| Section                      | Item | Checklist description                                                                                   | Reported on Page Number/Line Number | Reported on Section/Paragraph |
|------------------------------|------|--------------------------------------------------------------------------------------------------------|------------------------------------|------------------------------|
| Title and abstract           | Title| Identify the study as developing and/or validating a multivariable prediction model, the target population, and the outcome to be predicted. |                                    |                              |
| Abstract                     | 2    | Provide a summary of objectives, study design, setting, participants, sample size, predictors, outcome, statistical analysis, results, and conclusions. |                                    |                              |
| 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. |                                    |                              |
|                              | 3b   | Specify the objectives, including whether the study describes the development or validation of the model or both. |                                    |                              |
| 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. |                                    |                              |
|                              | 4b   | Specify the key study dates, including start of accrual; end of accrual; and, if applicable, end of follow-up. |                                    |                              |
| Participants                 | 5a   | Specify key elements of the study setting (e.g., primary care, secondary care, general population) including number and location of centres. |                                    |                              |
|                              | 5b   | Describe eligibility criteria for participants.                                                        |                                    |                              |
|                              | 5c   | Give details of treatments received, if relevant.                                                      |                                    |                              |
| Outcome                     | 6a   | Clearly define the outcome that is predicted by the prediction model, including how and when assessed. |                                    |                              |
|                              | 6b   | Report any actions to blind assessment of the outcome to be predicted.                                 |                                    |                              |
| Predictors                   | 7a   | Clearly define all predictors used in developing or validating the multivariable prediction model, including how and when they were measured. |                                    |                              |
|                              | 7b   | Report any actions to blind assessment of predictors for the outcome and other predictors.             |                                    |                              |
| Sample size                  | 8    | Explain how the study size was arrived at.                                                            |                                    |                              |
| Section                  | Step | 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               |      |                                                                             |
| Limitations              | 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. |
