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Socio-demographic, labour market marginalisation, and medical characteristics as risk factors for re-infarction and mortality within one year after a first acute myocardial infarction-A register-based cohort study of a working age population in Sweden

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7 8 9	3	infarction-A register-based cohort study of a working age population in Sweden
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Risk factors for re-infarction and mortality after acute myocardial infarction

27 ABSTRACT

Objectives: Research covering a wide range of risk factors related to the prognosis during the
first year after an acute myocardial infarction (AMI) is insufficient. This study aimed to
investigate whether socio-demographic, labour market marginalisation, and medical
characteristics before/at AMI were associated with subsequent re-infarction and all-cause
mortality.

Design: Population-based cohort study.

34 Participants: The cohort included 15 069 individuals aged 25-64 years who had a first AMI
35 during 2008-2010.

36 Primary and secondary outcome measures: The outcome measures consisted of re37 infarction and all-cause mortality within one year following an AMI, which were estimated by
38 univariate and multivariable hazard ratios (HR) and 95% confidence intervals (CI) by Cox
39 regression.

Results: Socio-demographic characteristics such as lower education showed a 1.1- and 1.3fold higher risk for re-infarction and mortality, respectively. Older age was associated with a higher risk of mortality while being born in non-European countries showed a lower risk of mortality. Labour market marginalisation such as previous long-term work disability was associated with a 2-fold higher risk of mortality. Regarding medical characteristics, ST-elevation myocardial infarction was predictive for re-infarction (HR: 1.14, 95% CI: 1.07-1.21) and all-cause mortality (HR: 3.80, 95% CI: 3.08-4.68). Moreover, diabetes mellitus, renal insufficiency, stroke, cancer, and mental disorders were associated with a higher risk of mortality (range of HRs: 1.24-2.59).

49 Conclusions: Socio-demographic and medical risk factors were identified as risk factors for
50 mortality and re-infarction after AMI, including older age, immigration status, somatic and
51 mental co-morbidities. Previous long-term work disability and infarction type provide useful

1 2		Risk factors for re-infarction and mortality after acute myocardial infarction
3 4	52	information for predicting adverse outcomes after AMI during the first year, particularly for
5 6 7	53	mortality.
8 9	54	Keywords: Acute myocardial infarction; Re-infarction; Mortality; Sick leave; Disability
10 11 12	55	pension; Insurance Medicine.
13 14	56	
$\begin{array}{c} 15 \\ 16 \\ 17 \\ 18 \\ 19 \\ 20 \\ 21 \\ 22 \\ 23 \\ 24 \\ 25 \\ 26 \\ 27 \\ 28 \\ 29 \\ 30 \\ 31 \\ 32 \\ 33 \\ 34 \\ 35 \\ 36 \\ 37 \\ 38 \\ 9 \\ 41 \\ 42 \\ 43 \\ 44 \\ 546 \\ 47 \\ 48 \\ 9 \\ 50 \\ 51 \\ 52 \\ 53 \\ 55 \\ 56 \\ 57 \\ 58 \\ 59 \\ 60 \end{array}$	57	

Risk factors for re-infarction and mortality after acute myocardial infarction

ARTICLE SUMMARY

Strengths and limitations of this study • This is a population-based cohort study on all patients with acute myocardial infarction from inpatient care. The Swedish national-wide register data has high quality, which reduces the risk of • recall bias regarding exposure and outcome. Despite a wide range of risk factors that have been examined, some potential for • residual confounding by unmeasured factors remains. There is no available information on sick-leave spells that are shorter than 14 days • among employed individuals.

INTRODUCTION

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Risk factors for re-infarction and mortality after acute myocardial infarction

Acute myocardial infarction (AMI), is the leading cause of mortality worldwide and re-infarction is common, ranging from 8% to 20% in the first year (1). Over the past decade, percutaneous coronary intervention (PCI) and medication have reduced mortality in AMI patients (2, 3). Despite this progress, AMI remains a major cause of mortality and disability. For patients who survive a first AMI, post-discharge optimal medical management and healthy life-style are essential. Particularly, re-infarction and heart failure can occur after an AMI, influencing quality of life and increasing healthcare costs (1). Knowledge of risk factors for re-infarction and mortality in the first year after an AMI could improve the ability of healthcare providers to reduce progression of disease as well as improve survival after AMI.

Previous studies have reported risk factors for re-infarction and mortality in patients with AMI, mainly focusing on events within the first month after discharge (4). Socio-demographic characteristics such as older age, lower socio-economic status, living alone, and (co-)morbidity (e.g. diabetes mellitus, renal diseases, hypertension, unstable angina, stroke or transient ischemic attack, cancer, and depression) have been found to be associated with a higher risk of re-infarction and mortality after discharge (4-8). None of these studies have taken into consideration risk factors for re-infarction or mortality in the mid-term i.e. one year after hospital discharge. Moreover, currently there is little evidence related to crucial AMI-related characteristics such as type of coronary revascularisation and infarction. Here, studies are lacking which include a vast range of risk factors and are based on register data, which provide large study populations and guarantee practically no loss to follow-up.

Risk factors for re-infarction and mortality after acute myocardial infarction

Additionally, there is a lack of studies elucidating the associations between charac labour market marginalisation and the risk of re-infarction and mortality among A In Sweden, more than 30 000 persons experience an AMI each year; of these, abo are below the age of 65 (9). This burden of disease may result in long-term work o the working age population (10, 11). To date, sickness absence (SA) is almost alw prescribed as a rehabilitation strategy in healthcare services for patients with AMI permanent work disability, i.e. disability pension (DP), is common in this patient g In a prior study, patterns of SA/DP before AMI provided crucial information for s work disability (13). To the best of our knowledge, this is the first study investigal market marginalisation measured in terms of trajectories of SA/DP and unemploy as risk factors for re-infarction and mortality in patients with AMI.
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110	MATERIALS AND METHODS
111	Study population
112	This is a nationwide register-based cohort study and the study population consisted of 16 983
113	individuals aged 25 to 64 who had a first AMI during 2008-2010. A main diagnosis of AMI
114	was ascertained from the inpatient care register and defined according to the International
115	Classification of Diseases (ICD)-10 code of I21. This means that individuals with a previous
116	main or side diagnosis of AMI in specialised healthcare from 1987 up to the hospital
117	admission date for AMI during 2008-2010 were excluded (n=1914). Altogether, there were
118	15 069 individuals included in the study.
119	
120	Registers
121	National register data was linked to the study population by using the unique personal identity
122	number assigned to all Swedish inhabitants, including information for each individual up to
123	31 st December 2013 from:
124	1.) Statistics Sweden: sex, age, education, country of birth, type of living area, family
125	situation, length of unemployment, and year of emigration from the Longitudinal integration
126	database for health insurance and labour market studies (LISA);
127	2.) The Social Insurance Agency: SA/DP (date and grade) from Micro-data for analyses of
128	social insurance (MiDAS);
129	3.) The National Board of Health and Welfare: date and cause of diagnosis-specific inpatient
130	and specialised outpatient care, and type of infarction and type of coronary revascularisation
131	from the National Patient Register; date of death from the Cause of Death Register (14) and
132	date, type and dose of prescription of dispensed psychiatric medication and antidiabetic
133	medication from the National Prescribed Drug Register.
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Risk factors for re-infarction and mortality after acute myocardial infarction

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Outcome measures

136 The outcome measures were re-infarction (ICD-codes: I21) which was ascertained from the 137 inpatient care, and all-cause mortality during the first year after AMI.

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1 2 3

139 **Risk measures**

Socio-demographic characteristics were recorded at the end of the year preceding AMI and
comprised: sex, age, education (low educational level (compulsory (≤9 years), high school
(10-12 years)), and high educational level (university (>12 years))), country of birth, type of
living area , and family situation (Table 1).

144

145 Labour market marginalisation characteristics included length of unemployment in the year 146 preceding AMI and the trajectory groups of SA/DP during three years before and up to the 147 AMI diagnosis (Table 1). The trajectory groups of SA/DP were measured using the combined 148 mean number of annual SA and DP net days before the AMI diagnosis. The total number of 149 net days were then transformed to number of months with SA/DP.

Medical characteristics included AMI-related characteristics (type of infarction and type of 152 coronary revascularisation) at inclusion and inpatient and specialised outpatient care due to 153 any main or side diagnosis of somatic and mental co-morbidities and medication which were 154 measured from three years before until the AMI diagnosis. Type of infarction was classified 155 as ST-elevation myocardial infarction (STEMI, ICD-codes: I21.0-I21.3), non-ST-elevation 156 myocardial infarction (NSTEMI, ICD-codes: I21.4), or unspecified (ICD-codes: I21.9). Information on type of coronary revascularisation was categorised as: percutaneous coronary 157 intervention (PCI) (FNG00-FNG05), coronary artery bypass grafting (CABG) (FNA-FNF, 158 159 FNG30, FNW96), and others (i.e. other treatments/examinations or missing information).

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Somatic co-morbidities were categorised as musculoskeletal diagnoses (ICD-codes: M00-99), renal insufficiency (ICD-codes: N17-N19), stroke (ICD-codes: I60, I61, I63, I64), hypertension (ICD-codes: 110), cancer (ICD-codes: C00-D48), and other somatic disorders (the other ICD-codes except for mental diagnoses). The individuals with any specialised care due to diabetes mellitus or having any prescribed antidiabetic medication were coded according to ICD-codes: E10-E14 and the Anatomic Therapeutic Chemical classification system (ATC) code: A10. Mental co-morbidities were grouped as CMDs (i.e. depressive (ICD-codes: F32-F33), anxiety (ICD-codes: F40-F42) and stress-related disorders (ICD-codes: F43)), and other mental disorders (ICD-codes: F00-F31, F34-F39, and F44-F99). Moreover, prescribed psychiatric medication during the year preceding the AMI diagnosis was included as mental co-morbidities. Psychiatric medication was measured by any antidepressants, anxiolytics and sedatives following the ATC codes, N06A, N05B and N05C, JIC4 respectively.

Statistical analyses

We used group-based trajectory modelling to estimate groups of SA/DP trajectories during the 3-year period before AMI. This method has been described elsewhere (13, 15). Five groups were selected as the best fitting model for patients with AMI. An annual time-scale was used in the study, where T0 represents the first hospital admission date due to AMI and T-3 represents the 3 years before the first AMI diagnosis (See Fig. 1). The five trajectory groups were named according to the patterns of each group: "Low increasing", "Low constant", "Middle increasing", "High decreasing" and "High constant".

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Chi-2 tests were used to estimate potential sex differences regarding all the examined characteristics among patients with AMI. Hazard ratios (HR) and 95% confidence intervals (CIs) for re-infarction and all-cause mortality were calculated using Cox regression. The proportional hazards assumption was tested and met. Follow-up time started from the first hospital admission date due to AMI diagnosis until the events (re-infarction or all-cause mortality), emigration to a foreign country, or the end of the first year after AMI, whichever came first. Mean follow-up time for re-infarction and all-cause mortality was 117 days (SD 120) and 177 days (SD 109), respectively. Analyses were adjusted for all risk measures in the multivariate model (mental co-morbidities were not mutually adjusted). Data processing was performed using SAS version 9.4. Patient and public involvement There was no patient involvement in this study. N.C.Z.O.J.

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RESULTS

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Table 1 shows descriptive analysis for patients with a first AMI during 2008-2010. Of all, there were 3673 women (24.4%). The majority of the study population was older (56-64 years, 59.3%), born in Sweden (80.2%), belonged to the low increasing SA/DP trajectory group (53.4%) (Fig. 1), were not unemployed before inclusion (91.6%), received PCI at inclusion (68.8%), had other somatic disorders (67.1%), and did not have mental co-morbidities. Re-infarction and all-cause mortality during the first year represented 35.2% and 4.4% of the study population, respectively. Futhermore, sex differences were significant for various factors. For example, with respect to labour market marginalisation characteristics, the "Low increasing" SA/DP group comprised more men (58.8% vs. 36.6%) while the "High constant" SA/DP group was more common for women (22.7% vs. 11.1%). Moreover, more men had a STEMI (36.9% vs. 28.8%) and received a PCI (72.5% vs. 57.2%) compared to women while more women had co-morbidities compared to men.

Re-infarction

In the univariate analyses, higher risks of re-infarction were found in those with lower
education and living in small towns/villages. In contrast, those born in non-Nordic European
countries, and those living in medium-sized cities had lower risks of subsequent re-infarction
during the first year. Moreover, a higher risk of re-infarction was observed among those with
STEMI compared to non-STEMI as well as those treated with CABG compared to PCI (HR
2.43; 95% CI 2.14-2.75) (Table 2).

In the final model, lower educational level and living in small towns/villages were associated
with a higher risk of re-infarction while living in medium-sized cities, and being single living

Risk factors for re-infarction and mortality after acute myocardial infarction without children at home showed lower risk of re-infarction. With regard to AMI-related characteristics, patients with STEMI and CABG had a higher risk of re-infarction (Table 2). **All-cause mortality** In the multivariable model, we found that older age, lower level of education, being married/single living without children at home, and belonging to the "High constant" SA/DP trajectory group were risk factors for all-cause mortality during the first year after AMI. Those born in non-European countries and those belonging to the "Low constant "and "High decreasing" SA/DP trajectory groups were associated with a lower risk of all-cause mortality. STEMI compared to non-STEMI was associated with a 4-fold higher risk of all-cause mortality following AMI. Moreover, a higher risk of all-cause mortality was found in patients with diabetes mellitus, renal insufficiency, stroke, cancer and other somatic disorders compared to those without such co-morbidities. Other mental disorders besides CMDs and psychiatric medication were significantly associated with subsequent all-cause mortality (Table 3).

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Risk factors for re-infarction and mortality after acute myocardial infarction

1 2		Risk factors for re-infarction and mortality after acute myocardial infarction
3 4	238	DISCUSSION
5 6 7	239	Socio-demographic and labour market marginalisation
, 8 9	240	Socio-demographic and labour market marginalisation were generally more associated with
10 11	241	mortality than re-infarction in AMI patients. Further, risk factors in common for both
12 13 14	242	outcomes showed slightly higher risk estimates for mortality. For instance, results showed
15 16	243	that a lower education level, which acts as a proxy of lower socioeconomic status, was
17 18	244	associated with a less favourable prognosis regarding re-infarction (HR: 1.12) and all-cause
19 20 21	245	mortality (HR: 1.29) during the first year after AMI. Previous studies have shown that
21 22 23	246	patients with a lower educational level generally have a higher risk profile, primarily due to
24 25	247	the presence of more risk factors such as smoking or the resistance of quitting smoking after
26 27 28	248	AMI and co-morbidities, leading to a worse health outcome (16, 17). After adjustment for co-
28 29 30	249	morbidities, we found that educational level remained an independent predictor of re-
31 32	250	infarction and mortality, Still, one cannot rule out the possibility of unmeasured residual co-
33 34 25	251	morbidities that may be associated with re-infarction and all-cause mortality.
35 36 37	252	
38 39	253	As expected, we observed that higher age was a strong predictor of all-cause mortality after
40 41	254	AMI, which is in agreement with other studies (18-20). Similar to individuals with a lower
42 43 44	255	educational level, elderly patients have a greater disease burden and thus are more likely to
44 45 46	256	have a higher risk of mortality. Somewhat unexpectedly, older age was not associated with re-
47 48	257	infarction during the first year. The different findings with respect to mortality and re-
49 50 51	258	infarction may be driven by the co-morbidities that were controlled for in the model, which
51 52 53	259	are closely related with AMI and the association between age and all-cause mortality might be
54 55	260	caused by other co-morbidites. Interestingly, we found a higher risk of re-infarction for
56 57 58 59 60	261	patients who were living in small towns/villages, while a lower risk of re-infarction was

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observed for those living in medium sized cities compared to those living in big cities. This result might indicate diversities in healthcare in relation to different types of living area (21).

Furthermore, AMI patients born in non-European countries had a lower risk of all-cause mortality during the first year than patients born in Sweden. Recent research has shown a lower risk of mortality after AMI among South Asians compared with the host population (22, 23). Our finding may also reflect a "healthy migrant effect", indicating a positive health selection of migrants who are able to overcome the obstacles of migration. Previous studies showed that migrants have revealed a lower risk of morbidity and mortality compared to natives (24, 25).

Compared to AMI patients who were married and living with children at home, those who were married/single and living without children at home had a higher risk of all-cause mortality. Patients who live alone may have poor adherence to medication and follow-up recommendations, which might be associated with an unfavourable outcome. The few studies that have described the association between social support and prognosis in patients with coronary artery disease have had inconsistent definitions of measures of social support, leading to a wide variety of conclusions (26). Therefore, the impact of family situation on re-infarction and all-cause mortality is open to speculation and warrants further investigation.

