

Trends in oral health status of schoolchildren from Iasi, Romania

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Summary

In 1999 the National Caries Preventive Program comprising supervised weekly mouth rinsing with 0.2% NaF was introduced in all primary schools in a deficient fluoride area, Iasi, Romania. Children grades I to IV participated. The aim of the present study was to analyze trends in dental caries over a ten years period (1992-2003) among children of 6 and 12 years of age. This study was carried out in order to assess the changes in oral health status after four years of application of National Caries Preventive Program.

All children were examined clinically at the school dental clinic, by the trained and calibrated dentist of the school, according with the WHO criteria. No radiographs were taken. Conducted visual-tactile examinations were made, using dental explorer and mouth mirrors for the counting of decayed, missing and filled (def - DMF) teeth (t - T) and teeth surfaces (s - S). The results of clinical examinations were recorded by a trained assistant on standardized forms.

In children of grade I (6 years old) the mean caries indices were constant - 8.8 defs in 1992 and 2003, but deft decreased from 5.1 in 1992 to 4.5 in 2003. The DMFT had a significant decreasing from 1.2 in 1992 to 0.11 in 2003. The DMFS also decreased over ten years, from 1.71 (1992) to 0.11 (2003). At grade VI (12 years old) the mean caries experience was 3.92 DMFS (2003) comparing with 6.0 DMFS (1992). The DMFT index decreased from 3.0 (1992) to 2.34 (2003). Most probably this decline cannot be attributed solely to the preventive program. Thus, even if the community of Iasi is fluoride-deficient, the children may be exposed to fluorides unassociated with the mouth rinsing programs. The possibility exists that some factors that influence dental caries other than the intervention being studied may have contributed to the observed changes in caries prevalence. Changes in diet, access to dental care, secular improvement of caries, or other factors may also have had an effect on our data.

The efficacy of school-based fluoride mouth rinsing programs has been evaluated in different studies, and subsequently, many states and localities adopted such programs for communities, particularly in non-fluoridated areas. This program has appeal because costs for supplies were low and the regimen could readily be supervised by school teachers after minimal in-service training. We will continue the program and all the methods recommended by WHO in order to achieve its objectives for 2010 and 2025.

WHO methods for primary prevention

- general fluoridation;
- local fluoridation;
- food hygiene;
- oral hygiene;
- professional methods - sealing.

In 1999, the National Caries Preventive Program comprising weekly mouth rinsing with 0.2% NaF solution was introduced in all primary schools from 4 focal points of Romania: Bucharest, Iasi, Timisoara and Constanta. In **Iasi**, a non-fluoridated area, the program includes **12.400 children** from **48 schools** (grades I - IV).



Objectives

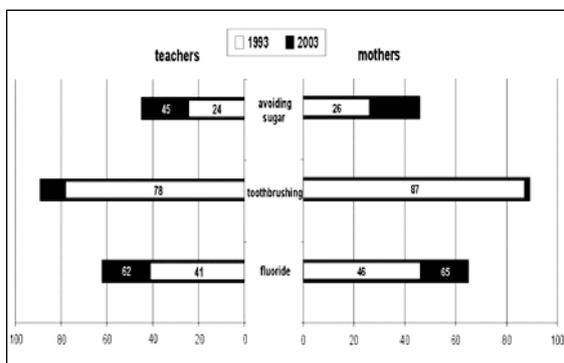
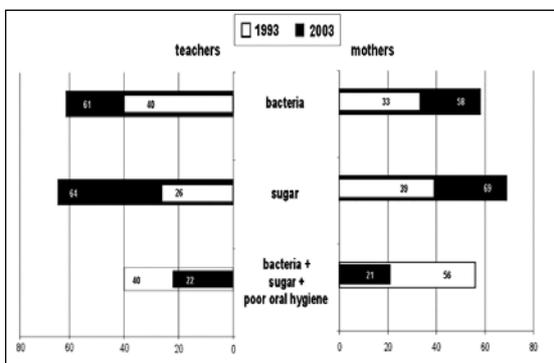
1. to evaluate trends of dental caries in school-children from Iasi (6-12 years old) after 4 years from the beginning of the National Caries Preventive Program;
2. to assess treatment needs in schoolchildren (grades I - VI);
3. to compare the level of oral health knowledge and attitudes among mothers and schoolteachers during 1993-2003.

Material and method

1. 15 school-office dentists, previously trained and calibrated according to WHO criteria;
2. 2815 schoolchildren, grades I-VI;
3. structured questionnaires, completed by 197 teachers and 381 mothers;
4. The SPSS 10.1 for Windows statistical software (SPSS Inc 2000) was used for data management and statistics.

