## TRIPOD Checklist: Prediction Model Development

| Section                        | Item | Checklist description                                                                 | Reported on Page Number/Line Number | Reported on Section/Paragraph |
|-------------------------------|------|----------------------------------------------------------------------------------------|-------------------------------------|------------------------------|
| **Title and abstract**        | 1    | Identify the study as developing and/or validating a multivariable prediction model, the target population, and the outcome to be predicted. | Page1/Line3-5                      | Title/Paragraph1             |
|                               | 2    | Provide a summary of objectives, study design, setting, participants, sample size, predictors, outcome, statistical analysis, results, and conclusions. | Page2/Line3-29                     | Abstract/Paragraph1-4        |
| **Introduction**              | 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. | Page3/Line5-20                     | Introduction/Paragraph1     |
|                               | 3b   | Specify the objectives, including whether the study describes the development or validation of the model or both. | Page3/Line21-24                    | Introduction/Paragraph2     |
| **Methods**                   | 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. | Page4/Line1-3                      | Methods/Paragraph1           |
|                               | 4b   | Specify the key study dates, including start of accrual; end of accrual; and, if applicable, end of follow-up. | Page4/Line6-8                      | Methods/Paragraph2           |
| **Participants**              | 5a   | Specify key elements of the study setting (e.g., primary care, secondary care, general population) including number and location of centres. | Page4/Line6-16                     | Methods/Paragraph2           |
|                               | 5b   | Describe eligibility criteria for participants.                                         | Page4/Line6-16                     | Methods/Paragraph2           |
|                               | 5c   | Give details of treatments received, if relevant.                                      | Page4/Line6-16                     | Methods/Paragraph2           |
| **Outcome**                   | 6a   | Clearly define the outcome that is predicted by the prediction model, including how and when assessed. | Page4/Line19-26                    | Methods/Paragraph3           |
|                               | 6b   | Report any actions to blind assessment of the outcome to be predicted.                  | Page4/Line19-26                    | Methods/Paragraph3           |
| **Predictors**                | 7a   | Clearly define all predictors used in developing or validating the multivariable prediction model, including how and when they were measured. | Page4/Line27-31                    | Methods/Paragraph4           |
|                               | 7b   | Report any actions to blind assessment of predictors for the outcome and other predictors. | Page4/Line27-31                    | Methods/Paragraph4           |
| **Sample size**               | 8    | Explain how the study size was arrived at.                                              | Page5/Line1-2                      | Methods/Paragraph4           |
| Section                      | Line | Content                                                                 | Page/Line/Area | Reference/Paragraph |
|------------------------------|------|-------------------------------------------------------------------------|----------------|---------------------|
| Missing data                 | 9    | Describe how missing data were handled (e.g., complete-case analysis, single imputation, multiple imputation) with details of any imputation method. | Page4/Line19-26 | Methods/Paragraph3  |
| Statistical analysis methods | 10a  | Describe how predictors were handled in the analyses.                    | Page4/Line19-26 | Methods/Paragraph3  |
|                              | 10b  | Specify type of model, all model-building procedures (including any predictor selection), and method for internal validation. | Page4/Line19-26 | Methods/Paragraph3  |
|                              | 10d  | Specify all measures used to assess model performance and, if relevant, to compare multiple models. | Page4/Line19-26 | Methods/Paragraph3  |
| Risk groups                  | 11   | Provide details on how risk groups were created, if done.                 | Page4/Line19-26 | Methods/Paragraph3  |
| 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. | Page5/Line7-8  | Results/Paragraph1  |
|                              | 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. | Page5/Line8-13 | Results/Paragraph1  |
| Model development            | 14a  | Specify the number of participants and outcome events in each analysis.   | Page5/Line7-13 | Results/Paragraph1  |
|                              | 14b  | If done, report the unadjusted association between each candidate predictor and outcome. | Page5/Line16-20 | Results/Paragraph2  |
| 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). | Page5/Line20-25 | Results/Paragraph2  |
|                              | 15b  | Explain how to the use the prediction model.                             | Page5/Line28-30 | Results/Paragraph3  |
| Model performance            | 16   | Report performance measures (with CIs) for the prediction model.          | Page5/Line30-31,Page6/Li | Results/Paragraph3  |
| Discussion                   | 18   | Discuss any limitations of the study (such as nonrepresentative sample, few events per predictor, missing data). | Page6/Line19   | Discussion/Paragraph2 |
| Interpretation               | 19b  | Give an overall interpretation of the results, considering objectives, limitations, and results from similar studies, and other relevant evidence. | Page6/Line5-18 | Discussion/Paragraph1 |
| Implications                 | 20   | Discuss the potential clinical use of the model and implications for future research. | Page6/Line21-26 | Discussion/Paragraph2 |
| Other information            | 21   | Provide information about the availability of supplementary resources, such as study protocol, Web calculator, and data sets. | Page4/Line1-2  | Methods/Paragraph1  |
| Funding                      | 22   | Give the source of funding and the role of the funders for the present study. | N/A            | NO FUNDING          |
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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.