With regard to labour market marginalisation factors, the "High constant" SA/DP trajectory group was associated with a 2.2-fold higher risk of all-cause mortality, even after controlling for confounders. As this group had around 12 months of SA/DP per annum before AMI, it is likely that this group consisted of a larger proportion of individuals with long-term SA or DP. This group may also have had a history of co-morbidities before AMI, which in turn increases

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the risk of all-cause mortality. On the other hand, the "Low constant" and "High decreasing" SA/DP trajectory groups showed a lower risk of all-cause mortality after adjusting for co-morbidities. The risk estimates of these two groups were not significant in the univariate model, thereby indicating that the effect of these SA/DP trajectory groups was mainly explained by co-morbidities. Our study is the first to report that SA/DP trajectory groups can be used as risk factors for mortality in patients with AMI. Our findings also revealed that risk estimates of SA/DP trajectory groups were comparable to well-known risk factors such as diabetes mellitus and renal insufficiency. Therefore, more attention in clinical practice in relation to work disabilityfactors in AMI patients is necessary.

24 296

297 Medical characteristics

Patients with STEMI had a higher risk of adverse outcomes, particularly for all-cause mortality, while those who underwent CABG had a higher risk of re-infarction than patients with NSTEMI and PCI. Indeed, STEMI is clinically associated with more serious medical conditions than non-STEMI (27). Several studies have suggested that STEMI patients exhibit an adverse prognosis in clinical settings due to related co-morbidities or the pathophysiological nature of STEMI (28, 29). With respect to coronary revascularisation, the outcome of PCI and CABG on AMI patients is inconsistent across studies. Although some studies have found similar morbidities and mortalities for PCI and CABG in AMI patients, others have shown that patients treated with PCI rather than CABG had fewer complications and a lower risk of mortality, particularly in the short-term (30, 31). It might also be due to the fact that patients with severe coronary artery disease are often treated with CABG and CABG is a more invasive method compared to PCI. On the other hand, some studies have also shown satisfying outcomes for those patients who were treated with CABG at 1 year after AMI (32). Therefore, the role of coronary revascularisation needs to be further investigated.

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We also found several co-morbidities such as diabetes mellitus, renal insufficiency, stroke, and cancer that were associated with a higher risk of all-cause mortality after AMI, which is in agreement with previous studies (33-35). Because patients with a greater disease burden are more likely to experience higher mortality rates than their healthier counterparts, future studies adressing surveillance and treatment approaches for patients presenting with multiple co-morbidities are necessary. In contrast, diabetes mellitus was associated with a lower risk of re-infarction.

In addition, a higher risk of all-cause mortality was observed among patients with mental co-morbidities. Both biological and behavioural mechanisms have been suggested to explain the association between mental disorders and cardiovascular disease. Patients with mental disorders have been reported to have several cardiac symptoms (36, 37). Further, they tend to have poorer diets, reduced medication adherence, and more stress (38). Overall, mental disorders reduce the success of interventions targeting cardiovascular risk factor modification, leading to higher healthcare costs, poorer health outcomes, and increased mortality rates.

Strengths and limitations

The strengths of this study include the use of a population-based cohort design, which offers satisfactory statistical power for the analyses. The use of high quality national register data also minimises the risk of recall bias regarding exposure and outcome (39). The high coverage of the register data also enabled us to identify all AMI patients from inpatient care with subsequent re-infarction and mortality. We included only AMI patients who were treated in inpatient care with more severe cardiac disease. This might explain the high incidence of re-infarction during the first year of the study. We also used an advanced method covering the

1		Risk factors for re-infarction and mortality after acute myocardial infarction
2 3 4	337	inherent heterogeneity, group-based trajectory modelling, to investigate work disability
5 6	338	patterns in the study. Moreover, we were able to examine a wide range of risk factors as well
7 8 9	339	as adjust for relevant confounders. Still, there might be other factors than those studied here
9 10 11	340	that are associated with re-infarction and mortality. Our registers did not include information
12 13	341	of compliance to prescribed medication such as dual-antiplatelet therapy, smoking habits
14 15	342	before and after AMI, rehabilitation measures and life-style changes.
16 17 18	343	
19 20	344	Limitations of the study and considerations when interpreting our findings are acknowledged.
21 22	345	In this study, we only included co-morbidities recorded in inpatient and specialised outpatient
23 24 25	346	care, but not those from primary care due to lack of data availability. While we adjusted for
25 26 27	347	potential confounders that were particularly relevant for AMI, we acknowledge that there may
28 29	348	be a wider range of co-morbidities that we were unable to control for. Mental co-morbidities
30 31 32	349	were measured by including prescribed psychiatric medication data. For somatic co-
32 33 34	350	morbidities, we did not include an equivalent measure except for diabetes mellitus as there
35 36	351	was no available information in the register data. With regard to sickness absence, we did not
37 38	352	have information on sick-leave spells that were less than 14 days among employed
39 40 41	353	individuals. Thus, the number of SA days contributing to the combined number of SA/DP
42 43	354	days might be underestimated.
44 45	355	
46 47 48	356	Conclusions
49 50 51 52	357	Several socio-demographic and co-morbidity risk factors were generally associated more
	358	strongly with mortality than re-infarction in AMI patients, including lower educational level,
53 54 55	359	older age, immigration status, somatic and mental co-morbidities. Previous long-term work
55 56 57	360	disability and infarction type showed a higher risk for all-cause mortality after AMI during
58 59	361	the first year.
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2 3 4	362	Author Contributions
5 6 7	363	EM, MV and MW conceived and designed the study. MW and EM were involved in the
, 8 9	364	statistical analysis and drafted the manuscript. All authors gave input to the drafts and
10 11 12	365	approved the final manuscript.
13 14	366	
15 16 17	367	ACKNOWLEDGEMENTS
18 19 20	368	None.
21 22 23	369	
24 25 26	370	FUNDING
27 28	371	This study was supported by the Swedish Research Council, grant nr 2015-02292.
29 30 31	372	
32 33	373	DECLARATION OF CONFLICTING INTERESTS
34 35	374	None.
36 37 38	375	
39 40	376	ETHICS APPROVAL
41 42	377	The study has been evaluated and approved by the Regional Ethical Review Board of
43 44 45	378	Karolinska Institutet, Stockholm, Sweden (2007/762–31). The ethical review board approved
46 47	379	the study and waived the requirement that informed consent of research subjects should be
48 49	380	obtained.
50 51	381	
52 53 54	382	DATA SHARING STATEMENT
54 55 56	383	The data that support the findings of this study are available from Statistics Sweden and The
57 58 59 60	384	Swedish National Board of Health and Welfare, but restrictions apply to the availability of

1		Risk factors for re-infarction and mortality after acute myocardial infarction
3	385	these data, which were used with ethical permission for the current study and therefore are not
2	385 386	
41 42 43 44 45 46 47 48 49 50 51		

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Table 1: Descriptive statistics for all women (n=3673) and men (n=11 396) aged between 25 and 64 years with	
a diagnosis of acute myocardial infarction (AMI) from inpatient care in 2008-2010 in Sweden (N=15 069)	

	Characteristics of patients with AMI	All		Wo	men	Mer	1	Chi ² (p-value)
		n	%	n	%	n	%	
0 1		15 069	100	3673	24.4	11 396	75.6	
2	Socio-demographic characteristics ^a							
3	Age*							
4	25-45	1401	9.3	335	9.1	1066	9.4	15.1 (<0.001)
5 6	46-55	4739	31.5	1065	29.0	3674	32.2	
7	56-64	8929	59.3	2273	61.9	6656	58.4	
3	Education (years) ^{*b}							
)	Compulsory (≤9)	4474	29.7	1040	28.3	3434	30.1	9.9 (<0.01)
)	High school (10–12)	7435	49.3	1895	51.6	5540	48.6	
,	University (>12)	3160	21.0	738	20.1	2422	21.3	
3	Country of birth ^{*c}	0100		,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,				
ŀ	Sweden	12 085	80.2	2991	81.4	9094	79.8	86.4 (<0.001)
;	Other Nordic countries	860	5.7	282	7.7	578	5.1	
,	Europe (except Nordic countries)	440	2.9	116	3.2	324	2.8	
	Non-European countries	1684	11.2	284	7.7	1400	12.3	
3	<i>Type of living area</i> ^{*d}	1004	11.4	204	7.7	1400	12.5	
	Big cities	4566	30.3	1052	28.6	3514	30.8	6.5 (<0.05)
	Medium sized cities	5347	35.5	1344	36.6	4003	35.1	0.5 (<0.05)
2	Small towns/villages	5156	34.2	1277	34.8	3879	34.0	
;	Family situation [*]	5150	54.2	12//	54.0	3079	54.0	
1	Married ^f living without children	4880	32.4	1342	36.5	3538	31.1	235.8 (<0.001)
;		4000	26.5	728	19.8	3338	28.7	233.8 (<0.001)
,	Married ^f living with children	5386		1271	34.6	4115	36.1	
;	Single ^g living without children		35.7					
,	Single ^g living with children	803	5.3	332	9.0	471	4.1	
)	Labour market marginalisation character	istics			\bigcirc			
2	Trajectory groups of SA/DP*							
3	from three years before up to inclusion	8048	52.4	1345	266	6702	50 0	705.4 (<0.001)
•	Low increasing	2714	53.4		36.6	6703	58.8	/03.4 (<0.001)
;	Low constant		18.0	709	19.3	2005	17.6	
5	Middle increasing	1420	9.4	455	12.4	965	8.5	
'	High decreasing	794	5.3	331	9.0	463	4.1	
;	High constant	2093	13.9	833	22.7	1260	11.1	
)	Unemployment*							
1	in the year before inclusion	12 700	01 (2420	02.1	10.270	01.1	15.0 (<0.001)
2	No unemployment	13 799	91.6	3420	93.1	10 379	91.1	15.0 (<0.001)
3	1-180 days	852	5.7	171	4.7	681	6.0	
-	>180 days	418	2.8	82	2.2	336	3.0	
5	AMI-related characteristics							
7	Type of infarction ^{*h}							
3	at inclusion	53 (0)	24.0	1050	20.0	4000	26.0	047(-0.001)
)	STEMI ⁱ	5260	34.9	1058	28.8	4202	36.9	84.7 (<0.001)
0	Non-STEMI ^j	6704	44.5	1832	49.9	4872	42.8	

Risk factors for re-infarction and mortality after acute myocardial infarction

1	Risk factors for re-infarction and m	ortality aft	er ueut	<i>J</i>		laietion		
2 3	TT '0' 1	2105	20.(702	21.2	2222	20.4	
4	Unspecified	3105	20.6	783	21.3	2322	20.4	
5	Coronary revascularisation characteristics*	ĸ						
6	at inclusion	10.0(4	(0.0	0100	67 0	00(4	70.5	252.0 (.0.001)
7	Percutaneous coronary intervention	10 364	68.8	2100	57.2	8264	72.5	353.9 (<0.001)
8	Coronary artery bypass grafting	336	2.2	59	1.6	277	2.4	
9 10	Others	4369	29.0	1514	41.2	2855	25.1	
11	Co-morbidity characteristics ^h							
12	Somatic co-morbidities ¹							
13	from three years before up to inclusion							
14	Musculoskeletal disorders*	2299	15.3	741	20.2	1558	13.7	90.9 (<0.001)
15	Diabetes mellitus ^{*m}	2529	16.8	675	18.4	1854	16.3	8.8 (<0.01)
16 17	Renal insufficiency	248	1.7	70	1.9	178	1.6	2.0 (0.15)
18	Hypertension*	5110	33.9	1365	37.2	3745	32.9	22.9 (<0.001)
19	Stroke	199	1.3	54	1.5	145	1.3	0.8 (0.36)
20	Cancer*	933	6.2	303	8.3	630	5.5	35.4 (<0.001)
21	Other somatic disorders*	10 107	67.1	2722	74.1	7385	64.8	108.9 (<0.001)
22	Mental co-morbidities							
23 24	Common mental disorders ^{*1}							
25	from three years before up to inclusion	791	5.3	287	7.8	504	4.4	64.2 (<0.001)
26	Other mental disorders ¹	171	0.0	207	7.0	201		01.2 (0.001)
27	from three years before up to inclusion	1331	8.8	328	8.9	1003	8.8	0.1 (0.81)
28	Psychiatric medication ^{*n}	1551	0.0	520	0.7	1005	0.0	0.1 (0.01)
29	in the year before inclusion	3231	21.4	1299	35.4	1932	16.7	559.1 (<0.001)
30 31	Re-infarction and all-cause mortality	5251	21.7	1277	55.4	1752	10.7	557.1 (<0.001)
32	during first year after AMI							
33	Re-infarction	5310	35.2	1276	34.7	4034	35.4	0.5 (0.47)
34	All-cause mortality*	666	4.4	191	5.2	475	4.2	7.0 (<0.01)
35	513 * Significant sex differences	000			5.2	175	1.2	7.0 (10.01)
36	0		,		arction			
	514 ^a Measured on 31 st December of the year p	receding acu	te myoca	irdial infa	neuon			
37	515 ^b Missing data is considered compulsory e	ducation	te myoca	irdial infa				
38	515 ^b Missing data is considered compulsory ex 516 ^c Missing data is considered Non-European	ducation n countries	-			1 /	• • • •	4
38 39	 515 ^b Missing data is considered compulsory ed 516 ^c Missing data is considered Non-European 517 ^d Type of living area: big cities (Stockholm 	ducation n countries n, Gothenbur	g and Ma	almö); me	edium siz			more than
38 39 40	 515 ^b Missing data is considered compulsory et composition of the second state of the second st	ducation n countries n, Gothenbur from the cent	g and Ma re of the	almö); me	edium siz			more than
38 39	 515 ^b Missing data is considered compulsory et 516 ^c Missing data is considered Non-European 517 ^d Type of living area: big cities (Stockholm 90 000 inhabitants within 30 km distance f ^e Missing data is considered single living within 519 	ducation n countries n, Gothenbur from the cent vithout child	g and Ma re of the	almö); me	edium siz			more than
38 39 40 41	 515 ^b Missing data is considered compulsory et computsory et	ducation n countries n, Gothenbur rom the cent vithout child cohabitant idowed	g and Ma re of the ren	ılmö); mo city); sm	edium siz all cities/	villages/rura	ıl	
38 39 40 41 42 43 44	 b Missing data is considered compulsory ed c Missing data is considered Non-European d Type of living area: big cities (Stockholm 90 000 inhabitants within 30 km distance f c Missing data is considered single living w f Married includes all living with partner; c S21 g Single includes divorced, separated, or w S22 h See method section for the International of 	ducation n countries n, Gothenbur rom the cent vithout child cohabitant idowed Classification	g and Ma re of the ren n of Dise	ılmö); me city); sm	edium siz all cities/	villages/rura	ıl	
38 39 40 41 42 43 44 45	 b Missing data is considered compulsory ed c Missing data is considered Non-European d Type of living area: big cities (Stockholm 90 000 inhabitants within 30 km distance f e Missing data is considered single living w f Married includes all living with partner; c g Single includes divorced, separated, or w h See method section for the International of Therapeutic Chemical classification system 	ducation n countries n, Gothenbur rom the cent vithout child cohabitant idowed Classification	g and Ma re of the ren n of Dise	ılmö); me city); sm	edium siz all cities/	villages/rura	ıl	
38 39 40 41 42 43 44 45 46	 b Missing data is considered compulsory ed c Missing data is considered Non-European d Type of living area: big cities (Stockholm 90 000 inhabitants within 30 km distance f e Missing data is considered single living w f Married includes all living with partner; c s Single includes divorced, separated, or w h See method section for the International of Therapeutic Chemical classification system i ST-elevation myocardial infarction 	ducation n countries n, Gothenbur rom the cent vithout child cohabitant idowed Classification	g and Ma re of the ren n of Dise	ılmö); me city); sm	edium siz all cities/	villages/rura	ıl	
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Risk factors for re-infarction and mortality after acute myocardial infarction

Table 2. Crude and adjusted hazard ratios (HR) and 95% Confidence Interval (CI) for re-infarction in indiviguals with a diagnosis of acute myocardial infarction (AMI) from inpatient care in 2008-2010 in Sweden (N=15 069) during the first gear after AMI

