### 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. | 1/3-5                             | Title page                    |
| Abstract                         | 2    | Provide a summary of objectives, study design, setting, participants, sample size, predictors, outcome, statistical analysis, results, and conclusions. | 2/27-52                           | 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. | 3-4/62-94                         | Introduction                  |
|                                  | 3b   | Specify the objectives, including whether the study describes the development or validation of the model or both. | 4/96-103                          | Introduction                  |
| **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. | 4-5/107-127                       | Methods/Study design and data source |
|                                  | 4b   | Specify the key study dates, including start of accrual; end of accrual; and, if applicable, end of follow-up. | 5/112-122                         | Methods/Study design and data source |
| Participants                     | 5a   | Specify key elements of the study setting (e.g., primary care, secondary care, general population) including number and location of centres. | 4-5/107-127                       | Methods/Study design and data source |
|                                  | 5b   | Describe eligibility criteria for participants.                                         | 5/122-124                         | Methods/Study design and data source |
|                                  | 5c   | Give details of treatments received, if relevant.                                         | N.A.                               | N.A.                          |
| Outcome                          | 6a   | Clearly define the outcome that is predicted by the prediction model, including how and when assessed. | 5/130-132                         | Method/Outcomes               |
|                                  | 6b   | Report any actions to blind assessment of the outcome to be predicted.                   | N.A.                               | N.A.                          |
| Predictors                       | 7a   | Clearly define all predictors used in developing or validating the multivariable prediction model, including how and when they were measured. | 5-7/139-175                       | Methods/Candidate risk predictors |
|                                  | 7b   | Report any actions to blind assessment of predictors for the outcome and other predictors. | N.A.                               | N.A.                          |
| Sample size                      | 8    | Explain how the study size was arrived at.                                               | 5/120-124                         | Method/Study design and data source |
| Section                        | Table Numbers | Notes                                          |
|-------------------------------|---------------|-----------------------------------------------|
| 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                       |               |                                               |
| 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. |
|                               | 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             |               |                                               |
| Supplementary information     | 21            | Provide information about the availability of supplementary resources, such as study protocol, Web calculator, and data sets. |
| Funding                       | 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.