

## The prevalence of dementia in Poland: A population-based, door-to-door survey in an urban community

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*The community survey of the Warsaw district Mokotów estimated the prevalence of dementia in a random, population-based sample, stratified for age and sex. The sample of 1000 elderly (65-84 years) was screened at home with the MMSE test. All elderly under the cut-off 24-25/30 was assigned a diagnosis via the CAMDEX and the DSM-III-R. The prevalence of dementia was estimated at 5.7%. The following age-specific prevalence of dementia was found in the age groups 65-69, 70-74, 75-79, 80-84: 1.9, 5.8, 8.6 and 16.5%. Rates for VD – 2.7 were higher than those for DAT- 2.3, mixed dementia- 0.5, and secondary dementia – 0.2%. In the younger subgroups (65-74 years) VD was the most frequent and in the older subgroups (75-84 years) the most frequent was DAT. The rates of dementia were quite similar to those found in other European studies.*

**Key words:** prevalence, dementia, Alzheimer's type dementia (DAT),  
vascular dementia (VD)

Dementia is one of the most important causes of disability in the elderly. Such dementing illnesses pose a major public health problem. The number of dementia patients is increasing, as the population is growing older. There are over thirty eight and half million inhabitants in Poland. The percentage of senior population increased from 12.8% in 1991 to 15% in 2000. This tendency's is expected to continue in the forthcoming years. Polish health and social care services face many of the same problems as similar services in the countries of Western Europe and other developed parts of the world. The planning of appropriate forms of psychogeriatric care depends on good local epidemiological data and tracking. Unfortunately, information concerning the epidemiological characteristics of dementia in Poland is very limited. Recently the results of two regional rural and semi rural surveys on the epidemiology of dementia in different regions of Poland have been completed. In the first of these investigations,

the prevalence of probable DAT in the population above 65 years of age was estimated at 5.99% and incidence at 1.8% [1]. The second study, also of those over 65 years, found a prevalence rate of probable DAT of 3.5% and VD of 3.2% [2].

The aim of the study was to estimate the prevalence of dementia among the people in the age group 65 to 84 years, living in the Warsaw district of Mokotów, and age-specific and sex-specific prevalence rates for dementia, DAT, VD, mixed dementia (MIXT) and secondary dementia (SD).

### Method

Among the population age group 65-84 years, in the Warsaw's district of Mokotów, the stratified random sample consisted of 1000 individuals obtained from the population registry, which includes all the citizens of this district. Individuals living in institutions were also included. The total senior population above the age of 65, in this district was 49,282, however the age group from 65 to 84 years included 44,887 individuals (18,390 men and 26,497 woman). In order to calculate the age-specific prevalence, the sample was stratified into 5-year groups, with 4 age groups. Age 80 and older constituted the oldest group. In order to study the influence of gender on the prevalence of dementia, an equal number of males and females were studied. The attainment of cases was done by means of a two-phase study design: a screening phase (phase I) and a clinical, diagnostic phase (phase II), (see Figure 1). The maximum period of time between identification of the subject and the first contact was 6 months. Each subject in the study population was sent a personal letter explaining the nature of the health survey and the importance of participation. The notices clearly indicated that participation was strictly voluntary. Phase I included a psychological test used to discriminate between subjects with and without cognitive impairment (screening test). This screening test was the Mini Mental State Examination (MMSE) which was translated into Polish, with a total possible score of thirty [3]. Based on the results of previous studies including the pilot study, the cut-off point of 24/25 was designated. Five trained interviewers who were experienced psychologists conducted the screening. The subjects, who scored below 25/30 on the MMSE, indicating possible cognitive deterioration, were seen for a diagnostic examination in the second stage. The diagnostic instrument used was the Cambridge Mental Disorders of the Elderly Examination (CAMDEX) [4], which includes a hetero-anamnesis, an auto-anamnesis, a physical and neurological exam and a neuropsychological investigation. Operational criteria for diagnosing dementia, including DAT and vascular dementia, were appended to the CAMDEX. They are virtually identical to DSM-III criteria, covering performance on activities of daily living, memory, intellect, higher cortical function and personality. If possible, CT scan and blood test was also administered. The blood test consists of haemoglobin, vitamin B12, folic acid, creatynine, electrolytes, liver function, VDRL/TPHA and thyroid hormones profile.

