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**An Evaluation of Primary Oral Care Services
Delivered by Medical Nurses
in Rural Cambodia**

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Summary and Recommendations

The study

This study is concerned with an investigation of the dental practices of medical nurses who had completed six months of postgraduate training in basic dental care. Personal interviews and postal questionnaires were conducted to obtain data on work practices and work conditions of the dental nurses. The managers of health centres or referral hospitals were also interviewed on the same day as the nurses. Finally, interviewers also investigated the opinions of community members about this new service and their utilisation of it.

Eighty-six nurses responded to this survey. 84% of respondents were still providing dental care; 70% provided both medical and dental services and 14% provided dental care services only. On average, nurses worked six hours per day. The bi-functional nurses estimated that they attended 20 medical and one dental patients daily, whereas nurses who offered dental care saw about 3 to 6 dental patients daily. Periodontal disease and facial swelling associated with dental caries were the major presenting problems, and consequently, the main service provided by nurses was emergency care, mostly involving tooth extraction. Twenty-nine (40%) dental nurses had conducted school preventive programs, some of which had run for two to four years. Some nurses said that because they have only one set of instruments, they burn or wipe instruments with alcohol between patients when busy. 35 respondents had attended continuing education seminars or workshops. Job satisfaction was rated highly by almost all respondents and they were confident in their ability. Of the 86 respondents, 71 nurses perceived barriers to the delivery of dental care. The main barriers included (1) insufficient materials and instruments, (2) lack of support from managers, (3) or being too busy with medical duties.

The main findings from the survey of the managers were that all 30 health centre managers interviewed considered that the presence of a dental nurse at their health centre was very useful. On a five-point scale (1= not competent, 5 = expert), forty percent of the 30 managers rated the treatment ability of the dental nurses at grade 4, and another forty percent indicated grade 3. Half of the managers recognised that there were insufficient dental supplies at their health center. 25 managers responded that they had plans for future dental activities, which included the provision for oral health education programs directed at the community and schoolchildren. Further needs were identified including (1) a proper plan for the oral health program, (2) sufficient dental supplies and instruments, and (3) additional budget support for oral health promotion activities.

The main findings of the survey of community members were that 70% of the respondents perceived that they were healthy whereas only 34% thought that their teeth were good. 98% perceived that their teeth were important for everyday life activities. Half of the respondents knew about the availability of a dental nurse at the health centre, but only 16% knew about the school preventive programs. 48% of the respondents perceived that the treatment provided by dental nurses was of high quality, but 43% said that they did not know or were unable to comment on the abilities of dental nurses. 73% said that they experienced dental problems, but only 23% had sought for help from dental nurses whereas 57% of people solved dental problems by self-medication or by using traditional herbs. 14% of the respondents preferred to attend a traditional dentist. All 76 patients, who had received dental treatment from dental nurses, said that they were very satisfied with the treatment provided by dental nurses. The majority of dental services were extraction and preventive advice to individual patients.

Recommendations

According to the results of this study and in line with the Cambodia Oral Health Master Plan, the following recommendations should be considered:

A. For the improvement of oral health care delivery system

1. The Dental Nurse Training Course should be continued to meet the dental workforce requirements of the rural population.
2. The number of dental instruments in regular use should be increased to allow nurses to treat more patients and reduce the waiting time for sterilization.
3. The issue of sterilisation is an important one. It needs to be addressed through the provision of adequate numbers of instruments, education and monitoring. Autoclave tape could be used as a simple test of whether a pressure cooker pot is functioning properly.
4. The training course should give more emphasis to the management of difficult operative and post-operative complications, oral health preventive programs, and cross-infection control.
5. Both the Provincial Health Departments (PHDs) and the Ministry of Health (MoH) should (1) establish an oral health bureau within the PHDs technical bureau, (2) develop a dental referral system for each respective level, and (3) provide a dental table/chair, sufficient instruments, supplies, and budget for oral health activities.
6. There needs to be both central (Oral Health Office at the MoH) and local (PHDs) monitoring and support for dental nurses which includes service data collection, clinical audit and advice, ensuring the scope of practice is limited and protocols followed.
7. If possible, workshops or seminars should be conducted at least one a year for both dental nurses and provincial dentists who are responsible for public oral health activities. These meetings would create a good environment for co-operation in implementing oral health programs and for building the "dental team". It also would provide the opportunity for dental health professionals to discuss issues related to oral health care services and, from that, the possible solutions could be found.
8. The job description for each level of oral health worker should be reviewed.
9. Regional dentists and clinic managers need to develop skills to be able to manage the dental system better. They also need to learn about the role of the dental nurse and what their own role is in supporting the provision of oral health services.
10. Measures should be taken to ensure that dental nurses do not undertake procedures that are beyond their training such as prosthetics, root canal treatment, and more complex oral surgery.

11. There seems to be a lack of awareness by the community about the presence and role of the dental nurse - some oral health promotion strategies are needed to inform the public about this.
12. Oral health status and treatment needs in Cambodia should be re-evaluated through another National Oral Health Survey.

B. For the improvement of oral health preventive activities

1. Water fluoridation should be considered in the cities where dwellers use piped water supplies. The benefits of water fluoridation have been recognized in many countries around the world.
2. The Ministry of Health should include budget support for oral health preventive programs.
3. Preventive programs should focus on pregnant women, mothers of young children, and preschool children to encourage positive oral health knowledge, attitudes, and behaviours from the early years of life.
4. School preventive programs should be continued in collaboration with the Ministry of Education and they should be extended to as many other schools as possible.
5. Mass media campaigns and brochures should be developed to encourage people to use fluoride toothpaste, improve oral hygiene, restrict sugar consumption, and create positive attitudes and behaviours towards oral health.

C. Areas for future research

1. The work of primary oral health care workers should be re-evaluated every few years in order to monitor their activities, especially in remote areas.
2. Studies are needed on cross-infection control in both dental public and private clinics as sterilisation is an important issue, especially on (1) sterilisation methods, (2) the use of pressure cookers and related problems, and (3) the re-use of local anaesthesia cartridges or needles.
3. The school preventive activities should be evaluated to determine their usefulness.

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DEDICATION



THIS THESIS IS DEDICATED

*To my late parents who valued knowledge
and who dedicated all of their strength
in guiding and supporting
their children to attain a higher education.*

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List of Abbreviations

AOI	Aide Odontologique Internationale
CPA	Complementary Package of Activities
DDS	Doctor of Dental Surgery
HC	Health Centre
HRD	Human Resource Development
ICC	International Cooperation for Cambodia
IOs	International Organizations
JGAGRP	Japanese Grant Assistance for Grass Root Projects
MOH	Medical Officers of Health
MoH	Ministry of Health
MPA	Minimum Package of Activities
NGO	Non-Governmental Organization
NOHP	National Oral Health Plan
OD	Operational District
OSD	Officier de Santé en Art Dentaire
PHC	Primary Health Care
PHD	Provincial Health Department
POHC	Primary Oral Health Care
RH	Referral Hospital
RTC	Regional Training Centre
TC	Tepirou Chher
UNICEF	United Nations Children's Fund
UNDP	United Nations Development Program
UNFPA	United Nations Fund for Population Activities
WB	World Bank
WHO	World Health Organization

PART I

REVIEW OF LITERATURE

Chapter 1

General Concept of the Primary Health Care Approach and Primary Oral Health Care

The content in this chapter is about the general concept of the Primary Health Care approach (PHC). It also identifies the successes and failures in implementing the PHC approach. From that general concept, it will lead to the primary oral health care definition, goals, and strategies in providing oral health services, especially in developing countries. The last part is about the integration of primary oral health care into the general health activities.

1.1 General concept of the primary health care approach

In recent decades, the World Health Organization (WHO) has been promoting the primary health care approach to improve the health situation in many developing countries. The purpose of the primary health care approach is to provide essential health care needs at low costs that countries and communities can afford. The key principles of the primary health care approach are:

“ ... (i) universal accessibility and coverage on the basis of need, (ii) community and individual involvement and self-reliance, (iii) intersectoral action for health, and (iv)

appropriate technology and cost-effectiveness in relation to the available resources.”
(Tarimo and Webster, 1996)

Primary health care, therefore, gives most emphasis to providing basic health care needs and preventing diseases that could improve the quality of life.

The concept of primary health care has strong social and political implications. It introduces a health strategy that not only provides health services, but also addresses the social, economic, and political factors that cause poor health in the population. Evans and Bedi (1999b) noted that two essential resources were necessary to operate a health care program successfully. Those resources are qualified health workers and political support. Without political support, the process of health care program will suffer. When those two resources are available, community participation and multisectoral actions will enable the implementation and maintenance of primary health care programs (WHO, 1987). These two actions have a strong relationship with each other. Without community participation there may be no multi-sectoral cooperation and integration.

Most health problems in developing countries are due to malnutrition, poor environment, poor sanitation, and widespread communicable diseases (WHO, 1988). However, most of these problems could be solved by PHC activity alone. Because the PHC approach focuses on basic aspects of health and causes of ill health and disease, people are persuaded to take care of their own health. Consequently, they will change their beliefs, their behaviour, their attitudes and will take action to prevent ill health through self-reliance, social action, and intersectoral action.

Many developing countries such as Sri Lanka, Thailand, Bangladesh, Indonesia, Nepal, Tanzania, Zambia, and Cambodia have introduced PHC into their health system (Bezroukov, 1977; Saparamadu 1986 and 1996; Jeboda, 1989 and 1990; Mosha, 1990; MoH, 1994; Songpaisan, 1994; Mautsch et al, 1995; Mazhani, 1995; Anumanrajadhon et al, 1996; Ntabaye et al, 1998; Helderma, 2000 and 2002; Reenen, 2001). As a result, many health programs have been operating according to PHC principles. The PHC approach has been accepted as the system for health care planning in developing countries.

1.1.1 Successes and failures of the PHC approach

Tarimo and Webster (1996) have analysed PHC outcomes and have noted both successes and failures.

On the positive aspect, firstly, the concept of PHC has attracted general acceptance among governments and organizations around the world. Firstly, it has provided strategies to encourage and to ensure more equitable distribution of health resources and health care services. It has also developed new types of health workers who could adapt to the needs of a particular country within available resources. Secondly, the infant and child mortality rates have declined due to the effectiveness of the immunization programs and some diseases have even been eliminated. Thirdly, social conditions have been improving in some countries due to economic development. Through this improvement, more resources have been provided to promote health care for all society. Lastly, the dissemination of strategies that were successful in overcoming practical problems were considered by Tarimo and Webster to be the main factors that encouraged improvements in the health sector. These strategies provided practical experiences to solve common health problems in the community.

On the other hand, negative aspects have also appeared in the implementation of the PHC approach. First of all, the key people involving in the PHC activities, such as governments, health workers, and supporter agencies, have provided little attention to important issues in setting priorities and managing activities. Another point was that the incidence of AIDS and tropical diseases is increasing rapidly in developing countries and other diseases, such as diabetes and lung cancer, are growing everywhere. Although some countries have met with success in reducing mortality, the levels of morbidity have either remained high or have even increased. The most important negative aspect was that although many health systems have been reformed to introduce the improvements of efficiency and adequacy, differences in the quality and quantity of health care services among different levels of society have changed little, and in some places have even increased.

1.1.2 Improving the primary health care approach

For future health development in developing countries, Tamiro and Webster (1996) emphasized four key areas in the PHC approach.

Partnership towards a new social contract and code of ethics

This action would involve all individuals, communities, governments, and agencies in all countries in sharing resources to ensure health for all. The establishment of a district level infrastructure would help to create a balanced mix of preventive, curative, and rehabilitative programs. Health care delivery at the district level, under supervision and with appropriate support, could be provided jointly or in a coordinated manner by different programs in a way that was cost-effective, integrated, and convenient to clients. The government, especially ministries of health, would play an important role in promoting and marketing public health by mobilizing resources and coordinating activities to provide a high standard of services in terms of both safety and quality. However, health workers should be provided with basic training and continued education in the PHC philosophy that will allow them to work effectively in their communities.

Targeting the underprivileged

As the gap in levels of health care available between socioeconomic and ethnic groups in each country is still wide, as well as between developing and developed countries, priority targeting to the disadvantaged communities must be emphasized. Special support is needed for those communities to improve equity in accessing health care services.

Ensuring the quality of health services

The quality of health care services at health centres, hospitals, outreach programs, and community-based activities in developing countries must be highlighted. The challenge in

developing countries is to improve performance of services in terms of both quantity and quality.

Rethinking priority setting in poor countries

Priority-setting is an essential policy in societies where resources are scarce. The methodology is based on epidemiologic data, sources of morbidity and mortality rates, the prevalence of infectious diseases that cause most of illness and deaths, and resources available. Research, therefore, is very essential to improve the quality of data on which the priority setting process depends.

1.2 Primary oral health care

Primary oral health care (POHC) has been defined as:

“ ... the diagnosis and prevention of oral diseases, using as much as possible available local technology, based on full co-operation and participation of the community, and the provision of emergency oral health services within the community, aimed at relief of pain and maintenance of good oral health.” (Jeboda, 1989)

This definition shows that primary oral health care is based on the main principles of the PHC approach and has a strong relationship to it.

According to a WHO expert group, oral health care should have two main goals:

“ ... (1) to influence the population's way of life so that oral health is promoted or maintained, and oral disease prevented; and (2) to provide adequate treatment to those members of the population affected by oral diseases so that disease is arrested at an early stage and loss of function is prevented.” (WHO, 1987)

In order to adopt the primary oral health care definition, two necessary activities were stated by Jeboda (1990). The first activity was preventive oral health care services and the second activity was emergency oral health care services.

The purpose of implementing primary oral health care, therefore, is to provide emergency oral health care services and oral health prevention and promotion services by using appropriate technology and available resources.

Based on the principles of the PHC approach, primary oral health care aims to create equal opportunity for all population members to access care services, which concentrate on prevention and health promotion together with the participation of the local community by using appropriate technology in the multisectoral framework (Mautsch and Dickson, 2000). Although primary oral health care delivers services, PHC programs need to be supported by research to provide information about the community requirements and the trend of professional training should be adapted to those needs.

In developing countries, the training of primary oral health care workers should address the special needs of the various communities (Jeboda, 1989 and 1997; Songpaisan, 1994). This comment was based on the PHC strategy that should provide for large numbers of personnel, at less cost, to carry out specific tasks. The training should also be based on the patterns of oral disease prevalence of the population in a particular country.

As school based preventive programs are a part of primary oral health care, this activity should be taken into account as part of provision of oral care services. Mosha (1990) reported that oral health preventive activities had been introduced in preschools, primary schools, and in maternal and child health care clinics in Tanzania. Non-dental health personnel, such as schoolteachers and the Maternal and Child Health personnel (MCH), were trained in oral health care activities for carrying out dental health preventive activities for children and women. They, the non-dental health personnel referred to, usually live and work close to the local population and they are well respected by them. This approach is useful in countries where dental human resources are limited.

The basic strategy of primary oral health care is to develop community members' awareness about oral diseases. The important messages are that oral diseases can be prevented and that it is known how to prevent them from happening. Because oral health is a part of general health, community members should know that their general health is affected by oral disease. From this point of view, oral health should be integrated into the delivery of the basic health care for the whole population.

1.3 Integrating oral health into primary health care activities

As common oral diseases are related to hygiene and diet, oral health should be more easily integrated into general health than other diseases (Mautsch, 1995). Oral hygiene could be included in the teaching of general hygiene because it is a part of body grooming and cleanliness. Reduction in sugar consumption will not only decrease dental caries, but also it will reduce general health problems such as diabetes, heart disease, and obesity. Therefore, a population-strategy should be adopted and promoted rather than a high-risk group strategy. This would provide a wide range of understanding about what health is and creates an awareness of the prevention of ill health in a large number of the population.

Some examples of integration have been provided in the report of a meeting of WHO experts (WHO, 1996). Several integration activities such as service provision, management and support, and organization components were included. However, the most important part in this review is focused only on the integration of service tasks, using multipurpose staff to provide general health care together with oral health care.

The advantages and disadvantages of integrated health care programs and vertical programs (such as dentistry, which operates independently from medicine in most countries) were provided by the WHO study group (WHO, 1996) (Table 1.1) and the assumptions and beliefs underlying of each approach also have been documented (Table 1.2).

Table 1.1: Advantages and disadvantages of vertical programmes and integrated health care
(Source: WHO technical report, No. 861, p. 6, 1996)

Vertical programmes		Integrated health care	
Advantages	- May set clear objectives and targets, which motivate those working on the programme. - Operational planning of activities may lead to more efficient and effective delivery of the service. - May provide performance incentives leading to higher quality of care. - Ability to monitor the restricted outputs and outcomes related to the program may improve identification and resolution of problems.	Advantages	- Allows delivery of a range of services selected to suit national health policies and local needs. - Incorporates inputs from different components of the health system and thus reflects the multidimensional concept of health. - Has the capacity to take on new activities and react to disasters. - Allows multipurpose use of resources, such as personnel, and allows more outputs to be achieved for a given input. - Allows planning and management of area health services according to local circumstances with appropriate political, intersectoral and community involvement. - Makes it easier to respond to user needs, which saves time, and encourages personalized service and continuity of care and thus increases convenience and user satisfaction. - Allows a more holistic approach to health, centred on the health needs of individuals and communities
Disadvantages	- May concentrate resources on a limited range of problems, detracting from development of comprehensive health systems. - Heavy dependence on donor funding with consequent sustainability problems and vulnerability to changing fashions on donor policy. - Single-purpose structure parallel to the general health service, with budgets controlled and targets set from above rather than by area health authorities. - May overload grassroots health services with many uncoordinated tasks, training programmes and reporting systems, usually determined by the central level of the health system. - May fail to mobilize sustained political and community support because intervention is imposed from above. - Cost-effectiveness may reduce as time goes on.	Disadvantages	- May fail to set appropriate priorities. - May fail to adopt a programming approach, with clearly defined objectives, targets, operational planning and monitoring by outputs/outcomes. - May fail to achieve the levels of output and impact in key health care areas that would be reached by single-purpose programmes. - May cause uncertainty and dissatisfaction among health service employees if adequate explanations and reassurances are not given.

Table 1.2: Assumptions and beliefs underlying vertical programmes and integrated primary health care
(Source: WHO technical report, No861, p.11, 1996)

	Definition of health	Efficacy of health technology	Community	Health professions	Equity
Vertical program	Absence of disease Reduced incidence of prevalence	Selection of interventions which are biomedically cost-effective	Provides resources/ organization for health interventions	Provide health care Limited or no influence on determinants of health	Limited to specific component of vertical program
Integrated PHC	Protection and promotion of health and well-being	Adaptation of interventions to local socioeconomic and health conditions	Responsible for own community health program and shares responsibility for health service	Provide health care and facilitate health promotion	Enhanced across wide range of health services

Oral health development, as an integral part of general health development, is an area where integrated action could produce more positive results. Health personnel could be trained to provide oral health education and emergency oral health care as an extension of their existing tasks. This would guarantee the full integration of oral health into the PHC system.

The meeting of WHO experts also provided an economic perspective on integrating oral health care into the PHC system (WHO, 1989). Health infrastructure, such as salaries and buildings may already exist, however, for training of additional skills in primary oral health care, some additional expenses must be considered, such as the cost of trainers, oral health education materials, consumable materials, and transportation expenditure. Long-term support for oral health activities after the completion of training must be taken into account to ensure the sustainability of the services.

According to Helderma et al (1999), the provision of additional skills in oral health emergency care and oral health prevention to health personnel at health centres is a good example of integrating oral health into the existing health care system. This is due to the fact that the demand for oral care at health centres is mainly emergency care which may be carried out by nurses or medical personnel following a short training program. However, dentists or auxiliary dentists would be needed at referral hospitals when a higher level of oral care is required.

The integration of oral care into general health care could be achieved, if functional local structures exist, for example, at the district level of the health system. According to the WHO study group (WHO, 1996), the district health system is a good environment for conducting intersectoral collaboration because they already offer multidisciplinary services.

As mentioned above, political factors play an important role in policy making for health activities and in planning health workforce resources. The process of integration is successful only if it has a strong political obligation. Without political support, the integration activity does not happen or if it is already implemented, the outcomes are not productive.

Chapter 2

Training of Primary Oral Health Care Workers and its Evaluation in Developing Countries

This section provides a brief introduction to oral health situations in some developing countries. The information includes the general background of oral health care services that have a focus on the training of primary oral health care workers. It also provides some information concerning evaluations of service providers' workload and the utilisation of the dental workforce by the population.

2.1 General background

In developing countries, about 80% of the population live in rural areas. In those disadvantaged communities, oral disease levels have tended to rise in recent decades, whereas resources (personnel, equipment) are scarce (Saparamadu, 1986). As a result, there is a high level of unmet oral health care needs.

The major treatment needs for these communities are pain relief, tooth extraction, and other dental emergency care. Most treatment procedures could be provided by basically trained health workers who work in the community using a minimum of equipment and materials. The dental auxiliary is an appropriate type of health worker for providing simple oral health care and oral health education (Sonpaisan, 1994). However, dental workforce training should be conducted according to specific goals, settings, and resources available. In

addition, non-dental personnel such as school teachers, health care workers, and health volunteers could conduct oral health preventive activities effectively.

In developed countries and some developing countries, for example Australia and Sri Lanka, dental auxiliaries provide dental treatment only for children (school dental services) (Saparamadu, 1996; Riordan, 1997; Helderma et al, 2000) whereas in other countries such as Nigeria, Tanzania, Nepal, Bangladesh, dental therapists/nurses provide dental care for both adults and children (Sundram, 1973; Jeboda, 1984 and 1989; Noar, 1990; Mazhani, 1995; Helderma et al, 1999; Gibbons et al, 2000; Reenen, 2001).

2.2 Primary oral health worker training in some developing countries

Experiences from some developing countries in Asia and Africa discussed below provide some evidence about the integration of oral health care into health care delivery systems. Many training courses for primary oral health care personnel were established to increase the oral health workforce. Some countries have even trained medical staff to become primary oral health care providers.

Bangladesh, Indonesia, and Nepal

A survey in rural Bangladesh and Indonesia has shown that the oral health of people living in remote areas is very poor due to a lack of knowledge about oral health (Helderma et al, 1999). Oral health care services are not available in most rural areas in these countries where more than 80 per cent of the population live. The absence of oral health care services in rural areas is partly overcome by traditional healers and traditional dentists.

A pilot project for training health workers to provide oral health care was established in Bangladesh. This project tested the integration of oral health into the primary health care system. Health workers and family welfare assistants at health centres received a one-day

in-service training session on oral health education and oral disease prevention. These trainees provided oral health messages to patients in combination with their daily medical duties. However, it is not known whether these projects have been evaluated.

A similar project was conducted in Indonesia. Nurses and midwives received a short training course in oral health education in order to provide a positive oral health message to mothers of small children and to pregnant women. Schoolteachers also were trained to carry out preventive programs for primary school children.

In Nepal, health assistants, who are working at health care centres, attended a four to six weeks training program on oral health and basic oral treatment (Reenen, 2001). These personnel work in remote areas and provide basic oral care services in communities where dentists are not available.

Sri Lanka

According to Saparamadu (1986 and 1996), Sri Lanka has a well-developed public health system. The Volunteer Health Workers and the Family Health Workers, who are working closely with the community, provide necessary health care services in a program of regular home visits. Oral health care forms one element of the primary health care package. Thus, oral health services are an integral component of general health services under the guidance and supervision of Medical Officers of Health (MOH).

