



# Prevalence and incidence of bronchiectasis in Catalonia, Spain: A population-based study



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## ABSTRACT

**Background:** Insufficient epidemiological data are available on bronchiectasis in southern European populations. The aim of this study was to determine the prevalence and incidence of bronchiectasis in Catalonia, Spain and describe the characteristics of patients with an active diagnosis of bronchiectasis in 2012.

**Methods:** This study used data from a population database containing information from 5.8 million people (80% of the population of Catalonia). Patients with bronchiectasis were identified using International Statistical Classification of Diseases and Related Health Problems, 10th revision (ICD-10) codes, and information on clinical characteristics and treatment was extracted.

**Results:** A total of 20895 patients with bronchiectasis were identified in 2012. The prevalence of bronchiectasis was 36.2 cases per 10 000 inhabitants, with an incidence of 4.81 cases per 10 000 inhabitants. Prevalence and incidence increased with age and were highest in men over 65 years of age. Among the whole bronchiectasis population in Primary Care, 48.6% of patients had had blood tests, 11.2% had undergone spirometry, only 2.1% had a chest X-ray, and 0.9% had undergone high-resolution computed tomography or sputum culture. 56% had at least one exacerbation and 12.5% had been admitted to hospital during the year of the study. The drugs most frequently used were inhaled corticosteroids (in 37.4% of patients) and long-acting  $\beta_2$ agonists (in 36%); half of the patients received no treatment (51.8%).

**Conclusions:** The prevalence and incidence of bronchiectasis increases with age. The management of bronchiectasis in primary care was not optimal, and the disease continues to represent an important clinical burden.

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**Abbreviations:** COPD, chronic obstructive pulmonary disease; CT, computed tomography; FEV<sub>1</sub>, forced expiratory volume in 1 second; ICD-10, International Statistical Classification of Diseases and Related Health Problems, 10th revision; ICS, inhaled corticosteroid; LABA, long-acting  $\beta_2$  agonist; LAMA, long-acting antimuscarinic agent; SAMA, short-acting antimuscarinic agent; SIDIAP, Information System for the Development of Research in Primary Care; SD, standard deviation.

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## 1. Introduction

Bronchiectasis is a pulmonary disorder defined morphologically as permanent bronchial dilatation. This disease is the end result of a pathological process involving a vicious circle of inflammation, recurrent infection and bronchial wall damage caused by a number of primary diseases [1–5].

Despite the clinical importance of bronchiectasis as a chronic respiratory disease, its true incidence and prevalence are not well known [6,7], and information from the few published reports available varies by country, study period, source and method of research [2–4,8,9]. In general, the data show increasing trends in prevalence, which could be due to improved diagnosis and early detection [2].

Overall, epidemiological information has been derived from hospital discharge data [8,10], while data from population-based studies are more limited. More studies are needed in order to quantitatively estimate the prevalence of bronchiectasis among general populations and to describe the demographic and clinical features [11].

The aims of the present study were to determine the prevalence and incidence of bronchiectasis in patients in primary care in Catalonia, Spain, in 2012, and to describe and compare the clinical characteristics and treatment patterns in patients with newly diagnosed bronchiectasis and those with an active diagnosis during the study period.

## 2. Methods

### 2.1. Data collection

Data for the present study were obtained from the Information System for the Development of Research in Primary Care (SIDIAP) database, which contains anonymised computerised primary care medical records from 5.8 million people in Catalonia (more than 80% of the total population) [12]. This database has been used and validated for epidemiological research in respiratory diseases [13].

All individuals with a diagnosis of bronchiectasis recorded in their clinical records during the study period (1 January to 31 December 2012) were included in the prevalence estimate. Patients with bronchiectasis newly diagnosed during the study period were included in the incidence estimate (incident cases). International Statistical Classification of Diseases and Related Health Problems, 10th revision (ICD-10) codes were used to identify patients with a diagnosis of bronchiectasis (ICD-10 codes J47, J47.0 and J47.1), tuberculosis bronchiectasis (code A15.0) and congenital bronchiectasis (codes Q33.4). Patients with a medical history of cystic fibrosis (ICD-10 code E84.9) before or during the study period were excluded from the analysis (Fig. 1).

