STROBE Statement—checklist of items that should be included in reports of observational studies

Section/item	Item No	Recommendation	Reported on Page Number/Line Number	Reported on Section/Paragraph
Title and abstract	1	(a) Indicate the study's design with a commonly used term in the title or the abstract	Page 1/Line 1-3	Title/Paragraph 1
		(b) Provide in the abstract an informative and balanced summary of what was done and what was found	Page 3/Line 38-Page 4/Line 67	Abstract/Paragraph 1-4
Introduction				
Background/ rationale	2	Explain the scientific background and rationale for the investigation being reported	Page 5−6/Line 77-Line 109	Introduction/Paragraph 1−2
Objectives	3	State specific objectives, including any prespecified hypotheses	Page 6/Line 100-109	Introduction/Paragraph 2
Methods				
Study design	4	Present key elements of study design early in the paper	Page 6/Line 114-152	Methods/Paragraph 1
Setting	5	Describe the setting, locations, and relevant dates, including periods of recruitment, exposure, follow-up, and data collection	Page 6/Line 114-118	Methods/Paragraph 1
Participants	6	(a) ***Cohort study***—Give the eligibility criteria, and the sources and methods of selection of participants. Describe methods of follow-up ***Case-control study***—Give the eligibility criteria, and the sources and methods of case ascertainment and control selection. Give the rationale for the choice of cases and controls ***Cross-sectional study***—Give the eligibility criteria, and the sources and methods of selection of participants	Page 7/Line 114-166	Methods/Paragraph 2-3
		(b) ***Cohort study***—For matched studies, give matching criteria and number of exposed and unexposed ***Case-control study***—For matched studies, give matching criteria and the number of controls per case	N/A	N/A
Variables	7	Clearly define all outcomes, exposures, predictors, potential confounders, and effect modifiers. Give diagnostic criteria, if applicable	Page 8-Page 9/Line 169-198	Methods/Paragraph 4
Data sources/ measurement	8*	For each variable of interest, give sources of data and details of methods of assessment (measurement). Describe comparability of assessment methods if there is more than one group	Page 8-Page 9/Line 169-198	Methods/Paragraph 5
Bias	9	Describe any efforts to address potential sources of bias	N/A	N/A
Study size	10	Explain how the study size was arrived at	Page 6/Line 114-118	Methods/Paragraph 1
Quantitative variables	11	Explain how quantitative variables were handled in the analyses. If applicable, describe which groupings were chosen and why	Page 8−9/Line 180-198	Methods/Paragraph 4-5

Statistical methods	12	(a) Describe all statistical methods, including those used to control for confounding	Page 9/Line 200−211	Methods/Paragraph 6
		(b) Describe any methods used to examine subgroups and interactions	N/A	N/A
		(c) Explain how missing data were addressed	Because of missing data was excluded. Hence, not available.	N/A
		(d) ***Cohort study***—If applicable, explain how loss to follow-up was addressed ***Case-control study***—If applicable, explain how matching of cases and controls was addressed ***Cross-sectional study***—If applicable, describe analytical methods taking account of sampling strategy	Page 9−10/Line 215-233	Methods/Paragraph 7
		(e) Describe any sensitivity analyses	N/A	N/A
Results				
Participants	13*	(a) Report numbers of individuals at each stage of study—eg numbers potentially eligible, examined for eligibility, confirmed eligible, included in the study, completing follow-up, and analysed	Page 10/Line 237	Results/Paragraph 1
		(b) Give reasons for non-participation at each stage	N/A	N/A
		(c) Consider use of a flow diagram	Page 10/Line 237, available at Fig.1	Results/Paragraph 1
Descriptive data	14*	(a) Give characteristics of study participants (eg demographic, clinical, social) and information on exposures and potential confounders	Page 10/Line 237-241. available at Table.1	Results/Paragraph 1
		(b) Indicate number of participants with missing data for each variable of interest	Because of missing data was excluded. Hence, not available.	N/A
		(c) ***Cohort study***—Summarise follow-up time (eg, average and total amount)	N/A	N/A
Outcome data	15*	***Cohort study***—Report numbers of outcome events or summary measures over time	N/A	N/A
		Case-control study—Report numbers in each exposure category, or summary measures of exposure	N/A	N/A
		Cross-sectional study—Report numbers of outcome events or summary measures	Page 10/Line 237−250, available at Table 1/2	Results/Paragraph 1−2
Main results	16	(a) Give unadjusted estimates and, if applicable, confounder-adjusted estimates and their precision (eg, 95% confidence interval). Make clear which confounders were adjusted for and why they were included	Page 11/Line 257-267 Page 11−12/Line 269-286 Page 12/Line 288-296	Result/Paragraph 3-5
		(b) Report category boundaries when continuous variables were categorized	N/A	N/A
		(c) If relevant, consider translating estimates of relative risk into absolute risk for a meaningful time period	N/A	N/A
Other analyses	17	Report other analyses done—eg analyses of subgroups and interactions, and sensitivity analyses	N/A	N/A
Discussion				
Key results	18	Summarise key results with reference to study objectives	Page 15/Line 370-382	Discussion/Paragraph 1

