### 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                    | N/A (not the main text)      |
| Abstract                         | 2    | Provide a summary of objectives, study design, setting, participants, sample size, predictors, outcome, statistical analysis, results, and conclusions.                                                                                                                                                                                                    | Page 2, 3/Line 32-51              | N/A (not the main text)      |
| **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 3-5/Line 55-90               | Section 1/Paragraph 1-2      |
|                                  | 3b   | Specify the objectives, including whether the study describes the development or validation of the model or both.                                                                                                                                                                                                                                          | Page 5/Line 91-92                 | Section 1/Paragraph 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, if applicable.                                                                                                                                                                                               | Page 5/Line 99-100                | Section 2/Paragraph 4        |
|                                  | 4b   | Specify the key study dates, including start of accrual; end of accrual; and, if applicable, end of follow-up.                                                                                                                                                                                                                                          | Page 5/Line 99-100                | Section 2/Paragraph 4        |
| Participants                     | 5a   | Specify key elements of the study setting (e.g., primary care, secondary care, general population) including number and location of centres.                                                                                                                                                                                                               | Page 5/Line 99-100                | Section 2/Paragraph 4        |
|                                  | 5b   | Describe eligibility criteria for participants.                                                                                                                                                                                                                                                                                                          | Page 5/Line 100-103               | Section 2/Paragraph 4        |
|                                  | 5c   | Give details of treatments received, if relevant.                                                                                                                                                                                                                                                                                                     | N/A (N/A description)             | N/A (N/A description)        |
| Outcome                          | 6a   | Clearly define the outcome that is predicted by the prediction model, including how and when assessed.                                                                                                                                                                                                                                                   | Page 5/Line 103-107               | Section 2/Paragraph 4        |
|                                  | 6b   | Report any actions to blind assessment of the outcome to be predicted.                                                                                                                                                                                                                                                                                  | Page 5/Line 103-107               | Section 2/Paragraph 4        |
| Predictors                       | 7a   | Clearly define all predictors used in developing or validating the multivariable prediction model, including how and when they were measured.                                                                                                                                                                                                              | Page 5/Line 103-107               | Section 2/Paragraph 4        |
|                                  | 7b   | Report any actions to blind assessment of predictors for the outcome and other predictors.                                                                                                                                                                                                                                                             | Page 5/Line 103-107               | Section 2/Paragraph 4        |
| Sample size                      | 8    | Explain how the study size was arrived at.                                                                                                                                                                                                                                                                                                           | Page 5/Line 99-100                | Section 2/Paragraph 4        |
| Section | Page | Line | Description |
|---------|------|------|-------------|
| **Missing data** | 9    |      | Describe how missing data were handled (e.g., complete-case analysis, single imputation, multiple imputation) with details of any imputation method. |
| **Statistical analysis methods** | 10a  |      | Describe how predictors were handled in the analyses. |
|          | 10b  |      | Specify type of model, all model-building procedures (including any predictor selection), and method for internal validation. |
|          | 10d  |      | Specify all measures used to assess model performance and, if relevant, to compare multiple models. |
| **Risk groups** | 11   |      | Provide details on how risk groups were created, if done. |
| **Results** | 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. |
|          | 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. |
| **Model development** | 14a  |      | Specify the number of participants and outcome events in each analysis. |
|          | 14b  |      | If done, report the unadjusted association between each candidate predictor and outcome. |
| **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). |
|          | 15b  |      | Explain how to use the prediction model. |
| **Model performance** | 16   |      | Report performance measures (with CIs) for the prediction model. |
| **Discussion** | 18   |      | Discuss any limitations of the study (such as nonrepresentative sample, few events per predictor, missing data). |
| **Interpretation** | 19b  |      | Give an overall interpretation of the results, considering objectives, limitations, and results from similar studies, and other relevant evidence. |
| **Implications** | 20   |      | Discuss the potential clinical use of the model and implications for future research. |
| **Other information** | 21   |      | Provide information about the availability of supplementary resources, such as study protocol, Web calculator, and data sets. |
|          | 22   |      | Give the source of funding and the role of the funders for the present study. |
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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.