

Oral health changes in seniors over a 9-year period: results of the 6th German Oral Health Study (DMS • 6). Online Appendix

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ABSTRACT

Objectives: Oral health is a key determinant of overall wellbeing and general health, particularly in seniors who are often affected by multimorbidity and polypharmacy and may also require nursing care. The German Oral Health Studies (DMS) are population-representative epidemiologic surveys that assess oral health in Germany. This study aimed to clarify the prevalence, incidence, and progression of oral diseases in Seniors using longitudinal data from the DMS • 6 cohort.

Method and Materials: The longitudinal analyses were based on data from 373 individuals who had previously participated in DMS V in 2014 as 65- to 74-year-olds (baseline) and were reexamined in 2023 as 73- to 82-year-olds (follow-up). Data on social demographics, disability, need for care, morbidity, oral functional capacity, and oral diseases were collected through social science interviews and clinical examinations.

Results: The mean age of the participants at baseline and follow-up was 69.4 ± 2.9 years and 78.3 ± 3.0 years, respectively. From baseline to follow-up, the mean number of missing teeth (excluding third molars) and incidence of edentulism increased. Furthermore, the number of replaced and unreplaced missing teeth both increased, and the mean number of missing teeth replaced with removable dentures increased. The caries incidence increased slightly, and periodontal health deteriorated. The number of teeth with probing depth (PD) ≥ 4 mm increased, whereas that of teeth with PD ≥ 6 mm remained unchanged. The proportion of participants requiring nursing care increased, and control-oriented dental service utilization decreased.

Conclusion: Seniors lost approximately two teeth during the 9-year observation period. However, many teeth were retained at an advanced age. The challenges faced by people in higher ages are not limited to dental therapy but are complemented by lifelong dental care. Implementing preventive dental requirements during disease-related transition processes in senior women and men is challenging for the dental profession, as good oral health despite frailty and care needs must in part also be organized and ensured outside the dental practice.

KEYWORDS: cohort studies, dental care for persons with disabilities, dental care for the aged, dental health surveys, dentists, disease progression, DMS 6, epidemiology, geriatric dentistry, Germany, incidence, oral health

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Appendix 1:**Table A1: Comparison of baseline morbidities by participation in the baseline examination (2014) and/or the follow-up examination (2023) in the senior cohort.**

Morbidity (baseline)	Unweighted analyses			Weighted analyses	
	Participation at baseline	Participation at baseline and follow-up	Participation at baseline, not at follow-up	Participation at baseline	Participation at baseline and follow-up
No. of participants (n)	1,042	373	667	1,042	373
Multimorbidity*	37.1%	35.6%	38.0%	37.0%	36.7%
Hypertension[†]	54.4%	54.7%	54.3%	54.5%	54.8%
Coronary heart disease, coronary artery stenosis, angina pectoris[†]	11.2%	9.9%	11.8%	11.7%	11.4%
Myocardial infarction[†]	2.0%	1.1%	2.5%	2.4%	1.8%
Cardiac insufficiency[†]	10.2%	9.7%	10.5%	10.5%	10.5%
Stroke[†]	2.1%	1.3%	2.5%	2.1%	1.5%
Bronchial asthma (allergic asthma)[†]	8.7%	9.9%	7.9%	9.7%	11.1%
Diabetes mellitus (with or without insulin treatment)	16.3%	13.1%	18.0%	16.0%	15.7%
Cancer, malignant tumor (including leukemia)[†]	5.5%	7.5%	4.3%	5.9%	9.1%
Degenerative joint disease/osteoarthritis of the hip or knee joints and/or the spine[†]	49.3%	50.9%	48.4%	48.5%	51.0%
Inflammatory joint or spinal disease (eg, chronic polyarthritis, rheumatoid arthritis, ankylosing spondylitis)[†]	15.3%	14.7%	15.6%	16.5%	17.3%
Osteoporosis[†]	9.5%	10.2%	9.1%	10.3%	11.2%
Mental disorder (eg, anxiety disorders, depression)[†]	9.2%	8.3%	9.7%	8.9%	9.4%
Underweight (BMI < 18.5 kg/m²)	2.6%	2.4%	2.7%	2.4%	2.0%

Obesity (BMI \geq 30 kg/m²)	22.0%	18.0%	24.3%	21.3%	18.9%
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Data are presented as unweighted numbers (n) and weighted percentages (with 95% confidence intervals).

*Multimorbidity is defined as the presence of at least three of the conditions listed in this table.

†Self-report based on the question: "Have you had any of the following conditions in the past 12 months...?"

NA, not available.

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CITATION

Nitschke, I., Stark, H., Kuhr, K., Zimmermann, F., Jordan, A. R., Wöstmann, B., Samietz, S.: Oral health changes in seniors over a 9-year period: results of the 6th German Oral Health Study (DMS • 6). Online Appendix. Zahnmed Forsch Versorg 2026, 6: 08, <http://dx.doi.org/10.23786/2026-6-08>

PUBLICATION DATE

14.04.2026

IMPRESSUM

ZAHNMEDIZIN, FORSCHUNG UND VERSORGUNG

Das Online-Journal des Instituts der Deutschen Zahnärzte (IDZ)



ISSN

0931-9816

PUBLISHER

Institute of German Dentists,
Universitätsstraße 73, 50931 Cologne
Funded by

German Dental Association (Bundeszahnärztekammer – Arbeitsgemeinschaft der deutschen Zahnärztekammern e. V. (BZÄK))
and National Association of Statutory Health Insurance Dentists (Kassenzahnärztliche Bundesvereinigung K. d. ö. R.)

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