The chi-square test was used to test the significance of differences. Statistical significance was indicated when 'p' was <0.05.

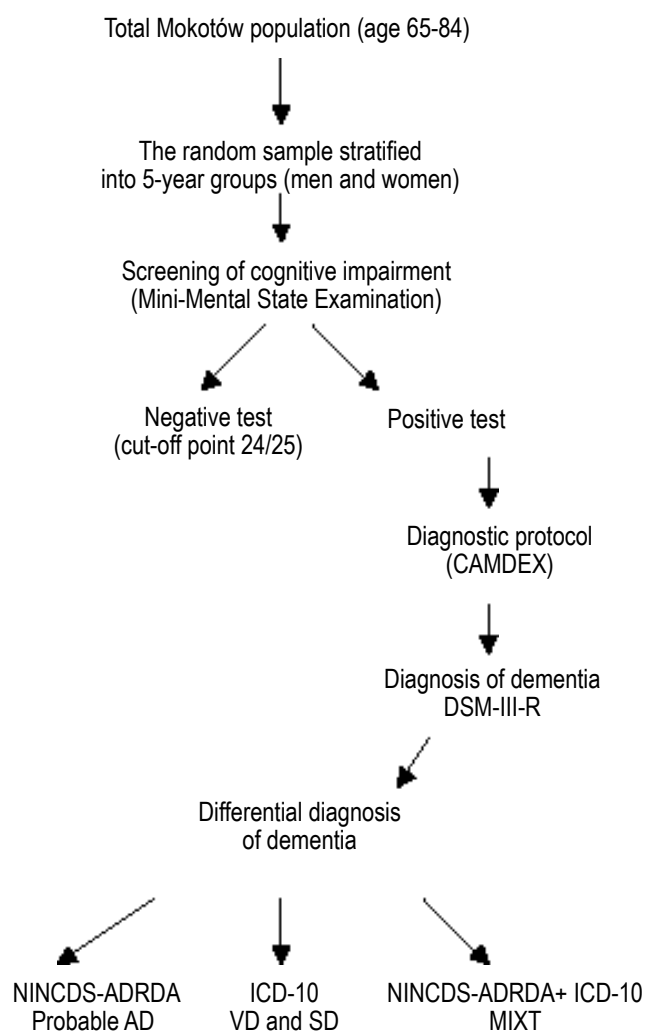


Figure 1 General design of the prevalence survey

## Results

The random sample consisted of 1000 subjects, 29 of which deceased during the period of the study (before they came into contact), 6 of the subjects relocated (were unable to come into contact), and 72 subjects definitely refused. Finally, 893 subjects took part in the study: 455 females (51%) and 438 males (49%), (see Figure 2).

