



COMPARATIVE PREVALENCE OF PERIODONTAL DISEASES IN THE GERMAN NATIONAL COHORT (NAKO)

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AIM

Periodontitis is a highly prevalent oral disease worldwide. While recent studies provide nationwide prevalence data, they lack detailed regional analysis and comparison. This study aims to visualize regional differences in prevalence, severity and extent of probing depths (PD), as well as number of present teeth and edentulism in 19- to 75-year-old German citizens using data from the German National Cohort Study (NAKO).

MATERIALS AND METHODS

In the NAKO, dental examinations were recorded at Level 1 (18 centres; core examinations; recording of full-mouth tooth counts incl. third molars) and at Level 2 (8 centres; N=18,996; recording of probing depths) in participants aged 19- to 75-years. We evaluated differences by region/centre, age and sex. Total prevalence estimates were weighted in order to retrieve population representative estimates.

RESULTS

Among the 184,926 participants, the prevalence of edentulism did not differ significantly between males (1.46%; 95% CI: 1.12-1.26) and females (1.19%; 95% CI: 1.12-1.54) (Table 1). In females, mean PD was lower (1.84 mm; 95% CI: 1.83-1.86) compared to men (1.97 mm; 95% CI: 1.95-1.98) (Table 2). Also, prevalences of edentulism and PD increased with increasing age. Regional differences were apparent (Figures 1 and 2) with a graduation from lower prevalences of edentulism and PD in southern and western Germany (Augsburg), intermediate prevalences in central and northern Germany (Hanover) and highest prevalences in northeastern Germany (Neubrandenburg).

Figure 1. Map of prevalences of edentulism and the number of teeth, Level 1.

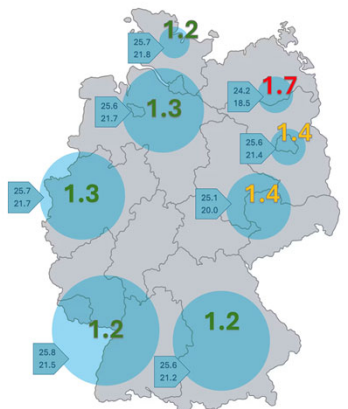


Figure 2. Map of probing depth data; Level 2.

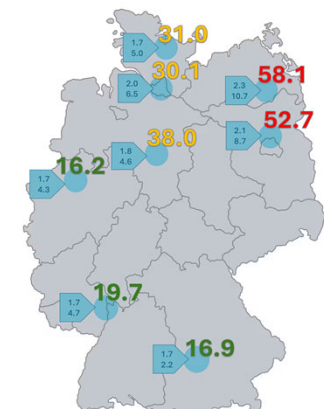


Table 1. Prevalence of edentulism and the number of teeth (incl. third molars) in total and stratified by sex and age (Level 1).

	N	Edentulism, %	Number of teeth	N	Number of teeth in dentates
By sex					
Female	93,057	1.19 (0.04); (1.12-1.26)	25.31 (0.02); (25.28-25.35)	91,953	25.62 (0.02); (25.59-25.65)
Male	91,869	1.46 (0.04); (1.39-1.54)	25.62 (0.02); (25.58-25.66)	90,524	26.00 (0.02); (25.96-26.03)
By age					
19-29 years	18,607	0.02 (0.01); (0.0004-0.04)	28.57 (0.02); (28.54-28.59)	18,603	28.57 (0.01); (28.54-28.60)
30-39 years	19,937	0.03 (0.01); (0.01-0.05)	28.16 (0.02); (28.12-28.19)	19,931	28.16 (0.02); (28.13-28.20)
40-49 years	48,597	0.15 (0.018); (0.12-0.19)	27.23 (0.02); (27.20-27.26)	48,524	27.27 (0.02); (27.24-27.30)
50-59 years	49,308	1.11 (0.05); (1.02-1.20)	25.14 (0.03); (25.08-25.19)	48,762	25.42 (0.02); (25.37-25.46)
60-75 years	48,477	3.75 (0.09); (3.59-3.92)	21.73 (0.04); (21.66-21.80)	46,657	22.58 (0.03); (22.52-22.64)
Total (19-75 years)	184,926	1.73 (0.06); (1.61-1.84)	25.34 (0.03); (25.28-25.39)	182,477	25.78 (0.02); (25.73-25.83)

Data are presented as mean (SE); (95% CI).

Table 2. Distribution of probing depth variables in the NAKO (half-mouth protocol, mesiobuccal and midbuccal sites), in total and by sex, age and region/centre (Level 2).

