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Prevalence of multiple sclerosis in France in 2021: data from the French health insurance database

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Abstract

Background

France is among the countries with high prevalence of multiple sclerosis (MS). The most recent estimates are from 2012 and need to be updated because MS prevalence has increased worldwide.

Objective

To estimate MS prevalence in France on December 31, 2021 and to describe the characteristics of the French MS population using data from the French national health insurance database (SNDS).

Material and Methods

Persons with MS (PwMS) were identified in the SNDS database (99% of national coverage) using an algorithm with three criteria: long-term disease status, hospitalizations, and MS-specific drug reimbursements. Crude and sex- and age-stratified prevalence rates were calculated with their 95% confidence intervals as well as the standardized prevalence stratified on the region of residence.

Results

In total, 134,062 PwMS were identified (71.8% of women, median age 53.0 ± 14.8 years) yielding a prevalence of 197.6 per 100,000 (95% CI: [196.5, 198.7]). Prevalence rates in women and men were respectively 274.9 (95% CI [273.2, 276.6]) and 115.2 (95% CI [114.0; 116.4]). In metropolitan France, the highest prevalence rates were observed in the northeastern regions (e.g. >230 PwMS per 100,000 in Grand Est and Hauts-de-France), and the lowest rates in the southwestern regions (~180 PwMS per 100,000 in Nouvelle-Aquitaine and Occitanie). Overall, 32.1% of PwMS had another long-term disease and 51.8% received at least one MS-specific drug in 2021.

Conclusion

MS prevalence in France has increased by ~30% in the last 10 years. This increase is probably linked to population ageing, longer survival of PwMS, and the long observation period. The part attributable to a possible increase in MS risk remains to be determined with incidence studies.

Keywords – Epidemiology, Prevalence, France, Multiple Sclerosis, Administrative Claims

1. Introduction

Multiple sclerosis (MS), a demyelinating autoimmune disorder of the central nervous system, is estimated to affect 2.8 million individuals worldwide [1], particularly women. It is often diagnosed between the age of 25 and 35 years [2]. MS has no known cure and leads to progressive cognitive, neurological and physical impairment over the lifetime [3]. As MS reduces life expectancy only marginally, patients with MS (PwMS) live with the disease for many decades and this is associated with increasing and complex healthcare needs [4,5]. The prevalence of MS is influenced by many factors, and shows wide geographical variations, even within the same country, meaning that some regions will have a higher disease burden, with different healthcare needs [6,7].

The third edition of the Atlas of MS by the MS International Federation reported an increase in MS prevalence by 35% in Europe and by 16% in the world between 2013 and 2020 [1]. As the last prevalence estimate for France (151.2 PwMS/100,000; n=99,123) is from 2012 [8], it needs to be updated to identify potential changes and trends and also to inform key decision-makers about the range and scope of the healthcare needs of PwMS.

Since 2009, France has integrated multiple databases from hospitals (private and public), in- and out-patient care clinics, and data on prescribed drug reimbursements into the French national health insurance database (Système national des données en santé; (SNDS)). This database covers approximately 66 million inhabitants (i.e. ~99% of the French population) and has been increasingly used for epidemiological studies [9]. The SNDS database was also used for estimating MS prevalence in France in 2012 [8].

The main objective of this study was to estimate MS prevalence in France on December 31, 2021 and to describe the French MS population in terms of age, sex and geographical location using the SNDS database.

2. Material and Methods

2.1 Data source

The SNDS database contains data from hospitalization records (in- and out-patient care) and all prescribed drug reimbursements. The hospital entry and exit dates are recorded, as well as the ICD-10 diagnosis codes at discharge [9].

Sociodemographic data also are available, such as date of birth, sex, insurance scheme and city of residence. Each city of residence is associated with an ecological deprivation index called FDep. This social deprivation index classifies cities in five quintiles of deprivation (from 5 = most deprived, to 1 = least deprived) based on four socioeconomic indicators (e.g. median household income, proportion of high school graduates, proportion of blue-collar workers, and the unemployment rate) [10]. Moreover, French residents with low income have the right to a specific insurance scheme called Couverture Medicale Universelle (CMU) based on their income and household size. Conversely, information on individual behaviors, such as tobacco, recreational drug and alcohol consumption, is not available. As SNDS primary goal is to measure healthcare expenditures, reports from consultations with clinicians and laboratory reports are not available and identification algorithms have to be used to identify diseases. Every year, the *Caisse National d'Assurance Maladie* (CNAM) releases reports on a list of 58 common diseases using SNDS data [11].

Since 1945, a long-term disease (LTD) status is used in France for 30 chronic diseases (e.g. MS, diabetes, cancer) with expensive and/or long treatments. For patients with this status, 100% of the healthcare costs are covered by the French national security system and no upfront payment is needed on all medical care related to that disease. The declaration of this status, present in the SNDS, is not mandatory and is done at the patient's and general practitioner's discretion. As MS has no cure, the LTD status for this disease does not have an expiration date.

This study was conducted at the French School of Public Health (EHESP), which has permanent access to the SNDS database in application of the provisions of Articles R. 1461–11 to R. 1461-17 of the French Public Health Code and the French data protection authority decision CNIL-2016-316. As permanent users of the SNDS, the authors declared the study to the EHESP's SNDS registry and were exempted from Institutional Review Board approval.

2.2 Study population

2.2.1 MS identification

The aim of this cross-sectional study was to quantify and describe the MS population in France on December 31, 2021. MS was identified based on the presence of at least one of the following criteria: i) LTD status for MS (MS-LTD), ii) hospitalization for MS, and iii) MS-specific drug reimbursement (beta-interferon, cladribine, dimethyl fumarate, fingolimod,

glatiramer acetate, natalizumab, ocrelizumab, ponesimod, and teriflunomide). The identification period for hospitalization records and drug reimbursement data was from January 1, 2009 to December 31, 2021 and was without any minimum date for LTD status (up to December 31, 2021).

LTD status and hospitalizations for MS were identified based on the “G35” ICD-10 code. To ensure the specificity of our case definition, individuals were not included if i) they did not have the MS-LTD status, ii) they had only one hospitalization related to MS, and iii) they did not have any MS-specific drug reimbursement. Similarly, individuals i) without MS-LTD status, ii) without hospitalizations for MS, and iii) with only one MS-specific drug reimbursement during the observation period were not included.

As the clinical similarities between neuromyelitis optica spectrum disorder (NMOSD) and MS can lead to a false-positive MS diagnosis, individuals with at least one NMOSD hospitalization (ICD-10: G36) and without MS-LTD status or MS-specific drug reimbursement also were excluded [12,13].

MS identification date was defined as the earliest available date for hospitalization for MS, MS-LTD status declaration, or MS-specific drug reimbursement. All individuals who met the inclusion criteria and without exclusion criteria and who were alive on December 31, 2021 were included.

2.2.2 Descriptive characteristics

Department of residence, insurance scheme, comorbidities of interest and MS-related characteristics were retrieved for the year 2021. In order to minimize missingness, when information was missing, characteristics from 2020 were retrieved. Patients were defined as having received a specific DMT if they had at least one reimbursement of that drug during the year and patients could be reimbursed for different DMTs.

3. Statistical analysis

3.1 Study population characteristics

The data of the study population were described using medians and interquartile ranges for continuous variables and crude numbers and percentages for categorical variables. Sociodemographic characteristics, comorbidities of interest, and MS-related characteristics were reported.

