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Risk Factor Control and Long-Term Outcomes in Patients After a Myocardial Infarction

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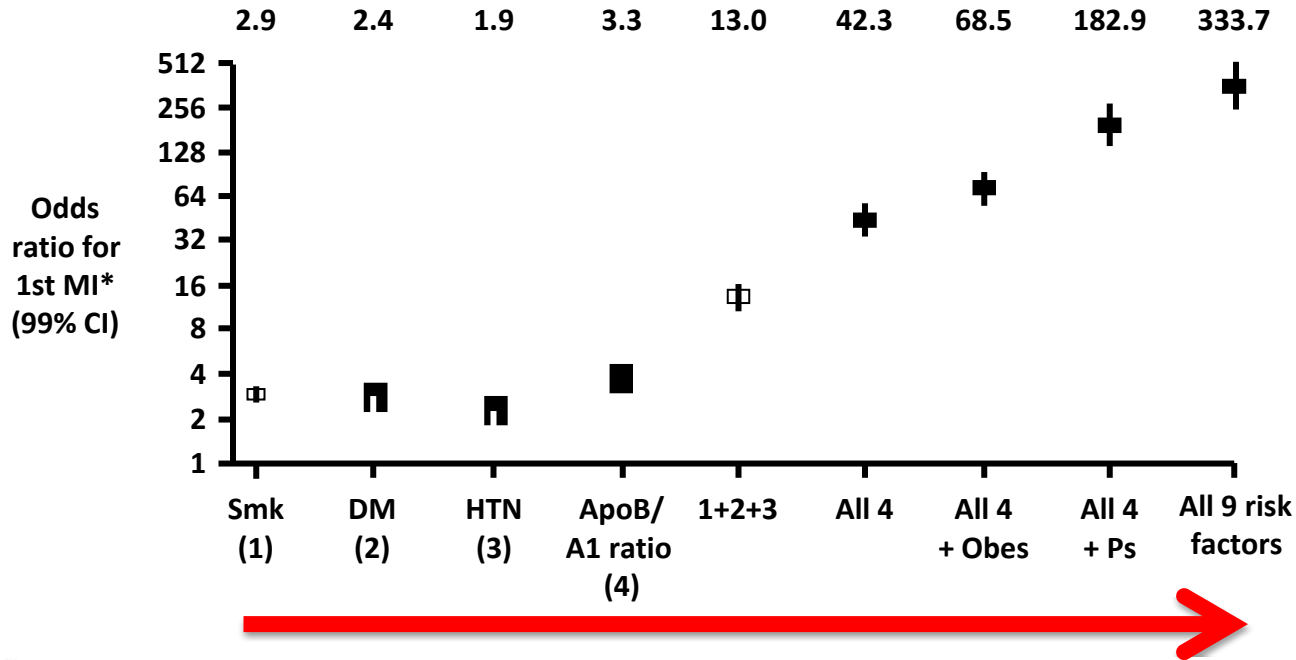


SWEDEHEART

Declaration of interest

Consulting/Royalties/Owner/Stockholder of healthcare company:
(Consulting for AMGEN, Bayer, and Sanofi. Speakers fee from AMGEN, AstraZeneca, Bayer, NovoNordisk, and Sanofi)

