

**[TITLE] Describe whether the study aims to create or validate a prediction model involving multiple variables, specify the population under investigation, and define the outcome the model intends to predict.**

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**Authors:**

[Include the names and affiliations of all authors.]

**Contact Details for Corresponding Author:**

[Include the corresponding author's name, email address, and other relevant contact information.]

## ABSTRACT [Maximum Length 300 Words]

**ABSTRACT:**

- The study's objectives should be summarized.
- The study design should be outlined.
- The setting where the study took place should be described.
- The participants involved in the research should be detailed.
- The sample size used for the study should be specified.
- The predictors or variables used in the analysis should be identified.
- The intended outcome or result the study aims to predict should be defined.
- The statistical methods and analysis techniques employed should be explained.
- The key findings and results of the study should be presented.
- The conclusions drawn from the research should be summarized.

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## INTRODUCTION:

### Background

- The authors should explain the medical context, detailing whether it concerns diagnostics or prognosis.
- The authors should clarify the rationale for developing or validating the multivariable prediction model.
- The authors should reference existing models to support the context and rationale provided.

### Objectives

- The authors should specify the study's objectives clearly, indicating the primary focus on either developing the model, validating it, or both processes simultaneously.

## METHODS:

### Source of Data

- The study design or source of data, such as randomized trials, cohorts, or registry data, should be described.
- The separate details for the development dataset should be provided
- If applicable, the distinct information for the validation dataset should be furnished.
- The authors should specify the key study dates, beginning with the start of accrual.
- The authors should include the date marking the end of accrual.
- The authors should provide the date indicating the end of follow-up for the study, if applicable.

### Participants

- The key elements of the study setting, including whether it pertains to primary care, secondary care, or the general population, should be specified.
- The information about the number of centers involved in the study should be provided.
- The details about the locations of these centers in the study description should be included.
- The authors should explain the eligibility criteria established for the participants in the study.
- The authors should detail the specific requirements participants must meet to be eligible for inclusion in the research.
- The authors should provide a clear description of the criteria used to determine the eligibility of participants in the study.
- Detailed information about the treatments received by participants should be provided, if applicable.
- The specific details regarding the types of treatments administered during the study should be included.

- The authors should describe any relevant therapeutic interventions received by participants throughout the research duration.

### Outcome

- The specific outcome predicted by the prediction model should be clearly defined.
- The details on how the outcome is assessed, specifying the methods and instruments used in the assessment should be included.
- The time frame during which the outcome is assessed should be indicated, providing clarity on the duration or specific points of assessment.
- The authors should report any actions taken to blind the assessment of the outcome to be predicted.
- The details on measures implemented to ensure a blinded assessment process for the predicted outcome should be provided.
- The authors should explain any steps or strategies adopted to prevent bias in the assessment of the outcome under consideration.

### Predictors

- All predictors utilized in the development or validation of the multivariable prediction model should be clearly defined.
- The authors should include specifics on how each predictor was measured, detailing the measurement methods or instruments employed.
- The authors should indicate the time frame during which the measurement of each predictor occurred, providing information on when the data was collected for analysis.
- The authors should report any actions taken to blind the assessment of predictors for the outcome.
- The details on measures implemented to ensure a blinded assessment process for the predictors related to the outcome should be provided.
- The authors should explain any steps or strategies adopted to prevent bias in the assessment of both the outcome and other predictors used in the study.

### Sample size

- The authors should explain how the study size was arrived at.

### Missing Data

- The methods used to handle missing data, such as complete-case analysis, single imputation, or multiple imputation, should be described.
- The authors should include specific details about the chosen imputation method, explaining how missing data points were estimated or replaced.

### Statistical Analysis Methods

- The authors should describe how predictors were handled in the analyses. [Just for Prediction Model Development Studies]
- The authors should specify the type of model employed in the study, indicating whether it's regression-based, machine learning, or another specific type. [Just for Prediction Model Development Studies]
- The authors should detail all the procedures involved in building the model, including any steps taken for predictor selection, such as feature engineering or variable screening. [Just for Prediction Model Development Studies]
- The authors should describe the method used for internal validation, outlining the techniques employed to assess the model's performance and generalizability within the dataset. [Just for Prediction Model Validation Studies]
- All measures employed to assess the performance of the model should be specified.
- The authors should describe the methods used to compare multiple models, outlining the specific measures and techniques used for the comparison, if applicable.
- The authors should provide a description of any model updating, such as recalibration, that was undertaken as a result of the validation process, if applicable.

