

TRIPOD Checklist: Prediction Model Development

Section	Item	Checklist description	Reported on Page Number/Line Number	Reported on Section/Paragraph
Title and abstract				
Title	1	Identify the study as developing and/or validating a multivariable prediction model, the target population, and the outcome to be predicted.	Page 2 Line 3-4	Title
Abstract	2	Provide a summary of objectives, study design, setting, participants, sample size, predictors, outcome, statistical analysis, results, and conclusions.	Page 2 Line 37-52	Abstract paras 1-3
Introduction				
Background and objectives	3a	Explain the medical context (including whether diagnostic or prognostic) and rationale for developing or validating the multivariable prediction model, including references to existing models.	Pages 2-3 Line 62-84	Intro paras 1-2
	3b	Specify the objectives, including whether the study describes the development or validation of the model or both.	Page 3 Line 85-88	Intro para 3
Methods				
Source of data	4a	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.	Pages 3-4 Line 94-107	Methods para 1
	4b	Specify the key study dates, including start of accrual; end of accrual; and, if applicable, end of follow-up.	Pages 3-4 Line 94-107	Methods para 1
Participants	5a	Specify key elements of the study setting (e.g., primary care, secondary care, general population) including number and location of centres.	Pages 3-4 Line 94-107	Methods para 1
	5b	Describe eligibility criteria for participants.	Pages 3-4 Line 94-111	Methods paras 1-2
	5c	Give details of treatments received, if relevant.	Pages 3-4 Line 94-111	Methods paras 1-2
Outcome	6a	Clearly define the outcome that is predicted by the prediction model, including how and when assessed.	Pages 3-4 Line 94-111	Methods paras 1-2
	6b	Report any actions to blind assessment of the outcome to be predicted.	NA	NA
Predictors	7a	Clearly define all predictors used in developing or validating the multivariable prediction model, including how and when they were measured.	Pages 4-5 Line 115-140	Methods paras 3-5
	7b	Report any actions to blind assessment of predictors for the outcome and other predictors.	NA	NA
Sample size	8	Explain how the study size was arrived at.	Page 5 Line 144-149	Methods para 6

Missing data	9	Describe how missing data were handled (e.g., complete-case analysis, single imputation, multiple imputation) with details of any imputation method.	NA	NA
Statistical analysis methods	10a	Describe how predictors were handled in the analyses.	Page 5 Line 144-155	Methods paras 6-7
	10b	Specify type of model, all model-building procedures (including any predictor selection), and method for internal validation.	Page 5 Line 144-155	Methods paras 6-7
	10d	Specify all measures used to assess model performance and, if relevant, to compare multiple models.	Page 5 Line 144-155	Methods paras 6-7
Risk groups	11	Provide details on how risk groups were created, if done.	NA	NA
Results				
Participants	13a	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.	Page 5 Line 161-168	Results para 1
	13b	Describe the characteristics of the participants (basic demographics, clinical features, available predictors), including the number of participants with missing data for predictors and outcome.	Pages 16-17 Line 435	Table 1
Model development	14a	Specify the number of participants and outcome events in each analysis.	Pages 5-6 Line 161-178 Line 435-443	Results Paras 1-3 Tables 1-3
	14b	If done, report the unadjusted association between each candidate predictor and outcome.	NA	NA
Model specification	15a	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).	Pages 5-6 Line 179-196 Line 426-434	Results Paras 4-5 Figure 2
	15b	Explain how to use the prediction model.	Pages 5-6 Line 188-196	Results Para 5
Model performance	16	Report performance measures (with CIs) for the prediction model.	Pages 5-6 Line 188-196 Line 419-425	Results Para 5 Figure 1
Discussion				
Limitations	18	Discuss any limitations of the study (such as nonrepresentative sample, few events per predictor, missing data).	Pages 9 Line 281-290	Discussion para 6
Interpretation	19b	Give an overall interpretation of the results, considering objectives, limitations, and results from similar studies, and other relevant evidence.	Pages 7-9 Line 205-274	Discussion paras 1-4
Implications	20	Discuss the potential clinical use of the model and implications for future research.	Page 9 Line 275-280	Discussion para 5
Other information				
Supplementary information	21	Provide information about the availability of supplementary resources, such as study protocol, Web calculator, and data sets.	Page 10 Line 309-319	Data Sharing Statement

Funding	22	Give the source of funding and the role of the funders for the present study.	Page 10 Line 301-302	Funding
---------	----	---	----------------------	---------

Article information: <https://dx.doi.org/10.21037/atm-21-4660>

*As the checklist was provided upon initial submission, the page number/line number reported may be changed due to copyediting and may not be referable in the published version. In this case, the section/paragraph may be used as an alternative reference.

