

# Learning from the Process evaluation of Korea's year 2000 National Oral Health Objectives

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## 1. Introduction

In Korea, the Division of Oral health, Ministry of Health and Welfare was established as the first and only administrative organization for oral health in the central government in December 1997. Since policy is a course of action that is adopted and pursued for its advantage<sup>1)</sup>, oral health policy should be developed to accelerate the improvement of oral health for the population.

In Korea, 88 percent of tooth-loss was due to dental caries; eight percent was caused by periodontal disease among people aged 15 years

or older<sup>2,3)</sup>. The DMFT index among 12 year olds increased from 0.6 in 1972 to 3.0 in 1990 and to 3.1 in 1995<sup>4,6)</sup>. The percent of persons affected by dental caries on permanent teeth was over 75 percent for youth 12 years of age or older<sup>5,6)</sup>. CPITN2 among 15 years olds has increased from 32.3 percent in 1990 to 36.3 percent in 1995. DT rate (DT/DMFT) decreased a little bit from 55.1 percent in 1990 to 52.4 percent in 1995, because National Health Insurance (NHI) has been provided to all Koreans since 1989. Based on results of the National Oral Health Status Survey in 1972 and the strategy of the World Health Organization (WHO) of Health for All by the year

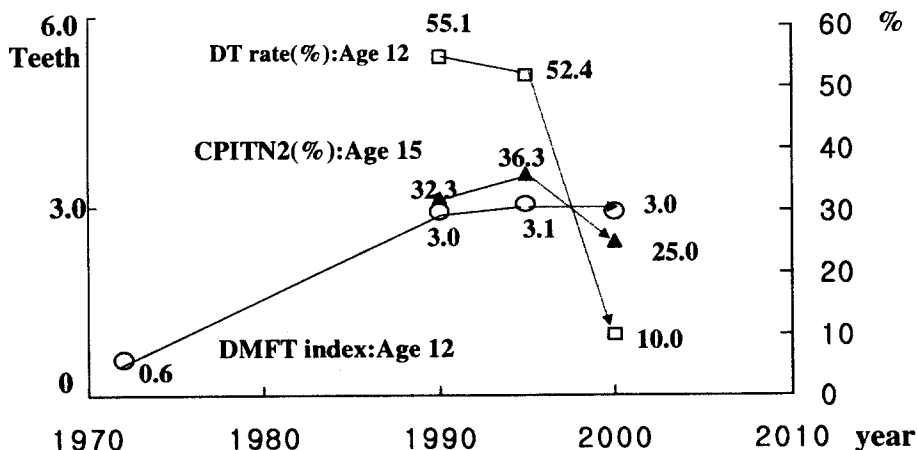


Fig 1. Trends and targets of oral health in Korea

Table 1. Oral health programs and National Oral Health Objectives by the year 2000

Programs	National Oral Health Objectives
Community Water Fluoridation (urban)	DMFT index < 3.0 in 12-olds
School-based FMR(Rural)	DMFT index < 3.0 in 12-olds
School-based FMR	CPITN2(<) < 25.0 in 15-olds
School-based IDC	DT rate(<) < 10.0 in 12-olds
Oral Health Education	All objectives

FMR: Fluoride Mouth Rinsing

IDC: Incremental Dental Care

2000 under Alma-Ata Declaration<sup>7)</sup>, National Oral Health Objectives the Year 2000 (NOHO 2000) proposed by the Institute of National Oral Health in 1990, as shown in Fig. 1, was accepted by the Korean central government in 1995.

To achieve the oral health objectives, five major public oral health programs, as shown in Table 1, were planned. To prevent dental caries, community water fluoridation (CWF) was recommended in urban areas where there were public water supply systems and school-based fluoride mouth rinsing (FMR) was planned in rural areas where there was no public water supply system. For the prevention of periodontal disease, school-based tooth-brushing practice

(TBP) was selected. To increase early treatment among children, school-based incremental dental care (IDC) was planned. To obtain public support for the oral health programs, oral health education (OHE) was recommended. Through the Health Promotion Act passed in 1996<sup>8)</sup>, public oral health programs such as water fluoridation and school-based fluoride mouth rinsing gained a legal foothold and a budget.

