

# The Prevalence of Dementia in Europe and in Slovenia: The Review and Estimate of Dementia for Slovenia for 2018 and Projection for 2030

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## ABSTRACT

*Dementia is becoming an increasingly important public health priority that will continue to increase due to the population aging and longevity. Appropriate national assessment of dementia prevalence is essential for properly planning the actions needed to address dementia. The purpose of this work was to identify the known prevalence of dementia in Europe and in Slovenia in the last twenty years, as well as to produce an estimation for 2018 and a projection for 2030 based on population data in Slovenia. The PubMed database search engine was used. We searched for hits in various combinations and reviewed the literature on the prevalence of dementia in Europe and in Slovenia. Estimates of dementia prevalence for Slovenia were not found in the reviewed literature; we calculated it based on Slovenian data for 2018 and projections for 2030. Dementia prevalence rates in Europe have not changed significantly in most age groups in recent decades. In Slovenia, in 2018, the age-standardized prevalence rate for those aged 65 and over was 6.9%, for women 8.8% and for men twice lower, and according to the projection for 2030 it was 7.2% for men, 9.0% for women, which was twice as much as in men. The gross prevalence rate for dementia in people aged 65 and older in Europe ranges from 5.9% to 9.4%. The results of all studies show that the prevalence is increasing with increasing age, that it is higher and it is increasing earlier and faster in women (80–84 years) compared to men (85–89 years). The prevalence of dementia in women was twice as high as that of men and was increasing more rapidly with age. In Slovenia we can expect an increase in the number of people with dementia in the next ten years, primarily due to the aging of the population and extending of the life expectancy.*

**Key words:** dementia, prevalence, projections, Slovenia, Europe

## Introduction

Due to demographic and social changes, the prevalence of dementia is rising sharply, especially in developing countries. Dementia is also a major public health problem in Europe, one of the most common diseases of the elderly, with a significant impact on disability and mortality<sup>1</sup>. According to current trends, experts estimate that by 2050 the number of people with dementia in the world is expected to triple and exceed 150 million<sup>2</sup>. Dementia is becoming an increasingly important public health problem and has economic, social and political dimensions<sup>3–5</sup>. It is the third leading cause of disability in the world<sup>6</sup>. According to WHO, it contributes significantly to disability, more than disability due to stroke, musculoskeletal and cardiovascular diseases, and all cancers combined<sup>7</sup>. Despite the recognition of dementia as an increasingly important public health problem,

people with dementia still remain in high proportions worldwide hidden, unrecognized, undiagnosed and without using the services despite contact with the health and social systems<sup>8</sup>. The estimates of dementia prevalence provide a starting point and a basis for policymakers, for the health and social policy planning<sup>9</sup>, have significant implications for social and public policy planning, and are needed for adequately providing of resources to cover health and social needs in this field<sup>10</sup>.

The purpose of the paper was to identify the known prevalence of dementia in Europe and in Slovenia in the last twenty years, when the prevalence of dementia began to be assessed more systematically in Europe, as well as to produce an estimation for 2018 and a projection for 2030 based on population data in Slovenia.

## Methods

The PubMed database was used for searching for the original publications and posts. We searched for dementia articles through various search strategies. The focus was on the PubMed/Medline database search engine. We searched for <dementia>, <dementia in Europe>, <prevalence of dementia in Europe> in various combinations. Articles published from the 1 January 2000 to 31 December 2019, in English, pertaining to prevalence estimates for all types of dementia together and for the European Region were included. Two reviewers independently reviewed the titles and abstracts. From these hits, meta-analyses and systematic reviews of the literature that included an assessment of the prevalence of dementia for Europe were considered. Dementia prevalence estimates were also searched specifically for Slovenia. The literature review was supplemented by an overview of the sources cited in the selected contributions. Other forms of contributions were provided when appropriate. Based on the selected article (literature review and meta-analysis of dementia prevalence in Europe), we prepared a calculation of dementia prevalence for Slovenia for 2018 and a projection for 2030. We took into account the data on the population of Slovenia in 2018 and the projection for 2030, according to the Statistical Office of the Republic of Slovenia.

## Results

Figure 1 schematically shows the course of search and inclusion of articles in the literature review. With the search engines described above, 6989 hits (from 1964 to 2020) for <prevalence of dementia in Europe> were obtained from the PubMed/Medline database. We excluded hits (n = 1462) that were published before 1 January 2000 and after 31 December 2019. Based on our exclusion criteria, we found 29 results. After re-checking the inclusion and exclusion criteria, after reviewing the titles and abstracts, we selected 6 articles that were reviewed. Data on the prevalence estimate for Slovenia were not found. (Figure 1)

After reviewing the included articles, the study of Bacigalupo et al. was selected for the calculation of the prevalence of dementia in Slovenia<sup>11</sup>. The authors conducted a systematic literature review and meta-analysis for the prevalence of dementia in Europe on the basis of three European projects funded by the European Commission (Eurodem, European Collaboration on Dementia – EuroCoDe and Alzheimer’s Cooperative Valuation in Europe – ALCOVE). The findings relate to the period from 1993 to 2018. According to the latest prevalence estimates, 7.1% of people aged 65 or older have dementia<sup>11</sup>.

