Table e-1: Participation rate of all Dutch hospitals in the Hospital Discharge Register (HDR)

| Year | Percentage of hospitals participating in the HDR |
|------|--------------------------------------------------|
| 1998 | 98.4%                                            |
| 1999 | 98.8%                                            |
| 2000 | 98.5%                                            |
| 2001 | 98.6%                                            |
| 2002 | 99.0%                                            |
| 2003 | 98.9%                                            |
| 2004 | 98.5%                                            |
| 2005 | 96.2%                                            |
| 2006 | 89.0%                                            |
| 2007 | 87.5%                                            |
| 2008 | 87.6%                                            |
| 2009 | 86.8%                                            |
| 2010 | 85.6%                                            |
| ICD-9 | ICD-10 |
|-------|--------|
| **Intracerebral haemorrhage** |        |
| 431   | I61    |
| **Ischaemic stroke** |        |
| 434   | I63    |
| **Unspecified stroke** |        |
| 436   | I64    |
| **All stroke** |        |
| 431   | I61    |
| 434   | I63    |
| 436   | I64    |
| **Composite vascular outcome** |        |
| 410   | I21    |
| 411   | I24    |
| 413   | I20    |
| 414   | I25    |
| 415   | I27    |
| 430   | I60    |
| 431   | I61    |
| 432   | I62    |
| 434   | I63    |
| 436   | I64    |
| 441   | I71    |
| 442   | I72    |
| 443   | I73    |
| 444   | I26    |
| 444   | I74    |
| 445   | I75    |
| 451   | I80    |
| 452   | I81    |
| 453   | I82    |

The Hospital Discharge Register contains reasons for admission coded with ICD-9. Causes of death are registered in the Cause of Death Register using ICD-10 codes.
Table e-3. Composition of the outcome all stroke

|                                             | Deaths, n (%) | Admissions, n (%) |
|---------------------------------------------|---------------|-------------------|
| All stroke*                                 | 1722          | 1655              |
| Intracerebral haemorrhage                   | 328 (19.0%)   | 449 (27.1%)       |
| Cerebral infarction                         | 72 (4.2%)     | 684 (41.3%)       |
| Stroke, not specified as haemorrhage or infarction | 1299 (75.4%) | 466 (28.2%)       |
| Subarachnoid haemorrhage                    | 23 (1.3%)     | 56 (3.4%)         |

* numbers of the stroke subtypes as a component of the outcome all stroke may differ from the numbers reported for these outcomes separately as reported in the text because multiple events may occur in individual patients.
### Table e-4. Composition of the composite vascular outcome

| Composite vascular outcome                                      | Deaths, n (%) | Admissions, n (%) |
|----------------------------------------------------------------|---------------|------------------|
| Composite vascular outcome                                      | 2160          | 2805             |
| Intracerebral haemorrhage                                       | 314 (14.5%)   | 418 (14.9%)      |
| Cerebral infarction                                             | 69 (3.2%)     | 623 (22.2%)      |
| Stroke, not specified as stroke or infarction                   | 1269 (58.8%)  | 435 (15.5%)      |
| Acute myocardial infarction                                     | 279 (12.9%)   | 295 (10.5%)      |
| Other acute ischaemic heart disease                             | 5 (0.2%)      | 175 (6.2%)       |
| Intracerebral haemorrhage                                       | 314 (14.5%)   | 418 (14.9%)      |
| Cerebral infarction                                             | 69 (3.2%)     | 623 (22.2%)      |
