

Oral Health Promotion Programmes in the Balkan Countries: Part II

SUMMARY

Background/Aim: The aim of this study was to conduct a comparative analysis of the oral health promotion programmes in the Balkan countries, to compare key measures and activities in the implementation of the programme, and to analyse the results achieved after the implementation of the programme. **Material and Methods:** Data were obtained through an electronic search of publicly available documents published in the field of dental healthcare in the Balkan countries. The search terms were: “national programme”, “strategy”, “action plan”, “project”, and “oral health”. The search was conducted in English and in the native languages of the Balkan Peninsula countries. A comparative analysis of valid documents and those whose validity period has expired was carried out. **Results:** This study illuminates the information on preventive programmes for each country and discusses the challenges faced in the Balkans region. While countries in the Balkan Peninsula have made progress in improving the oral health of their inhabitants, the absence of national oral health promotion programmes is striking. Greater involvement of the community in activities to maintain and improve oral health is needed, as is more comprehensive dental care for vulnerable populations. **Conclusions:** The findings of this study may be employed to enhance oral health in the delineated regions, and to confer benefits upon the population of the region and beyond. The findings from this analysis provide valuable insights for policymakers and public health professionals aiming to strengthen oral health initiatives and ensure more equitable access to dental care across the Balkan Peninsula. This paper (Part II) describes specifics of oral health promotion programmes, dental health care, and key epidemiological indicators in each Balkan country.

Keywords: Oral Health, Prevention, National Programme, Balkan Countries

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Introduction

Research on oral health in the Balkan countries and the implementation of oral health programs is scarce. There is a general belief that the population in the Balkans is not sufficiently aware of the significance of preventive dental care, including regular dental visits and early intervention for oral diseases. It is concerning that oral health is not given the same level of recognition as general health. Additionally, there is an increasing trend of patients seeking care in private clinics rather than public institutions, and some dental professionals may exhibit a lack of effort and interest in prevention¹.

We have previously made a comparison of existing national oral health promotion programmes in the Balkan countries². The aim of this paper was to describe specifics of oral health promotion programmes, dental health care, and key epidemiological indicators in the Balkan countries: Albania, Bosnia and Herzegovina, Bulgaria, Cyprus, Greece, Montenegro, North Macedonia, Romania, Serbia and Turkey.

Albania

Albania is a developing country undergoing many political and economic changes. Until 1990, it was under the communist regime and the dental service was fully public and funded by the government. With the fall of communism in 1993, privatization took place, so today only 5% of dental care is in the public sector³.

Dental care is provided mainly by private dental offices with the exception of first aid and dental treatment of children up to 18 years of age carried out by dentists in state institutions⁴. Prevention and informing the public about the importance of oral health are limited, and dentists are mainly engaged in the treatment of dental diseases. Studies that have examined behavioural factors related to caries emphasize the availability of sugary foods and carbonated drinks in schools and the negative trend of nutrition in the community. Albania does not have programmes for water, salt and milk fluoridation, and the main sources of fluoride are fluoridated tooth pastes⁴.

The literature lacks epidemiological data on the oral health of the Albanian population by age groups. Only pilot studies have been published in local dental journals⁴. Scarce studies concluded that Albanian children have a high prevalence of decayed teeth, that the consumption of sugar products should be reduced, and that the authorities should finance preventive programmes and improve the dental care of children³⁻⁵.

Epidemiological study from 2011 included 12-year-olds from three different socio-economically areas of Tirana (north and south as economically disadvantaged and the city centre as more well-off)⁴. Statistically significant differences between parts of the city were observed only for DMFT, while Decay index and Care

index were without significant differences. The mean DMFT was 3.72, which is higher than the values of the 2005 survey in the territory of the whole Albania, which recorded a mean DMFT of 3.1 in 12-year-olds⁵.

In 2015, a national survey was conducted in 5-year-olds in different regions of Albania. The mean dmft was 4.41, the prevalence of caries was 84%, and the prevalence of children without cavitated lesions was 20%³. Such high caries-experience and high prevalence of caries complications in 5-year-olds indicates the need for greater availability of dental care for this age group³.

The project "Healthy Teeth, Happy Children" has been organized in Albania since the 2012/2013 school year, according to the recommendations of the Ministry of Schools, Education, Science and Technology. This project involved over 200 preschool and school institutions. The goal was to introduce children to healthy eating habits and oral and dental hygiene in a fun way. Through two competitions, in the recitation and drawing of thematic content, children were introduced to healthy and unhealthy habits related to oral health. Then, through electronic social networks, which they prefer to communicate with, they voted for the winners who received funds for oral hygiene and free dental restoration as a reward.

Bosnia and Herzegovina

The health system in Bosnia and Herzegovina (BH) belongs to the Bismarck model. Countries in the region also have this model: Serbia, Croatia, Slovenia, and in the European Union (EU)- Germany, Austria, Belgium, Luxembourg, the Czech Republic. Healthcare is financed from compulsory health insurance paid by employees and employers. In this system, the majority of residents (60-80%) are covered by the basic health insurance rights package. The disadvantages of such a health system are: a constant lack of funds (in the case of Balkan countries), the dominant role of the state in deciding on key health care issues, and the inability of patients to choose where they will be treated⁶.

There are two entities in BH: the Federation of BH, and Republika Srpska, and one condominium of the two entities- the Brcko District, and the health system is complicated. In the Federation of BH, there is one federal and 10 cantonal ministries of health with 13 different subsystems of health insurance, while in the Republic of Srpska there is one Ministry of Health, which, as well as in the Federation, is financed through the contributions of the population⁶.

The last epidemiological survey of caries prevalence in preschool and school children was conducted in 2004 at 8 locations in the Federation of BH and 2 locations in Republika Srpska. It showed mean dmft=6.7 in 6-year-olds and mean DMFT=4.2 in 12-year-olds⁷. Although not directly comparable, this study and a previous study, performed in 1997⁸, showed an increase in dmft and a decline in the DMFT index. Among 12-year-olds, 6%

have at least one tooth with a fissure sealant. In this age group, 99.8% of children are in need for some dental intervention: 71% need fissure sealing of at least one molar, 49% need single-surface fillings, 27% double-surface/multi-surface fillings, 13% need endodontic treatment, and extraction (as a consequence of caries) is required in 19% of respondents. Gingivitis and poor oral hygiene are present in 43% of respondents⁷.

