Long-term survival after an ischemic stroke
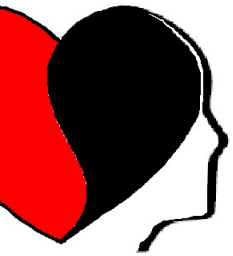
ESH Stroke Survey in the Czech Republic

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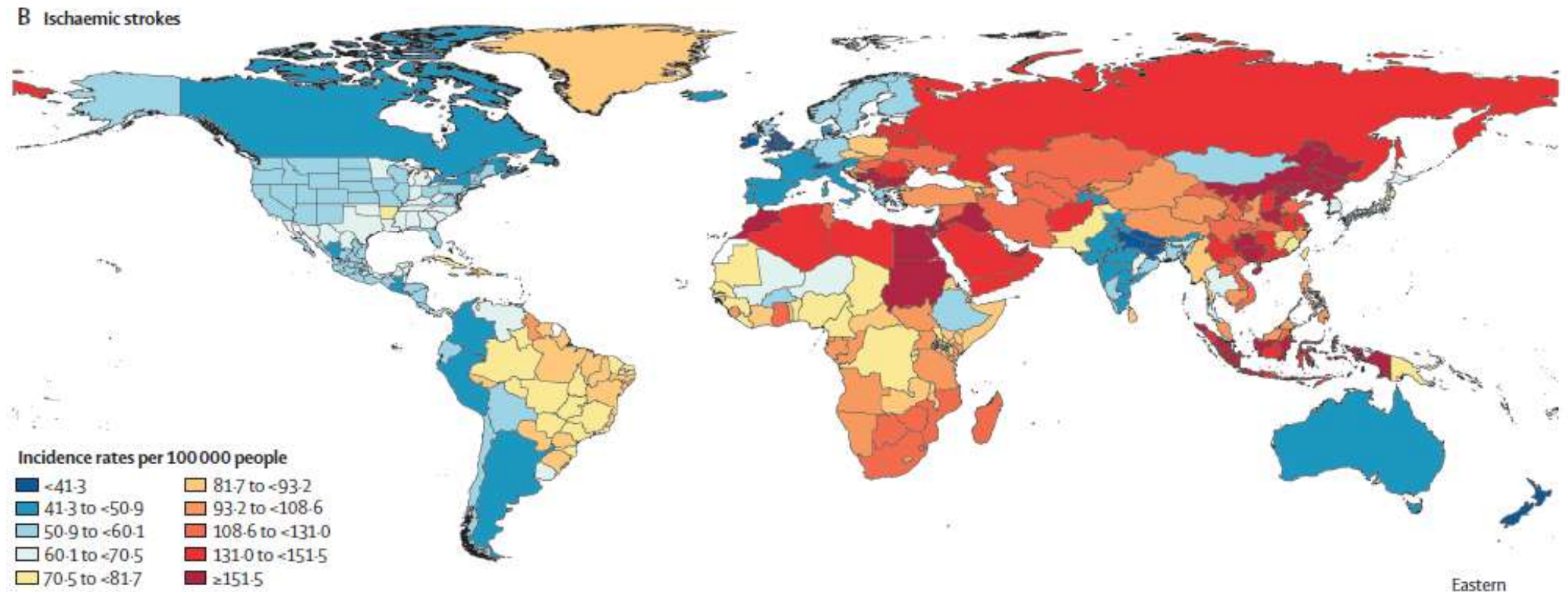[1]Thomayer University Hospital, Prague, Czech Republic
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BACKGROUND

- Stroke is currently the second leading cause of death and the third leading cause of death and disability combined worldwide.

- Due to the aging of populations, the annual number of strokes and death due to stroke increased substantially from 1990 to 2019, thus increasing the impact of stroke on society.

- Unlike CHD, ischemic stroke is a heterogeneous mixture of different pathological and etiological subtypes.

- The risk factors for ischemic stroke resemble the risk factors for CHD but differ in their importance for the disease (e.g., hypercholesterolemia).

- Different perception of stroke in the population compared to CHD (e.g., CHD as a "manager disease" compared to stroke as an "end-of-life disease") might result in different prevention regimens.

- Compared to CHD or cancer, stroke research is substantially underfunded.