Recently, "The Division of Oral Health" newly established in 1997 was doomed to change its title to "The Division of Oral Strategy". Moreover, many barriers expected and unexpected need to be overcome to accelerate program activities for national oral health policy

Table 2. Sources of information used for this study

Year	Title	Country
1972	National Oral Health Survey	Korea
1990	Annual Report of National Health Insurance	Korea
1990	National Oral Health Survey	Korea
1995	Annual Report of National Health Insurance	Korea
1995	National Oral Health Survey	Korea
1996	Annual Report of National Health Insurance	Korea
1996	Guidelines of Oral Health Services	Korea
1997	Social Indicators in Korea	Korea
1998	The Planning of Oral Health Services	Korea

in Korea. Hence, remedial changes for the process of national oral health policy were needed as an integrated component of the overall program for driving national oral health policy. We decided that the process evaluation of the past experience could give us the timely wisdom.

The objective of this study was to evaluate the implementation process of the Korean national oral health policy aimed toward achieving the NOHO 2000<sup>9)</sup>. The specific aims were two-folded: 1) to evaluate the progress of national oral health programs during 1995-1998; and 2) to suggest modifications for the national oral health programs and recommendations for future plans.

## 2. Methods

Analysis of policy focuses on a planning, budgeting, implementing, and evaluating cycle<sup>10-12)</sup>. Among them, this study was trying to focus on the implementation evaluation. For the purposes of this evaluation, the data from the reports in Table 2 were reviewed and evaluated. Specific procedures were as follows;

1. To identify the problems of implementing the

national oral health programs, the quantitative changes of the programs, the budgets used for the major oral health programs and the implementing system are reviewed and analyzed from 1990 to 1998.

2. To accomplish the national oral health policy successfully, modifications and recommendations were suggested.
3. Comments for national oral health policy in the near future were added.

## 3. Results

**Evaluation of the process of national oral health program:** Among the five national oral health programs planned for NOHO 2000, only two programs, CWF and FMR, has been implemented, as shown in Table 3.

CWF reduced dental caries on permanent teeth by 35 percent in Korea, according to the results of a recent five-year longitudinal evaluation study during 1991-1996 among children 6 years of age in 1991<sup>13)</sup>. The implementation of CWF depends on both the local government and central government. When a water fluoridation system is newly installed in a water plant (WP),

Table 3. Progress of national oral health regimens during 1990-2000

Program	1990	1995	1997	1998	2000
Water Fluoridation					
WP(change)	2	4(+2)	12(+8)	34(+22)	85
population(%)	-	0.16(1.4)	1.7(3.5)	4.0(9.0)	22.0(50)
budget	-	-	1,300*	1,100	-
FMR schools					
ps(%)	-	2,771(47.0)	3,929(68.7)	4,500(78.8)	5,000
population(%)	-	1.6(39.5)	1.8(45.5)	1.9(50)	2.0
budget	-	-	300*	4.5	-

WP: water plant

ps: primary school population (unit=million)

budget (unit= million win)

population (unit=million)

\*: budget used until 1997

which is managed by the local government, 50 percent of the cost can be subsidized by the central government; the local government underwrites the other 50 percent. The plan for 1998 was to increase the number of WPs with optimal fluoridation from 12 to 34 (34/616=5.5 percent of total WPs). If the plan were executed, 9 percent of the total population would benefit from this proven procedure. The cost for the installment of a water fluoridation system in one WP was estimated to be 100 million won (\$ 67,000) and the total budget for 22 water fluoridation systems was estimated at 2.2 billion won (\$ 1.4 million). One half of the total budget, 1.1 billion won (\$ 0.7million), already earmarked by the central government<sup>14)</sup>, and was more than 99 percent of total budget for national oral health program. For co-ordination and technical support for CWF, the Technical Support Team for Water Fluoridation is functioning under a budget of 68 million won (\$ 45,000) funded by the Health Promotion Fund of the Health Promotion Act. According to the amount of the

total budget, CWF must be the preventive regimen most mainly fostered by the national oral health program. For the rapid expansion of CWF in Korea, decision-makers in local government must be informed. Factors that may preclude the expansion of CWF are two-folded: one is the recent economic crisis in Korea may make the Division of Oral health disappear; the second is strong opposition of anti-fluoridationist.

