly increased to −5.8% (−6.6 to −5.1) through the rest of the study period.

Discussion

During the 24-year period from 1987 to 2010 in Sweden, there was a marked decrease in the incidence of IS among people

| Table 2. Incidence of Ischemic Stroke per 100,000 Person-Years in Sweden During 1987–2010 by Age Group and Period |
|-----------------|-----------------|-----------------|-----------------|-----------------|
| 18–44           |                 |                 |                 |                 |
| Rate/100,000 person-years | 7.17            | 8.13            | 8.26            | 9.55            |
| No. of cases    | 1402            | 1565            | 1565            | 1864            |
| Died within a year, n (%) | 141 (10.1)      | 122 (7.8)       | 98 (6.3)        | 86 (4.6)        |
| 45–54           |                 |                 |                 |                 |
| Rate/100,000 person-years | 51.3           | 64.1            | 63.7            | 61.4            |
| No. of cases    | 3182            | 4774            | 4629            | 4350            |
| Died within a year, n (%) | 336 (10.6)      | 328 (6.9)       | 289 (6.2)       | 235 (5.4)       |
| 55–64           |                 |                 |                 |                 |
| Rate/100,000 person-years | 188            | 221             | 208             | 189             |
| No. of cases    | 9620            | 11511           | 13353           | 13696           |
| Died within a year, n (%) | 1511 (15.7)    | 1249 (10.9)     | 1231 (9.2)      | 1119 (8.2)      |
| 65–74           |                 |                 |                 |                 |
| Rate/100,000 person-years | 606            | 689             | 614             | 503             |
| No. of cases    | 30414           | 32979           | 27459           | 24867           |
| Died within a year, n (%) | 7356 (24.2)     | 6187 (18.8)     | 4446 (16.2)     | 3446 (13.9)     |
| 75–84           |                 |                 |                 |                 |
| Rate/100,000 person-years | 1568           | 1705            | 1523            | 1278            |
| No. of cases    | 50063           | 57516           | 53312           | 42960           |
| Died within a year, n (%) | 20843 (41.6)   | 19644 (34.2)    | 16344 (30.7)    | 12384 (28.8)    |

All P for trends in 1-y mortality <0.0001.

Figure 1. Relative percentage change in the incidence of ischemic stroke by sex and age group in people aged 18 to 84 years in Sweden from 1987 to 2010. Incidence of ischemic stroke in 1987 was set at 100%, and subsequent percentages are in relation to that year.
aged 65 to 84 years starting in the mid-1990s. A decrease in the incidence of IS among middle-aged (45–64 years) people also started in the mid-1990s, but was considerably slower. In contrast, stroke rates among young people aged 18 to 44 years steadily increased by $\approx 1.5\%$ throughout the study period. Mortality from IS decreased markedly in all age groups.

Several studies have investigated national trends in stroke incidence and mortality. In the United Kingdom, the incidence of stroke decreased by 29% between 1999 and 2008,9 coinciding with a marked increase in primary care prescription of primary and secondary cardiovascular disease prevention therapies. However, age-specific incidence rates were not reported. An increase in IS incidence of 20% and 33% in Dutch men and women aged 35 to 64 years between 1997 and 2005 was recently reported,6 as well as no change in people aged $\geq 65$ years. However, similar to our study, a steep decline in mortality was found.6 Trends toward increasing stroke incidence at younger ages were recently reported from the United States.7 Another UK study10 found a leveling off in the decline of stroke mortality among younger middle-aged adults, particularly in men, with increasing obesity rates from the early 1980s suggested as one contributing factor. Although we found no indication of a leveling off in mortality at any age in our data set, the persistent increase in incidence of IS in the young coincides with increasing rates of obesity.