The first National Oral Health Survey in Sri Lanka was conducted in 1984 and revealed a high caries experience in the primary dentition (dmft=4.4) of children aged 6 years but it was low in the permanent dentition (DMFT=1.9) at the age of 12 years (Saparamadu, 1996). This picture of oral health status enabled, oral health goals and strategies to be set, including a program to develop an appropriate workforce.

The training of school dental therapists, based on the New Zealand system, was established. This type of dental worker provides oral health care services to preschool and school children up to age of 13 years. In addition, primary school teachers were trained on the basics of oral health and oral health education through a series of workshops conducted

in various health divisions in the country. Hence, close links between the school dental service and primary school teachers were established in this preventive program to promote good oral health habits for school children.

Family Health Workers were trained in the basics of oral health through three-day workshops on oral health education and screening procedures. Simple basic skills were taught including how to provide emergency care, such as control of post-operative bleeding, relief of pain and infection, scaling, prophylaxis, and oral health prevention. These activities integrate positive oral health messages in maternal and child health clinics and also in their home visits. The Village Health Volunteers were taught about oral health problems and how to achieve positive habits for oral health. Through them, community members receive positive messages and create good attitudes that could lead to the adoption of new health promoting behaviours.

Thailand

In Thailand, the National Oral Health Program was developed in 1977 as an integral part of the existing national health care delivery system (Songpaisan, 1994). The plan emphasises health development in rural areas, which is implemented by three groups of health workers: primary health care workers, dental nurses, and dentists. Primary health care workers provide simple preventive and dental care services at the sub-district level, whereas dental nurses provide simple preventive, curative and restorative services at community hospitals. Dentists act as leaders in supervision and they are in charge of complex care delivered at the provincial and regional hospitals.

In the 5th National Development Plan, the goals for oral health emphasised an increase in the integration of oral health into the primary health care system at sub-district and village levels (Anumanrajadhon et al, 1996). The Government of Thailand established the Inter-country Centre for Oral Health (ICOH) in Collaboration with the World Health Organization in July 1980 (Phantumvanit and Songpaisan, 1981) and the Community Care Model for Oral Health was developed. Three categories of primary health care village workers (oral health examiner, oral health educator, and village scaler) were trained in basic primary oral health care to perform some dental care activities such as dental examinations, preventive

advice, and basic and emergency care. They are responsible for oral health education and promotion, maintaining the oral health awareness, and for ensuring community participation in the primary oral health projects. The duration of the training ranged from one day (repeated at regular intervals) to two weeks.

Tanzania

Similar with other developing countries, more than 80% of Tanzanians live in poverty in rural areas (Ntabaye et al, 1998). Due to inadequate dental human resources, dental care services are available only in urban clinics or hospital. No public transport is available and people have to walk long distances to reach a dental health clinic when they have dental problems.

In 1988, the government developed a new policy to provide basic emergency oral services for rural communities at health centres. Non-dental primary health care workers called Rural Medical Aides (RMAs), who are working in rural health centres in Tanzania, received training on emergency oral health care services (Ntabaye et al, 1998; Helderma et al, 1999; Reenen, 2001). The duration of the training was two weeks. The oral health service included oral health education, emergency care, such as simple tooth extraction, draining abscesses, pain control and the management of acute oral infection with appropriate drug therapy, first aid for maxillo-facial trauma, and referral of certain conditions to hospital clinics.

Furthermore, primary school teachers and maternal and childcare staff were trained to carry out oral health preventive activities for school children and pregnant woman (Mosha, 1990). The oral health activities included oral health education, examination, and first aid. Through them, oral health messages are passed to more people within the community.

Botswana

In Botswana, the Primary Health Care approach was adopted in 1978 and in 1983. The National Dental Health Plan introduced strategies that integrated oral health messages into

general health messages (Mazhani, 1995). Different types of workers at the community level, such as school teachers and health care workers, would be the main sources of oral health promotion messages.

Health workers, who are working in the clinics and hospitals at the community level, were trained to provide oral health care services. This training provided some skills in dental health education, oral examination, and simple dental treatment. The health workers were expected to provide oral health messages to the community, conduct dental examinations of schoolchildren, offer pain relief on demand, and refer cases beyond their capacity to the next level of care. A basic set of dental instruments was provided to the participants at the end of the training program.

Peru

Similarly with other developing countries, Peru is faced with a dental workforce shortage. Most dentists are working in private practice or, if they work in public service, they are stationed only in a large town or city (Mautsch et al, 1995). People who live in rural villages have to travel a long way at a high cost to obtain a simple dental service. Some people obtain relief from dental pain by using traditional remedies.

An oral health project was established. Health workers at remote health centres and health posts were trained in two separate courses, each of two weeks duration, to carry out prophylactic and simple dental care. In course I, the participants were taught the basics of anatomy and physiology, and the causes and prevention of the main oral diseases. In course II, they were taught the basics of emergency dental care such as diagnosis, treatment planning, local anaesthesia, extraction, scaling, and how to manage post-operative complications. At the end of the second course, the participants received a set of basic dental instruments and materials. That set of instruments was the property of the respective health centre/health post.

2.3 Evaluations of dental workforce utilisation in developing countries

The above examples of training programs for primary health care workers provide good examples of dental workforce development based on the primary health care approach. These programs appear as suitable strategies for addressing oral care needs within disadvantaged communities. However, the most important question to consider is how effective are the dental services provided by this type of health worker after they have completed their training.

Several evaluations have been conducted to assess the dental work practices of dental personnel and to evaluate the adequacy of integration programs in some countries. Some studies aimed to examine the work practices of the service providers and problems related with the provision of dental care services. Other studies examined the acceptability of dental care services by the consumers.

In Peru, during a 10-year period, 12 training courses produced 66 health workers who were able to provide basic oral health care for their remote communities (Mautsch et al, 1995). About 75% of trained workers were still providing oral care for their community, but some issues were identified that needed attention. These included (1) lack of preventive and outreach activities, (2) lack of dental supplies, (3) lack of supervision, (4) lack of continuing education, and (5) professional resistance. Some health workers had transferred to work in other places or other departments.

In 1989, all nurses, who had participated in the oral health orientation course in Botswana, were asked to complete a questionnaire that assessed the integration of oral health care into general health care services (Mazhani, 1995). About 90% thought that oral care delivery was a part of their duty since they were trained to perform dental emergency care and that health care workers should, therefore, be involved in the delivery of oral health care services. The dental services provided mostly involved tooth extraction and oral health education. However, most nurses were not satisfied with the referral system. They claimed that they received very little support from the dental team. They identified a weakness in the

system for monitoring and supervising the dental activities. The work morale appeared to be low due to low payment of the staff.

Other studies have been conducted to assess the utilization and patient satisfaction with the emergency oral health care in rural Tanzania. In 1993, Sarita and Tuominen conducted a study about the use of health care services in two rural communities in Tanzania. Due to the lack of dental practitioners in their villages, many subjects sought help from medical professionals when they had dental problems. It was concluded that dental health care had not been given a high priority.

Ntabaye et al, (1998) conducted another study about the utilization of emergency oral health care services in rural Tanzania. More than 90% of the community members who participated in the survey knew about the availability of emergency care at health centres. The main sources of knowledge about the presence of dental services were from health facilities or from people who had utilized the services. The main barriers to utilization of services were (1) lack of money to pay for treatment, (2) problems with transportation, and (3) fear of dental treatment.

Another report of patient satisfaction with emergency oral health care in Tanzania was provided by the same authors (Ntabaye et al, 1998). More than 90% of respondents reported that they were satisfied with emergency services provided by Rural Medical Aide workers (RMAs). They described that the RMAs were very friendly, that they treated patients with care and respect, and provided a high quality service. Only 10% of the respondents had some doubts about the skills of RMAs in providing emergency dental care. Some of them reported that they did not receive any oral health instruction or any explanation from the workers of the problem before their tooth was extracted. More than half of the respondents thought that the number of oral health workers was not enough for the needs of the community.

This review of training programs and their evaluation raises some points for consideration. In developing countries where dental manpower is in short supply and where there is a limitation of resources, the training of dental auxiliaries or other health workers to provide basic oral health care and oral health prevention seems to be the most useful way to solve oral health problems in the poor communities in terms of improved accessibility to the

services. However, any service that depends on auxiliaries needs to include provision for professional support and monitoring after training. The need for support is important because in most countries, there is a problem of professional resistance to the training of dental auxiliaries. It was shown that oral health is not given a high priority in developing countries, but because oral health development is a part of general health development, oral health care should be integrated into the primary health care approach at the basic health care level.

Chapter 3

Training Primary Oral Health Care Workers in Cambodia

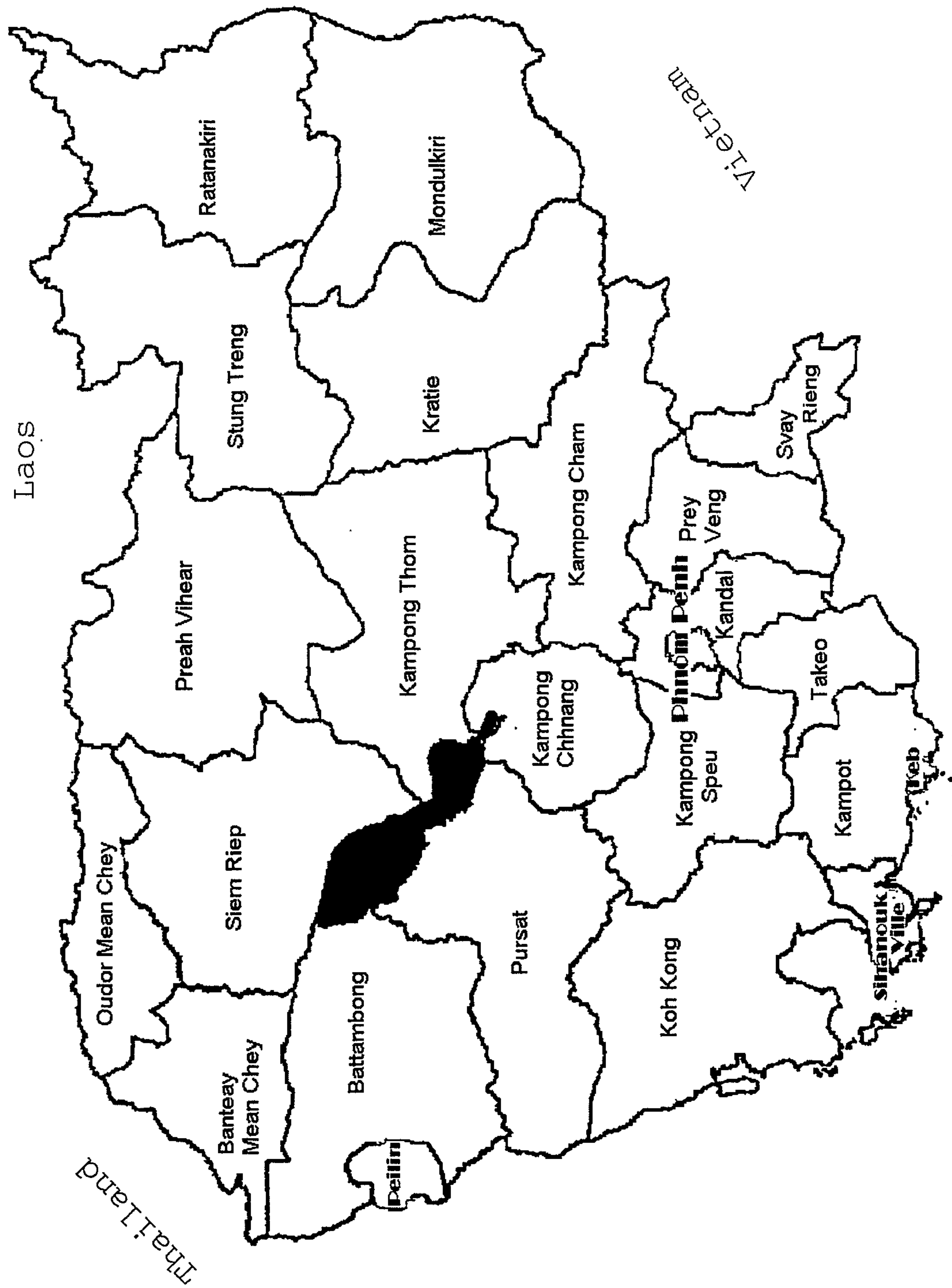
This chapter provides brief background information about Cambodia. The different characteristics that are considered in this chapter are location, demography, education, and health services which provide the setting for the primary oral health workforce training and its evaluation.

3.1 Location, demography, and education

The Kingdom of Cambodia is situated in South East Asia. Cambodia has a total area of 181,035 km² and is divided in 20 provinces and four municipalities. The neighboring countries are Thailand, Laos, and Vietnam (Figure 3.1).

According to the result of the last census conducted in 1998, Cambodia has a total population of 11,437,656 with a male to female ratio of 93:100 (MoP, 1999). The annual growth rate was 2.49%. The larger proportion of the population (84%) lives in rural areas whereas only about 16% are urban dwellers. The mean national population density is 64 per km². The population in Cambodia has a low level of education. More than half of the population has not completed primary school. The adult literacy rate is 67.3 and only 0.8% of the total population have obtained tertiary of education. About two percent have never been to school at all.

Figure 3.1: Map of the Kindom of Cambodia



During the four-year period of the Khmer Rouge regime, the whole country was destroyed by genocide and starvation. Professional personnel were killed and almost all infrastructures were destroyed. After the Khmer Rouge period, Cambodia was left with few resources and recovery was slow due to many more years of civil war. The civil war ended in 1991 following the signing of a peace agreement.

3.2 General Health

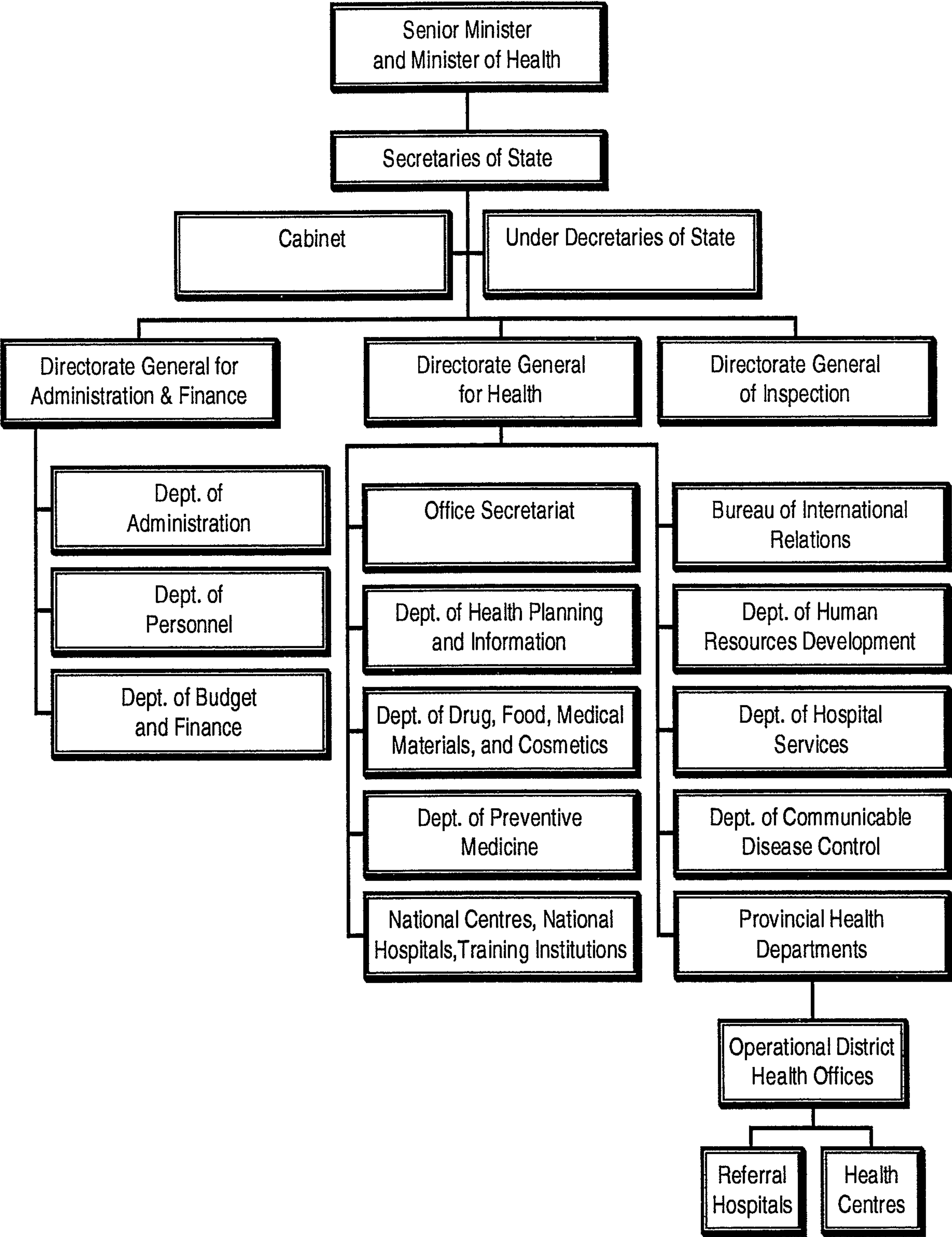
After the Khmer Rouge regime, Cambodia was left with very limited resources. Health activities are basically the responsibility of the Ministry of Health. Although a general health policy has been established to provide health care to the whole population, in practice, the health system does not adequately address population needs. Many issues related to this failure have been identified and include (1) inappropriate health posts and facilities, (2) lack of curative and preventive activities, (3) no clear difference between commune and district level activities, (4) workforce shortage and poorly skilled staff, and (5) inadequate coverage of the health system (MoH, 1996 and 1997). In addition, an inadequate government budget for the health sector and low salaries for government staff results in a lack of motivation to upgrade the quality of public health services. Consequently, the patients prefer to use private health care services that are associated with high cost but poor quality.

Compared with other countries, the health status of Cambodian people is among the lowest in the Western Pacific Region (MoH, 1999). The Infant Mortality Rate is high (89.4 per 1000 live births) and the Under Five Mortality Rate is 115 per 1000 live births. Life expectancy at birth is only 54 years. Furthermore, Cambodia is a country with a high prevalence of HIV test positive cases and Hepatitis B carriers.

Currently, the public health system operates at three levels: central, provincial, and operational district level. This last level includes the health centres and referral hospitals (MoH, 1999). The organisational structure of the Ministry of Health is presented in Figure 3.2.

Figure 3.2: Organization Chart of the Ministry of Health, Cambodia

(Source: Health Situation Analysis 1998 and Future Direction for Health Development 1999-2003, Department of Health Planning and Information, the Ministry of Health, 1999, page 8)



Non Government Organisations (NGOs) also operate in Cambodia. They work mainly in co-operation with the government hospitals and clinics.

3.2.1 Health policy and strategy

In 1994, with the support of the United Nations Children's Fund (UNICEF), the United Nations Development Program (UNDP), the World Health Organization (WHO), and the World Bank (WB), the health system was reformed and reorganized (MoH, 1997). The main objectives for the health system reform set by the Ministry of Health are:

“ ... to improve and extend primary health care through the implementation of a district based health system.” (MoH Master Plan, 1994-1996)

New policies give priority to basic level health services for all people, decentralization of financial and administrative functions, human resource development, the prevention of communicable diseases, the promotion of population health in all dimensions (general health, mental, oral health, and eye care), and finally, the strengthening of the health information system (MoH, 1999). The health system reform redefined the roles and functions of each level of the health care system and places great emphasis on the integration of all vertical health programs at district and commune levels. The basic integration package of health care at these levels is referred to as the Minimum Package of Activities (MPA) or the Complementary Package of Activities (CMA), which is based on prevention, promotion, and outreach multipurpose services.

Health centres deliver primary health care according to MPA policy. Health centres cater to about 8,000 to 12,000 inhabitants. Basic levels of health services include taking care of common health problems such as malaria, sexually transmitted diseases, and diarrhea disease (MoH, 1996). Also included are emergency care, simple surgery, and the management of the chronic diseases such as tuberculosis and leprosy. There is a program for infants aged 0 to 4 years that provides for vaccinations, the management of severe malnutrition, and prevention of vitamin A deficiency. It also gives emphasis to women's health by providing for birth spacing and care for pregnant women including both antenatal and postnatal care, anti-tetanus vaccination, and prevention of anemia. In cases where

treatment is beyond the capacity of staff or facilities at health centre clinics, patients are referred to second level care. The most important concept is that health promotion should be integrated into all activities.

More complicated cases are managed at referral hospitals where the optimal size of the population is between 10,000 to 200,000 (MoH, 1996). Health service activities include the management of referred cases, medical and surgical emergency operations, complicated deliveries, and simple surgery cases. Also included are laboratory diagnosis, radiological diagnosis, and ultrasound diagnosis. Dentistry and ophthalmology are also included at this level.

The overall goal of the Ministry of Health is:

“ ... to promote people's health enabling them to participate in the development of the economic sector and reduce poverty in Cambodia.” (MoH, 1999)

The main strategies to achieve the above goal, therefore, include the promotion of health for women and children, reduction in the incidence of communicable diseases, improvement in coverage of public health services, and improvement in quality and efficiency. Strategies have also been developed to upgrade the professional capacity of government health staff, to ensure appropriate supplies of drugs and other supplies and equipment to the public sector, and to upgrade technology and management at referral hospitals. In addition, the private sector is being encouraged to be a true partner of the Ministry of Health in service delivery and also in promoting consumer awareness of positive health behaviour and services utilization. Moreover, the laws and legislation related to the health sector are being strengthened and enforced; the health management system is being reformed and upgraded at each level, and health policy is being developed based on evidence-based studies.

3.2.2 Human resource development

Human resources in the public health sector are poorly distributed to meet the health requirements of the population. This is due to inadequate skills, low motivation, and very low salary levels. As a result, public health services are of a low quality and many patients seek help from the private sector or rely on self-medication.

One of main policies of the health system reform in Cambodia was human resource development (HRD) (MoH, 1999). HRD includes three main aspects: planning, training, and management. It aims to provide for quality of care, accessibility, and equity in service delivery for all population groups. The main objective of the MoH for human resource development is:

“ ... to ensure that the number and quality of health staff deployed provide an efficient, effective, sustainable and equitable level of service, consistent with the health needs and within the country's economic resources.” (MoH, 1997)

Human resource development in Cambodia places a priority on the upgrading of staff skills at all levels and on the rearrangement of health staff. Supported by the Asian Development Bank (ADB), the MPA modules have been developed (MoH, 1997). Health centre staff, according to the new policy, will receive in-service training on MPA whereas referral hospital staff will be trained in more specialized areas regarding Complementary Packages of Activities (CPA).

Regarding the redistribution of health staff, a policy of recruitment of new graduates to work in districts and regions of greatest need has been adopted. This approach has been encouraged by incentives such as providing staff housing and special allowances for remote areas.

3.3 Oral Health

Oral health care infrastructure suffered as other sectors did during the Khmer Rouge reign. Dental equipment was destroyed and almost all oral health professionals perished in this period. Of six dentists only two survived and they now both live outside the country, and only 34 out of 130 dental health officers survived (Durward and Todd, 1991; Chheng, 1991).

After the revolution in 1979, those 34 dental health officers were given additional training by Vietnamese teachers to become dentists. The only dental school reopened in 1984 for new dental students and the Doctor of Dentistry program commenced in 1987. In 1985, nine students (including the author) were sent to study at the Faculty of Odonto-Stomatology in Ho Chi Minh City, Vietnam.