Age-adj. incidence of ischemic stroke

B Ischaemic strokes

Incidence rates per 100 000 people

- <41·3
- 41·3 to <50·9
- 50·9 to <60·1
- 60·1 to <70·5
- 70·5 to <81·7
- 81·7 to <93·2
- 93·2 to <108·6
- 108·6 to <131·0
- 131·0 to <151·5
- ≥151·5

Eastern

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ESH Stroke Survey

OBJECTIVES

1. To determine, in patients after their first-ever ischemic stroke, whether the European recommendations on cardiovascular and cerebrovascular disease secondary prevention are being implemented (2012 Joint European Societies' Guidelines and European Stroke Initiative)

2. To detect potential differences in the secondary prevention of patients with ischemic stroke among European countries

Participating countries

Czech Republic   **Coordination of the survey**
Central laboratory
Data management
Statistics

Croatia

Hungary

Poland

Greece

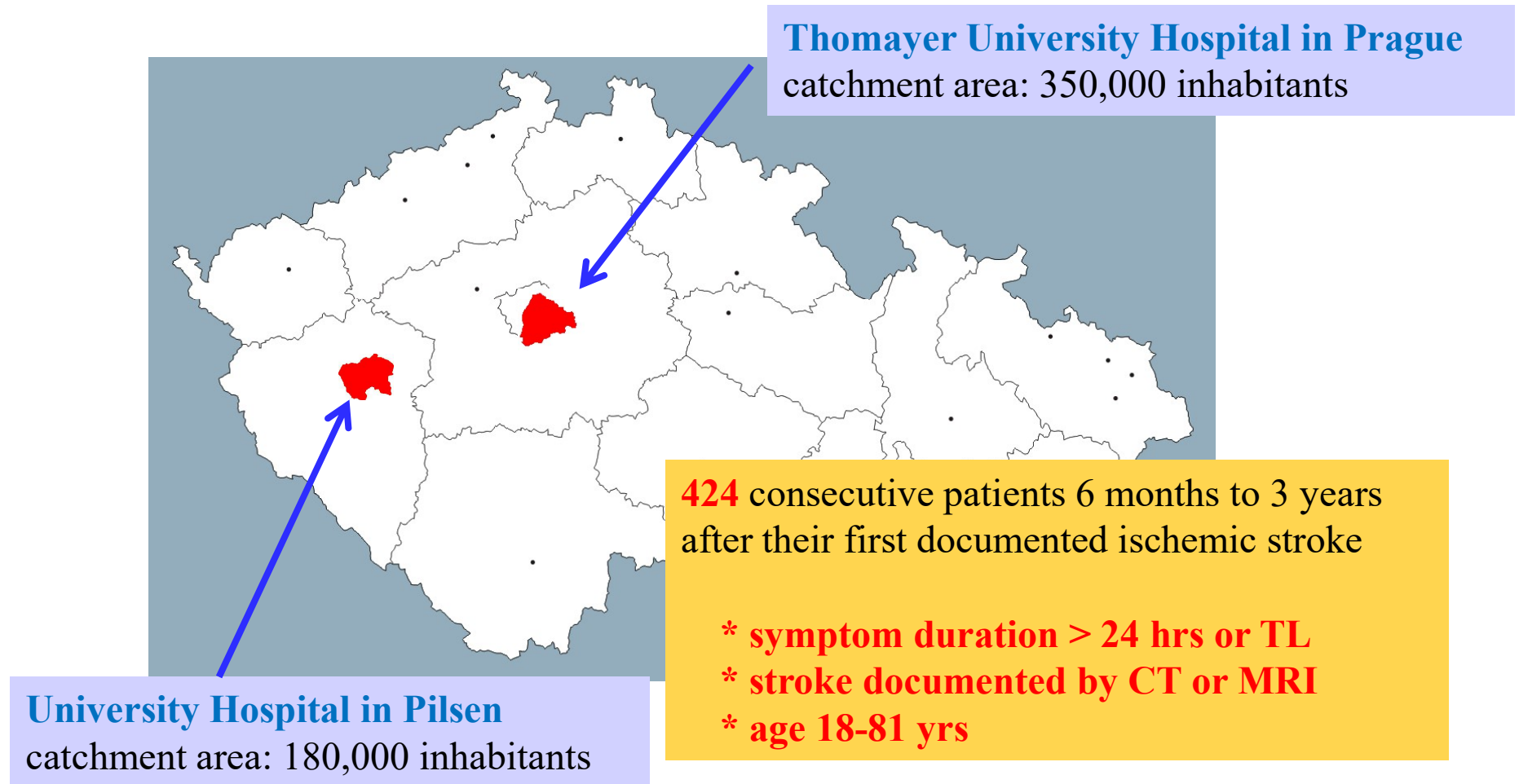**Italy**

Spain

United Kingdom

Objectives

- To analyze long-term survival of patients with ischemic stroke, previously enrolled in the ESH survey in the Czech Republic