School-based FMR was started as a public oral health program in 1984. Because this program was thought to be easy and less of a burden on finances, many boards of education in local governments preferred it to school water fluoridation. The total budget spent from 1985 to 1997 was 0.3 billion won (\$ 0.3 million). Although school-based FMR will increase from about 4,000 schools and 1.8 million pupils to 4,500 schools and 1.9 million in non-fluoridated communities, 4.5 million won (\$ 3,000) of the central government budget was allocated in 1997. It was only a trivial portion of total budget

Table 4. Suggestions related to National Oral Health Objectives by the year 2000

Contents	Specific Reasons
● Meet the target	To setup the Division of Oral health
● Implement Oral Health Education,	To empower the public
● Stipulate the bylaw of the mandatory Community Water Fluoridation,	For Water Fluoridation in cities with more than half million of people
● Organize the committee of Oral health program,	For School-based Fluoride Mouth Rinsing and Tooth Brushing Practice
● Make health centers aid schools,	For Incremental Dental Care

for national oral health. Albeit this program is not the most valuable public oral health program owing to its low effectiveness on the prevention of dental caries<sup>15)</sup>, this program has continued to be implement as an alternative fluoride program in rural areas.

Despite the agreed-upon importance of public OHE in the Division of Oral Health and the societies of oral health professionals, there has been no emphasis on educating the public except for a few intermittent events held during the week of oral health in the real situation. Although the Department of Oral Health has developed a plan of public oral health education<sup>14)</sup>, there was no budget allocated for these efforts. It could be a big problem on making the strategy for NOHO. Without OHE, the barriers on the expansion of CWF will not be removed and the correct implementation of FMR can not be expected. Although the Division of Oral Health started just before, it is time to implement this program to overcome the activities of anti-fluoridationist.

**Suggestions related to the NOHO 2000 (Table 4):** According to the results of the national oral health status survey in 1995 and the status of implementing national oral health programs,

NOHO 2000 could not be met. At that time, the Division of Oral Health needs time to establish both the organizational system and the administrative power. Therefore, it was realistic that the objectives should have remained the same, and only the target year should have been changed from 2000 to 2005, and in 2005, a new long-term based national oral health policy, i.e., NOHO 2020, should be made as normative objectives based on a comprehensive evaluation of national oral health status, trends and resources. But, the rapidly changing situation deprived "The Division of Oral Health" of the chance to fortify the organizational power.

CWF began in Korea as a pilot program in 1981 in Jinhae and in 1982 in Chungjoo. However, this preventive procedure was not expanded to other cities, until the city of Kwacheon decided to fluoridate in 1994. With the implementation of fluoridation in Kwacheon, another 9 cities also accepted this highly cost-effective public health measure by 1997. The most important factor considered in CWF was the size of population supplied by the water system rather than the number of water plants. Although 22 WP might install the system for fluoridated water was implemented in 1998,

there is no plan in large cities whose population is one million or more yet. It is expected that the current trend of increased dental caries will be reversed in ten years when CWF is expanded to the six largest cities (Seoul, Pusan, Incheon, Daegu, Daejeon, Kwangju) in Korea. The best way to implement water fluoridation in large cities with more than 500,000 people is mandatory water fluoridation. If the stipulation of mandatory water fluoridation in large cities with more than 500,000 people can be added to the Act related to health, CWF could be expanded in a short period of time. Ninety one percent of dentists agreed that CWF should be made available in communities with central water supplies<sup>16)</sup>, and 72 percent of employees supported it<sup>17)</sup>; however, the opponents of CWF has increased somewhat. In terms of the current political situation of Korea, the people might make the decision. Hence, the activity to make the bylaw to back-up CWF should be strongly emphasized to combine with the oral health education programs.

For achieving continued support on oral health from the public, OHE should be executed continuously through the following channels; 1) mass media such as TV, radio and newspaper, 2) school oral health programs including the revision of the contents about oral health in texts, 3) oral health education in health centers, 4) the societies of dental professionals, and 5) dental schools and dental hygienist schools. In addition, OHE about the national oral health policy and recommended programs such as CWF and FMR should be implemented for oral health

professionals at once, because the use of oral health personnel is pivotal in educating public about oral health in Korea. Due to the imminence, the budget for the public OHE should be allocated, because public oral health program without budget is vain.