| Stroke, not specified as stroke or infarction                   | 1269 (58.8%)  | 435 (15.5%)      |
| Acute myocardial infaration                                     | 279 (12.9%)   | 295 (10.5%)      |
| Other acute ischaemic heart disease                             | 5 (0.2%)      | 175 (6.2%)       |
| Aortic aneurysm and dissection                                  | 40 (1.9%)     | 137 (4.9%)       |
| Angina pectoris                                                 | 5 (0.2%)      | 168 (6.0%)       |
| Pulmonary embolism                                              | 26 (1.1%)     | 117 (4.2%)       |
| Chronic ischaemic heart disease                                 | 88 (4.1%)     | 43 (1.5%)        |
| Arterial embolism and thrombosis                                | 9 (0.4%)      | 116 (4.1%)       |
| Other intracranial haemorrhage                                 | 15 (0.7%)     | 95 (3.4%)        |
| Other venous embolism and thrombosis                            | 1 (<0.1%)     | 87 (3.1%)        |
| Subarachnoid haemorrhage                                        | 23 (1.1%)     | 52 (1.9%)        |
| Other aneurysm and dissection                                   | 7 (0.3%)      | 29 (1.0%)        |
| Phlebitis and thrombophlebitis                                  | 3 (0.1%)      | 15 (0.5%)        |
| Other peripheral vascular diseases                              | 4 (0.2%)      | 0                |
| Acute pulmonary heart disease                                   | 3 (0.1%)      | 0                |
| Study            | Country and period       | Setting       | Design      | Population | Analytic method       | Patients, n | Age, mean, y | Follow up duration, mean, y | Intracerebral haemorrhage | Ischaemic stroke | All stroke | CVO | Vascular death | All death |
|------------------|--------------------------|---------------|-------------|------------|------------------------|-------------|-------------|----------------------------|--------------------------|----------------|------------|-----|----------------|-----------|
| Douglas, 1982    | United States 1975-1979 | Two hospitals | Retrospective | Hypertensive ICH, clinical diagnosis, discharged alive | P           | 42          | 2.4                      | 0 (0.5-8.0)                  | N/A                      | N/A            | 4.8 (1.0-14.4) | 7.1 (2.1-17.9) | 16.7 (7.8-30.0) |
| Holweg-Larsen, 1984 | Denmark 1974-1982        | Single hospital | Retrospective | Any ICH, clinical diagnosis, 21 days survivors | P           | 39          | 54 (median)              | 4.5 (median)                  | 2.6 (0.3-11.4)              | N/A            | 5.1 (1.1-15.5) | N/A        | 18.0 (8.4-32.0) |
| Fieschi, 1988    | Italy 1982-1983          | Single hospital | Retrospective | First ICH, clinical diagnosis, 30 days survivors | P           | 73          | 61.5 (median)           | 1 (fixed)                      | 0 [0.3-4.9]                  | N/A            | N/A            | N/A            | 4.1 (1.2-10.6) |
| Fogelholm, 1992  | Finland 1985-1989        | Population    | Retrospective | First ICH, clinical diagnosis, 30 days survivors | P           | 79          | 68.2 (median)           | 2.7 (median)                     | 7.6 (3.2-15.0)              | N/A            | 6.3 (2.5-13.3) | 13.9 (7.6-22.8) | N/A        | 20.3 (12.6-30.1) |
| Franke, 1992     | Netherlands 1986-1989    | Two hospitals | Prospective  | First ICH, clinical diagnosis, 2 days survivors | P           | 120         | 1 (fixed)                | N/A                             | N/A                      | 3.3 (1.1-7.7)     | N/A            | 10.0 (5.6-16.3) | 38.8 (30.0-47.2) |
| Chen, 1995       | Taiwan 1987-1989         | Single hospital | Retrospective | Hypertensive ICH, clinical diagnosis, history of ICH | P           | 892         | 59 (median)              | 2.3 (median)                     | 5.3 (4.0-6.9)                | N/A            | N/A            | N/A            | N/A          |