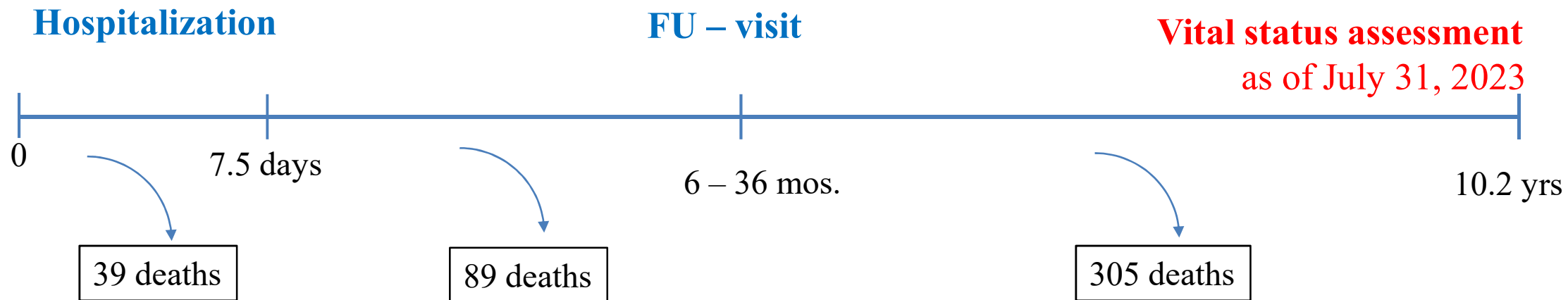- To assess factors associated with increased mortality following an ischemic stroke

Patients with first-ever ischemic stroke

536 patients admitted to 2 regional stroke units (out of 24 in the Czech Republic) 2009-2012

Thomayer University Hospital in Prague
catchment area: 350,000 inhabitants

424 consecutive patients 6 months to 3 years
after their first documented ischemic stroke

* symptom duration > 24 hrs or TL
* stroke documented by CT or MRI
* age 18-81 yrs

University Hospital in Pilsen
catchment area: 180,000 inhabitants

DATA COLLECTION

Data from patient medical records
both prior to and following the date of acute hospital admission:

- personal and demographic details

- neurological symptoms, disability on admission and at discharge
  (modified Rankin Scale, Barthel Index)

- etiological stroke subtype classification according to a mechanism-based classification
  scheme SSS-TOAST (CCS – Causative Classification System for Ischemic Stroke)

- personal vascular history including previous TIA, MI and PAD

DATA COLLECTION (cont'd)

Data from patient medical records

- other medical history including hypertension, hyperlipidemia, diabetes, atrial fibrillation, atrial septal defect, persistent foramen ovale, other CVD

- recorded measurements of blood pressure, diabetes, lipids, height, weight, waist circumference, and smoking status

- medication (generic name and total daily dose)

- acute stroke treatment including PTA treatment and management on stroke unit (thrombolysis)

