

# INPLASY

## Incidence and risk factors for lung cancer in patients with chronic obstructive pulmonary disease: A systematic review and meta-analysis of cohort studies

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### ADMINISTRATIVE INFORMATION

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**Review Stage at time of this submission** - Completed but not published.

**Conflicts of interest** - None declared.

**INPLASY registration number:** INPLASY202510093

**Amendments** - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 22 January 2025 and was last updated on 22 January 2025.

### INTRODUCTION

**Review question / Objective** To investigate the incidence and risk factors of lung cancer in chronic obstructive pulmonary disease (COPD) patients.

**Condition being studied** Study indicates that patients with COPD have a significantly increased risk of developing lung cancer, which poses a serious threat to their treatment and management.

### METHODS

**Search strategy** "lung cancer" and "chronic obstructive pulmonary disease."

**Participant or population** All patients diagnosed with COPD, regardless of the severity of disease.

**Intervention** Patients with lung cancer, these patients were diagnosed with lung cancer during the study period.

**Comparator** COPD patients without lung cancer.

**Study designs to be included** Studies employing either prospective or retrospective cohort designs.

**Eligibility criteria** The specific inclusion criteria are as follows: (1) Patients: all patients diagnosed with COPD, regardless of the severity of disease; (2) Exposure: patients with lung cancer, these patients were diagnosed with lung cancer during the study period; (3) Control: COPD patients without lung cancer. These patients were not diagnosed with lung cancer during the study period; (4) Outcomes: the primary focus is on the incidence of lung cancer in COPD patients, as well as the factors influencing lung cancer; (5) Study Design: studies

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employing either prospective or retrospective cohort designs.

**Information sources** PubMed, Embase, and the Cochrane Library.

**Main outcome(s)** The primary focus is on the incidence of lung cancer in COPD patients, as well as the factors influencing lung cancer.

**Quality assessment / Risk of bias analysis** Subsequently, these two reviewers independently assessed the quality of the included studies using the Newcastle-Ottawa Scale (NOS). The NOS consists of three main sections: selection (4 items), comparability (1 item), and outcome (3 items).

**Strategy of data synthesis** We conducted a comprehensive analysis of the overall incidence of lung cancer in patients with COPD using a random effects model. To ensure the comparability of the data, all raw data were log-transformed. During the model fitting process, restricted maximum likelihood estimation was uniformly applied to improve the accuracy of parameter estimates. The effect sizes of factors associated with the development of lung cancer in COPD patients were presented as odds ratios (ORs) and their 95% confidence intervals (CIs), and were also summarized using a random effects model.

**Subgroup analysis** Subgroup analyses of lung cancer incidence in COPD populations were conducted based on multiple dimensions, including study design type, geographical location (country), sample size, follow-up duration, and study quality, with differences between subgroups compared using interaction t-tests, assuming that the analyzed data met the normal distribution condition.

**Sensitivity analysis** Sensitivity analyses were performed by sequentially excluding individual studies to examine the stability and reliability of the final conclusions.

**Country(ies) involved** China.

**Keywords** incidence; risk factors; lung cancer; chronic obstructive pulmonary disease; systematic review; meta-analysis.

#### **Contributions of each author**

Author 1 - Xiaowei Gong.

Author 2 - Zhifeng Zhao.

Author 3 - Yadong Yuan.