| Counsell, 1995   | United Kingdom 1981-1985 | Population    | Prospective  | First ICH, clinical diagnosis, 30 days survivors | P           | 31          | 68.9 (median)           | 2.5 (median)                     | 12.9 (4.5-27.8)              | N/A            | 12.9 (4.5-27.8) | 29.0 (15.4-46.3) | N/A        | 19.4 (8.5-35.6) |
| Maruishi, 1995   | Japan 1984-1992          | Single hospital | Retrospective | Any ICH, clinical diagnosis, history of ICH | P           | 509         | 62.9 (median)           | 2.3 (median)                     | 5.9 (4.1-8.2)                | N/A            | N/A            | N/A            | N/A          |
| Passero, 1995    | Italy 1978-1982          | Single hospital | Prospective  | First ICH, clinical diagnosis, 30 days survivors | P           | 112         | 63.7 (median)           | 7.0                             | 24.1 (16.9-32.6)             | N/A            | 7.1 (3.4-13.0) | 31.3 (23.2-40.2) | N/A        | N/A            |
| Neau, 1997       | France 1984-1994         | Single hospital | Retrospective | First ICH, clinical diagnosis, 30 days survivors | P           | 375         | 64.7 (median)           | 4.0                             | 2.0 (0.9-3.7)               | N/A            | N/A            | N/A            | N/A          |
| Arakawa, 1998    | Japan 1982-1996          | Single hospital | Retrospective | First hypertensive ICH, clinical diagnosis, 3 months survivors | AR          | 74          | 59 (median)              | 5.6                             | 2.0 (0.9-3.7)               | N/A            | N/A            | N/A            | N/A          |
| Gonzalez-Duarte, 1998 | Mexico 1989-1997       | Single hospital | Retrospective | First ICH, clinical diagnosis, discharged alive | P           | 350         | 60 (median)             | 4.6                             | 6.3 (4.1-9.2)               | N/A            | N/A            | N/A            | N/A          |
| Hankay, 1998     | Australia 1989-1990      | Population    | Prospective  | First ICH, clinical diagnosis, 21 days survivors | P           | 36          | 73 (median)             | 5 (fixed)                       | 8.3 (2.4-20.6)              | N/A            | 8.3 (2.4-20.6) | 27.8 (15.3-43.7) | N/A        | N/A            |
| Bae, 1999        | Korea 1989-1995          | Single hospital | Retrospective | Any hypertensive ICH, clinical diagnosis, 3 months survivors | P           | 617         | 58 (median)             | 3.2                             | 8.4 (6.4-10.8)              | N/A            | N/A            | N/A            | N/A          |
| Year | Author       | Country       | Methodology                  | Study Details                                                                 | Population | Location | Follow-Up | Inclusion Criteria                                                                 | Results                                                                 |
|------|--------------|---------------|------------------------------|--------------------------------------------------------------------------------|------------|----------|-----------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| 1997 | Hill, 2000   | United States | Cross-sectional              | Single hospital, Prospective, clinical diagnosis, 1 year risk: 24% 5%          | N/A        | United States | 1991-1998 | 5-10.1 (18-30) i                                                                 | N/A                                                                    |
