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 1/Line 2	Title
Abstract	2	Provide a summary of objectives, study design, setting, participants, sample size, predictors, outcome, statistical analysis, results, and conclusions.	Page 1-2/Line 23-52	Abstract
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.	Page 3/Line 87-91	Introduction/P 3
	3b	Specify the objectives, including whether the study describes the development or validation of the model or both.	Page 3/Line 87-91	Introduction/P 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, ifapplicable.	Page 3-4/Line 95-106	Methods/P 1
	4b	Specify the key study dates, including start of accrual; end of accrual; and, if applicable, end of follow-up.	N/A	N/A
Participants	5a	Specify key elements of the study setting (e.g., primary care, secondary care, general population) including number and location of centres.	N/A	N/A
	5b	Describe eligibility criteria for participants.	N/A	N/A
	5c	Give details of treatments received, if relevant.	N/A	N/A
Outcome	6a	Clearly define the outcome that is predicted by the prediction model, including how and when assessed.	Page 4-5/Line 119-140	Methods/P 3-4
	6b	Report any actions to blind assessment of the outcome to be predicted.	N/A	N/A
Predictors	7a	Clearly define all predictors used in developing or validating the multivariable prediction model, including how and when they were measured.	Page 4-5/Line 108-140	Methods/P 2-4
	7b	Report any actions to blind assessment of predictors for the outcome and other predictors.	N/A	N/A
Sample size	8	Explain how the study size was arrived at.	Page 3-4/Line 95-106	Methods/P 1

Missing data	9	Describe how missing data were handled (e.g., complete-case analysis, single imputation, multiple imputation) with details of any imputation method.	N/A	N/A
Statistical analysis methods	10a	Describe how predictors were handled in the analyses.	Page 4-5/Line 108-140	Methods/P 2-4
	10b	Specify type of model, all model-building procedures (including any predictor selection), and method for internal validation.	Page 4-5/Line 108-140	Methods/P 2-4
	10d	Specify all measures used to assess model performance and, if relevant, to compare multiple models.	Page 4-5/Line 119-140	Methods/P 3-4
Risk groups	11	Provide details on how risk groups were created, if done.	Page 4-5/Line 119-140	Methods/P 3-4
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.	N/A	N/A
	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.	N/A	N/A
Model development	14a	Specify the number of participants and outcome events in each analysis.	4, 546-554, 555-560, 562-567	Results/Figure 2-5
	14b	If done, report the unadjusted association between each candidate predictor and outcome.	Page 6-7/Line 187-208	Results/P 2
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).	Page 6-8/Line 187-236	Results/P 2-3
	15b	Explain how to the use the prediction model.	Page 8/Line 238-252	Results/P 4
Model performance	16	Report performance measures (with CIs) for the prediction model.	Page 8/Line 238-252	Results/P 4
Discussion				
Limitations	18	Discuss any limitations of the study (such as nonrepresentative sample, few events per predictor, missing data).	Page 12/Line 367-373	Conclusion/P 1
Interpretation	19b	Give an overall interpretation of the results, considering objectives, limitations, and results from similar studies, and other relevant evidence.	Page 9-12/Line 287-363	Discussion/P 1-2
Implications	20	Discuss the potential clinical use of the model and implications for future research.	Page 12/Line 367-373	Conclusion/P 1
Other information				
Supplementary information	21	Provide information about the availability of supplementary resources, such as study protocol, Web calculator, and data sets.	Page 12/Line 377	Acknowledgement
Funding	22	Give the source of funding and the role of the funders for the present study.	Page 12/Line 378-379	Acknowledgement

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