Characteristics of patients with AMI	Re-infarction	Crude model	Model 1 ^a	Madel 2 ^b	Model 3 ^c
	n (%)		HR (9:	5% CI) 🖁	
Socio-demographic characteristics ^d			\$	ber	
Sex				201	
Men	4034 (35.4)	1	1	<u>9</u> 1	
Women	1276 (34.7)	0.97 (0.91-1.03)	0.97 (0.91-1.04)	0.98 (2.91-1.04)	1.03 (0.97-1.1
Age				nlo	
25-45	482 (34.4)	1	1	de 1	
46-55	1679 (35.4)	1.03 (0.93-1.14)	1.02 (0.92-1.13)	1.02 ().92-1.13)	1.01 (0.91-1.1
56-64	3149 (35.3)	1.01 (0.92-1.12)	0.98 (0.89-1.09)	0.99 (1.90-1.10)	0.99 (0.90-1.1
Education (years) ^e				http	
Compulsory (≤9)	1630 (36.4)	1.18 (1.09-1.28)	1.13 (1.05-1.23)	1.13 (2.04-1.23)	1.12 (1.04-1.2
High school (10–12)	2672 (35.9)	1.16 (1.08-1.25)	1.11 (1.03-1.19)	1.11 (03-1.19)	1.10 (1.02-1.1
University (>12)	1008 (31.9)	ĺ	1	. <u>1</u>	
Country of birth ^f),	bmj	
Sweden	4367 (36.1)	1	1	<u>§</u> 1	
Other Nordic countries	309 (35.9)	1.00 (0.89-1.12)	1.01 (0.90-1.13)	1.01 (0.90-1.13)	1.02 (0.91-1.1
Europe (except Nordic countries)	124 (28.2)	0.74 (0.62-0.88)	0.83 (0.69-0.99)	0.83 🖗.69-0.99)	0.83 (0.70-1.0
Non-European countries	510 (30.3)	0.80 (0.73-0.87)	0.91 (0.82-1.00)	0.91 (1.82-1.00)	0.91 (0.82-1.0
Type of living area ^g				23,	
Big cities	1368 (30.0)	1	1	202 1	
Medium sized cities	1428 (26.7)	0.87 (0.80-0.93)	0.84 (0.78-0.91)	0.84 (0.78-0.91)	0.84 (0.78-0.9
Small towns/villages	2514 (48.8)	1.88 (1.76-2.01)	1.81 (1.69-1.94)	1.81 (d. 69-1.94)	1.83 (1.71-1.9
Family situation ^h				ıest	
Married ⁱ living without children	1782 (36.5)	1.01 (0.95-1.09)	0.97 (0.90-1.05)	0.97 (9.90-1.05)	0.97 (0.90-1.0
Married ⁱ living with children	1439 (36.0)	1	1	oteo 1	
Single ^j living without children	1812 (33.6)	0.92 (0.86-0.98)	0.89 (0.83-0.96)	0.89 🖗.83-0.96)	0.89 (0.83-0.9
Single ^j living with children	277 (34.5)	0.94 (0.83-1.07)	0.96 (0.84-1.09)	0.96 (3).84-1.09)	0.96 (0.84-1.1

Risk factors for re-infarction and mortality after acute myocardial infarction

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Trajectory groups of SA/DP from three years before up to inclusion 9 Low increasing 2827 (35.1) 1 1 1 Low constant 951 (35.0) 0.99 (0.92-1.06) 0.96 (0.89-1.04) 0.96 (0.89-1.04) Middle increasing 501 (35.3) 0.97 (0.88-1.07) 0.95 (0.87-1.06) 0.96 (0.89-1.04) High decreasing 295 (37.2) 1.03 (0.91-1.16) 1.02 (0.90-1.16) 1.02 (0.90-1.16) High constant 736 (35.2) 0.99 (0.91-1.07) 1.00 (0.92-1.09) 1.00 (0.91-1.09) Unemployment 736 (35.2) 0.99 (0.91-1.07) 1.00 (0.92-1.09) 1.00 (0.91-1.09) No unemployment 4850 (35.2) 1 1 1 1 1-180 days 310 (36.4) 1.04 (0.93-1.17) 1.07 (0.95-1.20) 1.07 (9.95-1.20) >180 days 150 (35.9) 1.04 (0.89-1.23) 1.08 (0.92-1.27) 1.08 (9.92-1.27) AMI-related characteristics 7 7 1.19 (1.12-1.27) 1.19 (1.12-1.27) Non-STEMI ^m 2311 (34.5) 1 1 1 1 Unspecified 1054 (34.0) 1.02 (0.95-1.10) 1.02 (0.95-1.10) 1.02 (0.95-1.10) </th <th></th> <th>-033616</th> <th></th> <th></th> <th>teristics</th> <th>Labour market marginalisation charact</th>		-033616			teristics	Labour market marginalisation charact			
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AMI-related characteristics Image: Constraint of the system of infarction i	1.06 (0.94-1.19	1.07 (2.95-1.20)	1.07 (0.95-1.20)	1.04 (0.93-1.17)	310 (36.4)	1-180 days			
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Unspecified 1054 (34.0) 1.02 (0.95-1.09) 1.02 (0.95-1.10) 1.02 (0.95-1.10) Coronary revascularisation characteristics ⁿ g g g at inclusion 3772 (36.4) 1 1 g 1 Percutaneous coronary intervention 3772 (36.4) 1 1 g 1 Coronary artery bypass grafting 267 (79.5) 2.43 (2.14-2.75) 2.31 (2.04-2.62) 2.32 (2.05-2.63) Others 1271 (29.1) 0.74 (0.70-0.79) 0.71 (0.67-0.76) 0.71 (0.67-0.76) Co-morbidity characteristics ^k g g Somatic co-morbidities ^o g g g g from three years before up to inclusion 835 (36.3) 1.04 (0.96-1.12) 1.04 (0.96-1.12) 1.04 (0.96-1.12)	1.14 (1.07-1.2)	1.19 (1.12-1.27)	1.19 (1.12-1.27)	1.18 (1.11-1.26)	1945 (37.0)	STEMI ¹			
Coronary revascularisation characteristics ⁿ 9 at inclusion 9 Percutaneous coronary intervention 3772 (36.4) 1 1 Coronary artery bypass grafting 267 (79.5) 2.43 (2.14-2.75) 2.31 (2.04-2.62) 2.32 (3.05-2.63) Others 1271 (29.1) 0.74 (0.70-0.79) 0.71 (0.67-0.76) 0.71 (9.67-0.76) Co-morbidity characteristics ^k 9 9 9 9 Somatic co-morbidities ^o 9 9 9 9 Musculoskeletal disorders 835 (36.3) 1.04 (0.96-1.12) 1.04 (0.96-1.12) 1.04 (9.96-1.12)		<u>, 3</u> . 1	1	1	2311 (34.5)	Non-STEMI ^m			
at inclusion Description 3772 (36.4) 1 1 Description 1 Percutaneous coronary intervention 3772 (36.4) 1	1.05 (0.98-1.13	1.02 (0.95-1.10)	1.02 (0.95-1.10)	1.02 (0.95-1.09)	1054 (34.0)	Unspecified			
Percutaneous coronary intervention 3772 (36.4) 1 <th1< th=""> <th1< th=""></th1<></th1<>	Coronary revascularisation characteristics ⁿ								
Coronary artery bypass grafting 267 (79.5) 2.43 (2.14-2.75) 2.31 (2.04-2.62) 2.32 (2.05-2.63) Others 1271 (29.1) 0.74 (0.70-0.79) 0.71 (0.67-0.76) 0.71 (2.04-2.62) Co-morbidity characteristics ^k 0 0 9 Somatic co-morbidities ^o 9 from three years before up to inclusion 9 Musculoskeletal disorders 835 (36.3) 1.04 (0.96-1.12) 1.04 (0.96-1.12)		at inclusion							
Others 1271 (29.1) 0.74 (0.70-0.79) 0.71 (0.67-0.76) 0.71 (0.67-0.76) Co-morbidity characteristics ^k Image: Composition of the second sec	L	<u> </u>	1	1		· · · · · · · · · · · · · · · · · · ·			
Co-morbidity characteristicskImage: Co-morbidity characteristicskImage: Co-morbidities Co-mo	2.41 (2.13-2.74	```	/		`				
Somatic co-morbidities from three years before up to inclusion \$\$Musculoskeletal disorders835 (36.3)1.04 (0.96-1.12)1.04 (0.96-1.12)	0.74 (0.69-0.79		0.71 (0.67-0.76)	0.74 (0.70-0.79)	1271 (29.1)				
Irom three years before up to inclusion Image: Second	<u> </u>	by g							
Irom three years before up to inclusion Image: Second		Jues							
	105 (000 11		1.04 (0.06.1.10)	1.04 (0.06.1.10)					
Diabetes mollitus $827(327) + 0.87(0.81-0.94) + 0.87(0.81-0.94) + 0.87(0.81-0.94) + 0.87(0.81-0.94)$	1.05 (0.98-1.14	T (()	· · · ·	· · ·				
	0.91 (0.84-0.98	<u>v</u> ⁄	0.87 (0.81-0.94)	0.87 (0.81-0.94)	827 (32.7)	Diabetes mellitus ^p			
Renal insufficiency73 (29.4)0.77 (0.61-0.97)0.74 (0.58-0.93)0.74 (0.58-0.94)	0.84 (0.66-1.00	0.74 @.59-0.94)	0.74 (0.58-0.93)	0.77 (0.61-0.97)	73 (29.4)	Renal insufficiency			
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Risk factors for re-infarction and mortality after acute myocardial infarction

				33								
Hypertension	1741 (34.1)	0.92 (0.87-0.97)	0.92 (0.87-0.98)	0.93 (0.95 (0.89-1.00							
Stroke	59 (29.7)	0.80 (0.62-1.03)	0.76 (0.59-0.99)	0.77 (3.59-0.99)	0.81 (0.63-1.05							
Cancer	300 (32.2)	0.88 (0.79-0.99)	0.89 (0.79-1.00)	0.90 (2.80-1.01)	0.94 (0.83-1.06							
Other somatic disorders	3507 (34.7)	0.92 (0.87-0.98)	0.92 (0.87-0.97)	0.92 (0.87-0.97)	0.95 (0.90-1.01							
Mental co-morbidities				mb								
Common mental disorders ^o				er 2								
from three years before up to inclusion	300 (37.9)	1.08 (0.96-1.21)	1.12 (1.00-1.27)	019	1.13 (1.00-1.28							
Other mental disorders ^o				. D								
from three years before up to inclusion	474 (35.6)	1.02 (0.93-1.12)	1.06 (0.96-1.17)	Wn	1.05 (0.96-1.16							
Psychiatric medication ^q				load								
in the year before inclusion	1101 (34.1)	0.94 (0.88-1.00)	0.96 (0.90-1.04)	ded	1.00 (0.93-1.07							
	ers and other menta	l disorders, and psychia	atric medications; Men	tal co-morbidities were	Adjusted for sex, age, educational level, country of birth, type of living area, family situation, trajectory groups of SA/DP and prevous unemployment Adjusted for sex, age, educational level, country of birth, type of living area, family situation, trajectory groups of SA/DP and previous unemployment, inpatient and pecialised outpatient care due to common mental disorders and other mental disorders, and psychiatric medications; Mental co-mogbidities were not mutually controlle							

^cAdjusted for sex, age, educational level, country of birth, type of living area, family situation, trajectory groups of SA/DP and previous unemployment, inpatient and

specialised outpatient care due to common mental disorders and other mental disorders, and psychiatric medications, type of infarcian, type of coronary revascularisation, musculoskeletal disorders, diabetes mellitus, renal insufficiency, hypertension, stroke, cancer and other somatic disorders; Mental &-morbidities were not mutually controlled

^d Measured on 31st December of the year preceding acute myocardial infarction

^e Missing data is considered compulsory education

^f Missing data is considered Non-European countries

^g Type of living area: big cities (Stockholm, Gothenburg and Malmö); medium sized cities (cities with more than 90 000 inhabitants within 30 km distance from the centre of the city); small cities/villages/rural

the city); small cities/villages/rural ^h Missing data is considered single living without children ⁱ Married includes all living with partner; cohabitant ^j Single includes divorced, separated, or widowed ^k See method section for the International Classification of Diseases version 10 (ICD-10) codes or the Anatomic Therapeutic Chemical classification system (ATC) codes

¹ST-elevation myocardial infarction

^mNon-ST-elevation myocardial infarction

ⁿ See method section for the Classification of Surgical Procedures

^o Measured by main or side diagnosis in inpatient or specialised outpatient care

^p Additionally measured by prescribed antidiabetic medication

^q Measured by antidepressants, anxiolytics and sedatives

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 Risk factors for re-infarction and mortality after acute myocardial infarction

Table 3. Crude and adjusted hazard ratios (HR) and 95% Confidence Interval (CI) for all-cause mortality in adjusted hazard ratios (HR) and 95% Confidence Interval (CI) for all-cause mortality in adjusted hazard ratios (HR) and 95% Confidence Interval (CI) for all-cause mortality in adjusted hazard ratios (HR) and 95% Confidence Interval (CI) for all-cause mortality in adjusted hazard ratios (HR) and 95% Confidence Interval (CI) for all-cause mortality in adjusted hazard ratios (HR) and 95% Confidence Interval (CI) for all-cause mortality in adjusted hazard ratios (HR) and 95% Confidence Interval (CI) for all-cause mortality in adjusted hazard ratio (AMI) from inpatient care in 2008-2010 in Sweden (N=15 069) during the first sear after AMI

model Model 1 ^a H H 1 1 05-1.47) 0.95 (0.80-1.1) 1 1 80-1.67) 0.98 (0.67-1.4) 58-3.14) 1.76 (1.23-2.5) 37-2.15) 1.28 (1.02-1.6) 99-1.54) 1.06 (0.85-1.5)	HR (95% CI) HR (95% CI) 1 1 1 1 1 1 1 1 1 1 1 1 1
1 05-1.47) 0.95 (0.80-1.1) 1 80-1.67) 0.98 (0.67-1.4) 58-3.14) 1.76 (1.23-2.5) 37-2.15) 1.28 (1.02-1.6)	Image: Non-state state st
1 05-1.47) 0.95 (0.80-1.1) 1 80-1.67) 0.98 (0.67-1.4) 58-3.14) 1.76 (1.23-2.5) 37-2.15) 1.28 (1.02-1.6)	Image: Non-state state st
1 80-1.67) 0.98 (0.67-1.4 58-3.14) 1.76 (1.23-2.4 37-2.15) 1.28 (1.02-1.6	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
1 80-1.67) 0.98 (0.67-1.4 58-3.14) 1.76 (1.23-2.4 37-2.15) 1.28 (1.02-1.6	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
1 80-1.67) 0.98 (0.67-1.4 58-3.14) 1.76 (1.23-2.4 37-2.15) 1.28 (1.02-1.6	$\begin{array}{c ccccccccccccccccccccccccccccccccccc$
58-3.14) 1.76 (1.23-2.3) 37-2.15) 1.28 (1.02-1.6)	$\begin{array}{c} 2.50 \\ \hline 1.74 \\ \hline (1.22 - 2.48) \\ \hline 1.82 \\ \hline 1.82 \\ \hline 1.62 \\ \hline 1.29 \\ \hline (1.02 - 1.63) \\ \hline 1.29 $
58-3.14) 1.76 (1.23-2.3) 37-2.15) 1.28 (1.02-1.6)	$\begin{array}{c} 2.50 \\ \hline 1.74 \\ \hline (1.22 - 2.48) \\ \hline 1.82 \\ \hline 1.82 \\ \hline 1.62 \\ \hline 1.29 \\ \hline (1.02 - 1.63) \\ \hline 1.29 $
58-3.14) 1.76 (1.23-2.3) 37-2.15) 1.28 (1.02-1.6)	$\begin{array}{c} 2.50 \\ \hline 1.74 \\ \hline (1.22 - 2.48) \\ \hline 1.82 \\ \hline 1.82 \\ \hline 1.62 \\ \hline 1.29 \\ \hline (1.02 - 1.63) \\ \hline 1.29 $
58-3.14) 1.76 (1.23-2.3) 37-2.15) 1.28 (1.02-1.6)	$\begin{array}{c} 2.50 \\ \hline 1.74 \\ \hline (1.22 - 2.48) \\ \hline 1.82 \\ \hline 1.82 \\ \hline 1.62 \\ \hline 1.29 \\ \hline (1.02 - 1.63) \\ \hline 1.29 $
99-1.54) 1.06 (0.85-1	1.33) 1.06 (0.84-1.32) 1.05 (0.84-
1	
	1 9 1
	bm
1	1 8 1
01-1.79) 1.02 (0.77-1.3	1.36) 1.03 (0.78-1.38) 1.22 (0.91-
48-1.28) 0.70 (0.42-1.1	1.15) 0.73 (0.44-1.20) 0.80 (0.48-
46-0.83) 0.58 (0.43-0.8	0.80 $0.5 = (0.44 - 0.81)$ $0.62 (0.45 - 0.80)$
	23,
1	1 8 1
74-1.08) 0.84 (0.69-1.0	1.02) 0.84 (0.69-1.01) 0.88 (0.72-
	-1.01) 0.85(0.70-1.03) 0.86 (0.71-
79-1.14) 0.84 (0.69-1.0	
/9-1.14) 0.84 (0.69-1.4	S.
79-1.14) 0.84 (0.69-1.0 43-2.33) 1.31 (1.02-1.7	<u>\$</u> -1.70) 1.30 <u>(</u> 1.01-1.68) 1.36 (1.05-
	3-2.33) 1.31 (1.02-