3.3.1 Oral health status

From November 1990 to March 1991, the first National Oral Health Survey was conducted by the World Concern International Organization in cooperation with the Ministry of Health (Durward et al, 1991). The survey found that dental caries and periodontal diseases were widespread in Cambodia. Periodontal problems were identified in all age groups and they increased with age. About 96% of 12 year-olds, on average, had calculus in 3.9 sextants and had a mean DMFT of 3.2. However, caries experience in the primary dentition was at a high level. Urban 6-year-olds had, on average, 9 decayed teeth. Oral hygiene was poor and a high level of betel nut chewing among women, and tobacco smoking among men, was found.

Most Cambodian people had never had dental treatment. Their oral health knowledge, behaviours, and attitudes were not conducive to achieving good oral health. Most subjects who participated in this survey did not know about the causes of tooth decay. Only one-thirds of adult subjects thought that dental caries was preventable and about one-fifth believed that gum disease could be prevented.

3.3.2 Oral health services

After the civil war, oral health care services were available only in the cities and in some provincial hospitals. In some provinces, there were no dentists or auxiliary dentists. Dental facilities were very poor, and even though dentists were sent to work there, they could only provide limited emergency dental care, for example, tooth extraction. There is a huge unmet need for dental care, especially in the rural population. Most people solved their dental problems by self-medication or sought help from unqualified dentists (traditional dentists). Oral health was not seen as a priority in comparison with other general health problems.

Durward et al (1991) identified the reasons why people had never received dental treatment. The main reasons were that there was a lack of knowledge among the community members about (1) where to go for dental treatment, (2) what can prevent dental problems, and (3) what treatments are available and appropriate. In addition, many people were fearful of dental treatment. The unavailability and inaccessibility of treatment facilities reduced motivation to seek dental treatment. Cultural and traditional beliefs and behaviours were other barriers that prevented people from accessing dental care. Another important reason was that most people live in poverty and they are very busy with essential things of daily life. Finally, the cost of dental treatment and travelling costs were also identified as barriers to dental service accessibility.

Currently, there are two types of oral health services operating in Cambodia; public and private oral health services (www.dentistrycambodia.com).

Public oral health services

Public oral health services are provided by two types of university trained dentists - dentists (DDS) and auxiliary dentists (OSDs). They mostly work at hospital dental clinics in cities and towns in the 24 provinces/municipalities. In addition, general medical nurses, who receive further training in dental care at the Regional Training Centre in Kampong Cham provide basic oral health services for people in rural areas (see page 32). In Phnom Penh,

the capital city of Cambodia, there are nine public hospitals with dental clinics. There is also a public dental clinic at the Faculty of Dentistry. Apart from the services provided at the Faculty of Dentistry clinics, only very basic dental services are offered in the public system.

Private oral health services

Private oral health services are available almost everywhere to those who can afford them. Some private clinics in cities or towns are operated by university-trained dentists (DDS) or auxiliary dentists (OSDs) and some are owned by unqualified dentists (traditional dentists). Unqualified dentists mainly focus on rudimentary crowns and bridges and dentures. Their services are culturally acceptable in Cambodia and more affordable to the public than those of qualified dentists. There were about 300 traditional dentists practicing around the country (Chheng, 1991; Durward and Todd, 1991; Bagguley, 1993). The majority of Cambodians rely on this group for their dental care which is associated with poor technical and poor cross-infection control standards that may provide a greater harm than good for many of the patients.

Oral health preventive programs for school children were first introduced in 1991 with budget support from the World Concern International organization and were continued by Aide Odontologique Internationale in 1998 (www.dentistrycambodia.com). The main goal of this activity was to create positive oral health behaviours and self-reliance among the school children through education and prevention. The preventive activities include tooth brushing, fluoride mouth rinsing, and basic oral health education. All primary school children in Phnom Penh City and about four percent of provincial children have benefited from this program. The estimated cost was US\$ 0.21 per child per year.

In May 1992, a dental bus was donated by the Aichi Dental Association of Nagoya, Japan (Durward, 1994). Since then, the bus has been used for providing dental treatment for school children in Phnom Penh City and its suburbs. The main treatment types provided are simple restorations, extractions, fluoride gel applications, and fissure sealants (when the material is available). Difficult cases are referred to the dental school. About 400 children receive treatment each month and oral health education is also provided. The dental bus

service is still providing dental care with the support of New Asian World (a Japanese Organization) who supply dental materials and cover travelling expenses.

3.3.3 Oral health human resources

Human resources for oral health, in terms of numbers, quality, and management should be improved in line with the overall goals of human resources for health (MoH 2nd NOHP, 1996). The number of qualified dentists is insufficient to meet the requirements of the population and, furthermore, dentists are not the appropriate type of personnel to provide oral health care to the rural population. Firstly, most of the treatment needs in rural areas could be provided by non-dentist workforce at a much lower cost. The second reason is that even if dentists were available, the lack of dental equipment and materials would restrict their ability to offer more complex services.

According to the current situation, the majority of the dental workforce in Cambodia need only be trained to deliver a limited range of treatments that include simple fillings, simple extractions and scaling. Dental auxiliaries are the appropriate personnel to meet most of Cambodia's oral health needs; there is less need for highly trained dentists.

In order to overcome the shortfall in the oral health care workforce, the first National Plan for Oral Health recommended a new short course in Dentistry. This short course was to train medical nurses who are already working in rural communities to provide basic oral health care in those communities (Durward and Todd, 1993; So et al, 1995; Mallow et al, 1997) (see section 3.4).

At present, there are officially three types of dental workforce: doctor-dentists (DDS), auxiliary dentists (OSD), and dental nurses (medical nurses with further training in dentistry who are also referred as a rural primary oral health care workers) (RTC, 2000). The undergraduate training programs for the doctor-dentists and auxiliary dentists extend over 7 years and 5 years respectively. Dental nurses receive 6 months post-graduate training in dentistry. This may be extended to 12 months in the future in line with other post-graduate nursing training programs.

The National Oral Health Master Plan (MoH, 2000) identified some human resource development issues. It noted poor organization of the oral health system because no person was responsible for oral health activities. There was unclear policy about human resource development for oral health. One of the main objectives of the National Oral Health Master Plan was to integrate primary oral health care into the Minimum Package of Activities (MPA) and Complimentary Package of Activities (CPA). Another objective was to establish the second and third training schools in Battambang and in Phnom Penh that could produce more primary oral health personnel.

3.4 Dental nurse training course

In order to meet the dental health needs of the population, it is necessary to train primary oral health care workers who will play an important role of providing oral health services in the deprived communities. The nurses should be trained to have the knowledge and skills to carry out basic dental treatment and community oral health care in their communities.

As mentioned above, the Ministry of Health developed a strategic plan to strengthen the delivery of quality basic health services at the first level of health care, namely the Minimum Package of Activities (MPA) and the Complementary Packages of Activities (CPA) in Operational Districts (OD). Hence, for oral health activities to be supported by the Ministry of Health, they must be integrated within the MPA.

In 1992 World Concern International (WCI) began working with the Ministry of Health to implement further training of medical nurses who were already working in rural districts to provide basic oral health care services in the rural communities (So et al, 1995; Mallow et al, 1997).

3.4.1 Development of the dental nurse training program

The dental nurse training project developed in three phases (RTC, 2000):

Dental nurse training project Phase I

Phase I, from 1992 up to mid 1996. During this period the training was carried out in one district in each province. The duration of the training program was only four and half months. Trainers traveled from one province to another to conduct the training course. The training provided experience in an environment which was similar to the situation where the nurses would be working after they finished the course. The first curriculum was developed in 1993 and revised in 1995 to meet the changing situation of the Second National Oral Health Plan and the new health system policy.

Dental nurse training project Phase II

To integrate the oral health care worker training program into the general health care worker training program, a pilot training program was established at the Regional Training Centre in Kampong Cham in August 1996 according to the Second National Oral Health Plan. The Ministry of Health recognizes these multi-skilled nurses as the most cost-effective means to extend primary oral health care to rural villages. In 1998, the training was officially recognized by the Ministry of Health as a post-training program under the management of the Regional Training Centre in Kampong Cham province (Dickson et al, 2000). The duration of the training was upgraded to six months and the curriculum has been revised and teaching manuals have been prepared. In 1998, a new building for Dental Nurse Training was constructed with financial support from the Japanese Grant Assistance for Grass Root Projects (JGAGRP).

Dental nurse training project Phase III

From 1999 onwards, the training has been fully under the direction of the Human Resource Department of the Ministry of Health. However, it still receives financial support from the International Cooperation for Cambodia (ICC) (formerly World Concern International). On completion of training, each nurse receives a set of basic instruments, some dental supplies, and a pressure cooker for sterilization.

3.4.2 Sustainability of the training

For sustainability of training, as well as sustainability of oral care service delivery, all oral health activities must be integrated into the MPA first level of health care services. Since December 1998, when the Ministry of Health (MoH) officially recognized the dental nurse-training program as a post basic training program, the overall direction and selection of students and staff has been the responsibility of the Department of Human Resources, MoH. However, budget support is dependent mainly on NGOs or IOs, for example, the International Cooperation for Cambodia (ICC), as the MoH has no budget yet to cover all the direct training expenses.

Although the dental training has been integrated as part of post-basic training in conjunction with the Regional Training Center (RTC) since December 1998, oral health care has only been recently officially integrated within MPA since August 2001 (MoH, OH Master Plan 2000).

3.5 Evaluation of the dental nurse training course

3.5.1 The first evaluation

Two years after the dental training program was established, the program was evaluated by Dr. Murray Dickson (the author of *Where there is no dentist*) in 1994. This evaluation identified strengths and weaknesses regarding the sustainability of the program. Suggestions for curriculum development included a special focus on HIV/AIDS, community oral health, student research projects, minimisation of cross infection, and maternal and child health.

3.5.2 The second evaluation

Three years later, in 1997, Professor Martin Hobdell (the Department of Dental Public Health and Dental Hygiene, the University of Texas, Houston, USA) and Dr. Murray Dickson (the College of Dentistry, Saskatoon, Saskatchewan, Canada) conducted an evaluation of four dental projects in Cambodia that were supported by World Concern International organization; one of those projects was the Dental Nurse Training Program. The fundamental purpose of that evaluation was related to the urgent need to have a national level of training that would be operated and resourced by the Cambodian Government.

How would the training continue without a support from the NGO? According to the Second National Oral Health Plan, the training course would need to be integrated within the Regional Training Centre in Kampong Cham as one of the post-basic training courses. This would allow the transfer of the course from NGO to government management. The desire of the Oral Health Plan was not only to continue with the training program, but also, as a priority, to train enough nurses so that eventually there would be one dental nurse at every health centre in the country (MoH, 2nd NOHP, 1996).

3.5.3 The third evaluation

In 1999, Dr. Callum Durward (consultant in Paediatric Dentistry for the Auckland District Health Board, New Zealand) conducted a third evaluation of the Dental Nurse Training Course. He concluded that only secondary nurses (those who had completed a 3-year training program in general nursing) should be selected to undertake further training in oral care. In addition, he recommended that the curriculum should be updated, and that more emphasis be given to basic oral sciences and to identifying and managing oral manifestations of AIDS.

In addition, Dr. Durward conducted a mailed questionnaire survey of the dental workload of nurses after graduation. However, only one-third of the mailed out questionnaires were returned. The result indicated that all respondents except three were still providing oral

health care in their communities. The most common treatment type provided was tooth extraction. On average, each nurse implemented preventive programs in two schools. About 17% of respondents operated private practices and offered root canal therapy and dental prosthetics. More than 90% nurses claimed that there were insufficient dental instruments and supplies, and 73% said that they had no dental chair.

As part of this evaluation, 20 dental nurse students completed questionnaires. The students answered that the course was well organized and enjoyable. All of them said that they were happy to become dental nurses. The dental nurse students perceived some problems on completion of the course. These included (1) lack of transportation for outreach activities, (2) lack of budget, (3) lack of dental supplies, and (4) other issues such as the proportion of time available for dental and medical duties. They expected that when they returned to their communities, they would spend at least 50% of their time on dental activities.

3.5.4 The fourth evaluation

In August 2000, Dr. Dickson and his team conducted a fourth evaluation of the training program. As with the previous evaluations, the training course was found to provide positive outcomes. The evaluators suggested that this program should be identified as a model for other health training programs within the Human Resources Department (Dickson et al, 2000). The training program had addressed the current training and service policies of the Ministry of Health and had prepared district nurses to work effectively in a bi-functional manner at the first level of care, and as a result, had improved the utilization of primary oral health care services by the rural population. The training, in addition, was seen as a good model for teamwork and gave further experience in human caring and role modeling. Moreover, it demonstrated the effective integration of oral health within general health.

However, a system of monitoring and support for the new graduates was suggested. It was recommended that annual follow-up seminars would be an appropriate way to provide such support and evaluation for the graduated nurses. The Provincial Health Departments (PHDs) and the Ministry of Health should continue to develop a supportive environment to enable nurses to fulfill their job descriptions. In particular, it was recommended that (1) an

oral health bureau should be established within the PHDs technical bureau, (2) a referral system for each respective level should be instituted, and (3) that sufficient instruments, supplies, and a budget for oral health activities should be provided.

Since 1992 when the dental training program commenced until August 2001, a total of 255 nurses have graduated from 19 intakes. A field evaluation of the nurses' workload was suggested by Dr. Bernard Decroix (AOI Director) and Dr. François Courtel (AOI Cambodia Coordinator) (2001). Through such an evaluation, information on work practices at health centres, private practices, and school preventive programs could be collected. Other information, such as treatment outside their job description could be gathered and matters concerning supervision and monitoring issues could be explored.

PART II
THE STUDY

Chapter 4

An Evaluation of Primary Oral Care Services Delivered by Medical Nurses in Rural Cambodia

4.1 Introduction

Change is occurring in the training and recruitment of health personnel in ways that meet the needs of the population. The framework of the health system in most developing countries, nowadays, emphasises the Primary Health Care Approach (PHC) that is based on four principles:

“ ... (1) universal accessibility and coverage on the basis of need, (2) community and individual involvement and self-reliance, (3) intersectoral action for health, and (4) appropriate technology and cost-effectiveness in relation to the available resources.” (Tarimo and Webster, 1996)

Similarly, with other health systems, dentistry is facing the challenge of training oral health personnel and deploying them to address to the real needs of the population. Oral health delivery services should also be reorganized so that they can respond adequately to changing needs.

In many industrialized countries, a decline in the prevalence of dental caries in children and adolescents has been noticed in recent decades. The reason for this decline is due to the successful public health preventive measure of water fluoridation, regular use of fluoride

toothpaste, and an increasing public awareness (Murray, 1996). In these countries, due to political stability, economic development, and good social policies, people were encouraged to pursue higher education, which resulted in producing more skilled personnel including dentists and other types of dental personnel. In many of these countries, it seems that there is no human resource shortage but there is still a problem regarding an adequate distribution of these resources, especially in rural areas.

On the contrary, in developing countries, which have the poorest and most numerous populations in the world, oral disease prevalence remains a significant public health problem. Although oral diseases are preventable, a large proportion of the population in these countries still suffer from these preventable diseases. This is partly due to inadequate health policies, inadequate and inappropriate health workforce development and lack of community education and involvement. There is also a lack of awareness about oral disease and its prevention. Most people have low incomes so they may be unable to afford the high costs of oral disease treatment and even the price of fluoride toothpaste may be too high. Most treatment demands in these countries are for relief of pain and tooth extraction. It is obvious that employing dentists alone is not a cost-effective way of solving all of these oral health problems and may not be the most appropriate way to address the oral health needs of rural communities.

The Primary Health Care approach (PHC) is the most suitable strategy for controlling and preventing oral diseases and for the improvement of oral health in developing countries. As it was noted in the Part I, this approach can provide care more equitably to the population in deprived communities. Non-dentist personnel and auxiliaries are appropriate personnel for certain tasks because with a limited training, several functions of oral health care may be performed by these types of personnel, particularly in the fields of prevention, emergency and basic oral health care.

The oral health situation and oral health services in Cambodia are similar to those in other developing countries. Oral disease levels remain relatively high whereas dental materials and personnel resources are scarce. Oral health care services in remote communities have been neglected or are insufficient due mainly to an insufficient dental workforce.

For these reasons, the Cambodian first National Oral Health Plan 1992-2000 recommended that further training in dentistry should commence for some general medical nurses as a less expensive, and more appropriate, option to provide emergency and basic oral health care and preventive measures in rural communities. The medical nurses were already working in rural health centres or referral hospitals.

In the period of 10 years since training commenced (1992-August, 2001), 255 nurses have obtained a certificate in dental care from 19 course intakes. In this review, they will be referred to as dental nurses. Four evaluations of the training program have been carried out (Dickson, 1994 and 2000; Hobdell and Dickson, 1997; Durward, 1999) (see literature review). These evaluations provided evidence that this training is a good model for developing countries which have insufficient oral health human resources. In 1996 the second National Oral Health Plan recommended that training in primary oral care should be continued to reach the goal of providing one dental nurse for each health centre throughout the country.

However, until now there has been no comprehensive review of the actual service performed by the dental nurses following the completion of their training. Some information about the dental workload had been obtained from seminars or workshops but there was a need to know more about their work practices.

This study is concerned with such a review. Personal interviews were conducted to obtain data on work practices and the work conditions of the dental nurses. The managers of health centres or referral hospitals were also interviewed on the same day as the nurses. Finally, interviewers also investigated the opinions of community members about this new service and their utilisation of dental services.

4.2 Research aims

The purposes of this study were:

1. To investigate the work practices of dental nurses following their deployment at health centres or referral hospitals at both district and commune levels in Cambodia.
2. To investigate such factors that may impact on the ability of dental nurses to offer and or manage dental care and preventive programs.
3. To investigate professional issues of training, continuing education, work satisfaction, and contacts with other health care workers.
4. To investigate community demand for oral health care and community support for, and acceptance of, the oral care program offered by the dental nurses.

4.3 Research objectives

In fulfilling these aims the following objectives were pursued:

4.3.1 Services and service delivery

1. To determine the proportion of dental nurses who continue to provide oral care in the community
2. To determine the range and quantity of dentally-related preventive and treatment activities carried out by dental nurses
3. To estimate the proportion of time that dental nurses spend on dental preventive and treatment services
4. To investigate clinical management problems.
5. To investigate issues concerning dental instruments and materials.
6. To investigate infection control measures.
7. To investigate the extent of outside practice.

4.3.2 Administration, policy, and planning

1. To determine any administrative matters that are relevant to the delivery of dental care.
2. To determine the main barriers that dental nurses face in delivering dental services.
3. To determine the main sources of support, including management support, that nurses depend on to deliver dental care services.
4. To identify opportunities for improving or developing the range of dental services offered by nurses.

4.3.3 Professional

1. To determine how much continuing dental education nurses have had since graduation
2. To determined the ability (competence) of the dental nurses.
3. To determine any training deficiencies of the Dental Nurse Training Course in relation to work practices in the community.
4. To explore the attitudes of the dental nurses towards their work.
5. To define levels of collaboration/co-operation with other health workers.

4.3.4 Community oral health and oral health care

1. To gain an insight to community oral health.
2. To gain an insight to how well the treatment and preventive services are meeting the community dental needs/demands.
3. To determine the availability, accessibility, and acceptability of the oral care program to community members.

4.4 Materials and methods

4.4.1 Sampling

The following target groups were investigated: dental nurses, health centre/referral hospital managers, and community members or patients.

Dental Nurses

As noted in the literature review, 255 nurses have completed training in primary oral care following which they were deployed to serve their local communities throughout the country.

This survey was targeted at all nurses who had completed the dental course, except for those now employed at the Regional Training Centres in Kampong Cham and Battambang provinces. To ensure a high response, as many nurses as possible within budget limitations were personally interviewed.

The sample members for interview were selected on the basis of their ready availability and convenience to maximise the response. Sixty-one dental nurses (24%) were selected on this basis from 10 of 20 provinces in Cambodia. The selected 10 provinces were Kampong Cham, Kandal, Kampong Speu, Kampong Chhnang, Kampong Thom, Pursat, Battambang, Takeo, Prey Veng, and Kampot provinces. These 10 provinces represent that part of Cambodia where about 70% of dental nurses are working. In the rest of the country, the dental nurses are sparsely distributed.

Questionnaires were sent via Provincial Health Departments to the remaining 169 dental nurses (66.3%) who were not included in the interview sample and who were still working in public sector under the Ministry of Health. The questionnaire was sent together with a reply envelope and a cover letter explaining the purpose of the survey.

Questionnaires were not sent to nurses who were known to be undergoing training for qualification as secondary nurses or who had left their jobs or had died since graduation.

Health Centre Managers

This study was carried out at the same time as the evaluation of the dental nurses' workload. At each health centre or referral hospital visited, the manager was invited to attend an interview. The managers had clinical backgrounds; they were either nurses, medical auxiliaries, or doctors.

The number of managers interviewed, therefore, should have equalled to the number of dental nurses who were personally interviewed.

Community members/patients

In addition, community members were sampled for interview. Subjects were selected non-randomly from among patients who had come to health centres/referral hospitals. Others were selected at the convenience of the interviewer and were interviewed in their own homes, or in their businesses, or in the local market. Ten community members were interviewed in each of the communes where interviews of nurses took place. Community members were not interviewed in cases where the nurse at the health centre was no longer providing oral health services.

4.4.2 The questionnaires

Three sets of questionnaires were designed for this survey; one for dental nurses, one for the health centre managers, and another for community members (see Appendices A and B). The draft questionnaires were prepared in English and were then translated into Khmer (see Appendix C). The content of the Khmer version of the questionnaire was verified through a back translation to English (Appendix D).

Dental nurses

The dental nurse questionnaire included sections covering the following areas:

- current dental work practices (including treatment and prevention activities)
- dental practice outside of the work place
- cross-infection control
- status of supplies and instruments
- work environment and support
- continuing education follow-up seminars
- level of job satisfaction
- problems and difficulties
- collaboration and cooperation with other health workers in improving oral health
- general opinions on related matters with dental care services

The questionnaire developed for this study was partly based upon the evaluations of the Dental Nurse Training course and also partly based on a questionnaire of a previous study (Durward, 1999). Some questions were developed as open questions and some were in the format of a Likert scale.

After a few interviews had been conducted, it was apparent that some modifications were necessary. Some unnecessary questions were erased and few new questions were added, in particular, those concerning sterilization matters. Consequently, some results are available only from the personal interview sample.

The mailed out questionnaires were posted before the modifications were determined.

Health centre managers

A questionnaire was developed for completion at a structured personal interview. Information from the health centre managers was sought in relation to the following areas:

- perception of the relevance of both dental treatment and preventive activities and the ability of the dental nurses in providing dental services

- management of the bi-functional activities of the dental nurses
- support for oral health activities, and
- general opinions on other matters related to dental care services

Community members

A questionnaire was developed for completion at a structured personal interview. The questionnaire included sections dealing with the following:

- the perceptions of community members concerning their general health, teeth, gums, and dental problems
- knowledge about the availability of the dental nurse at health centres
- opinions regarding the quality of treatment provided by the dental nurses and their acceptance of the oral care services

4.4.3 Questionnaire administration

Prior to the interviews, the Provincial Health Department Director or Operational District Officer was met and informed about the survey and shown the permission letter from the Ministry of Health (see Appendix E).

Most questionnaire interviews (dental nurses, managers, and community members) were conducted by TC but, following a training session, four dentists from AOI and three dental nurses from the training school also assisted, mainly in remote areas. Nurses were interviewed at the health centres where each interview occupied about 45 minutes. The interviews with the managers took place at health centre/referral hospital and took about 10 to 15 minutes. For the community members, the interview time was about 10 minutes.