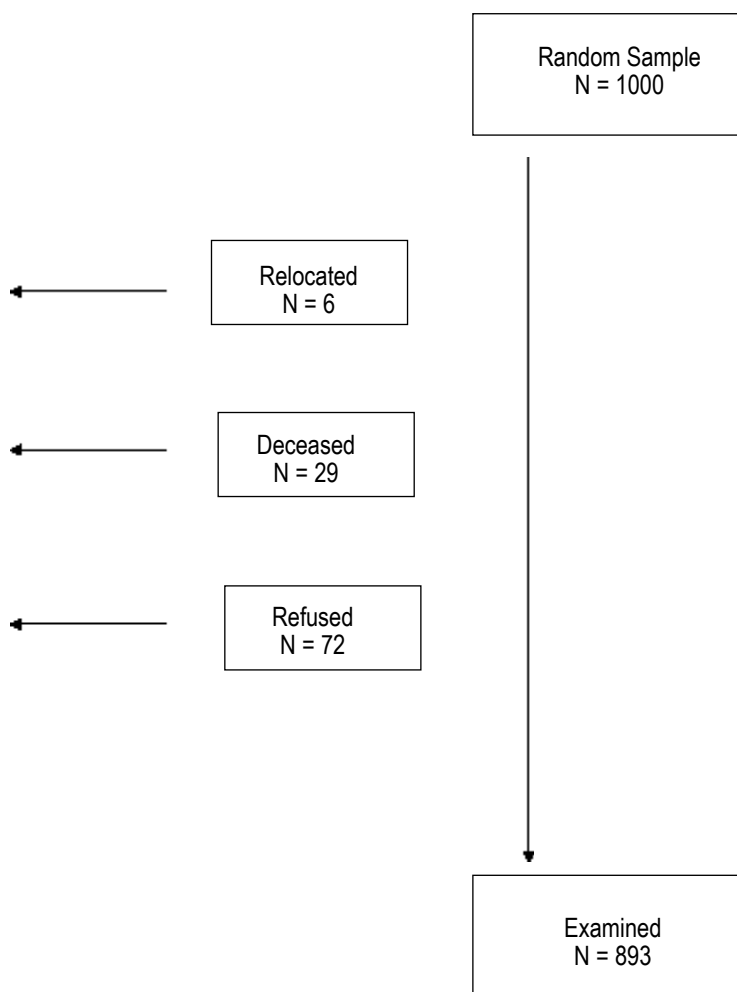


Figure 2 **Flow chart of the subjects in the screening phase**

Of the 893 subjects whose MMS was known, 92 subjects (10.3%) had a score of 24 or less. Thus, 92 subjects participated in the diagnostic phase of the study. Of these subjects 3 refused prior to the examination, consequently 89 (97%) were examined. Seventy persons (78.7%) of the 89 subjects examined by a psychiatrist fulfilled the CAMDEX (equivalent to DSM-III-R) diagnostic criteria of dementia, (see Figure

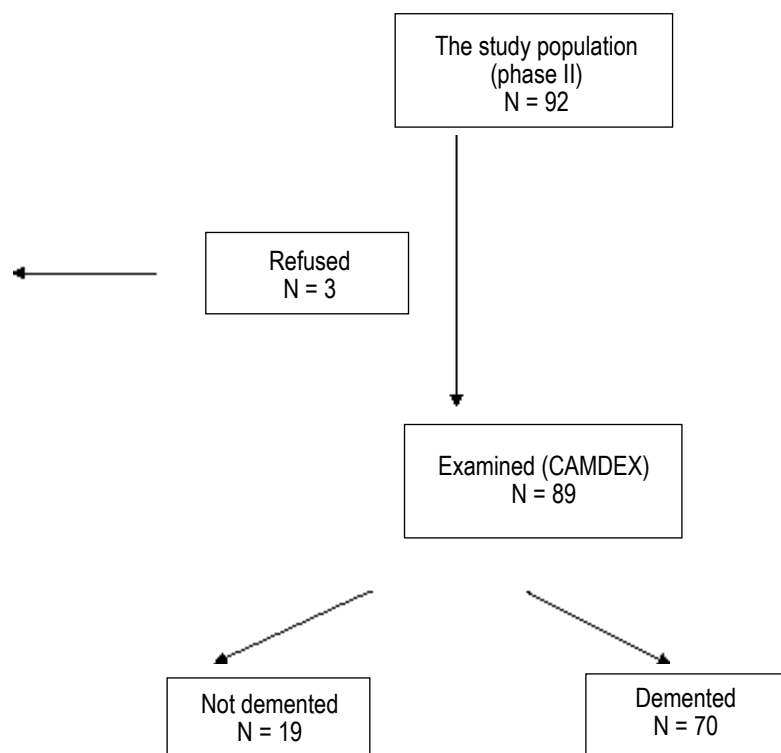


Figure 3 Flow chart of the subjects in the diagnostic phase, (cut-off point – MMSE 24/25)

3).

### The prevalence of dementia

For the purpose of redesign in the random sample age and sex structures of Mokotów

Table 1

The age-specific prevalence of dementia in Mokotów population

Age, years	Prevalence (%)
65-69	1.0
70-74	5.8
75-79	8.0
80-84	10.5
<b>Total (65-84)</b>	<b>5.7</b>

( $\chi^2=35.93$ ,  $df=3$ ,  $P<0.05$ , Cramer's  $V=0.20$ ,  $\Phi=0.20$ )

population, a statistical “weights” method was used.

