

Predicting major adverse cardiovascular events for secondary prevention: Protocol for a systematic review and meta-analysis of risk prediction models

Supplementary

Appendix 1 Example search strategy for Medline

Appendix 2 Data extraction template

Appendix 1 Example search strategy for Medline

Database(s): Ovid MEDLINE(R) 1946 to March Week 5 2019

- 1 cardiovascular diseases/ or heart diseases/ or exp myocardial ischemia/ or vascular diseases/ or exp arteriosclerosis/ or cerebrovascular disorders/ or exp brain ischemia/ or exp stroke/
- 2 ((cardio* or cardia* or heart* or coronary* or myocard* or pericard* or isch?em*) adj2 (disease? or event? or mortality)).tw.
- 3 ((cerebrovasc* or cardiovasc* or vasc*) adj2 (disease? or event? or mortality)).tw.
- 4 (myocardial adj (infarct* or revascular* or re-vascular* or isch?emi*)).tw.
- 5 heart attack?.tw.
- 6 angina.tw.
- 7 (morbid* adj5 (cardio* or cardia* or heart* or coronary* or myocard* or pericard* or isch?em*)).tw.
- 8 (apoplexy or (brain adj2 accident*)).tw.
- 9 ((brain* or cerebral or lacunar) adj2 infarct*).tw.
- 10 peripheral arter* disease*.tw.
- 11 (emboli* or arrhythmi* or thrombo* or atrial fibrillat* or atrial flutter* or tachycardi* or endocardi* or (sick adj sinus)).tw.
- 12 (stroke or strokes).tw.
- 13 cerebral vascular.tw.
- 14 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13
- 15 "Severity of Illness Index"/ and "Surveys and Questionnaires"/
- 16 **"Severity of Illness Index"/
- 17 ((severity or multicomponent or multi-component or multidimensional or multi-dimensional or prognos*) adj2 (index* or indice* or survey* or tool* or questionnaire* or grad* or rate or rating or scale* or scor*)).tw.
- 18 (severity adj2 assess*).tw.
- 19 (((scor* or grad* or rate or rating or composite) adj2 (scale* or system*)) and severity).tw.
- 20 (stratif* and severity).tw.
- 21 15 or 16 or 17 or 18 or 19 or 20
- 22 14 and 21
- 23 validation stud*.pt.
- 24 22 and 23
- 25 decision model*.tw.
- 26 22 and 25
- 27 decision tree.tw.
- 28 22 and 27
- 29 prognostic model*.tw.
- 30 22 and 29

- 31 (predictive adj1 (value of tests or model)).tw.
32 22 and 31
33 (prediction adj1 (model or tool or rule)).tw.
34 22 and 33
35 (risk adj1 (assessment or score or engine or equation or algorithm or table or function or model or tool or rule)).tw.
36 22 and 35
37 (valid* or discriminat* or calibrat* or accuracy or reproducib*).ti.
38 22 and 37
39 (predict* and risk*).tw.
40 predicting.tw.
41 39 or 40
42 "reproducibility of results"/
43 "sensitivity and specificity"/
44 receiver operating characteristic*.tw.
45 ROC curve/
46 (validation or discrimination or calibration or validity or accuracy or reproducibility).tw.
47 42 or 43 or 44 or 45 or 46
48 41 and 47
49 22 and 48
50 24 or 26 or 28 or 30 or 32 or 34 or 36 or 38 or 49
51 exp animals/ not humans.sh.
52 50 not 51

Appendix 2 Data extraction template

General Information		
Reviewer		
Date form completed		
Form number		
Title of paper		
Lead author and year		
Author contact information		
Funding sources <i>(including role of funders)</i>		
Possible conflicts of interest <i>(for study authors)</i>		
Source of data	Description <i>(as in paper)</i>	Location <i>(page/figure/table)</i>
Source of data <i>(e.g., Questionnaire, Medical records – electronic, personal interviews)</i>		
Study period <i>(e.g. 2009-2017)</i>		
Participants	Description	Location
Age <i>(years, mean ± SD, range)</i>		
Inclusion criteria		
Exclusion criteria		

Recruitment method (e.g., consecutive participants)		
Location (e.g., Canada)		
Number of centres		
Setting (e.g. community, primary care, hospital)		
Outcomes to be predicted	Description	Location
Definition of outcome		
Was the same outcome definition used in all participants? (yes/no/unclear)		
Method of outcome measurement		
Was the same method of outcome measurement used in all participants? (yes/no/unclear)		
Type of outcome (e.g., single or combined endpoints)		
Was the outcome assessed without knowledge of the candidate predictors (i.e., blinded)? (yes/no/unclear)		
Were candidate predictors part of the outcome? (yes/no/unclear)		
Duration of follow-up (e.g., 30 days)		
Candidate predictors	Description	Location
Risk factors considered		
Risk factors included		
Sample size	Description	Location
Number of participants		
Number of outcomes		

Number of outcomes in relation to the number of candidate predictors (events per variable)		
Missing data	Description	Location
Number of participants with any missing value		
Handling of missing data (e.g., complete case analysis, imputation, other methods)		
Model development	Description	Location
Modelling method (e.g. logistic, survival, neural network or ML techniques)		
Modelling assumptions satisfied		
Method for selection of predictors for inclusion in modelling (e.g. all candidate predictors, pre-selection based on unadjusted association with outcome)		
Method for selection of predictors during multivariable modelling (e.g. full model approach, backward or forward selection) and criteria used - e.g. p-value, AIC, BIC)		
Shrinkage of predictor weights or regression coefficients (e.g. no shrinkage, uniform shrinkage, penalized estimation)		
Model performance and Results	Description	Location
Outcome measures (e.g., risk, relative risk, absolute risk difference, sensitivity, specificity, predictive values) – with 95% CI		
Area under the receiver operating characteristics AUC with 95% CI		
Discrimination (e.g., C-statistic, D-statistic, long-rank) – with 95% CI		

Calibration (e.g., calibration plot, calibration slope, Hosmer-Lemeshow test)		
Model Evaluation	Description	Location
Method used for testing model performance (development dataset only) <ul style="list-style-type: none"> · Random split of data; resampling methods e.g. bootstrap or cross-validation; or none) · Separate external validation (e.g. temporal, geographical, different setting, different investigators) 		
In case of poor validation, was model adjusted or updated e.g. intercept recalibrated, predictor effects adjusted, or new predictors added		
Interpretation and Discussion		
Notes: (e.g., comparison with other studies, discussion of generalisability, strengths and limitations)		