Supplemental material

Tables

Table S1. Reviewer classification

Reviewer 1	Reviewer 2				
	Type 1	Type 2	Type 3-5	M. Injury	Total
Type 1	644	52	9	40	745
Type 2	30	102	1	48	181
Type 3-5	11	1	7	2	21
M. Injury	22	24	0	203	249
Total	707	179	17	293	1196

Overall Inter-reviewer agreement in classifying patients according to the Third Universal Definition of Myocardial Infarction. There was agreement in 79.9 % of the cases, with a kappa value of 0.64 (95% confidence interval 0.60-0.68) and AC_1 of 0.75 (95% confidence interval 0.72-0.78). MI – myocardial infarction. M. injury – myocardial injury.

Table S2. Agreement in distinguishing type 1 MI, type 2 MI and myocardial injury.

1st Adjudicator	2nd Adjudicator		
	Type 1 MI	Other	Total
Type 1 MI	644	101	745
Other	63	388	451
Total	707	489	1196
	Type 2 MI	Other	Total
Type 2 MI	102	79	181
Other	77	938	1015
Total	179	1017	1196
	Myocardial injury	Other	Total
Myocardial injury	203	46	249
Other	90	857	947
Total	293	903	1196

Cohen's κ for agreement between the initial two adjudicators were 0.71, 0.49 and 0.68 for type 1 MI, type 2 MI and myocardial injury respectively.

Table S3. Cause of hospital admission and first diagnosis among patients without a clinical myocardial infarction diagnosis.

Cause of hospital admission	n (%)	First diagnosis at discharge (ICD-10 code)	n (%)
Dyspnoea	61 (21.7)	Valvular heart disease (I33-I39)	35 (12.5)
Cardiac surgery	49 (17.4)	Heart failure (I50)	25 (8.9)
Chest pain	45 (16.0)	Arrhythmia (I47-I49)	21 (7.5)
Other pain	40 (14.2)	Circulatory or respiratory symptoms (R00-R09)	19 (6.8)
General condition	31 (11.0)	Cerebrovascular diseases (I60–I69)	17 (6.0)
Fall	31 (11.0)	Influenza and pneumonia (J09–J18)	15 (5.3)
Nausea/vomiting	25 (8.9)	Ischaemic heart diseases (I20–I25)	13 (4.6)
Fever	21 (7.5)	Arterial diseases (I70–I79)	11 (3.9)
Syncope	18 (6.4)	General symptoms and signs (R50–R69)	10 (3.6)
Non-cardiac surgery	18 (6.4)	Pulmonary heart/circulation disease (I26-I28)	7 (2.5)
None of the above	49 (17.4)	None of the above	108 (38.4)

Several causes of hospital admission were possible in each case.

Table S4. First diagnoses, stratified by cardiac surgery as the reason for hospital admission

First diagnosis at discharge (ICD-10 code)	Patients without clinical MI diagnosis (cardiac surgery excluded)	Patients without clinical MI diagnosis admitted for cardiac surgery
Total number of patients	232	49
Valvular heart disease (I33-I39)	2 (0.9)	31 (63.3)
Heart failure (I50)	22 (9.5)	3 (6.1)
Arrhythmia (I47-I49)	18 (7.6)	3 (6.1)
Circulatory or respiratory symptoms (R00-R09)	19 (8.2)	0
Cerebrovascular diseases (I60–I69)	17 (7.3)	0
Influenza and pneumonia (J09–J18)	15 (6.5)	0
Ischaemic heart diseases (I20–I25)	5 (2.2)	8 (16.3)
Arterial diseases (I70–I79)	9 (3.9)	2 (4.1)
General symptoms and signs (R50–R69)	10 (4.3)	0
Pulmonary heart/circulation disease (I26-I28)	7 (3.0)	0
None of the above	106 (45.7)	2 (4.1)

First diagnoses among patients without a clinical myocardial infarction diagnosis, stratified by cardiac surgery as the cause of hospital admission or not. Among patients admitted for cardiac surgery, “none of the above” include benign neoplasm of the heart (D15) in one case and complication of valve graft (T82) in one case. MI – myocardial infarction

Table S5. Patient characteristics, stratified by cardiac surgery as the reason for hospital admission