Statistical significant age-specific prevalence of dementia was stated, (see Table 1).

The prevalence of dementia increased progressively with age, from 1.9% for subjects between 65 and 69 years to 16.6% for early 80s (80-84). Mild dementia was diagnosed in 68.6% of the subjects, moderate in 19.6% and severe dementia in 11.8%.

Table 2

The age and sex-specific prevalence of dementia

Age, years	Females (%)	Males (%)
65-69	2.7	0.9
70-74	8.1	5.4
75-79	8.0	7.3
80-84	16.9	15.1
Total (65-84)	8.8	4.3

(Chi<sup>2</sup>=2.23, df=1, P> 0.05, Cramer's V=0.49, Phi= -0.49)

There were no significant differences in sex distribution of dementia. In female groups the prevalence increased with age from 2.7% to as much as 16.9%, and in the male groups from 0.9 to 15.1%, (see Table 2).

#### The prevalence of dementia by diagnosis

Dementia was diagnosed in 5.7% of the subjects. DAT was found in 2.3%, VD in 2.7%, MIXT in 0.5% and SD in 0.2% (see Table 3). Statistical significant age-specific prevalence of dementia by diagnosis was stated. Among subjects in two younger age groups (65 to 74 years of age) the most common type was VD, and in two older age groups (75 to 84) the most common was DAT.

Among males, (see Table 4), and females, (see Table 5), statistical significant

Table 3

The age-specific prevalence of dementia by diagnosis

Age, years	DAT (%)	VD (%)	MIXT (%)	SD (%)
65-69	0.5	1.4	0.0	0.0
70-74	1.0	3.0	0.0	0.0
75-79	3.0	3.0	0.3	0.0
80-84	7.0	0.5	1.2	0.0
Total (65-84)	2.3	2.7	0.5	0.2

(Chi<sup>2</sup>=42.26, df=12, P<0.05, Phi=0.22, Cramer's V=0.13)

Table 4

## The age and sex-specific prevalence of dementia by diagnosis among males

Age, years	DAT (%)	VD (%)	MKT (%)	SD (%)
65-69	0.0	0.0	0.0	0.0
70-74	0.0	3.0	0.0	0.0
75-79	2.8	3.7	0.0	0.0
80-84	8.5	3.8	1.0	0.0
Total (65-84)	1.4	2.3	0.5	0.1

(Chi<sup>2</sup>=25.15, df=12, p<0.05, Phi=0.26, Cramer's V=0.15)

Table 5

## The age-specific prevalence of dementia by diagnosis among females

Age, years	DAT (%)	VD (%)	MKT (%)	SD (%)
65-69	0.9	1.8	0.0	0.0
70-74	2.6	2.6	0.9	0.0
75-79	4.5	2.7	0.0	0.8
80-84	7.6	7.6	0.9	0.9
Total (65-84)	2.9	3.0	0.4	0.3

(Chi<sup>2</sup>=23.28, df=12, p<0.05, Phi=0.21, Cramers V=0.12)

age-specific prevalence of dementia by diagnosis is also indicated. Among males in younger groups (from 65 to 79 years of age) VD was prevalent, and in oldest groups (75 to 84) the most common was DAT. Among females from 65-74 VD was prevalent, and from 75-84 the most common was DAT.

### Discussion

The results of epidemiological studies on the prevalence of dementia in the population over 65 years of age, living in Mokotów (one of the districts in Warsaw) - in large correspond with the results found in other European countries in the past twenty years. A significant number of similar studies show a gradual increase in prevalence rates among dementia in relation to age. This study proved such findings, in which the factors of prevalence increased gradually with age. Accurate for age, general fac-

The comparison of the age-specific prevalence of dementia

Age, years	Jormetal %	EURODEM % min. max.	Mokotów %
65-69	1.4	1.4 0.4 3.2	1.9
70-74	2.8	4.1 1.0 5.4	5.8
75-79	5.6	5.7 2.5 9.0	8.6
80-84	10.5	13.0 5.7 17.9	16.5

tors of prevalence of dementia (without dividing them into subtypes) turned out to be larger than average factors in Jorm et al. (1987) analysis [5] and EURODEM [6]. But besides the factor for age between 70-74, which was larger by 0.4% from the largest in other EURODEM studies, other factors are included in sections of minimum and maximum values, (see Table 6).