- results of diagnostic tests including results of cerebral imaging (CT, MRI), vascular imaging (Doppler/Duplex sonography), echocardiography and ECG
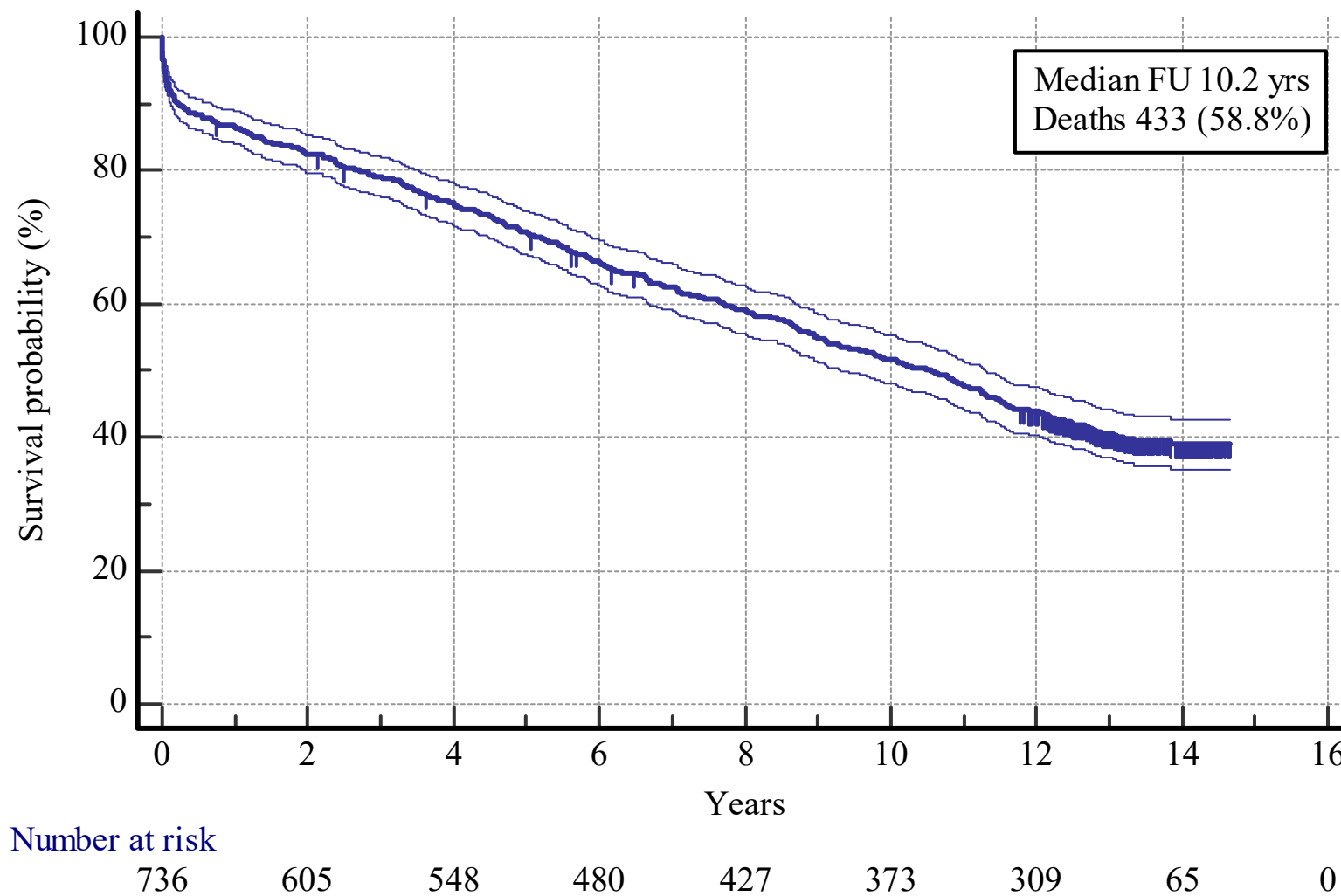
DATA COLLECTION

