Research Letter

Dental caries prevalence and age-related patterns among populations remaining in war-affected regions of Ukraine

Abstract *Background/purpose*: The ongoing war in Ukraine has severely disrupted health-care infrastructure, limiting access to preventive and restorative dental services. Most existing studies have focused on refugees abroad, while data from civilians who remained in conflict-affected regions are scarce. This study aimed to assess dental caries experience and age-related patterns among war-affected regions of Ukraine.

Materials and methods: A multinational medical team, in collaboration with local health institutions, delivered humanitarian medical and dental services in conflict-affected regions of Ukraine between September 17 and September 30, 2025. We retrospectively analyzed medical records from 230 civilians aged 12—85 years, assessing substance use, oral health behaviors, and dental caries experience, as quantified by the decayed, missing, and filled teeth (DMFT) index.

Results: The overall mean DMFT index was 9.93 ± 6.21, with 61.7 % of participants having at least one decayed tooth. A significant age gradient was observed, with DMFT increasing from 4.87 ± 3.33 in adolescents (12—19 years) to 15.39 ± 7.62 in elderly adults (≥65 years). In contrast, decayed teeth declined with age, from 2.13 ± 2.03 in adolescents to 0.70 ± 0.84 in elderly adults, while missing and filled teeth increased.

Conclusion: This study provides rare, clinically assessed evidence of a high burden of dental caries among Ukrainians remaining in war-affected areas. The observed age gradient and high prevalence of decayed teeth highlight the urgent need to restore access to dental care and to establish comprehensive oral health surveillance in postwar Ukraine.

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Introduction

The ongoing military conflict in Ukraine has created one of the largest humanitarian crises in recent history, causing extensive disruption to healthcare systems and essential preventive services, including oral health care. Dental facilities in affected regions have faced shortages of personnel, materials, and access to primary care, increasing the risk of unmet oral health needs. Despite growing international attention to the health consequences of the war, information on the dental health of Ukrainians who remain in conflict zones is remarkably limited.

Most available studies during the conflict have focused on refugee populations, mainly children, in host countries across Europe.[1—4] While these investigations provide insight into the burden of dental caries among displaced individuals, they do not reflect the situation of residents who remained in Ukraine, where healthcare infrastructure and service continuity have been most compromised. This gap highlights the need to assess the dental caries experience

and unmet oral health needs of Ukrainians still living in war-affected regions.

Materials and methods

Between September 17 and September 30, 2025, a multi-national medical team, in partnership with local health institutions, delivered humanitarian medical and dental services in conflict-affected regions of Ukraine. Of 1028 civilians receiving care, 230 individuals aged 12−85 years who sought dental services were included in this analysis.

Alcohol and tobacco use were categorized as current or none. Oral hygiene practices included tooth brushing frequency (less than once, once, twice, or three or more times per day), daily use of dental floss, and daily use of mouthwash were documented. Dental caries experience was assessed using the World Health Organization decayed, missing, and filled teeth (DMFT) index by an experienced clinician with seven years of dental practice.[5] Third molars and impacted teeth were excluded from analysis. Continuous variables are presented as means with standard deviations, and categorical variables as counts and percentages. Ethical approval was obtained from the Institutional Review Board of MacKay Memorial Hospital, Taipei, Taiwan (No. 25MMHIS074e).

Results

Among 230 participants, 142 (61.7 %) had at least one decayed tooth, with prevalence decreasing with age, from 80.0 % in adolescents (12−19 years) and 68.8 % in young adults (20−44 years) to 54.8 % in middle-aged (45−64 years) and 45.5 % in older adults (≥65 years). Missing teeth were found in 161 participants (70.0 %), increasing from 13.3 % in adolescents to 90.9 % in older adults. Similarly, 189 (82.2 %) had at least one filled tooth, rising from 46.7 % in adolescents to 90.9 % in older adults.

The mean DMFT index was 9.93 ± 6.21, showing a clear age-related increase (4.87 ± 3.33, 7.72 ± 4.54, 11.81 ± 5.79, and 15.39 ± 7.62 across ascending age groups). The mean number of decayed teeth declined from 2.13 ± 2.03 in adolescents to 0.70 ± 0.84 in older adults,

Table 1 Clinical characteristics (N = 230).

