

МИНИСТЕРСТВО ЗДРАВООХРАНЕНИЯ РЕСПУБЛИКИ БЕЛАРУСЬ
БЕЛОРУССКИЙ ГОСУДАРСТВЕННЫЙ МЕДИЦИНСКИЙ УНИВЕРСИТЕТ
1-я КАФЕДРА ТЕРАПЕВТИЧЕСКОЙ СТОМАТОЛОГИИ

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**ПЛАНИРОВАНИЕ КОММУНАЛЬНЫХ ПРОГРАММ
ПРОФИЛАКТИКИ СТОМАТОЛОГИЧЕСКИХ
ЗАБОЛЕВАНИЙ**

**PLANNING COMMUNITY PROGRAMS
FOR PREVENTION OF DENTAL DISEASES**

Учебно-методическое пособие



Минск БГМУ 2019

УДК 616.31-084(075.8)-054.6

ББК 56.6я73

К14

Рекомендовано Научно-методическим советом университета в качестве учебно-методического пособия 21.06.2019 г., протокол № 10

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К14 Планирование коммунальных программ профилактики стоматологических заболеваний = Planning community programs for prevention of dental diseases : учебно-методическое пособие / Л. А. Казеко, О. А. Тарасенко. – Минск : БГМУ, 2019. – 52 с.

ISBN 978-985-21-0386-2.

Изложены этапы планирования коммунальных программ профилактики стоматологических заболеваний. Приведена информация об особенностях применения различных методов профилактики. Включен пример программы профилактики стоматологических заболеваний.

Предназначено для студентов 5-го курса медицинского факультета иностранных учащихся, обучающихся на английском языке по специальности «Стоматология».

УДК 616.31-084(075.8)-054.6

ББК 56.6я73

ISBN 978-985-21-0386-2

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PLANNING PREVENTION PROGRAMS OF DENTAL DISEASES

One of the most important parts of community dentistry is the planning of dental care for the population. According to the WHO recommendations (WHO OP No. 53, 1980), any system of dental care for the population in the country should include:

- prevention (primary);
- services on demand (dental care for adults);
- systematic care services (for children);
- manpower production (training personnel in adequate quantity, quality and types for the implementation of the above-mentioned parts of the system);
- costing of the plan (material and financial provision of the system components);
- monitoring and evaluation (information system).

If some component lacks in the system or their coherence lacks, dental care for the population cannot be effective and people's health, as a rule, worsens. Without the community programs of primary prevention of dental diseases, its prevalence and intensity constantly increase. In the Republic of Belarus all components of dental care system recommended by the WHO are available, including the program of prevention at the communal level.

A question may arise: «Is it necessary for each dentist to be able to plan primary prevention at the communal level?» The experience of practical health care shows that every doctor who worries about the health of people devotes much time in his work to prevention. Scale up prevention planning can be different (depending on the position of the dentist), from a small area (local doctor) or schools (school specialist) to the whole country (the main dentist).

STAGES OF PLANNING COMMUNITY PREVENTION PROGRAMMS

Steps in *planning* a community-based prevention program:

- 1) need assessment;
- 2) identifying priorities;
- 3) developing goals and objectives;
- 4) assessment of resources;
- 5) implementation;
- 6) assessment.

The classic planning cycle may be summarized in a simple Problem, Objective, Activities, Resources, and Evaluation (POARE) format. This format provides an easy, step-by-step process to organize and evaluate the project.

P Proble:

- Determine the extent of the problem;
- Collect relevant information;
- Determine community support;
- Gather baseline data.

O Objectives:

- State SMART objectives;
- May be formative, process, or impact;
- May be short-term or long-term;
- Identify target population.

A Activities:

- Outline methods that will achieve objectives;
- Only PROVEN strategies should be used;
- Identify barriers and strategies to overcome those barriers.

R Resources:

- Identify personnel, supplies, other financial needs, time, space, travel, or in-kind contributions.

E Evaluation:

- Implementation and evaluation may be simultaneous;
- Plan how will objectives be evaluated;
- Qualitative methods may be used to explain «why» or «how» something happened;
- Use information to revise objectives.

Sequence of steps in the *development* of a community prevention program:

- 1) preliminary development of the program;
- 2) approbation;
- 3) program evaluation;
- 4) correction of the program;
- 5) wide implementation.

NEED ASSESSMENT/SITUATION ANALYSIS

The methodology for conducting situation analysis is described in special instruction manual. Conclusion of Doctor's logical analysis of all materials will include:

- incidence of diseases and trends (socially significant diseases, widespread dental diseases);
- risk factors;
- manpower provision;
- material and financial support/security;
- list of the most important dental health problems (socially significant and widespread diseases).

According to reports of dentists, as well as on the basis of published materials on the epidemiology of dental caries and periodontal diseases, one can get some information about the prevalence of major dental diseases among the population of the district, city, region, country. For example, the experience of dentists shows that over the past 5–10 years the number of people who need treatment is increasing year by year.

Although the data on dental morbidity in different sources can vary considerably, it is possible to make preliminary generalizations of supposed problems, for example, such as:

- there is a high prevalence and perhaps a high intensity of dental caries and periodontal diseases;
- the need for dental treatment is increasing.

After situation analysis, the dentist proceeds to scientifically based planning. At this stage, certain difficulties may arise, and mistakes can be made. The first most common mistake is the definition of too many dental problems that cannot be solved within the framework of one program, and sometimes it is not necessary because of their relatively small relevance.

Examples:

During the dental examination of the population in the city of M., the following data were obtained:

- Dental caries. High intensity.
- Periodontal disease. 100 % prevalence and high intensity.
- Dentofacial anomalies — 25 % prevalence.
- Diseases of the oral mucosa — 45 % prevalence in 65–74 year-olds.
- High need in dentures.
- Pathology of teeth of non-carious origin.
- Dryness of the oral mucosa in the elderly.

Concomitant factors and problems are: shortage of dental equipment, insufficient funding, lack of staffing of orthopedic departments, and shortage of nursery staff.

While planning prevention program in this city, the natural desire of the doctor is to eliminate or reduce every diagnosed disease and problem. This is just the mistake that cannot be tolerated in the development of primary prevention of dental diseases.

Comparison of the wishes of the doctor, which appeared after the detection of dental diseases, the world experience and the situation with the material support of potential programs is presented in tabl. 1.

Table 1

Orientation guide for the dentist in assessing the desire and possibilities of prevention

Dental problem	Doctor's wish	World experience	Situation
High intensity of dental caries	Reduce	Maybe	Material possibilities are minimal
100 % prevalence of periodontal disease	Reduce	Maybe	Material possibilities, staffing are insufficient
Dentofacial anomalies	Reduce	No experience	
Diseases of the oral mucosa	Reduce	No experience	
High need in dentistry	Satisfy all	Maybe	Great financial expenses
Non-carious lesions	Reduce	No experience	
Dryness of the oral mucosa in the elderly	Eliminate	No experience	

According to the given data, there is no world experience in the prevention of a number of diseases. Therefore, it is rational to plan a prevention program for diseases whose prevention methods have been studied at the community level.

IDENTIFYING PRIORITIES

It can be seen that plans to reduce or eliminate every disease are not feasible, since there are no effective methods and / or experience of prevention at the communal level in the world. A more correct solution would be to consider two diseases (dental caries and periodontal disease), the methods of prevention of which are well known, highly effective and widely used in the world. Thus, there is a theoretical possibility that in the city M. you can plan primary prevention of dental caries and periodontal diseases. However, we should take into account prospects for personnel and financial support for a possible program.

Obtained data of the studied area allow revealing a number of problems, the main of which are dental caries and periodontal diseases. Caries is likely to be the major problem due to:

- 1) the intensity of tooth decay in children is high, and periodontal disease is moderate;
- 2) the treatment of dental caries is associated with significant expenses;
- 3) dental caries and its complications adversely affect the general health of the population;
- 4) complications of caries are the cause of a large number of adult labor losses.

Analyzing the possible causes of high intensity of dental caries in the area, a number of factors predisposing to the development of caries should be highlighted, such as low levels of fluoride in drinking water, the use of sweets and others. Predisposing factors include poor oral hygiene in children and calculus according to the CPITN index.

According to the DCL (Dental Care Level), the level of dental care provided for 6-year-old children in the city M. is insufficient, and for 12 and 15-year-old children it is satisfactory.

From the experience of the World Health Organization it is known that dental caries and periodontal diseases can be prevented or significantly reduced with the help of available means and methods of prevention. In this regard, analyzing the existing dental problems, it can be assumed that their partial or complete resolution is theoretically possible through the introduction of an effective primary prevention program.

It is known that a number of cariogenic factors contribute to the development of dental caries, therefore, the elimination or reduction of the intensity of this disease is associated with the elimination or reduction of caries, increasing the resistance of teeth to pathology. Periodontal diseases are caused by unhygienic condition of the oral cavity. The elimination or reduction of plaque helps to reduce the intensity of the pathology. Therefore, the key to solve basic dental problems is the implementation of a program for the primary prevention of these diseases.

The tasks of reducing the intensity of dental caries and periodontal diseases are not theoretical. The WHO has information about a wide experience of primary prevention of major dental diseases, high efficiency at the level of whole countries. The WHO has documents confirming the cost-effectiveness of primary pre-

vention. As for the methods and means of preventing dental caries and periodontal diseases, they are well known to all dentists.

The possibility of reducing the intensity of basic dental diseases is real, and in this regard, the development and implementation of the program for the primary prevention of major dental diseases, dental caries and periodontal diseases for the population of the area is reasonable.

DEVELOPING GOAL AND OBJECTIVES

The objective should be problem oriented, i. e. aimed to resolve existing problem(s). The objective must also be realistic in terms of the possibility of achieving it. In formulating a objective, it is also necessary to take into account the possibility of adequate assessment.

Often, the objective of prevention is formulated in the following way: «Organization of the republican program for the prevention of main dental diseases». Obviously, in this formulation there is neither a problem orientation, nor assessment criteria.

The situation can be corrected if the objectives are measurable: Develop and implement in the region a program of primary prevention of main dental diseases (dental caries and periodontal diseases) to ensure their intensity decreases by 30–40 % in 15 years.

The objective of the program should be detailed by defining specific measurable objective.

While formulating objectives, it is recommended to use health criteria.

It is known that the decrease in the intensity of dental caries in children is possible if the level of the DMFT is medium, high or very high, and it is *impossible with a low or very low level of the DMFT* (detailed information in part Methods and means of prevention). Consequently, depending on the situation prevention programs may be aimed at achieving a certain level of health beyond which prevention is ineffective.

In the WHO program of dentistry, approved at the World Health Assembly in 1981, DMFT 3.0 in 12 years-old children were proposed as a global indicator (criterion) of the health of the world's population. This criterion cannot be an assessment of health in each specific situation, but it focuses national prevention programs on setting measurable objectives using health criteria.

The WHO and the International Federation of Dentists for measurable objectives «Health for everyone by 2000» proposed the following criteria for the world's dental health:

- 1) 50 % of 6-year-old children will be free of dental caries;
- 2) DMFT in 12-year-old children will be no more than 3.0;
- 3) 85 % of the population at the age of 18 will save all their teeth;
- 4) Number of people 35–44 year-old with edentia will decrease to 50 % from 1982 y. level;
- 5) Number of people 65 year-old and older will decrease to 25 % from 1982 y. level;

6) Monitoring system for oral health will be implemented.

