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 3-5	Title
Abstract	2	Provide a summary of objectives, study design, setting, participants, sample size, predictors, outcome, statistical analysis, results, and conclusions.	Page 2-3/Line 43-94	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 4/Line 114-125	Introduction/Paragraph 2
	3b	Specify the objectives, including whether the study describes the development or validation of the model or both.	Page3/Line 161-162	Introduction/Paragraph 5
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 6/Line 174-181	Methods/Paragraph 1
	4b	Specify the key study dates, including start of accrual; end of accrual; and, if applicable, end of follow-up.	Not Applicable	NA
Participants	5a	Specify key elements of the study setting (e.g., primary care, secondary care, general population) including number and location of centres.	Not Applicable	NA
	5b	Describe eligibility criteria for participants.	Page 6/Line 180-181	Methods/Paragraph 1
	5c	Give details of treatments received, if relevant.	Not Applicable	
Outcome	6a	Clearly define the outcome that is predicted by the prediction model, including how and when assessed.	Page 6-7/Line 201-207	Methods/Paragraph 3
	6b	Report any actions to blind assessment of the outcome to be predicted.	Not Applicable	
Predictors	7a	Clearly define all predictors used in developing or validating the multivariable prediction model, including how and when they were measured.	Page 7/Line 215-220	Methods/Paragraph 4
	7b	Report any actions to blind assessment of predictors for the outcome and other predictors.	Not Applicable	NA
Sample size	8	Explain how the study size was arrived at.	Not Applicable	NA

Missing data	9	Describe how missing data were handled (e.g., complete-case analysis, single imputation, multiple imputation) with details of any imputation method.	Page 6/Line 180-181	Methods/Paragraph 1
Statistical analysis methods	10a	Describe how predictors were handled in the analyses.	Page 6-7/Line 201-205	Methods/Paragraph 3
	10b	Specify type of model, all model-building procedures (including any predictor selection), and method for internal validation.	Page 6-7/Line 201-220	Methods/Paragraph 3
	10d	Specify all measures used to assess model performance and, if relevant, to compare multiple models.	Page 7/Line 210-215	Methods/Paragraph 3
Risk groups	11	Provide details on how risk groups were created, if done.	Page 7/Line 206-207	Methods/Paragraph 3
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.	Figure 1	Figure 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.	Page 9/Line 289-292	Results/Paragraph 1
Model development	14a	Specify the number of participants and outcome events in each analysis.	Page 9/Line 289-292	Results/Paragraph 1
	14b	If done, report the unadjusted association between each candidate predictor and outcome.	Not Applicable	
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 10/Line 320-324	Resluts/Paragraph 3
	15b	Explain how to the use the prediction model.	Page 10/Line 281-284	Resluts/Paragraph 3
Model performance	16	Report performance measures (with CIs) for the prediction model.	Page 10/Line 330-334	Resluts/Paragraph 3
Discussion				
Limitations	18	Discuss any limitations of the study (such as nonrepresentative sample, few events per predictor, missing data).	Page 17/Line 543-548	Disscussion/Paragraph 6
Interpretation	19b	Give an overall interpretation of the results, considering objectives, limitations, and results from similar studies, and other relevant evidence.	Page 15/Line 502-505	Discussion/Paragraph 3
Implications	20	Discuss the potential clinical use of the model and implications for future research.	Page 17/Line 549-551	Discussion/Paragraph 7
Other information				
Supplementary information	21	Provide information about the availability of supplementary resources, such as study protocol, Web calculator, and data sets.	Page 17/Line 554-555	Data availability statement/Paragraph 1
Funding	22	Give the source of funding and the role of the funders for the present study.	Page 17/Line 559-560	Funding/Paragraph 1

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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.