	Patients without clinical MI diagnosis (cardiac surgery excluded)	Patients without clinical MI diagnosis admitted for cardiac surgery
Total number of patients	232	49
cTn dynamics >20%	186 (80.2)	47 (95.9)
MI type		
Type 1	9 (3.2)	0
Type 2	37 (13.2)	0
Type 3-5	1 (0.4)	0
Myocardial injury	185 (83.3)	49 (100.0)
Department of care		
Not admitted	14 (6.0)	0
Cardiology	34 (14.7)	4 (8.2)
Medicine with ECG-monitoring	62 (26.7)	0
Medicine without ECG-monitoring	55 (23.7)	0
Intensive care unit	17 (7.3)	0
Surgery	37 (15.9)	45 (91.8)
Other	13 (5.6)	0
Cardiovascular risk factors		
Age, mean (SD)	74.8 (14.4)	66.0 (10.6)
Male Sex	122 (52.6)	37 (75.5)
Active smoking	29 (12.5)*	5 (10.2)
Hypertension	139 (59.9)	27 (55.1)
Hyperlipidemia	23 (9.9)	13 (26.5)
Diabetes mellitus	54 (23.3)	6 (12.2)
Medical history		
Myocardial infarction	65 (28.0)	12 (24.5)
Heart failure	20 (26.0)	9 (18.4)
COPD	19 (8.2)	3 (6.1)
Dementia	19 (8.2)	0
Investigations in hospital		
Coronary angiography	11 (4.8)	1 (2.0)
Echocardiography	48 (20.7)	35 (71.4)
Alive at discharge	208 (89.7)	49 (100.0)
Treatment at discharge		
Aspirin	103 (49.5)	17 (34.7)
Statin	50 (24.0)	24 (49.0)
Beta blocker	119 (57.2)	36 (73.5)
Death during Follow up (median 6.0 years)	157 (67.7)	3 (6.1)

Characteristics of patients without a clinical myocardial infarction diagnosis, stratified by cardiac surgery as the cause of hospital admission or not. Values are numbers (%). cTn – cardiac troponin, MI – myocardial infarction, COPD – chronic obstructive pulmonary disease.

* 16.4% missing data

Table S6. Adjudicated cases of myocardial injury stratified by troponin dynamics.

Rise or fall in cTn levels	≥20%		<20%	
Clinical MI diagnosis	Yes	No	Yes	No
Total number of patients	55	143	22	42
Age, mean (SD)	79.2 (10.4)	76.0 (14.3)	73.8 (14.2)	76.1 (13.4)
Male sex, n (%)	29 (52.7)	76 (53.1)	18 (81.8)	22 (52.4)
Active smoking, n (%) *	3 (8.6)	16 (11.2)	4 (22.2)	4 (9.5)
Medical history, n (%)				
Hypertension	34 (61.8)	88 (61.5)	9 (40.9)	21 (50.0)
Hyperlipidemia	15 (27.3)	17 (11.9)	6 (27.3)	4 (9.5)
Myocardial infarction	23 (41.8)	40 (28.0)	10 (45.5)	8 (19.0)
Clinical findings, n (%)				
Chest pain, n (%)	18 (32.7)	22 (15.4)	17 (77.3)	10 (23.8)
In hospital treatment, n (%)				
Coronary angiography	10 (18.2)	3 (2.1)	13 (59.9)	0
PCI	4 (7.3)	1 (0.7)	6 (27.3)	0
Fondaparinux s.c.	17 (30.9)	4 (2.8)	14 (63.6)	1 (2.4)
Treatment at discharge, n (%)				
Aspirin	35 (63.6)	67 (50.8)	20 (90.9)	15 (40.5)
P2Y12 inhibitor	22 (40.0)	6 (4.6)	12 (54.5)	0
Statin	24 (43.6)	33 (25.4)	16 (72.2)	9 (24.3)
Beta blocker	36 (65.5)	79 (60.3)	16 (72.2)	19 (51.4)
RAAS blocker	33 (60.0)	71 (54.2)	14 (63.6)	23 (62.2)

Clinical features among patients with myocardial injury with and without a clinical diagnosis of MI, stratified by whether cardiac troponin levels had a ≥20% rise or fall over serial measurements or not. cTn – cardiac troponin, n – number, SD – standard deviation, PCI – percutaneous coronary intervention. S.c. subcutaneous.

Table S7. Secondary preventive therapies at discharge and five year survival.

Adjudicated diagnosis	Type 2 MI		*p*	Myocardial injury		*p*
Dead after five years	Yes	No		Yes	No	
Total number of patients	100	55		136	98	
Aspirin	70 (70.0)	46 (83.6)	0.06	78 (57.4)	59 (60.2)	*0.71*
P2Y12-inhibitors	37 (37.0)	29 (52.7)	0.06	22 (16.2)	19 (19.4)	*0.56*
Statins	45 (45.0)	38 (69.1)	<0.01	40 (29.4)	41 (41.8)	*0.06*
RAAS blocker	56 (56.0)	40 (72.7)	0.03	79 (58.1)	61 (62.2)	0.61
Beta blocker	75 (75.0)	43 (78.2)	0.66	86 (63.2)	64 (65.3)	*0.86*

Secondary preventive therapies at discharge stratified by survival status after five years of follow up. The analysis only includes patients surviving the index care event.

