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| **Section/Topic** | **Item** |  | **Checklist Item** | **Page** |
| **Title and abstract** | | | | | |
| Title | 1 | D;V | Identify the study as developing and/or validating a multivariable prediction model, the target population, and the outcome to be predicted. | P1 Line 1-3 |
| Abstract | 2 | D;V | Provide a summary of objectives, study design, setting, participants, sample size, predictors, outcome, statistical analysis, results, and conclusions. | P1-2 Line 5-27 |
| **Introduction** | | | | | |
| Background and objectives | 3a | D;V | Explain the medical context (including whether diagnostic or prognostic) and rationale for developing or validating the multivariable prediction model, including references to existing models. | P2-3 Line 41-59 Section: ”Introduction” Paragraph: 1st - 4th |
| 3b | D;V | Specify the objectives, including whether the study describes the development or validation of the model or both. | P3-4 Line 60-71  Section: ”Introduction”  Paragraph: 5th |
| **Methods** | | | | | |
| Source of data | 4a | D;V | 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. | P4 Line 80-87 Section: ” Material and Methods” Paragraph: “Patient Data” |
| 4b | D;V | Specify the key study dates, including start of accrual; end of accrual; and, if applicable, end of follow-up. | P4 Line 80-87 Section: ” Material and Methods” Paragraph: “Patient Data” |
| Participants | 5a | D;V | Specify key elements of the study setting (e.g., primary care, secondary care, general population) including number and location of centres. | P4 Line 82-87 Section: ” Material and Methods” Paragraph: “Patient Data” Paragraph: 1st |
| 5b | D;V | Describe eligibility criteria for participants. | P5 Line 89-97 Section: ”Patient Data” Paragraph: 2nd |
| 5c | D;V | Give details of treatments received, if relevant. | Cases in test dataset-2 accepted major hepatectomy, including complete right hepatectomy, extended right hepatectomy, complete left hepatectomy, and extended left hepatectomy. And the FLR and FLR% assessment was calculated according to the actual resection procedures recorded in the operation notes. |
| Outcome | 6a | D;V | Clearly define the outcome that is predicted by the prediction model, including how and when assessed. | P6-7 Line 123-133 Section: ”Model development” Paragraph: 1st to 2nd |
| 6b | D;V | Report any actions to blind assessment of the outcome to be predicted. | The results of DL model in the segmentation of Couinaud’s liver segment and FLR were not available to human doctors during the process of manual measurements. |
| Predictors | 7a | D;V | Clearly define all predictors used in developing or validating the multivariable prediction model, including how and when they were measured. | P7-8 Line 147-168 Section: ” Model evaluation and Qualitative Assessment” Paragraph: 2nd to 6th |
| 7b | D;V | Report any actions to blind assessment of predictors for the outcome and other predictors. | P7-8 Line 147-168 Section: ” Model evaluation and Qualitative Assessment” Paragraph: 2nd to 6th |
| Sample size | 8 | D;V | Explain how the study size was arrived at. | NA. There is no reference for the calculation of sample size in the study of automatic segmentation of Couinaud’s segment and FLR prior to major hepatectomy. There is no clear threshold being defined for the segmentation performance of the model. How well should the DL model perform in clinical practice remains uncertain. So, it’s almost impossible to calculate the sample size. |
| Missing data | 9 | D;V | Describe how missing data were handled (e.g., complete-case analysis, single imputation, multiple imputation) with details of any imputation method. | NA. No missing data were generated. |
| Statistical analysis methods | 10a | D | Describe how predictors were handled in the analyses. | P8-9 Line 173-178 Section: ” Statistical Analysis and Evaluation” |
| 10b | D | Specify type of model, all model-building procedures (including any predictor selection), and method for internal validation. | P8-9 Line 173-182 Section: ” Statistical Analysis and Evaluation” Method for internal validation is NA, because our study focused on external validation. |
| 10c | V | For validation, describe how the predictions were calculated. | P7 Line 148-152 Section: ” Model evaluation and Qualitative Assessment” Paragraph: 1st to 2nd |
| 10d | D;V | Specify all measures used to assess model performance and, if relevant, to compare multiple models. | P7 Line 148-152 Section: ” Model evaluation and Qualitative Assessment” Paragraph: 1st to 2nd |