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Risk factors for re-infarction and mortali	ty after acute myocard	ial infarction		2019		
				9-033		
Labour market marginalisation char	acteristics			616		
Trajectory groups of SA/DP				on		
from three years before up to inclusion	l	-		18		
Low increasing	243 (3.0)	1	1	ec 1		
Low constant	69 (2.5)	0.84 (0.64-1.10)	0.82 (0.63-1.07)	0.79 (0.60-1.03)	0.68 (0.52-0	
Middle increasing	71 (5.0)	1.66 (1.27-2.16)	1.60 (1.22-2.09)	1.47 (1.12-1.93)	1.02 (0.78-1	
High decreasing	18 (2.3)	0.77 (0.48-1.24)	0.59 (0.36-0.95)	0.523(0.32-0.85)	0.33 (0.20-0	
High constant	265 (12.7)	4.32 (3.63-5.14)	3.94 (3.26-4.76)	3.45(2.81-4.23)	2.16 (1.75-2	
Unemployment				0WI		
in the year before inclusion				רור		
No unemployment	622 (4.5)	1	1			
1-180 days	27 (3.2)	0.69 (0.47-1.02)	1.07 (0.72-1.59)	1.05 (0.71-1.56)	1.04 (0.70-1	
>180 days	17 (4.1)	0.90 (0.56-1.46)	1.31 (0.81-2.14)	1.31 (0.81-2.14)	1.28 (0.79-2	
AMI-related characteristics			, , , , , , , , , , , , , , , , , , ,	ttp:/		
Type of infarction ^k at inclusion		6.		/bmjop		
STEMI ¹	267 (5.1)	2.28 (1.87-2.78)	2.45 (2.01-2.99)	2.48 (2.03-3.03)	3.80 (3.08-4	
Non-STEMI ^m	153 (2.3)	1	1	<u>, j.</u> 1	× .	
Unspecified	246 (7.9)	3.60 (2.94-4.41)	3.45 (2.82-4.23)	3.45 (2.82-4.22)	2.97 (2.42-3	
Coronary revascularisation characteristics ⁿ						
at inclusion				A r		
Percutaneous coronary intervention	257 (2.5)	1	1			
Coronary artery bypass grafting	11 (3.3)	1.35 (0.74-2.47)	1.26 (0.69-2.31)	1.27(0.70-2.33)	1.65 (0.90-3	
Others	398 (9.1)	3.78 (3.23-4.42)	3.30 (2.81-3.87)	3.25 (2.76-3.81)	3.60 (3.03-4	
Co-morbidity characteristics ^k				t by	· · · · · · · · · · · · · · · · · · ·	
Somatic co-morbidities ^o				gue		
from three years before up to inclusion	<u>on</u>			uest.		
Musculoskeletal disorders	112 (4.9)	1.12 (0.92-1.38)	0.90 (0.73-1.11)	0.91 (0.74-1.12)	1.00 (0.81-1	
Diabetes mellitus ^p	199 (7.9)	2.14 (1.81-2.53)	1.73 (1.46-2.05)	1.748(1.47-2.06)	1.70 (1.42-2	
Renal insufficiency	60 (24.2)	6.36 (4.88-8.30)	4.34 (3.31-5.71)	4.298(3.26-5.64)	2.59 (1.95-3	
Hypertension	198 (3.9)	0.82 (0.69-0.97)	0.74 (0.62-0.87)	0.74 (0.62-0.87)	0.68 (0.57-0	
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Risk factors for re-infarction and mortality after acute myocardial infarction

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roke incer ther somatic disorders ental co-morbidities ommon mental disorders ^o om three years before up to inclusion ther mental disorders ^o om three years before up to inclusion ther mental disorders ^o om three years before up to inclusion ther mental disorders ^o om three years before up to inclusion tychiatric medication ^q the year before inclusion justed for sex, age, educational level, country of pialised outpatient care due to common mental di culoskeletal disorders, diabetes mellitus, renal in easured on 31 st December of the year preceding a ssing data is considered compulsory education ssing data is considered Non-European countries pe of living area: big cities (Stockholm, Gothent city); small cities/villages/rural ssing data is considered single living without ch rried includes all living with partner; cohabitant gle includes divorced, separated, or widowed e method section for the International Classificat elevation myocardial infarction on-ST-elevation myocardial infarction	f birth, type of living are lisorders and other ments f birth, type of living are lisorders and other ments nsufficiency, hypertensi acute myocardial infarc es burg and Malmö); medir	al disorders, and psych ea, family situation, traj al disorders, and psych on, stroke, cancer and tion um sized cities (cities y	1.39 (1.16-1.66) jectory groups of SA/DI jectory groups of SA/DI jatric medications; Men jectory groups of SA/DI jatric medications, type other somatic disorders;	2.459(1.98-3.04) 1.595(1.31-1.92) 1.595(1.31-1.92) 9 9 9 9 9 9 9 9 9 9 9 9 9	2.22 (1.78-2.75) 1.46 (1.20-1.78) 0.90 (0.66-1.24) 1.46 (1.17-1.82) 1.24 (1.03-1.48) yment yment, inpatient and not mutually controlled yment, inpatient and ronary revascularisatio were not mutually cont distance from the cent
ther somatic disorders ental co-morbidities ommon mental disorders ^o om three years before up to inclusion ther mental disorders ^o om three years before up to inclusion tychiatric medication ^q the year before inclusion justed for sex, age, educational level, country of tialised outpatient care due to common mental di justed for sex, age, educational level, country of tialised outpatient care due to common mental di culoskeletal disorders, diabetes mellitus, renal in easured on 31 st December of the year preceding a ssing data is considered Non-European countries pe of living area: big cities (Stockholm, Gothenk city); small cities/villages/rural issing data is considered single living without ch rried includes all living with partner; cohabitant gle includes divorced, separated, or widowed e method section for the International Classificat- elevation myocardial infarction	102 (10.9) 530 (5.2) 43 (5.4) 101 (7.6) 241 (7.5) f birth, type of living are isorders and other menta nsufficiency, hypertensi acute myocardial infarc ss burg and Malmö); medition	1.93 (1.60-2.33) 1.25 (0.92-1.71) 1.86 (1.51-2.30) 2.10 (1.79-2.46) ea, family situation, trajea, family situation, trajal disorders, and psychea, family situation, trajal disorders, and psychon, stroke, cancer and tion um sized cities (cities v	1.62 (1.34-1.96)0.80 (0.59-1.11)1.40 (1.13-1.74)1.39 (1.16-1.66)jectory groups of SA/DIjectory groups of SA/DIiatric medications; Menjectory groups of SA/DIiatric medications, typeother somatic disorders;with more than 90 000 in	2.45 (1.98-3.04) 1.55 (1.31-1.92)	2.22 (1.78-2.75) 1.46 (1.20-1.78) 0.90 (0.66-1.24) 1.46 (1.17-1.82) 1.24 (1.03-1.48) yment yment, inpatient and not mutually controlled yment, inpatient and ronary revascularisation were not mutually controlled distance from the centre
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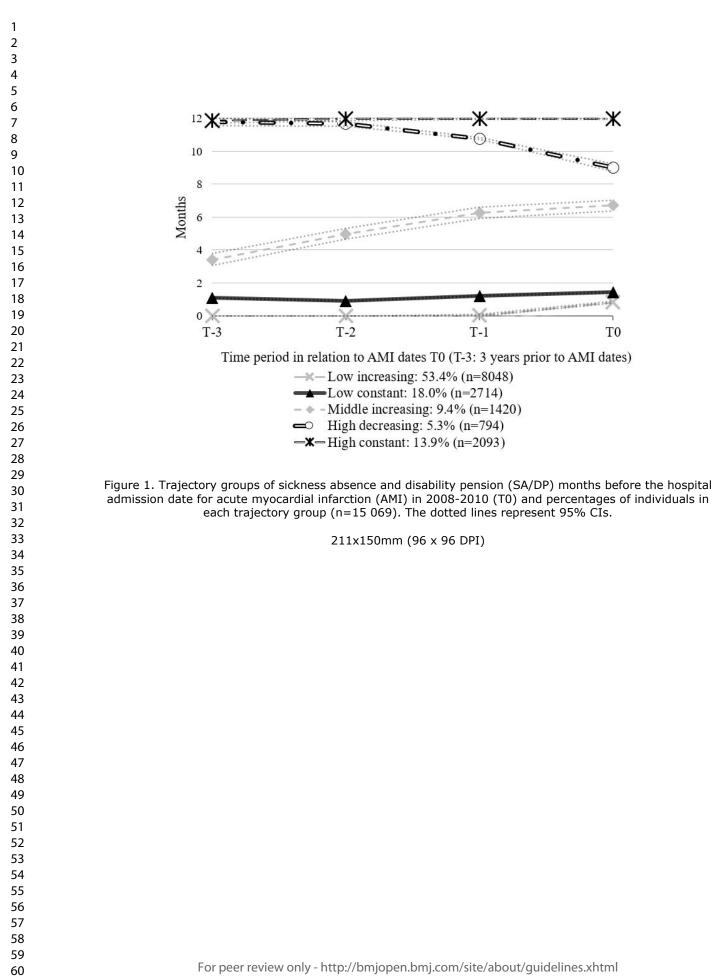
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Reporting checklist for cohort study. Based on the STROBE cohort guidelines. Instructions to authors Complete this checklist by entering the page numbers from your manuscript where readers will find each of the items listed below. Your article may not currently address all the items on the checklist. Please modify your text to include the missing information. If you are certain that an item does not apply, please write "n/a" and provide a short explanation. Upload your completed checklist as an extra file when you submit to a journal. In your methods section, say that you used the STROBE cohortreporting guidelines, and cite them as: von Elm E, Altman DG, Egger M, Pocock SJ, Gotzsche PC, Vandenbroucke JP. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) Statement: guidelines for reporting observational studies. Page Reporting Item Number Title and abstract Title #1a Indicate the study's design with a commonly used term in the title or the abstract For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

1 2	Abstract	<u>#1b</u>	Provide in the abstract an informative and balanced	2-3
3 4 5			summary of what was done and what was found	
6 7 8	Introduction			
9 10 11	Background /	<u>#2</u>	Explain the scientific background and rationale for the	5-6
12 13	rationale		investigation being reported	
14 15 16 17 18	Objectives	<u>#3</u>	State specific objectives, including any prespecified hypotheses	6
19 20 21 22	Methods			
23 24 25	Study design	<u>#4</u>	Present key elements of study design early in the paper	7
26 27 28	Setting	<u>#5</u>	Describe the setting, locations, and relevant dates,	7-8
28 29 30			including periods of recruitment, exposure, follow-up, and	
31 32 33			data collection	
34 35	Eligibility criteria	<u>#6a</u>	Give the eligibility criteria, and the sources and methods	7
36 37 38			of selection of participants. Describe methods of follow-	
39 40			up.	
41 42 43	Eligibility criteria	<u>#6b</u>	For matched studies, give matching criteria and number of	n/a It is not
44 45			exposed and unexposed	a matched
46 47 48				study.
49 50	Variables	<u>#7</u>	Clearly define all outcomes, exposures, predictors,	8-9
51 52 53			potential confounders, and effect modifiers. Give	
54 55 56			diagnostic criteria, if applicable	
57 58				
59 60		For pe	er review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml	

1 2	Data sources /	<u>#8</u>	For each variable of interest give sources of data and	7-9
3 4	measurement		details of methods of assessment (measurement).	
5 6 7			Describe comparability of assessment methods if there is	
7 8 9			more than one group. Give information separately for for	
10 11			exposed and unexposed groups if applicable.	
12 13 14 15	Bias	<u>#9</u>	Describe any efforts to address potential sources of bias	17
16 17 18	Study size	<u>#10</u>	Explain how the study size was arrived at	7
19 20 21	Quantitative	<u>#11</u>	Explain how quantitative variables were handled in the	7-8
21 22 23	variables		analyses. If applicable, describe which groupings were	
24 25			chosen, and why	
26 27	Statistical	#12a	Describe all statistical methods, including those used to	8-9
28 29		<u>#12a</u>		0-9
30 31	methods		control for confounding	
32 33 34	Statistical	<u>#12b</u>	Describe any methods used to examine subgroups and	8-9
35 36	methods		interactions	
37 38	Statistical	#12c	Explain how missing data were addressed	8-9
39 40	methods	<u>// 120</u>		0.0
41 42	methods			
43 44 45	Statistical	<u>#12d</u>	If applicable, explain how loss to follow-up was addressed	n/a there is
45 46 47	methods			no loss to
48 49				follow-up
50 51	Statistical	#12e	Describe any sensitivity analyses	9
52 53	methods			-
54 55	methode			
56 57 58	Results			
59 60		For pee	er review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml	

1 2	Participants	<u>#13a</u>	Report numbers of individuals at each stage of study—eg	11		
3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27			numbers potentially eligible, examined for eligibility,			
			confirmed eligible, included in the study, completing			
			follow-up, and analysed. Give information separately for			
			for exposed and unexposed groups if applicable.			
	Participants	<u>#13b</u>	Give reasons for non-participation at each stage	n/a		
	Participants	<u>#13c</u>	Consider use of a flow diagram	n/a		
	Descriptive data	<u>#14a</u>	Give characteristics of study participants (eg	s of study participants (eg 11		
			demographic, clinical, social) and information on			
			exposures and potential confounders. Give information			
			separately for exposed and unexposed groups if			
28 29			applicable.			
30 31 32 33 34 35 36 37 38 39 40 41	Descriptive data	criptive data <u>#14b</u>	Indicate number of participants with missing data for each	n/a		
			variable of interest			
	Descriptive data	<u>#14c</u>	Summarise follow-up time (eg, average and total amount)	10		
	Outcome data #15		Report numbers of outcome events or summary	11		
42 43			measures over time. Give information separately for			
44 45 46			exposed and unexposed groups if applicable.			
47 48 49	Main results	<u>#16a</u>	Give unadjusted estimates and, if applicable, confounder-	11-12		
50 51			adjusted estimates and their precision (eg, 95%			
52 53			confidence interval). Make clear which confounders were			
54 55			adjusted for and why they were included			
56 57 58						
58 59 60		For pee	er review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml			

1 2	Main results	<u>#16b</u>	Report category boundaries when continuous variables	11-12	
3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 32 4 25 26 27 28 29 30 31 32 33 4 35 36 37 38 9 40 41 42 43 44 5			were categorized		
	Main results	<u>#16c</u>	If relevant, consider translating estimates of relative risk	n/a	
			into absolute risk for a meaningful time period		
	Other analyses	<u>#17</u>	Report other analyses done—e.g., analyses of subgroups	n/a	
			and interactions, and sensitivity analyses		
	Discussion				
	Key results	<u>#18</u>	Summarise key results with reference to study objectives	17	
	Limitations	<u>#19</u>	Discuss limitations of the study, taking into account	17	
			sources of potential bias or imprecision. Discuss both		
			direction and magnitude of any potential bias.		
	Interpretation	<u>#20</u>	Give a cautious overall interpretation considering	13-17	
			objectives, limitations, multiplicity of analyses, results from		
			similar studies, and other relevant evidence.		
	Generalisability	<u>#21</u>	Discuss the generalisability (external validity) of the study	16	
			results		
	Other Information				
46 47 48	Funding	<u>#22</u>	Give the source of funding and the role of the funders for	18	
49 50			the present study and, if applicable, for the original study		
51 52 53			on which the present article is based		
54 55 56	Notes:				
57 58	• 6b: n/a It is not a matched study.				
59 60		For pee	er review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml		

1 •	12d: n/a there is no loss to follow-up The STROBE checklist is distributed under the terms of the
2 3	Creative Commons Attribution License CC-BY. This checklist was completed on 13. August 2019
4 5 6	using https://www.goodreports.org/, a tool made by the EQUATOR Network in collaboration with
3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46	
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50 51 52 53 54 55 56 57	
57 58 59 60	For peer review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml

Socio-demographic, labour market marginalisation, and medical characteristics as risk factors for re-infarction and mortality within one year after a first acute myocardial infarction-A register-based cohort study of a working age population in Sweden

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Primary Subject Heading :	Epidemiology
Secondary Subject Heading:	Cardiovascular medicine
Keywords:	Acute myocardial infarction, Re-infarction, Mortality, Sick leave, Disability pension, Insurance Medicine

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Page 1 of 42

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1 ว		Risk factors for re-infarction and mortality after acute myocardial infarction
2 3 4	1	Socio-demographic, labour market marginalisation, and medical characteristics as risk
5 6	2	factors for re-infarction and mortality within one year after a first acute myocardial
7 8 9	3	infarction-A register-based cohort study of a working age population in Sweden
10	4	Mo Wang ¹ , Marjan Vaez ¹ , Thomas Dorner ² , Syed Rahman ¹ , Magnus Helgesson ¹ , Torbjörn
11 12	5	Ivert ³ , Ellenor Mittendorfer-Rutz ¹
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52 53	23	Fax: +46-8-524 832 05
54 55 56	24	
50 57 58	25	Word count: 3178
59 60	26	

Risk factors for re-infarction and mortality after acute myocardial infarction

27 ABSTRACT

Objectives: Research covering a wide range of risk factors related to the prognosis during the
first year after an acute myocardial infarction (AMI) is insufficient. This study aimed to
investigate whether socio-demographic, labour market marginalisation, and medical
characteristics before/at AMI were associated with subsequent re-infarction and all-cause
mortality.

Design: Population-based cohort study.

34 Participants: The cohort included 15 069 individuals aged 25-64 years who had a first AMI
35 during 2008-2010.

36 Primary and secondary outcome measures: The outcome measures consisted of re37 infarction and all-cause mortality within one year following an AMI, which were estimated by
38 univariate and multivariable hazard ratios (HR) and 95% confidence intervals (CI) by Cox
39 regression.

