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 1-2	Title
Abstract	2	Provide a summary of objectives, study design, setting, participants, sample size, predictors, outcome, statistical analysis, results, and conclusions.	Page 1/Line 13-27	Abstract/Paragraph 1
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 2/Line 46-67	Introduction/Paragraph 1-3
	3b	Specify the objectives, including whether the study describes the development or validation of the model or both.	Page 2/Line 68-69	Introduction/Paragraph 4
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 2/Line 72-80	Materials and Methods/Paragraph 1
	4b	Specify the key study dates, including start of accrual; end of accrual; and, if applicable, end of follow-up.	This is not the specific type of study.	This is not the specific type of study.
Participants	5a	Specify key elements of the study setting (e.g., primary care, secondary care, general population) including number and location of centres.	This is not the specific type of study.	This is not the specific type of study.
	5b	Describe eligibility criteria for participants.	This is not the specific type of study.	This is not the specific type of study.
	5c	Give details of treatments received, if relevant.	This is not the specific type of study.	This is not the specific type of study.
Outcome	6a	Clearly define the outcome that is predicted by the prediction model, including how and when assessed.	Page 2-4/Line 82-136	Materials and Methods/Paragraph 2-9
	6b	Report any actions to blind assessment of the outcome to be predicted.	This is not the specific type of study.	This is not the specific type of study.
Predictors	7a	Clearly define all predictors used in developing or validating the multivariable prediction model, including how and when they were measured.	Page 3-4/Line 127-136	Materials and Methods/Paragraph 8
	7b	Report any actions to blind assessment of predictors for the outcome and other predictors.	This is not the specific type of study.	This is not the specific type of study.
Sample size	8	Explain how the study size was arrived at.	Page 2/Line 72-79	Materials and Methods/Paragraph 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.	Page 2/Line 72-80	Materials and Methods/Paragraph 1
Statistical analysis methods	10a	Describe how predictors were handled in the analyses.	Page 2-4/Line 82-136	Materials and Methods/Paragraph 2-9
	10b	Specify type of model, all model-building procedures (including any predictor selection), and method for internal validation.	Page 2-3/Line 82-107	Materials and Methods/Paragraph 2-4
	10d	Specify all measures used to assess model performance and, if relevant, to compare multiple models.	Page 3-4/Line 109-136	Materials and Methods/Paragraph 5-9
Risk groups	11	Provide details on how risk groups were created, if done.	Page 3/Line 96-97	Materials and 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.	Page 4/Line 145-164	Results/Paragraph 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.	Table 1	Table 1
Model development	14a	Specify the number of participants and outcome events in each analysis.	Page 4-6/Line 145-237	Results/Paragraph 1-7
	14b	If done, report the unadjusted association between each candidate predictor and outcome.	Page 4/Line 147-167	Results/Paragraph1
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 4/Line 158-162	Results/Paragraph 1
	15b	Explain how to the use the prediction model.	Page 6/Line 226-237	Results/Paragraph 7
Model performance	16	Report performance measures (with CIs) for the prediction model.	Page 4-6/Line 164-237	Results/Paragraph 1-7
Discussion				
Limitations	18	Discuss any limitations of the study (such as nonrepresentative sample, few events per predictor, missing data).	Page 7-8/Line 306-310	Discussion/Paragraph 8
Interpretation	19b	Give an overall interpretation of the results, considering objectives, limitations, and results from similar studies, and other relevant evidence.	Page 7-8/Line 251-305	Discussion/Paragraph 3-7
Implications	20	Discuss the potential clinical use of the model and implications for future research.	Page 7/Line 277-299	Discussion/Paragraph 6
Other information				
Supplementary information	21	Provide information about the availability of supplementary resources, such as study protocol, Web calculator, and data sets.	Page 8/Line 324-325	Data Availability Statement/Paragraph 1
Funding	22	Give the source of funding and the role of the funders for the present study.	Page 8/Line 322	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 copyediting and may not be referable in the published version. In this case, the section/paragraph may be used as an alternative reference.