When developing measurable program objectives, it is also necessary to:

- use the data of the dental status of the population not older than 5 years;
- take into account the tendency (increase, decrease) in incidence;
- take into account environmental factors (especially the presence of fluoride in the environment);
- use information about existing prevention experience to identify realistic objectives.

Examples of determining the measurable objectives of a long-term (15 years) program of community prevention:

1) To reduce the incidence of caries of deciduous teeth in 6-year-old children to 60 % or less:

Baseline: the prevalence of dental caries in 6-year-old children is 80 %.

2) To reduce the intensity of dental caries in 12-year-old children to DMFT 3.0 or less, on average, per child.

Baseline: the intensity of dental caries in 12-year-old children was 5.7 DMFT.

3) To increase the average number of sextants of a healthy periodontium in children of 15 years-old to 3.5 sextant or more, on average, per child.

Baseline: 15-year-old children had 1.4 healthy sextants, on average, per child.

4) To reduce the number of extracted teeth in 18 year-olds to 0.2 or less, on average per person.

Baseline: the average number of teeth extracted per person was 0.7.

5) To prevent a further increase in the number of extracted teeth in 35–44-year-old population.

Baseline: the average number of teeth extracted per person was 4.3.

6) To ensure a good level of dental care for all children of the Republic at least 80 % of the population.

The last objective is related to the provision of secondary prevention. In general, the objectives of the program are based on the initial dental status of the population, are comparable with global health criteria and are easily controlled using repeated simple methods of dental examination and registration of DMFT and CPI indices.

Based on the conclusion of the situation analysis, it is necessary to choose preventive methods acceptable for a specific area. Local factors should be taken into account: the fluorine content in water, methods of water supply, the incidence of dental caries, and the level of oral hygiene, sugar consumption.

Knowing the effectiveness of the selected methods, for example, the percentage of caries reduction, it is possible to plan a decrease in the DMFT by a specific value.

For example, in the framework of the National Program for the Prevention of Dental Diseases, the following methods were chosen: fluoridated salt (50 % reduction in caries), fluoridated paste teeth brushing (25 %), dietary sugar restriction (25 %). Mathematically, by addition, we get 100 % reduction of caries, but in reali-

ty this can not be. When we combine several methods of prevention, the result is improved, but not according to mathematical laws. The objective of the prevention program for 6-year-old children is to increase the percentage of children free from caries from 10 % to ≥ 50 % in 10 years. The objective of the prevention program for 12-year-old children is: to lower the DMFT from 3.8 to ≤ 2.5 , i. e. by 34 % $((3.8-2.5)/3.8 \times 100 \%)$ for 10 years. In the group of adults of 35–44 years, even such a small decline, we can not plan, because when we will begin program by the age of 25–34, a large number of teeth are already affected by caries. In this age group it is actually more likely to stabilize the DMFT than to achieve its decrease.

When planning objective for periodontal health, previously the average number of sextants with deep pockets per person was used. However, within the framework of the prevention program, specialized periodontal care is not provided. According to the WHO program, by 2020, the number of sextants with a healthy periodontium in young people should be increased to at least 5, in adults - to 2. In the new prevention program for 2017–2020 in the RB objective years the goal suggests the need to increase healthy sextants from 1.2 to 1.5 in the group of 35–44-year-olds.

The most common mistakes in planning prevention are:

- lack of specific objectives;
- lack of scientific grounds;
- measurements that cannot be controlled («less», «more», etc.);
- exaggeration of objectives;
- setting objectives without baseline data on morbidity.

Determining the objective of reducing the intensity of dental caries, the criterion can be DMFT index in specific figures for a particular age group of the population. For example, to reduce the intensity of caries of permanent teeth in 12 year-old children from 4.0 to 3.0 DMFT or to 1.0 DMFT, or 25 % of the initial level. For periodontal diseases, a measurable objective may be, for example, an increase in the average number of healthy sextants (CPITN «0») from 0.8 to 3.5 in young 18-year-old people.

The most difficult at this stage of planning is to ground the objective of the prevention program. For example, why does the doctor plan to reduce caries by 1 DMFT unit, rather than 2 or 3 units, etc. The simplest method of grounding measurable objectives is the use of previously known medical efficiency of selected prevention methods for calculations. Suppose that in the city M. the average DMFT in 12-year-olds is 4.0 and the doctor plans to use the method of drinking water fluoridation. It is known that in 3–5 years there will be a tendency to decrease the intensity of caries, and in 10–15 years the DMFT will be reduced by 40–60 % from the initial level, that is, it will reach the level of DMFT 2.0. Thus, it is possible to reasonably plan DMFT 2.0 in the form of a measurable objective of communal prevention for the next 10–15 years, if fluoridation of drinking water is introduced.

The WHO recommends the following methods of communal prevention of dental caries and periodontal diseases:

- restriction of sugars in the diet;

- oral hygiene education;
- systemic use of fluorides;
- local application of fluorides;
- secondary prevention;
- healthy lifestyle.

In exactly the same way, calculations can be made in the planning of other known **methods of primary prevention of dental caries**. Below (tabl. 2), we cite the WHO data on the effectiveness of prevention methods in community programs (WHO, STR 713, 1986):

Table 2

Methods for the prevention of dental caries (adapted from the WHO, 1984)

Method	Fluorine content	Frequency and duration of application	Decrease in caries, %
Fluorides Drinking water fluoridation	0.7–1.2 mg/l	Throughout life	50
Fluoride tablets	0.25–1 mg	6 months – 14 years old	50
F-salt	250 mg/kg	Throughout life	50
Fluoride applications locally, professionally	12–80 g/kg	1–2 times a year, school and young age	20–40
Mouth rinse with solutions of fluorides	0.5-2 g/l	2–30 times a month, school and young age	20–40
Fluoridated toothpastes	1–2.5 g / kg	Throughout life	25–30
Fissure sealants		At 6–7 and 12–13 years old, replacement as needed	14–90
Restriction of sweets Limitation of quantity and frequen- cy of sweet food consumption		Throughout life	20–25
Oral hygiene Controlled tooth brushing at school	Without fluorine With fluoride	School years	0 30
Self-brushing the teeth at home	Without fluorine With fluoride	Throughout life	0 25

Methods for the prevention of periodontal disease

The only effective method of community-based prevention of periodontal diseases (chronic gingivitis, chronic periodontitis) is a regular mechanical removal of plaque with a toothbrush, as well as the professional removal of calculus (WHO, STR 621, 1980).

The effectiveness of oral hygiene in the prevention of periodontal disease is high, but depends on the initial level of morbidity. In the Republic of Belarus there is an experience in prevention: a decrease in the intensity of gingivitis in the program for improving oral health of students of Minsk Medical Institute by 50–60 % of the initial high level (S. S. Lobko, 1996). Daily brushing of teeth:

- after 2 months — a decrease in DI-S from 1.0 to 0.5, i. e., 2 times;

- maintaining a good level of hygiene for 3 years;
- in 3 years the index of calculus decreased by 52 %;
- the gingival index (GI) decreased from 0.8 to 0.48, that is, by 40 %;
- the average number of healthy sextants increased by 54 % (from 1.2 to 1.85 CPITN «0»).

Since oral hygiene using fluorine-containing pastes is effective in preventing dental caries and gingivitis, it is logical to plan primary prevention of both diseases within the framework of one program.

Of course, we should take into account cost of selected prevention methods and presence of personnel for implementation of these methods.

With the final choice of prevention methods, their cost and the availability of personnel for practical implementation must be taken into account. The most common mistakes in choosing communal prevention methods are:

- choice of the method with unknown effectiveness;
- choice of the method with effectiveness which was not proved in community prevention programs;
- choice of an expensive prevention method;
- lack of personnel to implement the method.

ASSESSMENT OF RESOURCES AND CONSTRAINTS

On the way to the realization of this idea a lot of difficulties of organizational, methodical, material, etc. character may arise. Among the issues requiring careful professional analysis are the following:

- what methods of prevention should be used?
- are there enough effective means (materials) for prevention?
- who will practically implement preventive measures?
- what financial expenses are needed for prevention?
- what target groups of the population should be included in the program?
- how can the effectiveness of prevention be assessed?
- what result can be expected?

Resources:

- Personnel;
- Space;
- Time;
- Supplies;
- Travel;
- Financial need;
- In-kind contribution.

These are obstacles in achieving certain goals or objectives. If these obstacles are identified in time, then the program can be modified.

Constraints may result from:

- Resources limitation;
- Governmental policies;
- Inadequate transport system;

- Labor shortage;
- Inadequate facilities;
- Community's socioeconomic, cultural and educational characteristic.

Organizational issues:

1. Approval of the plan by local authorities at the appropriate level.
2. Budget allocation.
3. Organization of personnel training (if necessary).
4. Drawing up a schedule for the implementation of the program.
5. Providing means of prevention.
6. Planning of methods for monitoring the implementation of the program.

Preliminary planning should contain a summary of the program, including the main goals, methods, personnel and cost. Then this plan is discussed with the appropriate level of administration on the possibility of practical implementation. For example, personnel situation, economic opportunities, etc. are evaluated.

After discussing the preliminary plan with the authorities and other interested institutions, most often there is a need to revise it towards more acceptable prevention objectives, reduce the number of methods, limit the coverage of the population, for example, only school-age children, etc.

Analyzing the issues of dental personnel provision, it should be noted that historically all countries have sought to produce as many personnel as possible and, therefore, adhered to the criterion: the more, the better. However, the unlimited increase in the number of staff does not solve the problem of eliminating the incidence of diseases. At the same time, as in the example of the studied area, the lack of specialized personnel for carrying out primary prevention is a serious problem that makes prevention difficult to implement. It would be irrational to use dentists for this work.

An example of the preliminary plan analysis for choosing prevention methods is given in table 3.

Table 3

Choice of prevention methods

Method	Personnel	Cost of the program	Problems of implementation	Possible Solution
Fluoride tablets	Dentist	High	Budget is limited	Unreal
	Nurse	Moderate	Deficit of nurses	Unreal
Fluoride-gel	Dentist	High	No time	Unreal
	Dentist	High	Not trained	Unreal
	Hygienist	Moderate	Absent	Unreal
Controlled tooth	Dentist	High	Budget is limited	Unreal
	Hygienist	Moderate	Absent	Unreal
Brushing	Teacher	Low	Not trained, no motivation	Accept for further consideration

On the basis of careful consideration of all possible options for using prevention methods, budget allocation and staffing:

- a strategy is being revised or refined;

– a new detailed plan is being developed.

The implementation of the program should be preceded by approbation, during which it is possible to clarify unresolved issues. As a rule, approbation justifies the need for program correction.

The implementation of the program is carried out in a spiral (fig. 1) and it has no end until the dental diseases are eliminated.