Results: Socio-demographic characteristics such as lower education showed a 1.1- and 1.3fold higher risk for re-infarction and mortality, respectively. Older age was associated with a higher risk of mortality while being born in non-European countries showed a lower risk of mortality. Labour market marginalisation such as previous long-term work disability was associated with a 2-fold higher risk of mortality. Regarding medical characteristics, ST-elevation myocardial infarction was predictive for re-infarction (HR: 1.14, 95% CI: 1.07-1.21) and all-cause mortality (HR: 3.80, 95% CI: 3.08-4.68). Moreover, diabetes mellitus, renal insufficiency, stroke, cancer, and mental disorders were associated with a higher risk of mortality (range of HRs: 1.24-2.59).

49 Conclusions: Socio-demographic and medical risk factors were identified as risk factors for
 50 mortality and re-infarction after AMI, including older age, immigration status, somatic and
 51 mental co-morbidities. Previous long-term work disability and infarction type provide useful

1		Risk factors for re-infarction and mortality after acute myocardial infarction
2 3 4	52	information for predicting adverse outcomes after AMI during the first year, particularly for
5 6	53	mortality.
7 8 9	54	Keywords: Acute myocardial infarction; Re-infarction; Mortality; Sick leave; Disability
10 11 12	55	pension; Insurance Medicine.
13 14	56	
$\begin{array}{c} 15 \\ 16 \\ 17 \\ 18 \\ 19 \\ 20 \\ 21 \\ 22 \\ 23 \\ 24 \\ 25 \\ 26 \\ 27 \\ 28 \\ 29 \\ 30 \\ 31 \\ 32 \\ 33 \\ 34 \\ 35 \\ 36 \\ 37 \\ 38 \\ 39 \\ 41 \\ 42 \\ 43 \\ 44 \\ 45 \\ 46 \\ 47 \\ 48 \\ 9 \\ 50 \\ 51 \\ 52 \\ 53 \\ 45 \\ 56 \\ 57 \\ 58 \\ 59 \\ 60 \end{array}$	57	

Risk factors for re-infarction and mortality after acute myocardial infarction

58	ARTICLE SUMMARY
59	Strengths and limitations of this study
60	• This is a population-based cohort study on all patients with acute myocardial
61	infarction from inpatient care.
62	• The Swedish national-wide register data has high quality, which reduces the risk of
63	recall bias regarding exposure and outcome.
64	• Despite a wide range of risk factors that have been examined, some potential for
65	residual confounding by unmeasured factors remains.
66	• There is no available information on sick-leave spells that are shorter than 14 days
67	among employed individuals.
68	

INTRODUCTION

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Risk factors for re-infarction and mortality after acute myocardial infarction

Acute myocardial infarction (AMI), is the leading cause of mortality worldwide and re-infarction is common, ranging from 8% to 20% in the first year (1). Over the past decade, percutaneous coronary intervention (PCI) and medication have reduced mortality in AMI patients (2, 3). Despite this progress, AMI remains a major cause of mortality and disability. For patients who survive a first AMI, post-discharge optimal medical management and healthy life-style are essential. Particularly, re-infarction and heart failure can occur after an AMI, influencing quality of life and increasing healthcare costs (1, 4, 5). Knowledge of risk factors for re-infarction and mortality in the first year after an AMI could improve the ability of healthcare providers to reduce progression of disease as well as improve survival after AMI. Previous studies have reported risk factors for re-infarction and mortality in patients with AMI, mainly focusing on events within the first month after discharge (6). Socio-demographic characteristics such as older age, lower socio-economic status, living alone, and (co-)morbidity (e.g. diabetes mellitus, renal diseases, hypertension, unstable angina, stroke or

transient ischemic attack, cancer, and depression) have been found to be associated with a

higher risk of re-infarction and mortality after discharge (6-10). None of these studies have

after hospital discharge. Moreover, currently there is little evidence related to crucial AMI-

related characteristics such as type of coronary revascularisation and infarction. Here, studies

are lacking which include a vast range of risk factors and are based on register data, which

provide large study populations and guarantee practically no loss to follow-up.

taken into consideration risk factors for re-infarction or mortality in the mid-term i.e. one year

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93	Additionally, there is a lack of studies elucidating the associations between characteristics of
94	labour market marginalisation and the risk of re-infarction and mortality among AMI patients.
95	In Sweden, more than 30 000 persons experience an AMI each year; of these, about 10 000
96	are below the age of 65 (11). This burden of disease may result in long-term work disability in
97	the working age population (12, 13). To date, sickness absence (SA) is almost always
98	prescribed as a rehabilitation strategy in healthcare services for patients with AMI (14). Also,
99	permanent work disability, i.e. disability pension (DP), is common in this patient group (12).
100	In a prior study, patterns of SA/DP before AMI provided crucial information for subsequent
101	work disability (15). To the best of our knowledge, this is the first study investigating labour
102	market marginalisation measured in terms of trajectories of SA/DP and unemployment status
103	as risk factors for re-infarction and mortality in patients with AMI.
104	
	Aims
105	Aims
106	The study aimed to investigate to what extent socio-demographic, labour market
106 107	The study aimed to investigate to what extent socio-demographic, labour market marginalisation, and medical (including AMI-related factors and co-morbidities)
 107	marginalisation, and medical (including AMI-related factors and co-morbidities) characteristics before/at an AMI were associated with subsequent re-infarction and all-cause
107 108	marginalisation, and medical (including AMI-related factors and co-morbidities) characteristics before/at an AMI were associated with subsequent re-infarction and all-cause
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111	MATERIALS AND METHODS
112	Study population
113	This is a nationwide register-based cohort study and the study population consisted of 16 983
114	individuals aged 25 to 64 who had a first AMI during 2008-2010. A main diagnosis of AMI
115	was ascertained from the inpatient care register and defined according to the International
116	Classification of Diseases (ICD)-10 code of I21. This means that individuals with a previous
117	main or side diagnosis of AMI in specialised healthcare from 1987 up to the hospital
118	admission date for AMI during 2008-2010 were excluded (n=1914). Altogether, there were
119	15 069 individuals included in the study.
120	
121	Registers
122	National register data was linked to the study population by using the unique personal identity
123	number assigned to all Swedish inhabitants, including information for each individual up to
124	31 st December 2013 from:
125	1.) Statistics Sweden: sex, age, education, country of birth, type of living area, family
126	situation, length of unemployment, and year of emigration from the Longitudinal integration
127	database for health insurance and labour market studies (LISA);
128	2.) The Social Insurance Agency: SA/DP (date and grade) from Micro-data for analyses of
129	social insurance (MiDAS);
130	3.) The National Board of Health and Welfare: date and cause of diagnosis-specific inpatient
131	and specialised outpatient care, and type of infarction and type of coronary revascularisation
132	from the National Patient Register; date of death from the Cause of Death Register (16) and
133	date, type and dose of prescription of dispensed psychiatric medication and antidiabetic
134	medication from the National Prescribed Drug Register.
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6 **Outcome measures**

The outcome measures were re-infarction (ICD-codes: I21) which was ascertained from the inpatient care, and all-cause mortality during the first year after AMI.

140 **Risk measures**

Socio-demographic characteristics were recorded at the end of the year preceding AMI and comprised: sex, age, education (low educational level (compulsory (≤ 9 years)), high school (10-12 years), and high educational level (university (>12 years))), country of birth, type of living area, and family situation (Table 1).

146 Labour market marginalisation characteristics included length of unemployment in the year 147 preceding AMI and the trajectory groups of SA/DP during three years before and up to the 148 AMI diagnosis (Table 1). The trajectory groups of SA/DP were measured using the combined 149 mean number of annual SA and DP net days before the AMI diagnosis. The total number of 150 net days were then transformed to number of months with SA/DP.

Medical characteristics included AMI-related characteristics (type of infarction and type of coronary revascularisation) at inclusion and inpatient and specialised outpatient care due to any main or side diagnosis of somatic and mental co-morbidities and medication which were

155 measured from three years before until the AMI diagnosis. Type of infarction was classified

as ST-elevation myocardial infarction (STEMI, ICD-codes: I21.0-I21.3), non-ST-elevation

155 measured from three years before until the Alvir diagnosis. Type of infarction was classified

157 myocardial infarction (NSTEMI, ICD-codes: I21.4), or unspecified (ICD-codes: I21.9).

158 Information on type of coronary revascularisation was categorised as: percutaneous coronary

159 intervention (PCI) (FNG00-FNG05), coronary artery bypass grafting (CABG) (FNA-FNF,

160 FNG30, FNW96), and others (i.e. other treatments/examinations or missing information).

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Somatic co-morbidities were categorised as musculoskeletal diagnoses (ICD-codes: M00-99), renal insufficiency (ICD-codes: N17-N19), stroke (ICD-codes: I60, I61, I63, I64), hypertension (ICD-codes: 110), cancer (ICD-codes: C00-D48), and other somatic disorders (the other ICD-codes except for mental diagnoses). The individuals with any specialised care due to diabetes mellitus or having any prescribed antidiabetic medication were coded according to ICD-codes: E10-E14 and the Anatomic Therapeutic Chemical classification system (ATC) code: A10. Mental co-morbidities were grouped as CMDs (i.e. depressive (ICD-codes: F32-F33), anxiety (ICD-codes: F40-F42) and stress-related disorders (ICD-codes: F43)), and other mental disorders (ICD-codes: F00-F31, F34-F39, and F44-F99). Moreover, prescribed psychiatric medication during the year preceding the AMI diagnosis was included as mental co-morbidities. Psychiatric medication was measured by any antidepressants, anxiolytics and sedatives following the ATC codes, N06A, N05B and N05C, ile4 respectively.

Statistical analyses

We used group-based trajectory modelling to estimate groups of SA/DP trajectories during the 3-year period before AMI. This method has been described elsewhere (15, 17). Five groups were selected as the best fitting model for patients with AMI. An annual time-scale was used in the study, where T0 represents the first hospital admission date due to AMI and T-3 represents the 3 years before the first AMI diagnosis (See Fig. 1). The five trajectory groups were named according to the patterns of each group: "Low increasing", "Low constant", "Middle increasing", "High decreasing" and "High constant".

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Chi-2 tests were used to estimate potential sex differences regarding all the examined characteristics among patients with AMI. Hazard ratios (HRs) and 95% confidence intervals (CIs) for re-infarction and all-cause mortality were calculated using Cox regression. The proportional hazards assumption was tested and met. Follow-up time started from the first hospital admission date due to AMI diagnosis until the events (re-infarction or all-cause mortality), emigration to a foreign country, or the end of the first year after AMI, whichever came first. Mean follow-up time for re-infarction and all-cause mortality was 117 days (SD 120) and 177 days (SD 109), respectively. Interaction analyses were performed for sex and age, however, no interaction effects were found. We also carried out a sensitivity analysis h mor... nalyses were adjusted nor. ere not mutually adjusted). Data processin... Patient and public involvement There was no patient involvement in this study. with mortality due to cardiovasular diseases as outcome measure (See supplementary table). Analyses were adjusted for all risk measures in the multivariate model (mental co-morbidities were not mutually adjusted). Data processing was performed using SAS version 9.4.

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RESULTS

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Table 1 shows descriptive analysis for patients with a first AMI during 2008-2010. Of all, there were 3673 women (24.4%). The majority of the study population was older (56-64 years, 59.3%), born in Sweden (80.2%), belonged to the low increasing SA/DP trajectory group (53.4%) (Fig. 1), were not unemployed before inclusion (91.6%), received PCI at inclusion (68.8%), had other somatic disorders (67.1%), and did not have mental co-morbidities. Re-infarction and all-cause mortality during the first year represented 35.2% and 4.4% of the study population, respectively. Futhermore, sex differences were significant for various factors. For example, with respect to labour market marginalisation characteristics, the "Low increasing" SA/DP group comprised more men (58.8% vs. 36.6%) while the "High constant" SA/DP group was more common for women (22.7% vs. 11.1%). Moreover, more men had a STEMI (36.9% vs. 28.8%) and received a PCI (72.5% vs. 57.2%) compared to women while more women had co-morbidities compared to men. **Re-infarction**

In the univariate analyses, higher risks of re-infarction were found in those with lower
education and living in small towns/villages (data not shown). In contrast, those born in nonNordic European countries, and those living in medium-sized cities had lower risks of
subsequent re-infarction during the first year. Moreover, a higher risk of re-infarction was
observed among those with STEMI compared to non-STEMI as well as those treated with
CABG compared to PCI (HR 2.43; 95% CI 2.14-2.75) (Table 2).

In the final model, lower educational level and living in small towns/villages were associated
with a higher risk of re-infarction while living in medium-sized cities, and being single living

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225 without children at home showed lower risk of re-infarction. With regard to AMI-related

characteristics, patients with STEMI and CABG had a higher risk of re-infarction (Table 2).

228 All-cause mortality

In the multivariable model, we found that older age, lower level of education, being married/single living without children at home, and belonging to the "High constant" SA/DP trajectory group were risk factors for all-cause mortality during the first year after AMI. Those born in non-European countries and those belonging to the "Low constant "and "High decreasing" SA/DP trajectory groups were associated with a lower risk of all-cause mortality. STEMI compared to non-STEMI was associated with a 4-fold higher risk of all-cause mortality following AMI. Moreover, a higher risk of all-cause mortality was found in patients with diabetes mellitus, renal insufficiency, stroke, cancer and other somatic disorders compared to those without such co-morbidities. Other mental disorders besides CMDs and psychiatric medication were significantly associated with subsequent all-cause mortality (Table 3). The sensitivity analysis with mortality due to cardiovascular diseases as the

240 outcome showed similar results as for all-cause mortality (See supplementary table).

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1 2		
3 4	242	DISCUSSION
5 6 7 8 9 10 11 12	243	Socio-demographic and labour market marginalisation
	244	Socio-demographic and labour market marginalisation were generally more associated with
	245	mortality than re-infarction in AMI patients. For instance, results showed that a lower
12 13 14	246	education level, which acts as a proxy of lower socioeconomic status, was associated with a
15 16	247	less favourable prognosis regarding re-infarction (HR: 1.12) and all-cause mortality (HR:
17 18	248	1.29) during the first year after AMI. Previous studies have shown that patients with a lower
19 20 21	249	educational level generally have a higher risk profile, primarily due to the presence of more
21 22 23	250	risk factors such as smoking or the resistance of quitting smoking after AMI and co-
24 25	251	morbidities, leading to a worse health outcome (18-20). After adjustment for co-morbidities,
26 27	252	we found that educational level remained an independent predictor of re-infarction and
28 29 30	253	mortality, Still, one cannot rule out the possibility of unmeasured residual co-morbidities that
31 32	254	may be associated with re-infarction and all-cause mortality.
33 34	255	
35 36 37	256	As expected, we observed that higher age was a strong predictor of all-cause mortality after
37 38 39	257	AMI, which is in agreement with other studies (21-23). Somewhat unexpectedly, older age
40 41	258	was not associated with re-infarction during the first year. The different findings with respect
42 43	259	to mortality and re-infarction may be driven by the co-morbidities that were controlled for in
44 45 46	260	the model, which are closely related with AMI and the association between age and all-cause
47 48	261	mortality might be caused by other co-morbidites. Interestingly, we found a higher risk of re-
49 50	262	infarction for patients who were living in small towns/villages, while a lower risk of re-
51 52 53	263	infarction was observed for those living in medium sized cities compared to those living in
55 55 55	264	big cities. This result might indicate diversities in healthcare in relation to different types of
56 57	265	living area (24).
58 59	266	

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Furthermore, AMI patients born in non-European countries had a lower risk of all-cause mortality during the first year than patients born in Sweden. Recent research has shown a lower risk of mortality after AMI among South Asians compared with the host population (25, 26). Our finding may also reflect a "healthy migrant effect", indicating a positive health selection of migrants who are able to overcome the obstacles of migration. Previous studies showed that migrants have revealed a lower risk of morbidity and mortality compared to natives (27, 28).

Compared to AMI patients who were married and living with children at home, those who were married/single and living without children at home had a higher risk of all-cause mortality. Patients who live alone may have poor adherence to medication and follow-up recommendations, which might be associated with an unfavourable outcome. The few studies that have described the association between social support and prognosis in patients with coronary artery disease have had inconsistent definitions of measures of social support, leading to a wide variety of conclusions (29). Therefore, the impact of family situation on re-infarction and all-cause mortality is open to speculation and warrants further investigation.