Although it could have been expected that a period of about 30 years would bring some changes in the oral health of the population, this did not happen. The political transition from the post-war period and the comprehensive reform in the health system of BH coincided with the decline of the oral health in the children's population. The state of dental health care lags far behind the countries of Western Europe, and partially behind the countries in the region.

The "Zubomobil" project was created with the aim to educate children about oral health. It is a mobile dental office on wheels, cheerful, colourful, and full of amenities that aim to educate children and release them from fear during dental examinations in a fun way. The project was implemented during 2018 and involved about 10,000 children in about 50 schools with an emphasis on rural areas where preventive activities are most needed. The oral health status of the examined children was recorded. The dental records will serve as the basis for further planning of preventive activities⁹.

Bulgaria

The health system in Bulgaria is regulated by the Government of the Republic of Bulgaria. All Bulgarian citizens have compulsory social and health insurance, and their rights are guaranteed by the Constitution, as well as many laws and by-laws. The health insurance system was established in 1998 and includes social and voluntary health insurance. Every year, the Republic Health Insurance Fund contracts medical and dental service packages as well as their price. While social and voluntary insurance includes diagnostics, treatment, rehabilitation and medication services, the Ministry of Health is responsible for the organization and financing of public health¹⁰. Through the national health insurance fund, treatment services can be obtained in primary care clinics, specialized health care clinics, as well as clinical and technical laboratories (including dental).

According to 2016 survey¹¹, about 96% of Bulgarian dentists work in their own or rented offices and most have contracts with the national health insurance fund. Theoretically, the national health insurance fund covers dental services, but the number of services is limited annually to one check-up and three treatments, which include: amalgam/composite restorations or extractions with local anesthesia in adults. In children and adolescents up to 18 years, the fund covers the same number of services as in adults with two endodontic treatments per year. Patients who are treated privately pay the full amount of

services, and those who are treated through the national fund pay a participation fee of EUR 1.4 per each visit¹¹.

The last epidemiological study on the oral health in Bulgaria was conducted in 2011 in all 28 areas of Bulgaria. The next study, which was planned for 2020, was postponed due to the Covid-19 pandemic¹². The justification for the development of the National Programme for the Prevention of Oral Diseases (2021-2025) was based on statistically reliable epidemiological data and situational analysis from 2011.

The prevalence of dental caries in Bulgaria is much higher than the World Health Organization (WHO) global goals¹⁰. Twenty-nine percent of 5-6 yearold children is caries-free. With the increase in age, the proportion of children without caries decreases, to 21% for 12-year-olds and 8% for 18-year-olds. According to the place of living, the number of children without caries is higher in urban compared to rural areas¹². The key findings of the epidemiological research are that oral hygiene is unsatisfactory, and that it is necessary to increase the knowledge of parents and children about prevention and oral health through educational and motivational content¹².

Free access to various fluoride sources, i.e. supply of water with a fluoride concentration higher than 1.5 mg/l, bottled mineral water containing fluorides, etc., makes the intake of fluoride in the Bulgarian population above the EU average leading to a more frequent occurrence of dental fluorosis¹².

One of the dental caries prevention programmes implemented in Bulgaria is the Fissure Sealant Programme on the first permanent molars in children aged 6 years. The results of this programme are described in the doctoral dissertation "Comparative Study on Dental Caries in Children of the Plovdiv and Smoljanski Districts - Prevalence and Risk Factors"¹³, in which the results were compared with the data of the National Epidemiological Survey. As a result of the implementation of the Sealant Programme (2015-2020), there was an increase in the percentage of 12-year-olds without cavities, as well as a significant decrease in the mean DMFT in 18-year-olds.

According to the economic assessment, the implementation of Fissure Sealant Programme from 2015 to 2020 has resulted in significant savings in the budget of the national health insurance fund, since less than 1% of the budget is used for the sealing of the first permanent molars¹².

The "Community Milk Fluoridation Programme" was implemented from 1988 to 1993. Every day, children aged 3 and 4 years consumed 180-200 ml of milk with 0.5 ppm F for 5 years in kindergarten, and later at school. A reduction in dmft by 40%, and in DMFT by 79% was revealed. The authors emphasized that such a large reduction in caries could be attributed not only to the use of fluoridated milk, but also to other preventive measures such as better hygiene, and changing eating habits¹⁴. The second national project "Clinical Effect of Milk

Fluoridation" lasted from 2000 to 2004. It was applied to a larger sample of over 30,000 children. The result was a 43% reduction in the dmft index and a 68% reduction in the DMFT index. Both projects have confirmed that milk fluoridation can be an effective preventive measure in the global efforts against dental caries in children¹⁵.

The 2018 European Health Scoreboard notes that, despite marked and notable progress in some health indicators, Bulgaria lags behind EU countries. There are large socio-economic and regional health inequalities in Bulgaria, and a consensus of all stakeholders is needed to improve the oral health of the population¹⁰.

Cyprus

In 2019, Cyprus introduced a new health care system financed through state revenues and contributions levied on wages, salaries and pensions. It is a blended system that incorporates elements of both national health service and social health insurance, providing universal population coverage based on legal residency¹⁶.

For dental care, the new system reimburses only preventive dental interventions. To ensure access to dental care to the vulnerable groups (low-income citizens, pensioners, refugees, etc.), Public Dental Services (PDS), financed by the state budget, continue to offer a variety of dental treatments in a low cost (excluding fixed prosthetics and implants) for the abovementioned population groups. More specifically, patients visiting PDS pay only €3 per visit regardless of the offered treatment, except for removable prosthetics which cost €100 per denture. As a result, unmet needs for dental care which has been increased during the economic crisis are now low, although socioeconomic inequalities still persist. Financial barriers are reported as the primary reason for unmet dental care needs¹⁶.