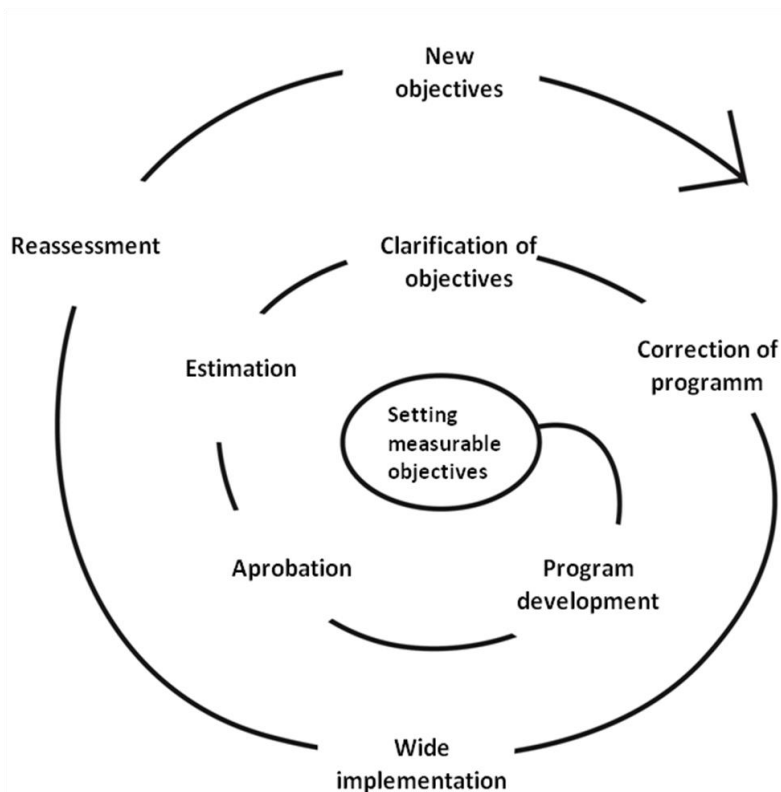


Fig. 1. Spiral of prevention program implementation

Revision of prevention programs may include:

- setting more small-scale objectives;
- limitation of method number;
- decreasing the number of people included into the program;
- restriction of personnel.

Cohort for prevention. The program of prevention should cover the entire population. However, if there are economic and other difficulties, then first of all, people at risk of dental caries and periodontal diseases should be covered:

- Preschool and school children.
- Elderly.
- Physically/mentally handicapped.
- Medically comprised.
- Wokers of enterprises.

If it is impossible to include all children into the program, then 6-7-year-olds are included, because they have just erupted permanent teeth, which must be protected from caries.

Staff for the practical implementation of the prevention program. It is important already at the planning stage of the program to clearly determine who will actually implement the proposed preventive measures.

The most frequent mistakes in planning the provision of personnel are:

- the absence of personnel;
- inefficient use of personnel, for example, the dentist is instructed to brush teeth to schoolchildren. This increases the cost of the program and / or makes its realization impossible, because the dentist is engaged in treatment;
- the use of unqualified or unprepared staff;
- the lack of measures to motivate staff to implement the program, for example, inadequate salary.

Thus, it is necessary to rationally select personnel in the required quantity to implement the proposed methods of prevention.

Sequence of personnel planning stages for implementation of communal prevention program:

- 1) calculation of required personnel total number;
- 2) determination of necessary personnel types;
- 3) distribution of duties;
- 4) calculation of personnel financial costs;
- 5) preparation of personnel.

Examples of personnel calculations for primary prevention of dental caries and periodontal diseases according to the WHO (1987) are given in table 4:

Table 4

Staff calculations for primary prevention

Preventive measure	Staff	Calculation needs	Note
Promotion of a healthy lifestyle	Dentist Assistant of the dentist Hygienist School nurse	One (of the listed) per 100 000 people	Mass media are used
Teaching tooth brushing	Hygienist Teacher Upbringer	One (of the listed) per 2400 people	6 minutes for the group of 30 people
Rinsing the mouth with fluoride solution	Nursing staff Hygienist	One per 14 000 people	Once a week 5 min for 30 people
Dental plaque removal	Dentist Hygienist	One per 3000 patients	30 min for 1 young person, 45 min for adult

If there are no or insufficient use of personnel, then it is necessary to review the planned methods and / or reduce the coverage of the population. It is possible to provide required number personnel training. But in this case, prevention planning is postponed, since the process of personnel training is not in itself a method of disease prevention and, therefore, it is impossible to expect a decline in the incidence during this period.

Calculations of the cost of the program. The main components of the cost of the primary prevention program are:

- the number of people covered by the program;
- preventive measures taken;
- value of funds used in the prevention program;
- staff salaries;
- the cost of equipment and offices;
- transport, business trips;
- other associated costs.

Until recently, in the CIS (former USSR) countries, the dentist at any level, from school office to the chief specialist of the Ministry of Health, did not calculate the cost of the program when planning communal prevention. It was enough to justify and propose a list of planned preventive measures. The remaining work on financial support of the program was carried out by economists. Theoretically this is correct, but practice shows that often excellent programs remained either on paper or poorly implemented due to lack of insufficient funding. Therefore, it is irrational to consider the planning process of the prevention program complete without specific funding.

Using the WHO documents, as well as the experience of other countries, it is possible to conduct approximate calculations of the cost of the program. Tabl. 5 gives examples of the cost of some methods of prevention according to the data from the United States (the WHO, STR, «Medicine», 1995):

Table 5

The cost of dental caries prevention

Method	Cost per person per year, USD
Drinking fluoridated water	0.20
Administration of F-tablets to schoolchildren	0.40
Rinsing the mouth with 0.2 % NaF solution once a week	0.50
F-gel application once a year	3.60
Regular tooth cleaning with F-containing toothpaste at home	4.00

According to prof. T. Terekhova (1996), the cost of dental caries prevention in preschool children in Belarus using fluoridated salt was \$ 0.04 per child per year. According to A. V. Kovalevskaya (2001), the introduction of an effective school program for the prevention of dental caries and periodontal disease in Mogilev was possible in the framework of existing funding for the mouth sanitation.

IMPLEMENTATION

The following should be considered:

- Definition of roles and tasks.
- Materials, media, methods and techniques to be used.
- Selection, training, motivation and supervision of them an power involved.

- Chronological sequence of activities.
 - Organization and communication.
- Many short-comings often appear at this stage.
Plan execution depends upon effective organization.

ASSESSMENT

Assessment is a mandatory component of the program and should also be planned from the very beginning. The correct choice of the criteria is important, it will allow objectively determine the effectiveness of the preventive program and correctly formulate new objectives.

«Medical effectiveness of prevention» is estimated by comparing the achieved level of health, according to supplied measurable objectives of the program with the initial state or with indicators of dental status of the control group. So, to determine the medical effectiveness of anti-caries drugs at the communal level, clinical observations require at least 2 years; to assess the effectiveness of oral hygiene products in the removal of plaque and anti-inflammatory drugs — 3–6 months are required.

Next recommendations should be followed:

- examine similar age groups, as at the beginning of the program, for example, 12 year-old children, 35–44 year-old adults;
- use control groups in places where prevention has not been done;
- the study is conducted by the same doctors who conducted the basic examination;
- the same diagnostic criteria or indices are used, for example, DMFT, CPI, OHI-S.

It is possible to assess the effectiveness of the program in the short term (one month, six months, and so on.), but in these cases, we assess not the results, but the process.

There is international experience in calculating the «economic efficiency» (economic feasibility, economic benefits) of prevention programs.

Economic efficiency (EE) is calculated by the following formula:

$$EE = \frac{\text{cost of procedure} \times \text{number of people} \times \text{time}}{\text{average DMFT of prevented caries} \times \text{number of people} \times \text{time}}$$

The economic benefit (EB) is determined by finding the difference between the costs spent for the prevention program and the expected cost of treatment (CT):

$$EB = EE - CT.$$

If prevention was not economically advantageous, the program was economically unjustified and should be revised as soon as possible (eg, 2–3 years) for further implementation.

Monitoring prevention program means to monitor trends in the incidence of caries and periodontal disease according to the WHO recommendations.

Evaluation may be defined as an investigation into the performance of a program in terms of its success or failure to achieve stated aims.

Green (1977) has given a broader view of evaluation and defines it as «*the comparison of an object of interest against a standard acceptability*». The definition implies that not only the outcome of a program should be monitored but also how it is used.

Purpose of Evaluation is to ensure that a program is fulfilling its purpose.

Types of Evaluation:

1. Formative:

- Implementation;
- Process.

2. Summative:

- Impact or also known as outcome.

There are two broad types of evaluation.

Formative Evaluation is focused on the factors involved in the implementation of the program. It ensures monitoring and improving the day to day activities of the program. It is usually carried out to aid in the development of a program in its early phases. It helps the developers to assess the performance of the program and decide whether changes should be made to improve program activities. It is done at several points of a project development and its activities, and assesses whether the project is being conducted as planned.

Example: Was there appropriate number of staff available for seeing patients in the casualty room?

Progress Evaluation:

- Assess of the progress in meeting the objectives.
- It involves collecting information to learn whether or not the benchmarks of participant progress were met and to point out unexpected developments.

Example: Are patients moving toward the anticipated objectives of the project?

Summative Evaluation:

– It concentrates on collecting information once the program has finished. The aim of summative evaluation is not to influence the outcome of a program but to record failure or success in terms of stated goal and objectives.

- Evaluation Methods.

Quantitative:

- Most evaluation is quantitative in nature, as most evaluation measures the extent to which the objectives were met.
- Numerical data is useful for future planning of resources.
- Quantitative evaluation does not inform organizers why the program was a success or failure.

For example, a survey may reveal how satisfied participants were with the program, but not why they were satisfied or how the program could be improved.

Methods of quantitative Evaluation:

- Computer searches;

- Chart reviews;
- Epidemiologic data;
- Demographic data;
- Surveys;
- Screenings.

Qualitative:

– Interviews with providers, program participants, or community members may divulge strengths or weaknesses in the program that can be used for future planning.

– Observations done during the program can identify problems in the program, other services that could be incorporated, or reasons for participant satisfaction or dissatisfaction. When using qualitative techniques such as observations or unstructured interviews.

– Focus groups acknowledge the participants' perspectives are meaningful and valuable.

– Checklist of desired topics will ensure obtaining relevant information. The list could contain roughly worded questions that can be paraphrased and/or points to cover in the interviews or observations.

Methods of Qualitative Evaluation:

- Interviews;
- Observations;
- Focus groups;
- Key informant interviews.

METHODS AND MEANS OF DENTAL DISEASES PREVENTION

Although dental caries and periodontal disease are still the subject of ongoing research, a great experience has been accumulated around the world in effectively preventing these diseases using available well-known methods. The main ones are:

- the use of fluoride;
- tooth-brushing;
- dental education of the population in relation to the restriction of sugars in nutrition.

Dental caries prevention includes highly effective means like the use of fluoride orally, topically or in combination, as well as a balanced diet, which limits the intake of carbohydrates to optimal ratios with other nutrients and following the diet regimen. The main tool of preventing periodontal diseases is oral hygiene (regular brushing).

Considering that these prevention methods are well known to dentists and senior students, only organizational approaches to their use will be described.

It is important to justify the expediency of applying certain methods at first stage of planning. Data submitted in table 6 can be a guideline in choosing preventive methods for a planned community program.

It is not recommended to use in the program insufficiently studied prevention methods, which are not very effective and expensive. Planning a set of measures, such as fluoridation, oral hygiene and nutritional advice is totally more effective than each method separately.

Depending on the situation, the program of specific prophylaxis may be directed to any separate disease. However, education of the population is a universal method and, therefore, should be included in any program.