| 10e | V | Describe any model updating (e.g., recalibration) arising from the validation, if done. | NA. No updating or recalibration was processed after the external validation. |
| Risk groups | 11 | D;V | Provide details on how risk groups were created, if done. | NA. We did not create risk groups, because creating risk groups does not help in the analysis of segmentation accuracy on Couinaud’s liver segment. |
| Development vs. validation | 12 | V | For validation, identify any differences from the development data in setting, eligibility criteria, outcome, and predictors. | P4 Line 87-88 Section: ” Patient data” Figure 1 |
| **Results** | | | | | |
| Participants | 13a | D;V | 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. | P9 Line 185-189 Section: ” Result” Paragraph: Patients and image characteristics” |
| 13b | D;V | Describe the characteristics of the participants (basic demographics, clinical features, available predictors), including the number of participants with missing data for predictors and outcome. | P9 Line 189（Table 1） Section: ” Result” Paragraph: Patients and image characteristics” |
| 13c | V | For validation, show a comparison with the development data of the distribution of important variables (demographics, predictors and outcome). | P9 Line 189（Table 1） Section: ” Result” Paragraph: Patients and image characteristics” |
| Model development | 14a | D | Specify the number of participants and outcome events in each analysis. | P9 Line 189（Table 1） Section: ” Result” Paragraph: Patients and image characteristics” |
| 14b | D | If done, report the unadjusted association between each candidate predictor and outcome. | NA. No candidate predictor was set up. |
| Model specification | 15a | D | 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). | P6-7 Line 132-135 Section: ” Materials and method” Paragraph: Model development” |
| 15b | D | Explain how to the use the prediction model. | P11-12 Line 240-260 Section: ” Result” Paragraph: Qualitative Analysis Results” |
| Model performance | 16 | D;V | Report performance measures (with CIs) for the prediction model. | P9-11 Line 197-230 Section: ” Result” Paragraph: “Segmentation Accuracy on Couinaud’s Liver Segment” and “Volumetry Accuracy on Couinaud’s Liver Segment, FLR and FLR% of test dataset 1+2” |
| Model-updating | 17 | V | If done, report the results from any model updating (i.e., model specification, model performance). | NA, no model updating was processed. |
| **Discussion** | | | | | |
| Limitations | 18 | D;V | Discuss any limitations of the study (such as nonrepresentative sample, few events per predictor, missing data). | P16 Line 341-349 Section: ” Discussion” |
| Interpretation | 19a | V | For validation, discuss the results with reference to performance in the development data, and any other validation data. | P13-14 Line 286-292 Section: ” Discussion” |
| 19b | D;V | Give an overall interpretation of the results, considering objectives, limitations, results from similar studies, and other relevant evidence. | P13-14 Line 270-285 Section: ” Discussion” |
| Implications | 20 | D;V | Discuss the potential clinical use of the model and implications for future research. | P16 Line 332-349 Section: ” Discussion” |
| **Other information** | | | | | |
| Supplementary information | 21 | D;V | Provide information about the availability of supplementary resources, such as study protocol, Web calculator, and data sets. | Supplementary resources were shown in Appendix E1 and Appendix E2 (supplement).  The study protocol has not been published yet, more complete protocol could be obtained at:https://github.com/wxypku20221205/liver-CT- CouinaudSegment. More detail information about the study protocol could be obtained from the corresponding author (Xiaoying Wang, email address: wangxiaoying@bjmu.edu.cn). |
| Funding | 22 | D;V | Give the source of funding and the role of the funders for the present study. | This research was supported by Research Foundation of Peking University Shenzhen Hospital (JCYJ2020007). The funder had no role in study design, data collection, data analysis, data interpretation, or writing of the report. The corresponding authors had full access to all the data in the study. |

\*Items relevant only to the development of a prediction model are denoted by D, items relating solely to a validation of a prediction model are denoted by V, and items relating to both are denoted D;V. We recommend using the TRIPOD Checklist in conjunction with the TRIPOD Explanation and Elaboration document.