4.4.4 Data analysis

The data were entered for computer analysis using Epi Info 2000 (see Appendix F). Data values that were left incomplete were defined as missing values. The Chi-square test was used to evaluate differences in group proportions of interest.

4.5 Results and Discussions

The results of this study are presented in the next three chapters in the format of scientific papers. The first paper is to be submitted for publication in *Community Dentistry and Oral Epidemiology* (authors T Chher and RW Evans). Results material, not included in tables within each paper, are included in an appendix at the end of the respective chapters.

Chapter 5

Primary Oral Care by Medical Nurses in Rural Cambodia

Abstract

Background - The Dental Nurse Training Program commenced in 1992 and by August 2001, a total of 255 medical nurses (19 intakes) had completed the training. The purpose of this study was to conduct a comprehensive investigation of work practices of the nurses following their dental training and deployment to health centres and factors that may impact on the ability of dental nurses to offer and/or manage dental care.

Methods - Questionnaires were developed for both a personal interview and for a mail-out survey.

Results - 86 nurses responded to this survey. 84% of respondents were still providing dental care: 70% provided both medical and dental services and 14% provided dental care services only. On average, nurses worked six hours per day, and the bi-functional nurses estimated that they attended 20 medical and one dental patients daily whereas nurses who offered dental care only saw about 3 to 6 dental patients daily. Periodontal disease and facial swelling associated with dental caries were the major presenting problems, and consequently, the main service provided by nurses was emergency care, mostly involving tooth extraction. Twenty-nine (40%) nurses had conducted school preventive programs, some of which had been running for two to four years. Some nurses said that because they have only one set of instruments, they burn or wipe instruments with alcohol between patients when busy. 35 respondents had attended continuing education seminars or workshops. Job satisfaction was rated highly by almost all respondents and they were confident in their ability. Of the 86 respondents, 71 nurses perceived barriers to the delivery of dental care. The main barriers included (1) insufficient materials and instruments, (2) lack of support from managers, (3) or being too busy with medical duties.

Discussion - Of great concern is the central problem of risk of cross-infection associated with inadequate sterilisation of surgical instruments in developing countries.

Conclusions - The solution to the dental care workforce crisis in Cambodia of recruiting experienced general nurses to undergo a period of further training in oral care has been success. Most nurses have been retained in active service. They enjoy dental practice and feel confident in dealing with a range of clinical situations and they appear to be well accepted in their communities.

5.1 Introduction

The Kingdom of Cambodia is situated in South East Asia and has a land area of 181,035 km² and a population of 11,437,656. The population growth rate is 2.49% per annum ⁽¹⁾. Cambodia is divided into 20 provinces and four municipalities. The majority of the population (84%) lives in rural areas and the average population density is 64 per km².

Due to years of genocide and civil war, Cambodia has very limited workforce resources. An inadequate health budget, low salaries for government workers, and associated low morale dampen motivation to upgrade public health services and consequently, the health status of the Cambodian people is among the lowest in the Western Pacific Region ⁽²⁾.

Professional groups including dentists were selectively killed by the Khmer Rouge regime. At the conclusion of the war, the 34 auxiliary dentists who survived upgraded their training to become fully qualified dentists ^(3,4), however, dental services were mainly available only in the cities or large towns.

The first National Oral Health Survey, conducted in early 1990, showed that dental caries and periodontal disease were widespread in Cambodia ⁽⁵⁾. The DMFT of 12 year-old children was 3.2 and urban 6 year-olds had 9 decayed primary teeth. Oral hygiene was poor and betel quid chewing was common among women while tobacco smoking was common among men. Most people have never received any kind of dental care. Today, there are about 300 traditional dentists practicing in Cambodia ^(5,6,7).

In 1992, the first National Oral Health Plan was adopted ^(4,7,8). It recommended that some medical nurses, who are already working in rural communities, should be given further training to provide basic dental care services. The Dental Nurse Training Program commenced in 1992 ⁽⁷⁻⁹⁾ and by August 2001, a total of 255 medical nurses (19 intakes) had completed dental training (Table 5.1) ⁽⁴⁾. In 1994, with support from the United Nations Children's Fund (UNICEF), the United Nations Development Program (UNDP), the World Health Organization (WHO), and the World Bank (WB), the health system in Cambodia was reformed and reorganized ^(10,11). New policies give priority to basic level health services, including oral health, to all people. A package of multipurpose primary health care services,

referred to as the Minimum Package of Activities (MPA) is based on prevention, health promotion, and outreach services to local communities. These services are available at health centres where catchments are about 8,000 to 12,000 inhabitants. Dental services are delivered within the context of the MPA policy.

The dental nurse course has been recognised as a success. It has been intensively monitored and upgraded according to recommendations arising from four reviews ⁽¹²⁻¹⁵⁾. A recommendation to evaluate the dental practices of the nurses was followed up ⁽¹⁶⁾ and a preliminary survey was conducted by means of a mailed questionnaire ⁽¹⁴⁾.

The purpose of this study was to conduct a comprehensive investigation of (1) the work practices of the nurses following their dental training and deployment to health centres at both district and commune levels (2) factors that may impact on the ability of dental nurses to offer and/or manage dental care, and (3) professional issues of training, continuing education, work satisfaction, and communication with other health care workers.

5.2 Methods

5.2.1 Sampling

The survey was targeted at all nurses who had completed the dental course, except for those now employed at the two training schools. To ensure a high response, as many nurses as possible within budget limitations were personally interviewed.

Sixty-one nurses of the eligible sample were selected for personal interview (Table 5.1). In addition, questionnaires were sent via Provincial Health Departments to the remaining 169 nurses who were not included in interview sample and were still working with the Ministry of Health. The questionnaire was sent with a cover letter explaining the purpose of the survey and included a reply envelope.

Table 5.1: Dental nurse graduates and survey respondents

	Numbers	Response	
		Success	Non-response
Working as teachers at RTC	7		
Others (attending further education, deceased, or no longer working)	18		
Potential sample	230		
Nurses selected for personal interview	61 (100%)	52 (85%)	9 (15%)
Remainder selected for self-completion of mailed questionnaire	169 (100%)	34 (20%)	135 (80%)
Total	255	86	144

5.2.2 The questionnaires

Questionnaires were developed for both the personal interview and for the mail-out survey. Information was sought on: (1) current dental work practices (including treatment and prevention activities), (2) problems and difficulties, (3) status of supplies and instruments, (4) work environment and support, (5) continuing education follow-up seminar, (6) practicing outside work place, (7) collaboration and cooperation with other health workers in improving oral health, and (8) general opinions on related matters with dental care services.

The questionnaires were prepared in English and were then translated into Khmer. The content of the Khmer version of the questionnaire was verified through a back translation to English. Most interviews were conducted by TC but, following a training session, four dentists from AOI and three dental nurses from the training school also assisted, mainly in remote areas. Nurses were interviewed at the health centres where each interview occupied about 45 minutes.

5.2.3 Data analysis

Following the survey, the data were entered for computer analysis using the Epi Info 2000 statistical package.

5.3 Results

5.3.1 Characteristics of respondents

Of 61 nurses who were selected for personal interview, 52 (85%) interviews were completed successfully (Table 5.1). The remainder was stationed at remote outposts and thus unavailable. Of 169 mailed questionnaires, 34 (20%) were returned. Overall, the majority of the 86 nurses who responded to this survey was male (84%). (Since training commenced, the overall proportion of males among the dentally qualified nurses is 88%). The age of the respondents ranged between 25 and 53 years and the overall mean age of both genders was 34.5 years (sd, 6.7) (Table 5.2).

Table 5.2: Age and gender distribution of respondents

Age group	Male	%	Female	%	Total	%
25-30	25		5		30	
31-40	32		6		38	
41-53	15		3		18	
Total	72	(83.7)	14	(16.3)	86	(100.0)
Mean age	34.4		35.1		34.5	

About 84% of respondents were still providing dental care: 70% provided both medical and dental services and 14% provided dental care services only (Table 5.3). Fourteen nurses (16%) were no longer offering dental services. They claimed that they were too busy with medical duties, continuing education, or lacked of dental instruments/equipment (see Appendix Table A5.4).

Table 5.3: Employment duties of nurse respondents (N = 86)

	Response	
	Frequency	%
Currently providing both medical and dental services	60	70
Currently providing dental services only	12	14
No longer providing dental services	14	16
Total	86	100

Most findings from this point forward are concerned with those respondents who are currently involved with dental activities (N = 72).

5.3.2 Current work practices

Dental services

On average, nurses worked six hours per day, and the bi-functional nurses estimated that they attended 20 medical and one dental patients daily whereas nurses who offered dental care only saw about 3 to 6 dental patients daily (Table 5.4).

Table 5.4: Self-estimated daily workload (N = 72)

	Number of patients attended		
	Nurses providing dental and medical services (N=60)		Nurses providing dental services only (N=12)
	Medical	Dental	Dental
Mean	18.1	1.8	3.2
(SD)	(10.4)	(1.8)	(1.5)
Median	20	1	3
Mode	20	1	3
Minimum	1	1	1
Maximum	50	10	6

Periodontal disease and facial swelling associated with dental caries were the major presenting problems (Table 5.5). Consequently, the main service provided by nurses was emergency care, mostly involving tooth extraction. Restorative procedures, scaling, and suturing were occasionally provided. Other services, such as abscess draining and jaw dislocation management were provided less frequently. Individual oral health education was given to most patients.

Table 5.5: Presenting oral health problems and services provided (N = 72)

	Frequency				Non-response	Total
	Often	Sometimes	Rarely	Never		
Presenting oral problem						
Periodontal disease	43	20	7	1	1	72
Swollen face	22	12	35	2	1	72
Localized gum swelling	18	13	33	7	1	72
Ulcers inside cheeks and lips	10	9	34	18	1	72
Other problems	5	3	12	51	1	72
Service provided						
Exo of permanent teeth	56	11	4	0	1	72
Exo of deciduous teeth	23	24	23	1	1	72
Restoration	10	18	33	10	1	72
Scaling	12	8	44	7	1	72
Suturing	0	3	19	49	1	72
Individual OH education	54	12	5	0	1	72
Other services (including incision of abscesses)	4	3	10	54	1	72

About two-thirds of the nurses had experienced difficulty with cases of exodontia (see Appendix Table A5.7). Root fracture and failed local anesthesia were the main problems. In addition, about half of the nurses had difficulties with post-operative bleeding and swelling, and one third experienced dry socket problems.

When asked how they managed the difficult operative problems, 31 nurses (43%) said that they felt confident in managing all cases by themselves, but others had referred patients elsewhere occasionally (see Appendix Table A5.8). Regarding post-operative problems, the majority of cases were dealt with by dental nurses themselves, but one-quarter who made reference to problems with post-operative haemorrhage, referred the cases elsewhere for attention (see Appendix Table A5.9). However, these difficult cases including post-operative problems were said to be uncommon.

School preventive program

Twenty-nine (40%) nurses had conducted school preventive programs, some of which had been running for two to four years (Table 5.6). The school programs included oral health education, tooth brushing, and fluoride mouth rinsing. The supervision of these programs ranged from once per week to more than three monthly (see Appendix Table A5.10). Most dental nurses assessed their school preventive activities as “good” or “very good”.

Of those 29 respondents, 19 nurses were still continuing with the school programs, but nine nurses were no longer doing so for reasons of (1) lack of budget support for travelling to schools, (2) lack of preventive materials, (3) being occupied with medical duties, (4) lack of manager support, and (5) lack of a plan (see Appendix Table A5.11).

5.3.2 Cross-infection control

Pressure cookers were given to each nurse upon graduation together with a set of basic instruments. About two-thirds of nurses reported that their pressure cookers were still in good condition (Table 5.6) and the majority reported that their instruments were still in a satisfactory condition. A few nurses had access to an autoclave or oven but some sterilised their instruments by simply boiling them in water (see Appendix Table A5.14). Some nurses said that because they have only one set of instruments, they burn or wipe instruments with alcohol between patients when busy.

**Table 5.6: Working conditions of dental nurses
and other activities conducted (N = 72)**

	Response				Non-response		Total	
	Yes	%	No	%	%		%	
Work environment and support								
Has separate room for dental consultation	26	36	45	63	1	1	72	100
Has dental chair	36	50	35	49	1	1	72	100
Has a good relationship with local dentist	32	44	35*	49	5	7	72	100
Other activities								
Has conducted school preventive program	29	40	42	58	1	1	72	100
Has attended continuing education	35	49	37	51	-	-	72	100
Operate private practice	48	67	24	33	-	-	72	100
Dental instruments and supplies								
Instruments in good condition	41	58	29	40	2	2	72	100
Pressure cooker in good condition**	28	62	17	38	-	-	45	100
Supplies ever exhausted	50	70	16	22	6	8	72	100

* Not applicable rather than no.

** This question was not included in the mail-out questionnaire.

5.3.3 Working environment and support

Twenty-six nurses (36%) have the use of a separate room at the health centre for dental treatment whereas 45 nurses (61%) have to share space in a room where other medical activities may also be occurring. About half of the respondents have a dental chair at their work place (Table 5.6).

On average, about 120 local anaesthesia cartridges, 95 local anaesthesia needles, three boxes of bulk cotton wool, 120 pairs of rubber gloves, half a bottle (10 mg) of glass-ionomer cement, and half of a pack (100 mg) of zinc oxide and eugenol, were used per three month period (see Appendix Table A5.15). About 30% of nurses received dental supplies from the Ministry of Health three or four times yearly and 20% received supplies every month (see Appendix Table A5.16). In general, the response to this aspect of the inquiry was not satisfactory.

Many nurses who received supplies from the Ministry of Health claimed that they sometimes exhausted them (Table 5.6) and at their own expense, had to purchase supplies from a pharmacy or other sources.

About two-thirds of the respondents confirmed that they received "a lot" of moral support from their managers, but little budget support (see Appendix Table A5.17). Nurses who had the support of their managers were more productive ($p < 0.05$).

Thirty-eight respondents felt that managers should assist with obtaining supplies, from either the Ministry of Health or other organizations and agencies and some thought that their dental service might be better if their managers reduced their medical responsibilities or allowed them to give priority to dental services (see Appendix Table A5.18).

5.3.4 Continuing education, workshops/seminars

Thirty-five respondents (48.6%) had attended continuing education seminars or workshops since graduation (Table 5.6). Of these, 17 nurses had attended only one workshop, ten nurses had attended two, and eight nurses had opportunities to attend three or four (see Appendix Table A5.19).

5.3.5 Communication with other dental workers

Thirty-two nurses (44.5%) claimed to have had a good relationship with local dentists due to the fact that they were working together or that they referred patients to them (Table 5.6). The other nurses had no contacts with dentists because none was working in their districts (see Appendix Table A5.20).

5.3.6 Private practice arrangements

Forty-eight (67%) of the respondents operated after hours outside of their work place to generate additional income (Table 5.6). Besides emergency care, 13 nurses provided root canal therapy and 16 prosthetic services (see Appendix Table A5.21). These skills were not included in the training curriculum, and nurses had acquired them from local dentists and traditional dentists.

5.3.7 Job satisfaction and self-evaluation

Job satisfaction was rated highly by almost all respondents and they were confident in their ability (Table 5.7).

Similarly, most nurses felt that the dental training course had provided them with enough practice skills in taking dental and medical histories, diagnosis, extraction, tooth restoration, and scaling. However, some nurses thought that their management skills in relation to difficult operative and post-operative cases were limited because they had not met or met only very few cases during their training. A few felt that the training course should have provided them with more practice in the skill of implementing school or community preventive programs.

Table 5.7: Work satisfaction, service competency, and adequacy of the Dental Nurse Training Program (N = 86)

	Rating					Non-response	Total
	1	2	3	4	5		
Work satisfaction of nurses*	0	0	6	26	48	6	86
Self-competency assessment by nurses **							
History taking	0	0	12	35	29	10	86
Diagnosis	0	1	17	38	20	10	86
Restoration	0	2	15	38	21	10	86
Tooth extraction	0	1	3	40	32	9	86
Managing haemorrhage	2	2	25	28	13	14	86
Treatment of a complicated case	0	1	19	38	14	14	86
Implementing a community program	2	4	14	27	22	17	86
Implementing a school program	4	3	10	26	23	20	86
Nurse assessment of sufficiency of the training program***							
History taking	0	0	4	29	43	10	86
Diagnosis	0	0	9	37	32	8	86
Restoration	0	2	7	35	34	8	86
Tooth extraction	0	0	3	31	45	7	86
Managing haemorrhage	0	3	16	34	23	10	86
Treatment of a complicated case	0	1	14	24	36	11	86
Implementing a community program	1	2	6	30	35	12	86
Implementing a school program	3	2	4	25	39	13	86

* Rating 1 = no enjoyment, rating 5 = much enjoyment.

** Rating 1 = not competent, rating 5 = expert.

*** Rating 1 = did not develop this skill, rating 5 = developed sufficient skill.

5.3.8 Barriers to service delivery and utilisation

Of the 86 respondents, 71 nurses (87%) perceived barriers to the delivery of dental care (see Appendix Table A5.26). The main barriers included (1) insufficient materials and instruments, (2) lack of support from managers, (3) or being too busy with medical duties

(Table 5.8). Other barriers cited were (1) not having a dental chair, (2) lack of systematic management, (3) low salary, (4) lack of budget support for travelling about the community, and (5) the lack of knowledge of the community members about oral disease and its prevention.

Table 5.8: Perceived barriers by dental nurses to the provision of dental services (N = 86)

	Response frequency*
Insufficient materials/instruments	43
Lack of support from manager	33
Busy with other duties	23
No dental chair	11
Other	24
Total	134

*Due to multiple responses, numbers do not total 86.

5.3.9 General comments

Fifty-five nurses made comments about the long-term support for dental activities following their training (Table 5.9). They believed that continuing support from either the training school or the Ministry of Health would be the most effective factor in improving dental care delivery. Again, most dental nurses highlighted the common problem concerning instruments and supplies. Thirty-two nurses referred to the lack of an overall plan for oral health in Cambodia. Twenty-six respondents expressed a need for budget support for travelling to schools or for travelling within the community, and 26 other nurses referred to a need for more regular workshops and seminars to upgrade their knowledge. Fourteen nurses indicated that they would like to learn new skills, such as root canal therapy and dental prosthetics.

Table 5.9: Other matters and needs expressed by dental nurses (N = 86)

Expressed need	Response frequency*
Continuing support from school after training	55
Regularity of provision and sufficiency of supplies/materials	50
Proper plan for oral health activities	32
Budget for community/school activities	26
Continuing education seminars/workshops	26
More instruments/equipment	15
Additional skills (e.g. prosthetics, root canal therapy)	14
Total	218

*Due to multiple responses, numbers do not total 86.

5.4 Discussion

This survey was the first comprehensive review of dental care provided in rural areas of Cambodia by medical nurses who had obtained a certificate in oral health following a six-month training program. The nurses who were personally interviewed worked in the 10 most density populated provinces where, in fact, 70% of the nurses are deployed. The remainder is sparsely distributed in the rest of the country.

The important findings were that most nurses were supported in their bi-functional roles and enjoyed a high level of job satisfaction. In general, the nurses had much heavier commitments to medical duties at the community clinics but, on a daily basis, one or two patients presented with dental problems. However, several nurses worked at clinics where there was a greater demand for dental care and they were occupied entirely with the delivery of dental services. Although not shown in Table 5.5, the presenting problems were mainly pain-related and consequently, tooth extraction was the most frequently performed service. It may appear that the dental workload was rather light, but it must be understood that the nurses have only one set of instruments and hence patient throughput is restricted by the sterilisation turn around. In addition, many nurses deliver dental services outside of the health clinics in a private capacity after hours, and in some cases services are delivered

in the health clinics on a private practice basis. However, this aspect of the nurses workload was not investigated and the results shown in Table 5.4 do not include after hours work.

The major difficulty claimed by the nurses in delivering oral care services, as has been reported in other developing countries, was the shortage of consumables (mainly local anaesthetic) and basic equipment ^(14,17,18). However, this problem in Cambodia is less acute now because supplies are available in the private sector and nurses may purchase them. In addition, the lack of budget support for the dental program has restricted the development of school programs where more restorative treatment and fissure protection could be carried out. Unlike the immunisation programs and other public health programs in Cambodia which are directly funded by the Ministry of Health, the school based preventive dentistry programs conducted by some nurses are not centrally funded. All nurses were expected to implement school-based oral health education, toothbrushing, and fluoride rinsing programs but this has been possible at only some locations where the programs were financed locally with budget support from the health centre managers. It is hoped that funding will, in future, be made available as dental care will now be included in the revised MBA.

Manager support has been crucial to the success of the dental program. Dental care productivity was significantly greater at health centres where the managers were supportive with budget matters and had provided an appropriate environment for delivering dental services.

Of great concern is the central problem of risk of cross-infection associated with inadequate sterilisation of surgical instruments in developing countries ⁽¹⁹⁾. The risk of HIV transmission via nosocomial infection has been largely ignored in developing countries due to the belief that heterosexual promiscuity was the main source of infection, in the absence of an assessment for confounding between sexual and medical exposures. Studies of serodiscordant couples in Africa suggest that high rates of HIV may not be due to heterosexual exposure ⁽²⁰⁾. Of equal concern are the risks of TB, Hepatitis B and C transmission via contaminated instruments associated with inadequate sterilization. It would be tragic to discover that these diseases are spread in association with unsafe dental practices. It is known that at least four Cambodian dentists have already died of AIDS. The entire question of sterilisation practices in relation to surgical instruments is in need of

urgent attention. The failure of the nurses to recognise that the breakdown of the pressure cookers, and hence the breakdown of the sterilisation system used in the supply of dental services in rural Cambodia, underlines the fact that the problem of cross-infection is seriously underestimated. The problem is compounded where nurses, having to cope with only one set of instruments on the one hand, and a queue of waiting patients on the other, find themselves under strain to reduce waiting times. In circumstances where health workers do not fully comprehend that these risks are absolute rather than remote theoretical possibilities, there is pressure to short cut-the sterilisation system.

In conclusion, the solution to the dental care workforce crisis in Cambodia of recruiting experienced general nurses to undergo a period of further training in oral care has been as success. Most nurses have been retained in active service. They enjoy dental practice and feel confident in dealing with a range of clinical situations and they appear to be well accepted in their communities.

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Appendix

Table A5.1: Number of dental nurses by year of graduation

Year of graduation	Number of nurses	%
1992	6	7.0
1993	8	9.3
1994	9	10.5
1995	6	7.0
1996	1	1.2
1997	7	8.1
1998	15	17.4
1999	5	5.8
2000	18	20.9
2001	11	12.8
Total	86	100.0

Table A5.2: The sample distribution - Dental nurses by work location

Province	Number				Total	
	Interview sample	%	Questionnaire sample	%	Number	%
Kampong Cham	19	36.6	5	14.8	24	27.9
Kampong Thom	8	15.5	6	17.7	14	16.3
Battambang	5	9.6			5	5.8
Prey Veng	5	9.6	5	14.8	10	11.6
Takeo	5	9.6	3	8.8	8	9.3
Kandal	3	5.8	1	2.9	4	4.7
Kampong Chhnang	2	3.8			2	2.3
Kampong Speu	2	3.8	1	2.9	3	3.5
Kampot	2	3.8	1	2.9	3	3.5
Pursat	1	1.9			1	1.2
Ratanak Kiri			3	8.8	3	3.5
Siem Reap			3	8.8	3	3.5
Svay Rieng			3	8.8	3	3.5
Kratie			2	5.9	2	2.3
Koh Kong			1	2.9	1	1.2
Total	52 (60.5%)	100.0	34 (39.5%)	100.0	86 (100.0%)	100.0

Table A5.3: Distance from dental nurse work place to nearest referral hospital

Distance (km)	Response frequency	%
0	12	14.0
1-9	23	26.8
10-20	31	36.0
21-50	16	18.6
>50	4	4.6
Total	86	100.0

Table A5.4: Reasons given by dental nurses for no longer providing dental care

	Response frequency	%
Busy with other duties	8	57.2
Dental chair/equipment not available	2	14.4
Continuing education	1	7.1
Ill health	1	7.1
No longer employed	1	7.1
Non response	1	7.1
Total	14	100.0

Table A5.5: Source of knowledge of the local dental nurse

	Response frequency
Health center staff	55
Word of mouth	15
Community leaders/health volunteers	14
Other (NGO)	1
Total *	85

* Due to multiple responses, numbers do not total 72.