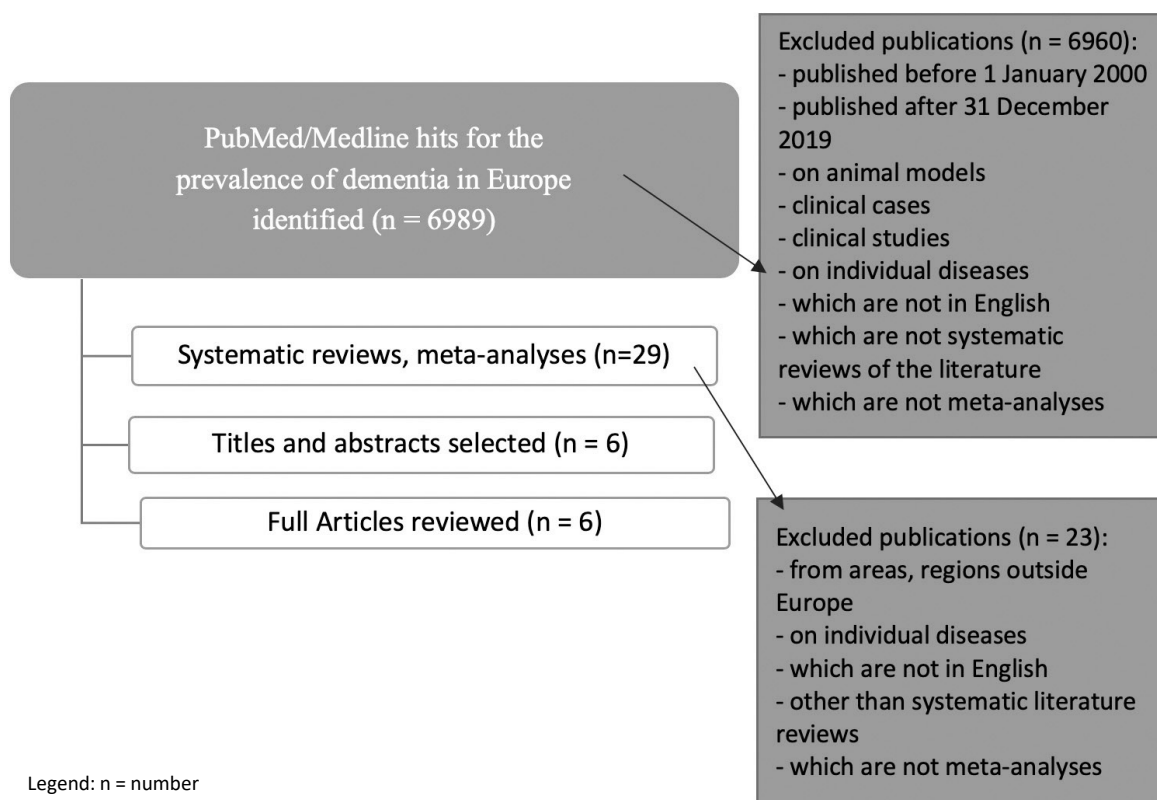


Fig. 1. Flowchart of the literature review process.

According to the Statistical Office of the Republic of Slovenia, in 2018, Slovenia had a total population of 2.070.050 (1.030.234 men and 1.039.816 women), 407.333 people aged 65 or more (19.6% of the population, 16.8% male and 22.6% female), 5.3% of the population were 80 years of age or older. According to the projections, in 2030, 25% of the population would be 65 years of age or older and 6.8% of the population would be 80 years of age or older<sup>12</sup>. The estimate of the prevalence of dementia for Slovenia for 2018 is shown in Table 1 and the projection for 2030 in Table 2. In 2018, there were 28114 cases of dementia in Slovenia in persons aged 65 years or more, 20648 women and 7466 men. The age-standardized rate of dementia was 6.9%, for women 8.8%, twice higher than for men (4.3%). In 2030, 37499 cases of dementia in people aged 65 years or older (26298 women and 11201 men) are projected to occur. According to the projection, the number of cases of dementia in the population of Slovenia aged 65 and more would increase by 33.4% by 2030. The age-standardized rate of dementia would be 7.2% in 2030, 9.0% for women, twice as high as for men (4.8%). (Tables 1 and 2)

## Discussion

Epidemiological estimates (prevalence of dementia) for Slovenia were not found in the literature review and were therefore made within the framework of estimates for Europe. In the results of the projects Eurodem, EuroCoDe and ALCOVE, data for Slovenia were not available, neither no Eastern European countries were included. To calculate the prevalence of dementia for Slovenia, we used the findings of a study by Bacigalupo et al., who took into account also the deviations regarding the use of different diagnostic criteria<sup>13</sup>.

