

## Prevalence and incidence of Parkinson's disease in Europe<sup>☆</sup>

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### Abstract

**Objective:** To provide an overview on the prevalence and incidence of Parkinson's disease (PD) in selected European countries. **Background:** PD is a common disease of unknown etiology. Accurate information on the epidemiology of PD is critical to inform health policy. An aging population will lead to more patients with PD; thus, the high financial burden PD places on society will increase. **Material and methods:** A systematic literature search was performed to identify studies on the prevalence and incidence of PD in the following European countries: Austria, the Czech Republic, France, Germany, Italy, The Netherlands, Portugal, Spain, Sweden and United Kingdom. Only published studies were included. Abstracts, reviews, meta-analyses and letters to the editor were excluded. There were no language restrictions. Data were extracted using a standardized assessment form, and evidence tables were used to systematically report and compare the data. **Results:** Of 39 identified studies, most (87%) reported estimates of PD prevalence rates, while only a few (13%) reported estimates of PD annual incidence rates. Crude prevalence rate estimates ranged from 65.6 per 100,000 to 12,500 per 100,000 and annual incidence estimates ranged from 5 per 100,000 to 346 per 100,000. No publications could be identified for Austria or the Czech Republic. **Discussion and conclusion:** The observed variations in prevalence and incidence rates may result from environmental or genetic factors, but might also be a consequence of differences in methodologies for case ascertainment, diagnostic criteria, or age distributions of the study populations. The comparability of existing studies is limited.

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### 1. Introduction

Parkinson's disease (PD) is characterised by bradykinesia, tremor, rigidity and impaired postural reflexes. In addition to the motor symptoms, mental disorders like depression or psychosis, and autonomic and gastrointestinal dysfunction may occur; all of these disorders considerably impair the quality of life of PD patients (Schrag et al., 2000b). Although the cerebral structures undergoing neurodegeneration in PD are well characterised, the underlying mechanisms of the disease are still

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unknown. PD is one of the most common neurodegenerative diseases and its relentless progression results in severe disability.

Data on the prevalence and incidence of PD are of particular interest for several reasons: (1) epidemiological studies can provide insights into suspected risk factors, protective factors, and primary causes of disease, and may be used to investigate the natural history of PD; (2) by providing critical information on the burden of a particular disease to the population, epidemiological data can inform public health planning. The latter has become of pivotal interest in recent years as longevity of the population increases and the incidence of PD rises with age. Its high financial burden adds to the need for accurate information on its epidemiology (Spotke et al., *in press*). To date, epidemiological studies of PD have not been published for all European countries (Table 1). Crude incidence rates reported in various studies and populations range from 5/100,000 to 26/100,000 (Twelves et al., 2003). Environmental and genetic factors are discussed as reasons for variations in these data; however,

other differences, such as methodological diversity, may also play a role.

This survey will provide an overview on the prevalence and incidence of PD in the following European countries: Austria (A), Czech Republic (CZ), France (F), Germany (G), Italy (I), The Netherlands (NL), Portugal (P), Spain (E), Sweden (S), and the United Kingdom (UK). In particular, we focus on the methodologies used in the respective studies (Fig. 1).

## 2. Methods

### 2.1. Literature search and inclusion criteria

We performed a systematic literature search in eight electronic databases using a combined search strategy that included the following terms: “Parkinson,” “Parkinson’s disease,” “Epidemiology,” “Incidence,” “Prevalence,” and the following countries: Austria, Czech Republic, France, Germany, Italy, Portugal, The Netherlands, Spain, Sweden, and the United Kingdom. The search was performed on the following databases: MEDLINE (1966 until 2004), PRE-MEDLINE (1966 until September 2002), CURRENT CONTENTS (all editions, 1993 until July 2002), the COCHRANE’s database of systematic reviews (until 2004), EconLit (1969 until July 2004), Biosis, PsycLit, and EMBASE (until 2004). We examined the reference lists of all identified studies and reviews and asked clinical experts for additional studies. Articles were also identified through searches of the extensive files of the authors. There were no restrictions on language or publication date. Only published studies were included in the survey. Studies published as abstracts with incomplete information on epidemiological index numbers were not considered. Reviews and meta-analyses were excluded, as well as letters to editors and comments. We included studies which provided data on prevalence or incidence in either the general population or in subpopulations (e.g., certain age groups).

### 2.2. Data extraction

Data extraction was performed using a standardized assessment form that included the following domains (defined prior to the study):

- study reference
- screening procedure
- diagnostic criteria
- number of PD cases used to estimate prevalence or incidence
- results (incidence, prevalence)
- distribution of Hoehn and Yahr stages
- study design
- screening personnel
- target population (country, setting).

Table 1  
Epidemiological studies in the different European countries

Country	Prevalence data	Incidence data	Reference
Austria	–	–	–
Belgium	–	–	–
Cyprus	–	–	–
Czech Republic	–	–	–
Denmark	+	+	(Dupont, 1977)
Estonia	+	+	(Taba and Asser, 2002)
Finland	+	+	(Marttila and Rinne, 1976)
France	+	–	*
Germany	+	–	*
Greece	–	–	–
Hungary	–	–	–
Iceland	+	+(idiopathic and arteriosclerotic)	(Gudmundsson, 1967)
Ireland	–	–	–
Italy	+	+	*
Latvia	–	–	–
Lithuania	–	–	–
Luxembourg	–	–	–
Malta	–	–	–
Netherlands	+	+	*
Norway	+	–	(Tandberg et al., 1995)
Poland	+	+	(Wender et al., 1989)
Portugal	+	(+)	*
Slovakia	–	–	–
Slovenia	–	–	–
Spain	+	+	*
Sweden	+	+	*
Switzerland	–	–	–
United Kingdom	+	+	*

–: No data available; +: data available. \*See tables below.

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