|  |  |  |  |
| --- | --- | --- | --- |
| **Section and topics** | **Item #** | **Description** | **Page for reporting location** |
| **PRE-REGISTRATION** | | | |
| Pre-register | 0 | Reporting pre-registration platform and valid hyperlink to access it |  |
| **TITLE AND ABSTRACT** | | | |
| Title | 1 | Identifying study as machine-learning model aiming at psychiatric diagnoses |  |
| Abstract | 2 | Structurally reporting background, methods (internal and external sample size, model, cross-validation, at least), results (AUC, accuracy, sensitivity and specificity) and conclusions |  |
| **INTRODUCTION** | | | |
| Introduction | 3 | Describing rationale for clinical and scientific implications |  |
|  | 4 | Clarifying research proposal and hypotheses as reported in pre-registration |  |
| **METHODS** | | | |
| Research sample | 5 | Identifying what sample population is for this study, such as different sites (multiple sites with different population would be recommended) |  |
| Sampling strategy | 6 | Detailing how to determine the sample size |  |
| Data collection | 7 | Reporting how to recruit participants or indicating what OA dataset is used |  |
| Data timing | 8 | Reporting data collection date or duration |  |
| Inclusion criteria | 9a | Detailing how to include patients by clinical criteria, such as DSM-5 or ICD-10 |  |
|  | 9b | Detailing how to include healthy control, and reporting the case/control ratio. If the ratio is at high risk of skewness, it would be reported for how to re-sample dataset |  |
| Exclusion criteria | 10a | Reporting how to exclude participants by clinical criteria, such as comorbidity and symptom |  |
|  | 10b | Reporting how to remove participants as technical flaws, such as head-motion or artifact |  |
| **DATA ANALYSIS** | | | |
| Technical details | 11a | Reporting adequate technical details for collecting data, such as scanner, task, equipment, scanning parameters, and neuroimaging modality, at least |  |
| Quality control | 11b | Reporting how to perform quality control |  |
| Preprocessing | 11c | Reporting how to preprocess raw neuroimaging data and detailing how to preprocess features preceding to build ML model, such as Fish’s z transformation or 0-1 normalization (preprocessing feature vectors preceding to train model would be recommended) |  |
| **MODEL SETTINGS** | | | |
| Model | 12a | Reporting what model is built, such as SVM, GPC or RNN |  |
| Toolkit | 12b | Reporting what toolbox, software or self-made codes are used for building ML model |  |
| Feature selection | 12c | Reporting how to do feature selection and preparation (if applicable), and validating no leakage of testing data in selecting features |  |
| Parameters | 12d | Reporting hwo to perform parameter selection (if applicable), such as kernel function or penalty function; clarifying what parameters are used in final ML model |  |
| Cross-validation | 12e | Reporting what cross-validation scheme is adopted for estimating model performance (k-fold cross-validation portfolio would be recommended) |  |
| External sample | 12f | Reporting details of independently external sample(s) for validation and generalizability (if applicable)(External sample for validation would be recommended) |  |
| Control analysis | 13 | Testing trained model by other sample splits or other populations (if applicable) |  |
| Robustness analysis | 14 | Testing model performance by different parameters for validating model robustness (if applicable) |  |
| Interpretation | 15 | Reporting feature contributions or anything else facilitating to improve model interpretation (if applicable) |  |
| **RESULTS** | | | |
| Diagram | 16 | Reporting the workflow diagram (see RNIMP 2022 Workflow Diagram) |  |
| Sample details | 17 | Reporting final sample characteristics |  |
| Model performance | 18 | Reporting mandatory measures for model performance, including accuracy, sensitivity, specificity, AUC, ROC plot and confusion matrix for inner and external samples (if applicable) |  |
| Statistics | 19 | Reporting how to make statistical inference, such as bootstrap or permutation test |  |
| Interpretation | 20 | Interpreting how this model could perform well to predict patients |  |
| **DISCUSSION** | | | |
| Model advance | 21 | Discussing how to achieve high model performance and major advance this model delivers |  |
| Interpretation | 22 | Discussing how to explain this ML model by decoding feature contributions or patterns |  |
| Clarification | 23 | Discussing why methods or parameters are used inconsistently as reported in pre-registration (if applicable) |  |
| Implication | 24 | Discussing the clinical and scientific values for this model |  |
| Limitation | 25 | Discussing what limitations this model possesses and directing future research |  |
| **ADDITIONAL INFORMATION** | | | |
| Model availability | 26 | Reporting how to get access for trained model, such as OSF or Github (if applicable) |  |
| Code availability | 27 | Reporting how to obtain codes or toolboxes to reproduce this study adequately (if applicable) |  |
| Data availability | 28 | Reporting how to gain raw data or materials (if applicable) |  |