Limitations	19	Discuss limitations of the study, taking into account sources of potential bias or imprecision. Discuss both direction and magnitude of any potential bias	Page18/Line 516-530	Discussion/Paragraph 8
Interpretation	20	Give a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies, and other relevant evidence	Page 15-17/Line 383−456	Discussion/Paragraph 2-5
Generalisability	21	Discuss the generalisability (external validity) of the study results	Page 17/Line 500-515	Discussion/Paragraph 7
Other information				
Funding	22	Give the source of funding and the role of the funders for the present study and, if applicable, for the original study on which the present article is based	Page 20/Line 540-546	Acknowledgement/Paragrah 1−2

TRIPOD Checklist: Prediction Model Development and Validation

Section	Item		Checklist description	Reported on Page Number/Line Number	Reported on Section/Paragraph
Title and 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.	NA	NA
Abstract	2	D;V	Provide a summary of objectives, study design, setting, participants, sample size, predictors, outcome, statistical analysis, results, and conclusions.	Page 3/Line 38-67	Abstract/Paragraph 1-4
Introduction					
Background and 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.	Page 6−7/Line 77-106	Introduction/Paragraph 2
	3b	D;V	Specify the objectives, including whether the study describes the development or validation of the model or both.	NA	NA
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, ifapplicable.	Page 6/Line 114-118	Methods/Paragraph 1
	4b	D;V	Specify the key study dates, including start of accrual; end of accrual; and, if applicable, end of follow-up.	Page 6/Line 115	Methods/Paragraph 1
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.	N/A	N/A

	5b	D;V	Describe eligibility criteria for participants.	Page 7/Line 155-166	Methods/Paragraph 2−3
	5c	D;V	Give details of treatments received, if relevant.	N/A	N/A
Outcome	6a	D;V	Clearly define the outcome that is predicted by the prediction model, including how and when assessed.	N/A	N/A
	6b	D;V	Report any actions to blind assessment of the outcome to be predicted.	N/A	N/A
Predictors	7a	D;V	Clearly define all predictors used in developing or validating the multivariable prediction model, including how and when they were measured.	N/A	N/A
	7b	D;V	Report any actions to blind assessment of predictors for the outcome and other predictors.	N/A	N/A
Sample size	8	D;V	Explain how the study size was arrived at.	Page 6/Line 114-118	Methods/Paragraph 1

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.	Because of missing data was excluded. Hence, not available.	N/A
Statistical analysis methods	10a	D	Describe how predictors were handled in the analyses.	Page 9/Line 201-211	Methods/Paragraph 7
	10b	D	Specify type of model, all model-building procedures (including any predictor selection), and method for internal validation.	N/A	N/A
	10c	V	For validation, describe how the predictions were calculated.	N/A	N/A
	10d	D;V	Specify all measures used to assess model performance and, if relevant, to compare multiple models.	N/A	N/A
	10e	V	Describe any model updating (e.g., recalibration) arising from the validation, if done.	N/A	N/A
Risk groups	11	D;V	Provide details on how risk groups were created, if done.	N/A	N/A
Development vs. validation	12	V	For validation, identify any differences from the development data in setting, eligibility criteria, outcome, and predictors.	N/A	N/A
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.	Page 10/Line 237	Result/Paragraph 1
	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.	Page 10/Line 237-241	Result/Paragraph 1
	13c	V	For validation, show a comparison with the development data of the distribution of important variables (demographics, predictors and outcome).	N/A	N/A
Model development	14a	D	Specify the number of participants and outcome events in each analysis.	Page 10/Line 244 Page 11/Line 257 Page 11/Line 269 Page 12/Line 288	Result/Paragraph 1-5
	14b	D	If done, report the unadjusted association between each candidate predictor and outcome.	N/A	N/A
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).	Page 13/Line 313 Page 13/Line 320 Page 13/Line 330 Page 14/Line 347 Page 14/Line 355	Result/Paragraph 7 Result/Paragraph 8 Result/Paragraph 9 Result/Paragraph 10 Result/Paragraph 11
	15b	D	Explain how to the use the prediction model.	Page 12/Line 297-305	Result/Paragraph 6
Model performance	16	D;V	Report performance measures (with CIs) for the prediction model.	Page 13/Line 314−318 Page 13/Line 321-326 Page 13−14/Line 340−343 Page 14/Line 348-352 Page 14−15/Line 356-360	Result/Paragraph 7 Result/Paragraph 8 Result/Paragraph 9 Result/Paragraph 10 Result/Paragraph 11

Model-updating	17	V	If done, report the results from any model updating (i.e., model specification, model performance).	N/A	N/A
Discussion					
Limitations	18	D;V	Discuss any limitations of the study (such as nonrepresentative sample, few events per predictor, missing data).	Page18/Line 444-452	Discussion/Paragraph 6
Interpretation	19a	V	For validation, discuss the results with reference to performance in the development data, and any other validation data.	N/A	N/A
	19b	D;V	Give an overall interpretation of the results, considering objectives, limitations, and results from similar studies, and other relevant evidence.	Page 15-17/Line 316-413	Discussion/Paragraph 3-4
Implications	20	D;V	Discuss the potential clinical use of the model and implications for future research.	Page 19/Line 506-515	Discussion/Paragraph 7
Other information					
Supplementary information	21	D;V	Provide information about the availability of supplementary resources, such as study protocol, Web calculator, and data sets.	N/A	N/A
Funding	22	D;V	Give the source of funding and the role of the funders for the present study.	Page 20/Line 543-546	Acknowledgement/Paragraph 2

* 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. We recommend using the TRIPOD Checklist in conjunction with the TRIPOD Explanation and Elaboration document.

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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.