3.2 Prevalence

MS prevalence was defined as the number of PwMS identified on December 31, 2021 divided by the French population on January 1, 2022 (i.e. the reference population) [14]. The age and sex-stratified MS prevalence rates also were reported. To facilitate comparison with previous French and international studies, prevalence was standardized by sex and age to the 1976, 2013 and 2021 European populations as well as to the 2013 and 2021 world populations.

Statistical analyses were performed with SAS v.8.3.7 and R v.4.1.2.

4. Results

4.1 Population characteristics

We identified 134,062 PwMS in France on December 31, 2021. Among these PwMS, 76.9% met at least two of the three selection criteria. The most frequent identification criterion was LTD status (92.6%). The Venn diagram showing the distribution of the three criteria is in Figure 1. The PwMS mean age was 52.9 ± 14.8 years, without difference between sexes, and 494 PwMS were 18 or younger; the age distribution by sex is shown in Figure 2. Overall, 71.8% of PwMS were women. The median time from the LTD declaration date to 2021 was 12 years (IQR [5; 19]) and the mean age at LTD declaration was 40.0 ± 12.2 years, without difference between sexes. The population characteristics are summarized in Table 1.

The MS population had a complex clinical profile: 32.1% of PwMS had at least one LTD status for another disease, 41.5% had been hospitalized at least once (in- or out-patient stay, related or not related to MS), and 27.4% had been hospitalized at least once for an MS-related pathology in 2021. Approximately a third of the population had a psychiatric disorder or was taking a psychotropic treatment.

Most PwMS were covered by the general insurance scheme and were living in cities that were evenly distributed in the five FDep index levels. In 2021, 51.7% of PwMS had been treated at least once with a DMT; teriflunomide, dimethyl fumarate and fingolimod were the most frequent. These patients were, on average, 12 years younger than patients who did not receive disease-modifying treatments (47 vs 59), without difference between sexes.

Between 2009 and 2021, we identified 14,159 PwMS deaths and their mean age at death was 68 years (F: 69, M: 66).

We excluded 11,653 persons because they only had one hospitalization for MS and no MS-LTD status or MS-specific drug reimbursement, 1,200 persons who had only one MS-specific drug reimbursement but no MS-LTD status or hospitalization, and 364 persons with at least one NMOSD hospitalization and no MS-LTD status or MS-specific treatment.

4.2 Prevalence

On December 31, 2021, the French national crude prevalence of MS was 197.6 per 100,000 inhabitants (95% CI: [196.5, 198.7]). Prevalence in women was 2.3-fold higher than in men (274.9, 95% CI [273.2, 276.6] vs 115.2, 95% CI [114.0, 116.4], respectively). The age- and sex-stratified prevalence rates are shown in Table 2, with a peak in the 55 to 59-year-old group for both men and women. Prevalence rates standardized to the 1976, 2013 and 2021 European populations and the 2013 and 2021 world populations are presented in Table 3.

The standardized prevalence rates for each region are presented in Table 4 and for each 'department' in Figure 3 and Supplemental Table 1. The percentage of prevalence increase compared with the 2012 regional rates are also shown in Table 4. MS prevalence rates varied among regions, with a 1.4-fold difference between the regions with the highest and lowest prevalence. The highest prevalence rates were in the northeastern regions (e.g. Grand Est and Hauts-de-France had rates >230 PwMS per 100,000) and the lowest rates in the southwestern regions (e.g. Nouvelle-Aquitaine and Occitanie had rates ~180 PwMS per 100,000).

Prevalence was substantially lower in the overseas regions (50.1, 95% CI: [47.0; 53.2]).

5. Discussion

We estimated an overall crude MS prevalence of 197.6 per 100,000 inhabitants (95% CI: [196.5, 198.7]), which corresponded to a 30% increase compared with the 2012 estimate [8]. When comparing standardized rates between 2012 and 2021, the increase ranged between 20% (1976-European population) and 36% (2013-World population). This increase is consistent with the 35% increase in MS prevalence in Europe between 2013 and 2020 [1]. Depending on the region, the increase ranged between 19.6% (Picardie) and 45.5% (Corse), without differences between men and women. We also confirmed the previously described North-East to South-West gradient [15]. The information on residence is from the year 2021 and may differ from their residence at the time of diagnosis, which was not reported in this study. Although we standardized on age and sex, we were unable to adjust for other

determinants of MS incidence such as sun exposure, country of birth or smoking behavior as well as other important factors such as mortality, availability of care and diagnostic practices.

Several potential mechanisms could explain this prevalence increase. First, it could be due to a decrease in mortality. Compared with 2012, the peak in prevalence by age group moved from the 50-54 years group to the 55-59 years group. Moreover, the prevalence increase was higher in the older age groups. For example, the percentage of >60-year-old PwMS increased from 26.3% to 30.6%. This aging trend in PwMS is in accordance with a potential decrease in mortality. Second, the criteria for MS diagnosis changed over time, becoming more sensitive. This could partly explain the prevalence increase, although it should be matched with an increase in the observed incidence [16]. Third, it could be linked to an increase in incidence; however, recent studies mostly observed a decrease or stabilization in MS incidence since 2010, arguing against this explanation [17–21]. Fourth, it could be due to a more sensitive identification algorithm; indeed, our observation period was 12 years for hospitalizations and MS-specific drug reimbursements and unlimited for LTD status and this allowed identifying persons with milder and less active MS whereas Foulon et. al. only had a 2-year observation period for DMTs and a 5 year observation period for hospitalizations

Every year, CNAM releases reports on the prevalence of some diseases in France, including MS, using data from the SNDS database. In 2021, it reported 122,800 active MS cases. This means that we identified approximately 9% more cases [22]. The CNAM population and our MS population shared the same age and sex characteristics. Therefore, the prevalence difference could be explained by a difference in selection algorithms. Our identification algorithm was based on the algorithm used by Foulon et al in 2012 [8] and updated in collaboration with neurologists and SNDS experts. LTD status is requested by the patient's general practitioner with the patient's approval and is then validated by an independent healthcare professional from the health insurance system. Hospitalization records are coded by clinicians and ICD-10 codes are mandatory because they will determine the cost of each hospital stay. Coding is regularly controlled by the paying bodies to ensure its validity. Finally, drug reimbursement is an automated process linked to the drug barcode. Moreover, due to the high price of MS-specific drugs, it is unlikely that patients would not request reimbursement.

Although the CNAM used the same three identification criteria, our observation period was longer (from 2009 to 2021 in our study vs 2017 to 2021 for hospitalizations and LTD status and only 2021 for MS-specific drugs in the CNAM population). The longer observation

period allowed identifying PwMS who are not treated anymore or who were not recently hospitalized for an MS-related reason. Moreover, CNAM required at least two reimbursements of MS-specific drugs in 2021. However, in 2021, a PwMS could have had only one reimbursement for MS-specific drugs, for example if this patient switched from a MS-specific to a non-specific drug, or if MS progressed to the progressive form (for which there is no treatment approved), or if the patient decided to stop treatment (e.g. side effects, contraindication, years of disease inactivity, pregnancy, personal convenience).

The higher sensitivity of our identification algorithm raises the question of whether false positives were included in our estimates [23]. To minimize this risk, we adapted the identification algorithm from 2012 to render it more specific by adding the following exclusion criteria : we excluded i) individuals with a single MS-specific drug reimbursement, no MS-LTD status and no hospitalizations as well as ii) individuals with a single hospitalization for MS, no drug reimbursement and no MS-LTD status. In addition, as NMOSD can sometimes lead to a false diagnosis of MS, we did not include individuals with one or multiple MS hospitalizations, but no MS-LTD status or MS-specific drug reimbursement if they also had at least one hospitalization for NMOSD. Also, unlike Foulon et. al, we did not use MS-dedicated pensions. Finally, we could not identify PwMS if they did not have MS-LTD status and had not been hospitalized or treated between 2009 and 2021. This means that we might have missed some benign cases as well as some 2021 incident cases who had not received MS-related care yet. Indeed, we could not measure MS incidence because we used healthcare consumption data.