| 2001 | O'Donnell,   | United States | Retrospective, record-linking | Single hospital, Clinical diagnosis, 4 year risk: 19.2 (17.4-21.0)             | N/A        | United States | 1994-1998 | 7.9 (3.8-13.4) i                                                                 | N/A                                                                    |
| 2003 | Chen, 2001   | Taiwan        | Retrospective                | Single hospital, Clinical diagnosis, 1 year risk: 21.4 (19.6-23.3)             | N/A        | Taiwan     | 1988-1999 | 7.9 (3.8-13.4) i                                                                 | N/A                                                                    |
| 2004 | Vermaer, 2002| Netherlands   | Retrospective                | Single hospital, Clinical diagnosis, 1 year risk: 27.4 (24.7-30.3)             | N/A        | Netherlands | 1986-1995 | 7.9 (3.8-13.4) i                                                                 | N/A                                                                    |
| 2006 | Yokota, 2004 | Japan         | Single hospital              | Population, Clinical diagnosis, 1 year risk: 27.4 (24.7-30.3)                 | N/A        | Japan      | 1978-1997 | 7.9 (3.8-13.4) i                                                                 | N/A                                                                    |
| 2005 | Fosbergholm, | Finland       | Single hospital              | Population, Clinical diagnosis, 1 year risk: 27.4 (24.7-30.3)                 | N/A        | Finland    | 1985-1991 | 7.9 (3.8-13.4) i                                                                 | N/A                                                                    |
| 2005 | Hata, 2005   | Japan         | Single hospital              | Population, Clinical diagnosis, 1 year risk: 27.4 (24.7-30.3)                 | N/A        | Japan      | 1961-1993 | 7.9 (3.8-13.4) i                                                                 | N/A                                                                    |
| 2005 | Ingawa, 2005 | Japan         | Single hospital              | Population, Clinical diagnosis, 1 year risk: 27.4 (24.7-30.3)                 | N/A        | Japan      | 1991-1998 | 7.9 (3.8-13.4) i                                                                 | N/A                                                                    |
| 2006 | Saloheimo,   | Finland       | Single hospital              | Population, Clinical diagnosis, 1 year risk: 27.4 (24.7-30.3)                 | N/A        | Finland    | 1993-1995 | 7.9 (3.8-13.4) i                                                                 | N/A                                                                    |
| 2007 | Hanger, 2007 | New Zealand   | Single hospital              | Population, Clinical diagnosis, 1 year risk: 27.4 (24.7-30.3)                 | N/A        | New Zealand | 1996-2004 | 7.9 (3.8-13.4) i                                                                 | N/A                                                                    |
| 2007 | McGuire, 2007| Scotland      | Single hospital              | Population, Clinical diagnosis, 1 year risk: 27.4 (24.7-30.3)                 | N/A        | Scotland   | 1995      | 7.9 (3.8-13.4) i                                                                 | N/A                                                                    |
| 2007 | Lee, 2007    | United States | Single hospital              | Population, Clinical diagnosis, 1 year risk: 27.4 (24.7-30.3)                 | N/A        | United States | 1997      | 7.9 (3.8-13.4) i                                                                 | N/A                                                                    |