WHO objectives for 2010 and 2025

	2010	2025
5 - 6 years	90% - caries-free	
12 years	DMF max. 2	DMF max. 1
20 years	75% - caries-free 75% - without periodontal disease	90% - caries-free 90% without periodontal disease
75% of young population must have enough knowledge regarding the etiology and prevention of dental caries in order to self-establish a diagnosis and the preventive measure		
Computerized evidence of epidemiological data		



Figures 1 and 2. Responses of mothers and schoolteachers (%) regarding the etiology and prevention of dental caries

Results and discussions

The level of oral health knowledge of mothers and schoolteachers improved considerably over the last decade (Figures 1 and 2).

Caries-free children proportion decreases with the increase of age. In the same time, proportions in zones 2 and 3 increased (Figure 3). On the other hand, tooth-brushing habit in children has improved significantly over the last ten years (Figure 4).

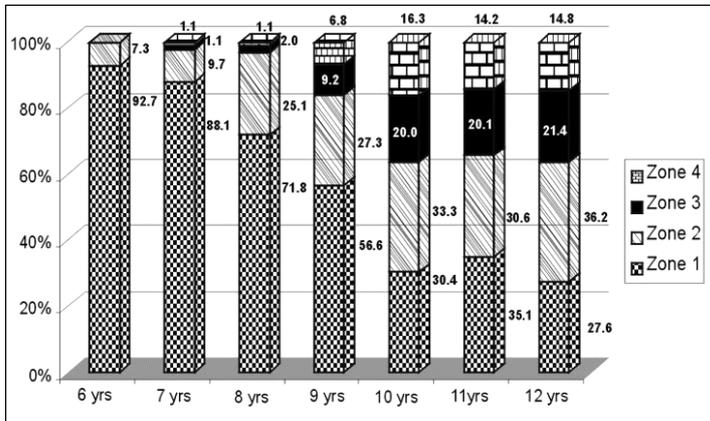


Figure 3. Distribution of schoolchildren (%) according to caries severity zones in permanent dentition (2003)

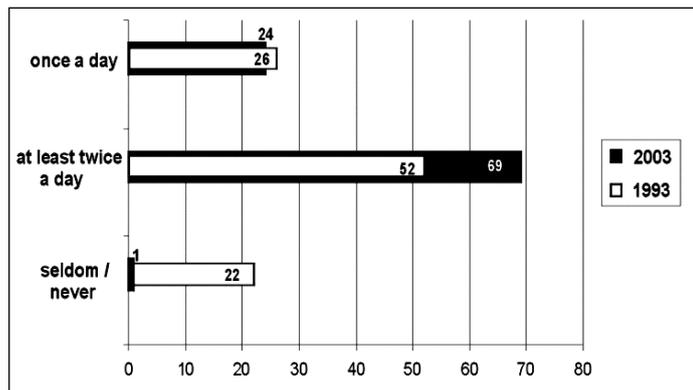


Figure 4. Distribution of schoolchildren (%) according to frequency of tooth brushing as reported by mothers (1992-2003)

Table 1. The cost of the implementation of the program

Urban schoolchildren population					
Age	Iasi	Romania	DS (Iasi, 2003)	Caries-free (%) (Iasi, 2003)	With carious lesions (%)
7 years	3149	111,481	0.27	88	12
8 years	3282	113,482	0.57	22	8
9 years	3459	124,209	1.37	54	46
10 years	3544	128,684	3.21	31	69
Iasi - 2003					
12% × 3149 → 378 children of 7 years old with carious lesions					
28% × 3282 → 919 children of 8 years old with carious lesions					
46% × 3459 → 1591 children of 9 years old with carious lesions					
69% × 3544 → 2445 children of 10 years old with carious lesions					
378 × 0,27 → 102 carious surfaces – 7 year-olds					
919 × 0,5 → 460 carious surfaces – 8 year-olds					
1591 × 1,37 → 2180 carious surfaces – 9 year-olds					
2445 × 3,21 → 7849 carious surfaces – 10 year-olds					
10,591 carious surfaces					