In 2024, Cyprus adopted the Strategic Plan 2024-2026 (Dental Services)¹⁷. The main axis of the strategy emphasizes the prevention of oral diseases, the promotion of oral health and the provision of quality dental services to all citizens. PDS are divided into two sectors (preventive and therapeutic) and aim to provide high-quality primary, secondary and tertiary dental care, as well as the promotion of oral health to the citizens of Cyprus. PDS are provided in 42 dental clinics/practices throughout Cyprus located in 7 hospitals, 8 urban health centers, 2 health institutions and 12 health centers in rural areas. Primary dental care performs preventive activities, secondary conservative treatment, and tertiary specialized treatments of complex therapeutic procedures in periodontology, paediatric dentistry, prosthetics, and endodontics. In addition, orthodontic service is provided to children up to 18 years who fulfil certain economic and functional criteria. Dental emergency care for the entire population is provided on a 24-hour basis, 365 days a year, at the public hospitals' emergency departments. Patients (usually with special needs) unable to receive

treatment in a dental chair undergo general anaesthesia, under the responsibility of a maxillofacial surgeon¹⁸.

In addition to providing dental care, PDS are responsible for conducting epidemiological and other research to monitor oral health in Cyprus. Furthermore, PDS implement a series of programmes aimed at preventing oral diseases and promoting oral health. These programmes include lectures on oral health for students, parents, pregnant women, and teachers. Schools attended by students from immigrant backgrounds implement the "Brush my teeth at school" programme, and PDS provide free toothbrushes and toothpaste to the students. Special attention is given to the elderly and people with special needs, and seminars on oral health for the caregivers of these individuals are organized by PDS. Awareness campaigns are organized frequently to inform the citizens about oral health and oral diseases.

The last epidemiological study (2017)¹⁹, provides an updated oral health profile and quality of life related to the oral health after the economic crisis. In addition to clinical indicators of oral health through five age groups, it also shows the subjective feeling and the way in which it affects the quality of life of an individual and the indirect costs caused by the loss of working and school hours.

The mean dmft in 6-year-olds is 1.83¹⁹, and shows a decline compared to results from 2006 (mean dmft 2.23) and 2010 (mean dmft 2.14)²⁰. However, the situation is not uniform across the country's regions. It was observed that various socio-economic factors, lower level of parental education and migration of residents are associated with the occurrence of oral diseases. In the age group of 12 to 15 years, mean DMFT has the same values as in the previous study from 2010. The mean DMFT of 12-year-olds is 1.26 and 1.98 in 15-year-olds¹⁹, which, according to the WHO criteria²¹, falls within the threshold values for a country with low caries risk. In the adolescent period, the number of preventive dental examinations decreases, and the number of first aid visits increases. The number of hours of absence from school due to toothache is higher in children who perform preventive examinations less often.

The mean DMFT in the 35-44 age group is 10.25, which is significantly less than the 13.32 recorded in the 1992 survey¹⁹. In this age group, a decrease in the M% component was also observed, indicating the preservation of natural dentition. In the 65-74 age group, mean DMFT is 16.93¹⁹. The majority of respondents in this age group (56%) rated their oral health as "good" or "very good", but at the same time 20% reported chewing difficulties due to dental problems. The average time of absence from work is 9.76 hours per year, which leads to an increase in both direct and indirect costs of treating oral diseases.

According to the Ministry of Health, a total of 550 new cases of cancer of the wider oral cavity area, salivary glands, oropharynx and the tonsils (categories C0 - C10) have been recorded in Cyprus during the last decade

(2010-2020), corresponding to 1.5% of the total number of cancers recorded in the country²².

During the 2013-2016 financial crisis, citizens' behaviour changed, visits to the dentist were reduced, and more affordable treatment plans were sought, especially among the elderly and in the lower socio-economic strata of society¹⁹. The COVID-19 pandemic and subsequent restrictive measures also had a significant negative impact on the provision and seeking of dental care through PDS. Statistics from Cyprus PDS indicate a national decline in dental visits of 41.3% in 2020 compared to 2019, and a further decline of 9.6% in 2021 compared to 2020. However, this decline was temporary and did not substantially affect the unmet dental care needs. Regarding dental treatments offered nationwide, the largest decrease in 2020 was observed in dental scaling (53.5%). The proportion of the most affected dental treatments (scaling, examination, composite, and amalgam) in the total workload decreased from 51% in 2019 to 40% in 2020. Interestingly, the share of extractions in the total workload increased from 16.6% in 2019 to 21.5% in 2021. The increase in extractions is expected to have a negative impact on oral health, given that extraction is the most radical dental treatment which may necessitate prosthetic rehabilitation. Furthermore, the economic impact of COVID-19 and the global economic instability, which has reduced family incomes, is expected to drive more patients towards the public sector, where fees are lower, adding to already burdened waiting lists. Individuals with lower socio-economic status are likely to bear the highest burden of these challenges, potentially exacerbating oral health inequalities²³.

Greece

Greece's health system is a mixed system that combines elements from both public and private sectors. A type of National Health System- NHS (Beveridge model) coexists with a Social Health Insurance system (Bismarck model) and an expanded private sector²⁴. Health care is financed from the state budget, health insurance funds, direct payments of patients to the private sector, and private health insurance programmes which do not cover dental care²⁵. In the context of the NHS, all citizens are eligible for free of charge preventive and therapeutic dental care services (laws 1397/1983, 4368/2016, 4487/2017)^{26,27}. Dental care is provided in public hospitals, urban and rural Primary Health Centres. Theoretically, all Greek NHS Primary Health Centres offer primary dental care to eligible patients, while various hospitals provide secondary care. Dental emergency care is provided for the entire population, on a 24 hour basis, 365 days a year, at the public hospitals' emergency departments. However, due to underfunding and understaffing, a large number of the NHS Primary Health Centres dental departments have been closed and

only a limited number of people have access to the NHS Dental Services²⁸.

Since the beginning of the austerity period, public health expenditure has significantly decreased and inequalities in access to health care have substantially increased. The most affected by the crisis are: the unemployed, people with income below the poverty line, children, the elderly population, chronic patients and patients with disabilities. Due to the growth of the private sector and unevenly distributed and reduced state sector, health inequalities are higher than ever²⁷. In 2016, in the middle of economic crisis, universal health coverage has been legislated in order to protect a large part of the population which was left without health insurance and the possibility of receiving oral healthcare.

Theoretically, oral healthcare is included in universal health coverage. However, due to the continuous underfunding of oral healthcare by the Greek state during the last twenty years, only a limited number of inhabitants have access to free dental healthcare services in practice. During the economic crisis and the COVID-19 pandemic, the Greek state almost withdrew the funding for dental care, further worsening the situation: the majority of the population cannot afford to use private sector services, while the PDS is severely understaffed and faces significant deficits in infrastructure and organization²⁹. During the economic crisis, total dental expenditure in Greece decreased appreciably by 67.97% (from €2085.37 million in 2008 to €667.854 million in 2022) and public dental expenditure is reaching almost 0%³⁰. As a consequence, inequalities in access to dental care have been exacerbated: In 2022, Greece had the highest percentage of unmet dental care needs in the EU: 12.1% comparing with average 3.4% in EU-27³¹.