INTERHEART: increasing number of risk factors are related to the risk of MI



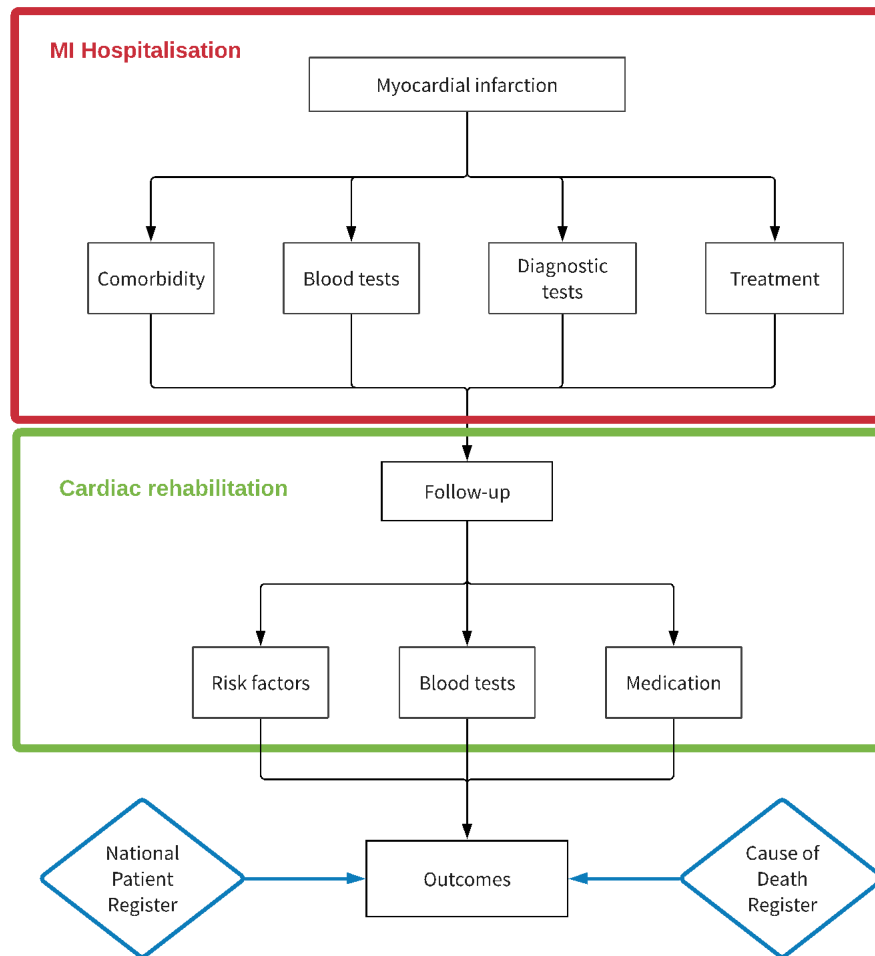
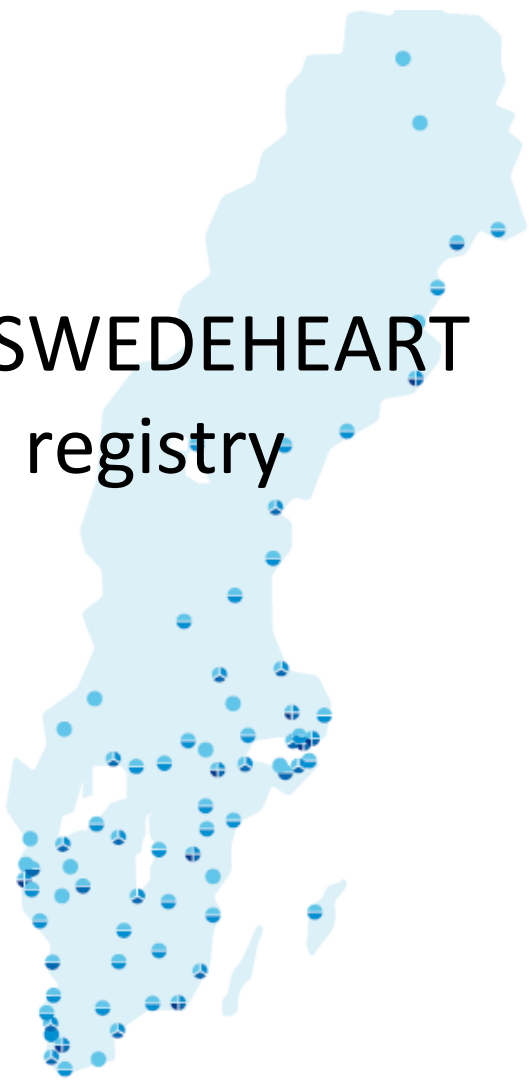
Aim

Assess **six major secondary prevention risk factors** after a first MI and:

- An increasing number of these risk factors **not** at target and prognosis, compared to matched controls
- The riskfactors' relative importance for CV events and mortality

