

# INPLASY PROTOCOL

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Performance of Prediction  
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submission: Data extraction.**

**Conflicts of interest:**  
None declared.

## INTRODUCTION

**Review question / Objective:** In this review, we evaluated the prognostic model for non-metastatic colorectal cancer (CRC) to clarify the performance and potential clinical use of the predictive model. Besides, extract and summarize the clinical predictors to guide clinical decision-making.

## Performance of Prediction Models of Non-Metastatic Colorectal Cancer : A Systematic Review and Meta-Analysis

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**Review question / Objective:** In this review, we evaluated the prognostic model for non-metastatic colorectal cancer (CRC) to clarify the performance and potential clinical use of the predictive model. Besides, extract and summarize the clinical predictors to guide clinical decision-making.

**Information sources:** A systematic search was performed in Medline, Pubmed, Web of Science, CNKI, Wanfang database, VIP database (limited to English and Chinese) from establishment of the library to June 28th 2022. The search was updated on October 27th 2022.

**INPLASY registration number:** This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 25 November 2022 and was last updated on 25 November 2022 (registration number INPLASY2022110130).

**Rationale:** A systematic search was performed in Medline, Pubmed, Web of Science, China National Knowledge Infrastructure (CNKI), Wanfang database, VIP database from establishment of the library to June 28th 2022. The search was updated on October 27th 2022. All model development or external validation studies predicting disease free survival (DFS), recurrence, metastasis outcomes from CRC were

included. We evaluate area under curve (AUC) and concordance index (C-index) to assess the performance of each model. Use the Prediction Model Risk of Bias Assessment tool (PROBAST) to assess the risk of bias (ROB) of selected studies.

**Condition being studied:** Colorectal cancer is one of the most common malignant tumors worldwide. According to the International Agency for Research on Cancer (IARC), there were 1.93 million new cases of colorectal cancer and 930,000 deaths worldwide in 2020, ranking third in the global spectrum of incidence and second in the spectrum of causes of death. Data suggest that the incidence of colorectal cancer shows a trend towards younger age. Radical surgery is the preferred treatment for patients with non-metastatic colorectal cancer, and adjuvant therapy is determined by postoperative analysis of risk factors for recurrence. According to the latest data report on the official website of ASCO in the United States, the 5-year survival rate of colorectal cancer in the early and middle stages is about 79% to 90%. Over the past 20 years, postoperative radical treatment rates for colon and rectal cancer have increased from 42% and 46% to 73% and 78%, respectively. Recurrence and metastasis of tumors is a major threat to long-term survival, with approximately 30 to 50 percent of patients experiencing tumor progression after surgery. Once advanced, the five-year survival rate is less than 20 percent.

With the rapid development of science and technology and medical level, medical treatment has entered the era of precision medicine. Scientifically making individualized risk assessment of diseases for patients and assisting clinical decision-making more accurately are important goals of today's medical development. Local recurrence and distant metastasis have been the primary outcomes observed in patients with non-metastatic colorectal cancer. With the advent of predictive model research, more and more researchers have conducted research on non-metastatic colorectal cancer prediction models that end with recurrent

metastasis. The included predictors mainly included clinical predictors, gene predictors, treatment methods and familial inheritance. Although there are several systematic reviews and meta-analyses of predictive models for non-metastatic colorectal cancer. However, there is no more detailed analysis of the performance of clinical predictive models.

In order to better assist clinical decision-making to provide a basis for it, this systematic review integrated the predictors affecting the outcome of relapse metastasis, the assessment of model bias and the predictive performance of the model.

## METHODS

**Search strategy:** 1# (((((((((Colorectal Neoplasms[Title/Abstract]) OR (Colonic Neoplasms[Title/Abstract])) OR (Rectal Neoplasms[Title/Abstract])) OR (Colorectal Cancers[Title/Abstract])) OR (Colorectal tumor[Title/Abstract])) OR (Colon Cancer[Title/Abstract])) OR (Colon tumor[Title/Abstract])) OR (Rectal Cancer[Title/Abstract])) OR (Rectal Tumor[Title/Abstract]))  
 2# (((Prediction Model[Title/Abstract]) OR (Prediction Rules[Title/Abstract])) OR (Prognosis Model[Title/Abstract])) OR (proportional hazards model[Title/Abstract]))  
 3# (((((((((((Machine Learning[Title/Abstract])) OR ((support vector machine[Title/Abstract])) OR (decision tree[Title/Abstract])) OR (random forest[Title/Abstract])) OR (k-nearest neighbor[Title/Abstract])) OR (recurrent neural network[Title/Abstract])) OR (convolutional neural network[Title/Abstract])) OR (linear regression[Title/Abstract])) OR (Logistic regression[Title/Abstract])) OR (Naive Bayes[Title/Abstract])) OR (Dimensional Reduction[Title/Abstract])) OR (Gradient Boosting[Title/Abstract])). Medline、Pubmed、Web of Science、CNKI、Wanfang database、VIP database (limited to English and Chinese).

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**Participant or population:** Non-Metastatic Colorectal Cancer patient.

**Intervention:** No Intervention.

**Comparator:** No Comparator.

**Study designs to be included:** 1) Contains at least two clinical predictors; 2) The participants in the prediction model were non-metastatic colorectal cancer, and the outcome measures were disease free survival, recurrence, metastasis, etc; 3) There must be one of the performance indicators of the predictive model, such as: AUC, C-index, sensitivity, specificity; 4) The time to predict all outcome in CRC patients after radical surgery must at least one year.

**Eligibility criteria:** No.

**Information sources:** A systematic search was performed in Medline、Pubmed、Web of Science、CNKI、Wanfang database、VIP database (limited to English and Chinese) from establishment of the library to June 28th 2022.The search was updated on October 27th 2022.

**Main outcome(s):** 1 Literature screening process and results; 2 Risk factors for non-metastatic CRC; 3 Risk bias assessment of models; 4 Performance of Prediction Models.

**Quality assessment / Risk of bias analysis:** Assessed the risk of bias (ROB) of selected studies according to the Prediction Model Risk of Bias Assessment tool (PROBAST).

**Strategy of data synthesis:** We rescaled the C-statistic by applying a logit transformation. The extracted 95% CI of a C-statistic was used to estimate its variance, and if this was not reported, the formula proposed by Debray et al. was used to approximate the 95% CI.

**Subgroup analysis:** No.

**Sensitivity analysis:** No.

**Country(ies) involved:** China.

**Keywords:** Colorectal cancer, Performance, Prediction model, Systematic Review, Meta analysis.

**Contributions of each author:**

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Author 2 - WANG YANSONG.

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