Patient interview and examination

Patient interview form

- personal and demographic details
- personal cerebrovascular history (TIA, recurrent stroke)
- personal cardiac history (CHD, atrial fibrillation)
- other medical history including hypertension, hyperlipidemia, and diabetes
- reporting lifestyle in relation to smoking, diet (including weight reduction and alcohol consumption) and exercise
- medication (generic name and total daily dose)
- level of education, school attendance, employment status, ethnicity
- living conditions pre stroke and at the time of interview
- interventional therapies:
- carotid endarterectomy
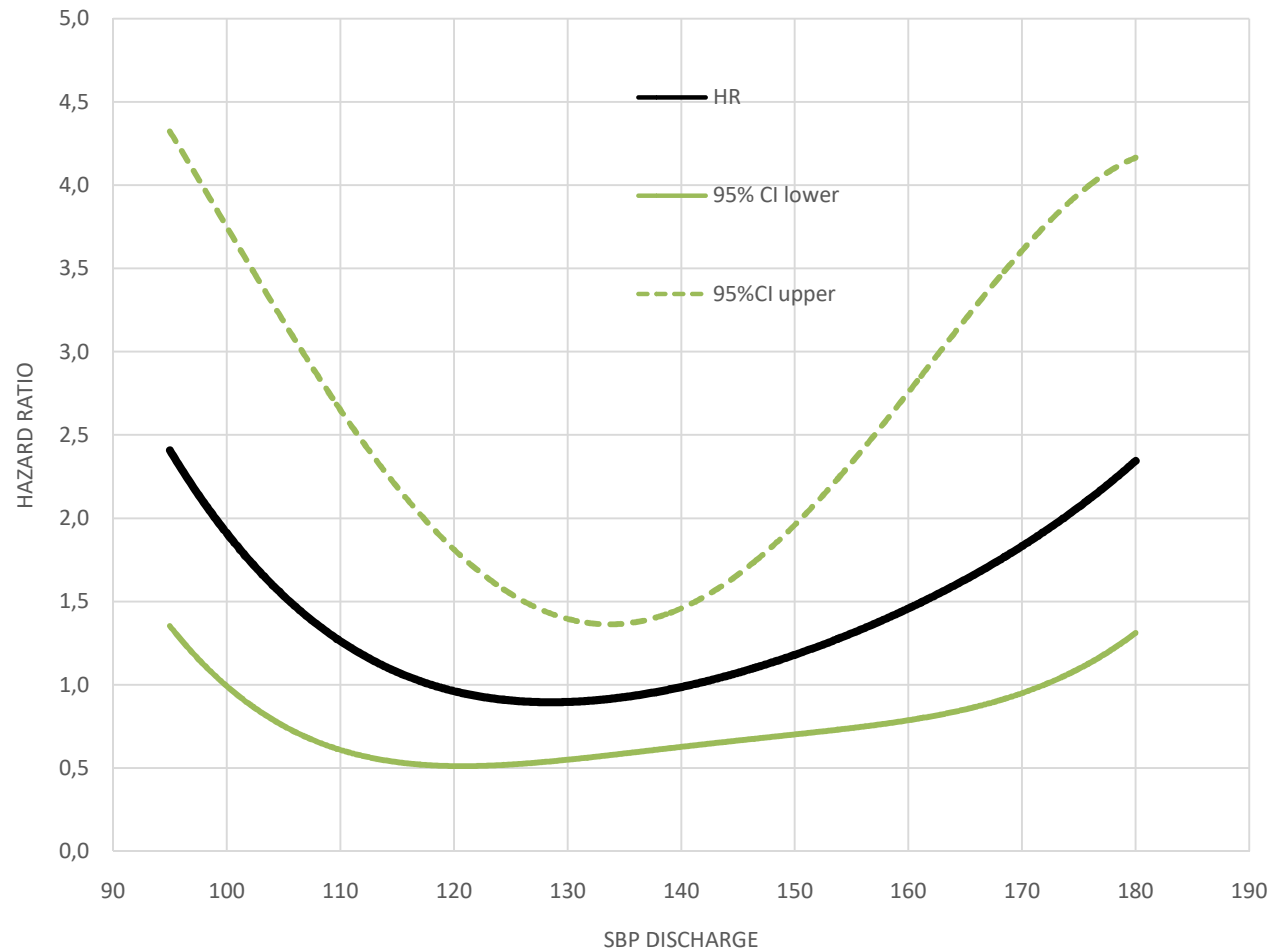- carotid PTA with or without stent implantation

Survival

n = 736

Median FU 10.2 yrs
Deaths 433 (58.8%)

Survival probability (%)

