Tripod checklist: Model Prediction & Validation

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Topic	Item*		Checklist item	Thesis' section
Title & Abstract				
Title	1	D; V	Identify the study as developing and/or validating a multivariable prediction model, the target population, and the outcome to be predicted.	Title
Abstract	2	D; V	Provide a summary of objectives, study design, setting, participants, sample size, predictors, outcome, statistical analysis, results, and conclusions.	Abstract
Introduction				
Background & Objectives	3a	D; V	Explain the medical context (including whether diagnostic or prognostic) and rationale for developing or validating the multivariable prediction model, including references to existing models.	Introduction: Sections 1.1, 1.2
	3b	D; V	Specify the objectives, including whether the study describes the development or validation of the model or both.	Introduction: Section 1.3
Methods				
Source of data	4a	D; V	Describe the study design or source of data (e.g., randomized trial, cohort, or registry data), separately for the development and validation data sets, if applicable.	Methods: Section 2.1
	4b	D; V	Specify the key study dates, including start of accrual; end of accrual; and, if applicable, end of follow-up.	Methods: Section 2.3
Participants	5a	D; V	Specify key elements of the study setting (e.g., primary care, secondary care, general population) including number and location of centres.	Methods: Section 2.1
	5b	D; V	Describe eligibility criteria for participants	*Not available (no information was available*

				about eligibility criteria for patients to be included/excluded from PROM datasets)
	5c	D; V	Give details of treatments received, if relevant.	*Not applicable*
Outcome	6a	D; V	Clearly define the outcome that is predicted by the prediction model, including how and when assessed.	Methods: Section 2.4
	6b	D; V	Report any actions to blind assessment of the outcome to be predicted.	*Not applicable*
Predictors	7a	D; V	Clearly define all predictors used in developing or validating the multivariable prediction model, including how and when they were measured.	Methods: Section 2.3, Appendices: Appendix 12
	7b	D; V	Report any actions to blind assessment of predictors for the outcome and other predictors.	*Not applicable*
Sample size	8	D; V	Explain how the study size was arrived at.	*Not available (no attempt was done to estimate an optimal sample size)*
Missing data	9	D; V	Describe how missing data were handled (e.g., complete-case analysis, single imputation, multiple imputation) with details of any imputation method.	Methods: Section 2.3
Statistical analysis methods	10a	D	Describe how predictors were handled in the analyses.	Methods: Section 2.3; Appendix 12
	10b	D	Specify type of model, all model-building procedures (including any predictor selection), and method for internal validation.	Methods: Section 2.6.2; Appendix 1
	10c	V	For validation, describe how the predictions were calculated.	Methods: Section 2.6.3
	10d	D; V	Specify all measures used to assess model performance and, if relevant, to compare multiple models.	Methods: Section 2.6.3
	10e	V	Describe any model updating (e.g., recalibration) arising from the validation, if done.	*Not applicable*
Risk groups	11	D; V	Provide details on how risk groups were created, if done.	*Not applicable*

Development vs. validation	12	V	For validation, identify any differences from the development data in setting, eligibility criteria, outcome, and predictors.	*Not available*
Results				
Participants	13a	D; V	Describe the flow of participants through the study, including the number of participants with and without the outcome and, if applicable, a summary of the follow-up time. A diagram may be helpful.	Results: Sections 3.1 and 3.2
	13b	D; V	Describe the characteristics of the participants (basic demographics, clinical features, available predictors), including the number of participants with missing data for predictors and outcome.	Results: Section 3.2; Appendices 6-9, 13, 14
	13c	V	For validation, show a comparison with the development data of the distribution of important variables (demographics, predictors and outcome).	Results: Section 3.2
Model development	14a	D	Specify the number of participants and outcome events in each analysis	Results: Section 3.2
	14b	D	If done, report the unadjusted association between each candidate predictor and outcome.	*Not applicable*
Model specification	15a	D	Present the full prediction model to allow predictions for individuals (i.e., all regression coefficients, and model intercept or baseline survival at a given time point).	Partially reported. Predictors' importance for trained/tested models is available in Figure 11
	15b	D	Explain how to the use the prediction model.	*Not applicable*
Model performance	16	D; V	Report performance measures (with CIs) for the prediction model.	Partially reported. Results: Section 3.3
Model update	17	V	If done, report the results from any model updating (i.e., model specification, model performance).	*Not applicable*
Discussion				
Limitations	18	D; V	Discuss any limitations of the study (such as nonrepresentative sample, few events per predictor, missing data).	Discussion: Section 4.5

Interpretation	19a	V	For validation, discuss the results with reference to performance in the development data, and any other validation data.	Discussion: Sections 4.1, 4.2, 4.3
	19b	D; V	Give an overall interpretation of the results, considering objectives, limitations, results from similar studies, and other relevant evidence	Discussion
Other information				
Supplementary information	21	D; V	Provide information about the availability of supplementary resources, such as study protocol, Web calculator, and data sets.	Appendices
Funding	22	D; V	Give the source of funding and the role of the funders for the present study.	*Not applicable*

*Items relevant only to the development of a prediction model are denoted by D, items relating solely to a validation of a prediction model are denoted by V, and items relating to both are denoted D;V.