Regarding psychiatric comorbidities, we observed estimates comparable to the existing literature with 33% of our population with an LTD, a hospitalization or more than 3 drug reimbursements related to a mental health disorder and 29% having received either antidepressants or anxiolytics in the year 2021 [24-27]. Our population had slightly higher than previously described estimates of prevalence for comorbidities associated with age such as diabetes and cancer, most probably due to differing age structures [28-30]. One limitation of our study is that the main purpose of the database is to manage healthcare reimbursement to patients and hospitals. Therefore, it does not include important information, such as income, smoking and alcohol drinking status, or immigration status, to better describe our population. We used proxy variables, such as the CMU status and the FDep index, to estimate the socioeconomic status of our population and did not observe a difference with the general population [31]. Moreover, as the SNDS database does not collect clinical information, the

type of MS, severity of symptoms and disability remained unknown as well as the date of diagnosis certified by a neurologist. In addition, mitoxantrone, a drug proposed only to patients with highly active MS, cannot be identified in the SNDS database. This might have resulted in missing a small number of PwMS.

6. Conclusion

To conclude, we estimated MS prevalence in France on December 31, 2021: 197.6 PwMS per 100,000 inhabitants (95% CI: [196.5, 198.7]). This represents roughly an increase by 30% from the previous estimate in 2012, as observed in other European countries. It remains unclear whether this prevalence increase can be explained solely by longer PwMS survival, and better case identification with our algorithm, or if it reflects an increase in incidence. Incidence studies are needed to understand the underlying mechanisms behind this increase.

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Declaration of competing interest

Chloé Pierret and Marie Mainguy have no conflicts of interest.

Emmanuelle Leray reports consulting and lecture fees or travel grants from Alexion, Biogen, Merck, Novartis, Roche, and Sanofi, not related to the submitted work.

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Figures (all printed in color)

Figure 1. Venn diagram showing the MS identification criteria, December 31, 2021: n=134,062.

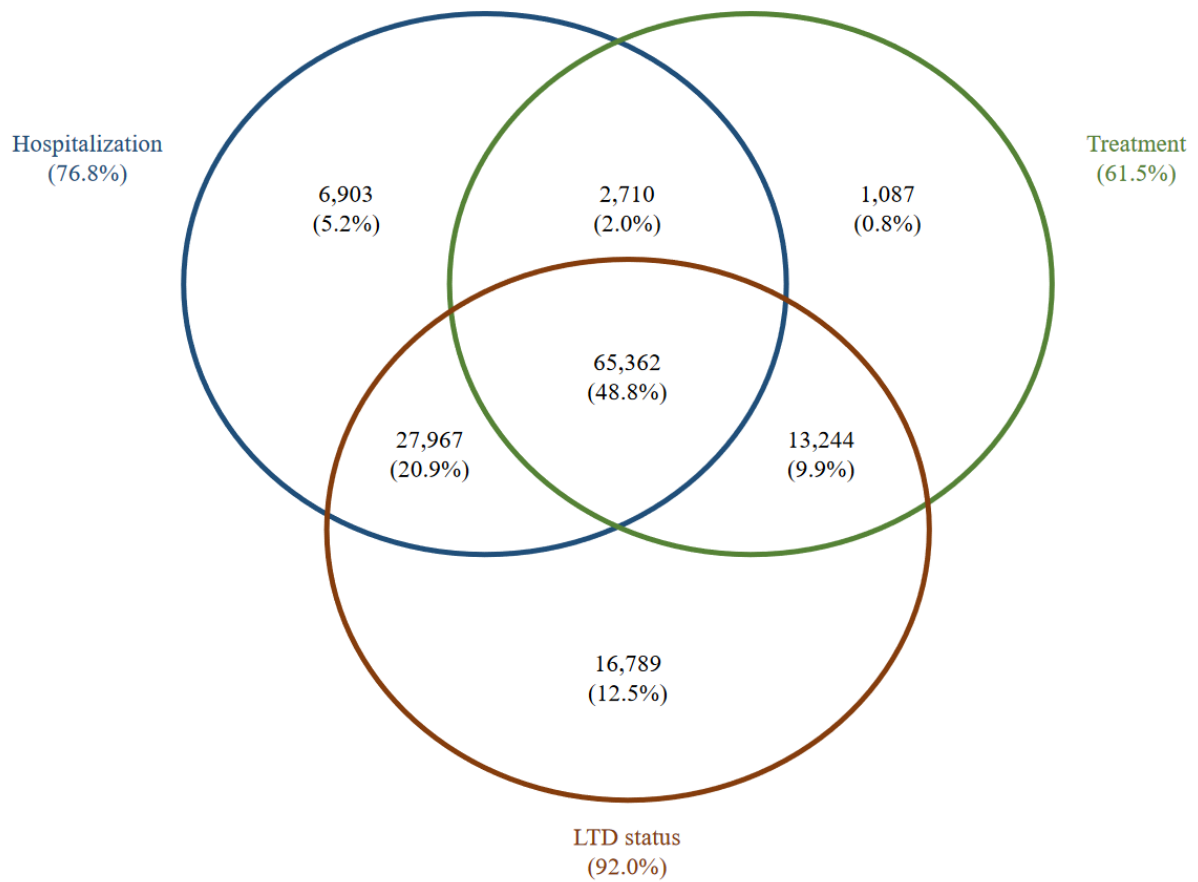


Figure 2. Age and sex pyramid of the French population with MS on December 31, 2021 (n=134,062).