The prevalence of dementia has been increasing rapidly in recent decades, especially in less developed countries<sup>14</sup>.<sup>15</sup> According to the WHO projections, between 2001 and 2040 the number of people with dementia will increase by 234% in the world and between 84% and 169% in the WHO European Region<sup>15–17</sup>. The prevalence of dementia varies by geographical region<sup>9,16</sup>. This is partly due to differences in methodology, including the use of different diagnostic criteria, differences in the year and period of the assessment,

**TABLE 1**  
AGE-STANDARDIZED RATE OF DEMENTIA BY GENDER, SLOVENIA, 2018

Age groups/years	65–69	70–74	75–79	80–84	85–89	≥90	Total
Prevalence of dementia in Europe-women (%) <sup>~</sup>	1.1	2.2	5.6	13.3	26.4	38.9	8.8*
Women (N)	66234	48768	45836	36440	24748	12595	234621
Women with dementia (N)	729	1073	2567	4847	6533	4899	20648
Prevalence of dementia in Europe-men (%)	0.9	2.1	4.6	9.0	13.9	31.2	4.3*
Men (N)	62728	40840	33536	21611	10473	3524	172712
Men with dementia (N)	565	858	1543	1945	1456	1099	7466
Persons with dementia, total (N)	1294	1931	4110	6792	7989	5998	28114
Population (N)	128962	89608	79372	58051	35221	16119	407333
Prevalence (%)	1.0	2.1	5.2	11.7	22.7	37.2	6.9*

Source: Bacigalupo et al.<sup>11</sup>

\*Calculation for Slovenia

**TABLE 2**  
PROJECTION OF AGE-STANDARDIZED RATE OF DEMENTIA BY GENDER, SLOVENIA, 2030

Age groups/years	65–69	70–74	75–79	80–84	85–89	≥90	Total
Prevalence of dementia in Europe-women (%) <sup>~</sup>	1.1	2.2	5.6	13.3	26.4	38.9	9.0*
Women (N)	71372	67578	60998	41647	28652	19297	289544
Women with dementia (N)	785	1487	3416	5539	7564	7507	26298
Prevalence of dementia in Europe-men (%)	0.9	2.1	4.6	9.0	13.9	31.2	4.8*
Men (N)	67309	60871	50846	29316	15627	6948	230917
Men with dementia (N)	606	1278	2339	2638	2172	2168	11201
Persons with dementia, total (N)	1391	2765	5755	8177	9736	9675	37499
Population (N)	138681	128449	111844	70963	44279	26245	520461
Prevalence (%) <sup>*</sup>	1.0	2.1	5.1	11.6	22.0	36.9	7.2*

Source: Bacigalupo et al.<sup>11</sup>

\*Calculation for Slovenia

the age of the selected study population, and the manner used for the identification of dementia. Even with respect to bias and its elimination, differences in the prevalence of dementia by geographical regions remain<sup>9</sup>. Dementia incidence rates are rising in all regions of the world, including in the projections, especially in developing countries, and are associated with an aging population and an increase in life expectancy<sup>18,19</sup>. Projections could be significantly influenced by preventive measures and improvements in the accessibility and effectiveness of health care<sup>14</sup>. In addition to the differences in the regions of the world, the prevalence of dementia may vary across regions within countries, especially when it comes to older estimates and the use of less reliable data, which complicates epidemiological assessment<sup>9, 20</sup>. Over the past twenty years, several estimates of the prevalence of dementia in the world and in Europe have been made. A panel of experts reviewed available epidemiological data in 2005 and reached a consensus on assessing the prevalence of dementia in individual WHO regions<sup>15</sup>. It was estimated that there were 24.3 million people with dementia in the world in 2001, more than a half in less developed countries<sup>15</sup>. For each year after 2001, there were estimated 4.6 million new cases of dementia in the world, or one new case every 7 seconds, for the year 2020, 42.3 million cases, for every 20 years after the year 2001, the number of cases is projected to double, and it would reach 81.1 million cases of dementia in 2040<sup>15</sup>.

Prince and colleagues reported 10 million people with dementia in Europe (WHO region) in 2010<sup>9</sup>. On the basis of the projections, the number of people with dementia in Europe was estimated for every 10 years: for the WHO European Region, 14 million by 2030 and 19 million by 2050<sup>9</sup>. The authors found out that the number of people with dementia is projected to increase by 40% between 2010 and 2030 in the WHO European Region, and by 87% between 2010 and 2050<sup>9</sup>. These prevalence estimates were 10% higher than previous estimates made by Ferri et al., who estimated prevalence for 2000 and projections by 2040<sup>15</sup>.