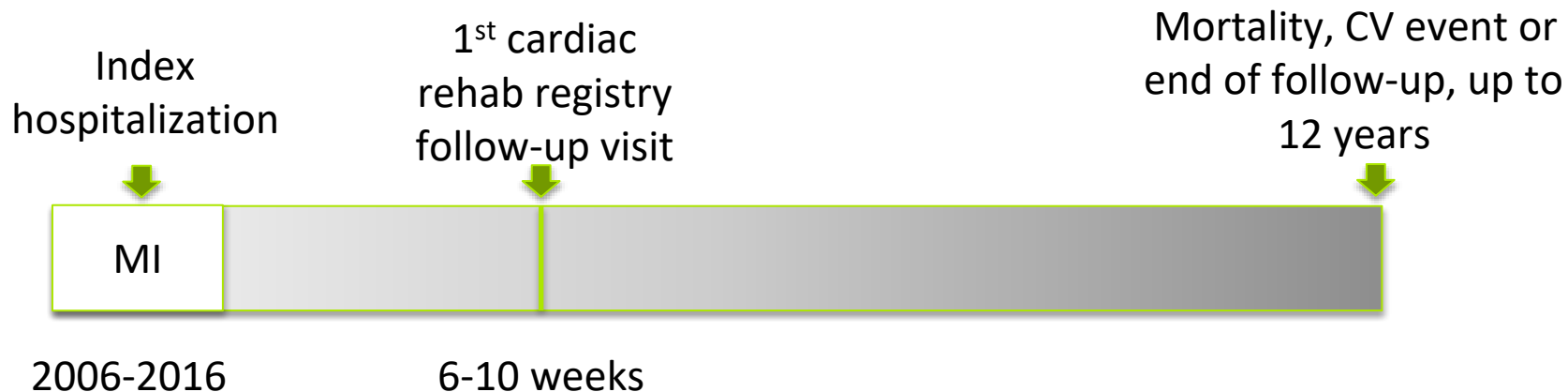


The SWEDEHEART registry





Study design



Outcomes

- All-cause mortality
- Cardiovascular mortality
- Ischemic stroke
- Heart failure hospitalisation
- Major bleeding
- Exploratory analyses:
 - MACE (mortality, MI, stroke)
 - Myocardial infarction



Study population

Matched controls were individuals ever registered in the:

- national hospital outpatient registry (50% of the controls)
- inpatient registry (50% of the controls)
- total number of individuals: >3 miljon
- start date 1987

65,002
first MI patients

325,010 age and sex matched
controls, no prior MI

Secondary prevention risk factors not at target

- Blood pressures: $\geq 140/\geq 90$ mmHg
- Elevated fasting plasma glucose: ≥ 7.0 mmol/L (≥ 126 mg/dL)
- Obesity: BMI ≥ 30 kg/m²
- LDL-C: ≥ 1.8 mmol/L (≥ 70 mg/dL)
- Current smoking
- Not performing ≥ 30 minutes of moderate intensity daily physical activity ≥ 5 days/week (“insufficient physical activity”)

Methods

- Unique identification number matching between registries
- In adjusted Cox regression models (COPD, cancer, dementia):
 - increasing number of risk factors outside target and outcomes were assessed
 - prespecified age strata
- Compared the relative importance of risk factors for outcomes

Results



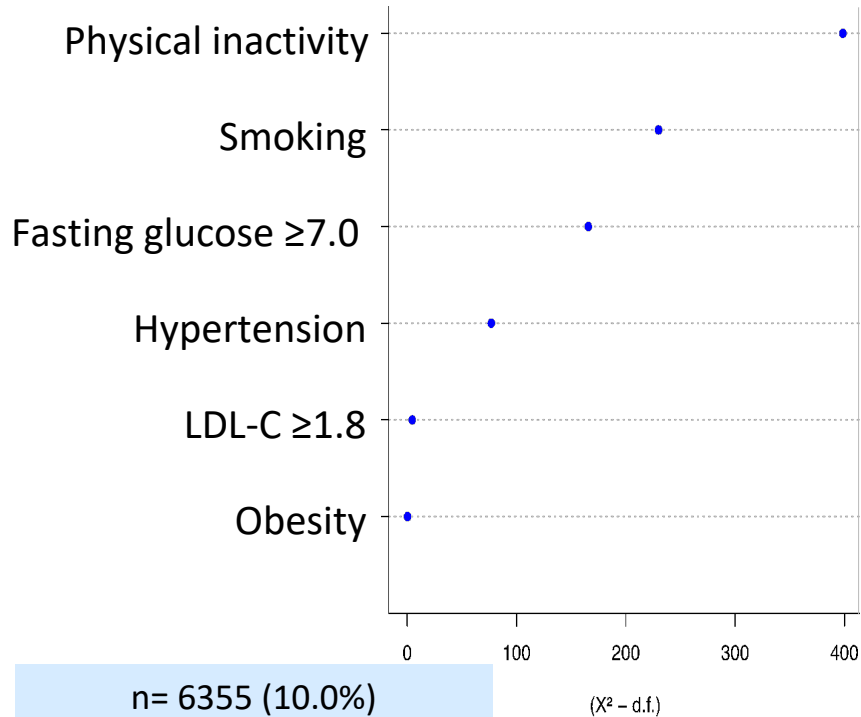
Population characteristics

	Patients	Controls
n	65,002	325,010
Age (years)	64 (57, 69)	64 (57, 69)
Females (%)	26.3	26.3
Current smoker (%)	29.7	-
Diabetes mellitus (%)	17.9	-
BMI (kg/m ²)	26.9 (24.5, 29.8)	-
Systolic blood pressure (mmHg)	130 (120, 140)	-
Diastolic blood pressure (mmHg)	78 (70, 81)	
Physical activity <5 days/week (%)	50.4	-