Table 6

Indications for using some methods in prevention of major dental diseases

Methods of prevention	Intensity of dental caries			Periodontal diseases
	high	medium	low	
Fluoridation of drinking water and other methods of systemic use of fluorides	Is indicated	Is indicated	Is not indicated	
Topical use of fluorides	Is indicated	Is indicated	Is indicated	
Toothbrushing				Is indicated
Dental education/ Oral health promotion	Is indicated	Is indicated	Is indicated	Is indicated

In the process of choosing prevention methods it is necessary to analyze:

- availability of materials;
- cost of materials;
- availability of personnel to ensure implementation;
- estimated effectiveness;
- the presence of objective assessment criteria;
- legal aspects (especially in relation to system methods of fluorination).

EDUCATION OF THE POPULATION (HEALTHY LIFESTYLE PROMOTION)

Definition: Dental education of the population is a purposeful dissemination of modern popular science-based knowledge about the causes and possible ways to prevent dental diseases.

Indications: Low (insufficient) activity of the population in the use of individual and mass prophylactic measures and treatment of widespread (or hazardous to health) dental diseases.

In general, the goal of dental education is to stimulate the activity of the population in maintaining healthy teeth.

The tasks of dental education of the population are aimed at ensuring that people will:

- know about the symptoms and consequences of dental caries, periodontal diseases and other common or dangerous diseases of the oral organs and tissues;
- know about the possible causes of diseases of the dental system and the factors contributing to their development;
- know about the measures of individual prevention and will be active in their use;

- show interest and willingness to cooperate with the organizers of mass prevention programs;
- actively participate in the recommended programs;
- understand a personal responsibility for dental health and in case of a disease, will visit a dentist in time for treatment.

Methodical approaches: Dental education must be well organized, planned activities should be addressed directly to the right age groups, since the tasks of dental education can be different for:

- pregnant women and young people;
- children of preschool and primary school age;
- teenagers;
- population of mature age;
- old people.

In addition, both for these age groups and for the population as a whole specific tasks for dental education, depending on environmental factors, conditions of life and living conditions, socio-economic conditions, etc. may be implemented.

Depending on the specific tasks of dental education, as well as groups this education is addressed to various means are applied: mass media, individual training, etc.

General information about dental diseases, their causes and methods of prevention, can be conveyed to the public by the media, radio, television, newspapers, magazines, popular brochures, cinema. Radio and television broadcasts and movie scripts are compiled by dentists. Hygiene training is possible in groups or individually. Depending on the age of children, training is conducted in the form of games, conversations, demonstrations. Preschool children can be taught by their parents. Dental education plans should also include the provision of visual aids and other materials in the required quantity and adequate quality.

Personnel. The dentist should be in charge of planning and assessing dental education. However, interviews, lessons, games, distribution of brochures and television demonstrations, etc. can be carried out by other workers: nurses, teachers, kindergarten teachers, etc. after their short-term dental instruction.

Approximate number of medical personal for dental education is the following:

- administrators: 1–2 specialists per district;
- organizers of mass dental education: 1 per 100 000;
- dental education workers: school teachers — 15–30 min. in week;
- kindergarten teachers — 60 min. per week;
- nurses in dental offices or hygienists — 1 : 3000 of the population.

The effectiveness of the method. Taking into account that the goal of dental education was to increase the activity of the population in maintaining healthy teeth, health criteria should be used to assess the program. A common mistake is to assess dental education by the number of organized lectures,

conversations, published brochures, etc. Changes in the behavior (motivation) of the population in relation to health are more important, for example:

- increased demand for oral hygiene products;
- increased attendance of the dentist for preventive examinations;
- reduction of sugar intake;
- improvement of dental status.

To assess the knowledge of the population obtained in the process of dental education the method of questioning can be used. The assessment is carried out according to the results of population polls prior to the implementation of the program and at its stages.

The so-called «control groups» of the population are not required to assess the effectiveness of dental education. Assessment is carried out compared to the baseline. Dental education can be considered effective if 20 % or more of the population have increased activity aimed at improving dental health.

ORAL HYGIENE

Definition: An individual procedure of cleansing the teeth from plaque with the help of special means of oral hygiene.

Indications: Oral hygiene is necessary for everyone, since early childhood.

General purpose: Hygienic status of the oral cavity.

Specific tasks: Depending on the situation, various specific program tasks can be set. Examples are the following:

- to teach preschool children how to clean their teeth and ensure their skills during primary school age in order to reduce the dental calculus index in children 6, 9, 12, 15 and 18 years by 80 %, 60 %, 50 %, 40 % and 30 %, respectively, of the initial level;

- to increase the activity of parents in the hygienic education of preschool age children, so that the number of 7 year-old children who have the right brushing skills increases by 15 % or more from the initial level.

Approaches. Hygienic education of children is possible either by the method of dental education of the population, or by direct training in brushing their teeth, or by a combination of these approaches. Hygienic education is a more efficient method, but it will require high material costs.

It is recommended to apply different approaches to different groups of the population. Children of preschool and primary school age should be taught to brush their teeth; combined methods can be used for adolescents, as for adults and the elderly it is advisable to provide dental education.

Materials. At the planning stage of the program, it is necessary to carry out preliminary calculations of the required quantity of oral hygiene products.

In theory the ideal material supply should include 4–6 toothbrushes and 8–12 tubs of toothpastes per year for each individual of the district. In practice the hygiene needs are much lower, and it is necessary to plan the production in accordance with a reasonable prediction of increasing motivation of the population to use hygienic products compared to the initial level. For example, if

it is planned to increase the percentage of the population regularly brushing teeth by 20 % from the initial level, it is necessary take into account. One should remember that both the lack of hygiene products and their excess reduce the economic efficiency of the program.

When planning material provision, the following should be considered:

- trends in public demand for oral hygiene products;
- cultural and everyday characteristics of the population in different areas;
- economic opportunities of the area;
- purchasing opportunities of the population;
- availability of staff to support the program.

Personnel. Teaching tooth-brushing in kindergartens and schools can be conducted by:

- kindergarten teachers;
- teachers;
- nurses of school dental or medical offices.

At the beginning of the program, these workers must undergo short-term training, organized by the specialists.

Professional oral hygiene can be carried out as a preventive measure or be included in the complex of medical and preventive work of dental institutions.

Professional oral hygiene is carried out in a dental chair. The operator needs hygiene products, common and special, as well as equipment and tools. Professional oral hygiene is carried out by hygienists. Depending on the planned volume of work and the age of the population served, the hygienist can provide systematic (1–2 times a year) professional cleaning of the teeth of 1500–3000 people.

Preschool children who do not attend kindergartens can be taught how to brush their teeth by parents. Collaboration with parents is also necessary to consolidate the skills acquired by children at schools and kindergartens.

The following data is necessary for the personal:

- 6 minutes a day are required to teach 30 children how to brush their teeth;
- one hygienist can provide professional oral hygiene for 2500–3000 children per year;
- teaching medical personnel by the hygienist may take from several hours to several working days per group of up to 20 students.

Efficiency. Performance assessment is carried out according to the degree of implementation of program objectives.

For the final assessment generally accepted health criteria should be used. The WHO recommends the assessment of the periodontal index (CPITN) in children of 15 years-old. In older age groups the effectiveness of the program can be determined by reducing the average number of lost teeth.

FLUORIDATION OF DRINKING WATER

Definition: Artificial enrichment of drinking water with fluorine within optimal concentrations.

Indications: medium or high intensity of dental caries of the population in an area with a low content of fluoride in the environment.

Specific objectives: examples of specific objectives for drinking water fluoridation include:

- providing fluoridation of drinking water to the urban population of the region to reduce the intensity of dental caries by 40–50 % from the initial level within 15 years;

- reducing the prevalence of dental caries in 5–6-year-old children by 20–30 % from the initial level within 5 years.

Organization and materials. First of all, a list of localities that require fluoridation of drinking water is compiled. Further, depending on the climatic conditions of the area the optimal dose of fluoride in drinking water is determined. The need for materials is calculated in accordance with the population size: the amount of fluorine, the number of fluorine units, etc. The preliminary calculated data are coordinated with the health care authorities.

When planning the fluoridation of drinking water, the following aspects should be considered:

- the program should be designed for a long period;
- reliable technical means are available to ensure continuous monitoring of the level of fluoride in drinking water;

- the population of the district is motivated to get positive effects due to fluoridation;

- fluoridation of drinking water at the implementation stage is associated with high material costs, although later they are paid off.

Personnel. According to the experience of many countries, for the fluoridation of drinking water, $\frac{1}{4}$ of the engineer's rate and three technical workers per 1000 000 people are required.

The effectiveness of the method. Assessment of the effectiveness of fluoridation of drinking water in the prevention of dental caries is carried out by comparing the results achieved with the target figures of the program. DMFT indices of teeth of main age groups of the population are used. Evaluation by comparison with «control population groups» in areas where water is not fluoridated is not recommended, since it is impossible to take into account many factors affecting dental status in the «control area». It may be predicted that decrease in the intensity of dental caries in the area with fluoridation of drinking water can be about 50 % within 10–15 years if the initial level of caries was *high*. A sharp decrease in the need for treatment of dental caries in children can be expected (2 or more times).

FLUORIDATION OF SALT

Definition: artificial enrichment of salt with fluoride in the prescribed concentration.

Indications: caries of teeth of medium or high intensity in the area with low content of fluoride in the environment.

Purpose: enrichment of salt with fluoride for the primary prevention of dental caries.

Examples of specific prevention objectives include: to reduce the intensity of dental caries to the level no more than 3.0 DMFT, on average per child at the age of 12 years.

Organization and materials: Fluoridation of salt is an alternative to fluoridation of drinking water. When planning this method of prevention, the following should be taken into account:

- fluorine content in drinking water;
- the possibility of centralized distribution of fluoridated salt.

Material costs for fluoridation of food salt are relatively small.

Personnel: Salt fluoridation is carried out by technical workers. Laboratory assistants are also necessary to control the level of urine fluoride excretion.

Efficiency of the method: Assessment is carried out in 3–5 years from the beginning of the program and with an interval of 5 years in the future. Dental status indices are used for assessment. The WHO recommends to use the DMFT index of 5–6, 12, 15 year-old children and 15–44 year-old adults. The final assessment is carried out by comparing the results with the objective of the planned program.

Fluoridation of edible salt may result in the decrease of *high* caries intensity by 40–60 % from the initial level.

PREScription OF FLUORIDE TABLETS

Definition: Medical prescription of fluoride tablets in the prescribed dosage for internal use.

Indications: caries of teeth of medium or high intensity in an area with a low content of fluoride in the environment.

Purpose: the administration of fluoride tablets for the primary prevention of dental caries. Examples of specific objectives include:

- to ensure the reduction of dental caries intensity to a level of no more than DMFT 3.0, on average, per child at the age of 12 years within 15 years.

Organization and materials: organization of taking fluoride tablets by children presents certain difficulties due to the fact that the use of the drug (poison) must be careful and, at the same time, it is necessary to ensure daily administration of tablets within 14–15 years.

When planning a program one should consider the following:

- the number of children in the program;
- the need for the drug;
- the possibility of providing tablets;
- consent and assistance of parents in the implementation of the program.

Personnel. Prescription of fluoride in the form of tablets and the organization of distribution should be carried out by a dentist.

Fluoride tablets can be given to school teachers, parents or medical staff. The actual intake of fluoride tablets by a child should be monitored.

It is not recommended:

- 1) to instruct children to take tablets on their own;
- 2) to give out weekly, monthly, etc. drug doses;
- 3) break the rules for storage of fluoride tablets.