The last National Action Plan for Oral Health (2008-2012) was adopted, but it was not implemented due to the lack of financial resources for the implementation of activities. However, a national oral health promotion programme was implemented in 800 all-day elementary schools and 150 elementary schools in remote areas during 2011-2013. The purpose of the programme was to guide students through active learning to change attitudes and behaviours, aiming to promote oral and general health. The number of the 2nd grade elementary school students who participated exceeded 37,000. More than 1,000 dentists visited the schools, providing oral health education, as well as oral cavity clinical examination and topical application of fluoride to young students³².

Since 2017, an oral health promotion programme for pupils in kindergartens, and 1st and 2nd grades of elementary schools³³ has been implemented. During the school year 2018-2019, 86,823 pupils participated in the programme, which is almost one-third of the children of these age groups in the country. Due to the COVID-19 pandemic, the programme was canceled for two school years. Since the 2022-2023 school year, the Ministry of

Health has been making continuous efforts to enforce its implementation and reach pre-pandemic levels.

In 2021, in the context of WHO Global Oral Health Strategy consultation, the Hellenic Republic officially proposed to the WHO the idea of a dedicated oral health budget as a key for sustainable oral health funding. Establishing a guaranteed share of public health spending dedicated exclusively to oral health care is an innovative instrument to significantly increase public resources for oral health. This approach does not require an overall increase in public health spending but calls for evidence-based reprioritization of health funding in favour of oral health. WHO endorsed the proposal by including it in the Global Oral Health Strategy (May 2022)³⁴ and in the Draft Global Action Plan on Oral Health (April 2023)³⁵. However, the Greek government has not yet legislated the introduction of a dedicated oral health budget.

Nevertheless, in May 2023, the “Dentist Pass” has been introduced- a universal, free, preventive dental program for children aged 6-12 years³⁶. This programme allows a possibility to freely choose any doctor in the private sector. The budget of the program was €27 million for one year. This programme has significant advantages: it is universal, provided to all children without any exclusion based on the income criteria of their parents; it is aimed at primary school children, a period very important for the adoption of healthy behaviour; it is simple and without bureaucracy in its application. The number of children that participated at the programme was almost 240,000.

Following the onset of the economic crisis in Greece, a significant number of Non-Governmental Organizations (NGOs) or other voluntary bodies emerged, several of which are active in the health sector. They are funded through European donor funds and sponsorships. Their services include primary health care: preventive check-ups, and simpler dental treatments for children, migrants, uninsured residents and other socially vulnerable categories in NGO clinics and centres²⁷. One such organization is the independent NGO *Médecins du Monde*. Dental services within primary and secondary health care are provided through two projects “Smile” and “Adamantiada”. Professional teams of about 50 volunteer dentists, centred in Athens, are equipped with mobile dental units that visit schools and other institutions and provide dental care (e.g. Smile mobile units in different areas of Greece)³⁷. The Adamantiada project aims to cover the dental needs of children in Athens. *Médecins du Monde* mobile units are fully supplied with dental equipment and materials, and aim to raise awareness of oral hygiene, the importance of dental examinations and fluoride intake²⁷. Children who need further dental care and do not have financial opportunities are referred for further treatment at the *Médecins du Monde* Clinic in Athens.

In addition, the Region of Crete has presented a significant action work in dental diseases prevention and oral health promotion in the community and vulnerable

population groups since 2009. “Ensuring Children’s Oral Health” is a successful prevention programme of Region of Crete including a mobile dental unit, children’s fairytale “The Beaver the Dentist, the Master of Teeth”, presentation of an interactive theatrical performance in primary schools, as well as distribution of toothbrushes free of charge to all primary schools in Crete. The Mobile Dental Unit conducts approximately 5,000 examinations annually for primary school students across Crete, visiting various childcare facilities (such as S.O.S. Children’s Villages, Agios Spyridonas centre for children with special needs, etc.) and serving residents in remote areas (including Gavdos, Karpathos, etc.). Additionally, more than 3.000 posters and an equal number of drawing blocks, featuring advice from Doctor Beaver, have been distributed to students in 1st and 2nd grades across all Primary Education schools in Crete. Over 13.000 toothbrushes are being distributed free of charge to all primary schools in Crete, with an additional 26.150 expected to be received soon. The Organizing Committee of the recent 28th Congress of European Association of Dental Public Health, which took place in Heraklion, Crete, October 3-5, 2024 awarded the Authorities of Region of Crete for their commitment and work in oral disease prevention and promotion of oral health in the community and vulnerable populations³⁸.

Despite the absence of a consistent national preventive oral health policy, oral health status of Greek children has improved over time as it is proven by the national epidemiological surveys conducted by the Hellenic Dental Association³⁹. The latest national survey performed in 2012 reported that 60.1%, 48.1%, and 34.7% of the 5, 12, and 15-year-olds, respectively, were caries-free. The mean dmft/DMFT was 1.48, 1.61, and 2.46 for 5, 12, and 15-year-old children, respectively.

Since no water fluoridation is carried out in Greece, the improvement in oral health can be attributed to the increasing use of fluoride toothpastes, education and raising awareness of the importance of oral hygiene for health in general. However, there is an urgent need to conduct a new national epidemiological survey of oral health. The previous survey was conducted before the recent financial crisis and the pandemic, which are expected to have impacted the oral health status of the Greek population. Inequalities in the oral health of the population are pronounced, and require well-designed universal oral health promotion and disease prevention interventions within a national oral health strategy, with priority investment in children⁴⁰.

Montenegro

In 2008, a reform of the health system which included primary dental care was implemented in Montenegro. The concept of the “chosen doctor” was introduced and the reorganization of dental health care and its privatization began. The reforms reduced the rights of insured persons

in the field of dental care. Children up to 18 years of age, students up to 26 years of age, pregnant women, adults over 65 years of age, and specific groups of patients have the right to free preventive and curative services. With the abolition of specializations in paediatric and preventive dentistry in Montenegro, the opportunity to work on the prevention with the most vulnerable groups has been lost. The needs for specialist dental care from all dental branches are implemented within the secondary and tertiary level of health care in the Clinical Center of Montenegro, except for orthodontics, which remained within the primary health care⁴¹.