Table A5.6: Patient mix – percentages of children and adult patients presenting for care

	Children	Adults
Mean %(SD)	30.4 (14.02)	69.6 (14.02)
Median %	30	70
Minimum %	5	30
Maximum %	70	95

Table A5.7: Operative and post-operative problems

	Frequency				Total
	Often	Sometimes	Rarely	Never	
<i>Difficult cases</i>					
Teeth difficult to extract	0	9	41	22	72
Failed local anaesthesia	1	2	50	19	72
Roots break during extraction	0	3	54	15	72
Other cases	0	2	18	52	72
<i>Post-operative problems</i>					
Haemorrhage	2	1	34	35	72
Swelling	4	4	31	33	72
Dry socket	1	2	22	47	72
Filled teeth abscess	1	1	27	43	72
Lost or fractured filling	4	5	37	26	72
Other problems	0	1	12	59	72

Table A5.8: Management of operative problems

	Response frequency	%
Manage all cases by self	31	43.1
Refer patient to other place	14	19.4
Manage some, refer others	19	26.4
Non response	8	11.1
Total	72	100.0

Table A5.9: Management of post-operative problems

	Manage by self	Refer elsewhere	Provide medication	Total*
Haemorrhage	22	7	7	36
Swelling	13	2	22	37
Dry socket	19	1	4	24
Filled teeth abscess	23	4	2	29
Lost or fractured filling	38	4	3	45
Other	5	3	3	11

* Due to multiple responses, numbers do not total 72.

Table A5.10: Supervision and self-assessment of 29 school preventive programs

	Tooth brushing	F mouth rinse	Oral health education
Supervision			
Once a week	7	1	8
Once a month	3	1	2
Once in three months	7	2	9
> three months	5	2	8
Non-response	2		2
Total	24	6	29
Program grade (self-assessment)			
Very good	7	1	7
Good	12	4	18
Poor	5	1	4
Total	24	6	29

Table A5.11: Reasons for not running school preventive programs

Reason	Response frequency
No budget support	16
Lack of materials	15
Busy with other duties	14
Lack of support from the leaders	6
No proper plan	5
Total *	56

* Due to multiple responses, numbers do not total 29.

Table A5.12: Duration of school program packages

Program duration	Number of program packages	%
One year	4	33.3
Two years	6	50.0
Four years	2	16.7
Total *	12	100.0

* This question addressed to the interview sample only.

Table A5.13: Current status of school preventive programs

	Response frequency	%
Continuing	19	65.5
No longer continuing	9	31.0
Non-response	1	3.5
Total	29	100.0

Table A5.14: Method of sterilization

	Response frequency					Total
	Often	Sometimes	Rarely	Never	Non-response	
Pressure cooker	53	3	2	10	4	72
Boil in water	9	0	2	59	2	72
Autoclave	8	3	2	57	2	72
Oven	4	1	2	63	2	72
Wipe with alcohol	3	3	6	58	2	72
Burn with alcohol	3	6	9	52	2	72

Table A5.15: Dental supplies used per 3 month period and main source of supplies

	LA cartridges	LA Needles	Bulk cotton wool (500gm)	Gloves (pairs)	GIC (10 mg)	ZOE (packs)
<i>Mean dental supplies used per 3 months (amounts)</i>						
Mean	121.7	94.6	2.8	118.3	0.5	0.5
Median	90	61.5	3	85	0.3	0.3
Maximum	600	600	10	600	1	1
Minimum	30	20	1	30	0	0
<i>Main source of supplies (response frequency)</i>						
MoH	52	16	54	54	8	5
NGOs	5	3	2	1	15	13
Buy from market/						
Pharmacy	9	42	9	9	16	19
Non-response	6	11	7	8	33	35
Total	72	72	72	72	72	72

Table A5.16: Regularity of supplies

	Response frequency	%
None received	3	4.2
Once a year	4	5.6
Twice a year	5	6.9
3 – 4 times per year	21	29.2
5 – 10 times per year	5	6.9
Monthly	14	19.4
Weekly	1	1.4
Non-response	19	26.4
Total	72	100.0

Table A5.17: Manager support for dental program

Support type	Response frequency				Total
	None	Little	A lot	Non-response	
Moral	8	15	41	8	72
Budget	42	18	4	8	72
Other	47	9	7	9	72

Table A5.18: Further support needs of managers identified

Further support needs	Response frequency
Obtaining supplies from MOH and other agencies	38
Moral/encouragement	13
Prefer dental duties only/ reduce other duties	6
Other	9
Non-response	11
Total *	77

* Due to multiple responses, numbers do not total 72.

Table A5.19: Seminar/workshop attendance by 35 dental nurses

Number of seminars/ workshops attended	Number of nurses attending	%
1	17	48.6
2	10	28.6
3	4	11.4
4	4	11.4
Total	35	100.0
Mean number attended	1.86	
Median	2	

Table A5.20: Relationship with local dentist

	Comments	Response frequency
Satisfactory relationship	Dentist willing to receive referred patient	10
	Working together	7
	Other reasons	1
	Non-response	14
	Total	32
Unsatisfactory relationship	No dentist in that district	26
	Other reasons	5
	Non-response	4
	Total	35
Non-response		5
Total		72

Table A5.21: Outside treatment services provided

Service provided	Number of nurses providing this service
Extraction	47
Restoration	44
Scaling	42
Prosthetic	16
Root canal therapy	13
Total*	162

*Due to multiple responses, numbers do not total 48 (above table).

Table A5.22: Administration – dental records and reports

	Response		Non-response	Total
	Yes	No		
<i>Dental records kept</i>				
Symptoms	41	29	2	72
Diagnosis	43	27	2	72
Treatment procedures	59	11	2	72
<i>Dental reports prepared</i>				
Monthly report	65	5	2	72
Annual report	31	39	2	72

Table A5.23: Major oral health problems in community

Problem	Response frequency
Dental caries	32
Gum disease	27
Other	16
Non-response	14
Total *	89

*Due to multiple responses, numbers do not total 72.

Table A5.24: Causes of dental problems in community

Causes	Response frequency
Lack of knowledge about oral health	36
Poor oral hygiene	19
Lack of oral health education	11
Low incomes/low SES	11
Other	7
Non-response	12
Total *	96

*Due to multiple responses, numbers do not total 72.

Table A5.25: Dental nurse role in preventing community problems

Role of dental nurse	Response frequency
Oral health education	48
Treatment	13
Other	12
Non-response	10
Total*	83

*Due to multiple responses, numbers do not total 72.

Table A5.26: Experience of perceived barriers to the delivery of dental care

	Response frequency	%
Barriers perceived	71	82.6
No barriers	11	12.8
Non-response	4	4.6
Total	86	100.0

Table A5.27: Perceived changes that would improve the dental service (N=86)

	Response frequency
Proper plan for oral health program	32
Provide sufficient materials/supplies/instrument	28
Have a budget for community/school activity	19
Improve equipment/dental chair	15
Provide more staff for HC/reduce duties	13
Non-response	20
Total *	127

*Due to multiple responses, numbers do not total 86.

Chapter 6

Primary Oral Care by Medical Nurses in Rural Cambodia - Perceptions of Health Clinic Managers

Abstract

Background - the Dental Nurse Training Program commenced in 1992 and by August 2001, a total of 255 medical nurses (19 intakes) had completed the training. The purpose of this study was to investigate manager support for, and acceptance of, the oral care program offered by the dental nurses at health centres or referral hospitals.

Methods - Information from 30 health centre managers was obtained by personal interviews.

Results - All 30 health centre managers interviewed considered that the presence of a dental nurse at their health centre was very useful. On a five-point scale (1= not competent, 5 = expert) to grade the treatment ability of dental nurses, forty percent of the 30 managers rated their ability at grade 4 and another forty percent indicated grade 3. Half of the managers recognized that there were insufficient dental supplies at their health center. 25 managers responded that they had plans for future dental activities, which included the provision of oral health education programs directed at the community generally and to schoolchildren. Further needs were emphasized (1) a proper plan for the oral health program, (2) sufficient dental supplies and instruments, and (3) additional budget support for oral health promotion activities.

Conclusions - This survey found that the managers were satisfied with the competence of the dental nurses and that most managers were interested to develop future dental activities, especially in the field of preventive and health promotion. Some managers had provided strong interest and support for the oral health program. Not all managers were enthusiastic about the oral health program, but they did recognise the need to cater for oral care since they had attended a workshop on the Minimum Package of Activities policy of the Ministry of Health.

6.1 Introduction

In order to provide oral care services for the rural population, the National Oral Health Plan 1992-2000 ^(1,2) recommended that some medical nurses, who are already working in health centres, should be given additional training to provide basic emergency oral care and preventive programs ⁽³⁾. A dental nurse training program commenced in 1992 ^(4,5) and until August 2001, a total of 255 dental nurses have completed the dental training program and returned to their posts. In this paper, the graduates of this program are referred to as “dental nurses”. The services they provide include exodontia, dental restoration, dental scaling, the draining of abscesses, first aid for maxillo-facial trauma, and control of acute oral infection with appropriate medication ^(5,6). Dental nurses are also expected to deliver oral health prevention programs to schoolchildren as well as to other community members ⁽³⁾.

Since the dental training program commenced, no detailed study concerning the utilization of dental services provided by dental nurses has been carried out. In association with a survey to evaluate the work practices of the nurses (see Chapter 5), interviews were also conducted with managers of the health centres or referral hospitals in which they worked. Health centre managers are responsible for implementing and managing the multidisciplinary services provided at health centres. The purpose of this study was to investigate manager support for, and acceptance of, the oral care program offered by the dental nurses at health centres or referral hospitals. An additional purpose was to explore opportunities for improving the dental services and for developing the preventive program.

6.2 Methods

6.2.1 Sampling

This study was carried out at the same time as the evaluation of the nurses' workload. At each health centre or referral hospital visited, the manager was also invited to attend an

interview. All managers had clinical backgrounds; they were either nurses, medical auxiliaries, or doctors.

6.2.2 The questionnaire

A questionnaire was developed for completion at a personal interview. Information from the health centre managers was sought in relation to the following areas: (1) perception of the relevance of both dental treatment and preventive activities and the ability of the dental nurses in providing dental services, (2) management of the bi-functional activities of dental nurses, (3) support for oral health activities, and (4) general opinions on other matters related to dental care services.

The questionnaire was prepared in English and then translated into Khmer. The content of the Khmer version of the questionnaire was verified through a back translation to English. Following a training session, five dentists, including TC and two dental nurses conducted the interviews. Managers were interviewed at the health centres where each interview occupied about 10-15 minutes.

6.2.3 Data analysis

Following the survey, the data were entered for computer analysis using the Epi Info 2000 statistical package.

6.3 Results

A total of 30 managers were interviewed.

6.3.1 Manager perceptions of the dental program

All 30 health centre managers interviewed considered that the presence of a dental nurse at their health centre was very useful. Most (70%) responded that the delivery of dental care for common oral problems was an important community service (Table 6.1). Five managers drew attention to the point that dental health problems now included in the Ministry of Health MPA (Minimum Package of Activities) policy as one of the "first level of care" services that should receive priority attention within the spectrum of multidisciplinary services available at health centres. However, of the 30 managers interviewed, only 12 had a copy of dental nurse's job description (Table 6.2).

Table 6.1: Manager perceptions of the benefits of providing dental services

Reasons	Response frequency	%
Can manage common oral problems	21	70.0
Extends range of multidiscipline services provided	5	16.7
Both reasons stated above	4	13.3
Total	30	100.0

Table 6.2: Manager knowledge of dental program - details (N=30)

	Response frequency					
	Yes	%	No	%	Don't know	%
Has a copy of dental nurse' job description	12	40	18	60		
Considers that dental supplies are sufficient	11	37	15	50	4	13
Knew that school preventive program had been/had not been conducted	6	20	23	77	1	3
Plans for future dental activities	25	83	5	17		

In relation to workload management, the majority of managers (73.4%) said that dental care was provided on demand (Table 6.3). Thus when dental patients came, the dental nurse

would be available to treat them and when there were no dental patients, nurses would be occupied with other medical duties. However, four managers claimed that they had arranged a specific day for the treatment of dental problems and one manager had appointed the dental nurse to provide dental services only.

Table 6.3: Management of bi-functional activities by dental nurse

Arrangement for dental services	Response frequency	%
Service on demand	22	73.4
Specific days in week	4	13.3
Working full time as dental nurse	1	3.3
Other	3	10.0
Total	30	100.0

Seventy percent of managers claimed that dental nurses carried out dental care everyday, and 20% said that dental nurses provided dental treatment every few days (see Appendix Table A6.2).

6.3.2 Manager assessment of dental nurse competency

On a five-point scale (1= not competent, 5 = expert) to grade the treatment ability of dental nurses, forty percent of the 30 managers rated their ability at grade 4 and another forty percent indicated grade 3 (Table 6.4). Only one manager was not very satisfied with the treatment provided by the dental nurse.

Twenty-three managers (77%) indicated that the dental nurses they were responsible for had not run school preventive programs (Table 6.2). However, six managers (20%) claimed to know about the introduction of the school programs and they rated these programs at score 3 or 4 on a 5 point scale (1 = not successful, 5 = highly successful) (Table 6.4).

Table 6.4: Manager rating of dental nurse ability in providing oral health care activities

	Rating					Non-response	Total
	1	2	3	4	5		
Grading of dental nurses' competency to treat oral problems *	0	1	12	12	3	2	30
Grading of school preventive program conducted by dental nurses **	0	0	5	1	0		6

*Rating 1 = incompetent, rating 5 = extremely competent.

** Rating 1 = not successful, rating 5 = highly successful (see Table 6.2).

6.3.3 Manager views on work environment and support

Most managers indicated that the main support that they could provide was moral support and assistance with obtaining supplies (Table 6.5). Publicity concerning the availability of a dental nurse at the health center was identified by some managers as an important support for the dental program. Some managers claimed that they provided additional budget support.

Table 6.5: Manager support for dental nurse activities

Type of support	Response frequency*
Encouragement/moral support	23
Arrangements for outside support/supplies	19
Budget support	9
Publicise dental nurse activities	6
Other	1
Total	58

* Due to multiple responses, numbers do not total 30.

Half of the managers recognized that there were insufficient dental supplies at their health center whereas 11 managers said, in fact, that they did have enough supplies to support dental care delivery (Table 6.2).

6.3.4 Manager comments on program developments

Twenty-five managers responded that they had plans for future dental activities (Table 6.2). These plans included the provision for oral health education programs directed at the community generally and to schoolchildren in particular (Table 6.6).

Table 6.6: Manager plans for future dental health activities in community

	Response frequency	%
Oral health education for community	7	23.3
Oral health education for school children	6	20.0
Both programs	4	13.3
Other	8	26.7
No plan	5	16.7
Total	30	100.0

Further comments made by health centre managers on dental health matters are shown in Table 6.7. Most managers emphasized (1) the need for a proper plan for the oral health program, (2) that the Ministry of Health should provide sufficient supplies and instruments to health centres where dental nurses are stationed, and (3) that there should be additional budget support for oral health promotion activities. Some managers also indicated that further education seminars and workshops would be useful to upgrade dental nurses' knowledge and skills.

Table 6.7: Other comments by managers on dental health matters

	Response frequency *
Proper plan for oral health program	14
Regularly supply dental materials/supplies	13
Instruments/equipment	12
Budget for oral health activities	9
More workshops/seminars	7
More skill needed/further education	4
Other comments	4
Total	63

* Due to multiple responses, numbers do not total 30.

6.4 Discussion

It was planned that in addition to the dental nurse interviews, the managers at the centres would also be interviewed. However, only 30 health centre managers participated in this survey. The reasons for the low response were that some managers were not available because they were attending meetings at district level or were attending workshops during the time of the interviews of the nurses. In fact, 10 dental nurses were the managers of the health centres at which they worked. In these cases, they were not interviewed separately as the health centre manager.

Although the managers said that the presence of a dental nurse at health centre was very useful, only 12 of them were knowledgeable about the activities that the dental nurses should perform, and only six managers were aware that the dental nurses they were responsible for had, or had not, conducted school preventive programs. Their explanation for this poor result was that this outreach activity was not running because of lack of budget support from the Ministry of Health. Another factor contributing to the program failure was the lack of any central planning for the oral health program and the lack of a person responsible for this program.

Not all of the dental nurses were busy with dental duties. The dental service is new and people in some areas do not use it much because knowledge of its availability is not widespread. On the other hand, at some health centres human resource are insufficient and the nurses are occupied with other medical duties that take priority.

This survey found that the managers were satisfied with the competence of the dental nurses and that most managers were interested to develop future dental activities, especially in the field of preventive and health promotion activities for both community groups and for school children. Some managers indicated a need for a full time dental service because they knew that most community members experienced dental problems. In addition, a few managers queried why prosthetic training was not included in the curriculum because they thought that there was a need to offer denture services.

Besides the formal interviews, the opportunity was taken to discuss other issues with managers on an informal basis. The interviewers were also able to discuss matters with a few operational district officers. The important issues that arose in these discussions were (1) outreach activities, (2) central management of oral health program, (3) accountability for the dental instruments, and (4) selection criteria for dental nurse training.

6.4.1 Outreach activities

Because there was no budget support available, there were problems with dental outreach activities. This situation is different from that regarding other health areas (such as the immunisation program) which, in fact, receive specific budget support for related public health outreach activities. As a result, it is difficult to encourage dental nurses to conduct oral health preventive and promotion programs. However, most managers thought that with adequate budget support, oral health could be improved in the same way that general health had improved.

Dental outreach activities should be, therefore, considered in parallel with other medical programs. This would create a supportive environment in which to encourage dental nurses to conduct oral health preventive and promotion programs. The Ministry of Health should

provide this support, not only for the outreach activities, but also for workshops to upgrade the dental nurses' skills.

6.4.2 Central management of the oral health program

There is no official body responsible for the dental care activities at health centres and referral hospitals, and consequently, any deficiencies may remain unnoticed.

According to recommendations contained in the report of the 4th evaluation of the dental nurse training program, the Provincial Health Department should establish in each province an Oral Health Unit within its technical bureau in order to support oral health activities ⁽⁷⁾. In this case, a provincial dentist would act as the officer responsible for the dental activities of dental nurses at health centres and referral hospitals in that province. These dentists would need special skills in planning and management and, therefore, the dental curriculum at the Faculty of Dentistry in Phnom Penh should be reviewed to place more emphasis on community dentistry, especially in outreach activity planning and management. It is noted that a new dental public health course will start in Phnom Penh in February 2003.

6.4.3 Accountability for dental instruments

The issue concerning the lack of instruments and supplies was partly clarified. There is a need to maintain an official inventory of dental supplies and of the instruments given to the dental nurses on graduation from the training school. This would facilitate the ordering of new instruments and would prevent accountability problems relating to the instruments. At some health centres, conflict has arisen between the dental nurses and managers because the nurses had claimed that the instruments that they had been given on graduation were their private property. It was claimed that these nurses had taken the instruments to their homes for use in their private practices.

In fact, the instruments belong to the health centre or referral hospital in which the dental nurse works. However, this problem should not arise in future because the training school

has prepared a list of all dental instruments and materials provided and it has been sent to the respective districts in recent years. However, there is a clear need for additional instruments so that there is time for proper sterilisation to be carried out between patients.

6.4.4 Selection criteria for dental nurse training

The criteria for selecting medical nurses to attend the dental training program was questioned. Some managers pointed to the problem of restricting the selection from among Secondary Nurses only. In some health centres there is only one Secondary Nurse who is, therefore, the clinic manager. Since managers have many administrative responsibilities, in addition to their clinical responsibilities, the burden of these duties limits the scope for such managers to deliver oral care services. It was the view of some managers that the eligibility criteria for selection should be broadened to include Primary Nurses, and this would ensure that, once trained, they would be available mainly for clinical service delivery.

With regard to the selection criteria for dental nurse training, the reason for restricting selection to Secondary Nurses (those who have completed a three-year program of general training) is that some dental services, such as minor oral surgery (exodontia), are complex and may frequently involve both pre-operative and post-operative complications. It is considered that services of this type should only be delivered by health workers who have completed a program of advanced general training. Such level of training and related experience is much higher than that of Primary Nurses who are exposed to a training program of only one-year duration.

6.4.5 Concluding remarks

The points raised by way of the informal discussions with some managers were important and demonstrated their strong interest and support for the oral health program. Not all managers were enthusiastic about the oral health program, but they did recognise the need to cater for oral care since they had attended a workshop on the Minimum Package of

Activities policy of the Ministry of Health. This policy gives priority to certain activities, and recently oral care was added to the "first level of care" list.

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Appendix

Table A6.1: Distribution of health centre managers by province

Province	Number	%
Kampong Cham	10	33.3
Kampong Thom	4	13.3
Prey Veng	4	13.3
Takeo	4	13.3
Battambang	2	6.7
Kandal	2	6.7
Kampot	2	6.7
Kampong Speu	1	3.3
Pursat	1	3.3
Total	30	100.0

Table A6.2: Manager perceptions of dental treatment workload

Patient treatment	Response frequency	%
Every day	21	70.0
Every few days	6	20.0
Once a week	1	3.3
Less than once a week	2	6.7
Total	30	100.0

Chapter 7

Primary Oral Care by Medical Nurses in Rural Cambodia - Perceptions of Community Members

Abstract

Background - The Dental Nurse Training Program commenced in 1992 and by August 2001, a total of 255 medical nurses (19 intakes) had completed the training. The purpose of this study was to investigate community support for, and acceptance of, the oral care program offered by the dental nurses and to investigate the utilisation of oral health care services.

Methods - Information from 448 respondents was obtained by personal interviews with ten community members at each health centre where a nurse was providing dental care.

Results - 70% of the respondents perceived that they were healthy whereas only 34% thought that their teeth were good. 98% perceived that their teeth were important for everyday life activities. Half of the respondents knew about the availability of a dental nurse at the health centre, but only 16% knew about the school preventive programs. 48% of the respondents perceived that the treatment provided by dental nurses was of high quality, but 43% said that they did not know or were unable to comment on the abilities of dental nurses. 73% said that they experienced dental problems, but only 23% had sought for help from dental nurses whereas 57% of people solved dental problems by self-medication or by using traditional herbs. 14% of the respondents preferred to attend a traditional dentist. All 76 patients, who had received dental treatment from dental nurses, said that they were very satisfied with the treatment provided. The majority of dental services were extraction and preventive advice to individual patients.

Conclusions - The deployment of dental nurses has been a recent initiative in Cambodia and, therefore, information about the availability of oral health services at health centres is still limited and some people still attend a traditional dentist when help is needed. Compared with medical problems, dental problems do not receive a high priority in Cambodia. However, the quality of oral health care delivered by nurses was highly appreciated by people who had received it.

