## 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 3/Line 37-58                  | 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. | Page 4-5/Line 63-87                | Introduction/Para 1-3         |
|                        | 3b   | Specify the objectives, including whether the study describes the development or validation of the model or both. | Page 6/Line 87-90                  | Introduction/Para 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 98-101                 | Materials and methods/Para 2  |
|                        | 4b   | Specify the key study dates, including start of accrual; end of accrual; and, if applicable, end of follow-up. | Page 5/Line 98-101                 | Materials and methods/Para 2  |
| 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 98-104                 | Materials and methods/Para 2  |
|                        | 5b   | Describe eligibility criteria for participants.                                       | Page 5-6/Line 104-116              | Materials and methods/Para 2-3|
|                        | 5c   | Give details of treatments received, if relevant.                                      | Page 6/Line 125-128                | Materials and methods/Para 4  |
| Outcome                | 6a   | Clearly define the outcome that is predicted by the prediction model, including how and when assessed. | Page 6/Line 129-132                | Materials and methods/Para 5  |
|                        | 6b   | Report any actions to blind assessment of the outcome to be predicted.                  | NA                                  | NA                           |
| Predictors | 7a | Clearly define all predictors used in developing or validating the multivariable prediction model, including how and when they were measured. | Page 6-Line 118-128 | Materials and methods/Para 4 |
|------------|----|---------------------------------------------------------------------------------------------------------------------------------|----------------------|-------------------------------|
| 7b         |    | Report any actions to blind assessment of predictors for the outcome and other predictors.                                                                                                   | NA                   | NA                            |

| Sample size | 8  | Explain how the study size was arrived at.                                                                                                                                             | Page 5-Line 98-104   | Materials and methods/Para 2  |

| Missing data | 9  | Describe how missing data were handled (e.g., complete-case analysis, single imputation, multiple imputation) with details of any imputation method. | NA                   | NA                            |

| Statistical analysis methods | 10a | Describe how predictors were handled in the analyses.                                                                                                                                     | Page 6-7-Line 134-145 | Materials and methods/Para 6  |
|                             | 10b | Specify type of model, all model-building procedures (including any predictor selection), and method for internal validation.                                                                 | Page 6-7-Line 134-145 | Materials and methods/Para 6  |
|                             | 10d | Specify all measures used to assess model performance and, if relevant, to compare multiple models.                                                                                       | Page 7-Line 142-145   | Materials and methods/Para 6  |

| Risk groups | 11  | Provide details on how risk groups were created, if done.                                                                                                                                  | Page 5-Line 101-103   | Materials and methods/Para 2  |

### 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 7-Line 150-151   | Results/Para 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. | Page 7-Line 151-159   | Results/Para 1  |

| Model development | 14a | Specify the number of participants and outcome events in each analysis.                                                                                                                  | Page 7-Line 151-157   | Results/Para 1  |
|                  | 14b | If done, report the unadjusted association between each candidate predictor and outcome.                                                                                                     | NA                   | NA              |

| 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 7-8-Line 160-169 | Results/Para 2  |
|                    | 15b | Explain how to use the prediction model.                                                                                                                                                   | Page 18-Line 379-384 | Figure legends  |

| Model performance | 16  | Report performance measures (with CIs) for the prediction model.                                                                                                                         | Page 8-Line 170-187   | Results/Para 3-5 |
| Discussion         | 18 | Discuss any limitations of the study (such as nonrepresentative sample, few events per predictor, missing data). | Page 11/Line 258-261 | Discussion/Para 6 |
|--------------------|----|-------------------------------------------------------------------------------------------------|----------------------|-------------------|
| Interpretation     | 19b| Give an overall interpretation of the results, considering objectives, limitations, and results from similar studies, and other relevant evidence. | Page 9-11/Line 190-249 | Discussion/Para 1-4 |
| Implications       | 20 | Discuss the potential clinical use of the model and implications for future research.              | Page 9.11-12/Line 190-204,256-263 | Discussion/Para 1,6 |

**Other information**

| Supplementary information | 21 | Provide information about the availability of supplementary resources, such as study protocol, Web calculator, and data sets. | Page 13/Line 279 | Footnote/para 2 |
|---------------------------|----|-------------------------------------------------------------------------------------------------|------------------|------------------|
| Funding                   | 22 | Give the source of funding and the role of the funders for the present study.                   | Page 13/Line 271-274 | Acknowledgments/para 1-2 |

Blind assessment is not available, because our study is retrospective. Missing data is not available, because the patients whose medical data was not complete are excluded.

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*As the checklist was provided upon initial submission, the page number/line number reported may be changed due to copy editing and may not be referable in the published version. In this case, the section/paragraph may be used as an alternative reference.