A pilot study on the effectiveness of the implemented reform in dental health care, nine years after its implementation, notes that there is no significant change in awareness and practice in maintaining oral hygiene in children aged 11 to 14 years in Montenegro⁴².

Oral health and hygiene habits are not at a satisfactory level also in the elderly population. The survey, conducted in older adults of average age 71 years, showed that 40% of respondents were toothless, and 82% had some prosthetic restoration. The reason for visiting the dentist was pain in 59% of the cases. Tobacco products in Montenegro are used by as much as 41% of the population. The results show that, in addition to health education, it is necessary to improve prosthetic services for elderly patients in the state health system⁴³.

The national survey on the oral health of children was conducted in 2006⁴⁴. The average DMFT value in 12-year-olds was 3.43, and 88% of the children examined had cavities. The percentage of children with healthy periorodentium was 64%, and 12% of children had at least one tooth protected by a fissure sealer. Given the unsatisfactory oral health, the authors emphasize the importance of introducing modern preventive measures and programmes and more intensive promotion of oral health.

Montenegro does not have a national programme for prevention and conservation of the oral health of population. As in the surrounding countries, limited availability of services, insufficient health promotion and the high price of dental services have led to poor oral health of the population.

In order to help Montenegro, as well as Croatia and BH, the European Regional Development Fund financed the project "Mobile Access Dental Clinic" from 2012 to 2020⁹. The project activities were focused on health institutions, non-governmental organizations, regional administrations that would organize mobile dental units to provide dental services to target population groups. The aim of these projects was to relieve the financial burden on the health system of these three countries and to save costs for expensive dental procedures by intensifying preventive activities.

North Macedonia

After the disintegration of the Yugoslavia, Macedonia inherited a good model of health care that implies free

access to health services for all residents of the country, good health coverage and the distribution of professional staff⁴⁵. The problems after gaining independence since 1991 were how to strengthen a large health infrastructure with a large number of employees and increase health performance.

In the period 2004-2006, part of the primary dental care was privatized and the office space was leased. The privatization process did not include paediatric and preventive dental care and emergency dental services. The new reforms retained the positive experiences and benefits of the former socialist system such as strong prevention, control of infectious diseases and free access to health care⁴⁵.

The Republic Health Insurance Fund pays the institutions for dental services provided at the primary, secondary and tertiary level, but patients might have to contribute for dental service. The contribution varies from 0% for preventive services to up to 20% for services at the tertiary level⁴⁶.

The Ministry of Health has supported and funded the "National Strategy for the Prevention of Oral Diseases in Children up to 14 Years of Age"⁴⁷ implemented by 147 preventive teams (dentist and dental assistant employed in the service for pediatric and preventive dentistry) in 34 public health centers. Implementation started on January 1, 2008. The strategy is implemented through five key preventive measures, namely: mechanical and chemical plaque control, local application of fluoride, fissure sealing, control of sugar intake and education and motivation in maintaining oral health⁴⁵. To ensure uniform work, the Coordinating Body prepared the Manual for the implementation of the National strategy⁴⁸.

The results of the national preventive programme implemented from 2008 to 2018 showed that preventive activities can achieve the set goals of the programme. Before the start of the programme in 2007, mean DMFT was 6.88⁴⁵. At the end of the 10-year implementation period, mean DMFT in 12-year-olds was 1.93⁴⁹. DMFT of the first permanent molars in this age group was 1.59, with the F component being proportionally the largest⁵⁰. By reducing the DMFT in 12-year-olds by more than 50%, one of the planned medium-term goals of this preventive programme was achieved.

The Ministry of Education, the Ministry of Labor and Social Policy, and the Ministry of Local Self-Government were partners in the successful implementation of the planned activities. The results achieved and the improvement in oral health among children over the ten-year period of the Strategy (2008-2018) encouraged the government of the Republic of North Macedonia to assign the Coordination Body, through the Ministry of Health, the task of preparing a new, updated Strategy for the prevention of oral diseases in children aged 0-14 years⁵¹. The new strategy is set for the period 2018-2028, and aims to set the focus on preschool children, young children and pregnant women.

Romania

The health system of Romania is organized at the national and district level. The national level implements the state health policy through the government and the Ministry of Health, and the district level is responsible for the provision and implementation of health services⁵². Like in other EU countries, all residents have the right to health insurance. Oral care has been funded through the public health insurance system since 1998, but services are limited. The proportion of employed dentists who work in the public sector is 14%, and they work in dental offices at schools and universities.

Other dentists are employed in private practices or polyclinics. Each of the 41 provincial districts has at least one emergency dental clinic. Services through the health insurance system are provided to children of up to 18 years of age and specific groups of the population such as: pregnant women, women on maternity leave, persons with disabilities, students up to 26 years of age, and war veterans. Dental treatments financed by the Health Insurance Fund are: annual control examination, fissure sealing and removal of dental plaque, restorative treatment, endodontic treatment, periodontal treatment, orthodontic treatment, simple prosthetic procedures, and oral surgery⁵³. The problem is that a small number of Romanian dentists (about 1/5) have contracts with the national health insurance fund, so that few patients can benefit from health insurance. Currently, there are no plans to reform dental health care⁵².

The problems concerning oral health in Romania are: small budget allocations for this field, a small number of offices contracted with the national health insurance fund, poor accessibility of dentists in rural areas, low number of dentists *per capita* in comparison to EU countries, as well as the lack of a national plan for preventive oral health care⁵⁴. In addition, the treatment of people with disabilities is not at the desired level, and the reason is the lack of knowledge and neglect of health care for vulnerable groups in the community⁵³. Another public health problem with a high incidence and mortality rate is oral cavity cancer. According to 2011 European statistics, 26% of men and 27% of women in Romania are smokers⁵³.