	Total (n = 230)	12−19 years (n = 15)	20−44 years (n = 109)	45−64 years (n = 73)	≥65 years (n = 33)	P value
Male sex, %	123 (53.5)	5 (33.3)	61 (56.0)	39 (53.4)	18 (54.5)	0.43
Substance use						
Alcohol consumption, %	11 (4.8)	0 (0.0)	5 (4.6)	5 (6.8)	1 (3.0)	0.64
Tobacco smoking, %	8 (3.5)	0 (0.0)	5 (4.6)	3 (4.1)	0 (0.0)	0.52
Oral hygiene habits						
Brushing frequency, %						
< 1 time/day	7 (3.0)	0 (0.0)	1 (0.9)	3 (4.1)	3 (9.1)	0.16
1 time/day	116 (50.4)	5 (33.3)	52 (47.7)	41 (56.2)	18 (54.5)	
2 times/day	103 (44.8)	10 (66.7)	54 (49.5)	27 (37.0)	12 (36.4)	
≥3 times/day	4 (1.7)	0 (0.0)	2 (1.8)	2 (2.7)	0 (0.0)	
Daily dental floss use, %	52 (22.6)	6 (40.0)	25 (22.9)	13 (17.8)	8 (24.2)	0.30
Daily mouthwash use, %	35 (15.2)	2 (13.3)	19 (17.4)	10 (13.7)	4 (12.1)	0.84
Remaining teeth	24.07 ± 4.67	27.60 ± 1.29	25.82 ± 2.73	23.05 ± 3.91	18.91 ± 7.07	<0.001
With ≥1 decayed tooth, %	142 (61.7)	12 (80.0)	75 (68.8)	40 (54.8)	15 (45.5)	0.02
With ≥1 missing tooth, %	161 (70.0)	2 (13.3)	65 (59.6)	64 (87.7)	30 (90.9)	<0.001
With ≥1 filled tooth, %	189 (82.2)	7 (46.7)	87 (79.8)	65 (89.0)	30 (90.9)	0.001
DMFT index	9.93 ± 6.21	4.87 ± 3.33	7.72 ± 4.54	11.81 ± 5.79	15.39 ± 7.62	<0.001
Decay teeth	1.58 ± 2.14	2.13 ± 2.03	1.85 ± 2.15	1.47 ± 2.43	0.70 ± 0.84	0.03
Anterior teeth	0.38 ± 0.95	0.40 ± 0.91	0.40 ± 0.97	0.41 ± 1.05	0.24 ± 0.66	0.84
Posterior teeth	1.20 ± 1.58	1.73 ± 2.05	1.45 ± 1.61	1.05 ± 1.62	0.45 ± 0.71	0.006
Missing teeth	3.93 ± 4.67	0.40 ± 1.29	2.18 ± 2.73	4.95 ± 3.91	9.09 ± 7.07	<0.001
Anterior teeth	0.70 ± 1.52	0.00 ± 0.00	0.32 ± 0.80	0.75 ± 1.27	2.15 ± 2.81	<0.001
Posterior teeth	3.23 ± 3.68	0.40 ± 1.29	1.86 ± 2.31	4.19 ± 3.42	6.94 ± 5.03	<0.001
Filling teeth	4.46 ± 3.28	2.33 ± 2.92	3.70 ± 3.02	5.51 ± 3.26	5.61 ± 3.26	<0.001
Anterior teeth	1.13 ± 1.70	0.13 ± 0.35	0.56 ± 1.10	1.79 ± 1.97	2.03 ± 2.08	<0.001
Posterior teeth	3.32 ± 2.54	2.20 ± 2.85	3.14 ± 2.58	3.71 ± 2.20	3.58 ± 2.84	0.13

Continuous variables are expressed as mean ± SD (standard deviation), and categorical variables as N (%).
DMFT, decayed-missing-filling teeth.

whereas filled and missing teeth rose progressively with age ([Table 1](#)).

Discussion

This study is among the few to assess the dental caries burden among Ukrainians remaining in war-affected areas rather than refugees abroad. The mean DMFT index approached 10, and 61.7 % of participants had at least one decayed tooth, reflecting a considerable burden of disease. No recent nationally representative oral-health data are available for Ukraine, limiting direct prewar comparisons. A regional analysis reported a decayed teeth prevalence of about 43 % in Eastern Europe during 1990—2010,[6] which is lower than our findings.

A similarly high burden was observed among Ukrainian children displaced to Italy, with a mean DMFT of 3.5.[1] The present investigation included towns historically affected by the Chernobyl catastrophe, and previous research suggested that residents of radiation-contaminated regions had higher caries prevalence than those in unaffected areas.[7] In contrast, a study of Ukrainian adults in Germany reported that only 23 % perceived their oral health as poor.[2] That study used self-administered questionnaires without professional or radiographic examination, likely underestimating clinically detectable disease and contributing to discrepancies with our clinically assessed results.

Our principal finding revealed an age-related pattern in which the prevalence of decayed teeth decreased with increasing age, whereas the numbers of missing and filled teeth rose. A similar inverse relationship between age and caries prevalence was seen among Ukrainian child refugees early in the war, where younger children had higher caries prevalence than older ones.[3] However, our results differ from the U-shaped age distribution described in global epidemiologic studies, which show peaks in early childhood and adolescence/young adulthood, followed by a nadir near 40 years.[6] This inconsistency may arise from differences in population characteristics and sampling; our cohort comprised residents who remained in conflict zones. Altered care-seeking behaviors during the war may have disproportionately limited access to preventive and restorative care for younger individuals, influencing age-specific detection. Prior evidence indicates that modest increases in fluoride levels within the safe range of drinking water may lower caries prevalence among school-aged children,[4] offering a potential strategy for postwar oral-health planning.

This study has several limitations. First, radiographic examinations were not performed, which may have led to an underestimation of caries prevalence due to potential false negatives. Second, dietary information was not collected. Changes in dietary patterns before and during the war may also influence the interpretation of these findings. Third, because civilians have relocated and concentrated in limited areas during the conflict, our sample, though modest in size, may not represent the entire Ukrainian population but captures the oral health status of those directly affected by ongoing hostilities. A major strength of this study is that it directly addresses residents remaining in conflict zones, providing rare and timely assessed evidence that complements existing research focused primarily on refugees abroad.

In summary, this study provides rare, clinically assessed evidence of the substantial dental caries burden among Ukrainians remaining in war-affected regions, revealing both a high overall DMFT index and an age gradient in caries experience. These findings underscore the urgent need to restore access to preventive and restorative dental services for populations living under conflict conditions. Future research should focus on establishing comprehensive surveillance systems to identify the underlying determinants of this burden and to inform evidence-based oral health reconstruction strategies in postwar Ukraine.

Declaration of competing interest

The authors have no conflicts of interest relevant to this article.

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