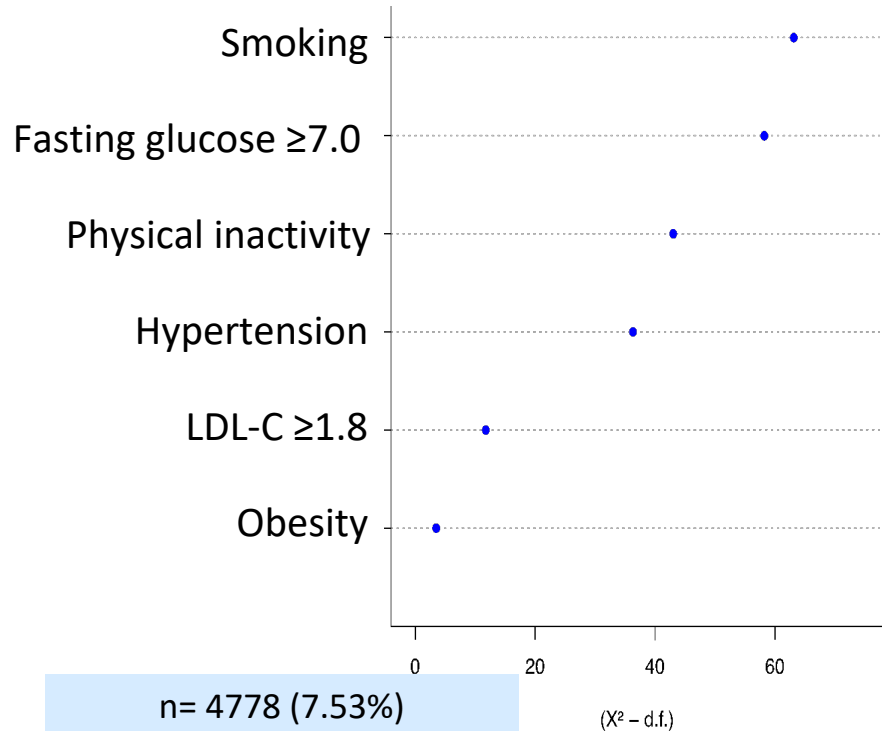
(median; Q1, Q3)