The 2000 National Oral Health Survey⁵⁵ showed that the mean DMFT in 12-year-olds was 2.8. Epidemiological studies in school children show the importance of socio-economic factors for the prevalence of untreated caries, in addition to the applied preventive measures implemented in schools. Later epidemiological studies (2019 – 2020)⁵⁶ in school children focused on 11-14 years old children of rural and urban areas of Romania. Prevalence of caries showed to be under influence of socio-economic background and specific dietary habits such as consuming sodas, milk, candies⁵⁶. It has been shown that oral health education has a positive effect on oral health knowledge

and behaviour among teenagers, particularly on oral hygiene practices while its impact on dietary behaviour is less pronounced⁵⁷.

Romania implemented several national programmes in the field of oral health, such as the “Mouthwash Programme with Fluoride Rinse”, using 0.275% sodium fluoride, in schools in Iasi and Constanta in the period from 2000 to 2007. After seven years of implementing the programme in 12-year-olds, the mean DMFT was reduced by 12.5% in Iasi and 29% in Constanta, which indicates that there is a need for caries prevention programmes in the community⁵⁸.

Since 2012, the European platform for better oral health has activated a project in Romania called “Smile Romania”, which aims to raise the awareness of the population about oral hygiene, dental sensitivity, gingival bleeding, and the choice of toothbrush and toothpaste. Within the project, companies that produce oral hygiene products share the promotional material and point towards the importance of oral health⁵³.

The Red Cross of Romania with the support of the National Association of Paediatric Dentistry has been implementing the “Colgate School Programme” since 1993. This programme involves tens of thousands of children from urban and rural schools. Since the beginning of this initiative, 7 million children have been involved. During school hours, children gain valuable knowledge through the educational film “Dr. Tooth and his Superheroes” about the rules that children must follow in order to have a bright and healthy smile. In an interactive workshop, volunteers demonstrate proper oral hygiene techniques, give tips and “toolkits” for proper hygiene⁵⁹.

A national “Children’s Dental Health Project” is ongoing. It is implemented by the Faculty of Medicine and Dentistry in Timisoara in cooperation with WHO. This will be the first analysis related to the prevention of oral diseases of children in Romania according to the WHO methodology⁶⁰.

Serbia

In Serbia, every citizen has the right to health insurance in line with Law on Health Protection⁶¹ and Law on Health Insurance⁶². Citizens who have income pay health insurance through compulsory contributions, while health insurance of those who do not have income is paid by the state. Dental health service is available at the level of primary health care, in the state and private sector. Since 2005, the Law on Health Insurance introduced a change in the financing of dental care. The National Health Insurance Fund⁶³ covers dental services for children <18 yrs, university students <26 yrs, pregnant women, disabled, and patients with severe medical conditions. Some services are available for people aged >65 yrs. Free services are available to all citizens in cases of dental emergencies. There is also a

possibility for unemployed to have free basic dental care, but administrative procedures hinder implementation in practice. Reforms in the health care system have led to a decline in the rate of dental treatment of adult citizens. Citizens exercise their right to primary dental healthcare through a selected dentist who conducts activities prescribed by the Law, which include measures to preserve and improve health for all categories of residents, examinations for the purpose of diagnosis and timely treatment, as well as referral of patients to the secondary and tertiary level of treatment⁶⁴.

Paediatric dentistry in Serbia is practiced by paediatric and general dentists, both in the public and private sectors, but clear boundaries between “specialist” and “general” paediatric dentistry are not clearly defined⁶⁵. According to the data published by the Institute of Public Health of Serbia “Milan Jovanovic Batut”⁶⁶, in 2022, out of a total of 1497 dentists in public health institutions in Serbia, 296 specialists, and 33 residents in preventive and paediatric dentistry performed the activity of paediatric and preventive dentistry.

In Serbia, there are regulations and rulebooks based on the example of countries where exceptional progress has been made in the state of oral health. One of these was the Law on Water Fluoridation⁶⁷ in each place with 20,000 inhabitants, where the natural level of fluoride in drinking water was below 0.8 mg F/L. However, the water fluoridation was implemented for a short time during the 1970s. Health concerns and technical and technological non-equipment were cited as the reasons for its termination.

The last epidemiological study on the oral health of children and youth in Serbia was conducted in 2019 in accordance with the WHO methodology⁶⁸. The study included children from five age groups: nursery children aged 12-36 months, kindergarten children aged 36-71 months, preschoolers - 6-year olds and school children aged 12 and 15 years. Eighty-seven percent of children aged 12-36 months, and 49% of children aged 36-71 months are caries-free, while 20% of 6-year-olds have all healthy deciduous teeth. In 12-year-olds, 36% of children are caries-free (mean DMFT 2.32). At the age of 15, all healthy teeth can be found in 22% of children (mean DMFT 4.09). Research has shown that 50-77% of young children brush their teeth only once a day or less often, while more than half of children eat sweets every day. Comparison of caries incidence scores in 12-year-olds from earlier epidemiological studies shows a slight decline compared to earlier years: 2004-85%; 2008-82%; 2009-75%; 2020-64%. According to this study, Serbia is ranked at the very limit of low caries incidence (mean DMFT in 12-year-olds: 1.2-2.6) and moderate caries incidence (mean DMFT in 12-year-olds: 2.7-4.4). However, at the age of 15, DMFT almost doubles, caries is in severe categories, and two thirds of the children

examined have dental plaque and apply inadequate hygiene⁶⁹.

It has been shown that continuous implementation of preventive activities as well as the promotion of oral health and healthy living habits among children and adolescents is necessary in the Republic of Serbia. Dentists involved in the provision of dental healthcare for children and adolescents in primary healthcare centers in Serbia participate in oral healthcare education and promotion activities in the community. At the same time, cooperation with healthcare and professionals from other sectors stays suboptimal⁷⁰. The existing school-based prevention programme for oral health promotion needs additional attention. Corrective actions and reforms to the current preventive oral health programme in Serbia are necessary to deliver strategies for addressing the specific challenges in schoolchildren.

Turkey

The Republic of Turkey allocates 5% of the annual state budget for health. Out of this amount, 4.5% is given to dental health care expenditures. This proportion has been increasing slightly for years, but it is still insufficient to solve the problem of oral health⁷¹.

About 90% of the population in Turkey is covered by health and social insurance. Primary health care services are provided on the principle of a family doctor, while dental services are not provided within this model and dentists are not included in the family medical care system⁷¹.