It was stated that in the age group between 65 and 84 years of age, among the citizens of the Mokotów district, the most common type of dementia was VD (2.7%), in which the prevalence was the largest of the two younger age groups (65 to 74 years of age). In the two older age groups (75 to 84) the most common was DAT. The third place is reserved for MIXT, and the fourth for dementia in other diseases (in Parkinson's disease and cancer). Similar proportions were found in EURODEM studies. Also in the Belgian prevalence survey [7], in which the same design and methodology (like in our study) was used- proportions were entirely similar. Up to 80 years of age, VD appeared as often or more often than DAT (e.g. in Finland, among people age 65 to 74 VD was stated in 44%, DAT in 30% [8]). After the age of 80 the proportion reversed and the prevalence of DAT was significantly larger. This can be explained by the fact that VD affects younger people- the risk factors appear respectively earlier. This is of great importance in Poland, where the length of life, particularly among males, is much shorter than in other western countries. Because of that, in general, in the age group between 65 and 84, most common is VD (the largest prevalence of DAT occur in the later age, then is the Polish average length of life). The second factor, which has an important meaning, is the length of life of patients with VD, which is significantly shorter than in people with DAT.

The results of these studies, referring to the relation between the prevalence of DAT and VD differ from most of the results from other western European countries and North America. In these countries the proportion was stated between major types of dementia as follows: DAT- 50 to 60%, VD-25 to 30%. Although VD was higher than DAT in 14 out of the 17 Japanese studies [9], in Chinese studies [10, 11], in the American study [12], in the Russian [13], Scandinavian [14], Italian [15] and Polish [2] studies. Some of the authors assume that the type of dementia depends on ethnical background (Alzheimer's disease - Caucasian race, European origin). In contradiction to this conception is a study [16] led among Japanese descendants, living in Hawaii. It showed that the prevalence of DAT in this group was significantly larger than VD-



opposite then in the Japanese population, which indicates the significant meaning of environmental factors.

In the presented study, when stating the differential diagnosis, MIXT was isolated. In some studies this type is classified as DAT, which affects the increase of prevalence rates of this disease. Rocca et al. [15], stating MIXT as a separate type of dementia (studies in Appignano), showed the preponderance of prevalence of VD over DAT. Skoog et al. [14] studied MIXT to vascular type and also showed preponderance of prevalence of this disorder (46.9%) over DAT (43.5%).

In the Mokotów group of subjects with dementia, low education is of concern among those studied: 21.4% of individuals were illiterate or had incomplete elementary education, 45.7%- elementary education, 15.7%- occupational education and only 17.1% secondary or university (in a group with cognitive impairment, but without dementia, suitably: 31.6, 47.4, 5.3, and 15.8%). No data on education in the whole studied group enables to check the hypothesis about protective role of education in exposition of dementia disorders.

In the study group only 6 out of 70 people (4.2%), in which dementia was diagnosed took advantage of welfare institutions in the time of study. This situation differs from the one observed in other countries. For example in Helsinki- Juva et al. [17] found that only 25 individuals (27%) from 93 didn't take advantage of welfare institutions. In all of Finland, 57% of individuals over 65 years of age, with mild and severe dementia, take advantage of different types of help. In Sweden [18] this percentage was 58%. This results obtained in the Mokotów district are similar to the results of the Italian studies [15], concerning the village society of Appignano- 3 people with dementia, from the entire group of 48 subjects, were in care facilities. The reason for this phenomenon may be based in the imperfection of institutional care for the aged. In the Mokotów district the existing forms of help and the number of places, which is in their disposition, stay in gross disproportion towards the needs. The estimated number of people with dementia is around 3500, among which most demand different forms of institutional and other types of help. The authors of this study hope, that this data will contribute to the development of such a help.