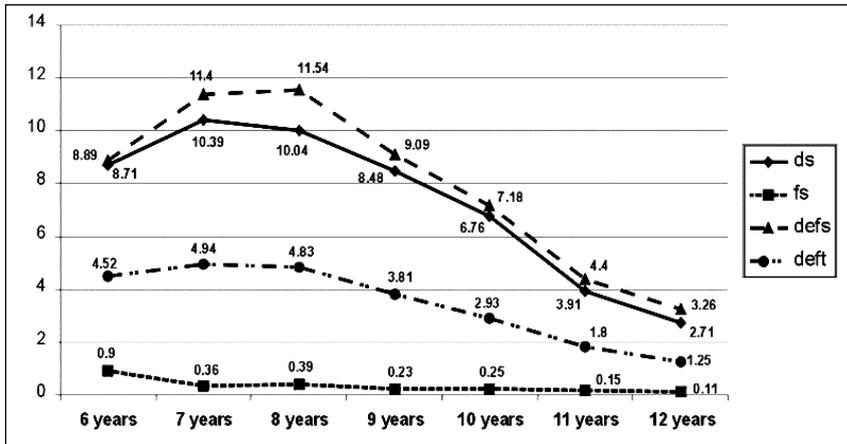


Figure 5. Caries indices in primary dentition (2003)

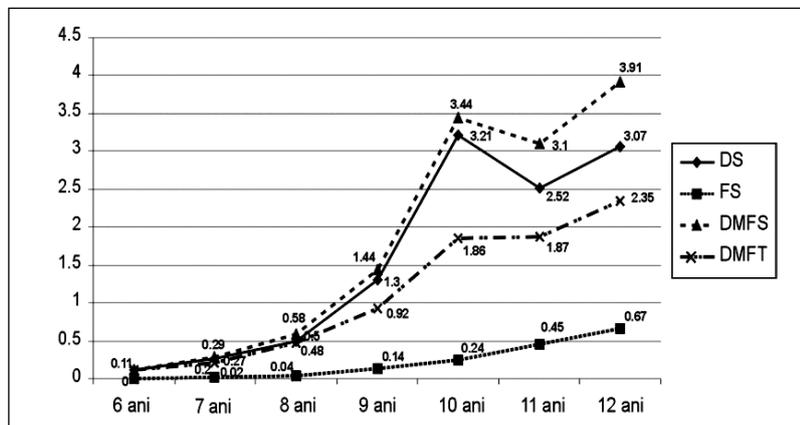


Figure 6. Caries indices in permanent dentition (2003)

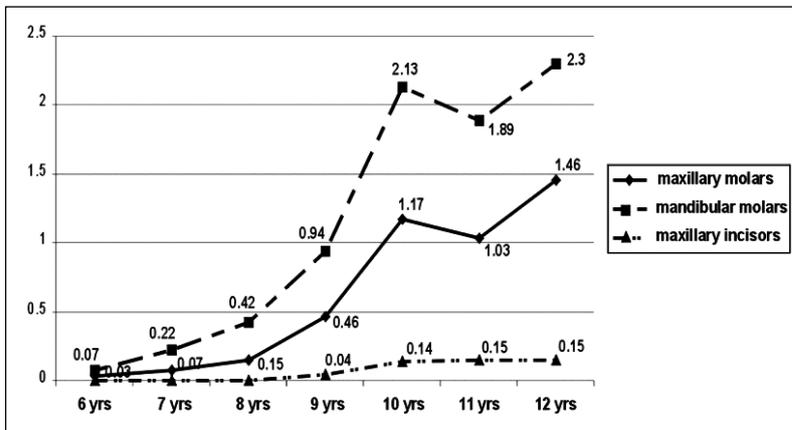


Figure 7. DMFS index according to teeth groups (2003)

With regard to caries indices in primary dentition, we found that after an initial increase, with a maximum at 8 years old, caries indices decreased as a result of deciduous teeth exfoliation. **Filling index** is much below the **decay index** in all age groups (Figure 5). In permanent dentition, all caries indices increase with age, although at 11 years olds there is a tendency to decrease. **DS/FS** rapport is very **high** – the

DMFS index value is given by the number of decayed and not by filled surfaces (Figure 6).

According to teeth groups and dental surfaces, we found that mandibular molars (Figure 7) respectively occlusal surfaces are the most affected (Figure 8).

With regard to trend of dental caries over the last decade we found that caries indices decreased both in primary and permanent dentition (Figures 9 and 10).