According to 2022 data⁷², dental care of the population is performed at several levels: health centers funded by the Ministry of Health (26%), universities (12%), private sector (60%), and other institutions (2%). The average number of inhabitants per dentist in Turkey is 2,241, and the frequency of dental visits is 0.9 visits *per capita* per year⁷³. According to the Ministry of Health report from 2017⁷⁴, there are on average 33 dentists per 100,000 inhabitants in Turkey. In the region of Southeast Anatolia that number is 15, while in the region of West Anatolia there are 52 dentists per that number of inhabitants. In Istanbul there are 41.1 dentists per 100,000 inhabitants. The fact that 20% of residents are waiting for therapy in public institutions indicates the need for an organized distribution of dentists and a strategy for prevention⁷¹. Rural and the urban poor populations are experiencing the greatest difficulties in accessing dental services⁷⁵. Turkey lacks published comprehensive national-level information on oral health⁷⁶.

It has been reported that the use of oral health services among children and adolescents is generally low to moderate and inconsistent⁷⁵. In addition, oral health literacy has not been established, and regular dental visits are not the accepted norm^{75,76}.

Recently introduced ‘Family Dentistry Model’ targets prevention starting from childhood to control the disease.

The report of the Working Group for Family Dentistry on the costs of dental services states that complications of oral disease are resolved in public centers, and preventive measures and promotion of oral health are disregarded, so that there is no improvement of oral health measures⁷¹. The introduction of regular annual dental examinations by the 'Family Dentistry Model' would reduce the volume of expensive treatment services in the future. At the same time, it is proposed to introduce the private sector into the system of compulsory health insurance, which would relieve the public sector⁷⁷. Priority should be given to preventive medical services and regular annual examinations of residents aged up to 18 and over 65, as well as treatment procedures for those patients who had regular annual examinations.

The Strategic Activity Plan (2014-2017) implemented by the Turkish Public Health Institution states the following important strategic goals: "continuation and improvement of preventive oral and dental health services" and "oral and dental health prevention programme". Proposals within the Strategic Action Plan (2014-2017) are:

- Broadcasting educational videos from 8 pm to 9 pm on a public service (videos on the harmful effects of dental plaque microorganisms, described with examples, and targeted at mothers);
- Introduction of the subject "oral and dental health" in schools;
- Comprehensive education on preventive dentistry at dental faculties;
- Training of health professionals from different disciplines (family doctors, paediatricians, obstetricians, gynaecologists) on oral health;
- Contributing of private practice dentists to the improvement of oral health of the society in their regions through dental chambers and dental associations;
- The need to have a national database, as this would make it easier to monitor patients and groups at risk, and reduce the prevalence of oral diseases in the community;
- Developing school programmes to improve oral health as the easiest way to reach children and young people⁷⁸.

At pre-school age, a study estimated a reduction in the prevalence of caries from 58% to 23% by fluoride applications⁷⁹. Another study reported that the economic assessment of fissure sealant application in schoolchildren may provide a possible savings of 68%⁸⁰.

The paper on funding, service delivery, human resources and vocational education process related with oral health in Turkey revealed the need for including oral and dental health as a part of public health, and suggested that the programs should be planned in accordance with the socioeconomic status of the society in both service provision and financing where Turkey's epidemiological

characteristics should be taken into account, along with the global health goals set by international health organizations⁸¹.

The 'Preventive Oral and Dental Health Programme' has been carried out at the national level under the umbrella of the Ministry of Health, General Directorate of Public Health since 2014. Within the Programme, oral hygiene education, oral examinations, and fluoride varnish applications are carried out for pre-school and primary school pupils with parental consent. Two interventions are scheduled in each academic year, with 6-month intervals between them. Immediately before fluoride varnish application, tooth brushing activities are conducted using toothbrushes and toothpastes distributed by the Ministry. The application is performed by dentists and trained medical personnel, as well as students of dental faculties. The implementation of this project lists problems such as: the refusal of parents to this procedure and the lack of an organized system of further referring children for dental therapy. According to the observations of the professionals involved in the programme, the percentage of implementation varies but is generally low. For instance, while the level of individual continuity in Ankara Province is not fully known, it is observed that only 30-35% of the target population is reached⁸². The problem is also the frequent inability to apply fluoride varnish adequately due to the non-ambulance setting in which the application is performed, the lack of staff implementing the programme, as well as standardization and coordination of the programme^{78, 82}.

The third national oral health survey, conducted between March and September 2018 and including five index ages and age groups, revealed a high prevalence of dental caries in the community⁸³. The improved oral health services were reflected in the findings of the current national survey, which showed an increase in the mean number of ft/FT across all examined age groups. However, oral health services that are primarily treatment-oriented and interventionist fail to address the underlying causes of dental caries. Therefore, it is recommended that the relevant authorities schedule future national surveys to maintain surveillance. Additionally, there is a need for protocols in the application of preventive measures in target groups such as: pregnant women, diabetics, cardiovascular patients, people with disabilities, etc. The development of a national preventive oral health programme is planned in Turkey.

The Family Dentistry Model has been implemented in the Strategic Plan and approved by the Ministry of Health⁸¹. In 2022, its implementation began in the provinces of Eskişehir, Karabük, and Kırşehir⁸⁴. Parents/caregivers of children aged 2-12 are invited to meet with their family dentist to learn about the oral and dental health status, regardless of whether the child has oral and dental health problems, to become informed about oral and dental health care, and to benefit from preventive oral

and dental health practices. Families informed about this initiative are encouraged to participate in dental health awareness training.

In this context, access to services has been facilitated. The model records children's oral and dental health status, performs necessary evaluations, assesses caries-risk, applies preventive treatments, and ensures regular follow-up examinations. The primary aim of the "Family Dentistry" programme is to prevent and control tooth decay and address risk factors before health problems arise, with the ultimate goal to raise healthy generations.

The Ministry of Health has taken significant steps to raise awareness among the public about oral and dental health, aiming to instil the habit of oral and dental care from a very young age and to create a healthy society. This "Family Dentistry" programme is expected to expand to 20 provinces in 2024. It is aimed to gradually implement the program in all 81 provinces in Turkey by the end of 2028, covering the entire population. With the new model, alongside ongoing therapeutic services, preventive oral care, which is crucial for children, will be integrated into the existing system⁸⁴.