| 2007 | Yen, 2007    | Taiwan        | Single hospital              | Population, Clinical diagnosis, 1 year risk: 27.4 (24.7-30.3)                 | N/A        | Taiwan     | 1999-2003 | 7.9 (3.8-13.4) i                                                                 | N/A                                                                    |

Notes:
- AR: Annual Report
- P: Retrospective
- N/A: Not available
| Study, Year | Country | Study Design | Age | Study Population | ICH, no stroke in prior 5y, ICD code based, discharged alive | Prospective | 1 year risk: | 3 year risk: | 5 year risk: | 10 year risk: | Median Risk: |
|------------|---------|-------------|-----|------------------|-------------------------------------------------|------------|-------------|-------------|-------------|-------------|-------------|
| Christensen, 2005-2010 | Scotland | All hospitals in Scotland | Retrospective, record-linking | ICH, no stroke in prior 5y, ICD code based, discharged alive | First ICH, ≥64y clinical diagnosis, 28 days survivors | P | 557 | 67.0% | 1 fixed | 8.4 (6.0-10.8) | 1.9 (0.7-3.1) | 15.0 (12.1-17.9) | 1.0 (0.2-1.8) | N/A | 7.3 (5.6-8.9) |
| Azarpazhooh, 2008 | Australia | Population | Prospective | First ICH, ≥64y clinical diagnosis, 28 days survivors | | P | 191 | N/A | 2 fixed | 2.6 (1.0-5.6) | 3.7 (1.7-7.4) | 6.3 (3.5-10.4) | N/A | N/A | N/A |
| Zia, 2009 | Sweden | Single hospital | Prospective | First ICH, clinical diagnosis, 28 days survivors | AR | P | 353 | 73% | 3 fixed | 2.3 (1.4-3.5) | 2.8 (1.8-4.0) | 5.1 (3.7-6.7) | N/A | - | 3 year risk: 30.3 (25.7-35.3) | |
| Weimar, 2011 | Germany | 13 hospitals | Prospective | First ICH, clinical diagnosis, discharged alive | AR | P | 496 | 69.6% | 2 | 2.2 (1.2-3.8) | 4.2 (2.7-6.3) | 9.3 (7.0-12.1) | N/A | 6.3 (4.4-8.6) | |
| Hansen, 2013 | Sweden | 12 hospitals | Retrospective, record-linking | First ICH, clinical diagnosis, 1 year survivors | AR | P | 172 | 67.7 | 13 fixed | 0.5 (0.2-1.7) | 0.7 (0.3-1.3) | 3.2 (2.4-4.3) | N/A | 4.9 (3.8-6.2) | |
| Jones, 2013 | United States | Population | Prospective | First ICH, clinical diagnosis, no intercept | AR | P | 85 | 66 | 5.3 | 1.1 (0.3-2.9) | 2.1 (0.9-4.4) | 3.2 (1.6-5.8) | 9.4 (3.6-23.2) | N/A |
| Rutten-Jacobs, 2013 | Netherlands | Single hospital | Prospective | First ICH, age 18-50y clinical diagnosis, 30 days survivors | AR | P | 71 | 38.1 | 6.1 | 0.3 (0.0-0.9) | 0 (0.0-0.4) | 0.3 (0.0-0.9) | N/A | 0.8 (0.3-1.6) | |
| Rutten-Jacobs, 2013 | Netherlands | Single hospital | Prospective | First ICH, age 18-50y clinical diagnosis, 30 days survivors | AR | P | 68 | 38.0 | 6.6 | 5.9 (2.0-13.4) | 1.5 (0.2-6.7) | 7.4 (2.9-15.4) | 8.8 (3.8-17.3) | N/A |
| Pennlert, 2014 | Sweden | Population | Prospective | First ICH, age 25-74y clinical diagnosis, 28 days survivors | AR | P | 815 | 62.1 | 4.0 | 4.1 (2.9-5.6) | 7.7 (6.1-9.7) | 12.4 (10.3-14.8) | N/A | N/A | N/A |
| Yeh, 2014 | Taiwan | Single hospital | Prospective | First ICH, clinical diagnosis, 1 month survivors | AR | P | 3,785 | 58.7% | 5.5 | 1 year risk: 3.2 (2.7-3.8) | 1 year risk: 1.4 (1.1-1.8) | 1 year risk: 3.6 (3.0-4.2) | 1 year risk: 11.6 (10.6-12.7) | 10 year risk: 20.9 (19.6-22.2) | N/A |
| Biffi, 2015 | United States | Single hospital | Prospective | Any ICH, clinical diagnosis, 90 days survivors | AR | P | 1,145 | 73.4 | 3.1 | 7.6 (4.0-13.1) | 3.1 (1.0-7.1) | 10.7 (6.3-16.8) | N/A | N/A | N/A |
| Koivunen, 2015 | Finland | Single hospital | Retrospective, record-linking | First ICH, age 16-49y clinical diagnosis, 30 days survivors | AR | P | 131 | N/A | 9.7 | 7.6 (4.0-13.1) | 3.1 (1.0-7.1) | 10.7 (6.3-16.8) | N/A | N/A | N/A |
| Samaraoeva, 2015 | Scotland | Population | Prospective | First ICH, clinical diagnosis, no intercept | AR | P | 128 | 78 | 1 | 3.1 (1.1-7.3) | 6.3 (2.0-15.3) | N/A | N/A | N/A | N/A |
| Bjørkem, 2016 | Norway | Single hospital | Prospective | First ICH, clinical diagnosis, discharged alive | AR | P | 121 | 72.3 | 1 | 1.4 (0.2-6.3) | 2.8 (0.6-8.6) | 4.2 (1.2-10.7) | 9.7 (4.5-18.1) | 14.9 (8.9-22.7) |