### Table 3. Age-Standardized Trends in the Incidence of Ischemic Stroke Among Swedish Men and Women From 1987 to 2010: Joinpoint Analysis

<table>
<thead>
<tr>
<th>Age Group (Years) and Period</th>
<th>No. of Stroke Cases (min–max)*</th>
<th>Age-Standardized Rates per 105 (min–max)†</th>
<th>Annual Percentage Change (95% Confidence Interval)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Men</td>
<td></td>
<td></td>
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<tr>
<td>18–44 y</td>
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<td></td>
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<tr>
<td>1987–2010</td>
<td>125 to 189</td>
<td>7.5 to 11.4</td>
<td>1.3 (0.8 to 1.8)‡</td>
</tr>
<tr>
<td>45–64 y</td>
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<tr>
<td>1987–1989</td>
<td>1362 to 1580</td>
<td>147 to 176</td>
<td>−8.7 (−12.8 to −4.4)‡</td>
</tr>
<tr>
<td>1989–1996</td>
<td>1362 to 1872</td>
<td>147 to 175</td>
<td>2.6 (1.7 to 3.5)‡</td>
</tr>
<tr>
<td>1996–2008</td>
<td>1865 to 2032</td>
<td>165 to 177</td>
<td>−0.4 (−0.7 to −0.1)‡</td>
</tr>
<tr>
<td>2008–2010</td>
<td>1878 to 2032</td>
<td>155 to 168</td>
<td>−3.2 (−7.4 to 1.2)‡</td>
</tr>
<tr>
<td>65–84 y</td>
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<tr>
<td>1987–1989</td>
<td>6373 to 7075</td>
<td>1060 to 1190</td>
<td>−5.7 (−10.8 to −0.2)‡</td>
</tr>
<tr>
<td>1989–1993</td>
<td>6943 to 7463</td>
<td>1277 to 1366</td>
<td>4.1 (1.3 to 7.0)‡</td>
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<tr>
<td>1993–1998</td>
<td>7434 to 7828</td>
<td>1240 to 1324</td>
<td>1.2 (−0.5 to 2.9)‡</td>
</tr>
<tr>
<td>1998–2010</td>
<td>5599 to 7828</td>
<td>819 to 1324</td>
<td>−3.7 (−4.0 to −3.4)‡</td>
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<tr>
<td>Women</td>
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<tr>
<td>18–44 y</td>
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<tr>
<td>1987–2010</td>
<td>81 to 176</td>
<td>5.1 to 10.8</td>
<td>1.6 (1.0 to 2.3)‡</td>
</tr>
<tr>
<td>45–64 y</td>
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</tr>
<tr>
<td>1987–1990</td>
<td>681 to 630</td>
<td>66 to 75</td>
<td>−3.7 (−7.9 to 0.5)</td>
</tr>
<tr>
<td>1990–1996</td>
<td>630 to 963</td>
<td>66 to 91</td>
<td>6.4 (4.2 to 8.6)‡</td>
</tr>
<tr>
<td>1996–2010</td>
<td>962 to 1108</td>
<td>85 to 93</td>
<td>−0.6 (−1.0 to −0.2)‡</td>
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<tr>
<td>65–84 y</td>
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<tr>
<td>1987–1990</td>
<td>6851 to 6331</td>
<td>822 to 902</td>
<td>−2.9 (−4.6 to −1.2)‡</td>
</tr>
<tr>
<td>1990–1993</td>
<td>6345 to 7357</td>
<td>822 to 956</td>
<td>5.5 (2.0 to 9.2)‡</td>
</tr>
<tr>
<td>1993–1997</td>
<td>7357 to 7633</td>
<td>956 to 1006</td>
<td>1.4 (−0.3 to 2.9)</td>
</tr>
<tr>
<td>1997–2005</td>
<td>7633 to 6063</td>
<td>827 to 1006</td>
<td>−2.5 (−2.9 to −2.1)‡</td>
</tr>
<tr>
<td>2005–2010</td>
<td>6063 to 4983</td>
<td>638 to 827</td>
<td>−5.1 (−5.8 to −4.4)‡</td>
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</table>

*The total number of cases in the age group for each particular year.
†Comparison of mortality rates in each age group and time interval.
‡Annual percentage change is significantly different from zero at $\alpha=0.05$. 