Discussion

Oral health remains a major public health problem among Balkan countries. Although oral health is an inseparable part of general health, many states do not mention it in their national programmes for the maintenance of general health. The consequence of such a policy is huge budget allocations for the treatment of oral diseases (together with the treatment of cardiovascular diseases, diabetes, obesity and cancer). Such large expenditures cannot be afforded even by economically rich countries. Developed countries recognize oral diseases as a significant public health problem and undertake well-organized preventive activities in order to reduce expensive therapeutic treatment services.

Bulgaria and the Republic of North Macedonia are the Balkan countries which have current preventive programmes related to oral health. In Cyprus, a strategic plan for preservation of oral health and the provision of dental services is described. An oral health promotion programme for elementary school children and universal preventive programme for children ("dentist pass") have been implemented in Greece. Serbia has a national preventive programme that has expired, but the programme activities still apply. Epidemiological data are collected in other Balkan countries and drafting of such documents is planned².

Balkan countries belong to economically developing countries. Recessionary crises and wars, as well as the recent crisis caused by the COVID-19 pandemic, have further weakened the economy, so the budget expenditures

for health care are modest. Preventive and therapeutic services are commonly provided to children and certain vulnerable groups of the population for free and within primary health care. They are performed by general dentists and dentists specialized in working with children. In Greece, one of the reasons for unsatisfactory oral health of children is the lack of specialized dentists for working with children. Bulgaria has limited the number of annual therapeutic interventions provided free of charge under the regular health insurance package. This might be regarded as an example of a good measure that could stimulate parents to bring their children to more regular dental examinations.

Common problems of Balkan countries are the number and distribution of dentists in primary health care. Compared to other EU Member States, Greece has the highest number of dentists in the total population⁸⁵. Due to unemployment, a large number of dentists go to work in other EU countries and the United Kingdom. In the last ten years, Romania has also faced a large migration of both general population and doctors to EU countries⁵³.

Geographically dispersed countries such as Greece do not have adequate staff distribution. Therefore, Greece introduced mobile dental offices that are transported to rural areas, migrant camps, and social welfare institutions. In addition to dental examinations, simpler therapeutic procedures are provided in those offices. In Montenegro, BH, and Turkey, such mobile offices are adapted to children and primarily aim to relieve children from fear and educate them about the importance and manner of maintaining oral hygiene.

Too many patients per one dentist compared to too many trained dentists is a paradox faced by the Balkan countries. On the one hand, there are dentists within the framework of primary care who, dealing with treatment as a consequence, do not have time to devote to preventive activities, while on the other, there is a large number of unemployed dentists. There is an uncontrolled expansion of the private sector and a cruel struggle for survival, which significantly affects the quality of health care and deepens inequalities in the preservation of oral health. Commercial interests and orientation towards highly profitable services, unavailable to the majority of the population, are pushing health promotion and preventive services into the background. The economically disadvantaged population is subjected to a gradual collapse of oral health.

Epidemiological studies, performed according to the WHO methodology²¹, are necessary to gain an insight into oral health pathology and detect subgroups within the population to which special preventive activities should be directed. The results of dental health analyses conducted in the Balkans within the framework of primary care expressed through DMFT in 12-year-olds significantly differ from the results obtained for their peers in Denmark – 0.4 (2014), France – 1.23 (2006), Germany – 0.5 (2014),

Spain – 0.58 (2020), and Norway – 0.9 (2020).⁸⁶ Such a low prevalence of caries in some countries of Europe may be associated with a better socioeconomic standard, well-organized preventive programmes, and greater motivation to preserve oral health.

In each country, the community should advocate for continuous and binding preventive education, primarily of dental professionals, and then also of educators and teachers. These should be the strategic objectives of each prevention programme. WHO suggests that oral health research should be conducted every five to six years in the same population as this is the only way to obtain information on key risk factors relevant to oral health promotion planning and the development of national prevention programmes²¹.

The authorities in the Balkan countries fund various prevention programmes. All countries give preference to local exposure to fluoride preparations. The Strategic Activity Plan implemented by Turkey is a local application of fluoride varnishes twice a year from kindergarten age to the fourth grade of primary school. The programme aimed to include oral examination records, distribution of toothbrushes and toothpaste, and oral health education sessions in the classrooms. Unfortunately, these elements could not be implemented properly, and the outcomes, as well as the acceptance and success of the programme, could not be reported. Romania records a reduction in caries in schoolchildren with a programme of rinsing the mouth with fluoride. In the Bulgarian and North Macedonian programmes, fissure sealing is highlighted as a key prevention measure. Bulgaria is currently conducting a media campaign for the sealing of the first permanent molars in 6-year-olds, which is also one of the key activities in the implementation of preventive measures in Serbia. In Bulgaria, table salt is fluoridated as a measure of systemic fluoridation. The trend of systemic fluoride application is changing in favour of different modalities of local fluoride application.

In all countries of the Balkans, the children at earliest ages and school population are priority groups for the implementation of preventive activities. The explanation is the possibility to include the entire group, and on the other hand, the acquisition of good habits and awareness of the importance of oral health in the early age. In addition to children, pregnant women are another important group for health education work. One of the proposals in the Turkish strategy for the preservation of oral health, aimed at mothers, is the daily broadcasting of educational videos on a public media service that vividly show the harmful effect of dental plaque microorganisms. Greece is the only country in the region whose national prevention programme covers the entire population, and strategic activities are aimed at reducing inequalities in the provision of oral health care services.

Studies on the effectiveness of applied prevention programmes prove that in economically less developed

and poorer countries, with more pronounced oral pathology, each prevention programme is effective, while in developed countries it should focus on high-risk subgroups within the population⁸⁷. Recent systematic literature reviews⁸⁸ describing the effectiveness of preventive programmes indicate major differences in the methodology of preventive interventions. Except for fluoridation, there is low evidence of preventive programmes implemented so far, and therefore they cannot be compared directly.

Conclusions

Despite the difficult economic circumstances, the countries of the Balkan Peninsula have made considerable progress in improving the oral health of their populations. However, it is striking that many countries in the region do not have long-lasting national programmes to improve oral health. It is important to recognise oral diseases as a major public health problem and find the best strategic measures for their prevention. Professionals should be supported in the regular situation analysis of the population's oral health. Greater involvement of the community in activities to improve oral health is necessary, as well as broader coverage of the target groups of dental care, which in all countries include children, adolescents and pregnant women, as well as the elderly population, national minorities, migrants and patients with special needs.

Disclaimer

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