The prevalence of dementia is relatively comparable for different European countries compared to other regions of the world<sup>21</sup>. In some individual countries, there has been a declining trend in the incidence and prevalence of dementia (eg UK, Sweden) over the past two decades, which is encouraging<sup>22</sup>. The age-standardized prevalence rate for dementia in people aged 60 years and more ranges from 5% to 7% in most regions of the world<sup>9,16</sup>, and the

age-standardized rate of dementia for those aged 65 years and more ranges from 6.4% to 9.3%<sup>9,11,23,24</sup>. The crude prevalence rate for dementia in Europe in people aged 65 years and more ranges from 5.9% to 9.4%<sup>1</sup>.

The prevalence of dementia increases with age<sup>21</sup> from about 2–3% among persons aged 70–75 years to 20–25% among persons aged 85 years or more<sup>15</sup>. However, after this age, according to some authors there is insufficient data, which would confirm that the prevalence of dementia is still increasing<sup>25</sup>, but some authors estimate the prevalence to be more than 30% among people aged 90 and over<sup>14</sup>. The results of all studies show that the prevalence increases with increasing age and that the prevalence is higher in women compared to men<sup>9</sup>, the prevalence increases earlier and faster in women (80–84 years) compared to men (85–89 years)<sup>26,27</sup>. Similar findings were made in our estimates. The prevalence of women's dementia was twice as high as that of men and was increasing more rapidly with age.

Various authors have found that the prevalence of dementia in Europe, compared to other regions of the world, has not changed significantly in most age groups, despite a time span of several decades between the two largest European studies (Eurodem and Eurocode) and in comparison with other studies. The prevalence of dementia was higher in women than in men and was increasing with age in both genders<sup>28,29</sup>. Research findings confirm the stability of prevalence in the elderly over the last twenty years<sup>14,30</sup>. Age-specific prevalence rates for dementia in different regions of the world have become less diverse and moving closer in recent decades, and may be affected by preventive measures (by reducing incidence), improving early identification of the disease, diagnosis and treatment (disease delay and survival), interventions, affecting the onset of the disease (preventing and slowing the progression of the disease)<sup>9</sup>.

## Conclusion

From a public health perspective, the assessment of the prevalence of dementia is the basis for planning and organizing health and social services and assessing the potential impact of prevention strategies on the health burden of the disease<sup>19</sup>. Due to the prolongation of life expectancy, we expect an increase in the number of persons with dementia in Slovenia in the next ten years, mainly due to the aging of the population and extending life expectancy.

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## **PREVALENCIJA DEMENCIJE U EUROPI I SLOVENIJI: PREGLED I PROCJENA DEMENCIJE U SLOVENIJI ZA 2018. I PROJEKCIJA ZA 2030. GODINU**

### **SAŽETAK**

Demencija postaje sve važniji prioritet za javno zdravstvo koji će se nastaviti povećavati zbog starenja i dugovječnosti stanovništva. Odgovarajuća nacionalna procjena prevalencije demencije ključna je za pravilno planiranje aktivnosti potrebnih za rješavanje problema demencije. Svrha ovog rada bila je identificirati poznatu prevalenciju demencije u Europi i Sloveniji u posljednjih dvadeset godina, kao i izraditi procjenu za 2018. i projekciju za 2030. na temelju podataka o broju stanovnika u Sloveniji. Upotrijebljena je bila tražilica baze podataka PubMed. Tražili smo nazive u raznim kombinacijama i pregledali literaturu o rasprostranjenosti demencije u Europi i Sloveniji. U recenziranoj literaturi nismo pronašli procjene prevalencije demencije za Sloveniju; izračunali smo ju na temelju slovenskih podataka za 2018. godinu i projekcija za 2030. Stopa prevalencije demencije u Europi nije se značajno promijenila u većini dobnih skupina posljednjih desetljeća. U Sloveniji je u 2018. godini standardizirana stopa prevalencije za starije od 65 godina bila 6,9%, za žene 8,8%, a za muškarce dvostruko niža, a prema projekciji za 2030. bila je za muškarce 7,2%, za žene 9,0%, što je dvostruko više nego kod muškaraca. Gruba stopa prevalencije demencije kod ljudi starijih od 65 godina u Europi kreće se od 5,9% do 9,4%. Rezultati svih studija pokazuju da je prevalencija u porastu s porastom dobi, da je veća i da se povećava ranije i brže kod žena (80-84 godina) u usporedbi s muškarcima (85-89 godina). Prevalencija demencije kod žena bila je dvostruko veća nego kod muškaraca i s godinama se brže povećavala. U Sloveniji možemo očekivati porast broja oboljelih od demencije u sljedećih deset godina, prije svega zbog starenja stanovništva i produljenja životnog vijeka.