Relative risk factor importance for outcomes

All-cause mortality

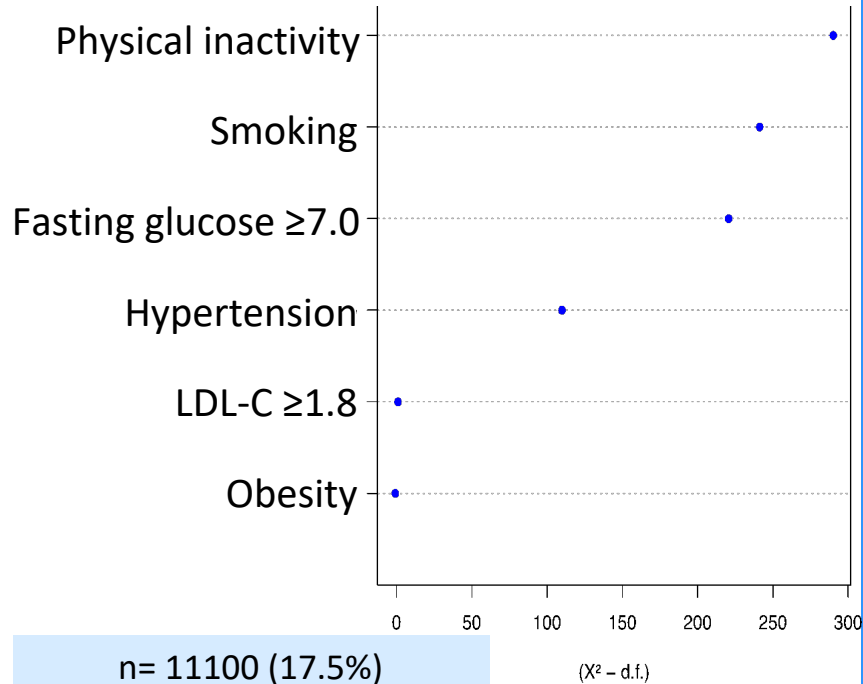


MI

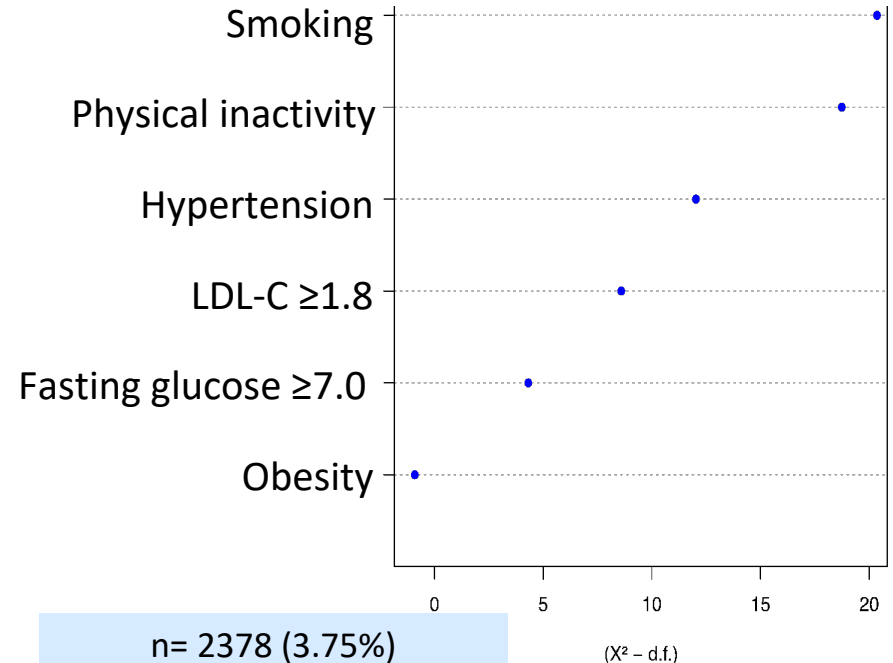


Relative risk factor importance for outcomes

MACE

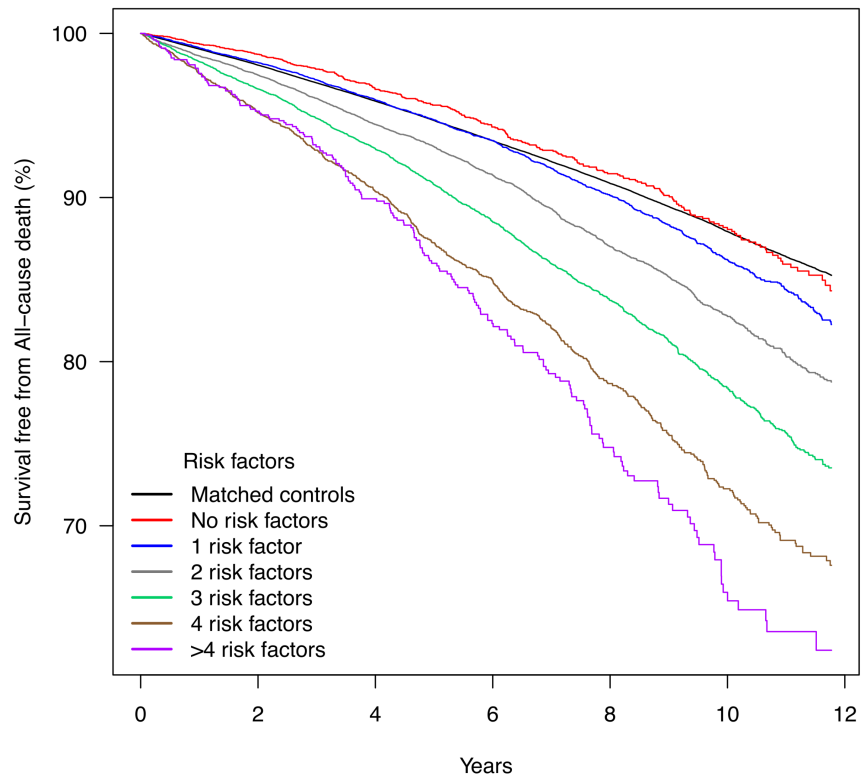


Major bleeding