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### References

1. Wender M, Mularczyk J, Modestowicz R. *Epidemiologia choroby Alzheimerera w wybranym regionie Polski*. Przegląd Epi 1990; 3: 215-221.
2. Rossa G. *Rozpowszechnienie otępienia typu Alzheimerera i otępienia naczyniowego na terenie miasta i gminy Świebodzin*. Psychiatr Pol 1997; 31: 121-134.
3. Folstein M, Anthony JC, Parhad I, Duffy B, Gruenberg EM. *The meaning of cognitive impairment in the elderly*. J Am Geriatr Soc 1985; 33: 228-235.
4. Roth M, Tym E, Mountjoy C, Huppert F, Hendrie H, Verma S, Goddard R. *Camdex: A standardised instrument for the diagnosis of mental disorder in the elderly with special reference to the early detection of dementia*. Br J Psychiatry 1986; 149: 698-709.
5. Jorm AF, Korten AE, Henderson AS. *The prevalence of dementia: a quantitative integration of*

- the literature.* Acta Psychiatr Scand 1987; 76: 465-479.
6. Hofman A, Rocca WA, Brayne C, Breteler MMB, Clarke M, Cooper B, Copeland JRM et al. *The prevalence of dementia in Europe: A collaborative study of 1980-1990 findings.* EURODEM Prevalence Research Group. Int J Epidemiol 1991; 20: 736-748.
  7. Roelands M, Wostyn P, Dom H, Baro F. *The prevalence of dementia in Belgium: A population-based door-to-door survey in a rural community.* Neuroepidemiol 1994; 13: 155-161.
  8. Sulkava R, Wikstrom J, Aromaa A, Raitasalo R, Lehtinen V, Lahtela K, Palo J. *Prevalence of severe dementia in Finland.* Neurol 1985; 35: 1025-1029.
  9. Shibayama H, Kasahara Y, Kobayashi H. *Prevalence of dementia in a Japanese elderly population.* Acta Psychiatr Scand 1986; 74: 144-151.
  10. Li G, Shen YC, Chen CH, Zhao YW, Li SR, Lu M. *An epidemiological survey of age-related dementia in an urban area of Beijing.* Acta Psychiatr Scand 1989; 79: 557-563.
  11. Li G, Shen YC, Chen CH, Zhao YW, Li SR, Lu M. *A three-year follow-up study of age-related dementia in an urban area of Beijing.* Acta Psychiatr Scand 1991; 83: 99-104.
  12. Folstein M, Folstein S, McHugh P. *Mini Mental State: A practical method for grading the cognitive state of patients for the clinician.* J Psych Res 1975; 12: 189-198.
  13. Jorm AF. *Cross-national comparisons of the occurrence of Alzheimer's and vascular dementias.* Eur Arch Psychiatry Clin Neurosci 1991; 240: 218-222.
  14. Skoog I, Nilsson L, Palmertz B, Andreasson LA, Svanborg A. *A population-based study of dementia in 85-years-olds.* New Eng J Med 1993; 328:153-158.
  15. Rocca WA, Bonaiuto S, Lippi A, Luciani P, Turtu F, Cavarzeran F, Amaducci L. *Prevalence of clinically diagnosed Alzheimer's disease: a door-to-door survey in Appignano, Macerata Province, Italy.* Neurol 1990; 40: 626-631.
  16. White L, Petrovitch H, Ross GW, Masaki KH, Abbott RD, Teng EL et al. *Prevalence of dementia in older Japanese-American men in Hawaii: The Honolulu-Asia Aging Study.* Jama 1996; 271: 955-960.
  17. Juva K, Sulkava R, Erkinjuntti T, Valvanne J, Tilvis R. *The demented elderly in the city of Helsinki: Functional capacity and placement.* J Am Geriatr Soc 1992; 40: 1146-1150.
  18. Sandman PO. *Is good care the best treatment for the Alzheimer patient?* Acta Neurol Scand 1990; 82, suppl: 37-39.