Table S8. All-cause mortality with time zero at hospital admission.

Adjudicated **Type 2 MI** with vs. without a clinical MI diagnosis			Adjudicated **myocardial injury** with vs. without a clinical MI diagnosis		
Model	Valid cases (events)	Hazard ratio (95% CI)	Model	Valid cases (events)	Hazard ratio (95% CI)
1 year			*1 year*		
Crude	171 (53)	0.84 (0.44-1.60)	Crude	268 (99)	1.94 (0.64-5.90)
Model 1	171 (53)	0.54 (0.28-1.05)	Model 1	267 (98)	1.80 (0.65-4.92)
5 year			*5 year*		
Crude	171 (116)	0.94 (0.56-1.55)	Crude	268 (170)	1.53 (0.52-4.52)
Model 1	171 (116)	0.66 (0.42-1.03)	Model 1	267 (169)	1.43 (0.46-4.42)
Model 2	171 (116)	0.70 (0.42-1.17)	Model 2	267 (169)	1.38 (0.56-3.39)

Cox regression models for all-cause mortality with time zero at hospital admission in type 2 MI (left) and myocardial injury patients with a clinical MI diagnosis compared with patients without a clinical MI diagnosis.

Model 1: Adjusted for age, sex, active smoking and modified Charlson comorbidity index.

Model 2: As per model 1 with adjustment for clinical parameters at admission (systolic blood pressure, heart rate and reaction level scale >1 y/n), laboratory results (troponin max level, CRP max level and creatinine at admission) and invasive/non-invasive ventilation y/n.

Table S9. All-cause mortality after merging of adjudicated type 2 MI and myocardial injury

Adjudicated **Type 2 MI** or myocardial injury with vs. without a clinical MI diagnosis with time zero at hospital admission			Adjudicated type 2 MI or **myocardial injury** with vs. without a clinical MI diagnosis with time zero 30 days after hospital admission		
Model	Valid cases (events)	Hazard ratio (95% CI)	Model	Valid cases (events)	Hazard ratio (95% CI)
1 year			*1 year*		
Crude	439 (154)	1.15 (0.61-2.16)	Crude	370 (84)	1.16 (0.75-1.78)
Model 1	438 (153)	1.07 (0.57-2.01)	Model 1	370 (84)	1.09 (0.71-1.68)
5 year			*5 year*		
Crude	439 (288)	1.11 (0.60-2.04)	Crude	370 (218)	1.12 (0.57-2.20)
Model 1	438 (287)	0.97 (0.56-1.69)	Model 1	370 (218)	0.95 (0.56-1.63)
Model 2	438 (287)	1.03 (0.59-1.80)	Model 2	370 (218)	0.97 (0.54-1.75)

Cox regression models for all-cause mortality in patients with a clinical MI diagnosis compared with patients without a clinical MI diagnosis, regardless of a type 2 MI or myocardial injury adjudication. To the left; time zero is set at hospital admission and to the right at 30 days after hospital admission.

Model 1: Adjusted for age, sex, active smoking and modified Charlson comorbidity index.

Model 2: As per model 1 with adjustment for clinical parameters at admission (systolic blood pressure, heart rate and reaction level scale >1 y/n), laboratory results (troponin max level, CRP max level and creatinine at admission) and invasive/non-invasive ventilation y/n.

Figures

Figure S1. Inclusion of patients with a clinical MI diagnosis. The target was to include the first 100 patients with ICD-code I.21 at discharge reported to the Swedish Web-system for Enhancement and Development of Evidence-based care in Heart disease Evaluated According to Recommended Therapies (SWEDEHEART) from each site. However, data had been collected in slightly less than 100 patients with ICD-code I.21 from three of the sites. As a next step, all patients with ICD-code I.21 at discharge not reported to SWEDEHEART, within the same dates as the SWEDEHEART reported patients, were included from each site.

Figure S2. Departments of care after hospital admission among patients without a clinical myocardial infarction diagnosis.

Figure S3. Caring department among adjudicated type 2 MI patients with (left) and without (right) a clinical myocardial infarction diagnosis.

Figure S4. Caring department among adjudicated myocardial injury patients with (left) and without (right) a clinical myocardial infarction diagnosis.

Figure S5. Crude zero days to five years survival curves for adjudicated type 2 MI and myocardial injury patients with and without a clinical myocardial infarction diagnosis (ICD-10 code I.21).