For the prevention of dental caries in rural area, school-based FMR should be the regimen of the choice, although FMR alone does not control the large increase in dental caries. The focus must be given to the continued and correct operation of FMR, because this regimen has been stopped frequently in many schools due to the indifference of the board of education and teachers. For the success of FMR, the organization to drive and support the program at each school is pivotal, although the Division of Oral Health has a plan to develop the working relationship with the Department of School Health in the Ministry of Education. Committees for School Oral Health which consist of teachers, parents, dentists and hygienists in health centers also should be organized to support and assist school-based oral health programs.

Since school-based IDC has been an efficient treatment program, it was recommended as a regimen to reduce the DT rate. However, costs must be a problem, because much equipment and human resources are needed. The plan to support school-based incremental dental care in primary and middle school is useful especially in rural areas where the proportion of children receiving treatment of dental caries is so low. If health centers and/or satellite clinics (the health sub-center in Korea) can be used for school-

Table 5. Recommendations for National Oral Health in 21<sup>st</sup> Century

Contents
<ul style="list-style-type: none"> <li>● Organize the oral health administrative agencies in central and local government.</li> <li>● Execute periodic National Oral Health Survey including oral health status, knowledge, opinion and behavior of the public and oral health professionals.</li> <li>● Develop the public measure of periodontal disease and implement it.</li> <li>● Develop Maternal and Child Oral Health.</li> <li>● Develop Oral Health for under served and seniors.</li> <li>● Execute Occupational Oral Health.</li> </ul>

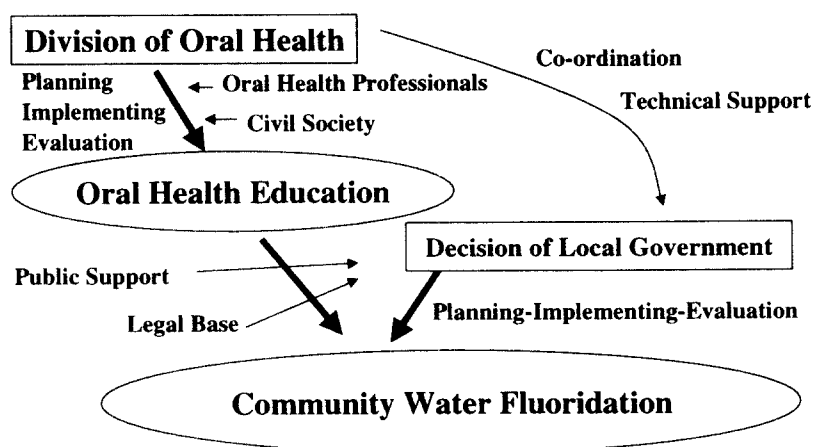


Fig 2. Tentative Scheme for expanding Water Fluoridation

based IDC and the dental health professionals in these facilities can be used, the costs may be substantially lower. When this plan is executed, the health centers and health sub-centers will do their two principal roles -- oral health promotion and dental care. Thus, comprehensive School Oral Health Program including oral health education, prevention and early treatment can be launched.

School-based TBP can be selected as a regimen to reduce CPITN2. Periodontal disease spreads widely and frequently progresses to requiring surgical treatment by the age of 35-40 years in Korea<sup>7,8)</sup>. There has been no major effort to promote conventional tooth brushing for the

prevention of periodontal disease for the masses in Korea. In theory, this program is efficient, but in practice, it is not easy to implement. If a committee of school oral health as mentioned above can be well organized, TBP can be implemented as one component of School Oral Health Program.

Without the support of the public, CWF is being suppressed and the Division of Oral Health was forced to change its title to the Division of Oral Strategy. Therefore, it is urgent to activate two major public oral health programs, CWF and OHE. As shown in Fig 2., OHE attracts the support of the public and then CWF will be implemented widely and rapidly. These

continuous programs will inevitably create a need for public oral health professionals, which then might retrieve the Division of Oral Health, and finally meet the NOHO.