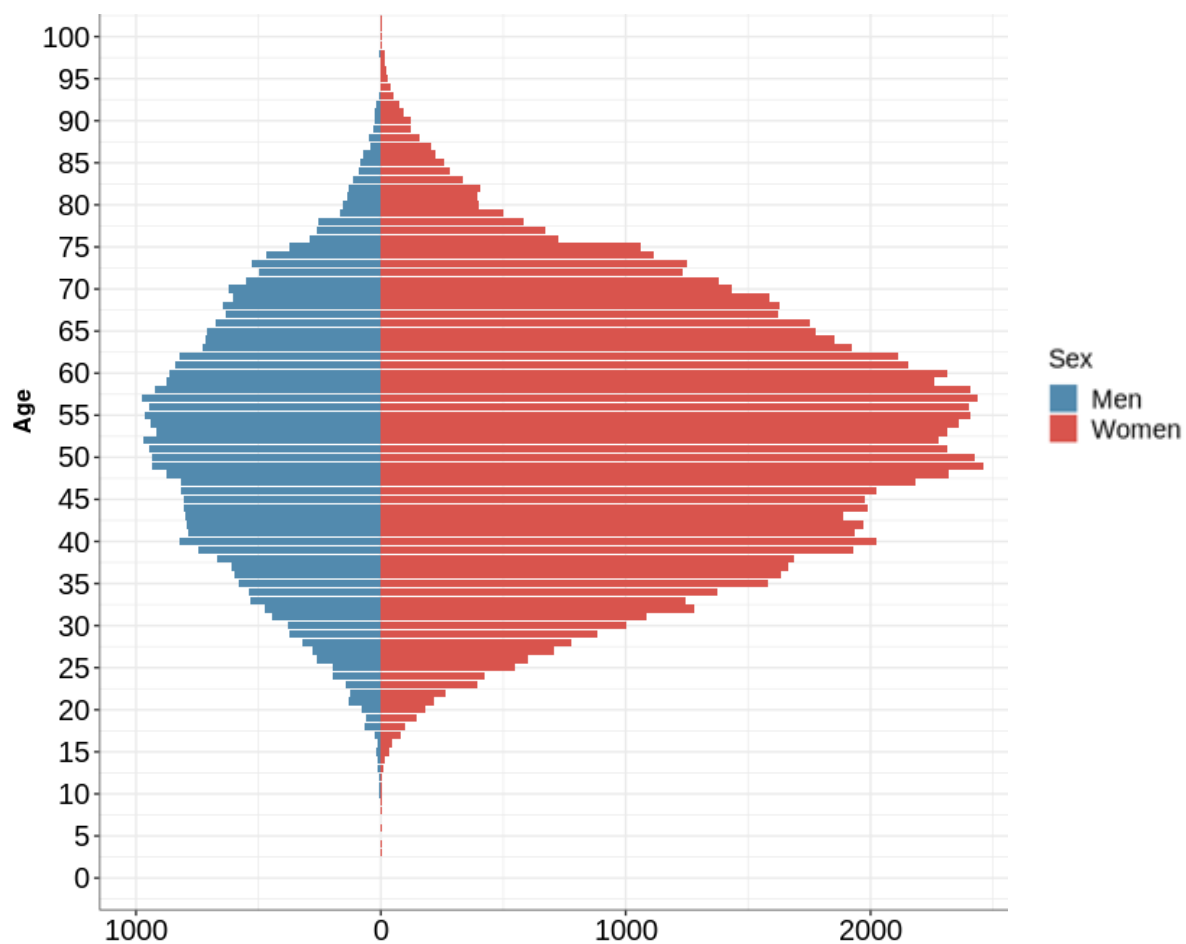


Figure 3. Age- and sex-standardized prevalence by department in metropolitan France in 2021.

Tables

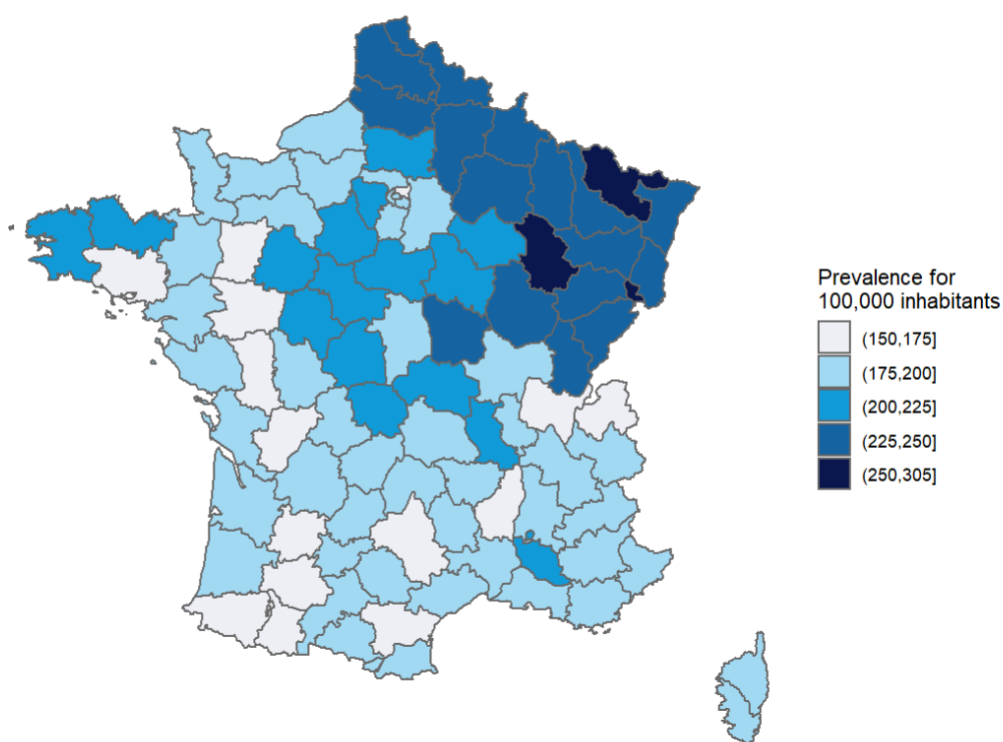


Table 1: Characteristics of the population with MS in France on December 31, 2021 (n=134,062).

| Demographics | n (%) |
|---|----------------|
| Sex at birth | |
| Men | 37,805 (28.2) |
| Women | 96,257 (71.8) |
| Age in years, median (IQR) | 53 (42-63) |
| ≤18 | 494 (0.4) |
| 19 - 30 | 8,688 (6.5) |
| 31-40 | 21,519 (16.1) |
| 41-50 | 29,531 (22.0) |
| 51-60 | 32,816 (24.5) |
| 61-70 | 24,832 (18.5) |
| 71≤ | 16,182 (12.1) |
| Insurance scheme | |
| General scheme | 117,189 (87.4) |
| SLM | 7,291 (5.4) |
| MSA | 4,528 (3.4) |
| Other scheme | 2,897 (2.2) |
| Missing | 2,157 (1.6) |
| CMU | |
| Yes | 10,556 (7.9) |
| No | 120,763 (90.1) |
| Missing | 2,743 (2.0) |
| FDep index, quintile | |
| 1 (least deprived) | 26,249 (19.6) |
| 2 | 25,934 (19.3) |
| 3 | 26,370 (19.7) |
| 4 | 25,860 (19.3) |
| 5 (most deprived) | 25,051 (18.7) |
| Missing | 4,598 (3.4) |
| Comorbidities (n=129,449) | |
| Psychiatric disorder or psychotropic drug treatment | 42,402 (32.7) |
| Antidepressants use | 30 178 (23.3) |
| Anxiolytics use | 18 084 (14.0) |
| Paraplegia | 11,785 (9.1) |
| Cardio-neurovascular diseases | 10,236 (7.9) |
| Cancer | 7,600 (5.9) |
| Diabetes | 7,624 (5.9) |

| | |
|---|---------------|
| Comorbidities information missing | 4,613 (3.4) |
| Additional LTD | |
| 0 | 91,048 (67.9) |
| 1 | 24,323 (18.1) |
| 2 | 10,290 (7.7) |
| 3 | 4,422 (3.3) |
| 4+ | 3,979 (3.0) |
| MS-related characteristics | |
| Disease-modifying treatments | |
| No DMT | 64,786 (48.3) |
| Any moderate efficacy DMT | 43,314 (32.3) |
| <i>Teriflunomide</i> | 13,529 (10.1) |
| <i>Dimethyl fumarate</i> | 12,136 (9.0) |
| <i>Beta interferon</i> | 8,664 (6.5) |
| <i>Glatiramer acetate</i> | 6,650 (5.0) |
| <i>Mycophenolic mofetil</i> | 1,359 (1.0) |
| <i>Methotrexate</i> | 1,459 (1.1) |
| <i>Azathioprine</i> | 1,097 (0.8) |
| <i>Cladribine</i> | 182 (0.1) |
| <i>Cyclophosphamide</i> | 24 (0.02) |
| Any high efficacy DMT | 28,025 (20.9) |
| <i>Fingolimod</i> | 10,776 (8.0) |
| <i>Ocrelizumab</i> | 8,528 (6.6) |
| <i>Natalizumab</i> | 6,258 (4.7) |
| <i>Rituximab</i> | 3,303 (2.5) |
| All hospitalizations, median (IQR) | 0 (0-2) |
| ≥ 1 | 55,612 (41.5) |
| MS-related hospitalizations, median (IQR) | 0 (0-1) |
| ≥ 1 | 36,745 (27.4) |
| <p><i>Abbreviations: DMT, Disease modifying treatments; IQR, interquartile range; FDep, city of residence social deprivation index; LTD, Long-term disease status; MS, Multiple Sclerosis ; SLM, "Sections locales mutualistes"; MSA, "Mutualité sociale agricole"</i></p> <p><i>Notes: All statistics reported as n(%) unless otherwise specified.</i></p> <p><i>MS-related characteristics are reported for the January 1, 2021 to December 31, 2021 period.</i></p> <p><i>Comorbidity percentages were calculated after exclusion of the missing data.</i></p> | |