The steep increase in stroke incidence with age, this segment represents $>4$ of 5 cases in the population that we studied, with a substantial reduction in the annual number of cases.
in Sweden. However, with respect to the incidence of IS, it is still unclear why trends in Sweden differ according to age and why rates in Sweden are decreasing, in contrast to the stable trends found in the Netherlands, a country with many similarities to Sweden.

Stroke is a heterogeneous disease with respect to cause. Hemorrhagic stroke and IS do not share the same risk factors, and there are also various types of IS, such as large-vessel, small-vessel, and cardioembolic strokes. However, high blood pressure and smoking are risk factors, irrespective of the type of stroke, whereas the relationship between blood lipids and stroke is more complex. In the present study, we focused on IS, which forms the majority of all stroke cases in Sweden, to avoid some of the issues concerning causal and pathophysiological heterogeneity.

There have been significant changes in cardiovascular risk factors in Sweden during the period we studied. A decrease in serum cholesterol levels contributed, to a large extent, to the marked decline in coronary heart disease mortality observed in Sweden since the 1980s, but because the relationship between serum cholesterol and the overall incidence of stroke is not straightforward, it is unlikely to be a major factor, but could still reflect, or be a marker for, other changes in dietary habits, such as intake of fruit or less salt. Decreasing smoking rates would also have contributed to the decline in coronary heart disease mortality. The prevalence of hypertension decreased from 1990 to 2010, as did the use of antihypertensive treatment and the proportion of people reaching treatment goals. A diagnosis of hypertension among the hospitalized subjects of our sample became increasingly common. However, this was probably more in recognition of the importance of hypertension as a contributor to stroke, as well as a less strict definition of hypertension, rather than reflecting a real increase.

Although it is likely that reduction in smoking and blood pressure, as well as better antihypertensive treatment, contributed to the marked decrease in the incidence of IS observed in elderly people, the continuous increase in this incidence in younger subjects is more difficult to explain. Because stroke is rare among the young, risk factors in this age group have not been extensively studied. However, causes not related to atherothrombotic disease are probably more common than among older patients. Nevertheless, the burden of cardiovascular disease risk factors has been shown to be high in young stroke victims. Although there have been favorable developments with respect to several risk factors, increasing obesity rates in young and middle-aged people may have had an adverse effect.

**Strengths and Limitations**

There are a few limitations, as well as some strengths of our study. Strengths include a near-complete ascertainment of all hospitalized stroke cases in an entire country during a long period, permitting analyses in young people where stroke is rare. Limitations include the use of data collected for administrative purposes, where current validity of stroke diagnoses and comparability with earlier data may be in doubt. Similarly, the comparability across time of contributory diagnoses, such as diabetes mellitus or hypertension, may not be certain. Validation of stroke diagnoses in the IPR has led to varying conclusions, with 1 study showing up to one third false-positive stroke diagnoses. However, because a proportion of these were former stroke cases that were classified as
new stroke cases and our cohort represents incident cases, recurrent stroke is unlikely to explain the large reduction among the old. Because stroke is rare among the young, large populations are required, which precludes the use of more carefully ascertained and characterized clinical populations. Although we used the entire Swedish population, the number of cases each year among people aged <45 years was low, with substantial random variation. Regardless, we were able to demonstrate a significant annual increase in IS throughout the 24-year period. Better diagnostic methods could increase detection; however, this mechanism should not operate only in the young.

