

# Trends in Dental Caries in 12-Year Old Children in Croatia

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## ABSTRACT

*In this epidemiological study the caries status of 12-year-old children was compared over time for the years 1968, 1973, 1980, 1985, 1990, 1991 and 1999. The mean number of decayed, missing and filled teeth (DMFT) decreased from 7.0 in 1968 to 2.6 in 1991. From 1991 to 1999 and increase of DMFT 2.6 in 1991, to 3.5 in 1999) has been seen which is result of war in Croatia and reorganisation of health care delivery system. With the expected continuing decline in the prevalence and severity of oral diseases, one of the main problems in the future seems to be the transition of the oral health care delivery system from a disease-oriented system to a health-oriented one.*

## Introduction

Dental caries is one of the most prevalent infectious diseases in the world<sup>1</sup>. For centuries, tooth loss and edentulism were unavoidable. A popular expression said, *you come to the world without teeth and you leave the world without teeth*. Since the studies of McKay and Dean in the 1930s and 1940s followed by the introduction of fluoride, this has no longer been the case. Adult and senior cohorts in economically developed countries today are fully dentate or have lost very few teeth<sup>2-3</sup>. Since dental caries status is context-specific, caries prevention strategies must be customised to the specific deter-

minants and opportunities of that context and community<sup>4</sup>. In recent years the prevalence of dental caries has been found to be decreasing in those developed Western countries where the caries trend is being followed and reliable epidemiological data are available<sup>5,6</sup>. The aim of this study was to investigate whether there had been a similar change in caries level in 12-year-old children living in Croatia.

## Materials and Methods

The caries status of 12-year-old children was assessed seven times from year 1968–1999. For each child the status of teeth (decayed, missing and filled teeth,

**TABLE 1**  
THE MEAN NUMBER OF DMFT  
IN 12-YEARS-OLD CHILDREN

Year	DMFT	Caries free (%)	Sanation index
1968	7.0	0	10
1973	6.5	0	23
1980	6.2	5	40
1985	5.9	8	43
1990	3.4	19	80.4
1991	2.6	23	89.7
1999	3.5	14.9	62

DMFT) were recorded<sup>7-9</sup>. Only in year 1968 Klein-Palmer DMF index was used. Caries was diagnosed at the cavitation level, disregarding white, chalky or discoloured spots and fissures. Nevertheless, areas of teeth that showed visual evidence of undermined enamel tactile evidence of soft tooth structure at the base of pits and fissures were also recorded as carious. A tooth with filling and caries (primary or secondary) was counted as decayed tooth. Artificial light, a plane mirror and a sharp explorer were used.

## Results

Table 1 shows that in year 1968 DMFT per person was 7.0, and there was no child without caries. In 1968 also began topical fluoridation with 2% Na fluoride<sup>10,11</sup>. Five years later in 1973 DMFT dropped to 6.3. Another small decline has been seen until 1980 when DMFT was 6.2. After that analysis the comprehensive preventive programme which was carried out in pre-school and school children was established<sup>12</sup>. Dental health educational programme in schools and kindergartens with regular tooth brushing with an amine-fluoride gel was introduced. This program also comprehended pregnant women. All these measures

**TABLE 2**  
CARIES PREVALENCE, NATIONAL AVERAGES

Country	DMFT
Albania	3.4
Austria	4.3
Belgium	6.9
Bulgaria	3.4
Czechoslovakia	3.6
Croatia	5.9
Denmark	1.6
United Kingdom	
England and Wales	2.9
Scotland	2.2
Northern Ireland	3.1
Finland	2.0
France	4.2
Germany	3.8
Greece	4.3
Hungary	5.5
Iceland	4.1
Ireland	2.9
Italy	3.0
Liechtenstein	3.4
Malta	1.6
Netherlands	1.7
Norway	2.7
Poland	4.4
Portugal	3.8
Romania	3.1
San Marino	3.7
Spain	4.2
Sweden	2.4
Switzerland	2.0
Turkey	2.7
USA	1.8

have resulted in improved oral hygiene. According to that in year 1985 DMFT was 5.9. A further decline in caries prevalence happened in 1990 when DMFT was 3.4. Maximal improvement was seen in 1991, when the value of DMFT was 2.6, which was according to WHO a goal for the year 2000. In the same year the war in Croatia begun. The structure of population was changed due to the great number of refu-

gees. Also, in the same period some changes like privatisation in dental health care took place. As the result of these changes DMFT value increased to 3.5 in 1999.

## Discussion

For the average number of decayed teeth, which have been attacked by caries, or DMFT, the WHO has defined severity criteria. These criteria for dental caries prevalence at the age of 12 are very low: 0.0–1 DMFT per person; low: 1.2–2.6 DMFT per person; moderate: 2.7–4.4 DMFT per person; high: 4.5–6.5 DMFT per person, or very high: > 6.5 DMFT per person. In Table 2 it is evident that there are no countries with very low caries prevalence at the age 12. A low prevalence at the age of 12 was documented for seven European countries: Denmark, Finland,

Malta, The Netherlands, Scotland, Sweden, Switzerland, and the USA (Table 2)<sup>13</sup>.

The substantial decline in the caries rate of 12-year-old children is considered to be due largely to the use of fluoridated dentifrices, tooth brushing with amine-fluoride gel and dental health educational programme in schools and kindergartens<sup>14</sup>. With the expected continuing decline in the prevalence and severity of oral diseases, one of the main problems in the future seems to be the transition of the oral health care delivery system from a disease-oriented system to a health-oriented one. The future oral health care delivery system, be it public or private, will be faced with other demands, some of which are simpler than before (introduction of oral hygiene, topical fluoride application, fissure sealant, etc.).

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## **ORALNO ZDRAVLJE U DVANAESTGODIŠNJAKA U HRVATSKOJ**

### **S A Ž E T A K**

U ovom epidemiološkom istraživanju obrađeno je oralno zdravlje u dvanaestgodišnjaka u Hrvatskoj za razdoblje od 1968. do 1999. godine. Određivan je KEP indeks za slijedeće godine: 1968, 1973, 1980, 1985, 1990, 1991 i 1999. Srednja vrijednos KEP indeksa pokazala je pad od 7.0 koliko je iznosila 1968. godine na 2.6 1991. godine. Od 1991. zabilježen je porast KEP indeksa s vrijednosti od 2.6 na 3.5 što je rezultat rata u Hrvatskoj, migracije stanovništva, ali i reorganizacije, odnosno privatizacije stomatološke zdravstvene zaštite. Rezultati ukazuju na to da samo dobro organizirana stomatološka zdravstvena zaštita, te redovita primjena preventivnih mjera omogućuju bolje oralno zdravlje stanovništva.