7.1 Introduction

Cambodia has a total population of more than 11 million and about 80% of the people live in rural areas ⁽¹⁾. There were 392 qualified dentists and auxiliary dentists in Cambodia in 2002 ⁽²⁾. The dentist to population ratio was 1:29,178. However, most dentists work only in the cities or large towns. Knowledge about oral health among the community members is very low, and similarly, knowledge about the availability and utilisation of oral health services is inadequate ⁽³⁾.

In order to provide oral health care services for the rural population, the 1991 draft National Oral Health Plan ⁽⁴⁾ recommended that some medical nurses, who are already working in health centres, should be given additional training to provide basic and emergency oral care and preventive programs. This draft plan was further developed and adopted in 1992 ⁽⁴⁾. The Dental Training Program commenced later that year ^(5,6). In the following, the graduates of this program will be referred to as “dental nurses”.

By August 2001, a total of 255 dental nurses have completed the course and returned to their posts ^(2,7). The services they provide include simple tooth extraction, dental restoration, scaling, the draining of abscesses, first aid for maxillo-facial trauma, and control of acute oral infection with appropriate medication ⁽⁸⁾. Dental nurses are also expected to deliver oral health prevention programs to schoolchildren as well as to other community members.

Since the course commenced, no detailed study concerning the utilisation of dental services provided by the dental nurses has been carried out. In association with a survey to evaluate the work practices of the nurses (see Chapter 5), a survey of some community members was also conducted.

The purpose of this study was to investigate community support for, and acceptance of, the oral care program offered by the dental nurses and to investigate the utilization of oral health care services. A second purpose of this study was to explore the perceptions of the community members concerning their general health and oral health.

7.2 Methods

7.2.1 Sampling

This study was carried out at the same time as the evaluation of dental nurses' workload. Subjects were selected non-randomly for personnel interviews from among patients who had come to health centres and referral hospitals. Others were selected at the convenience of the interviewer and were interviewed in their own homes, or in their business shops, or in the local market.

Ten subjects were interviewed in each commune where the nurse was still providing dental care.

7.2.2 The questionnaire

A questionnaire was developed for completion at a personal interview. The questionnaire included sections dealing with the following: (1) the perception of community members concerning their general health, teeth, gums, and dental problems, (2) knowledge about the availability of the dental nurse at health centre, (3) opinions regarding the quality of treatment provided by the dental nurse, and (4) their acceptance of the oral care services.

The questionnaire was prepared in English and then translated into Khmer. The content of the Khmer version of the questionnaire was verified through a back translation to English.

7.2.3 Data analysis

Following the survey, the data were entered for computer analysis using the Epi Info 2000 statistical package.

7.3 Results

7.3.1 Participant characteristics

The age and gender distribution of community members or patients who participated in this survey is presented in Table 7.1. About 60% of the participants were female. The overall mean age for both genders was 38.9 years and the median age was 38 years. Most participants were interviewed at their homes (86%) although some interviews took place at health centres (see Appendix Table A7.1). More participants were from Kampong Cham than other provinces (see Appendix Table A7.2).

Table 7.1: Age and gender distribution of community member respondents (N=448)

Age group	Male	Female	Unknown	Total
< 30	45	77	2	124
30 – 39	36	68		104
40 – 49	35	62		97
50 – 59	25	45		70
≥ 60	18	19		37
Unknown	1	2	13	16
Total	160 (36%)	273 (61%)	15 (3%)	448 (100%)
Mean age	39.8	38.5		38.9
Median	39	38		38

7.3.2 Perceptions of general health and oral health

Perceptions by the community members/patients about their general health, teeth, and gums are shown in Table 7.2. Approximately 71% of respondents perceived that they were healthy. However, only about 34% thought that their teeth were good, and half of the respondents claimed that their gums were healthy.

Table 7.2: The perceptions of community members about general health, teeth, and gums (N=448)

	Response frequency					
	General health	%	Teeth	%	Gums	%
Healthy	320	72	152	34	229	51
Not so healthy	127	28	296	66	217	48
Non-response	1	0.2			2	0.4
Total	448	100	448	100	448	100

Of 448 respondents, 438 people (98%) perceived that their teeth were important for everyday life activities (Table 7.3). Almost all community members described the function of teeth as mastication tools (423 responses), and some suggested they were important for good general health (148 responses), aesthetic appearance (94 responses), pronunciation (32 responses), and for having good breath (3 responses) (Table 7.4).

Table 7.3: Dental experiences, knowledge, and attitudes of community members (N=448)

	Response frequency				Non-response	
	Yes	%	No	%		%
Experience of tooth problem	327	73	119	26	2	1
Knowledge of dental nurse availability at health centre	229	51	216	48	3	1
Agreement that teeth are important for daily life	438	98	10	2		

Table 7.4: Important functions of teeth as perceived by community members

	Response frequency *
Mastication	423
Good health	148
Aesthetic	94
Good speech	32
Good breath	3
Total	700

*Due to multiple responses, numbers do not total 438.

7.3.3 Perceptions of dental experiences and the dental service

Of 448 respondents, 73% had experienced a dental problem, whereas only half knew about the availability of a dental nurse at the health centre (Table 7.3). Among these, 45% received this information from health centre staff and about 47% from their neighbours (see Appendix Table A7.3). Forty-eight percent of the respondents perceived that the dental treatment provided by dental nurses was of high quality (Table 7.5) but approximately 43% said that they did not know about, or were unable to comment on, the abilities of dental nurses. Only 16% of the respondents knew about the school preventive programs conducted by dental nurses (see Appendix Table A7.4).

Table 7.5: The opinions of community members about the quality of care provided by dental nurses (N=229, see Table 7.3)

	Response frequency	%
High quality	110	48.1
Low quality	4	1.7
Don't know	98	42.8
Non-response	17	7.4
Total	229	100.0

7.3.4 Access to services

As previously noted, 327 people (73%) said that they had experienced dental problems (Table 7.3). However, only 23% of these respondents had sought help from a dental nurse whereas 57% had solved their dental problems by self-medication or by use of traditional herbs (Table 7.6). Approximately 14% preferred to attend a traditional dentist.

Table 7.6: Treatment provider for dental problems experienced by community members (N=327)

	Response frequency	%
Dental nurse	76	23
Dentist	19	6
Traditional healer	46	14
Self	186	57
Total	327	100

The majority of respondents lived within 5km of the health centres and only a few survey participants came from more distant parts (see Appendix Table A7.5). The main method of transportation used for travelling to the health centres was by bicycle or by foot (see Appendix Table A7.6). Not many respondents travelled by motorbike.

7.3.5 Acceptability and satisfaction of services

Of 76 patients who had received dental treatment from dental nurses, about 80% of the services were delivered at the health centre and the other 20% at the dental nurse's home/private clinic (Table 7.7). The primary treatment service delivered at both locations was tooth extraction. Very few of these patients (about 2%) received services such as prosthetic or root canal therapy. In fact, endodontics and prosthetics are not included in the dental curriculum at the Regional Training Centre. The nurses had learned these extra skills from local dentists or traditional dentists.

Table 7.7: Frequency of treatment types received by community member respondents from dental nurses (N=76)

	Response frequency*				Total	%
	At health centre	%	At dental nurse's home	%		
Extraction	42	69	13	86	55	73
Restoration	13	21			14	18
Scaling	2	3			2	3
Prosthetic			1	7	1	1
Root canal therapy	1	2	1	7	1	1
Other	3	5			3	4
Total	61	100	15	100	76	100
Additional preventive advice received	60	79	16	21	76	100

* Only respondents who had received dental treatment from a dental nurse are included (see Table 7.6).

Dental nurses also provided preventive advice to individual patients who came for treatment. Sixty patients (79%) claimed that they had received preventive advice from dental nurses.

Although not shown in Table 7.7, all 76 patients said that they were very satisfied with the treatment that provided by dental nurses.

7.4 Discussion

The deployment of dental nurses to government clinics throughout Cambodia has been a recent initiative and, therefore, it was not surprising to find that the majority of the sample of community members had not received dental care services from the dental nurses. For most people, the traditional way of solving dental problems is through self-medication with painkillers and antibiotics, the use of herbal remedies obtainable from traditional healers, and visiting traditional dentists. In Cambodia, people may buy medicine in stores or pharmacies freely without the need of a professional prescription.

Compared with medical problems, dental problems do not receive a high priority in Cambodia. Although Cambodians value their teeth, most people believe that toothache does not kill anybody and help is sought only as a last resort, when all else has failed. In addition, dental treatment costs and fear of treatment combine to limit demand for dental care. However, the most probable reason for the failure among rural people to seek attention for dental problems earlier, rather than later, is due to ignorance and of not being able to interrupt the busy everyday-activity of securing the necessities of life.

Information about the availability of oral health services at health centres is still limited, even though most community members sampled lived within 5 km of a health centre. Similarly, the majority of respondents did not know about oral health preventive programs at schools. Knowledge of the presence of dental nurses was mainly by word of mouth. For those who were unaware of the new oral health service at health centres, the only option is to attend a traditional dentist when help is needed. On the other hand, among those who had never experienced dental problems, there was little concern for the dental service. In remote communities, people cannot differentiate between university-trained dentists and traditional dentists. They do not understand the concept of cross-infection control or that some forms of treatment might be considered as inappropriate, harmful, or unprofessional. In these circumstances people seek help from those with whom they are familiar.

This study revealed that the dental care services, now available at commune and district levels, are being favourably accepted by community members, despite the fact that patients must contribute towards the cost of services provided through the new co-payment policy introduced by the Ministry of Health. Because the dental service is not free, and because the health clinic services are mainly available in the mornings, patients are also prepared to attend the private dental practices of the dental nurses in which they operate after-hours. This situation allows patients some flexibility because they may attend for dental care in the afternoons and evenings when they have no work or employment related obligations. The private service also helps to supplement the meagre government salary of the dental nurses.

Prospects for the continuation of the dental service and its development appear positive since the members of the community who had received care from the dental nurses were all very satisfied with the services provided. Some respondents expressed a desire for the

services to be extended to include provision for the prosthetic replacement of teeth following tooth extractions.

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Appendix

Table A7.1: Place of interview

	Response frequency	%
At health center	63	14.1
At home	385	85.9
Total	448	100.0

Table A7.2: Number of community respondents by province

Province	Response frequency	%
Kampong Cham	165	36.8
Kampong Thom	60	13.4
Takeo	43	9.6
Kandal	42	9.4
Prey Veng	41	9.2
Battambang	32	7.1
Kampot	20	4.5
Kampong Speu	20	4.5
Kampong Chhnang	14	3.1
Pursat	11	2.5
Total	448	100.0

Table A7.3: Source of information about dental nurse availability

	Response frequency	%
Health center staff	103	45.0
Neighbor	107	46.7
Relative	19	8.3
Total *	229	100.0

* (See Table 7.3)

Table A7.4: Knowledge of preventive program provided at local school by dental nurse

	Response frequency	%
Yes	36	15.7
No	44	19.2
Don't know	149	65.1
Total	229	100.0

Table A7.5: Distance from community member's house to health centre

Distance (km)	Response frequency	%
< 0.5	183	40.8
0.5 – 1	171	38.2
>1 – 5	78	17.4
6 – 10	10	2.2
>10 – 17	4	0.9
Non-response	2	0.5
Total	448	100.0

Table A7.6: Type of transportation used to attend health centre

Type of transportation	Response frequency	%
Foot	189	42.2
Bicycle	153	34.2
Motorbike	91	20.3
Other (including horse)	9	2.0
Non-response	6	1.3
Total	448	100.0

Chapter 8

Recommendations

According to the results of this study and in line with the Oral Health Master Plan, the following recommendations should be considered:

8.1 For the improvement of oral health care delivery system

1. The Dental Nurse Training Course should be continued to meet the dental workforce requirements of the rural population.
2. The number of dental instruments in regular use should be increased to allow nurses to treat more patients and reduce the waiting time for sterilization.
3. The issue of sterilisation is an important one. It needs to be addressed through the provision of adequate numbers of instruments, education and monitoring. Autoclave tape could be used as a simple test of whether a pressure cooker pot is functioning properly.
4. The training course should give more emphasis to the management of difficult operative and post-operative complications, oral health preventive programs, and cross-infection control.
5. Both the Provincial Health Departments (PHDs) and the Ministry of Health (MoH) should (1) establish an oral health bureau within the PHDs technical bureau, (2) develop a dental referral system for each respective level, and (3) provide a

dental table/chair, sufficient instruments, supplies, and budget for oral health activities.

6. There needs to be both central (Oral Health Office at the MoH) and local (PHDs) monitoring and support for dental nurses which includes service data collection, clinical audit and advice, ensuring the scope of practice is limited and protocols followed.
7. If possible, workshops or seminars should be conducted at least one a year for both dental nurses and provincial dentists who are responsible for public oral health activities. These meetings would create a good environment for co-operation in implementing oral health programs and for building the "dental team". It also would provide the opportunity for dental health professionals to discuss issues related to oral health care services and, from that, the possible solutions could be found.
8. The job description for each level of oral health worker should be reviewed.
9. Regional dentists and clinic managers need to develop skills to be able to manage the dental system better. They also need to learn about the role of the dental nurse and what their own role is in supporting the provision of oral health services.
10. Measures should be taken to ensure that dental nurses do not undertake procedures that are beyond their training such as prosthetics, root canal treatment, and more complex oral surgery.
11. There seems to be a lack of awareness by the community about the presence and role of the dental nurse - some oral health promotion strategies are needed to inform the public about this.
12. Oral health status and treatment needs in Cambodia should be re-evaluated through another National Oral Health Survey.

8.2 For the improvement of oral health preventive activities

1. Water fluoridation should be considered in the cities where dwellers use piped water supplies. The benefits of water fluoridation have been recognized in many countries around the world.
2. The Ministry of Health should include budget support for oral health preventive programs.
3. Preventive programs should focus on pregnant women, mothers of young children, and preschool children to encourage positive oral health knowledge, attitudes, and behaviours from the early years of life.
4. School preventive programs should be continued in collaboration with the Ministry of Education and they should be extended to as many other schools as possible.
5. Mass media campaigns and brochures should be developed to encourage people to use fluoride toothpaste, improve oral hygiene, restrict sugar consumption, and create positive attitudes and behaviours towards oral health.

8.3 Areas for future research

1. The work of primary oral health care workers should be re-evaluated every few years in order to monitor their activities, especially in remote areas.
2. Studies are needed on cross-infection control in both dental public and private clinics as sterilisation is an important issue, especially on (1) sterilisation methods, (2) the use of pressure cookers and related problems, and (3) the re-use of local anaesthesia cartridges or needles.
3. The school preventive activities should be evaluated to determine their usefulness.

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Appendices

Appendix A: The questionnaires for dental nurses, health centre managers, and community members.

Appendix B: Khmer translation of questionnaires.

Appendix C: Khmer translation of draft questionnaires for dental nurses, health centre managers, and community members.

Appendix D: Back translation of Khmer draft to English.

Appendix E: The Ministry of Health permission letter.

Appendix F: Data value codes.

Appendix A

- Questionnaire for dental nurses
- Questionnaire for health centre managers
- Questionnaire for community members

Questionnaire for dental nurses

ID NUMBER:.....

Date of interview:

General information

- 1. Name:
- 2. Age (Date of birth):
- 3. Gender: M ☐ F ☐
- 4. Month/Year of graduation: Course:
- 5. Name of Commune..... District Province
- 6. How far is it from your working place to the nearest referral hospital? km
- 7. Are you still working as a dental nurse? Yes ☐ , No ☐
- 8. If no, why not?
.....(go to Q. 60)
- 9. Do people in your community know that you can treat tooth problems? Yes ☐ , No ☐
- 10. If yes, how do they know?

Treatment services

- 11. How many patients do you usually see each working day?
 - Medical patients:.....
 - Dental patients :.....
- 12. How many hours do you usually work each working day? hours
- 13. What dental symptoms do you usually see each working day?

Symptoms	Diagnosis	Treatment	Treatment time (minutes)
.....			
.....			
.....			
- 14. How often do you provide the following treatment services:
 - Extraction of permanent teeth often ☐ sometimes ☐ rarely ☐ Never ☐
 - Extraction of deciduous teeth often ☐ sometimes ☐ rarely ☐ Never ☐
 - Restoration often ☐ sometimes ☐ rarely ☐ Never ☐
 - Scaling often ☐ sometimes ☐ rarely ☐ Never ☐
 - Suturing often ☐ sometimes ☐ rarely ☐ Never ☐
 - Individual oral health education often ☐ sometimes ☐ rarely ☐ Never ☐
 - Other services often ☐ sometimes ☐ rarely ☐ Never ☐
- 15. Proportions of your dental patients are: (must add up to 100 %)
 - Children:%
 - Adults:%

- Swollen face	often ☐	sometimes ☐	rarely ☐	Never ☐
- Ulcers inside cheeks and lips	often ☐	sometimes ☐	rarely ☐	Never ☐
- Periodontal disease	often ☐	sometimes ☐	rarely ☐	Never ☐
- Localized gum swellings (gum boils)	often ☐	sometimes ☐	rarely ☐	Never ☐
- Other patient problems that you meet:				
-	often ☐	sometimes ☐	rarely ☐	Never ☐

a) Teeth that are very difficult to extract often ☐ sometimes ☐ rarely ☐ Never ☐

b) Failed local anaesthesia often ☐ sometimes ☐ rarely ☐ Never ☐

c) Teeth/roots that break during extraction often ☐ sometimes ☐ rarely ☐ Never ☐

d) Other difficulties that you meet often ☐ sometimes ☐ rarely ☐ Never ☐

a)

b)

c)

d)

- Haemorrhage	often ☐	sometimes ☐	rarely ☐	Never ☐
- Swelling	often ☐	sometimes ☐	rarely ☐	Never ☐
- Dry socket	often ☐	sometimes ☐	rarely ☐	Never ☐
- Filled teeth abscess	often ☐	sometimes ☐	rarely ☐	Never ☐
- Fillings fall out or fracture	often ☐	sometimes ☐	rarely ☐	Never ☐
- Other	often ☐	sometimes ☐	rarely ☐	Never ☐

- Haemorrhage	1	2	3
- Swelling	1	2	3
- Dry socket	1	2	3
- Filled teeth abscess	1	2	3
- Fillings fall out or fracture	1	2	3
- Other	1	2	3

- Pressure cooker often ☐ sometimes ☐ rarely ☐ Never ☐

- Autoclave often ☐ sometimes ☐ rarely ☐ Never ☐

- Oven often ☐ sometimes ☐ rarely ☐ Never ☐

- Wipe with alcohol often ☐ sometimes ☐ rarely ☐ Never ☐

- Burn with alcohol

often ☐ sometimes ☐ rarely ☐ Never ☐
- Boil in water

often ☐ sometimes ☐ rarely ☐ Never ☐
- Other method

often ☐ sometimes ☐ rarely ☐ Never ☐

22. Is your pressure cooker sterilizer working well?

Yes ☐ , No☐
23. Did you sterilize instruments for each patient?

Yes ☐ , No☐
24. How many times you use a needle before throwing it away?

times
25. If more than once, how do you sterilize the needle for reuse?

.....
26. Do you ever use one cartridge of LA for more than one patient?

Yes ☐ , No☐
27. How many times do you use glove before throwing it away?

times
28. If more than once, how do you sterilize gloves for reuse?

.....

Preventive services

29. Did you run any preventive programs for school children?

Yes ☐ , No☐
30. If no, why not?.....

(go to Q. 37)
31. If yes, how many schools already run preventive programs?

schools
32. What kind of preventive programs have been introduced in schools?

- Tooth-brushing

☐

- Fluoride mouth-rinse

☐

- Oral health education

☐

- Other activities

☐

Please give the name of those activities:

.....

33. How often do you supervise the preventive activities?

1 = Once a week, 2 = Once a month, 3 = Once in three months, 4 = > 3 months

- Tooth-brushing

1

2

3

4

- Fluoride mouth-rinse

1

2

3

4

- Oral health education

1

2

3

4

- Other activities

1

2

3

4

34. How do you grade the school preventive program?

a- Tooth-brushing

very good ☐

good ☐

poor ☐

b- Fluoride mouth-rinse

very good ☐

good ☐

poor ☐

c- Oral health education

very good ☐

good ☐

poor ☐

d- Other activities

very good ☐

good ☐

poor ☐

35. Do you have school programs for how many years?

Years

36. Do you still continue this programs at school?

Yes ☐ , No☐

Instruments and supplies

37. Are your instruments are still in good condition? Yes ☐ , No ☐

38. What quantities of the following dental supplies do you use each 3-month period?

- a) LA : cartridges
- b) LA needles : needles
- c) GIC : boxes
- d) Cotton : rolls
- e) Gloves : pairs
- f) ZOE : bottles (packs)

39. Where is the major source for your supplies?

MoH = 1, NGOs = 2, Buy from market of pharmacy = 3

- a) LA 1 2 3
- b) LA needles 1 2 3
- c) GIC 1 2 3
- d) Cotton 1 2 3
- e) Gloves 1 2 3
- f) ZOE 1 2 3

40. How regularly do you get supplies? (Number of times per year):

41. Do you ever run out of supplies? Yes ☐ , No ☐

42. If yes, what do you do?

Work environment and support

43. At your work place, do you have a separate room for dental treatment? Yes ☐ , No ☐

44. Do you have dental chair/table? Yes ☐ , No ☐

45. Does the manager (PHD, district and health center directors) support your dental activities?

- Moral none ☐ a little ☐ a lot ☐
- Budget none ☐ a little ☐ a lot ☐
- Other support - specify none ☐ a little ☐ a lot ☐

46. What further support would you like to obtain from your manager?

.....

47. Do you have a good relationship with your local dentist at the district or provincial hospital?

Yes ☐ , No ☐

48. Why?

49. Since you graduated, have you ever attended any seminars/workshops/meetings to upgrade your knowledge about dental activities? Yes ☐ , No ☐

50. If yes, how many times: and in which year:

51. What topics were covered? Please list:

-
-
-

Other activities

52. Do you provide dental care outside your working place?

- Yes ☐ → Where
- No ☐

53. If yes, what treatment services? (circle more than one)

- Extraction ☐
- Restoration ☐
- Scaling ☐
- Prosthetic ☐
- Root canal therapy ☐

For prosthetic and root canal therapy, who teach you?

Community needs assessment

54. What are the major oral health problems in this community?

-
-

55. What causes these problems?

-
-

56. Do you play any role in the community prevention of these problems?

-
-

Administration

57. For each patient, do you record:

- symptoms/signs Yes ☐ , No ☐
- diagnosis Yes ☐ , No ☐
- treatment procedure Yes ☐ , No ☐

58. Do you prepare:

- monthly reports Yes ☐ , No ☐
- annual reports Yes ☐ , No ☐

59. Who do you forward these reports to? (List all destinations)

-
-

Opinions

60. On a scale of 1 to 5:

	1	2	3	4	5
	Not at all			Very much	
How much do you enjoy dental work?	1	2	3	4	5

61. If you rated 1 or 2, why do you not enjoy dental work?

.....

62. On the scale of 1 to 5:

	1	2	3	4	5
	Very incompetent			Very expert	

How competent do you feel NOW in carrying out the following duties:

- taking a history	1	2	3	4	5
- making diagnosis	1	2	3	4	5
- doing restoration	1	2	3	4	5
- extracting teeth	1	2	3	4	5
- managing hemorrhage	1	2	3	4	5
- treating a complication case	1	2	3	4	5
- implementing a community program	1	2	3	4	5
- implementing school program	1	2	3	4	5

63. On a scale of 1 to 5:

	1	2	3	4	5
Did not					Developed
develop this skill					sufficient skill

Did that dental nurse course give you sufficient skill following duties?