Special staff for the distribution of tablets is not required. The following individuals may give out the tablets:

- nurses of dental offices;
- medical nurses at schools;
- kindergarten teachers;
- school teachers;
- parents.

A group of 30 schoolchildren need no more than 5 minutes to take tablets.

The effectiveness of the method. Assessment of the effectiveness of prevention is carried out according to the dental status, DMFT index is used. Prescribing a drug in early childhood is more effective. Assessments are conducted every 5 years from the beginning of the program. The reduction of caries in children by 40–60 % of the initial *high* level can be expected.

FLUORIDATION OF MILK

Definition: artificial enrichment of milk with fluorine preparations in the prescribed concentration.

Indications: prevention of dental caries of medium or high intensity in children living in the area with a low content of fluoride in the environment.

Purpose: to provide children with fluoridated milk to reduce the intensity of dental caries.

An example of specific objectives is the following: to reduce the intensity of caries to the level of DMFT 3.5 or lower in 12 year-old children within 10 years.

Organization and materials: Special equipment is required for fluoridation. It is necessary to explore the possibilities of milk import or production. When planning a program, one should take into account:

- availability of milk in the area in sufficient quantities for children included in the program;
- methods of delivering fluoridated milk to consumers;
- methods of controlling the consumption of milk by children at schools and preschool institutions.

Depending on the production conditions, fluoridated milk may be somewhat more expensive than regular milk.

Personnel: Technical staff is necessary to maintain the plant for milk fluoridation.

In addition, to provide workers for the delivery of raw materials to the plant and fluoridated milk to schools and kindergartens. The number of staff depends on the number of children, schools and delivery distances. Direct

distribution of milk at kindergartens can be carried out by kindergarten teachers, school teachers, and employees of the counters.

The effectiveness of the method. The evaluation of anti-caries efficacy of fluoridated milk consumption is similar to other methods of fluorine intake. There are few long-term observations of the results of caries prevention with fluoridated milk. The decrease in the intensity of caries by 20–40 % of the initial **high** level may be expected. The assessment is carried out not earlier than in 5 years from the beginning of the program.

RINSING MOUTH WITH FLUORIDE SOLUTIONS

Definition: mouth rinse procedure to ensure the teeth contact with a fluoride solution of prescribed concentration.

Indications: prevention of dental caries of medium or high intensity.

Purpose: to reduce a high intensity of dental caries in children. An example of specific objectives is the following:

– to reduce the intensity of dental caries to DMFT 3.5 or less on average per child at the age of 12 years within 10 years.

Organization and materials: Several methods of rinsing the mouth with fluoride solutions have been developed and applied daily, weekly and once in two weeks. Different concentrations of various fluorides are used: from 0.05 % to 0.2 %. Due to the fact that the effectiveness of different methods and different drugs is practically the same, the WHO recommends to use less time-consuming methods. Sodium fluoride solution has several advantages: it is cheap, easy to prepare, does not cause side effects in the form of staining the teeth. The most rational scheme: rinsing the mouth is carried out once a week with a 0.1 % solution of sodium fluoride. Freshly prepared solution or finished product in the form of a solution is used. For one procedure 10 ml of 0.1 % solution of sodium fluoride is necessary. Other required materials are napkins and disposable paper cups.

Personnel. Depending on how and where the application of this method is organized (home, kindergarten, school), the procedure is carried out by:

- parents;
- kindergarten teachers;
- teachers;
- medical workers.

One procedure takes no more than 10 minutes for a group of 30 people.

The effectiveness of the method. Effectiveness is assessed by positive changes in the dental status of the population in accordance with the objectives of the prevention. Positive effect of prevention can be expected in 2–3 years.

Expected effectiveness: reduction in the intensity of dental caries by 20–40 % from the initial **high** level.

FLUORIDE VARNISHES

Definition: fluoride-containing sticky, moisture-resistant substance (varnish) is used by the specialist to cover the patient's teeth.

Indications: prevention of caries, as well as acute caries.

Purpose: to reduce the intensity of dental caries. An example of specific tasks is the following: to reduce the intensity of caries to DMFT 2.5 or less in 12 year-old children.

Organization and materials: The coating of teeth with fluoride varnish can be organized in different ways, it depends on the planned workload (number of children) and on equipment availability at school dental offices, mobile offices.

It is necessary to remember time of teeth eruption while choosing children for the program. Procedure should be prescribed if permanent teeth have erupted. The varnish is applied to the teeth once or repeatedly. The WHO recommends to apply fluoride varnish two times at one to two week intervals. The procedure must be repeated for many years, for example, during school years.

The provision of material should be planned on the basis that one procedure requires 0.5–1 ml of fluoride varnish.

Personal. Procedure should be carried out by the dentist or nursing staff with special training: nurses of dental offices, hygienists, and dental therapists. Calculation of required personal is carried out on the basis that one procedure takes from 5 to 15 minutes.

Effectiveness of the technique: expected effectiveness of the procedure in the prevention of caries is a decrease in the DMFT by 20–40 % of the initially *high* incidence. In addition to DMFT index, DMFTindex of surfaces is recommended, which is more sensitive in determining the effectiveness of this technique.

FLUORIDE GELS

Definition: colloidal solution of fluoride in prescribed concentration, intended for application to the patient's teeth.

Indications. This procedure is recommended for children of school age, and young people who are at risk of caries.

Purpose: to reduce the intensity of dental caries. An example of specific objectives is the following: to reduce the intensity of caries in children of 12 and 15 years old by 20 % and 30 %, respectively, from the initial level within 5 years.

Organization and materials. In general, the organization of fluoride gel application is the same as fluoride varnish. The method of gel application has some specific features. Special plastic trays are used for application. The duration of one procedure, including preparation, takes 10–15 minutes.

In order to calculate the gel requirements for the program, experimental measurements of material consumption should be made, since this depends on the type of preparation used, the design and size of trays, or other devices.

This method of prevention is expensive.

Personnel. The procedure of fluoride gel application to the teeth of children can be performed by nursing personnel according to dentist's prescription. Calculations of necessary personal are carried out by calculating the time spent on the planned number of children in the program.

The effectiveness of the technique. The effectiveness of this method can range from 20 to 80 %. The effectiveness of the program is assessed according to the reduction in the indices of the DMFT and the DMFT of the surfaces, compared to the initial level.

FLUORIDE-CONTAINING TOOTHPASTES

Definition: Toothpaste containing fluoride in prescribed concentrations.

Indications: Individual and community prevention of dental caries and periodontal diseases.

Purpose: to ensure the stabilization or reduction of the intensity of dental caries and periodontal diseases. Examples of specific program objectives are the following:

- to reduce the intensity of dental caries by 20 % from the initial level within 15 years;
- to increase the number of healthy sextants CPITN «0» by 30 % from the initial level in 15 years-olds within 5 years.

Organization and materials. The main organizational aspects of this method are described in topic «Oral health education». An important organizational step is the coordination of planned tasks with the provision of materials in sufficient quantity and adequate quality. Fluoride toothpastes can also be used in areas with optimal fluoride in drinking water. However, in these areas, fluoride toothpastes should not be recommended for young children due to additional intake of fluoride if paste is ingested.

Personnel: the same workers who teach oral hygiene.

Effectiveness of the method: The decrease in the intensity of caries to 25–30 % from the initial *high* level or stabilization at *medium and low* levels can be expected.

FISSURE SEALING

Definition: a procedure for sealing fissures of a person's teeth with the help of sealants or other suitable filling materials.

Indications: Deciduous and permanent newly erupted teeth of children at risk of caries.

Purpose: to reduce the incidence of caries fissures of permanent teeth in children. An example of a specific objective is the following: to reduce the intensity of dental caries to the level of DMFT 3.5 in 15 year-olds.

Organization and materials. The organization of the program is similar to the use of fluoride varnishes. Depending on the type of material, different technologies of «sealing» fissures and, accordingly, different equipment are used. The procedure is carried out at the dental office by the doctor or specially trained paramedical staff.

Properly applied sealants are retained on the tooth surface for several years. If sealants drop out procedure should be repeated. Calculations of materials for sealing fissures are carried out similarly to the calculations of filling materials.

When planning the program, one should remember the high cost of the procedure.

Personnel. Fissure sealing is a medical procedure, but it can be carried out by a specially trained paramedical worker. Procedure may take from 20 to 40 minutes per patient.

The effectiveness of the method: The index of the DMFT of teeth or the DMFT of surfaces are determined and compared with the control group. Difficulties may arise due to the inclusion of a «sealed» fissure into the «F» component of the DMFT index. Therefore, calibrated specialists should conduct the assessment. Expected effectiveness of sealing fissures is from 40 to 80 % of the initial level.

SYSTEMATIC DENTAL CARE (ORAL SANATION)

Definition: a complex of treatment and preventive measures conducted by dental personnel systematically.

Indications: children and other high-risk groups of dental diseases.

Purpose: Maintaining the oral cavity of the population in a healthy (sanitized) state according to established criteria and ensuring secondary prevention of dental diseases.

Examples of specific tasks of the program include:

- to raise the level of dental care for school-age children so that the DCL (dental care level) is at least 80 % in all age groups of children within 10 years,
- to reduce the number of extracted teeth to a level of less than 0.1 tooth, on average per person in 18 year-olds;
- to reduce the number of secondary dental caries in children and adolescents from 7 to 18 to an average level of less than 0.05 per patient.

Approaches. Depending on the level of economic development and the availability of dental resources (staff, equipment, etc.), different approaches may be used in providing the population with systematic dental care. However, attention is mainly focused on children. Among other age groups, systematic dental care is provided to:

- pregnant women;
- military personnel;
- students of higher and secondary educational institutions;
- workers and employees;
- patients suffering from common chronic diseases;
- elderly.

Since the prophylactic value of systematic treatment (sanation) decreases significantly with ageing, first of all children should be included into this program.

Organization. An ideal organization can be considered when the entire child population is served systematically, which provides every child with healthy teeth and periodontium.

It is known that new carious tooth lesions may appear in children and young people in terms from 3–6 months to 2–3 years. These observations were the basis for planning the frequency of repeated visits. The program is also influenced by such factors as personnel and dental equipment supply. Thus, the type of systematic dental care to the population should depend on a number of conditions, including economic ones. The World Health Organization offers 5 types of systematic services for children (Planning of Oral Health Services. WHO, 1980).

When planning systematic dental care for children, one should remember that treatment should be carried out as early as possible at the stages of superficial and middle caries. In case of preventive treatment, the volume will decrease with time, and fewer complications will develop. In addition, in the early stages of caries treatment, it is easier to ensure high quality.

Systematic dental care is recommended for children in the following order:

- 1) permanent teeth of 5–6 year-old children;
- 2) permanent teeth of 12–13 year-old children;
- 3) permanent teeth of 7–12 year-old children;
- 4) deciduous teeth of children under 6 years old;
- 5) permanent teeth of 14–17 year-old adolescents;
- 6) deciduous teeth of school-age children.

For practical implementation of dental care to the population, it is necessary to plan adequate provision of personnel, equipment and materials. Already at the planning stage, a periodic evaluation of the program's effectiveness is envisaged using the DCL index or other similar criteria.

Personnel. Systematic dental care is carried out by dentists or dental therapists. In some countries, there is a special nursing staff (hygienists with advanced functions) for the prophylactic treatment of uncomplicated dental caries. However, the dentist manages the work of the auxiliary staff and provides treatment in complex cases.