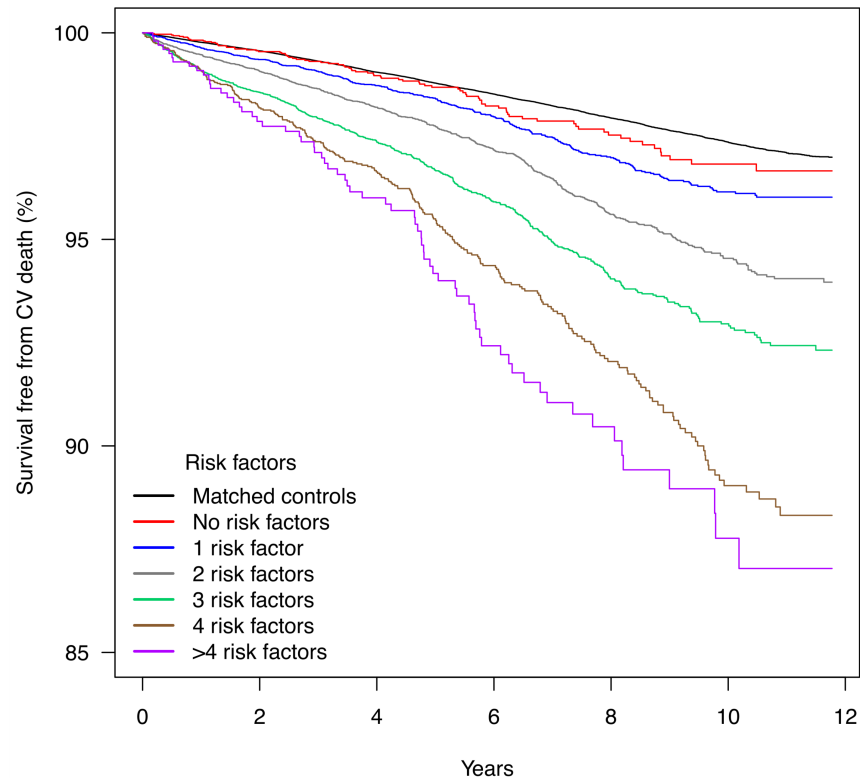


Cumulative incidence by outcome

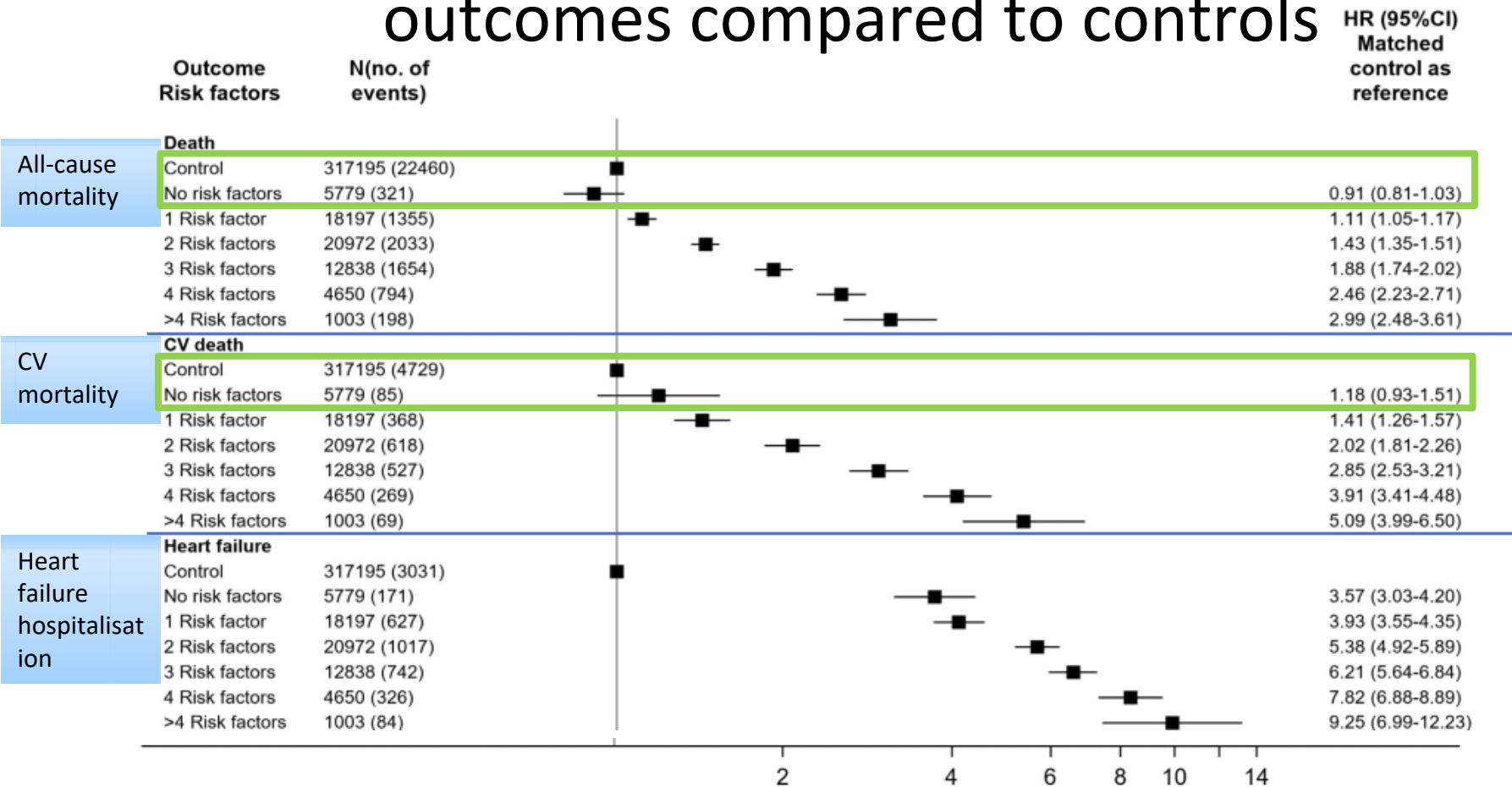
All-cause mortality



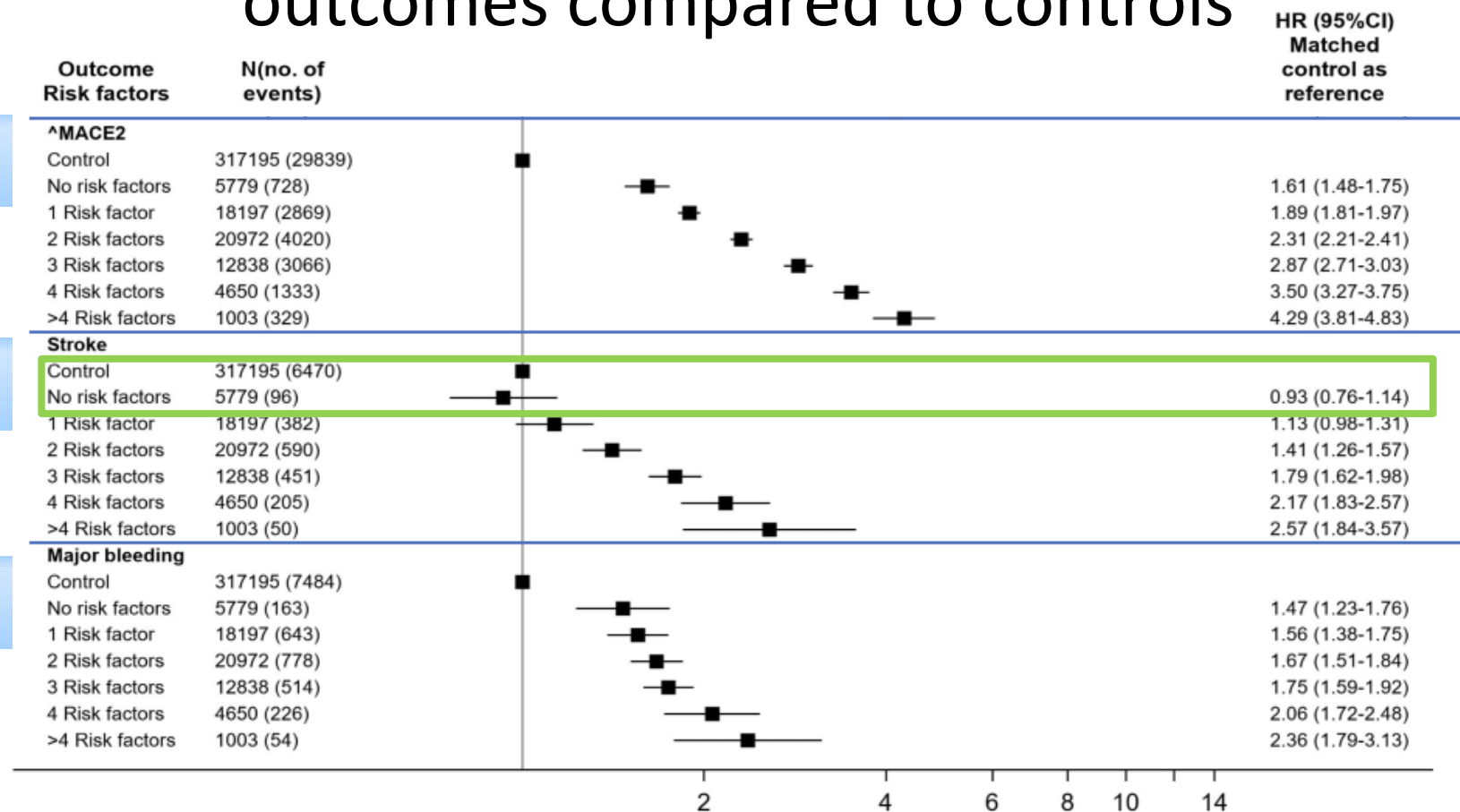
Cardiovascular mortality



Association between number of risk factors and outcomes compared to controls



Association between number of risk factors and outcomes compared to controls



2 Risk factors

<55	4177 (115)	1.83 (1.50-2.23)
56-64	7276 (529)	1.55 (1.41-1.71)
65-70	5624 (675)	1.44 (1.27-1.64)
71-75	3576 (643)	1.30 (1.19-1.43)