- taking a history	1	2	3	4	5
- making diagnosis	1	2	3	4	5
- doing restoration	1	2	3	4	5
- extracting teeth	1	2	3	4	5
- managing hemorrhage	1	2	3	4	5

- treating a complication case	1	2	3	4	5
- implementing a community program	1	2	3	4	5
- implementing school program	1	2	3	4	5

64. Do you perceive any barriers to your ability to deliver dental care? Yes ☐ , No☐

65. If yes, please specify:

.....

.....

66. What changes could be made that would help you provide a better dental service?

.....

.....

67. Are there any matters you would like to comment on?

.....

.....

.....

Questionnaire for health centre managers

ID Number:.....

1. What do you think about the presence of a dental nurse in your health center (or hospital)?
a) Useful ☐
b) Unnecessary ☐
2. Please give the reasons why?
.....
.....
3. How you manage the bi-functional work that is performed by the dental nurse?
.....
.....
4. How do you support the dental nurse activities?
Please specify:
.....
.....
5. In your opinion, how well on a 5 point scale is the dental nurse able to treat the dental problems?
- Don't know ☐ or:

12345

Not at all wellExtremely well
6. Has the dental nurse has conducted dental preventive programs at schools?
a) Yes ☐
b) No ☐
c) Don't know ☐
7. If yes, how successful on a 5 point scale were those activities in your opinion?
- Don't know ☐ or:

12345

Not successfulHighly successful
8. At your health center (hospital), do you have enough supplies for dental activities?
a) Yes ☐
b) No ☐
9. Do you have a copy of the dental nurse job description?
a) Yes ☐
b) No ☐
10. How often does the dental nurse carry out dental treatment?
a) Daily ☐
b) Every few days ☐
c) Once a week ☐
d) Less than once a week ☐
11. Do you have any plans for dental health activities for your community?
a) Yes ☐
b) No ☐
12. If yes, please specify:
.....
.....
13. Are there any dental health matters that you wish to comment on:
.....
.....

Questionnaire for community members

ID Number:.....

Gender: Male ☐, Female ☐

Age: years-old

Province:

1. How is your health?

- Good ☐
- Not so good ☐

2. How about your teeth- are they:

- Healthy ☐
- Not so healthy ☐

3. How about your gum- are they:

- Healthy ☐
- Not so healthy ☐

4. Have you ever had problems with your teeth?

- Yes ☐
- No ☐ → (Go to Q. 7)

5. If yes, who treat your dental problem?

- | | | | |
|----------------------|--------------------------|-----------------|--------------------------|
| - Traditional healer | ☐ | - Take medicine | ☐ |
| - Dental nurse | ☐ | - Other methods | ☐ |

6. If dental nurse treat your problem:

- (a) Where? - At health center ☐
- At DN home ☐

(b) What did the dental nurse do about it?

- Extraction ☐
- Filling ☐
- Scaling ☐
- Prosthetic ☐
- Root Canal Therapy ☐

(c) Were you satisfied with the treatment?

- Yes ☐
- no ☐

(d) How long did you have to wait for treatment? minutes

(e) The cost of that treatment: Riels

(f) Did the dental nurse talk to you about preventing dental problems?

- Yes ☐
- No ☐

7. Did you know that there is a dental nurse at the health center/hospital?

- Yes ☐
- No ☐

if yes, (a) How did you hear about this?

.....

(b) Does the dental nurse provide a good service?

.....

8. Does the dental nurse visit the local school?

- Yes ☐
- No ☐
- Don't know ☐

9. How far is it from your home to the dental clinic? km

10. How would you get there?

- By foot ☐
- By bike ☐
- By motorbike ☐
- Other transportation ☐

11. Are your teeth important for your life?

- Yes ☐
- No ☐

12. If yes, why are they important?

- Mastication ☐
- Aesthetic ☐
- Good health ☐
- Good breath ☐
- Good speech ☐

Appendix B

- Khmer translations of questionnaires

សំណួរសំរាប់ទទួលបានប្រាក់ (Qs-Dental Nurses)

ID number: 31.....

ក. ព័ត៌មានទូទៅ:

ថ្ងៃធ្វើសំភាសន៍: ...21/02/22

១. ឈ្មោះ : ខៀវ ខ័ណ្ឌ ខា

២. អាយុ (ឆ្នាំកំណើត) : 1967

៣. ភេទ : ប្រុស ☒ ស្រី ☐

៤. ខែ-ឆ្នាំបញ្ចប់ ការសិក្សា (វគ្គទទួលបានប្រាក់) 02 / 1998 គ្រូទី ៥

៥. ឈ្មោះឃុំ-ខណ្ឌ-ស្រុក ឃុំ គីរីវង្ស ខេត្ត កោះកុង (ទីកន្លែងធ្វើការ) ឈ្មោះ 1998 - ឃុំ គីរីវង្ស ខេត្ត កោះកុង 20

៦. តើពីកន្លែងធ្វើការរបស់អ្នក ទៅមន្ទីរពេទ្យបង្អែក មានចំងាយប៉ុន្មាន ? ៦ គ.ម

៧. តើអ្នកនៅតែធ្វើការ ជាទទួលបានប្រាក់ដែរ ឬទេ ? បាទ ☒ ទេ ☐

៨. បើទេ . ហេតុអ្វីបានឈប់ ?

(សូមសួរទៅផ្នែក (ឈ) សំនួរ ទី ៦០)

៩. តើប្រជាជននៅក្នុងសហគមន៍ របស់អ្នក ដឹងទេថា អ្នកអាចព្យាបាលបញ្ហាផ្នែកធ្មេញបាន ? បាទ ☒ ទេ ☐

១០. បើដឹង, តើគេដឹងដោយវិធីណា ? ឯងនិយាយ ឯងនិយាយ ឯងនិយាយ ឯងនិយាយ

ខ. សេវាព្យាបាល:

១១. ជាទូទៅ, តើអ្នកទទួលបានអ្នកជំនាញប៉ុន្មាននាក់ក្នុងមួយថ្ងៃ?

- ផ្នែកទូទៅ: នាក់

- ផ្នែកធ្មេញ : នាក់

សំណួរ ១១ ៖ ចុះ បង្អើ
15 - 30 នាក់/ថ្ងៃ (ខ្លះ 3 នាក់)

១២. ជាទូទៅ, តើអ្នកធ្វើការ ប៉ុន្មានម៉ោង ក្នុងមួយថ្ងៃ ? ៦ ម៉ោង

១៣. ជាទូទៅ, តើអ្នកជួបរោគសញ្ញាផ្នែកធ្មេញអ្វីខ្លះ?

រោគសញ្ញា	រោគវិនិច្ឆ័យ	ការព្យាបាល	រយៈពេលព្យាបាល (នាទី)
ឆ្អឹង	ឆ្អឹង	 ៥០	 15 - 30
.....			
.....			
.....			

១៤. តើអ្នកផ្តល់ការព្យាបាល ដូចរៀបរាប់ខាងក្រោមនេះ ព្រឹកញាប់ដែរឬទេ ?

- ដកធ្មេញស្រុក	ព្រឹកញាប់ ☒	ជួនកាល ☐	ម្តងម្កាល ☐	មិនដែលសោះ ☐
- ដកធ្មេញព្រៃ	ព្រឹកញាប់ ☐	ជួនកាល ☒	ម្តងម្កាល ☐	មិនដែលសោះ ☐
- បិតប៉ះធ្មេញ	ព្រឹកញាប់ ☐	ជួនកាល ☐	ម្តងម្កាល ☒	មិនដែលសោះ ☐
- កោសសំអាតធ្មេញ	ព្រឹកញាប់ ☒	ជួនកាល ☐	ម្តងម្កាល ☐	មិនដែលសោះ ☐
- ដេររណ្តៅធ្មេញ	ព្រឹកញាប់ ☐	ជួនកាល ☐	ម្តងម្កាល ☐	មិនដែលសោះ ☒
- អប់រំសុខភាពមាត់ធ្មេញអ្នកជំងឺម្នាក់ៗ	ព្រឹកញាប់ ☒	ជួនកាល ☐	ម្តងម្កាល ☐	មិនដែលសោះ ☐

-ការព្យាបាល ផ្សេងទៀត

.....	ញឹកញាប់ ☐	ជួនកាល ☐	ម្តងម្កាល ☐	មិនដែលសោះ ☐
.....	ញឹកញាប់ ☐	ជួនកាល ☐	ម្តងម្កាល ☐	មិនដែលសោះ ☐

១៥). ចំនួនភាគរយ នៃអ្នកជម្ងឺ ផ្នែកមាត់-ធ្មេញ : (បូកចំនួនទាំងពីរក្រុម ត្រូវជា ១០០%)

- កុមារ ១០ %

- មនុស្សពេញវ័យ ៩០ %

១៦). តើអ្នកជួបអ្នកជម្ងឺមានសភាពដូចរៀបរាប់ខាងក្រោមនេះ ញឹកញាប់ ដែរឬទេ ?

- ហើមមុខ	ញឹកញាប់ ☐	ជួនកាល ☐	ម្តងម្កាល ☒	មិនដែលសោះ ☐	
- ដំបៅផ្នែកខាងក្នុងនៃថ្ពាល់-បបូរមាត់	ញឹកញាប់ ☐	ជួនកាល ☐	ម្តងម្កាល ☒	មិនដែលសោះ ☐	
- ជំងឺអញ្ចាញធ្មេញ	ញឹកញាប់ ☐	ជួនកាល ☐	ម្តងម្កាល ☒	មិនដែលសោះ ☐	
- អញ្ចាញហើមនៅនិងកន្លែង	ញឹកញាប់ ☐	ជួនកាល ☐	ម្តងម្កាល ☒	មិនដែលសោះ ☐	
- បញ្ហាផ្សេងៗទៀត		ញឹកញាប់ ☐	ជួនកាល ☐	ម្តងម្កាល ☐	មិនដែលសោះ ☐

១៧). តើអ្នកធ្លាប់ជួបករណីពិបាក ដូចមានរៀបរាប់ខាងក្រោមនេះ ញឹកញាប់ដែរឬទេ ?

ក)- ធ្មេញដែលមិនអាចដកបាន	ញឹកញាប់ ☐	ជួនកាល ☐	ម្តងម្កាល ☒	មិនដែលសោះ ☐	
ខ)- បរាជ័យក្នុងការប្រើថ្នាំស្តីក	ញឹកញាប់ ☐	ជួនកាល ☐	ម្តងម្កាល ☐	មិនដែលសោះ ☒	
គ)- ធ្មេញ ឬសធ្មេញ បាក់ក្នុងពេលដក	ញឹកញាប់ ☐	ជួនកាល ☐	ម្តងម្កាល ☒	មិនដែលសោះ ☐	
ឃ)- ករណី ពិបាក ផ្សេងៗទៀត		ញឹកញាប់ ☐	ជួនកាល ☐	ម្តងម្កាល ☐	មិនដែលសោះ ☐

១៨). តើអ្នកចាត់ចែងយ៉ាងដូចម្តេចដែរ ចំពោះករណីពិបាកទាំងនោះ ?

ក)- (ឱ្យគ្រូពេទ្យ មក ព្យាបាល ដោយ ប្រើ ថ្នាំ ឬ វិធី ផ្សេងៗ)

ខ)-

គ)- ឱ.វ.ស.

ឃ)-

១៩). តើអ្នកធ្លាប់ជួបប្រទះបញ្ហាកើតឡើងក្រោយពេលព្យាបាល ដូចរៀបរាប់ខាងក្រោមនេះ ញឹកញាប់ដែរឬទេ ?

- ហូរឈាម	ញឹកញាប់ ☐	ជួនកាល ☐	ម្តងម្កាល ☐	មិនដែលសោះ ☒	
- ហើម	ញឹកញាប់ ☐	ជួនកាល ☐	ម្តងម្កាល ☒	មិនដែលសោះ ☐	
- រលាករណ្តៅធ្មេញស្ងួត	ញឹកញាប់ ☐	ជួនកាល ☐	ម្តងម្កាល ☐	មិនដែលសោះ ☒	
- ធ្មេញប៉ះបិតហើយ កខ្វះ	ញឹកញាប់ ☐	ជួនកាល ☐	ម្តងម្កាល ☒	មិនដែលសោះ ☐	
- បំណះធ្មេញជ្រុះចេញ ឬ បែក	ញឹកញាប់ ☐	ជួនកាល ☐	ម្តងម្កាល ☐	មិនដែលសោះ ☒	
- ករណីផ្សេងទៀត		ញឹកញាប់ ☐	ជួនកាល ☐	ម្តងម្កាល ☐	មិនដែលសោះ ☐

២០). តើអ្នកចាត់ចែងយ៉ាងដូចម្តេចដែរ ចំពោះករណីទាំងនោះ ?

១-ព្យាយាមព្យាបាលដោយខ្លួនឯង, ២-បញ្ជូនទៅកាន់កន្លែងផ្សេងទៀត, ៣-ឱ្យថ្នាំ

- អប្បសុខភាពមាត់ធ្មេញ ☐

- សកម្មភាពផ្សេងទៀត (ចូររៀបរាប់:.....)

៣៣. តើអ្នកត្រួតពិនិត្យ សកម្មភាពការពារទាំងនោះ ញឹកញាប់ប៉ុណ្ណា ?

១ = ក្នុង ១ អាទិត្យម្តង

២ = មួយខែម្តង

៣ = ៣ ខែ ម្តង

៤ = > ៣ ខែ

- ដុសធ្មេញ	១	២	៣	៤
- ខ្ពុរទឹក Fluoride	១	២	៣	៤
- អប្បសុខភាពមាត់ធ្មេញ	១	២	៣	៤
- សកម្មភាពផ្សេងទៀត	១	២	៣	៤

៣៤. តើអ្នកចាត់ថ្នាក់ សកម្មភាព ការពារទាំងនោះ ដូចម្តេចដែរ ?

- ដុសធ្មេញ	ល្អណាស់ ☐	ល្អ ☐	មិនល្អ ☐
- ខ្ពុរទឹក Fluoride	ល្អណាស់ ☐	ល្អ ☐	មិនល្អ ☐
- អប្បសុខភាពមាត់ធ្មេញ	ល្អណាស់ ☐	ល្អ ☐	មិនល្អ ☐
- សកម្មភាពផ្សេងទៀត	ល្អណាស់ ☐	ល្អ ☐	មិនល្អ ☐

៣៥. តើអ្នកមានកម្មវិធីតាមសាលារៀននេះ ប៉ុន្មានឆ្នាំហើយដែរ? ឆ្នាំ

៣៦. តើអ្នកនៅតែបន្តកម្មវិធីនោះ ទៀតដែរឬទេ? បាទ ☐ , ទេ ☐

ឃ. ឧបករណ៍ និង សំភារៈ

៣៧. តើឧបករណ៍ព្យាបាលធ្មេញរបស់អ្នកនៅល្អដែរឬទេ ? បាទ ☐ , ទេ ☒

៣៨. បរិមាណសំភារៈ ដែលអ្នកប្រើក្នុងរយៈពេល៣ខែ:

- ថ្នាំស្អិត	...150... អំពូល	- ស្រោមដៃ	...100... គូ
- ម្ជុល	...100... ម្ជុល	- ZOE	...1/4... ដប
- GIC	...0... ដប	- សំឡី	...3... ដុំ

៣៩. តើទីណាដែលជាប្រភពសំខាន់ក្នុងការផ្គត់ផ្គង់សំភារៈទាំងនេះ? (អាចគូសគ្រប់ទាំង បីលេខ)

១ - ក្រសួងសុខាភិបាល .	២ - អង្គការក្រៅរដ្ឋាភិបាល .	៣ - ទីពឹងផ្សារ ឬកន្លែងលក់ផ្ទាល់ខ្លួន
- ថ្នាំស្អិត ១ ២ ៣	- សំឡី ១ ២ ៣	
- ម្ជុល ១ ២ ៣	- ZOE ១ ២ ៣	
- GIC ១ ២ ៣	- ស្រោមដៃ ១ ២ ៣	

៤០. តើអ្នកទទួលបានការផ្គត់ផ្គង់សំភារៈទាំងនេះទៀងទាត់យ៉ាងណាដែរ? ចំនួនប៉ុន្មានដងក្នុង១ឆ្នាំ? ដង / ៥

៤១. តើអ្នកមានដែលដាច់ការផ្គត់ផ្គង់សំភារៈដែរឬទេ? បាទ ☒ ទេ ☐

៤២. បើបាទ, តើអ្នកដោះស្រាយយ៉ាងណាដែរ?

..... ឱក្ខន្ធ វិជ្ជា

(ខ). វិធានការការងារ និងការគាំទ្រ:

៤៣. តើអ្នកមានបន្ទប់ព្យាបាលធ្មេញដោយឡែកដែរឬទេ? បាទ ☒ ទេ ☐

៤៤. តើអ្នកមានកៅអី-តុសម្រាប់ព្យាបាលធ្មេញដែរឬទេ? បាទ ☒ ទេ ☐

៤៥. តើប្រធាន (មណ្ឌលសុខភាព, មន្ទីរពេទ្យ) របស់អ្នកគាំទ្រសកម្មភាពផ្នែកធ្មេញរបស់អ្នកដែរឬទេ?

- | | | | |
|--|-----------------------------|---------------------------------------|---|
| - ជំនួយគាំទ្រផ្នែកស្មារតី | ទេ ☐ | បន្តិចបន្តួច ☐ | ច្រើន ☒ |
| - ជំនួយគាំទ្រផ្នែកចរិត | ទេ ☐ | បន្តិចបន្តួច ☐ | ច្រើន ☐ |
| - ការគាំទ្រដទៃទៀត... ការគាំទ្រផ្នែកស្មារតី | ទេ ☐ | បន្តិចបន្តួច ☐ | ច្រើន ☒ |

៤៦. តើអ្នកចង់បានការគាំទ្រអ្វីផ្សេងទៀតពីប្រធានរបស់អ្នក?

..... ការគាំទ្រផ្នែកស្មារតី និង ចរិត ច្រើន គួស!

៤៧. តើអ្នកមានទំនាក់ទំនងជាមួយទន្តពេទ្យ-ទន្តបណ្ឌិត នៅក្នុងស្រុកអ្នកដែរឬទេ? បាទ ☐ ទេ ☒

៤៨. ហេតុអ្វី?..... ខ្ញុំ មិន ចង់ ទេ.....

៤៩. ចាប់តាំងពីបញ្ចប់ការសិក្សា, តើអ្នកធ្លាប់បានចូលរួមសិក្ខាសាលា ឬប្រជុំផ្សេងៗដើម្បីបង្កើនចំណេះដឹងផ្នែកធ្មេញទៀត ដែរឬទេ?
☒ បាទ ☐ ទេ

៥០. បើមាន, ចំនួនប៉ុន្មានដង?..... ១..... ដង និង នៅក្នុងឆ្នាំណា ខ្លះ..... ២០១០.....

៥១. នៅក្រោមប្រធានបទអ្វីខ្លះ? ចូររៀបរាប់:

- ក)..... ប្រធាន បទ គ្រឹះស្ថាន.....
- ខ).....
- គ).....

(គ). សកម្មភាពផ្សេងៗទៀត:

៥២. តើអ្នកមានបើការព្យាបាលធ្មេញនៅក្រៅទីកន្លែងធ្វើការដែរឬទេ?

- បាទ ☐ នៅទីណា.....
- ទេ ☒

៥៣. បើមាន, តើព្យាបាលអ្វីខ្លះ?

- | | |
|--|--|
| - ដកធ្មេញ ☐ | - ដាក់ធ្មេញ ☐ |
| - បិទបិះធ្មេញ ☐ | - ពត់ធ្មេញ ☐ |
| - កោសសំអាតធ្មេញ ☐ | - ព្យាបាលរន្ធឬស ☐ |

ក្នុងករណីដាក់ធ្មេញ, ពត់ធ្មេញ, ព្យាបាលរន្ធឬស តើអ្នករៀនពីទីណា?

.....

(ឃ). ការវាយតម្លៃតម្រូវការសហគមន៍:

៥៤. តើអ្វីខ្លះដែលជាបញ្ហាចម្បងនៃសុខភាពមាត់-ធ្មេញ ក្នុងសហគមន៍អ្នក?

..... ខ្ញុំ មិន ដឹង.....

៥៥. តើកត្តាអ្វីខ្លះ ដែលបណ្តាលឱ្យមានបញ្ហាទាំងនេះ?

.....ឯកជន... ឧបត្ថម្ភហិរញ្ញវត្ថុ.....

៥៦. តើអ្នកមានតួនាទីអ្វីដែរទេ នៅក្នុងកិច្ចការពារចំពោះបញ្ហាមាត់-ធ្មេញក្នុងសហគមន៍របស់អ្នក?

.....អប់រំ..... គ្រូបង្រៀន.....

(៥). ការងារផ្នែករដ្ឋបាល:

៥៧. សំរាប់អ្នកជម្ងឺម្នាក់ៗ. តើអ្នកមានកត់ត្រាទុកអំពី:

- | | | |
|----------------|---|--|
| - រោគសញ្ញា | បាទ ☐ | ទេ ☒ |
| - រោគវិនិច្ឆ័យ | បាទ ☐ | ទេ ☒ |
| - វិធីព្យាបាល | បាទ ☒ | ទេ ☐ |

៥៨. តើអ្នកមានរៀបចំ:

- | | | |
|------------------------|---|--|
| - របាយការណ៍ប្រចាំខែ | បាទ ☒ | ទេ ☐ |
| - របាយការណ៍ប្រចាំឆ្នាំ | បាទ ☐ | ទេ ☒ |

៥៩. តើអ្នកបញ្ជូនរបាយការណ៍ទាំងនេះទៅទីណា? ចូររៀបរាប់:

.....គ្រូបង្រៀន.....

(ឈ). មតិយោបល់:

៦០. នៅលើពិន្ទុពី ១ ដល់ ៥:

មិនចូលចិត្តសោះ

រីករាយខ្លាំងណាស់

តើអ្នករីករាយក្នុងការបំពេញការងារផ្នែកធ្មេញដែរឬទេ? ១ ២ ៣ ៤ ៥

៦១. តើអ្នកជ្រើសរើសយក ១ ឬ ២. តើអ្វីជាមូលហេតុដែលបណ្តាលឱ្យអ្នកមិនរីករាយក្នុងការងារផ្នែកធ្មេញ?

៦២. នៅលើពិន្ទុពី ១ ដល់ ៥:

តើក្នុងពេលនេះ អ្នកមានអារម្មណ៍ថា អ្នកអាចអនុវត្តន៍នូវតួនាទី ដូចរៀបរាប់ខាងក្រោមនេះយ៉ាងណាដែរ?

	១	២	៣	៤	៥
មិនជឿជាក់លើសមត្ថភាពខ្លួនឡើយ					
យ៉ាងជំនាញបំផុត					
- សាកសួរកត់ត្រាប្រវត្តិជម្ងឺ	១	២	៣	៤	៥
- ធ្វើរោគវិនិច្ឆ័យ	១	២	៣	៤	៥
- បិទបិះធ្មេញ	១	២	៣	៤	៥
- ដកធ្មេញ	១	២	៣	៤	៥
- ព្យាបាលការហូរឈាម	១	២	៣	៤	៥
- ចាត់ចែងករណីកើតឡើងក្រោយពេលព្យាបាល	១	២	៣	៤	៥

សំណួរសំរាប់ប្រធានមណ្ឌលសុខភាព, មន្ទីរពេទ្យ: (Qs-Managers)

ID Number:

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ឈ្មោះមណ្ឌលសុខភាព: វិទ្យាស្ថាន

១). តើអ្នកមានមតិយ៉ាងណាដែរ ចំពោះវត្តមានរបស់ទន្តតិណនុប្បដ្ឋាកនៅក្នុងមណ្ឌលសុខភាព (មន្ទីរពេទ្យ) របស់អ្នក?