Conclusions
In conclusion, the incidence of IS in Sweden in elderly people, in whom most cases occur, seems to have peaked and is now decreasing, whereas the decline in middle-aged people is much less steep. The incidence of IS is increasing in the youngest part of the population. Although young people represent a small proportion of all stroke cases, this is worrying, but might at least partly be caused by detection of smaller strokes. An alternative explanation may be the same factors that lead to increasing obesity rates. If this trend is carried forward as these young cohorts become older, this would mean an increase in human suffering and put additional strain on limited resources for a disease that is largely preventable. Accordingly, further steps to prevent stroke, a major risk of disability in adults, are required.

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Disclosures
None.

References
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The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://stroke.ahajournals.org/content/44/9/2388

Data Supplement (unedited) at:
http://stroke.ahajournals.org/content/suppl/2013/07/09/STROKEAHA.113.001170.DC1
SUPPLEMENTAL MATERIAL
Table I. Characteristics of 391081 patients with ischemic stroke identified in the Swedish Hospital and Death registries 1987 to 2010 by age group and period at first admission

<table>
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<td><strong>18-44</strong></td>
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</tr>
<tr>
<td>Number, n (%)</td>
<td>1402</td>
<td>1565</td>
<td>1565</td>
<td>1864</td>
<td>6396</td>
</tr>
<tr>
<td>Mean age, years (SD)</td>
<td>37.2 (6.8)</td>
<td>36.7 (6.7)</td>
<td>37.3 (6.2)</td>
<td>37.7 (6.2)</td>
<td>37.2 (6.46)</td>
</tr>
<tr>
<td>Women, n (%)</td>
<td>590 (42.1)</td>
<td>717 (45.8)</td>
<td>690 (44.1)</td>
<td>817 (43.8)</td>
<td>2814 (44.0)</td>
</tr>
<tr>
<td>Diabetes, n (%)</td>
<td>135 (9.6)</td>
<td>143 (9.1)</td>
<td>131 (8.4)</td>
<td>179 (9.6)</td>
<td>588 (9.2)</td>
</tr>
<tr>
<td>Hypertension, n (%)</td>
<td>162 (11.5)</td>
<td>192 (12.3)</td>
<td>226 (14.4)</td>
<td>350 (18.8)</td>
<td>930 (14.5)</td>
</tr>
<tr>
<td>Prior AMI, n (%)</td>
<td>46 (3.3)</td>
<td>45 (2.9)</td>
<td>27 (1.7)</td>
<td>33 (1.8)</td>
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<td>69 (4.9)</td>
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<td>Atrial fibrillation, n (%)</td>
<td>21 (1.5)</td>
<td>24 (1.5)</td>
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<td>120 (1.9)</td>
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<td>Malignancy, n (%)</td>
<td>30 (2.1)</td>
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<td>160 (2.5)</td>
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<td>Number, n (%)</td>
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<td>Mean age, years (SD)</td>
<td>58.0 (5.2)</td>
<td>57.4 (5.3)</td>
<td>57.6 (4.9)</td>
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<td>Women, n (%)</td>
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<td>2090 (16.3)</td>
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<td>3102 (17.2)</td>
<td>3276 (18.2)</td>
<td>11418 (17.5)</td>
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<td>Hypertension, n (%)</td>
<td>2946 (23.0)</td>
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<td>8448 (46.8)</td>
<td>21863 (33.6)</td>
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<td>Prior AMI, n (%)</td>
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<td>Any IHD, n (%)</td>
<td>2305 (18.0)</td>
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<td>9831 (15.1)</td>
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<td>65-79</td>
<td>70-74</td>
<td>75-79</td>
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<td><strong>Atrial fibrillation, n (%)</strong></td>
<td>942 (7.4)</td>
<td>1254 (7.7)</td>
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<td>1734 (9.6)</td>
<td>5491 (8.4)</td>
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<tr>
<td><strong>Malignancy, n (%)</strong></td>
<td>614 (4.8)</td>
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<td>1216 (6.7)</td>
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65-84

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<td><strong>Mean age, years (SD)</strong></td>
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<td><strong>Women, n (%)</strong></td>
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<td><strong>Diabetes, n (%)</strong></td>
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<td><strong>Hypertension, n (%)</strong></td>
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<td><strong>Any IHD, n (%)</strong></td>
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<td>23629 (26.1)</td>
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<td>18159 (26.8)</td>
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<td><strong>Atrial fibrillation, n (%)</strong></td>
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<td><strong>Malignancy, n (%)</strong></td>
<td>7779 (9.7)</td>
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<td>9585 (14.1)</td>
<td>37668 (11.8)</td>
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Table II. Incidence of ischemic stroke per 100 000 person-years in Sweden during 1987–2010 by age, sex, and period.