Table 2: Age and sex-stratified MS prevalence rates in France in 2021.

| Age in years | Number of MS cases | Number of people living in France | Overall | | Women | | Men | |
|--------------|--------------------|-----------------------------------|---------------------|-------------|---------------------|-------------|---------------------|-------------|
| | | | Crude MS prevalence | 95% CI | Crude MS prevalence | 95% CI | Crude MS prevalence | 95% CI |
| Total France | 134,062 | 67,842,591 | 197.6 | 196.5-198.7 | 274.9 | 273.2-276.6 | 115.2 | 114.0-116.4 |
| <15 | 106 | 11,870,954 | 0.9 | 0.7-1.1 | 0.9 | 0.7-1.1 | 0.9 | 0.7-1.1 |
| 15-19 | 591 | 4,208,524 | 14.0 | 12.9-15.1 | 19.8 | 17.9-21.7 | 8.6 | 7.4-9.8 |
| 20-24 | 2,160 | 3,922,318 | 55.1 | 52.8-57.4 | 77.2 | 73.3-81.1 | 33.9 | 31.3-36.5 |
| 25-29 | 4,946 | 3,725,962 | 132.7 | 129.0-136.4 | 187.7 | 181.5-193.9 | 77.1 | 73.1-81.1 |
| 30-34 | 8,358 | 4,064,176 | 205.7 | 201.3-210.1 | 288.3 | 281.0-295.6 | 119.4 | 114.6-124.2 |
| 35-39 | 11,696 | 4,200,292 | 278.5 | 273.5-283.5 | 392.9 | 384.5-401.3 | 157.1 | 151.7-162.5 |
| 40-44 | 13,805 | 4,239,439 | 325.6 | 320.2-331.0 | 452.9 | 443.9-461.9 | 192.9 | 186.9-198.9 |
| 45-49 | 15,213 | 4,320,709 | 352.1 | 346.5-357.7 | 501.5 | 492.1-510.9 | 199.1 | 193.1-205.1 |
| 50-54 | 16,398 | 4,454,399 | 368.1 | 362.5-373.7 | 516.9 | 507.5-526.3 | 214.7 | 208.6-220.8 |
| 55-59 | 16,598 | 4,437,879 | 374.0 | 368.3-379.7 | 522.5 | 513.1-531.9 | 217.1 | 210.9-223.3 |
| 60-64 | 14,327 | 4,176,777 | 343.0 | 337.4-348.6 | 475.4 | 466.2-484.6 | 198.8 | 192.6-205.0 |
| 65-69 | 11,629 | 3,904,715 | 297.8 | 292.4-303.2 | 402.8 | 394.2-411.4 | 178.5 | 172.4-184.6 |
| 70-74 | 9,080 | 3,707,830 | 244.9 | 239.9-249.9 | 321.2 | 313.3-329.1 | 155.7 | 149.8-161.6 |
| 75-79 | 4,900 | 2,524,031 | 194.1 | 188.7-199.5 | 253.6 | 245.3-261.9 | 120.2 | 113.8-126.6 |
| 80-84 | 2,431 | 1,802,512 | 134.9 | 129.5-140.3 | 171.8 | 163.9-179.7 | 82.8 | 76.3-89.3 |
| ≥85 | 1,824 | 2,282,074 | 79.9 | 76.2-83.6 | 93.9 | 89.1-98.7 | 50.6 | 45.5-55.7 |

Table 3: Crude and standardized MS prevalence rates in France on December 31, 2021.

| | Overall | Women | Men |
|--|---------------------|---------------------|---------------------|
| Number of MS cases | 134,062 | 96,257 | 37,805 |
| 2021 population | 67,842,591 | 35,020,367 | 32,822,224 |
| Crude prevalence rates per 100,000 population | 197.6 (196.5-198.7) | 274.9 (273.2-276.6) | 115.2 (114.0-116.4) |
| Standardized prevalence rates per 100,000 (2013 World population) | 159.2 (158.3-160.1) | 224.9 (223.5-226.3) | 91.7 (90.8-92.6) |
| Standardized prevalence rates per 100,000 (2021 World population) | 166.3 (165.4-167.2) | 234.3 (232.8-235.8) | 96.1 (95.1-97.1) |
| Standardized prevalence rates per 100,000 (1976 European population) | 172.1 (171.2-173.0) | 244.9 (243.4-246.4) | 98.2 (97.2-99.2) |
| Standardized prevalence rates per 100,000 (2013 European population) | 202.2 (201.1-203.3) | 279.8 (278.0-281.6) | 118.7 (117.5-119.9) |
| Standardized prevalence rates per 100,000 (2021 European population) | 203.5 (202.4-204.6) | 281.3 (279.5-283.1) | 119.7 (118.5-120.9) |

Table 4: Region-specific standardized MS prevalence rates in metropolitan France, 2021.