With regard to labour market marginalisation factors, the "High constant" SA/DP trajectory group was associated with a 2.2-fold higher risk of all-cause mortality, even after controlling for confounders. As this group had around 12 months of SA/DP per annum before AMI, it is likely that this group consisted of a larger proportion of individuals with long-term SA or DP. This group may also have had a history of co-morbidities before AMI, which in turn increases the risk of all-cause mortality. On the other hand, the "Low constant" and "High decreasing" SA/DP trajectory groups showed a lower risk of all-cause mortality after adjusting for co-morbidities. Our study is the first to report that SA/DP trajectory groups can be used as risk

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Risk factors for re-infarction and mortality after acute myocardial infarction factors for mortality in patients with AMI. Our findings also revealed that risk estimates of SA/DP trajectory groups were comparable to well-known risk factors such as diabetes mellitus and renal insufficiency. Therefore, more attention in clinical practice in relation to work disability factors in AMI patients is necessary. **Medical characteristics** Patients with co-morbidities and STEMI had a higher risk of adverse outcomes, particularly for all-cause mortality, while those who underwent CABG had a higher risk of re-infarction. Indeed, STEMI is clinically associated with more serious medical conditions than non-STEMI (30). With respect to coronary revascularisation, some studies have found that patients treated with PCI rather than CABG had fewer complications and a lower risk of mortality, particularly in the short-term (31, 32). In addition, a higher risk of all-cause mortality was observed among patients with mental co-morbidities. Both biological and behavioural mechanisms have been suggested to explain the association between mental disorders and cardiovascular disease. Patients with mental disorders have been reported to have several cardiac symptoms (33, 34). Further, they tend to have poorer diets, reduced medication adherence, and more stress (35). Overall, mental disorders reduce the success of interventions targeting cardiovascular risk factor modification, leading to higher healthcare costs, poorer health outcomes, and increased mortality rates. **Strengths and limitations** The strengths of this study include the use of a population-based cohort design, which offers satisfactory statistical power for the analyses. The use of high quality national register data

Risk factors for re-infarction and mortality after acute myocardial infarction also minimises the risk of recall bias regarding exposure and outcome (36, 37). There still might be misclassification and missing information in the register data. However, misclassification and missing information seems to be randomly distributed across the different exposure and outcome measures and this misclassification is assumed to be non-differential. The high coverage of the register data also enabled us to identify all AMI patients from inpatient care with subsequent re-infarction and mortality. We included only AMI patients who were treated in inpatient care with more severe cardiac disease. This might explain the high incidence of re-infarction during the first year of the study. We also used an advanced method covering the inherent heterogeneity, group-based trajectory modelling, to investigate work disability patterns in the study. Moreover, we were able to examine a wide range of risk factors as well as adjust for relevant confounders. Still, there might be other factors than those studied here that are associated with re-infarction and mortality. Our registers did not include information of compliance to prescribed medication such as dual-antiplatelet therapy, smoking habits before and after AMI, rehabilitation measures and life-style changes. Limitations of the study and considerations when interpreting our findings are acknowledged. In this study, we only included co-morbidities recorded in inpatient and specialised outpatient care, but not those from primary care due to lack of data availability. While we adjusted for potential confounders that were particularly relevant for AMI, we acknowledge that there may be a wider range of co-morbidities that we were unable to control for. Mental co-morbidities were measured by including prescribed psychiatric medication data. For somatic co-morbidities, we did not include an equivalent measure except for diabetes mellitus as there was no available information in the register data. With regard to sickness absence, we did not have information on sick-leave spells that were less than 14 days among employed

1		Risk factors for re-infarction and mortality after acute myocardial infarction
2 3 4 5 6 7 8 9 10 11	342	individuals. Thus, the number of SA days contributing to the combined number of SA/DP
	343	days might be underestimated.
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	345	Conclusions
12 13	346	Several socio-demographic and co-morbidity risk factors were generally associated more
14 15 16	347	strongly with mortality than re-infarction in AMI patients, including lower educational level,
17 18	348	older age, immigration status, somatic and mental co-morbidities. Previous long-term work
19 20	349	disability and infarction type showed a higher risk for all-cause mortality after AMI during
21 22 23	350	the first year.
23 24 25 26	351	
20 27 28 29 30 31 32 33 34	352	AUTHOR CONTRIBUTIONS
	353	EM, MV and MW conceived and designed the study. MW and EM were involved in the
	354	statistical analysis and drafted the manuscript. MW, MV, TD, SR, MH, TI and EM
35 36	355	contributed to the critical revision and approved the manuscript.
37 38	356	
39 40 41	357	ACKNOWLEDGEMENTS
42		ACKNOWLEDGEMENTS None.
43 44 45	358	None.
45 46 47 48 49 50 51 52 53	359	
	360	Funding
	361	This study was supported by the Swedish Research Council, grant nr 2015-02292.
54 55	362	
56 57	363	DECLARATION OF CONFLICTING INTERESTS
58 59 60	364	None.

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ETHICS APPROVAL The study has been evaluated and approved by the Regional Ethical Review Board of Karolinska Institutet, Stockholm, Sweden (2007/762–31). The ethical review board approved the study and waived the requirement that informed consent of research subjects should be obtained. **DATA SHARING STATEMENT** The data that support the findings of this study are available from Statistics Sweden and The Swedish National Board of Health and Welfare, but restrictions apply to the availability of these data, which were used with ethical permission for the current study and therefore are not

376 publicly available.

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Ļ	Table 1: Descriptive statistics for all women (n=3673) and men (n=11 396) aged between 25 and 64 years with
	a diagnosis of acute myocardial infarction (AMI) from inpatient care in 2008-2010 in Sweden (N=15 069)

6 7 8	Characteristics of patients with AMI	All		Wo	men	Mei	1	Chi ² (p-value)
9		n	%	n	%	n	%	
10 11		15 069	100	3673	24.4	11 396	75.6	
12	Socio-demographic characteristics ^a							
13	Age*							
14	25-45	1401	9.3	335	9.1	1066	9.4	15.1 (<0.001)
15 16	46-55	4739	31.5	1065	29.0	3674	32.2	
17	56-64	8929	59.3	2273	61.9	6656	58.4	
18	Education (years)*b	0,2,	09.0		01.9	0000	00.1	
19	Compulsory (≤9)	4474	29.7	1040	28.3	3434	30.1	9.9 (<0.01)
20	High school (10–12)	7435	49.3	1895	51.6	5540	48.6	<i>y.y</i> (0.01)
21	University (>12)	3160	21.0	738	20.1	2422	21.3	
22 23	Country of birth*c	5100	21.0	750	20.1		21.5	
24	Sweden	12 085	80.2	2991	81.4	9094	79.8	86.4 (<0.001)
25	Other Nordic countries	860	5.7	282	7.7	578	5.1	00.1 (0.001)
26	Europe (except Nordic countries)	440	2.9	116	3.2	324	2.8	
27	Non-European countries	1684	11.2	284	7.7	1400	12.3	
28 29	<i>Type of living area</i> ^{*d}	1004	11.2	204	1.1	1400	12.5	
29 30	Big cities	4566	30.3	1052	28.6	3514	30.8	6.5 (<0.05)
31	Medium sized cities	5347	35.5	1344	36.6	4003	35.1	0.5 (<0.05)
32	Small towns/villages	5156	34.2	1277	34.8	3879	34.0	
33	Family situation [*]	5150	54.2	12//	34.0	30/9	54.0	
34	Married ^f living without children	4880	32.4	1342	36.5	3538	31.1	235.8 (<0.001)
35 36	Married ^f living with children	4000	26.5	728	19.8	3338	28.7	233.8 (<0.001)
37	Single ^g living without children	5386	35.7	1271	34.6	4115	36.1	
38								
39	Single ^g living with children	803	5.3	332	9.0	471	4.1	
40	Labour market marginalisation character	istics			\bigcirc			
41 42	<i>Trajectory groups of SA/DP*</i> <i>from three years before up to inclusion</i>							
42 43		8048	53.4	1345	36.6	6703	58.8	705.4 (<0.001)
44	Low increasing Low constant	2714	18.0	709	19.3	2005		/03.4 (<0.001)
45		1420		455	19.5	<u>2003</u> 965	17.6 8.5	
46	Middle increasing	794	<u>9.4</u> 5.3	331				
47	High decreasing	2093		833	9.0 22.7	463	4.1	
48 49	High constant	2093	13.9	833	22.1	1260	11.1	
50	Unemployment*							
51	<i>in the year before inclusion</i> No unemployment	13 799	91.6	3420	93.1	10 379	91.1	15.0 (<0.001)
52	1 2	852	5.7		4.7			13.0 (<0.001)
53	1-180 days			171		681	6.0	
54 55	>180 days	418	2.8	82	2.2	336	3.0	
56	AMI-related characteristics							
57	Type of infarction ^{*h}							
58	at inclusion STEMI	5260	24.0	1059	200	4202	26.0	9/7 (< 0.001)
59	STEMI ⁱ Non STEMI ⁱ	5260 6704	34.9	1058	28.8 49.9	4202	36.9	84.7 (<0.001)
60	Non-STEMI ^j	6704	44.5	1832	47.7	4872	42.8	

1		-		-				
2 3	Unspecified	3105	20.6	783	21.3	2322	20.4	
4	Coronary revascularisation characteristics*			II	II.			
5	at inclusion							
6 7	Percutaneous coronary intervention	10 364	68.8	2100	57.2	8264	72.5	353.9 (<0.001)
8	Coronary artery bypass grafting	336	2.2	59	1.6	277	2.4	
9	Others	4369	29.0	1514	41.2	2855	25.1	
10		+507	27.0	1,717	71.2	2000	23.1	
11	Co-morbidity characteristics ^h							
12	Somatic co-morbidities ¹							
13	from three years before up to inclusion	2200	15.0	741	20.2	1550	12.7	
14 15	Musculoskeletal disorders*	2299	15.3	741	20.2	1558	13.7	90.9 (<0.001)
16	Diabetes mellitus ^{*m}	2529	16.8	675	18.4	1854	16.3	8.8 (<0.01)
17	Renal insufficiency	248	1.7	70	1.9	178	1.6	2.0 (0.15)
18	Hypertension*	5110	33.9	1365	37.2	3745	32.9	22.9 (<0.001)
19	Stroke	199	1.3	54	1.5	145	1.3	0.8 (0.36)
20	Cancer*	933	6.2	303	8.3	630	5.5	35.4 (<0.001)
21	Other somatic disorders*	10 107	67.1	2722	74.1	7385	64.8	108.9 (<0.001)
22	Mental co-morbidities							
23 24	Common mental disorders ^{*1}							
24	from three years before up to inclusion	791	5.3	287	7.8	504	4.4	64.2 (<0.001)
26	Other mental disorders ¹		5.5	207	7.0	504	7.7	04.2 (\0.001)
27	from three years before up to inclusion	1331	8.8	328	8.9	1003	8.8	0.1 (0.81)
28	Psychiatric medication ^{*n}	1551	0.0	520	0.9	1005	0.0	0.1 (0.01)
29	•	2221	21.4	1200	25 4	1022	167	550 1 (<0.001)
30	in the year before inclusion	3231	21.4	1299	35.4	1932	16.7	559.1 (<0.001)
31	Re-infarction and all-cause mortality		\mathbf{N}_{\star}					
32 33	during first year after AMI	5210	25.0	107(247	4024	25.4	0.5 (0.47)
33 34	Re-infarction	5310	35.2	1276	34.7	4034	35.4	0.5 (0.47)
35	All-cause mortality*	666	4.4	191	5.2	475	4.2	7.0 (<0.01)
36	 495 * Significant sex differences 496 * Measured on 31st December of the year p 	raading aau	to muoo	rdial info	ration			
37	497 ^b Missing data is considered compulsory ed		ite myöca					
38	498 ° Missing data is considered Non-European	n countries						
39	499 ^d Type of living area: big cities (Stockholm	n, Gothenbur						more than
40	500 90 000 inhabitants within 30 km distance f			city); sm	all cities/	villages/rura	al	
41 42	501 ° Missing data is considered single living v		ren					
42 43	502 ^f Married includes all living with partner; c 503 ^g Single includes divorced, separated, or w							
44	504 ^h See method section for the International (n of Dise	ases vers	ion 10 (I0	D-10) code	es or the	Anatomic
45	505 Therapeutic Chemical classification system					0D 10) 0000		inatonne
46	506 ⁱ ST-elevation myocardial infarction	· /						
47	^j Non-ST-elevation myocardial infarction							
48	508 ^k See method section for the Classification							
49	509 ¹ Measured by main or side diagnosis in inp 510 ^m Additionally measured by prescribed ant			outpatier	nt care			
50	510 ^m Additionally measured by prescribed ant 511 ⁿ Measured by antidepressants, anxiolytics							
51 52	511 Weasured by antidepressants, anxiotytics 512	una scuativa						
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Table 2. Adjusted hazard ratios (HR) and 95% Confidence Interval (CI) for re-infarction in individua	ls with a
diagnosis of acute myocardial infarction (AMI) from inpatient care in 2008-2010 in Sweden (N=15 0	69) during the
first year after AMI	00 C

Characteristics of patients with AMI	Re-infarction	Model 1 ^a	Model 2 ^b	Mgdel 3 ^c
	n (%)		HR (95% CI)	mber
Socio-demographic characteristics ^d				r 2019
Sex				019.
Men	4034 (35.4)	1	1	Do
Women	1276 (34.7)	0.97 (0.91-1.04)	0.98 (0.91-1.04)	1.03 🙆.97-1.11
Age	1 6			bad
25-45	482 (34.4)	1	1	led f
46-55	1679 (35.4)	1.02 (0.92-1.13)	1.02 (0.92-1.13)	1.01 👰.91-1.12
56-64	3149 (35.3)	0.98 (0.89-1.09)	0.99 (0.90-1.10)	0.99 👰.90-1.10
Education (years) ^e				p://t
Compulsory (≤9)	1630 (36.4)	1.13 (1.05-1.23)	1.13 (1.04-1.23)	1.12 📮.04-1.22
High school (10–12)	2672 (35.9)	1.11 (1.03-1.19)	1.11 (1.03-1.19)	1.10 🖪 .02-1.18
University (>12)	1008 (31.9)	1	1	h.br
Country of birth ^f		ľ (nj.co
Sweden	4367 (36.1)	1	1	om/
Other Nordic countries	309 (35.9)	1.01 (0.90-1.13)	1.01 (0.90-1.13)	1.02 🕄 .91-1.14
Europe (except Nordic countries)	124 (28.2)	0.83 (0.69-0.99)	0.83 (0.69-0.99)	0.83 🖗.70-1.00
Non-European countries	510 (30.3)	0.91 (0.82-1.00)	0.91 (0.82-1.00)	0.91 👰.82-1.00
Type of living area ^g				, 20
Big cities	1368 (30.0)	1	1	2024
Medium sized cities	1428 (26.7)	0.84 (0.78-0.91)	0.84 (0.78-0.91)	0.84 🖗.78-0.91
Small towns/villages	2514 (48.8)	1.81 (1.69-1.94)	1.81 (1.69-1.94)	1.83 🛱 .71-1.96
Family situation ^h				st. F
Married ⁱ living without children	1782 (36.5)	0.97 (0.90-1.05)	0.97 (0.90-1.05)	0.97 @.90-1.05
	1439 (36.0)	1	1	ecte
Married ⁱ living with children Single ^j living without children		0.89 (0.83-0.96)	0.89 (0.83-0.96)	0.89 🖗.83-0.96

45 46

<u>т</u> ореп-2019-03 30 0.96 (Ф.84-1.10) 0.96(0.84-1.09)Single^j living with children 277 (34.5) 0.96 (0.84-1.09) Labour market marginalisation characteristics on 8 Trajectory groups of SA/DP Dec from three years before up to inclusion Low increasing 2827 (35.1) 0.97 (0.90-1.04) Low constant 951 (35.0) 0.96 (0.89-1.04) 0.96 (0.89-1.04) Middle increasing 501 (35.3) 0.95 (0.87-1.06) 0.96 (0.87-1.05) 0.99 (3.89-1.09) High decreasing 295 (37.2) 1.02 (0.90-1.16) 1.02 (0.90-1.16) 1.08 (0.95-1.23) High constant 736 (35.2) 1.00 (0.92-1.09) 1.00 (0.91-1.09) 1.06 (5).97-1.17) **Unemployment** aded in the year before inclusion 4850 (35.2) No unemployment 310 (36.4) 1.07 (0.95-1.20) 1.07 (0.95-1.20) 1.06 (9.94-1.19) 1-180 days >180 days 150 (35.9) 1.08(0.92-1.27)1.08(0.92-1.27)1.07 (0.91-1.26) **AMI-related characteristics** *Type of infarction^k* at inclusion 1.14 (1.07-1.21) **STEMI**¹ 1945 (37.0) 1.19 (1.12-1.27) 1.19 (1.12-1.27) Non-STEMI^m 2311 (34.5) 1.05 (0.98-1.13) Unspecified 1054 (34.0) 1.02 (0.95-1.10) 1.02 (0.95-1.10) Coronary revascularisation characteristicsⁿ pril 23 at inclusion Percutaneous coronary intervention 3772 (36.4) 2 2.41 (2.13-2.74) 2.31 (2.04-2.62) 2.32 (2.05-2.63) Coronary artery bypass grafting 267 (79.5) 0.74 (0.69-0.79) Others 1271 (29.1) 0.71 (0.67-0.76) 0.71 (0.67-0.76) Co-morbidity characteristics^k Somatic co-morbidities^o Pro from three years before up to inclusion Musculoskeletal disorders 1.04 (0.96-1.12) 1.04 (0.96-1.12) 1.05 (2).98-1.14) 835 (36.3) 0.87 (0.81-0.94) 0.87 (0.81-0.94) 0.91 (0.84-0.98) Diabetes mellitus^p 827 (32.7) copyright