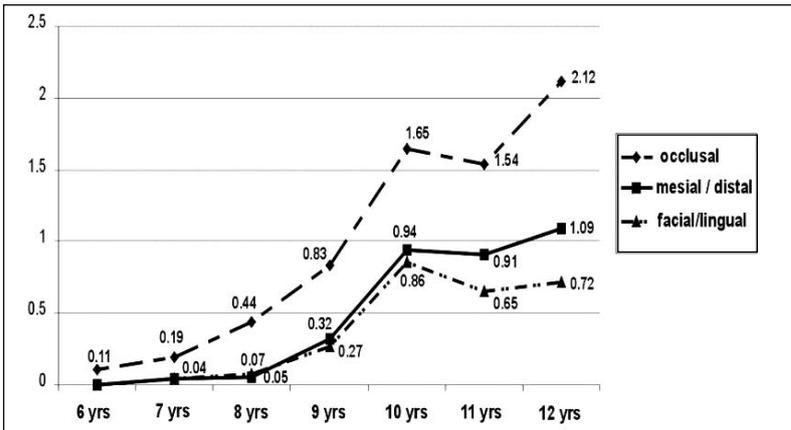


Figure 8. DMFS index according to tooth surface (2003)

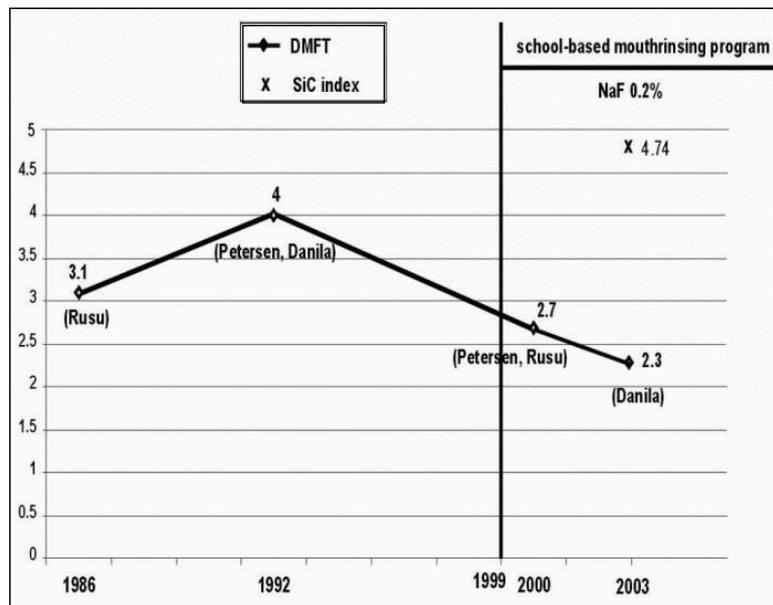


Figure 9. DMFT index in 12 year-old schoolchildren (1992-2003) and SiC index

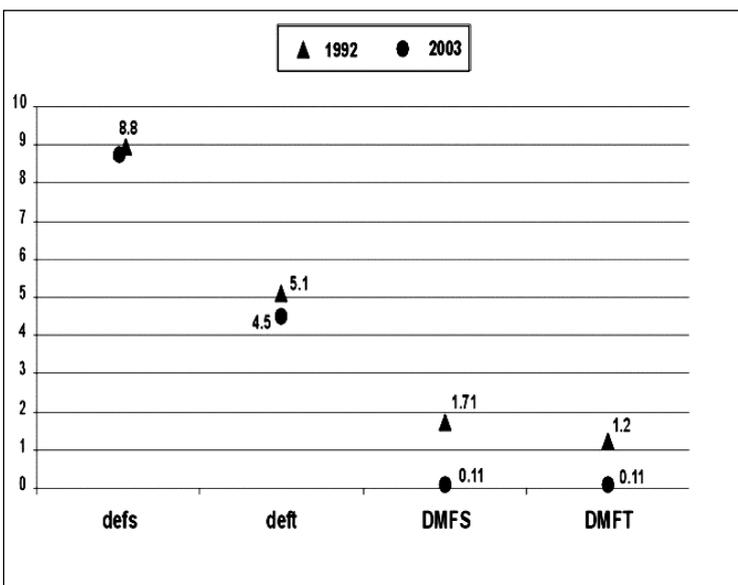


Figure 10. Caries indices in 6 year-old schoolchildren (1992-2003)

SiC index has also been calculated (Figure 9), which represents the DMFT index in the one third of the population of 12 years old with the highest values. Over 50% of the work volume will be addressed to this one third.

It is necessary to introduce a program for the restoration of simple carious lesions of permanent teeth – SECONDARY PREVENTION, so that the DMF index value is given by the number of filled and not by decayed surfaces. For this purpose we have calculated the approximate cost for the implementation of such a program (Table 1).

The average price for a single surface filling has been calculated according to:

- the composite amount necessary to fill a medium cavity – 0.12 g;
- sealant material – 0.01 g;
- annex materials (1 Kando brush + brushing paste + 1 saliva aspirator/child, burrs).

Thus, the medium price for a composite filling on a single dental surface is approximately 80,000 lei.

From these data we calculated that there are necessary 847,280,000 lei for financing a pro-

gram of secondary prevention in schoolchildren from Iasi (grades I-IV).