**Comments for National Oral Health in the 21st Century (Table 5):** Until the early part of the 21st Century, the prevention of dental caries must be the focus of the Korean national oral health policy. Once community water fluoridation is more widely implemented, the focus is going to be moved to the surveillance of CWF and prevention oriented dental care, and then the prevention of periodontal disease will be newly focused. Although in 1997, the Division of Oral Health was established, any oral health administrative agency has not been established in local governments. It is indispensable to establish an oral health administrative agency in local governments for the purpose of organizing the oral health programs in Korea at the local level. The periodic national oral health survey has to include the oral health status as well as knowledge, opinions and practices of health care providers and the public. Knowledge, opinions and practices are prerequisites as enabling factors for the development and the evaluation of national oral health<sup>18)</sup>. Maternal and Child Oral Health, Oral Health for Under-served and Seniors, and Occupational Oral Health can be future areas of the focus to foster good oral health for all Koreans.

#### 4. Discussion

The public policy process is generally

executed as follows: 1) to perceive the problem and socially redefine it through representation of various interest groups, 2) to formulate possible proposal solutions among legitimate acceptable alternatives, 3) to decide upon and implement a policy, and 4) to evaluate the public response<sup>1)</sup>. In Korea, the process of oral health policy was quite different from the general pattern. The oral health policy process really started to break the long blank in 1998. There has been no valid information related to the responses of the public and political effects of the national oral health programs in Korea. These could be the limitations of this implementing or process evaluation. Moreover, the current socio-economic difficulties in Korea forced the restructuring of the entire organization both in the public sector and in the private sector. Under this condition, "The Division of Oral Health" newly established in 1997 was designated to change its title to "The Division of Oral Strategy" for surviving as an independent division. The sustainability of recommended programs is critical to attain the outcome expected from the implementation of public policy and many programs will not survive long after the initial enthusiasm<sup>19)</sup>. To maintain the national oral health programs and to retrieve and maintain "The Division of Oral Health" in Korea, we hope that this kind of approach to evaluate the process of program activities for national oral health policy will be helpful.

WHO suggested two oral health objectives for all people in the world: 1) DMFT index among 12 years olds should be 3.0 or less, and 2)



CPITN2 among 15 years olds should be 25% or less<sup>20)</sup>. NOHO 2000 was made by adding one more objective, DT rate (DT/DMFT) should be 10% or less, to the WHO suggestion for the guidance of early treatment of dental caries<sup>21)</sup>. Although NOHO 2000 must have been an arbitrary standard, it seemed to be useful to develop and implement the national oral health programs. The results of national oral health surveys in 1990 and 1995 confirmed that the arbitrary targets of NOHO 2000 were somewhat acceptable to national oral health objectives in Korea<sup>21)</sup>. It was speculated that NOHO 2000 gave the sound direction for improving oral health for Koreans.

Interest in, support for and participation by the general public were prerequisite to execute and maintain the public health program. Without oral health education programs, any national oral health programs such as CWF, FMR, and school oral health program will not be successfully implemented and the anticipated effect of the program is going to be unmet. Therefore, oral health education should be implemented through various educational methods such as group instruction, printed materials, audio-visuals, one-to-one instruction, demonstrations, mass media, seminars/workshops for health workers, group discussion, exhibits, teacher workshops, campaigns, presentation to community leaders, public relations, community participation, programmed instruction and outreach workers, etc<sup>22)</sup>.

To plan and implement appropriate health education and health promotion, certain

information is necessary: the triangle of health, i.e., physical, psychological and social, allows dental health professionals to appreciate the importance of the holistic view of health<sup>23)</sup>. Through oral health promotion, the task of providing appropriate oral health can be modified<sup>24)</sup>. To prevent caries effectively, health providers must know about, recommend, and use scientifically proven, available procedures<sup>25)</sup>. Moreover, these preventive procedures must be made available to the public and individuals must know about and use them<sup>16)</sup>. Without this information, problem-based policy will not be made, and reasonable strategies and tactics will not be established.