Risk factors for re-infarction and mortality after acute myocardial infarction

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Renal insufficiency	73 (29.4)	0.74 (0.58-0.93)	0.74 (0.59-0.94)	0.84 ∰.66-1.06)	
Hypertension	1741 (34.1)	0.92 (0.87-0.98)	0.93 (0.87-0.98)	0.95 (30.89-1.00)	
Stroke	59 (29.7)	0.76 (0.59-0.99)	0.77 (0.59-0.99)	0.81 @.63-1.05)	
Cancer	300 (32.2)	0.89 (0.79-1.00)	0.90 (0.80-1.01)	0.94 (0.83-1.06)	
Other somatic disorders	3507 (34.7)	0.92 (0.87-0.97)	0.92 (0.87-0.97)	0.95 (.90-1.01)	
Mental co-morbidities				P N	
Common mental disorders ^o				2019	
from three years before up to inclusion	300 (37.9)	1.12 (1.00-1.27)	-	1.13 (2.00-1.28)	
Other mental disorders ^o	Jh			wnl	
from three years before up to inclusion	474 (35.6)	1.06 (0.96-1.17)	_	1.05 👰.96-1.16)	-
Psychiatric medication ^q					
<i>in the year before inclusion</i> Adjusted for sex, age, educational level, country o	1101 (34.1)	0.96 (0.90-1.04)	_	1.00 @.93-1.07)	
specialised outpatient care due to common mental of musculoskeletal disorders, diabetes mellitus, renal i ¹ Measured on 31 st December of the year preceding ² Missing data is considered compulsory education	f birth, type of living are lisorders and other menta insufficiency, hypertension acute myocardial infarct	a, family situation, traje al disorders, and psychi on, stroke, cancer and o	ectory groups of SA/DF atric medications, type	e and previous unemplo of infarcion, type of co	oronary revascularisati
Adjusted for sex, age, educational level, country of specialised outpatient care due to common mental of musculoskeletal disorders, diabetes mellitus, renal i ¹ Measured on 31 st December of the year preceding ² Missing data is considered compulsory education ³ Missing data is considered Non-European countries ³ Type of living area: big cities (Stockholm, Gothen the city); small cities/villages/rural ⁴ Missing data is considered single living without cl Married includes all living with partner; cohabitan Single includes divorced, separated, or widowed ⁵ See method section for the International Classification	f birth, type of living are disorders and other menta insufficiency, hypertension acute myocardial infarct es uburg and Malmö); mediu hildren t	a, family situation, traju al disorders, and psychi on, stroke, cancer and o tion um sized cities (cities w	ectory groups of SA/DF atric medications, type other somatic disorders; vith more than 90 000 ir	and previous unemplo of infarction, type of co Mental & morbidities	oyment, inpatient and oronary revascularisati were not mutually cor n distance from the cen
specialised outpatient care due to common mental c musculoskeletal disorders, diabetes mellitus, renal i ¹ Measured on 31 st December of the year preceding ² Missing data is considered compulsory education ³ Missing data is considered Non-European countries ³ Type of living area: big cities (Stockholm, Gothen the city); small cities/villages/rural ⁹ Missing data is considered single living without cl Married includes all living with partner: cohabitam	f birth, type of living are disorders and other menta insufficiency, hypertension acute myocardial infarct es iburg and Malmö); mediu hildren t ation of Diseases version cal Procedures r specialised outpatient c medication	a, family situation, traju al disorders, and psychi on, stroke, cancer and o tion um sized cities (cities w 10 (ICD-10) codes or t	ectory groups of SA/DF atric medications, type other somatic disorders; vith more than 90 000 ir	and previous unemplo of infarction, type of co Mental & morbidities habitants within 30 kn pril 22 tic Chemical classificat	oyment, inpatient and oronary revascularisati were not mutually cor n distance from the cen
specialised outpatient care due to common mental c musculoskeletal disorders, diabetes mellitus, renal i ¹ Measured on 31 st December of the year preceding ² Missing data is considered compulsory education ³ Missing data is considered Non-European countrie ³ Type of living area: big cities (Stockholm, Gothen he city); small cities/villages/rural ⁴ Missing data is considered single living without cl Married includes all living with partner; cohabitant Single includes divorced, separated, or widowed ⁵ See method section for the International Classificat ST-elevation myocardial infarction ⁶ Non-ST-elevation for the Classification of Surgio ⁹ Measured by main or side diagnosis in inpatient of ⁹ Additionally measured by prescribed antidiabetic	f birth, type of living are disorders and other menta insufficiency, hypertension acute myocardial infarct es iburg and Malmö); mediu hildren t ation of Diseases version cal Procedures r specialised outpatient c medication	a, family situation, traju al disorders, and psychi on, stroke, cancer and o tion um sized cities (cities w 10 (ICD-10) codes or t	ectory groups of SA/DF atric medications, type other somatic disorders; vith more than 90 000 ir	and previous unemplo of infarction, type of co Mental & morbidities	oyment, inpatient and oronary revascularisati were not mutually cor n distance from the cen

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 Risk factors for re-infarction and mortality after acute myocardial infarction

Table 3. Adjusted hazard ratios (HR) and 95% Confidence Interval (CI) for all-cause mortality in individual with a diagnosis of acute myocardial infarction (AMI) from inpatient care in 2008-2010 in Sweden (N=15 069) during the first year after AMI

Characteristics of patients with AMI	Mortality	Model 1 ^a	Model 2 ^b	Model 3 ^c
	n (%)		HR (95% CI)	mber
Socio-demographic characteristics ^d				¢r 20
Sex				- 2019.
Men	475 (4.2)	1	1	Do
Women	191 (5.2)	0.95 (0.80-1.14)	0.92 (0.78-1.10)	0.94 <u>5(</u> 0.78-1.12
Age	1 6			oad
25-45	35 (2.5)	1	1	ided f
46-55	137 (2.9)	0.98 (0.67-1.42)	0.97 (0.66-1.40)	1.04 (0.71-1.51
56-64	494 (5.5)	1.76 (1.23-2.50)	1.74 (1.22-2.48)	1.82 (1.27-2.60
Education (years) ^e		k		p://t
Compulsory (≤9)	255 (5.7)	1.28 (1.02-1.62)	1.29 (1.02-1.63)	1.29 (1.02-1.62
High school (10–12)	305 (4.1)	1.06 (0.85-1.33)	1.06 (0.84-1.32)	1.05 (0.84-1.31
University (>12)	106 (3.4)	1	1	n.br
Country of birth ^f				л <u>ј</u> .о
Sweden	550 (4.6)	1	1	OM/
Other Nordic countries	52 (6.1)	1.02 (0.77-1.36)	1.03 (0.78-1.38)	1.22 (0.91-1.62
Europe (except Nordic countries)	16 (3.6)	0.70 (0.42-1.15)	0.73 (0.44-1.20)	0.80 (0.48-1.32
Non-European countries	48 (2.9)	0.58 (0.43-0.80)	0.59 (0.44-0.81)	0.62 (0.45-0.84
Type of living area ^g				8, 2
Big cities	214 (4.7)	1	1	2024
Medium sized cities	224 (4.2)	0.84 (0.69-1.02)	0.84 (0.69-1.01)	0.88 (0.72-1.06
Small towns/villages	228 (4.4)	0.84 (0.69-1.01)	0.85 (0.70-1.03)	0.8億(0.71-1.05
Family situation ^h				st. I
Married ⁱ living without children	208 (4.3)	1.31 (1.02-1.70)	1.30 (1.01-1.68)	
Married ⁱ living with children	94 (2.4)	1	1	ecte
	334 (6.2)	1.75 (1.38-2.22)	1.69 (1.33-2.14)	1.73 (1.36-2.20

		BMJ Open		mjoper
Risk factors for re-infarction and mortality	after acute myocardi	ial infarction		mjopen-2019-033
				033
Single ^j living with children	30 (3.7)	1.28 (0.84-1.94)	1.25 (0.83-1.90)	1.2&(0.84-1.94)
Labour market marginalisation charac	teristics			on 1
Trajectory groups of SA/DP from three years before up to inclusion				8 Dece
Low increasing	243 (3.0)	1	1	B 1
Low constant	69 (2.5)	0.82 (0.63-1.07)	0.79 (0.60-1.03)	0.68 (0.52-0.89)
Middle increasing	71 (5.0)	1.60 (1.22-2.09)	1.47 (1.12-1.93)	1.02 (0.78-1.35)
High decreasing	18 (2.3)	0.59 (0.36-0.95)	0.52 (0.32-0.85)	0.33(0.20-0.54)
High constant	265 (12.7)	3.94 (3.26-4.76)	3.45 (2.81-4.23)	2.16 (1.75-2.70)
Unemployment inclusion	5			lloadec
No unemployment	622 (4.5)	1	1	fro 1
1-180 days	27 (3.2)	1.07 (0.72-1.59)	1.05 (0.71-1.56)	1.04 (0.70-1.55)
>180 days	17 (4.1)	1.31 (0.81-2.14)	1.31 (0.81-2.14)	1.28 (0.79-2.09)
AMI-related characteristics				
Type of infarction ^k at inclusion				jopen.t
STEMI ¹	267 (5.1)	2.45 (2.01-2.99)	2.48 (2.03-3.03)	3.80 (3.08-4.68)
Non-STEMI ^m	153 (2.3)	1	1	
Unspecified	246 (7.9)	3.45 (2.82-4.23)	3.45 (2.82-4.22)	2.978(2.42-3.65)
Coronary revascularisation characteristi at inclusion				April 23
Percutaneous coronary intervention	257 (2.5)	1	1	, , N 1
Coronary artery bypass grafting	11 (3.3)	1.26 (0.69-2.31)	1.27 (0.70-2.33)	1.65 (0.90-3.02)
Others	398 (9.1)	3.30 (2.81-3.87)	3.25 (2.76-3.81)	3.60 (3.03-4.28)
Co-morbidity characteristics ^k	, , ,	, , , , , , , , , , , , , , , , , , , ,	``````````````````````````````````````	guest.
Somatic co-morbidities ^o from three years before up to inclusion				ist. Prot
Musculoskeletal disorders	112 (4.9)	0.90 (0.73-1.11)	0.91 (0.74-1.12)	1.00 (0.81-1.24)
Diabetes mellitus ^p	199 (7.9)	1.73 (1.46-2.05)	1.74 (1.47-2.06)	1.70 (1.42-2.03)
Renal insufficiency	60 (24.2)	4.34 (3.31-5.71)	4.29 (3.26-5.64)	2.5%(1.95-3.45)
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Risk factors for re-infarction and mortality a	after acute myocardi	ial infarction		mjopen-2019-033 0.666 (0.57-0.81)	
Hypertension	198 (3.9)	0.74 (0.62-0.87)	0.74 (0.62-0.87)	$\frac{3}{2}$]
Stroke	25 (12.6)	1.96 (1.31-2.94)	1.99 (1.33-2.98)	1.639(1.09-2.45)	
Cancer	102 (10.9)	2.46 (1.99-3.05)	2.45 (1.98-3.04)	2.22 = (1.78 - 2.75)	
Other somatic disorders	530 (5.2)	1.62 (1.34-1.96)	1.59 (1.31-1.92)	1.46 (1.20-1.78)	
Mental co-morbidities		1.02 (1.0 + 1.90)	1.09 (1.01 1.92)	e	
Common mental disorders ^o				nber	
from three years before up to inclusion	43 (5.4)	0.80 (0.59-1.11)	_	0.90 (0.66-1.24)	
Other mental disorders ^o					
from three years before up to inclusion	101 (7.6)	1.40 (1.13-1.74)	_	1.46 (1.17-1.82)	
Psychiatric medication ^q				nlo	
in the year before inclusion	241 (7.5)	1.39 (1.16-1.66)	_	1.24 (1.03-1.48)	
 ^e Missing data is considered compulsory education ^f Missing data is considered Non-European countries ^g Type of living area: big cities (Stockholm, Gothenb the city); small cities/villages/rural ^h Missing data is considered single living without ch ⁱ Married includes all living with partner; cohabitant ^j Single includes divorced, separated, or widowed ^k See method section for the International Classificat ¹ ST-elevation myocardial infarction 	ourg and Malmö); mediu ildren	Ň		on April 23 c Chemical classification 24	
 ⁿ See method section for the Classification of Surgic. ^o Measured by main or side diagnosis in inpatient or ^p Additionally measured by prescribed antidiabetic n ^q Measured by antidepressants, anxiolytics and sedat 	specialised outpatient canedication	are		by guest. Protected by copyright.	29
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 Risk factors for re-infarction and mortality after acute myocardial infarction
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 Figure 1. Trajectory groups of sickness absence and disability pension (SA/DP) months before the hospital admission date for acute myocardial

 ., r pensio. .ndividuals in eac. infarction (AMI) in 2008-2010 (T0) and percentages of individuals in each trajectory group (n=15 069). The Botted lines represent 95% CIs.

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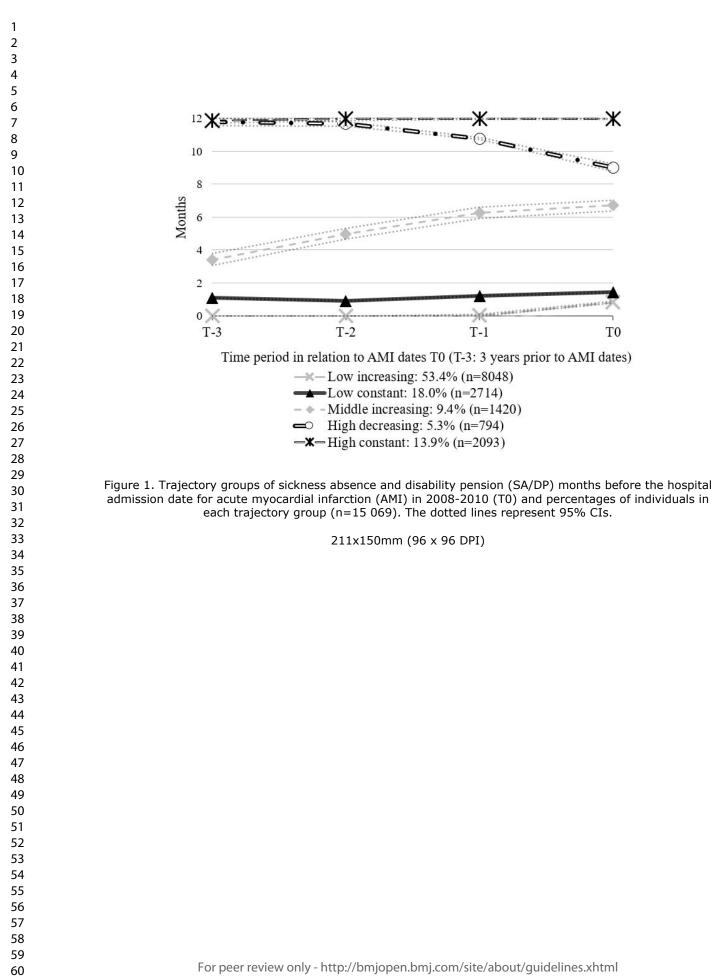
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Supplementary Table

 Table. Crude and adjusted hazard ratios (HR) and 95% Confidence Interval (CI) for mortality due to circula \vec{B} ry disorders during first year of follow-up in individuals with diagnosis of acute myocardial infarction (AMI) from inpatient care in \vec{B} 008-2010 in Sweden (N=15 069)

Characteristics of patients with AMI	Mortality	Crude model	Model 1 ^a	Mgdel 2 ^b	Model 3 ^c
	(First year)			019	
	n (%)		HR (95	5% CI) 💆	
Socio-demographic characteristics ^d	6			Wn	
Sex	6			oad	
Men	365 (3.1)	1	1	<u>e</u> 1	1
Women	133 (3.6)	1.14 (0.94-1.40)	0.92 (0.75-1.13)	0.91 @.74-1.12)	0.93 (0.75-1.15)
Age				n ht	
25-45	24 (1.7)	1	1	t 1	1
46-55	99 (2.1)	1.21 (0.77-1.89)	1.04 (0.66-1.63)	1.02 🕄 .65-1.60)	1.15 (0.73-1.81)
56-64	375 (4.1)	2.40 (1.59-3.63)	1.89 (1.24-2.90)	1.85 🛱 .21-2.84)	2.10 (1.37-3.23)
Education (years) ^e				en.t	
Compulsory (≤9)	190 (4.1)	1.61 (1.25-2.09)	1.26 (0.96-1.64)	1.25 (2).96-1.63)	1.23 (0.94-1.61)
High school (10–12)	225 (3.0)	1.16 (0.90-1.49)	1.02 (0.79-1.32)	1.02 (0.79-1.31)	1.02 (0.79-1.32)
University (>12)	83 (2.6)	1		2 1	1
Country of birth ^f					
Sweden	408 (3.3)	1	1	prii 1	1
Other Nordic countries	44 (5.0)	1.51 (1.11-2.07)	1.20 (0.87-1.64)	1.20 (9.87-1.64)	1.32 (0.97-1.81)
Europe (except Nordic countries)	11 (2.5)	0.73 (0.40-1.32)	0.69 (0.38-1.25)	0.70 (0.38-1.28)	0.76 (0.42-1.39)
Non-European countries	35 (2.1)	0.61 (0.43-0.87)	0.62 (0.43-0.89)	0.63 (🖗.44-0.90)	0.67 (0.46-0.96)
Type of living area ^g				S G	
Big cities	150 (3.2)	1	1	les 1	1
Medium sized cities	173 (3.2)	0.99 (0.79-1.23)	0.92 (0.74-1.15)	0.93 (0 .75-1.17)	0.97 (0.78-1.21)
Small towns/villages	175 (3.3)	1.04 (0.83-1.29)	0.92 (0.73-1.15)	0.94 🖗.75-1.18)	0.93 (0.74-1.16)
Family situation ^h			. , , ,	čte	
Married ⁱ living without children	172 (3.4)	1.95 (1.48-2.57)	1.41 (1.06-1.88)	1.40 (2.05-1.87)	1.47 (1.10-1.97)
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				ght.	