Depending on the prevalence and intensity of dental caries and the organization of the program, one doctor can serve from 1 500 to 6 000 patients. Nurses from dental offices are also required for this program. One nurse is required for one doctor.

The effectiveness of the method. You can assess the degree of the health of children using any health criteria. The simplest is the index of dental care level (DCL). The quality of treatment can be assessed by the number of cases of secondary caries, complicated caries, the number of extracted teeth. A reliable sign of the effectiveness of the program is a reduction in the number of revisits, as well as a decrease in the need for dental treatment.

BACKGROUND OF THE CHOICE OF PREVENTION METHODS FOR THE IMPLEMENTATION OF THE COMMUNITY PREVENTION PROGRAM

According to the situation analysis data, in the area, the following methods are proposed for the primary prevention of dental caries and periodontal diseases.

For the primary prevention of dental caries, which is high in the area, it is recommended to:

- prescribe fluoride tablets;
- use fluorides topically;
- promote oral health;
- encourage oral hygiene (brushing teeth).

For the primary prevention of periodontal diseases, the level of which is medium in the area, it is recommended to:

- encourage oral hygiene;
- promote oral health.

To ensure systematic dental care for children, it is proposed to introduce the fourth type of the WHO program.

Thus, in general, the program for the prevention of major dental diseases in the region will include:

- oral health promotion;
- fluorides;
- oral hygiene;
- systematic dental care for children.

APPROXIMATE PLAN OF IMPLEMENTATION OF COMMUNITY PREVENTION PROGRAM

Examples of state and regional preventive programs you can find in Appendix 1 and 2.

1. *Cohort selection.* While choosing people for involvement in the prevention program, one should be guided by the well-known provision that primary prevention of dental caries and periodontal diseases is most effective in childhood. Already in the adolescent period, a number of prophylactic agents, such as fluorides, partially lose their effectiveness in the prevention of dental caries. Tabl. 7 summarizes the recommendations on the choice of the cohort, depending on the methods of primary prevention. Tabl. 8 shows the pattern of implementation according to the year.

Planning should be in full coordination with material support and personnel capabilities. If a national prevention program is developed for the first time, then it is advisable to develop a plan for the gradual involvement of the population in the program, giving priority to children.

Below there are examples of planning the implementation of the program in relation to the situation in the area.

Table 7

The choice of cohort for prevention program participation

Dental diseases	Methods of prevention	Recommended age for prevention beginning	Recommended duration of the program
Dental caries	Fluoridation of drinking water	All age groups	Throughout life
	Administration of fluoride tablets	From 6 month	10–15 years
	Topical use of fluorides	From 6 years	Till 14–15 years and risk groups of any age
	Dental education/ Oral health promotion	School years	Throughout life
	Toothbrushing	From 4–6 years	Throughout life
Periodontal diseases	Dental education/ Oral health promotion	School years	Throughout life
	Toothbrushing	From 4–6 years	Throughout life

Table 8

Pattern of prevention program implementation

Coverage of population by prevention methods	Years of program implementation						
	1	2	3	4	5	10	15
Prognosed number of people in the region	10 000 000	10 170 000	10 343 000	10 519 000	10 700 000	11 641 000	12 665 000
Dental education/Oral health promotion	1 000 000	5 000 000	8 800 000	9 000 000	9 000 000	10 000 000	12 665 000
Fluoridation of drinking water	Installation of equipment	260 000	500 000	1 000 000	1 000 000	3 000 000	Correction of program
Administration of fluoride tablets for children 6 month – 5 years	42 000	84 000	126 000	160 000	200 000	Correction of program	
Mouth-rinsing for children 6–14 years	20 000	40 000	64 000	90 000	110 000	171 000	Correction of the program
Fluoride varnish	14 000	20 000	36 750	46 000	56 000	43 350	16 200
Tooth-brushing education of children 4–15 years	136 000	272 000	408 000	544 000	680 000	1 360 000	Correction of the program
Professional oral hygiene	Hygienists training		67 500	305 000	460 000	620 000	Correction of the program
Systematic care for children 7–17 years	412 000	618 000	824 000	1 030 000	1 320 000	2 640 000	3 400 000

Oral health promotion covers 80–90 % of the population in three years from the start of the program, with gradual involvement in the program up to 100 % within 15 years. The percentage of the population practicing regular toothbrushing should increase from 20 % at the beginning of the program to 75–80 % in 15 years.

Fluoridation of drinking water should be introduced in 1–2 small towns at the beginning of the program with a gradual expansion up to 50 % of the urban population in 10 years, after which the correction is required.

Prescription of fluoride tablets should be made in 5 years for 50 % of children from 6 months to 5 years in rural areas, followed by correction of the plan.

Mouth rinsing with fluorides should be introduced in 2 years for 40 % of 6–14 year-old children living in cities where water is not fluoridated. In 10 years correction is required.

Fluoride varnishes should be introduced according to indications for 10–15 % of those who need it at the beginning of the program with a gradual increase in coverage to 80–90 % of those who need it over the course of 15 years.

Fluoride-containing toothpastes. Gradually increase the percentage of use of fluoride-containing pastes from 5 % to 80–90 % over 10 years.

Teaching toothbrushing: At least 60 % of children of primary school age should be involved in training program within 10 years.

Professional oral hygiene. Professional oral hygiene should be implemented in 2–3 years after the start of the program with a gradual increase in the coverage of the population up to 20 % of those in need or more.

Systematic dental care should be provided to 95 % of 7 year-old children at the beginning of the program and at least 80 % of 7–17 year-old children within 10 years.

2. *Calculations of necessary materials to ensure the program.* Some information was given regarding the necessary materials for the introduction of various methods of prevention. However, the need for materials can vary considerably depending on local conditions. According to the situation analysis of the area, as well as on the basis of cohort planning, oral health promotion for the population will require:

- short films on prevention: two new films per year;
- slides for public lectures: two sets per 100 000 people;
- popular brochures: three new brochures per year, one set of brochures for 10 people participating in the program;
- posters: 5 new posters per year; on average, 3 sets of posters for all pre-school institutions, schools, and dental facilities.

To ensure regular brushing the population will need:

- about 10 tubes (100 ml) of toothpaste and 5 toothbrushes are necessary for an adult per year;
- about 7 tubes (100 ml) of toothpaste and 4 toothbrushes are required for children per year.

These approximate calculations can depend on the types of toothpastes and materials for the manufacture of toothbrushes. It necessary to remember that part of the population will continue irregular tooth-brushing, using on average 2 tubes of toothpaste and one brush per person per year.

When using fluoride-containing toothpastes in the program, their number should be calculated according to the planned percentage of inclusion of fluoride toothpastes in the total number of toothpastes.

To maintain tooth-brushing training the following means are required:

- each kindergarten or school should have one hygiene room;
- samples of toothpastes and brushes for demonstration and training: one tube of paste and one toothbrush for 1 child per year;
- dummies for demonstration of the tooth brushing technique: one dummy for one hygiene room for 2–3 years;
- posters: one set per hygiene room per year;
- cabinet for storing personal hygiene products in each hygiene room.

Professional tooth brushing requires:

- dental chair: one chair per 2000–5000 people participating in the program;
- samples of toothpastes and toothbrushes for demonstration: 3–4 sets per office per year;
- dummies for demonstration of the tooth brushing technique: one or two models per office for 2–3 years;
- posters: one set per office per year;
- ultrasound apparatus for removal of calculus: one per one office for 5 years;
- instruments for calculus removal: at least 20 sets per one room for 2 years;
- special hygiene products (interdental brush, dental silk and etc.);
- means of monitoring the quality of tooth brushing (tablets or solution for staining plaque).

For systematic dental care, the population requires: dental institutions (polyclinics, departments, offices) and the corresponding equipment at the rate of 1 chair per 1200–3000 population included in the program.

For fluoridation of Drinking Water:

- fluorine installations (plants) of the required capacity to ensure water fluoridation in the area;
- fluoride preparations;
- laboratories to control the concentration of fluoride in drinking water.

To organize a prescription of fluoride tablets one will require:

- fluoride tablets, 300 tablets (appropriate dosage) for 1 child per year;
- laboratory to monitor the concentration of fluoride in the urine.

To provide rinsing oral cavity with fluoride solution one will require:

- fluoride (sodium fluoride) — 0.005 g of the drug per procedure per child;
- paper cups — one cup for one procedure per child.

To organize fluorine varnishes application one will require: fluorine varnish, 0.5 ml of substance per procedure.

Tabl. 9 shows approximate calculations of necessary materials. Approximate data of planned population in the program were used.

Table 9

Approximate material requirements for prevention programs

Materials and equipment	Number	Approximate requirement	
		Start of the program	Fifth year of the program
Film		2	10
Flyers		3	15
		100 000 × 3	900 000
Posters		5	25
	set	6 278 × 5	7 000 × 5
Toothpaste	tubes	24 060 700	50 431 600
toothbrushes	number	11 961 000	24 961 000
Oral hygiene rooms		3 566	4 000
Dummies		3 566	4 000
Dental unit and equipment for oral hygiene		34	230
Fluoride toothpaste	tubes	2 406 000	17 651 000
Dental unit and equipment to serve of schoolchildren	number	343 (1 : 1200)	880 (1 : 1500)
Equipment for water fluoridation	number	1	2–4
Fluoride tablets	number	12 600 000	60 000 000
Sodium fluoride for mouthrinsing	kg	8	44
Fluoride varnish	l	14	56

Planning for the personnel provision is carried out taking into account the personnel situation in the area and the possibilities of personnel training.

«Inappropriate» use of the personnel, for example, carrying out non-medical procedures by the dentist will lead to a significant increase in the cost of the prevention program. If the necessary staff is not available, then training should be planned in accordance with the requirements.

First of all, it is necessary to determine what types of personnel are required for the planned program. Supposed activities and recommended methods of prevention should be analyzed. Then the necessary types of personnel and the need for them in quantitative terms are determined at the beginning of the program and in 5–10–15 years. The scheme for determining the need is given in the table 10.

Approximate personnel requirements

Recommended methods of prevention	Planned activity	Possible personnel	Recommended personnel in the studied area	Number of personnel
Dental education	Lectures Demonstrations of films Discussions Printing and spreading of educational literature	Dentist Doctor Nurse Teachers	Nurse	10 rates
Oral hygiene	Education and control Professional oral hygiene	Hygienist Dental therapist Nurse Upbringers Teachers Parents	Dental nurse Hygienist	9 (1:14 000) 23 (1:3 000)
Dental service for children	Treatment of dental diseases	Dentist Dental therapist	Dentist	343 (1:1200)
The use of fluorides	Water fluoridation Fluoride tablets Fluoride mouth-rinsing Fluoride varnishes	Engineer Upbringers Teachers Nurse Parents Dentist Dental therapist Hygienist	Engineer Nurses Dental nurse	¼ Equivalent 0.2 rates Equivalent 0.1 rates Equivalent 2.5 rates
Administration of the program		Dentist	Dentist	Equivalent 0.5 rates
Teachers for personal training		Teachers for dentists Nurse	Teachers for dentists	10-20

3. *Personnel training.* Personnel training planning is carried out on the basis of the requirements. From the analysis of the situation, it is known that there are already all types of personnel in the district, with the exception of hygienists, but it is important to find out whether it is possible to divert the required number of personnel from their current activities to implement a prevention program. It is also necessary to organize retraining of the personnel (short courses).