| Administrative region of France | Number of MS cases | Number of people living in the region | Overall | | | Women | | | Men | | |
|---------------------------------|--------------------|---------------------------------------|-------------------------|-------------|----------------------|-------------------------|-------------|----------------------|-------------------------|--------------|----------------------|
| | | | Standardized prevalence | 95% CI | Comparison with 2012 | Standardized prevalence | 95% CI | Comparison with 2012 | Standardized prevalence | 95% CI | Comparison with 2012 |
| Total France | 131,086 | 67,842,591 | 193.1 | 192.1-194.1 | +27.71% | 269.1 | 267.4-270.8 | +28.14% | 111.9 | 110.8-113.0 | +26.16% |
| Auvergne-Rhône-Alpes | 14,891 | 8,156,391 | 183.3 | 180.4-186.3 | | 255.0 | 250.2-259.8 | | 107.7 | 104.5-110.9 | |
| Auvergne | 2,752 | 1,371,196 | 194.0 | 186.8-201.2 | 25.16% | 286.3 | 274.0-298.6 | 27.30% | 98.5 | 91.1-105.9 | 22.21% |
| Rhône-Alpes | 12,139 | 6,785,195 | 180.9 | 177.7-184.1 | 28.85% | 248.4 | 243.1-253.7 | 28.97% | 109.6 | 106.0-113.2 | 29.40% |
| Bourgogne-Franche-Comté | 6,452 | 2,791,006 | 226.6 | 221.1-232.1 | | 329.6 | 320.3-338.9 | | 119.2 | 113.5-124.9 | |
| Bourgogne | 3,541 | 1,614,708 | 212.8 | 205.8-219.8 | 25.10% | 310.2 | 298.4-322.0 | 25.49% | 110.7 | 103.65-117.9 | 25.65% |
| Franche-Comté | 2,911 | 1,176,298 | 245.4 | 236.5-254.3 | 32.15% | 356.3 | 341.2-371.4 | 31.67% | 130.6 | 121.3-139.9 | 36.90% |
| Bretagne | 6,755 | 3,412,207 | 195.6 | 190.9-200.3 | 33.42% | 279.1 | 271.3-286.9 | 35.09% | 108.7 | 103.87-113.7 | 31.44% |
| Centre Val de Loire | 5,515 | 2,572,636 | 211.9 | 206.3-217.5 | 25.16% | 299.7 | 290.4-309.0 | 25.40% | 119.4 | 113.54-125.4 | 25.55% |
| Corse | 675 | 348,830 | 182.7 | 168.9-196.5 | 45.46% | 257.0 | 234.2-279.8 | 45.86% | 103.2 | 88.4-118.0 | 43.73% |
| Grand Est | 13,831 | 5,561,482 | 243.9 | 239.8-248.0 | | 343.6 | 337.1-350.3 | | 139.5 | 135.1-143.9 | |
| Alsace | 4,745 | 1,930,273 | 240.3 | 233.5-247.1 | 24.77% | 336.5 | 325.2-347.8 | 24.86% | 139.6 | 132.2-147.0 | 26.11% |
| Champagne-Ardenne | 3,127 | 1,312,778 | 237.4 | 229.1-245.7 | 24.75% | 336.7 | 322.9-350.5 | 25.82% | 132.8 | 123.9-141.7 | 22.96% |
| Lorraine | 5,959 | 2,318,431 | 250.7 | 244.3-257.1 | 25.22% | 354.0 | 343.4-364.6 | 27.38% | 143.0 | 136.1-149.9 | 21.70% |
| Hauts-de-France | 13,672 | 5,985,483 | 232.4 | 228.5-236.3 | | 318.6 | 312.5-325.0 | | 140.6 | 136.2-145.0 | |
| Nord-Pas-de-Calais | 9,231 | 4,063,753 | 232.5 | 227.8-237.2 | 21.98% | 312.5 | 304.9-320.1 | 22.55% | 146.7 | 141.3-152.1 | 20.25% |
| Picardie | 4,441 | 1,921,730 | 231.7 | 224.9-238.5 | 19.56% | 330.9 | 319.5-342.3 | 21.34% | 127.7 | 120.5-134.9 | 16.41% |
| Ile-de-France | 22,561 | 12,329,432 | 188.9 | 187.7-191.4 | 26.61% | 254.8 | 250.8-258.8 | 26.08% | 117.3 | 114.5-120.1 | 26.26% |
| Normandie | 6,424 | 3,319,743 | 192.4 | 188.0-197.1 | | 268.7 | 261.1-276.5 | | 111.6 | 106.5-116.7 | |
| Basse-Normandie | 2,832 | 1,468,032 | 189.5 | 182.5-196.5 | 28.04% | 264.8 | 253.3-276.3 | 28.79% | 110.6 | 103.0-118.2 | 27.57% |
| Haute-Normandie | 3,592 | 1,851,711 | 194.8 | 188.4-201.2 | 29.18% | 272.0 | 261.5-282.5 | 32.42% | 112.1 | 105.1-119.1 | 20.93% |
| Nouvelle-Aquitaine | 11,291 | 6,086,584 | 178.9 | 175.6-182.2 | | 254.9 | 249.6-260.4 | | 97.6 | 94.1-101.1 | |
| Aquitaine | 6,473 | 3,534,811 | 177.1 | 172.8-181.4 | 29.18% | 250.1 | 243.0-257.2 | 29.32% | 98.5 | 93.9-103.1 | 27.59% |
| Limousin | 1,479 | 722,658 | 195.0 | 185.1-204.9 | 34.95% | 281.7 | 265.0-298.4 | 33.95% | 104.3 | 93.9-114.7 | 40.00% |
| Poitou-Charentes | 3,339 | 1,829,115 | 176.1 | 170.1-182.1 | 35.36% | 253.9 | 243.9-263.9 | 36.07% | 93.4 | 87.2-99.6 | 33.43% |
| Occitanie | 11,114 | 6,060,331 | 180.4 | 177.0-183.8 | | 253.7 | 248.4-259.2 | | 102.1 | 98.5-105.7 | |
| Languedoc-Roussillon | 5,424 | 2,917,252 | 183.2 | 178.3-188.1 | 37.64% | 253.9 | 246.0-261.8 | 36.07% | 105.9 | 100.5-111.3 | 39.34% |
| Midi-Pyrénées | 5,690 | 3,143,079 | 178.1 | 173.5-182.7 | 26.13% | 253.9 | 246.2-261.6 | 27.46% | 98.7 | 93.8-103.6 | 24.15% |

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|-----------------------------------|-------|-----------|-------|-------------|--------|-------|-------------|--------|-------|-------------|--------|
| Pays de la Loire | 7,087 | 3,882,895 | 183.7 | 179.4-188.0 | 31.78% | 267.0 | 259.8-274.2 | 33.30% | 96.7 | 92.3-101.1 | 29.62% |
| Provence-Alpes-Côte d'Azur | 9,790 | 5,139,817 | 187.3 | 183.6-191.0 | 32.65% | 257.5 | 251.5-263.5 | 32.80% | 110.2 | 106.1-114.3 | 29.49% |
| Overseas departments* | 1,028 | 2,195,754 | 50.1 | 47.0-53.2 | | 67.3 | 62.5-72.1 | | 29.6 | 26.1-33.1 | |

Comparison with 2012 from Foulon et al 2017

Reference population: French population on January 1, 2022

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Appendix

Supplemental Table 1: Department-specific standardized MS prevalence rates in metropolitan France, 2021.

