## 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.                                                                           | 1 page/1-2 line                    | title/paragraph 1            |
| **Abstract**                   | 2    | Provide a summary of objectives, study design, setting, participants, sample size, predictors, outcome, statistical analysis, results, and conclusions.                                                              | 1 page/11-31 line                  | abstract/paragraph 1-4      |
| **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.                        | 1 page/34-45 line                  | introduction/paragraph 1    |
| **Background and objectives**  | 3b   | Specify the objectives, including whether the study describes the development or validation of the model or both.                                                                                                | 1 page/55-58 lines                 | introduction/paragraph 3    |
| **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.                                          | 2 page/61-69 lines                 | materials and methods/paragraph 1 |
| **Source of data**             | 4b   | Specify the key study dates, including start of accrual; end of accrual; and, if applicable, end of follow-up.                                                                                                    | 2 page/61-69 lines                 | materials and methods/paragraph 1 |
| **Participants**               | 5a   | Specify key elements of the study setting (e.g., primary care, secondary care, general population) including number and location of centres.                                                                     | 2 page/61-69 lines                 | materials and methods/paragraph 1 |
| **5b**                         |      | Describe eligibility criteria for participants.                                                                                                                                                                      | 2 page/61-69 lines                 | materials and methods/paragraph 1 |
| **5c**                         |      | Give details of treatments received, if relevant.                                                                                                                                                                    | NA                                 | NA                          |
| **Outcome**                    | 6a   | Clearly define the outcome that is predicted by the prediction model, including how and when assessed.                                                                                                           | 3 page/84-86 lines                 | materials and methods/paragraph 3 |
| **6b**                         |      | Report any actions to blind assessment of the outcome to be predicted.                                                                                                                                             | 2-3 pages/73-86 lines              | materials and methods/paragraph 2 |
| **Predictors**                 | 7a   | Clearly define all predictors used in developing or validating the multivariable prediction model, including how and when they were measured.                                                                    | 2-3 pages/73-84 lines              | materials and methods/paragraph 2 |
| **7b**                         |      | Report any actions to blind assessment of predictors for the outcome and other predictors.                                                                                                                         | 2-3 pages/73-86 lines              | materials and methods/paragraph 2 |
| **Sample size**                | 8    | Explain how the study size was arrived at.                                                                                                                                                                          | page 2 lines 61-70                 | materials and methods/paragraph 1 |
| Section | Page | 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 | | |
| 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 | 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. |
Article information: https://dx.doi.org/10.21037/atm-21-5574
*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.