Short-term courses should be organized for 10 employees at the beginning of the program. In the future, training is planned according to the necessary number of employees involved in the program, as well as taking into account that each employee undergoes retraining courses every 3–5 years. According to the

analyzed situation the need for oral health promotion workers will increase to 127 workers within 15 years, therefore by this time it is necessary to plan short-term courses for approximately 40 workers annually.

Nurses of dental offices should undergo short term courses to get acquainted with their responsibilities in the program.

Approximate requirements on 9 rates of nurses are given on the basis of the time required for each procedure. In fact, more workers of school dental offices can participate in the program, devoting only part of the working time to prevention. According to this, short courses should be planned for all or most nurses at dental offices. In the future, it is necessary to plan retraining of personnel once every 5 years. It is also important to introduce a course of prevention of dental diseases into the current curriculum.

Training hygienists. A hygienist is a paramedical professional with 2–3 years of training. The main work of the hygienist is to teach oral hygiene and to carry out professional oral hygiene, as well as to conduct all types of local preventive procedures using fluoride.

It is planned to use hygienists for professional oral hygiene. 23 hygienists are required by the beginning of the program, (see table 10), and in the future, the preparation of hygienists should be planned in the following way: in 1–2 years of the program implementation at least 200 hygienists should work in the area.

Training dentists. Dentists are planned to be used in the program for systematic dental care for children. 343 dentists are required to provide treatment for 6–7 year-old children at the beginning of the program; In the future, within 11 years, the need will increase annually up to 100–150 dentists. The number of children served by one dentist will increase (from 1 : 1200 at the beginning of the program, to 1 : 3000 in 10–15 years), therefore the number of dentists involved in the treatment of children will gradually decrease. Thus, an increase in the number of dentists in connection with the introduction of a prevention program is not required.

However, due to implementation of the program requirements are the following:

- 1) curriculum should include a course of prevention and communal dentistry/dental public health;
- 2) short-term prevention courses for program organizers and dentists;
- 3) prevention course in the program of advanced courses for dentists.

The training of teachers can be conducted in the form of short-term courses (1–3 months) on the basis of the dental faculty.

4. *Program Financing.* Financial support for the program should be provided at the planning stage of the program. Financial capabilities actually determine the coverage of the program, the choice of methods and means, personnel provision.

Dental care is known to be one of the most expensive types of medical care and, therefore, it is necessary to plan the appropriate costs of implementing prevention programs.

The budget of the prevention program should include:

- the cost of staff training, including short-term courses;
- staff salary;
- equipment and its maintenance;
- transport;
- means of prevention.

It is also necessary to foresee the economic benefits of prevention. According to the international experience, at the beginning the cost of implementing a prevention program can be approximately 4 % of the dental care budget. Within 10 years, the prevention budget increases and then stabilizes, and is about 10 % of the total dental budget.

In 5 years the reduction in the number of the main dental diseases, a decrease in the need for dental treatment is expected. In 10 years it is possible to predict a decrease in the volume of treatment for dental caries by 20–30 %; in 20 years — by 50 % or more. Thus, less money will be spent on each patient per year and this fully justifies the cost of the prevention. In the future, the economic benefit due to implementation of prophylaxis can be reflected in a significant reduction in the budget for dental care. According to the size of the current budget it is possible to predict economic benefits specifically in monetary terms.

A slight increase in the budget for the introduction of a prevention program is justified by the concern of the government of the country to ensure public health.

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Репозиторий БГМУ

**THE NATIONAL PROGRAM FOR THE PREVENTION OF DENTAL
DISEASE AMONG THE POPULATION OF THE REPUBLIC
OF BELARUS**

(Approved by the Minister of Health of the Republic of Belarus on 29.09.98,
No. 375. It is given in the abbreviated form as an example of a really functioning
program at the communal level).

Rationale of the program

Situation analysis of dentistry in the Republic of Belarus revealed the following:

1. High prevalence and intensity of dental caries in children and adults with a tendency to increase.
2. High prevalence and intensity of periodontal diseases.
3. The presence of risk factors, the main of which are: (a) a low content of fluoride in the drinking water, (b) unsatisfactory oral hygiene, (c) frequent consumption of carbohydrate foods, including sweets.

Scientific-methodical approaches and methods of prevention

This program uses scientific and methodological approaches recommended by the World Health Organization.

According to situational analysis primary prevention program is based on the combination of the following three methods:

- oral hygiene;
- fluorides (fluoridated salt and toothpaste);
- rational nutrition.

Objectives of the program: according to the global goals of dental health of the WHO in relation to the situation in the Republic of Belarus, the following objectives are real for implementation for a 2-year (until 2000) and 12-year (until 2010) periods.

The main objectives of dental health in the Republic of Belarus are in tabl. 11.

Table 11

The main objectives of dental health in the Republic of Belarus

Criteria	Age, years	Initial data 1996/97	Goals	
			2000	2010
% of children free of caries	5–6	10 %	15 %*	≥ 50 %
Average DMFT	12	3.8	Not more than 4.0	≤ 2.5
	35–44	13.5	Stabilization	
The average number of sextants with a healthy periodontium	15	1.0	1.5	< 3.0

* this indicator was achieved in 2000.

Cohort (population coverage). To achieve the goals, the program should cover the entire population, but the practical implementation of established methods of prevention is carried out taking into account the characteristics of the following age groups:

- 0–2 years — newborns and young children
- 3–5 \ 6 years — children of preschool age
- 6 \ 7–14 \ 17 — children of school age
- 15 \ 18–25 years — young people
- 26+ — adult population

Staff.

There are no special personnel for the implementation of the primary prevention program in the Republic of Belarus, therefore all dentists participate in preventive measures.

The objectives of dental health were defined in the development of this program in 1996. Using special time allocated for this goal (at least 4 hours per month), as well as during the usual examination of patients.

Approximate duties of various types of personnel in implementing the program.

Academic teaching staff of the dental faculty and scientists

- Preparation of lectures, methodological materials for students, dentists, general practitioners.
- Delivering lectures on prevention.
- Conducting practical classes on prevention.
- Conducting scientific and practical conferences of dentists on prevention.
- Organization and carrying out epidemiological studies to assess the effectiveness of the prevention program.

Administrative staff at all levels (republic, city, district, village):

- Publication of orders, decisions, instructional materials on the organization of the prevention program.
- Creation of the necessary conditions for the implementation of the planned activities within the framework of the program of the appropriate level.
- Material support of the program.

Doctors and dentists: Practical implementation of preventive measures according to the program.

Nurses and paramedical staff: Practical implementation of preventive measures under the guidance of a doctor.

Objectives for staff training:

- improvement of knowledge of practical doctors through seminars and conferences;
- acquaintance of non-dental personnel (doctors, school teachers, kindergarten teachers) with the program of prevention.

Program implementation plan for newborns and young children (younger than 3 years)

Activities: training of parents at each visit by the staff of the pediatric service.

Performers: pediatricians, nurses of the pediatric service.

Materials:

- methodical manual for pediatric staff;
- a set of posters (4) for children's polyclinics, departments, offices;
- flyers for young parents.

Assessment.

Primary:

- coverage (in %) of young parents;
- number of visits for the purpose of prevention.

Intermediate:

- improvement of parents' knowledge in comparison with the baseline up to > 80 %;
- tendency to decrease prevalence and intensity of caries in 1–2 year-old children.

Final: achievement of the objectives in 2000 and 2010 (percentage of 5–6-year-old healthy children).

Program implementation plan for preschool children: 3–5 / 6 years

Activities:

- training parents at every preventive visit;
- training parents of children attending kindergartens;
- training kindergartens teachers.

Performers:

- doctors and nurses of the pediatric service;
- teachers of kindergartens;
- dentists serving this area, including kindergartens.

Materials:

- flyers for parents;
- flyers for kindergarten teachers;
- a set of posters (4) for children's polyclinics (departments, offices) and kindergartens;
- game materials (an album for coloring, models of teeth, samples of toothpastes and brushes).

Assessment.

Primary:

- coverage (in %) of organized and unorganized children participating in the program;
- the number of children attending dentist for the purpose of prevention;
- publication of educational and methodological materials.

Intermediate:

- improving the knowledge of parents and children about prevention: up to > 80 %;
- the tendency to improve oral hygiene in children of all age groups.

Final: achievement of the objectives in 2000 and 2010 (percentage of 5–6-year-olds free of caries).

Program implementation plan for children and teenagers of school age 6/7 ~ 14/17 years

Activities:

- lectures for school teachers;
- teaching parents of school children at school and by the dentists.

Activities held at schools are subject of agreement with educational authorities at all levels.

Performers:

- dentists serving schoolchildren in the area;
- school teachers.

Materials:

- a set of posters (4) for schoolchildren;
- flyers for parents of junior schoolchildren;
- flyers for schoolchildren.

Assessment.

Primary:

- publication of educational and methodological literature and visual aids (implementation of the plans according to the terms and number of publications);
- coverage (in %) of schoolchildren according to the curriculum;
- preventive visits of a dentist by school children (in %).

Intermediate:

- improving the knowledge and behavior of schoolchildren up to > 80 % of the baseline;
- improvement of schoolchildren oral hygiene (according to the OHI-S index);
- improvement of the periodontal status (CPITN index).

Final: Achievement of the objectives in 2000 and 2010 (DMFT of 12-year-olds and CPITN «0» of 15-year-olds).

Program implementation plan for young people from 15/18 to 25 years old

Activities:

- training young people by the dentist (except emergency care visits);
- individual preventive procedures (except emergency care visits).

Performers: all dentists of all specialties working at public health care facilities.

Materials:

- methodological guide for dentists to implement prevention programs;

- flyers for young people about the methods of dental caries prevention and periodontal diseases;
- popular science brochures (3) on the prevention of dental caries and periodontal diseases.

Assessment.

Primary:

- publication of methodological and educational materials (terms and quantity);
- acquisition of preventive means (terms, completeness of maintenance of medical facilities);
- coverage (in %) of young people with preventive measures;
- involvement (in %) of dentists in the prevention program.

Intermediate:

- an increase in the percentage of patients who regularly use fluoride-containing toothpaste (up to > 90 %);
- an increase in the percentage of patients practicing correct diet (up to > 80 %);
- tendency to improve oral hygiene (OHI-S index);
- tendency to improve the condition of periodontal disease (CPITN index).

Final: evaluation criteria for the final assessment will be introduced in case of positive dynamics of the intermediate assessment data.

Budget

This program is designed to be implemented within the existing budget for dental treatment and prevention services. For additional financing of certain activities, such as publication of educational literature (brochures, posters), the health authorities submit applications in accordance with the established procedure at both local and national levels.

The main means of prevention — toothpastes — are purchased by the population as a regular product of daily consumption. In some cases, taking into account economic opportunities, local authorities can finance the purchase of hygiene products for the implementation of the prevention program in children's institutions, among the population of preferential categories, etc.

Sponsor support is expected in the implementation of pilot projects on assessment of the effectiveness of individual prevention methods (for example, toothpastes marketed in Belarus), as well as the publication of educational.