100

80

60

40

20

0

0   2   4   6   8   10   12   14   16

Years

Number at risk

736   605   548   480   427   373   309   65   0

HR of SBP at discharge
Compared with SBP at discharge = 130 mm Hg

dj. for age, sex

Median FU 10.2 years
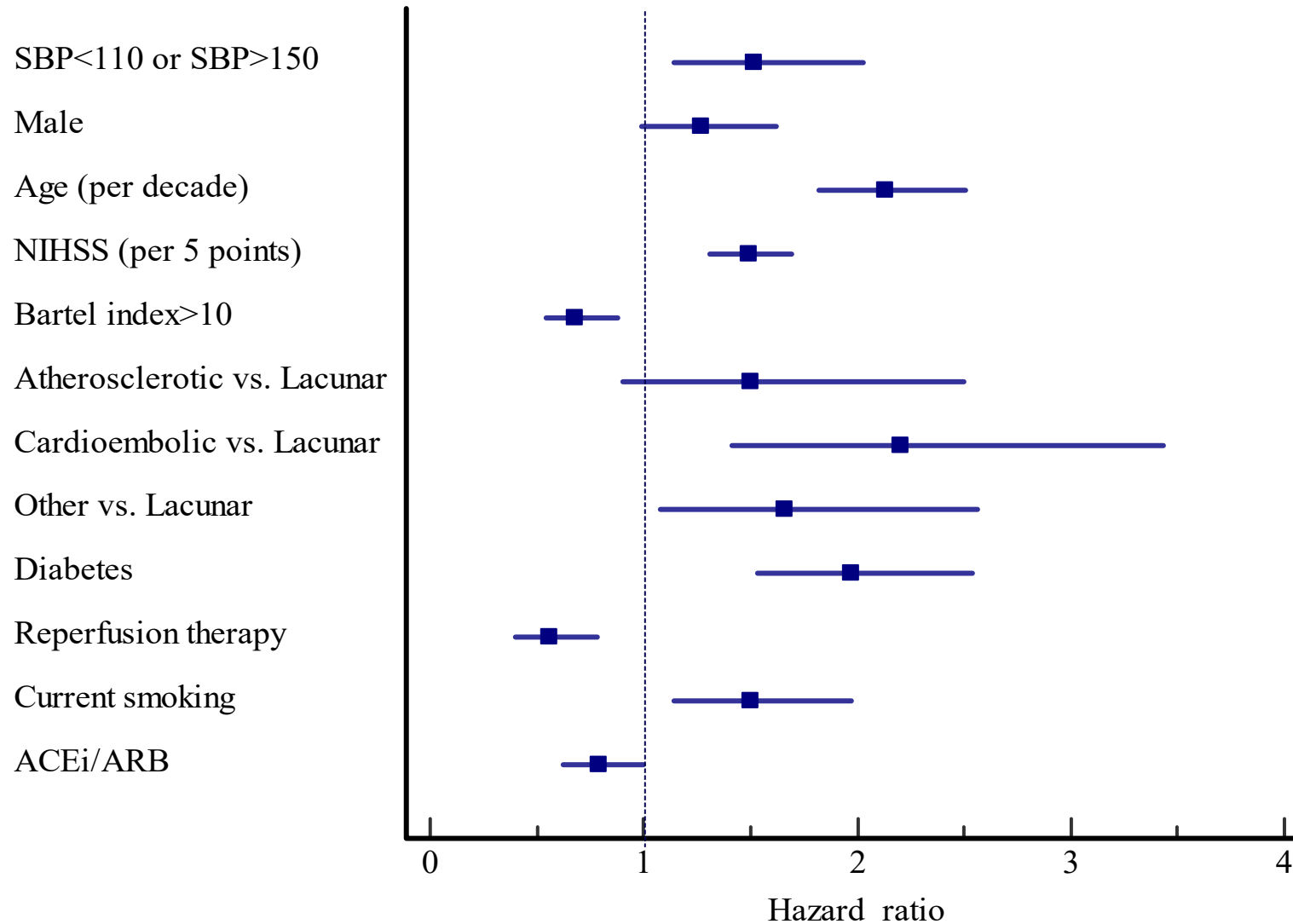## Vital status assessed as of Jul 31, 2023

	Deceased n = 433	Survivors n = 303	p
Age, years	70.3 ± 7.7	60.5± 11.2	**< 0.001**
Men/women, n (%)	244/189 (56.3/43.7)	181/122 (59.7/40.3)	ns
Symptoms to hospitalization time, h	3.71 (1.50–13.7)	4.23 (1.83–15.94)	ns
Hospital stay duration, days	8 (4–13)	7 (4–11)	**0.021**
In-hospital death, n	39	0	
Discharge destination, n	393	303	**< 0.001**
Home, n (%)	241 (61.3)	243 (80.2)	
Other hospital/other ward nursing/residential home, n (%)	61 (15.5)	34 (11.2)	
Rehabilitation unit, n (%)	91 (23.2)	26 (8.6)	

Median FU 10.2 years

	Deceased n = 433	Survivors n = 303	p
Atrial fibrillation (resting EKG/monitoring), n (%)	100 (23.1)	17 (5.6)	**< 0.001**
Echocardiography	**145**	**111**	
LVEF ≤ 40%, n (%)	22 (15.2)	2 (1.8)	**< 0.001**
Stroke unit hospitalization, n (%)	207 (47.8)	128 (42.2)	ns
History of CVD (prior to stroke), n (%)	105 (24.2)	47 (15.5)	**0.004**
ACEI/ARB (prior to stroke), n (%)	240 (56.9)	143 (47.2)	**0.011**
Statins (prior to stroke), n (%)	120 (28.9)	62 (20.5)	**0.012**