| Administrative 'department' of France | Number of MS cases | Number of people living in the 'department' | Overall | | Women | | Men | |
|---------------------------------------|--------------------|---|-------------------------|-------------|-------------------------|-------------|-------------------------|-------------|
| | | | Standardized prevalence | 95% CI | Standardized prevalence | 95% CI | Standardized prevalence | 95% CI |
| Total Metropolitan France | 130,059 | 65,646,837 | 197.4 | 196.3-198.5 | 275.5 | 273.7-277.3 | 114.3 | 113.1-115.5 |
| Ain | 1,102 | 666,971 | 164.7 | 155.0-174.4 | 232.4 | 216.2-248.6 | 94.7 | 84.2-105.2 |
| Aisne | 1,238 | 524,723 | 233.8 | 220.8-246.8 | 333.6 | 311.8-355.4 | 130.1 | 116.2-144.0 |
| Allier | 778 | 333,500 | 221.5 | 205.9-237.1 | 324.4 | 298.2-350.6 | 112.9 | 96.9-128.9 |
| Alpes-de-Haute-Provence | 315 | 166,198 | 177.2 | 157.6-196.8 | 251.3 | 218.7-283.9 | 99.0 | 78.2-119.8 |
| Alpes-Maritimes | 2,086 | 1,106,233 | 184.3 | 176.4-192.2 | 263.5 | 250.5-276.5 | 96.1 | 87.8-104.4 |
| Ardèche | 544 | 331,214 | 157.9 | 144.6-171.2 | 220.3 | 198.4-242.2 | 93.7 | 79.0-108.4 |
| Ardennes | 643 | 266,690 | 235.0 | 216.8-253.2 | 323.8 | 293.9-353.7 | 142.7 | 122.5-162.9 |
| Ariège | 313 | 154,424 | 196.3 | 174.6-218.0 | 279.3 | 243.0-315.6 | 110.1 | 86.7-133.5 |
| Aube | 676 | 312,183 | 219.4 | 202.9-235.9 | 309.7 | 282.3-337.1 | 123.8 | 106.0-141.6 |
| Aude | 684 | 378,330 | 174.8 | 161.7-187.9 | 249.8 | 228.0-271.6 | 93.3 | 79.6-107.0 |
| Aveyron | 507 | 279,639 | 172.1 | 157.1-187.1 | 240.5 | 215.5-265.5 | 103.7 | 87.2-120.2 |
| Bas-Rhin | 2,939 | 1,161,777 | 249.4 | 240.4-258.4 | 348.5 | 333.6-363.4 | 145.3 | 135.5-155.1 |
| Bouches-du-Rhône | 3,893 | 2,061,919 | 189.0 | 183.1-194.9 | 251.9 | 242.4-261.4 | 119.4 | 112.6-126.2 |
| Calvados | 1,380 | 699,791 | 197.0 | 186.6-207.4 | 273.4 | 256.4-290.4 | 115.1 | 103.7-126.5 |
| Cantal | 308 | 143,803 | 196.5 | 174.6-218.4 | 286.9 | 249.4-324.4 | 106.2 | 83.4-129.0 |
| Charente | 618 | 351,283 | 166.7 | 153.6-179.8 | 241.5 | 219.3-263.7 | 87.9 | 74.4-101.4 |
| Charente-Maritime | 1,307 | 662,822 | 185.3 | 175.3-195.3 | 262.4 | 245.8-279.0 | 101.9 | 91.2-112.6 |
| Cher | 596 | 298,249 | 191.8 | 176.4-207.2 | 290.0 | 263.4-316.6 | 89.2 | 74.3-104.1 |
| Corrèze | 480 | 237,790 | 189.9 | 172.9-206.9 | 272.9 | 244.4-301.4 | 104.0 | 86.1-121.9 |
| Corse | 675 | 348,830 | 182.7 | 168.9-196.5 | 257.0 | 234.2-279.8 | 103.2 | 88.4-118.0 |
| Côte-d'Or | 1,292 | 535,786 | 241.4 | 228.2-254.6 | 350.6 | 328.5-372.7 | 125.4 | 111.8-139.0 |
| Côtes-d'Armor | 1,346 | 606,868 | 214.5 | 203.0-226.0 | 304.2 | 285.1-323.3 | 120.9 | 108.6-133.2 |
| Creuse | 262 | 114,142 | 203.5 | 178.9-228.1 | 321.5 | 278.0-365.0 | 83.7 | 61.0-106.4 |

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|------------------|-------|-----------|-------|-------------|-------|-------------|-------|-------------|
| Deux-Sèvres | 609 | 374,142 | 158.0 | 145.5-170.5 | 234.1 | 212.7-255.5 | 79.1 | 66.4-91.8 |
| Dordogne | 812 | 411,988 | 180.1 | 167.7-192.5 | 253.8 | 233.3-274.3 | 102.1 | 88.7-115.5 |
| Doubs | 1,289 | 548,458 | 239.5 | 226.4-252.6 | 341.1 | 319.2-363.0 | 133.7 | 119.8-147.6 |
| Drôme | 942 | 521,319 | 178.1 | 166.7-189.5 | 246.3 | 227.7-264.9 | 105.5 | 92.9-118.1 |
| Essonne | 2,417 | 1,312,419 | 193.0 | 185.3-200.7 | 269.1 | 256.4-281.8 | 112.7 | 104.3-121.1 |
| Eure | 1,136 | 597,425 | 188.0 | 177.1-198.9 | 271.9 | 253.6-290.2 | 99.4 | 88.0-110.8 |
| Eure-et-Loir | 954 | 429,570 | 219.5 | 205.6-233.4 | 313.0 | 289.7-336.3 | 121.9 | 107.1-136.7 |
| Finistère | 2,059 | 923,400 | 217.3 | 207.9-226.7 | 317.3 | 301.4-333.2 | 114.2 | 104.5-123.9 |
| Gard | 1,403 | 755,497 | 182.1 | 172.6-191.6 | 252.9 | 237.3-268.5 | 105.3 | 94.8-115.8 |
| Gers | 342 | 192,553 | 163.2 | 145.9-180.5 | 239.4 | 210.1-268.7 | 83.8 | 66.1-101.5 |
| Gironde | 3,096 | 1,673,755 | 184.9 | 178.4-191.4 | 260.4 | 249.7-271.1 | 102.8 | 95.8-109.8 |
| Haute-Garonne | 2,535 | 1,452,541 | 178.6 | 171.6-185.6 | 251.4 | 239.9-262.9 | 101.6 | 94.1-109.1 |
| Haute-Loire | 429 | 227,097 | 179.6 | 162.6-196.6 | 270.7 | 241.2-300.2 | 87.8 | 71.1-104.5 |
| Haute-Marne | 487 | 168,881 | 276.1 | 251.6-300.6 | 408.2 | 366.3-450.1 | 142.3 | 117.2-167.4 |
| Hautes-Alpes | 294 | 140,078 | 198.7 | 176.0-221.4 | 274.9 | 237.5-312.3 | 120.5 | 95.2-145.8 |
| Haute-Saône | 603 | 232,619 | 249.0 | 229.1-268.9 | 361.2 | 327.6-394.8 | 134.6 | 113.7-155.5 |
| Haute-Savoie | 1,412 | 853,015 | 163.9 | 155.4-172.4 | 229.9 | 215.7-244.1 | 94.9 | 85.6-104.2 |
| Hautes-Pyrénées | 422 | 230,404 | 174.0 | 157.4-190.6 | 251.1 | 223.4-278.8 | 91.5 | 74.2-108.8 |
| Haute-Vienne | 737 | 370,726 | 194.2 | 180.2-208.2 | 271.9 | 248.8-295.0 | 111.3 | 96.0-126.6 |
| Haut-Rhin | 1,806 | 768,496 | 227.8 | 217.3-238.3 | 319.8 | 302.4-337.2 | 132.3 | 120.9-143.7 |
| Hauts-de-Seine | 2,988 | 1,637,090 | 184.9 | 178.3-191.5 | 240.0 | 229.6-250.4 | 122.6 | 114.7-130.5 |
| Hérault | 2,213 | 1,218,474 | 182.5 | 174.9-190.1 | 248.9 | 236.6-261.2 | 109.3 | 100.8-117.8 |
| Ille-et-Vilaine | 1,990 | 1,108,972 | 184.2 | 176.1-192.3 | 256.1 | 242.7-269.5 | 109.4 | 100.5-118.3 |
| Indre | 481 | 216,241 | 212.1 | 193.1-231.1 | 299.7 | 268.2-331.2 | 121.7 | 101.1-142.3 |
| Indre-et-Loire | 1,261 | 616,107 | 205.4 | 194.1-216.7 | 277.6 | 259.3-295.9 | 128.1 | 115.2-141.0 |
| Isère | 2,239 | 1,288,501 | 176.1 | 168.8-183.4 | 237.5 | 225.6-249.4 | 111.7 | 103.4-120.0 |
| Jura | 597 | 257,304 | 225.2 | 207.1-243.3 | 340.1 | 309.0-371.2 | 106.4 | 88.7-124.1 |
| Landes | 796 | 425,229 | 175.5 | 163.3-187.7 | 249.3 | 229.1-269.5 | 97.6 | 84.5-110.7 |
| Loire | 1,548 | 770,678 | 203.0 | 192.9-213.1 | 284.6 | 267.9-301.3 | 116.8 | 105.8-127.8 |
| Loire-Atlantique | 2,743 | 1,480,188 | 188.2 | 181.2-195.2 | 273.3 | 261.5-285.1 | 98.4 | 91.1-105.7 |
| Loiret | 1,512 | 685,081 | 223.6 | 212.3-234.9 | 316.4 | 297.7-335.1 | 125.5 | 113.4-137.6 |