Data demonstrated that dental caries had already become a major expenditure of NHI<sup>26-28)</sup> among oral diseases, even though the increase in cases and expenditures for dental cares were not so high as that of medical care. The only rational choice was to use scientifically proven methods of prevention to control dental caries - the wide use of fluoride - from an economical and humane perspective. It was logical that CWF had a higher priority than school-based FMR, because more than 90 percent of the population lives in urban communities in Korea<sup>29)</sup> and the preventive effect of CWF was higher than that of FMR<sup>15)</sup>.

The main function of Korean health centers was not oral health promotion, but rather dental care to meet the demand of residents. The use of preventive regimens in health centers should be expanded to support the School Oral Health Programs including fissure sealing (FS), topical fluoride application (TFA) and oral health

education. When NHI covers the preventive regimens such as FS and TFA, it guides the preventive care in private dental care too. These clinical preventive measures will also accelerate the reduction of dental caries in Korea.

Although most Koreans report that they brush their teeth almost twice per day with toothpaste<sup>17,30)</sup>, periodontal disease is still on the increase like in the UK: 46 percent of eight years olds were found to have gingival inflammation in 1983, and this had risen to 58 percent by 1993, in spite of the twice daily tooth-brushing<sup>31)</sup>. Since conventional tooth brushing might be not so easy for both individuals and groups to perform correctly, the preventive effect of tooth brushing on periodontal disease was still equivocal<sup>19)</sup>. For the prevention of periodontal disease, a more efficient and practical method to prevent and suppress the periodontal disease should be developed.

Public policies are not usually adopted because they are right, or rejected because they are wrong. Rather the balance of competing social, economic, and political forces dictates trade-off among various alternatives, resulting in compromise solutions<sup>1)</sup>. Because preventive programs suffer in part because of the lack of identity of the specific individuals benefited, prevention is an essentially multidisciplinary area requiring the participation of many professions and disciplines<sup>32)</sup>, active involvement of the workforce, the use of dental auxiliaries, voluntary participation and paraprofessional training<sup>33,34)</sup>. Without professional leadership about public oral health, oral health

administration will not be achieved. For this, the role of dental public health should be 1) a leadership in the incorporation of expanded public health skills into the education of every clinical dentist and 2) a broadening of the special ability to solve occupational, environmental, dental care management and policy problems<sup>35)</sup>. Therefore, qualified public health dentists are needed to lead the oral health administration.

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## 국문초록

## 2000년 한국구강보건정책목표 과정평가의 교훈

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**색인 : 구강보건정책평가, 구강보건정책목표, 공중구강보건, 구강보건행정**

본 연구의 목적은, 1995년부터 1998년 기간 동안의 과거 구강보건정책사업의 수행과정을 평가 분석하여, 한국 구강보건정책의 개선과 향후 방향을 검토함에 있다. 연구자료수집은 기존자료조사법을 사용하였다. 구강보건정책사업 수행과정의 문제점을 파악하기 위하여, 주요구강보건정책사업의 양적 변화와 예산 및 수행 조직체계를 분석 검토하였다. 분석결과 한국 구강보건정책목표의 중점목표는 치아우식증 예방이었고, 중심 구강보건정책사업은 수돗물불소농도조정사업이었다. 예산은 대부분 수돗물불소농도조정사업과 불소용액양치사업에 할당되어 있었고, 구강보건교육사업에는 예산이 할당되어 있지 않았다. 중앙구강보건 행정조직이 전문화되지 않았고, 지방구강보건행정조직은 존재하지 않았다. 향후, 치아우식증이 감소하는 경우, 보다 효과적인 치주조직병 예방사업과 소외계층 및 학생과 근로자 대상의 계속구강건강관리사업을 개발할 필요가 있다고 검토되었다. 총괄적으로, 치아우식증을 예방하기 위한 수돗물불소농도조정사업은 더욱 확산되어야 한다고 사료되었고, 이는 구강보건인력과 국민 대상의 구강보건교육을 통한 국민의 성원으로 수행되어야 한다고 검토되었다. 성공적인 구강보건정책사업을 수행하기 위하여, 중앙 및 지방 구강보건행정조직이 정비되어야 하며, 이는 구강보건전문행정으로 이루어져야 한다고 검토되었다.