# Outcome predictors
N = 540 (deceased 311; survivors 229)

SBP<110 or SBP>150

Male

Age (per decade)

NIHSS (per 5 points)

Bartel index>10

Atherosclerotic vs. Lacunar

Cardioembolic vs. Lacunar

Other vs. Lacunar

Diabetes

Reperfusion therapy

Current smoking

ACEi/ARB

0   1   2   3   4

Hazard ratio

Outcome predictors

N = 345, incl. 159 deaths
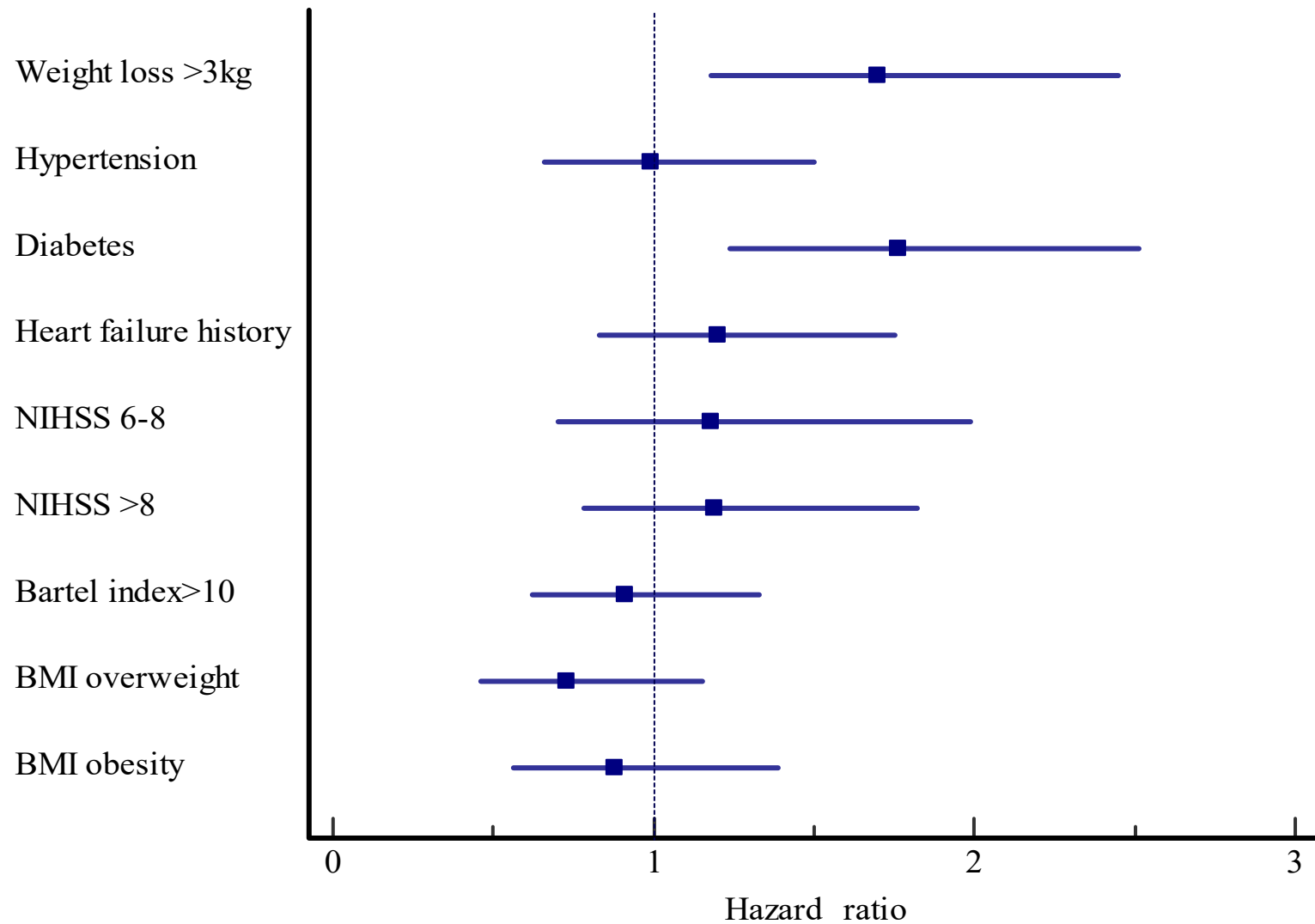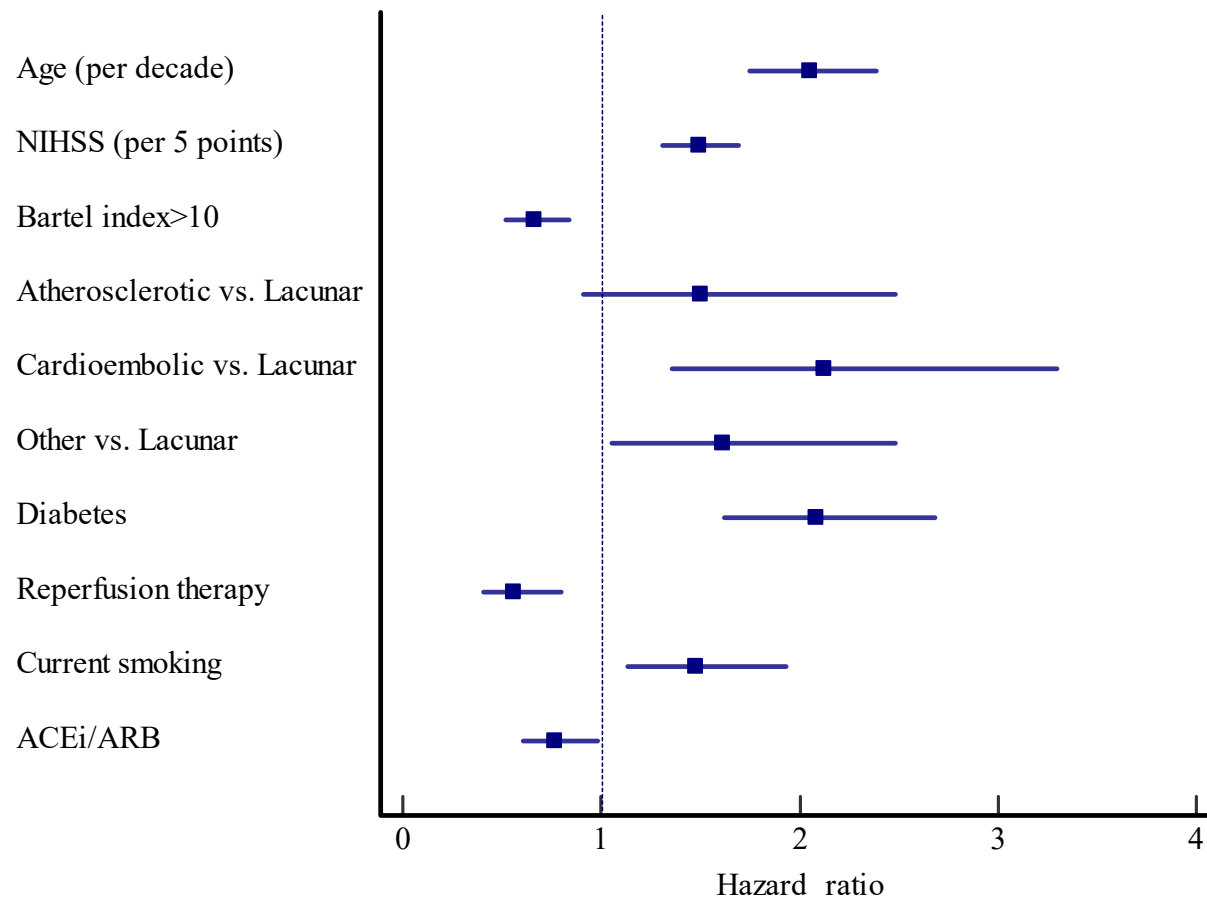
Conclusions

1. Despite several advances in stroke management, the mortality of patients with ischemic stroke remains high – from our cohort of 736 patients, 58.8% died within 10.2 years.

2. Systolic BP at discharge (adj. for age and sex) of 110-150 mm Hg was associated with the lowest mortality risk.

3. Reperfusion therapy and treatment with ACEIs/ARBs decreased the mortality risk.

4. Weight loss of more than 3 kg (between hospital discharge and FU visit) was associated with increased mortality.