Conclusions

Dental caries decreased in all age groups, but this trend is not due solely to the National Caries Preventive Program. Some other factors have contributed;

- changes in oral health behavior of children;
- changes in oral health knowledge and attitudes among educators (mothers and school-teachers);
- dental care access improvement.

1. it absolutely necessary to introduce a program of secondary prevention in order to change the decayed teeth/filled teeth rapport;

2. it is necessary to enlarge the contribution of nonprofessional persons in sanogenic actions promotion;

3. the access of population to information regarding oral health must be enlarged, especially by mass-media campaigns;

4. prevention programs must be sustained and extended.

References

1. Dănilă I., Duda R., Hanganu C. Evaluarea comparativă a unor metode de fluorizare. *Jurnal de Medicină Preventivă*, 1994; 2 (3-4): 109-114.
2. Dănilă I., Vataman R., Iliescu A., Ungureanu C. Profilaxie Stomatologică. Ed. Didactică și Pedagogică, București, 1996.
3. Dănilă I., Amarici C., Barna S., Hanganu C., Baci I. Riscul carios – terminologie, modele de apreciere, strategii. *Medicina Stomatologică*, 1997; 2 (3): 64-72.
4. Dănilă I., Hanganu C., Nechita I. Studiul comparativ al eficienței unor metode de fluorizare locală într-o colectivitate școlară din municipiul Iași – rezultate după trei ani. *Medicina Stomatologică*, 1997; 1: 79-81.
5. Dănilă I., Amarici C. Orientări profilactice în stomatologie (The preventive concept in dentistry). Ed. Syrinx-Med Constanța, 1997.
6. Dănilă I., Păruș M., Hanganu C., Bârleanu L., Murariu A. Fluoridation agree and contradiction at the beginning of the third millenium. 6th Congress of the Balcan Stomatological Society; Bucharest-Romania, 2001.

7. Dănilă I., Hanganu C., D Mardare, Popescu E. Dinți frumoși și sănătoși pentru întreaga familie. Pliant de educație pentru sănătate orală, editat de Universitatea de Medicină și Farmacie “Gr.T. Popa” Iași, Facultatea de Medicină Stomatologică, Disciplina de Sănătate Orală și Direcția de Sănătate Publică Iași, 2003.

8. Hanganu C. Clinical and Microbiological Status in Romanian Schoolchildren after Six Years of Application of Two Caries Preventive Programs. ISBN 82-7815-025-7, Bergen, Norway.

9. Hanganu C. Biofilmele Orale – implicații clinice și microbiologice. ISBN 973-8292-57-3, Ed. “Gheorghe Asachi” Iași, 2002.

10. Hanganu C., Dănilă I. Stomatologie comunitară. ISBN 9975-63-146-0, Ed. Tehnica-Info, Chișinău, 2002.

11. Hanganu C., Dănilă I. Determinarea riscului carios. *Medicina Stomatologică în prag de mileniul trei. Supliment al “Revistei de Medicină Stomatologică”*, 2001; 5(2): 295-299.

12. Hanganu C. Studiul clinic și microbiologic al eficienței unor agenți antiplacă. *Medicina Stomatologică*, 2001; 5(5): 81-85.

13. Hanganu C., Dănilă I. Eficiența unor agenți antimicrobieni asupra microorganismelor din

salivă. *Supliment al revistei "Medicina Stomatologică"*, 2001; **5**(6): 59-65.

14. Hanganu C., Danila I., Bârlean L., Mihailovici L., Parus M., Saveanu I., Murariu A. Educația pentru sănătatea orală – cunoștințe, comportament, atitudini. Droguri, biomateriale, echipamente și tehnici în medicina stomatologică; *Supliment al revistei „Medicina Stomatologică”*, 2002; **Vol. II**: 67-78.

15. Harris N.O. Elements of an Organized Delivery System for Prevention: Manpower Considerations. In: JP Carlos, ed. Prevention and Oral Health. DHEW Pub. No. (NIH) 74-707. Bethesda. Md. National Institutes of Health 1974.

16. Petersen, P. E., Dănilă, I., Delean, A., Grivu, O., Ionipă, G., Pop, M. Oral health status among schoolchildren in Romania. *Community Dentistry and Oral Epidemiology*, 1994; **22**: 90-93.

17. Petersen, P. E., Rusu, M. Oral Health Status of Romanian Schoolchildren – national survey 2000. Copenhagen: World Health Organization Regional Office for Europe, 2001.

18. World Health Organization. Oral Health Surveys. Basic Methods (4th Edition). Geneva: WHO, 1997.

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