3 Risk factors

<55	2741 (137)	2.84 (2.30-3.51)
56-64	4349 (427)	2.11 (1.89-2.37)
65-70	3313 (529)	1.93 (1.60-2.34)
71-75	2222 (506)	1.65 (1.51-1.80)

4 Risk factors

<55	972 (62)	3.94 (2.97-5.22)
56-64	1621 (234)	2.89 (2.31-3.62)
65-70	1182 (261)	2.64 (2.24-3.11)
71-75	801 (217)	2.16 (1.76-2.65)

>4 Risk factors

<55	217 (23)	6.10 (3.74-9.95)
56-64	398 (71)	3.98 (2.77-5.72)
65-70	230 (58)	3.30 (2.38-4.56)
71-75	142 (38)	2.12 (1.49-3.03)

-CV mortality

-Heart failure

hospitalisation

-Stroke

Major bleeding

1

2

3

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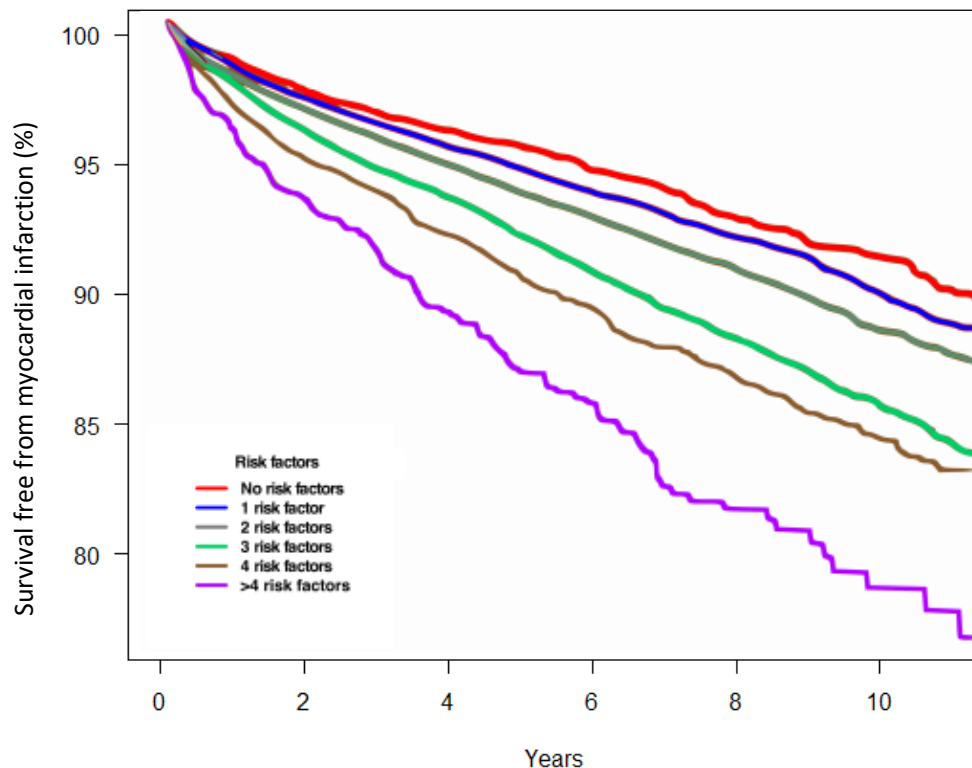
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Cumulative incidence of myocardial infarction



Exploratory outcome. Comparator: no risk factors.

Conclusions

In this real-world population of patients with MI and over 10 years of follow-up:

- **Insufficient physical activity and current smoking** were the **strongest predictors** of future major outcomes
- **Raised LDL-C** (at statin steady state) and **obesity** were the **weakest**
- For **every risk factor at target**, there was a **linear, stepwise additional reduction in risk** of all outcomes
- **Patients after a MI with no risk factors** had the **same hazard** of all-cause mortality, CV mortality and stroke as compared to **controls**



Thank you for your attention!



Acknowledgements

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Together with