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<td>18–44</td>
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<tr>
<td>Rate/100 000 person-years</td>
<td>8.11</td>
<td>8.62</td>
<td>9.05</td>
<td>10.5</td>
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<td>No of cases</td>
<td>812</td>
<td>848</td>
<td>875</td>
<td>1047</td>
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<td>Died within a year, n (%)</td>
<td>88 (10.8)</td>
<td>64 (7.5)</td>
<td>55 (6.3)</td>
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<td>Rate/100 000 person-years</td>
<td>70.3</td>
<td>81.7</td>
<td>79.1</td>
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<td>2906</td>
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<td>Died within a year, n (%)</td>
<td>241 (10.9)</td>
<td>200 (6.5)</td>
<td>183 (6.3)</td>
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<tr>
<td>Rate/100 000 person-years</td>
<td>265</td>
<td>297</td>
<td>272</td>
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<td>7660</td>
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<td>Died within a year, n (%)</td>
<td>1027 (15.5)</td>
<td>845 (11.0)</td>
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<td>727 (8.1)</td>
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<td>Rate/100 000 person-years</td>
<td>778</td>
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<td>767</td>
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<td>Died within a year, n (%)</td>
<td>4362 (24.2)</td>
<td>3621 (19.0)</td>
<td>2582 (16.1)</td>
<td>2064 (13.9)</td>
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<td>75–84</td>
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<tr>
<td>Rate/100 000 person-years</td>
<td>1762</td>
<td>1935</td>
<td>1699</td>
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<td>No of cases</td>
<td>22655</td>
<td>26539</td>
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<td>20444</td>
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<td>Died within a year, n (%)</td>
<td>9411 (41.5)</td>
<td>9181 (34.6)</td>
<td>7609 (30.9)</td>
<td>5811 (28.4)</td>
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<tr>
<td><strong>Women</strong></td>
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<td>18–44</td>
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<td>Rate/100 000 person-years</td>
<td>6.18</td>
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<td>7.44</td>
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<td>Died within a year, n (%)</td>
<td>53 (9.0)</td>
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<td>45–54</td>
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<tr>
<td>Rate/100 000 person-years</td>
<td>31.7</td>
<td>46.0</td>
<td>48.0</td>
<td>44.6</td>
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<td>Died within a year, n (%)</td>
<td>97 (10.0)</td>
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<tr>
<td>Rate/100 000 person-years</td>
<td>114</td>
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<td>3851</td>
<td>4582</td>
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<tr>
<td>Died within a year, n (%)</td>
<td>484 (16.1)</td>
<td>404 (10.5)</td>
<td>418 (9.1)</td>
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**65–74**

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<th>Rate/100 000 person-years</th>
<th>458</th>
<th>539</th>
<th>480</th>
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<td>13881</td>
<td>11391</td>
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<td>Died within a year, n (%)</td>
<td>2994 (24.2)</td>
<td>2566 (18.5)</td>
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**75–84**

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<th>1437</th>
<th>1548</th>
<th>1399</th>
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<td>28714</td>
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<td>Died within a year, n (%)</td>
<td>11432 (41.7)</td>
<td>10463 (33.8)</td>
<td>8735 (30.4)</td>
<td>6573 (29.2)</td>
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All p for trends in 1-year mortality <0.0001, except for women 18-44 years, where p was 0.00216