PREVENTION PROGRAM OF DENTAL CARIES FOR GOMEL REGION

The most common (basic) dental diseases are dental caries and periodontal disease. These diseases occur in childhood, progress with age, cause complications leading to partial or total tooth loss, make chewing function worse and reduce the quality of life [4]. These data were obtained in epidemiological studies _____ (date) of the key age groups (tabl. 12):

Table 12

Summarized data form report on the dental status of the key age groups

Agegroup (years old)	Dental caries					Periodontaldiseases
	Incidencein %	DMF	D	M	F	Incidenceand intensity
5-6	Temporaryteeth	6.7				Not determined
12		3.8				Bleeding gums _____ %
15		5.6				Bleeding gums __23__ %
35-44		15.7				pathological periodontal pockets_____ mm 1.5 70 % attachment loss ___mm

Associated risk factors:

- Poor oral hygiene: average meaning of OHI-S 2.4 in 12 year-olds and 2.5 in 15 year-olds.
- Noncompliance of the recommended norms of tooth brushing (2 times a day) ___ % of 15 year-olds.
- Don't know what tooth paste (with or without fluoride) do they use for brushing teeth ___ % of 15 year-olds.
- Don't know the benefit of fluoride toothpaste _____ % of 15 year-olds.
- Don't use fluoride toothpaste _____ % of 15 year-olds.
- Often consume sweet food and sweet drinks _____ % of 15 year-olds.
- Poor knowledge among schoolchildren of risk factors of dental diseases and preventive measures ___ %.
- Poor knowledge among parents of junior schoolchildren of risk factors of dental diseases and preventive measures ___ %.
- ___ % of women during their pregnancy did not get information from the dentist about preventive measures of dental diseases in children.
- ___ % of young parents (mothers) did not visit dentist in order to prevent dental diseases of their children at the age of up to 1 year old.
- ___ % of schools (from total amount) is involved in the program of tooth brushing under teachers` control among children of 1–2 grades.

Grounding of preventive measures

Caries develops when the structure of hard dental tissue is weakened due to the insufficient supply of fluoride, abnormal amount of dental deposit (due to bad oral hygiene) and frequent consumption (more than 5 times a day) of starchy foods, especially, sweets. It hasn't been proved by scientific researches but by world practice of caries prevention as well, which means elimination or reduction of above mentioned factors. Consequently, the following three methods should be included into the program of caries prevention:

1) Increase of structural resistance of hard dental tissue to caries by using systematic or local fluorine and/or mineralizing substances;

2) Decrease of dental deposits on teeth due to regular and thorough oral hygiene;

3) Decrease of frequency (no more than 5-6 times a day) of starchy foods and sweet drinks consumption.

Defining long-term goals of the prevention program

Taking into account the situation analysis, long-term (for 5–10 years) objectives of the program of dental caries and periodontal diseases prevention are defined according to the plan in table 13. As the program is a continuous process, the goals can be updated or new goals can be defined.

Table 13

Defining long-term goals of the prevention program

Age groups (years old)	Criteria of dental health	Data 2010	Goals			
			2012	2015	2020	2025
5–6	DMF of temporary teeth					
12	DMF of permanent teeth					
	Gingivitis (bleeding) %					
15	DMFT					
	Gingivitis (bleeding) %					
35–44	DMFT					
65–74	DMFT					
	Complete adentia, %					

Implementation of the prevention program

Grounding of methods

Dental caries develops in the early childhood due to risk factors that can be eliminated or reduced by parents only. That is why prevention of dental caries among children depends only on parents who should know recommended methods. It is necessary for implementing the program of antenatal prevention and activities for children of young age, preschool age and primary school age.

Analysis of dental status of children of primary school age shows that just erupted teeth of most schoolchildren from 1st grade are covered with thick layer

of dental plaque. Therefore, entering the school 6–7 year old children do not possess the skills of independent hygienic care of the oral cavity. They are at risk group for dental caries and gum inflammation, which is observed at this age period. The most practical and effective way of preventing tooth and gum diseases in young schoolchildren is to instill tooth brushing. This goal can be achieved in two academic years. High efficiency of the tooth brushing under teachers' control is proved by international practice.

Most middle-aged and older children can use recommended in this program methods of dental caries and periodontal diseases primary prevention. However, they need constant motivation and periodic monitoring. This can be done during routine dental examinations, health lessons and by dentist or dental hygienist.

Adult population is also susceptible to the risk factors of dental caries, and especially of periodontal diseases. The most rational and economical approach of community involvement in prevention program is education through the media. In addition people should be motivated in prevention. At the outpatient appointment for the purpose of dental treatment, the dentist advises the patient individual preventive measures depending on the dental status and the availability of disposable risk factors.

Prevention program implementing objects and their functions

Media: Radio, Television, Newspapers, Magazines

- Promotion of a healthy lifestyle.
- Informing the population about the risk factors of major dental diseases and methods of their elimination.

Materials for central and local media are given by the managers of the prevention program of the appropriate level.

Program implementation monitoring: *execution of the agreed implementation plan of information and propaganda.*

School

- Health lessons about the prevention of dental diseases in children of early age.
- Health lessons on healthy lifestyles, risk factors and prevention methods of dental diseases.
- Organization of daily controlled tooth brushing for children of 1st and 2nd grades under the supervision of teachers.

Program implementation monitoring:

- *survey key age groups to assess the level of knowledge about risk factors and methods of its elimination, 1 time every 2–3 years;*
- *follow the schedule of daily tooth brushing for 1–2 grades children at school;*
- *annual assessment of oral hygiene index level in 7 year old children;*
- *selective dental research of key age groups (7, 12 and 15 years old) every 2–5 years to determine the prevalence and intensity of permanent teeth caries,*

DMFT index components, the prevalence of gum bleeding and subjective indicators of oral health (using questionnaires) in 15 years old adolescence.

The study conducts clinically calibrated epidemiological group of experts on WHO 2013 methods.

Antenatal Clinic

– Providing information for dental clinic administration about taken on record pregnant women.

– Providing pregnant women with reminders about prevention of dental diseases in newborns and children of early age.

– Conversations with pregnant women about prevention of dental diseases in newborns and children of early age.

– Referral to the dentist for pregnant women for oral cavity rehabilitation.

Reminder fliers for pregnant women are provided by program prevention manager at antenatal clinic.

Program implementation monitoring:

– amount and percentage of pregnant women who have visited a dentist from the total number of pregnant women are registered at the antenatal clinic.

Maternity Accommodation

– Midwife conversation with obstetric patients about the newborn hygienic care of the oral cavity are carried out.

Program implementation monitoring:

– assessment of young mothers' knowledge of the oral cavity hygienic care rules in newborn.

Children's Clinic

– Pediatricians or nurses perform conversations with young mothers about the hygienic care methods of the oral cavity, safe food and rules of feeding, the necessity for the first visit with a 6-month old baby to the dentist for the examination of the child and recommendations on dental diseases risk factors exclusion.

– Providing young mothers with reminders about prevention of dental diseases in children of early age.

Reminder fliers for pregnant women are provided by the program prevention manager at the children's clinic.

Program implementation monitoring:

– amount and percentage of young mothers who have visited a dentist with 6-month old child for the purpose of dental diseases prevention;

– assessment of mothers' knowledge about risk factors and prevention methods of major dental diseases in children of early age (a selective survey of mothers with children under the age of 2 years).

Preschool

– Conversations with parents about dental disease risk factors and methods of its exclusion for the purpose of prevention of major diseases of the oral cavity in children of preschool age.

– Inclusion of educational elements about the adverse factors for the teeth and its exceptions in nutrition and oral cavity care in the content of the lessons and games.

– Organization of the tooth brushing lessons in the older groups of children with educators.

Program implementation monitoring:

– *random parents survey to assess their knowledge of risk factors and prevention methods of dental diseases in children of preschool age, rules of home tooth brushing and anti-caries toothpastes using, frequency of sugary foods intake;*

– *annual dental examinations for children of 5–6 years to determine the prevalence and intensity of caries of temporary teeth.*

Children's Dental Clinic (Department, Center)

– Cooperation with schools, preschools, antenatal clinics, maternity hospitals, children's clinics for the purpose of prevention program implementation.

– Systematic admission of children from 6 months up to 2 years twice, further at the age of 3 once a year for routine inspection and individual dental caries and periodontal diseases primary prevention; recommendations on rational diet, regular and thorough maintenance of the oral cavity habit, the use of fluoride or mineralized toothpastes for tooth brushing.

Program implementation monitoring:

– *children key age groups dental status comparison with the goals of the dental caries and periodontal disease primary prevention program according to the results of dental epidemiological research carried out once in 2-5 years.*

Dental Clinic, Department, Office

– Creation of conditions for increasing the uptake of the population in dental caries and periodontal disease prevention, the purpose is 50 % of all references.

– Interviews on the prevention of dental diseases with patients who applied for the purpose of dental treatment.

– Motivate patients to regular no less than 1 time per year visits to the dentist or dental hygienist for the purpose of preventing major oral diseases.

Program implementation monitoring:

– *amount and % of patients referred to the dental healthcare facility during the year from the total number of inhabitants in the service area;*

– *amount and % of primary patients referred to the dental healthcare facility during the year for the purpose of prophylaxis from total number of patients.*

– *comparison of the key age groups dental status of the adult population with the goals of the dental caries and periodontal disease primary prevention program according to the results of epidemiological dental research carried out once in 5 years.*

Prevention Program General Management

At the level of country, region, area, city, district the major dental diseases primary prevention program among the population is performed by the responsible official (Director, Manager) for the implementation of the program. Manager is appointed by the health authorities from the number of professionals actually working in the industry – Heads of the Preventive Departments in the city or Heads of the district dental clinics.

Prevention Program Budget

This prevention program is designed for existing infrastructure of medical and dental establishments of all types of property and its staff. Therefore, the additional financing is not a prerequisite for program development and implementation.

Expensive tools for tooth decay prevention such as fluoride varnishes, sealants are not need. Program does not provide drinking water or salt fluoridation and other methods of systemic fluoride prophylaxis in the form of compulsory methods. The desirability and feasibility of incorporating these and other prevention methods is solved by local health authorities with the relevant technological, human and financial support.

Funding material part of this program is the publication of manuals for medical staff, educational materials for the public and etc. Financing volume for this purpose is determined at the local authority level depending on the quantity and quality of these materials.

Prevention Program Economic Feasibility

In the long-term objectives of the prevention program measurable medical criteria of efficiency are indicated, such as average dental caries intensity reduction in children. Decreasing the number of carious teeth reduces the need for fillings and, consequently, reduces the costs of equipment and materials for fillings. It partially exempts the time for preventive procedures. This fact will improve further medical and economic effectiveness of the prevention program in the future.

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Учебное издание

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**ПЛАНИРОВАНИЕ КОММУНАЛЬНЫХ ПРОГРАММ
ПРОФИЛАКТИКИ СТОМАТОЛОГИЧЕСКИХ
ЗАБОЛЕВАНИЙ**

**PLANNING COMMUNITY PROGRAMS
FOR PREVENTION OF DENTAL DISEASES**

Учебно-методическое пособие

На английском языке

Ответственная за выпуск Л. А. Казеко
Переводчик О. А. Тарасенко
Компьютерная вёрстка А. В. Янушкевич

Подписано в печать 06.08.19. Формат 60×84/16. Бумага писчая «Снегурочка».

Ризография. Гарнитура «Times».

Усл. печ. л. 3,02. Уч.-изд. л. 2,78. Тираж 40 экз. Заказ 470.

Издатель и полиграфическое исполнение: учреждение образования
«Белорусский государственный медицинский университет».

Свидетельство о государственной регистрации издателя, изготовителя,
распространителя печатных изданий № 1/187 от 18.02.2014.

Ул. Ленинградская, 6, 220006, Минск.