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			19-0	
72 (1.8)	1	1	3361 1	
· ,	2 40 (1 84-3 12)	1 64 (1 24-2 15)	റ '	1.61 (1.22-2.
· · ·	· · · · · ·	````		1.37 (0.85-2
20 (210)	1.00 (1.00 2.00)	1.50 (0.01 2.10)		1.57 (0.05 2
			iber	
210 (2.6)	1	1	20, 1	
· ,	0.66 (0.48-0.90)	0.65 (0.47-0.89)	0.64 (0.46-0.88)	0.58 (0.42-0
· ,	````	· · · · · · · · · · · · · · · · · · ·	Ų,	0.93 (0.67-1
	, ,	· · · · · · · · · · · · · · · · · · ·	N	0.33 (0.18-0
	````	, , ,		1.97 (1.54-2
			d fre	× ×
			m	
462 (3.3)	1	1	<u>الج</u> 1	
18 (2.1)	0.63 (0.39-1.01)	0.95 (0.59-1.54)	0.94 🗑.58-1.52)	0.94 (0.58-1
18 (4.3)	1.30 (0.81-2.08)	1.82 (1.13-2.93)	1.83 🛱 .14-2.96)	1.83 (1.13-2
			ben.	
			ğ	
316 (3.3)	1		<b>c</b> 1	
182 (3.2)	0.95 (0.79-1.14)	0.86 (0.72-1.04)	$0.86  \bar{\oplus} .71 - 1.03)$	0.74 (0.61-0
			oril	
			23,	
219 (4.1)	2.78 (2.20-3.51)	2.98 (2.35-3.76)	3.00 (2.37-3.80)	4.29 (3.36-5
104 (1.5)	1	1	1 <del>و</del>	
175 (5.5)	3.73 (2.93-4.75)	3.62 (2.84-4.61)	3.58 @81-4.57)	3.13 (2.45-4
			est.	
			Pro	
	1	1	tec 1	
· · ·	````	· · · · · · · · · · · · · · · · · · ·		1.88 (0.99-3
277 (6.1)	3.12 (2.61-3.74)	2.80 (2.33-3.36)		3.37 (2.76-4
			юру	
			- F	
	18 (2.1) 18 (4.3) 316 (3.3) 182 (3.2) 219 (4.1) 104 (1.5)	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$	$\begin{array}{cccccccccccccccccccccccccccccccccccc$

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		BMJ Open		ıjope	
				n-20	
				n-2019-03361	
Morbidity characteristics				33616	
Somatic (co)-morbidities ^o				on	
three years before and/or at inclusion				18	
Musculoskeletal disorders				Dec	
No	423 (3.3)	1	1	<u>ě</u> 1	
Yes	75 (3.2)	0.98 (0.77-1.26)	0.84 (0.66-1.08)	0.84 (9.66-1.08)	0.91 (0.71
Diabetes mellitus ^p				201	
No	360 (2.8)	1	1	<mark>به</mark> 1	
Yes	138 (5.2)	1.87 (1.53-2.27)	1.55 (1.27-1.89)	1.56 🖉 .27-1.91)	1.53 (1.24
Renal insufficiency				nloa	
No	458 (3.0)	1	1	đe 1	
Yes	40 (15.4)	5.29 (3.83-7.30)	3.88 (2.78-5.40)	3.75 (2.68-5.25)	2.75 (1.94
Hypertension				3	
No	353 (3.5)	1	1	र्ष्ट्र 1	
Yes	145 (2.8)	0.79 (0.65-0.96)	0.71 (0.59-0.87)	0.71 🚯.59-0.87)	0.67 (0.55
Stroke				jope	
No	477 (3.1)	1	1	⁵ .b 1	
Yes	21 (10.1)	3.33 (2.15-5.15)	2.26 (1.45-3.51)	2.30 🛱 .48-3.58)	1.96 (1.25
Cancer				Ŭ B	
No	459 (3.2)	1		9 I	
Yes	39 (4.1)	1.28 (0.93-1.78)	1.15 (0.83-1.60)	1.13 (3.81-1.57)	1.01 (0.72
Other somatic disorders					
No	115 (2.3)	1	1	م ال	
Yes	383 (3.7)	1.62 (1.32-2.00)	1.43 (1.16-1.77)	1.41 (¥.14-1.75)	1.36 (1.10
Mental co-morbidities				by (	
Common mental disorders ^o				guest.	
three years before and/or at inclusion				਼ਾਂ ਸ	
No	471 (3.2)	1	1	'rote	
Yes	27 (3.4)	1.04 (0.70-1.53)	0.76 (0.51-1.13)	čte	0.81 (0.54
Other mental disorders ^o				d by	
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				oyri	
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Page 35 of 42			BMJ Open		mjopen-	
1					2019-033616	
2					033	
3	three years before and/or at inclusion				616	
-	No	431 (3.1)	1	1	9 —	1
) )	Yes	67 (5.0)	1.63 (1.26-2.11)	1.31 (1.01-1.71)	18-	1.28 (0.98-1.68)
7	Antidepressants				Dec	
3	in the year before inclusion				čem	
	No antidepressants	418 (3.1)	1	1	ber	1
0 1	Small doses ( $<0.5 \text{ DDD}^{q}$ )	24 (4.0)	1.26 (0.84-1.91)	1.05 (0.69-1.59)	 mber 2019.	0.96 (0.63-1.46)
2	Moderate doses (0.5-1.5 DDD)	42 (4.8)	1.57 (1.14-2.16)	1.15 (0.83-1.59)		1.17 (0.84-1.63)
3	High doses (>1.5 DDD)	14 (3.4)	1.12 (0.66-1.90)	0.70 (0.41-1.21)	. Downloaded	0.81 (0.47-1.40)
4	Anxiolytics				nloa	
5	in the year before inclusion				ideo	
6 7	No Anxiolytics	431 (3.1)	1	1	d fro	1
8	Small doses (<0.5 DDD)	45 (4.5)	1.48 (1.09-2.01)	1.10 (0.80-1.51)	ă_	1.06 (0.77-1.46)
9	Moderate doses (0.5-1.5 DDD)	13 (6.1)		1.10 (0.63-1.93)	<u></u>	1.04 (0.59-1.83)
0	High doses (>1.5 DDD)	<10 (8.0)	2.63 (1.36-5.09)	1.15 (0.59-2.25)	/br	1.22 (0.62-2.40)
1 2	Sedatives				jop	
3	in the year before inclusion				en.t	
4	No sedatives	394 (2.9)	1		, mi	1
5	Small doses (<0.5 DDD)	41 (4.5)	1.58 (1.14-2.17)	1.33 (0.96-1.85)	│ │ │ │ from http://bmjopen.bmj.com/	1.16 (0.83-1.61)
6	Moderate doses (0.5-1.5 DDD)	40 (6.5)	2.25 (1.63-3.12)	1.42 (1.01-1.99)	√ 9n —	1.28 (0.90-1.80)
27 28	High doses (>1.5 DDD)	23 (7.5)	2.65 (1.74-4.03)	1.52 (0.98-2.36)	Ap	1.47 (0.95-2.28)

^a Adjusted for sex, age, educational level, country of birth, type of living area, family situation, trajectory groups of SA/DP and previous unemployment

^b Adjusted for sex, age, educational level, country of birth, type of living area, family situation, trajectory groups of SA/DP and previous unemployment, in- and specialised outpatient care due to common mental disorders and other mental disorders, antidepressants,

anxiolytics and sedatives; Mental comorbidities were not mutually controlled ⁶/₂ ^c Adjusted for sex, age, educational level, country of birth, type of living area, family situation, trajectory groups of SA/DP and previous unemployment, in- and specialised outpatient care due to common mental disorders and other mental disorders, antidepressants, anxiolytics, sedatives, inpatient days due to AMI, type of infarction, musculoskeletal disorders, diabetes melitus, renal insufficiency, hypertension, stroke, cancer and other somatic disorders; Mental comorbidities were not mutually controlled

^d Measured on 31st December of the year preceding acute myocardial infarction

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- ^e Missing data is considered compulsory education ^f Missing data is considered Non-European countries
- ^g Type of living area: big cities (Stockholm, Gothenburg and Malmö); medium sized cities (cities with more than 90 000 inhabitants

- within 30 km distance from the centre of the city); small cities/villages/rural ^h Missing data is considered single living without children ⁱ Married includes all living with partner; cohabitant ^j Single includes divorced, separated, or widowed ^k See method section for the International Classification of Diseases version 10 (ICD-10) codes or the Anatomic Therapeutic Chemical Downloaded from http://bmjopen.bmj.com/ on April 23, 2024 by guest. Protected by copyright
- classification system (ATC) codes

- ¹ ST-elevation myocardial infarction
- ^m Non-ST-elevation myocardial infarction
- ⁿ See method section for the Classification of Surgical Procedures
- ^o Measured by main or side diagnosis in in- or specialised outpatient care
- ^p Additionally measured by prescribed antidiabetic medication review only
  - ^q Daily dispensed dose (DDD)

1 2 3 4 5	Reportir	ng ch	ecklist for cohort study.				
6 7 8 9	Based on the S	TROBE co	hort guidelines.				
10 11 12	Instructions	to autho	ors				
13 14	Complete this c	hecklist by	entering the page numbers from your manuscript where read	lers will find			
15 16 17	each of the item	is listed be	low.				
18 19 20	Your article may	/ not curre	ntly address all the items on the checklist. Please modify your	text to			
21 22	include the miss	sing inform	ation. If you are certain that an item does not apply, please w	rite "n/a" and			
23 24 25	provide a short explanation.						
26 27 28	Upload your completed checklist as an extra file when you submit to a journal.						
29 30 31	In your methods	In your methods section, say that you used the STROBE cohortreporting guidelines, and cite them					
32 33 34	as:						
35 36	von Elm E, Altm	ian DG, Eg	gger M, Pocock SJ, Gotzsche PC, Vandenbroucke JP. The St	rengthening			
37 38	the Reporting of Observational Studies in Epidemiology (STROBE) Statement: guidelines for						
39 40 41	reporting observ	/ational stu	udies.				
42 43				Page			
44 45 46			Reporting Item	Numbe			
47 48 49	Title and abstra	act					
50 51 52	Title	<u>#1a</u>	Indicate the study's design with a commonly used term in	1			
53 54 55			the title or the abstract				
56 57 58 59		_					
60		For pe	er review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml				

Page

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Number

1 2	Abstract	<u>#1b</u>	Provide in the abstract an informative and balanced	2-3
3 4 5			summary of what was done and what was found	
6 7 8	Introduction			
9 10 11	Background /	<u>#2</u>	Explain the scientific background and rationale for the	5-6
12 13 14	rationale		investigation being reported	
15 16	Objectives	<u>#3</u>	State specific objectives, including any prespecified	6
17 18 19			hypotheses	
20 21 22	Methods			
23 24 25	Study design	<u>#4</u>	Present key elements of study design early in the paper	7
26 27 28	Setting	<u>#5</u>	Describe the setting, locations, and relevant dates,	7-8
20 29 30			including periods of recruitment, exposure, follow-up, and	
31 32 33			data collection	
34 35	Eligibility criteria	<u>#6a</u>	Give the eligibility criteria, and the sources and methods	7
36 37			of selection of participants. Describe methods of follow-	
38 39 40			up.	
41 42 43	Eligibility criteria	<u>#6b</u>	For matched studies, give matching criteria and number of	n/a It is not
44 45			exposed and unexposed	a matched
46 47 48				study.
49 50 51	Variables	<u>#7</u>	Clearly define all outcomes, exposures, predictors,	8-9
52 53			potential confounders, and effect modifiers. Give	
53 54 55 56 57			diagnostic criteria, if applicable	
58 59 60		For pe	er review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml	

1 2	Data sources /	<u>#8</u>	For each variable of interest give sources of data and	7-9
3 4	measurement		details of methods of assessment (measurement).	
5 6 7			Describe comparability of assessment methods if there is	
, 8 9			more than one group. Give information separately for for	
10 11			exposed and unexposed groups if applicable.	
12 13 14 15	Bias	<u>#9</u>	Describe any efforts to address potential sources of bias	17
16 17 18	Study size	<u>#10</u>	Explain how the study size was arrived at	7
19 20 21	Quantitative	<u>#11</u>	Explain how quantitative variables were handled in the	7-8
21 22 23	variables		analyses. If applicable, describe which groupings were	
24 25			chosen, and why	
26 27	Statistical	#12a	Describe all statistical methods, including those used to	8-9
28 29		<u>#12a</u>		0-9
30 31	methods		control for confounding	
32 33	Statistical	<u>#12b</u>	Describe any methods used to examine subgroups and	8-9
34 35 36	methods		interactions	
37 38	Statistical	#12c	Explain how missing data were addressed	8-9
39 40 41	methods			
41 42 43				
44 45	Statistical	<u>#12d</u>	If applicable, explain how loss to follow-up was addressed	n/a there is
46 47	methods			no loss to
48 49				follow-up
50 51	Statistical	<u>#12e</u>	Describe any sensitivity analyses	9
52 53	methods			
54 55 56				
57 58	Results			
59 60		For pee	er review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml	

1 2	Participants	<u>#13a</u>	Report numbers of individuals at each stage of study—eg	11
3 4			numbers potentially eligible, examined for eligibility,	
5 6 7			confirmed eligible, included in the study, completing	
7 8 9			follow-up, and analysed. Give information separately for	
10 11			for exposed and unexposed groups if applicable.	
12 13 14 15	Participants	<u>#13b</u>	Give reasons for non-participation at each stage	n/a
16 17 18	Participants	<u>#13c</u>	Consider use of a flow diagram	n/a
19 20 21	Descriptive data	<u>#14a</u>	Give characteristics of study participants (eg	11
21 22 23			demographic, clinical, social) and information on	
24 25			exposures and potential confounders. Give information	
26 27			separately for exposed and unexposed groups if	
28 29 30			applicable.	
30 31 32 33	Descriptive data	<u>#14b</u>	Indicate number of participants with missing data for each	n/a
34 35			variable of interest	
36 37 38 39	Descriptive data	<u>#14c</u>	Summarise follow-up time (eg, average and total amount)	10
40 41	Outcome data	<u>#15</u>	Report numbers of outcome events or summary	11
42 43			measures over time. Give information separately for	
44 45 46			exposed and unexposed groups if applicable.	
47 48	Main results	<u>#16a</u>	Give unadjusted estimates and, if applicable, confounder-	11-12
49 50 51			adjusted estimates and their precision (eg, 95%	
52 53			confidence interval). Make clear which confounders were	
54 55			adjusted for and why they were included	
56 57 58				
59 60		For pee	er review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml	

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1 2	Main results	<u>#16b</u>	Report category boundaries when continuous variables	11-12		
3 4 5			were categorized			
6 7 8	Main results	<u>#16c</u>	If relevant, consider translating estimates of relative risk	n/a		
9 10			into absolute risk for a meaningful time period			
11 12 13	Other analyses	<u>#17</u>	Report other analyses done—e.g., analyses of subgroups	n/a		
14 15 16			and interactions, and sensitivity analyses			
17 18 19	Discussion					
20 21 22	Key results	<u>#18</u>	Summarise key results with reference to study objectives	17		
23 24 25	Limitations	<u>#19</u>	Discuss limitations of the study, taking into account	17		
25 26 27			sources of potential bias or imprecision. Discuss both			
28 29 30			direction and magnitude of any potential bias.			
31 32	Interpretation	<u>#20</u>	Give a cautious overall interpretation considering	13-17		
33 34			objectives, limitations, multiplicity of analyses, results from			
35 36 37			similar studies, and other relevant evidence.			
38 39	Generalisability	#21	Discuss the generalisability (external validity) of the study	16		
40 41 42	·		results			
43 44 45	Other Information					
46 47	Funding	#22	Cive the course of funding and the role of the funders for	18		
48 49	Funding	<u>#22</u>	Give the source of funding and the role of the funders for	10		
50 51			the present study and, if applicable, for the original study			
52 53 54			on which the present article is based			
55 56	Notes:					
57 58	• 6b: n/a It is not a matched study.					
59 60		For pee	er review only - http://bmjopen.bmj.com/site/about/guidelines.xhtml			

 12d: n/a there is no loss to follow-up The STROBE checklist is distributed under the terms of the Creative Commons Attribution License CC-BY. This checklist was completed on 13. August 2019 using <u>https://www.goodreports.org/</u>, a tool made by the <u>EQUATOR Network</u> in collaboration with <u>Penelope.ai</u>

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