| Callaly, 2016<sup>43</sup> | Ireland | Population | Prospective | Any ICH, clinical diagnosis, 28 days survivors | P | 61 | 70.6 | 2 (fixed) | 3.3 (0.7-10.1)<sup>f</sup> | 0 (0.0-4.0)<sup>f</sup> | 3.3 (0.7-10.1)<sup>f</sup> | N/A | N/A | 6.7 (1.7-24.1) |
| Ottosen, 2016<sup>44</sup> | Denmark | Nationwide | Retrospective, record-linking | First ICH, age >18y, ICD code based, 30 days survivors | P | 6,369 | N/A | 2.3 (median) | 3.2 (2.8-3.7)<sup>#</sup> | N/A | N/A | N/A | N/A | N/A | N/A |
| Schmidt, 2016<sup>45</sup> | Denmark | Nationwide | Retrospective, record-linking | First ICH, age >18y, ICD code based, 7 days after discharge | P | 15,270 | N/A | 2.8 (median) | 1 year risk: 8.0 (8.4-9.3) | 5 year risk: 13.7 (13.2-14.3) | N/A | N/A | N/A | N/A | N/A | N/A |
| Wolf, 2016<sup>46</sup> | Germany | Single hospital | Retrospective | First ICH, clinical diagnosis, 28 days survivors | P | 1,273 | 69 | 1.5 (median) | 2.6 (1.8-3.6)<sup>#</sup> | N/A | N/A | N/A | N/A | N/A | N/A |
| He, 2017<sup>47</sup> | China | 109 hospitals | Retrospective | Any ICH, ICD code based, unknown intercept | P | 23,748 | 58 | 2 (fixed) | 3.3 (3.0-6.5)<sup>f</sup> | 2.1 (1.9-2.2)<sup>f</sup> | 5.4 (5.1-5.7)<sup>f</sup> | N/A | N/A | N/A |
| Qiu, 2017<sup>48</sup> | Singapore | Single hospital | Prospective | First ICH, clinical diagnosis, 14 days survivors | AR | 1,708 | 62 | 3.8 | 1.1 (0.8-1.3)<sup>f</sup> | 3.5 (2.7-4.5)<sup>f</sup> | N/A | N/A | N/A | N/A | N/A | 8.7 (8.0-9.5)<sup>f</sup> | 32.6 (30.4-34.9)<sup>f</sup> |
| Tsivgoulis, 2018<sup>49</sup> | Greece | Population | Prospective | First ICH, clinical diagnosis, 1 day survivors | P | 83 | 77 | 1 (fixed) | N/A | N/A | 1.2 (0.7-2.2) | N/A | N/A | 47.0 (36.6-57.6) |
| Casolla, 2019<sup>50</sup> | France | Single hospital | Prospective | Any ICH, clinical diagnosis, 30-day survivors | P | 310 | 70 (median) | 6 (median) | 1-year risk: 3.0 (2.1-4.6) | 5-year risk: 4.9 (2.9-7.7) | 1-year risk: 3.2 (1.7-5.7) | 5-year risk: 9.0 (6.1-12.6) | 1-year risk: 7.2 (4.6-18.4) | 5-year risk: 14.2 (10.5-18.4) | N/A | N/A | N/A |

Abbreviations: AR, annual rate; N/A, not available; P, proportion.

<sup>a</sup> Unless otherwise specified
<sup>b</sup> Mean age relates to the whole cohort, including non-survivors
<sup>c</sup> Defined as stroke, myocardial infarction, or major extracranial haemorrhage
<sup>d</sup> Defined as the composite event of fatal or non-fatal stroke (ischaemic or hemorrhagic), fatal or nonfatal myocardial infarction, or cardiovascular procedures (coronary artery bypass grafting, percutaneous transluminal coronary angioplasty, carotid endarterectomy, or other peripheral arterial revascularization procedures), whichever occurred first
<sup>e</sup> All-cause mortality was available for 282 patients
<sup>f</sup> 95%-CI calculated by Mid-P exact test
<sup>g</sup> 95%-CI calculated by Jeffreys score interval
<sup>#</sup> Only fatal events
<sup>1</sup> Defined as fatal or non-fatal acute myocardial infarction, fatal arrhythmia, fatal heart failure and fatal cardiac arrest.
<sup>2</sup> Defined as the composite of stroke, acute coronary syndrome, acute limb ischemia, coronary artery revascularization (either coronary artery bypass or percutaneous coronary intervention), severe peripheral artery disease (ie, symptomatic arterial stenosis or stenosis requiring a revascularization procedure), and severe internal carotid stenosis requiring a revascularization procedure, bleeding with hemoglobin drop of ≥3g/dL or needing blood transfusion, surgical intervention or intravenous vasoactive agents, imaging confirmed intracranial or intraspinal haemorrhage or intraocular bleed, coronary bypass-related bleeding, or fatal bleeding
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