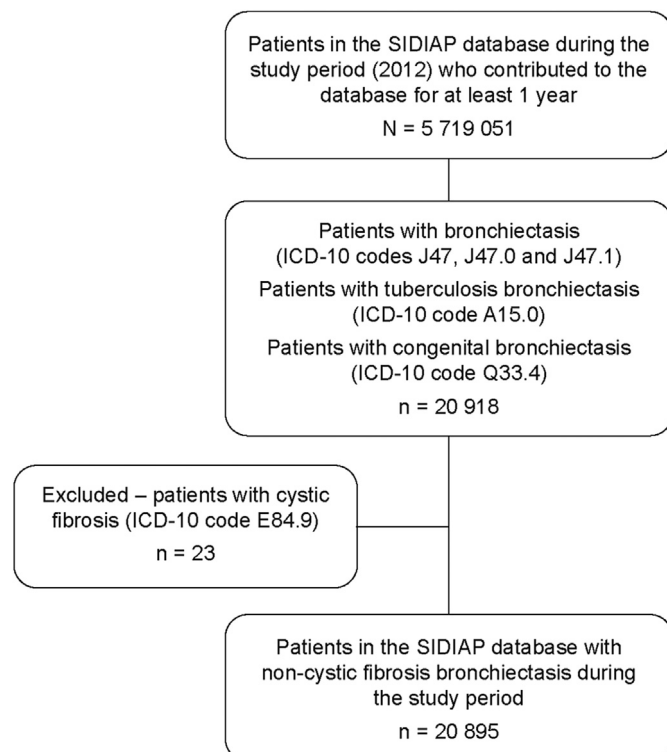


Fig. 1. Study algorithm.

The clinical characteristics and treatment patterns of the patients were compared for incident cases of bronchiectasis and individuals with an active diagnosis in 2012. Data of the baseline, sociodemographic and clinical characteristics were collected (age, sex, height, weight, smoking status, area of residence and comorbidities). Information on a number of complementary tests were collected: chest X-ray, blood tests (including blood cell counts and routine biochemical parameters), high-resolution computed tomography (CT), sputum cultures and spirometry. Data for health-care resource utilisation, including exacerbations of bronchiectasis, hospital admissions and visits to the primary care physician during the previous year, were also collected to describe the baseline characteristics. Additional information was obtained in relation to the treatment received for respiratory conditions, including the antibiotic therapy prescribed for respiratory infections (after excluding other simultaneous infections), bronchodilators (short-acting  $\beta_2$ agonists, short-acting antimuscarinic agents [SAMAs], long-acting  $\beta_2$ -agonists [LABAs] and long-acting antimuscarinic agents [LAMAs]), anti-inflammatory treatment (inhaled corticosteroids [ICSs], oral corticosteroids, phosphodiesterase-4 inhibitors, and antipneumococcal and influenza vaccines).

Exacerbations of bronchiectasis were identified from diagnostic codes and by treatment when patients received antibiotics and/or oral corticosteroids in the absence of other codified infectious events such as tonsillitis or urinary tract infections.

This study was approved by the Ethics and Clinical Research Committee of the Jordi Gol Primary Care University Research Institute (Barcelona, Spain).

### 2.2. Statistical analysis

Descriptive statistics were used to analyse the study population and to summarise the clinical burden associated with bronchiectasis. For qualitative variables, absolute frequencies and their corresponding percentages were calculated. Quantitative variables following a normal distribution were described using means and standard deviations, while medians and interquartile ranges were employed for such variables that did not follow a normal distribution. Patients were stratified by sex and age. The SIDIAP database was used to calculate the denominator population for prevalence and incidence.

Differences between patients with previously and newly diagnosed bronchiectasis during the year of the study (2012) were analysed using the  $\chi^2$  test or Fisher's exact test for categorical data and the Student's *t*-test for continuous data or the corresponding non-parametric tests as appropriate. Statistical tests were two-sided and *p* values < 0.05 were considered to be statistically significant. For data analysis the SPSS Statistics software, version 20 (IBM Corp., New York, NY, USA) was used.

## 3. Results

### 3.1. Prevalence and incidence of bronchiectasis

A total of 20 895 patients with bronchiectasis were identified in the year of the study, 2703 of whom (12.9%) were incident cases. The prevalence of bronchiectasis was 36.2 cases per 10 000 inhabitants, with higher rates in women than in men (39.1/10 000 vs. 33.3/10 000, respectively). The average incidence of bronchiectasis was 4.81 cases per 10 000 inhabitants per year, with higher rates found in women than in men (4.93/10 000 vs. 4.69/10 000, respectively). The prevalence and incidence increased with age in both sexes, and men aged 65–99 years had both the highest prevalence (152.9/10 000) (Fig. 2) and the highest incidence (21.95/10 000) (Fig. 3).

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