	N	Mean PD, mm	PD ≥ 4 mm, Prevalence, %	Percentage of affected sites, %	Number of affected teeth	PD ≥ 6 mm, Prevalence, %	Percentage of affected sites, %	Number of affected teeth
By sex								
Female	9,043	1.84 (0.01); (1.83-1.86)	31.54 (0.049); (30.58-32.50)	4.83 (0.12); (4.60-5.06)	0.92 (0.02); (0.88-0.96)	5.26 (0.23); (4.80-5.72)	0.60 (0.04); (0.52-0.68)	0.10 (0.01); (0.09-0.11)
Male	9,953	1.97 (0.01); (1.95-1.98)	36.62 (0.048); (35.68-37.57)	6.30 (0.13); (6.04-6.56)	1.19 (0.02); (1.14-1.23)	6.76 (0.25); (6.27-7.26)	0.78 (0.05); (0.69-0.87)	0.13 (0.01); (0.11-0.14)
By age								
19-29 years	1,696	1.64 (0.01); (1.62-1.67)	17.22 (0.92); (15.42-19.02)	2.11 (0.17); (1.78-2.44)	0.51 (0.04); (0.44-0.59)	1.59 (0.30); (1.00-2.19)	0.11 (0.02); (0.06-0.15)	0.02 (0.004); (0.01-0.03)
30-39 years	1,946	1.75 (0.01); (1.72-1.78)	24.97 (0.98); (23.05-26.90)	3.23 (0.20); (2.85-3.62)	0.76 (0.04); (0.68-0.84)	3.19 (0.40); (2.41-3.97)	0.24 (0.04); (0.15-0.32)	0.05 (0.01); (0.03-0.07)
40-49 years	4,868	1.87 (0.01); (1.85-1.89)	31.90 (0.67); (30.59-33.21)	4.44 (0.15); (4.16-4.73)	0.96 (0.03); (0.91-1.02)	4.29 (0.29); (3.72-4.86)	0.42 (0.05); (0.33-0.51)	0.08 (0.01); (0.06-0.09)
50-59 years	5,220	1.95 (0.01); (1.93-1.97)	37.64 (0.67); (36.33-38.96)	6.42 (0.19); (6.05-6.79)	1.18 (0.03); (1.12-1.24)	7.32 (0.36); (6.61-8.03)	0.91 (0.07); (0.77-1.05)	0.15 (0.01); (0.13-0.16)
60-75 years	4,488	2.04 (0.01); (2.02-2.06)	41.69 (0.74); (40.25-43.13)	7.79 (0.22); (7.36-8.22)	1.26 (0.03); (1.20-1.33)	9.50 (0.44); (8.63-10.35)	1.14 (0.08); (0.99-1.29)	0.17 (0.01); (0.15-0.20)
By region/centre								
Augsburg	4,322	1.65 (0.01); (1.64-1.67)	16.91 (0.57); (15.80-18.03)	2.33 (0.12); (2.09-2.57)	0.41 (0.02); (0.37-0.44)	2.24 (0.23); (1.80-2.69)	0.24 (0.03); (0.18-0.31)	0.04 (0.004); (0.03-0.05)
Heidelberg/ Mannheim	2,620	1.70 (0.01); (1.68-1.73)	19.73 (0.78); (18.21-21.26)	3.61 (0.22); (3.17-4.05)	0.56 (0.03); (0.45-0.62)	4.73 (0.41); (3.92-5.55)	0.57 (0.08); (0.41-0.72)	0.08 (0.01); (0.06-0.10)
Muenster	1,263	1.74 (0.02); (1.71-1.77)	16.15 (1.04); (14.12-18.18)	1.99 (0.18); (1.63-2.35)	0.38 (0.03); (0.31-0.44)	4.28 (0.79); (3.16-5.39)	0.41 (0.07); (0.28-0.55)	0.06 (0.01); (0.04-0.08)
Berlin North	1,282	2.05 (0.02); (2.02-2.09)	52.73 (1.39); (50.00-55.47)	7.10 (0.30); (6.51-7.69)	1.59 (0.06); (1.47-1.72)	8.74 (0.79); (7.19-10.28)	0.83 (0.10); (0.64-1.02)	0.17 (0.02); (0.13-0.20)
Hanover	1,400	1.85 (0.02); (1.81-1.88)	38.0 (1.30); (35.45-40.55)	5.56 (0.29); (5.00-6.13)	1.18 (0.06); (1.07-1.29)	4.64 (0.56); (3.54-5.75)	0.56 (0.11); (0.33-0.78)	0.09 (0.02); (0.06-0.12)
Hamburg	1,535	1.96 (0.02); (1.93-1.99)	30.10 (1.17); (27.80-32.40)	4.05 (0.27); (3.52-4.58)	0.78 (0.05); (0.70-0.87)	6.51 (0.63); (5.28-7.75)	0.84 (0.13); (0.58-1.10)	0.15 (0.02); (0.11-0.20)
Kiel	1,189	1.69 (0.03); (1.64-1.74)	31.03 (1.34); (28.40-33.67)	6.50 (0.45); (5.63-7.38)	1.04 (0.06); (0.92-1.16)	5.05 (0.64); (3.80-6.29)	0.93 (0.18); (0.57-1.29)	0.12 (0.02); (0.08-0.15)
Neubrandenburg	4,607	2.30 (0.009); (2.28-2.31)	58.09 (0.73); (56.66-59.50)	10.22 (0.23); (9.78-10.66)	1.96 (0.04); (1.88-2.03)	10.72 (0.46); (9.83-11.62)	1.14 (0.07); (1.00-1.28)	0.19 (0.01); (0.17-0.21)
Total (19-75 years)	18,996	1.90 (0.005); (1.90-1.92)	34.20 (0.34); (33.53-34.88)	5.50 (0.09); (5.42-5.77)	1.06 (0.02); (1.03-1.09)	6.05 (0.17); (5.71-6.39)	0.69 (0.03); (0.63-0.75)	0.11 (0.004); (0.10-0.12)

Data are presented as mean (SE); (95% CI).

CONCLUSIONS

We found notable regional differences in prevalences of edentulism and periodontitis. As anticipated, the prevalence of both edentulism and periodontitis was highest in Northeast Germany. In contrast, the lowest prevalences were observed in Southwest Germany. This supports our hypothesis of disparities between rural and urban regions. In addition, highest prevalences were found in older participants. Given the demographic shifts, these results underline the importance to comprise them into future healthcare and treatment concepts.