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|----------------------|-------|-----------|-------|-------------|-------|-------------|-------|-------------|
| Loir-et-Cher | 711 | 327,388 | 209.3 | 193.9-224.7 | 301.3 | 275.4-327.2 | 112.9 | 96.9-128.9 |
| Lot | 341 | 175,196 | 177.8 | 158.9-196.7 | 271.0 | 238.1-303.9 | 81.1 | 63.4-98.8 |
| Lot-et-Garonne | 594 | 329,180 | 172.4 | 158.5-186.3 | 233.3 | 210.9-255.7 | 106.9 | 91.2-122.6 |
| Lozère | 155 | 76,572 | 188.5 | 158.8-218.2 | 288.9 | 236.6-341.2 | 89.5 | 61.0-118.0 |
| Maine-et-Loire | 1,387 | 825,814 | 172.5 | 163.4-181.6 | 248.9 | 233.7-264.1 | 92.5 | 83.0-102.0 |
| Manche | 907 | 493,646 | 176.6 | 165.1-188.1 | 248.7 | 229.5-267.9 | 103.0 | 90.5-115.5 |
| Marne | 1,321 | 565,024 | 236.6 | 223.8-249.4 | 336.1 | 314.9-357.3 | 130.4 | 116.8-144.0 |
| Mayenne | 492 | 305,719 | 161.4 | 147.1-175.7 | 241.3 | 216.7-265.9 | 81.1 | 66.8-95.4 |
| Meurthe-et-Moselle | 1,783 | 730,393 | 246.0 | 234.6-257.4 | 347.2 | 328.3-366.1 | 138.8 | 126.5-151.1 |
| Meuse | 454 | 179,626 | 244.4 | 221.9-266.9 | 361.6 | 322.9-400.3 | 126.9 | 104.1-149.7 |
| Morbihan | 1,360 | 772,967 | 171.7 | 162.6-180.8 | 246.4 | 231.1-261.7 | 93.1 | 83.5-102.7 |
| Moselle | 2,875 | 1,050,548 | 263.7 | 254.1-273.3 | 366.9 | 351.0-382.8 | 156.0 | 145.4-166.6 |
| Nièvre | 470 | 199,379 | 225.1 | 204.7-245.5 | 333.8 | 299.0-368.6 | 112.0 | 91.6-132.4 |
| Nord | 5,717 | 2,607,165 | 226.8 | 220.9-232.7 | 302.0 | 292.6-311.4 | 145.4 | 138.6-152.2 |
| Oise | 1,829 | 831,729 | 222.2 | 212.0-232.4 | 315.4 | 298.4-332.4 | 124.4 | 113.5-135.3 |
| Orne | 545 | 274,595 | 196.1 | 179.6-212.6 | 274.7 | 247.3-302.1 | 115.0 | 97.2-132.8 |
| Paris | 4,137 | 2,117,702 | 195.9 | 189.9-201.9 | 255.4 | 246.0-264.8 | 129.3 | 122.3-136.3 |
| Pas-de-Calais | 3,514 | 1,456,588 | 241.8 | 233.8-249.8 | 330.2 | 317.2-343.2 | 148.2 | 139.2-157.2 |
| Puy-de-Dôme | 1,237 | 666,796 | 183.5 | 173.3-193.7 | 270.7 | 253.3-288.1 | 92.6 | 82.2-103.0 |
| Pyrénées-Atlantiques | 1,175 | 694,659 | 160.8 | 151.6-170.0 | 230.9 | 215.6-246.2 | 85.3 | 75.7-94.9 |
| Pyrénées-Orientales | 969 | 488,379 | 193.2 | 181.0-205.4 | 267.2 | 247.5-286.9 | 110.9 | 97.5-124.3 |
| Rhône | 3,531 | 1,908,625 | 194.8 | 188.4-201.2 | 258.9 | 248.6-269.2 | 125.3 | 117.9-132.7 |
| Saône-et-Loire | 1,073 | 548,526 | 187.5 | 176.3-198.7 | 269.8 | 251.0-288.6 | 101.9 | 90.0-113.8 |
| Sarthe | 1,147 | 567,053 | 202.2 | 190.5-213.9 | 292.7 | 273.0-312.4 | 107.9 | 95.6-120.2 |
| Savoie | 821 | 444,872 | 179.9 | 167.6-192.2 | 256.4 | 235.8-277.0 | 100.4 | 87.3-113.5 |
| Seine-et-Marne | 2,693 | 1,444,389 | 191.6 | 184.4-198.8 | 264.7 | 252.9-276.5 | 113.0 | 105.0-121.0 |
| Seine-Maritime | 2,456 | 1,254,286 | 198.1 | 190.3-205.9 | 272.2 | 259.4-285.0 | 118.4 | 109.7-127.1 |
| Seine-Saint-Denis | 2,587 | 1,673,645 | 165.6 | 159.2-172.0 | 223.0 | 212.6-233.4 | 106.1 | 98.9-113.3 |
| Somme | 1,374 | 565,278 | 244.0 | 231.1-256.9 | 352.2 | 330.6-373.8 | 130.0 | 116.5-143.5 |
| Tarn | 735 | 393,436 | 180.4 | 167.4-193.4 | 255.9 | 234.3-277.5 | 100.4 | 86.3-114.5 |
| Tarn-et-Garonne | 495 | 264,886 | 185.0 | 168.1-201.3 | 266.5 | 239.1-293.9 | 99.9 | 82.8-117.0 |

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|-----------------------|-------|-----------|-------|-------------|-------|-------------|-------|-------------|
| Territoire de Belfort | 422 | 137,917 | 304.0 | 275.0-333.0 | 444.1 | 395.0-493.2 | 159.5 | 129.4-189.6 |
| Val-d'Oise | 2,230 | 1,266,471 | 185.3 | 177.6-193.0 | 258.5 | 245.9-271.1 | 106.4 | 98.0-114.8 |
| Val-de-Marne | 2,626 | 1,420,404 | 191.1 | 183.8-198.4 | 255.2 | 243.5-266.9 | 121.0 | 112.6-129.4 |
| Var | 2,061 | 1,102,074 | 179.9 | 172.1-187.7 | 249.3 | 236.6-262.0 | 104.6 | 96.0-113.2 |
| Vaucluse | 1,141 | 563,315 | 200.4 | 188.8-212.0 | 278.3 | 259.3-297.3 | 115.6 | 102.9-128.3 |
| Vendée | 1,318 | 704,121 | 183.8 | 173.9-193.7 | 267.1 | 250.3-283.9 | 97.5 | 87.2-107.8 |
| Vienne | 805 | 440,868 | 185.1 | 172.3-197.9 | 267.7 | 246.3-289.1 | 97.4 | 84.1-110.7 |
| Vosges | 848 | 357,864 | 227.6 | 212.3-242.9 | 330.4 | 304.5-356.3 | 121.8 | 105.9-137.7 |
| Yonne | 706 | 331,017 | 204.0 | 189.0-219.0 | 301.5 | 275.9-327.1 | 102.6 | 87.3-117.9 |
| Yvelines | 2,883 | 1,457,312 | 203.2 | 195.8-210.6 | 279.4 | 267.3-291.5 | 121.5 | 113.2-129.8 |

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