### Risk Groups

- If done, the details on how risk groups were created should be provided.

### Development vs. Validation

- The discrepancies between the validation data and the development data regarding the setting used should be identified in the validation phase. [Just for Prediction Model Validation Studies]
- The authors should examine and document any variations in eligibility criteria between the validation and development datasets. [Just for Prediction Model Validation Studies]
- The differences in the outcome measures used in the validation data compared to those in the development dataset should be identified. [Just for Prediction Model Validation Studies]
- The authors should analyze and specify any disparities in the predictors utilized in the validation data compared to those used in the development dataset. [Just for Prediction Model Validation Studies]

## RESULTS

### Participants

- The authors should describe how participants moved through the study, highlighting the number of individuals who experienced the outcome and those who did not.

- The authors should summarize the follow-up period, including relevant time frames for data collection or observation, if applicable.
- The incorporating a diagram to visually illustrate the participant flow and enhance the understanding of the study's progression should be considered.
- The authors should provide a detailed description of the participants, outlining their basic demographics, clinical features, and the predictors available for analysis.
- The authors should specify the number of participants with missing data for the predictors, highlighting any gaps or limitations in the dataset.
- The authors should document the number of participants with missing data for the outcome variable, emphasizing the completeness of the information available for analysis.
- In the validation phase, the distribution of important variables such as demographics, predictors, and the outcome with the corresponding data from the development phase should be compared. [Just for Prediction Model Validation Studies]
- The authors should present a detailed analysis demonstrating the differences or similarities in the distribution of these key variables between the validation and development datasets. [Just for Prediction Model Validation Studies]
- The authors should highlight any discrepancies observed in demographics, predictors, and the outcome, emphasizing the significance of these variations in the validation context. [Just for Prediction Model Validation Studies]

### Model Development

- The authors should specify the number of participants and outcome events in each analysis. [Just for Prediction Model Development Studies]
- If applicable, the authors should provide a report on the unadjusted association between each candidate predictor and the outcome variable. [Just for Prediction Model Development Studies]

### Model Specification

- The authors should 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) [Just for Prediction Model Development Studies]
- The authors should explain how to use the prediction model. [Just for Prediction Model Development Studies]

### Model Performance

- The authors should present performance measures for the prediction model, including confidence intervals (CIs), in the report.

### Model Up-dating

- If model updating has been conducted, the authors should ensure the results from the updated model specification are reported comprehensively. [Just for Prediction Model Validation Studies]
- A detailed account of the outcomes related to the updated model's performance should be provided. [Just for Prediction Model Validation Studies]

## DISCUSSION

### Limitations

- The authors should discuss any limitations related to the study, including factors such as a non-representative sample.
- The authors should address limitations concerning the number of events per predictor, providing context on the challenges posed by limited events in the analysis.
- The authors should examine limitations associated with missing data, offering insights into how missing data might have impacted the study's findings and conclusions.

### Interpretation

- In the validation process, the obtained results and evaluate them concerning the performance seen in the development data should be carefully analyzed. [Just for Prediction Model Validation Studies]
- The authors should compare and contrast the validation results with the outcomes observed in the development dataset, providing a comprehensive assessment of the model's consistency and reliability across these stages. [Just for Prediction Model Validation Studies]
- The validation results in the context of any other validation datasets used, offering insights into the model's performance across various datasets, should be discussed. [Just for Prediction Model Validation Studies]

- The authors should provide a comprehensive interpretation of the results, considering the study's objectives and how they align with the findings.
- The authors should acknowledge and incorporate limitations into the interpretation, addressing potential constraints that might have influenced the results.
- The study results with findings from similar studies, emphasizing both consistencies and divergences in the outcomes should be compared.
- The authors should integrate other relevant evidence into the interpretation, creating a holistic understanding of the study results within the broader context of existing research.

### Implications

- The potential clinical applications of the developed model, examining its practical utility and relevance in healthcare settings, should be discussed.
- The authors should explore the implications of the model's findings for future research, highlighting possible avenues for further exploration and refinement in the field.

## OTHER INFORMATION

### Supplementary Information

- The authors should offer details regarding the availability of supplementary resources, including the study protocol.
- The authors should specify the accessibility of a web calculator related to the study, if applicable.
- The authors should inform about the availability of datasets used in the research, outlining how interested parties can access this data for further analysis or reference.

### Funding

- The source of funding and the role of the funders for the present study should be given.