- មានប្រយោជន៍ណាស់ ☒ - មិនចាំបាច់ឡើយ ☐

២). សូមបញ្ជាក់មូលហេតុ (ចំពោះចម្លើយទាំងពីរខាងលើ):

..... គ្រប់គ្រងបានល្អ មានប្រសិទ្ធភាព ។.....

៣). តើអ្នកចាត់ចែងការងារអនុវត្តរបស់ទន្តតិណនុប្បដ្ឋាកដែលមានតួនាទីយ៉ាងនេះយ៉ាងដូចម្តេចដែរ?.....

..... បានល្អ ។.....

៤). តើអ្នកផ្តល់ការគាំទ្រ ចំពោះសកម្មភាពផ្នែកធុញយ៉ាងណាដែរ? ចូររៀបរាប់

..... គ្រប់គ្រងបានល្អ ។.....

៥). ចំពោះមតិរបស់អ្នកផ្ទាល់, តើអ្នកចាត់ថ្នាក់ចំពោះការងារព្យាបាលធុញរបស់ទន្តតិណនុប្បដ្ឋាកយ៉ាងណាដែរ?

- មិនដឹង ☐

- ១ ២ ៣ ៤ ៥
មិនល្អសោះ ល្អណាស់

៦). តើអ្នកដឹងទេថា ទន្តតិណនុប្បដ្ឋាកមានកម្មវិធីការពារសុខភាពមាត់-ធុញនៅតាមសាលារៀន?

បាទ ☐ ទេ ☒ មិនដឹង ☐

៧). បើមាន, តើកម្មវិធីនោះទទួលបានជោគជ័យប៉ុណ្ណាដែរ?

- មិនដឹង ☐

- ពិន្ទុពី ១ ដល់ ៥ ១ ២ ៣ ៤ ៥
បរាជ័យ ជោគជ័យសម្បើមណាស់

៨). នៅមណ្ឌលសុខភាព (មន្ទីរពេទ្យ) របស់អ្នក, តើអ្នកមានឧបករណ៍សំភារៈផ្គត់ផ្គង់សកម្មភាពផ្នែកធុញគ្រប់គ្រាន់ដែរឬទេ?

បាទ ☒ ទេ ☐

៩). តើអ្នកមានឯកសារចំណងអំពីតួនាទីការងាររបស់ទន្តតិណនុប្បដ្ឋាកដែរឬទេ?

បាទ ☐ ទេ ☒

១០). តើទន្តតិណនុប្បដ្ឋាក ធ្វើការងារផ្នែកធុញញឹកញាប់ប៉ុណ្ណាដែរ?

- ជារៀងរាល់ថ្ងៃ ☒ - ពីរ-បីថ្ងៃម្តង ☐

- មួយអាទិត្យម្តង ☐ - តិចជាងមួយអាទិត្យម្តង ☐

១១). តើអ្នកមានគំរោងការណ៍ចំពោះការងារផ្នែកមាត់ធុញសំរាប់សហគមន៍របស់អ្នកដែរឬទេ? បាទ ☐ ទេ ☐

១២). បើមាន, តើគំរោងការណ៍អ្វីខ្លះ?

..... គ្រប់គ្រងបានល្អ ។.....

១៣). តើអ្នកមានមតិយោបល់អ្វីទៀតដែរ ចំពោះបញ្ហាមាត់-ធុញ?

..... គ្រប់គ្រងបានល្អ ។.....

សំណួរសំរាប់អ្នកជម្ងឺ ឬប្រជាជនគ្មានសហគមន៍: (Qs – Patients)

ID Number: 383

ភេទ: ប្រុស ☒ ស្រី ☐ អាយុ: ៥៥

ភូមិ គោកដំរី ឃុំ ទឹកថ្លា
ស្រុក ថ្មបាំង ខេត្ត តាកែវ

- ១). តើសុខភាពទូទៅរបស់អ្នកយ៉ាងដូចម្តេចដែរ?
- ល្អ ☒ មិនល្អ ☐
- ២). ចុះចំណែកធ្មេញរបស់អ្នកវិញ យ៉ាងណាដែរ?
- មានសុខភាពល្អ ☐ មិនល្អទេ ☒
- ៣). ចុះចំណែកអញ្ចាញធ្មេញរបស់អ្នកវិញ យ៉ាងណាដែរ?
- មានសុខភាពល្អ ☒ មិនល្អទេ ☐
- ៤). តើអ្នកធ្លាប់មានបញ្ហាផ្នែកធ្មេញដែរឬទេ?
- បាទ ☒ ទេ ☐ (សួរទៅ សំនួរទី៧)
- ៥). បើមាន, តើអ្នកណាជាអ្នកព្យាបាលបញ្ហាធ្មេញឱ្យអ្នក?
- ជាងធ្មេញ ☐ ទិញថ្នាំលេប ☐
- ទន្តគិលានុប្បដ្ឋាក ☒ វិធីផ្សេងទៀត
- ៦). បើទន្តគិលានុប្បដ្ឋាក (ពេទ្យធ្មេញ) ជាអ្នកព្យាបាលបញ្ហាធ្មេញរបស់អ្នក:
ក). តើព្យាបាលនៅទីណា? - នៅមណ្ឌលសុខភាព_មន្ទីរពេទ្យ ☐ - នៅគ្លីនិកឯកជន ☒
ខ). តើទន្តគិលានុប្បដ្ឋាកបានធ្វើអ្វីខ្លះ? ដកធ្មេញ ☐ បិតប៉ះ ☐ កោសសំអាត ☐
ដាក់ធ្មេញ ☒ ព្យាបាលរន្ធបួស ☐
គ). តើអ្នកពេញចិត្តចំពោះការព្យាបាលនេះដែរទេ? បាទ ☒ ទេ ☐
ឃ). តើអ្នកត្រូវរង់ចាំប៉ុន្មាននាទីដើម្បីព្យាបាល? ៥ នាទី
ង). តម្លៃព្យាបាល ៥.០០ រៀល
ច). តើពេលនោះ ទន្តគិលានុប្បដ្ឋាកមាននិយាយប្រាប់អ្នកអំពីការការពារបញ្ហាធ្មេញដែរឬទេ? បាទ ☐ ទេ ☐
- ៧). តើអ្នកដឹងទេថា នៅមណ្ឌលសុខភាព (មន្ទីរពេទ្យ) ក្នុងឃុំ, ស្រុកអ្នកមានទន្តគិលានុប្បដ្ឋាក? បាទ ☒ ទេ ☐
បើបាទ → ក). តើអ្នកដឹងដោយសារអ្វី?
..... គោរពស្រឡា
ខ). តើទន្តគិលានុប្បដ្ឋាកផ្តល់សេវាថែទាំព្យាបាលល្អដែរឬទេ? ល្អ ☐ មិនល្អទេ ☐ មិនដឹង ☒
- ៨). តើទន្តគិលានុប្បដ្ឋាកមានចុះទៅអប់រំតាមសាលារៀន ដែរឬទេ? បាទ ☐ ទេ ☒ មិនដឹង ☐
- ៩). តើពីផ្ទះអ្នក ទៅមណ្ឌលសុខភាព (មន្ទីរពេទ្យ) មានចំងាយប៉ុន្មាន? ១.៥០ គ.ម
- ១០). តើអ្នកធ្វើដំណើរទៅទីនោះដោយមធ្យោបាយណា?
- ថ្មើជើង ☒ - កង់ ☐
- ម៉ូតូ ☐ - មធ្យោបាយផ្សេងទៀត.....
- ១១). តើធ្មេញរបស់អ្នកមានសារៈសំខាន់សំរាប់ជីវិតអ្នកដែរឬទេ? បាទ ☒ ទេ ☐
- ១២). បើមាន, ហេតុអ្វីបានជាមានសារៈសំខាន់?
..... ទំលាក់សាច់រាង

Appendix C

- Khmer translations of draft questionnaires

18). කේෂ්‍ය ස්වල්පාදාන ස්වල්පවත් නිවැරදිවත්: ක්‍රියාත්මක වන්නේ ?

- ස්වල්පාදාන	ක්‍රියාත්මක ...	ස්වල්ප ...	ස්වල්ප ...
- ස්වල්පාදාන	- 11 -	- 11 -	- 11 -
- ප්‍රතිපත්ති	- 11 -	- 11 -	- 11 -
- කෙටිකාලීන	- 11 -	- 11 -	- 11 -
- ස්වල්පාදාන	- 11 -	- 11 -	- 11 -
- කෙටිකාලීන	- 11 -	- 11 -	- 11 -
- කෙටිකාලීන	- 11 -	- 11 -	- 11 -
- කෙටිකාලීන	- 11 -	- 11 -	- 11 -
- කෙටිකාලීන	- 11 -	- 11 -	- 11 -
- කෙටිකාලීන	- 11 -	- 11 -	- 11 -

19). ජිව්‍ය ස්වල්පාදාන (ක්‍රියාත්මක) :

- ජිව්‍ය : ... %
- ජිව්‍ය : ... %
- ජිව්‍ය : ... %
- ජිව්‍ය : ... %

20). කේෂ්‍ය ස්වල්පාදාන ස්වල්පවත් නිවැරදිවත්: ක්‍රියාත්මක වන්නේ ?

- ක්‍රියාත්මක	ක්‍රියාත්මක ...	ස්වල්ප ...	ස්වල්ප ...
- ක්‍රියාත්මක	- 11 -	- 11 -	- 11 -
- ක්‍රියාත්මක	- 11 -	- 11 -	- 11 -
- ක්‍රියාත්මක	- 11 -	- 11 -	- 11 -
- ක්‍රියාත්මක	- 11 -	- 11 -	- 11 -

21). කේෂ්‍ය ස්වල්පාදාන ස්වල්පවත් නිවැරදිවත්: ක්‍රියාත්මක වන්නේ ?

- ක්‍රියාත්මක	ක්‍රියාත්මක ...	ස්වල්ප ...	ස්වල්ප ...
- ක්‍රියාත්මක	- 11 -	- 11 -	- 11 -
- ක්‍රියාත්මක	- 11 -	- 11 -	- 11 -
- ක්‍රියාත්මක	- 11 -	- 11 -	- 11 -

22). කේෂ්‍ය ස්වල්පාදාන ස්වල්පවත් නිවැරදිවත්: ක්‍රියාත්මක වන්නේ ?

23). කේෂ්‍ය ස්වල්පාදාන ස්වල්පවත් නිවැරදිවත්: ක්‍රියාත්මක වන්නේ ?

- ක්‍රියාත්මක	ක්‍රියාත්මක ...	ස්වල්ප ...	ස්වල්ප ...
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- පේෂ	මාර්ගගත ...	දුරකතන ...	දුරකතන ...
- ගෘහගත මාර්ගගත	—	—	—
- තැන්පත් කිරීම	—	—	—

24). මාර්ගගත මාර්ගගත තැන්පත් කිරීමේදී මාර්ගගත මාර්ගගත ?

- 1 = මාර්ගගත මාර්ගගත මාර්ගගත
- 2 = මාර්ගගත මාර්ගගත මාර්ගගත
- 3 = මාර්ගගත මාර්ගගත

- මාර්ගගත	1	2	3
- පේෂ	1	2	3
- ගෘහගත මාර්ගගත	1	2	3
- තැන්පත් කිරීම	1	2	3

25). මාර්ගගත මාර්ගගත මාර්ගගත මාර්ගගත මාර්ගගත ?

- මාර්ගගත මාර්ගගත : ...
- Autoclave : ...
- මාර්ගගත මාර්ගගත : ...
- මාර්ගගත මාර්ගගත : ...
- මාර්ගගත මාර්ගගත : ...

26). මාර්ගගත මාර්ගගත මාර්ගගත මාර්ගගත මාර්ගගත ? ආදිය

27). මාර්ගගත, මාර්ගගත ?

මාර්ගගත මාර්ගගත :

28). මාර්ගගත මාර්ගගත මාර්ගගත මාර්ගගත මාර්ගගත ?
ආදිය (මාර්ගගත මාර්ගගත මාර්ගගත 35)

29). මාර්ගගත මාර්ගගත මාර්ගගත ? ...

30). මාර්ගගත මාර්ගගත මාර්ගගත මාර්ගගත මාර්ගගත ?

- මාර්ගගත
- මාර්ගගත Fluoride
- මාර්ගගත මාර්ගගත මාර්ගගත
- මාර්ගගත මාර්ගගත (මාර්ගගත මාර්ගගත) :

31). මාර්ගගත මාර්ගගත මාර්ගගත මාර්ගගත මාර්ගගත ?

- 1 = 1 මාර්ගගත , 2 = මාර්ගගත
- 3 = 3 මාර්ගගත , 4 = 4 මාර්ගගත

- අයුක්ෂණ	1	2	3	4
- දියුණු Fluoride	1	2	3	4
- අවිද්‍යාත්මක ස්වභාවය	1	2	3	4
- ස්වභාවය සෞඛ්‍යය	1	2	3	4

32). ජීවත්වීමේ ස්වභාවය සෞඛ්‍යය සහ ස්වභාවය ?

- අයුක්ෂණ	අංකයන් ...	අංකයන් ...	අංකයන් ...
- දියුණු Fluoride	- 1	- 1	- 1
- අවිද්‍යාත්මක ස්වභාවය	- 1	- 1	- 1
- ස්වභාවය සෞඛ්‍යය	- 1	- 1	- 1

33). ජීවත්වීමේ ස්වභාවය සෞඛ්‍යය සහ ස්වභාවය ?

34). ජීවත්වීමේ ස්වභාවය සෞඛ්‍යය සහ ස්වභාවය ?

- ජීවත්වීමේ ස්වභාවය :
- අවිද්‍යාත්මක ස්වභාවය :
- ස්වභාවය සෞඛ්‍යය :

අවසාන විය ස්වභාවය : ආශ්වාස :

35). ජීවත්වීමේ ස්වභාවය සෞඛ්‍යය සහ ස්වභාවය ?

36). ජීවත්වීමේ ස්වභාවය සෞඛ්‍යය සහ ස්වභාවය ?

37). ජීවත්වීමේ ස්වභාවය සෞඛ්‍යය සහ ස්වභාවය ?

- ජීවත්වීමේ ස්වභාවය :
- අවිද්‍යාත්මක ස්වභාවය :
- GIC :
- ස්වභාවය සෞඛ්‍යය :
- ජීවත්වීමේ ස්වභාවය :
- ස්වභාවය සෞඛ්‍යය :

38). ජීවත්වීමේ ස්වභාවය සෞඛ්‍යය සහ ස්වභාවය ?

- ජීවත්වීමේ ස්වභාවය :
- අවිද්‍යාත්මක ස්වභාවය :
- ජීවත්වීමේ ස්වභාවය / ස්වභාවය සෞඛ්‍යය :
- ස්වභාවය සෞඛ්‍යය (ආශ්වාසය) :

39). ජීවත්වීමේ ස්වභාවය සෞඛ්‍යය සහ ස්වභාවය ?

ජීවත්වීමේ ස්වභාවය සෞඛ්‍යය සහ ස්වභාවය ?

40). ເຫຼັກ ທຳຢືນ ດ້ານ ນາໆ ດັ່ງນີ້ ຫາ: ປະຖູ ເ? ວາ/ ເ

41). ප්‍රශ්නය , ප්‍රශ්න ප්‍රශ්න ප්‍රශ්න ප්‍රශ්න ?

ଉତ୍ତରାଞ୍ଚଳ ଲେଖା ଓ ଲେଖକ:

42]. ස්ත්‍රී භය පද්‍රව් සීමාව භූගෝලය තුළ කොටස් කීයකි? 10/10

43) ଗୋଟିଏ ଗୋଟିଏ ଗୋଟିଏ ଗୋଟିଏ ଗୋଟିଏ ? ୩୯/୦୯

44). ଶେଫାଳୀ (ଅନ୍ଧାର ସ୍ୱରୂପ / ଅସୁବିଧା) ରଖାଇବା ଦାମ୍ଭିକତାକୁ କଣ ବୁଝାଏ ?

ନାମ ପୃଷ୍ଠା ଗ୍ରନ୍ଥ

[illegible]

— u — ଶେଷପୃଷ୍ଠା — u — — u — — u —

45). କେନ୍ଦ୍ରୀୟ ଚଳନର ନିମ୍ନ ଲିଖିତ ସମ୍ପର୍କର ଉତ୍ପତ୍ତି କିପରି ହେବ ?

46) જો કુરુ અને દ્રૌપદીના પાત્રોના અલગ અલગ ગુણોના આધારે આપણે આ કથાના પાત્રોનું વર્ણન કરીએ તો તે કેવું થાય? (૧૦)

47). 606 1/2 9

48). අප විසින් මෙහෙයුම් කළේය. මේ සඳහා වූ ආයතන සේවකයා වූවේ කවුද?
 ඔහු වූයේ ඊශායස් විසින්ය. ඔහු විසින්මය? 49/00

49). $\frac{1}{x^2} = x^{-2}$ $\frac{d}{dx} x^{-2} = -2x^{-3} = -\frac{2}{x^3}$ $\therefore \frac{d}{dx} \frac{1}{x^2} = -\frac{2}{x^3}$

50). ଶୀତଳିତ ପ୍ରଦାନପତ୍ର କି? ଫର୍ମ୍‌ସ୍‌ଟାଏ :

ନିଉତ୍ତର ଗଣିତ ଶ୍ରେଣୀ :

51). ལྟེན་ལྟེན་པོར་ ར་གྲྭ་ཤར་ལྟེན་ ར་གྲྭ་ཤར་ལྟེན་ ར་གྲྭ་ཤར་ལྟེན་ ?

→ 75 : - - - - - ରେ $\frac{1}{2}$ କିଲୋ ? - - - - -

— ୧୭ —

52). පිටත ස්ථානයන්හිදී ?

1 ୧୫୫୫

- ਪੰਨਾ ਪੰਨਾ

— চৌদশ অ ক হে ম

- ବିଜ୍ଞାନର ଲକ୍ଷ୍ୟ (୧୭. ସାବିତ୍ରୀ) :

പ്രശ്നം: ഏതെങ്കിലും കാരണത്താൽ?

53). සිංහලාභාස,

- සරණය : දේශ
- ඵලදායීත්වය : දේශ
- කෙසේදැයි : දේශ
- සාමාන්‍යයන් : දේශ

සාමාන්‍ය සිංහල ජීවිතයේ සාමාන්‍යයන්:

54). ජීවිතයේ සිංහල ජීවිතයේ සාමාන්‍යයන් සාමාන්‍යයන් සාමාන්‍යයන් ?

55). ජීවිතයේ සිංහල ජීවිතයේ සාමාන්‍යයන් සාමාන්‍යයන් සාමාන්‍යයන් ?

56). ජීවිතයේ සිංහල ජීවිතයේ සාමාන්‍යයන් සාමාන්‍යයන් සාමාන්‍යයන් ?

සාමාන්‍යයන්:

57). සිංහල ජීවිතයේ සාමාන්‍යයන් සාමාන්‍යයන් සාමාන්‍යයන් :

- සාමාන්‍යයන් : 1/2
- සාමාන්‍යයන් : 1/2
- සාමාන්‍යයන් : 1/2

58). ජීවිතයේ සිංහල ජීවිතයේ සාමාන්‍යයන් සාමාන්‍යයන් සාමාන්‍යයන් :

- සාමාන්‍යයන් : 1/2
- සාමාන්‍යයන් : 1/2

59). ජීවිතයේ සිංහල ජීවිතයේ සාමාන්‍යයන් සාමාන්‍යයන් සාමාන්‍යයන් ?

සාමාන්‍යයන් :

60). සිංහල ජීවිතයේ සාමාන්‍යයන් සාමාන්‍යයන් සාමාන්‍යයන් :

ජීවිතයේ සිංහල ජීවිතයේ සාමාන්‍යයන් සාමාන්‍යයන් සාමාන්‍යයන් ?

61). ජීවිතයේ සිංහල ජීවිතයේ සාමාන්‍යයන් සාමාන්‍යයන් සාමාන්‍යයන් ?

මිනිස් ස්වභාවය ප්‍රකාශනය 2 ක්‍රමය (Ds. managers).

- 1) . ක්ෂේත්‍රයන්හි පිළිගැනීමේ වාසිකාමීය ඒකාකාරී ව්‍යුහයක් වශයෙන් ව්‍යුහගත වනු ලබන ක්ෂේත්‍රයන්හි ව්‍යුහයන් ?
 - ක්ෂේත්‍රයන්හි ව්‍යුහයන්
 - ව්‍යුහගත වනු ලබන ක්ෂේත්‍රයන්
- 2) . සූර්‍ය පඤ්චක ප්‍රදානය (ඒකාකාරී ව්‍යුහයන්) .
- 3) . ක්ෂේත්‍රයන්හි ව්‍යුහයන්හි ව්‍යුහයන්හි ව්‍යුහයන් ව්‍යුහගත වනු ලබන ක්ෂේත්‍රයන්හි ව්‍යුහයන් ?
- 4) . ක්ෂේත්‍රයන්හි ව්‍යුහයන්හි ව්‍යුහයන් ව්‍යුහගත වනු ලබන ක්ෂේත්‍රයන්හි ව්‍යුහයන් ? (ඉන්ද්‍රියයන්)
- 5) . ඒකාකාරී ව්‍යුහයන්හි ව්‍යුහයන්හි ව්‍යුහයන් ව්‍යුහගත වනු ලබන ක්ෂේත්‍රයන්හි ව්‍යුහයන් ?
 ව්‍යුහයන් : 1 2 3 4 5
 ව්‍යුහයන් : 1 2 3 4 5
- 6) . ක්ෂේත්‍රයන්හි ව්‍යුහයන්හි ව්‍යුහයන් ව්‍යුහගත වනු ලබන ක්ෂේත්‍රයන්හි ව්‍යුහයන් ?
 ව්‍යුහයන් : 1 2 3 4 5
- 7) . ව්‍යුහයන්හි ව්‍යුහයන්හි ව්‍යුහයන් ව්‍යුහගත වනු ලබන ක්ෂේත්‍රයන්හි ව්‍යුහයන් ?
 ව්‍යුහයන් : 1 2 3 4 5
- 8) . ව්‍යුහයන්හි ව්‍යුහයන්හි ව්‍යුහයන් ව්‍යුහගත වනු ලබන ක්ෂේත්‍රයන්හි ව්‍යුහයන් ?
- 9) . ක්ෂේත්‍රයන්හි ව්‍යුහයන්හි ව්‍යුහයන් ව්‍යුහගත වනු ලබන ක්ෂේත්‍රයන්හි ව්‍යුහයන් ?
- 10) . ක්ෂේත්‍රයන්හි ව්‍යුහයන්හි ව්‍යුහයන් ව්‍යුහගත වනු ලබන ක්ෂේත්‍රයන්හි ව්‍යුහයන් ?
- 11) . ව්‍යුහයන්හි ව්‍යුහයන්හි ව්‍යුහයන් ව්‍යුහගත වනු ලබන ක්ෂේත්‍රයන්හි ව්‍යුහයන් ?
- 12) . ක්ෂේත්‍රයන්හි ව්‍යුහයන්හි ව්‍යුහයන් ව්‍යුහගත වනු ලබන ක්ෂේත්‍රයන්හි ව්‍යුහයන් ?

බිහිවීමේ වැටුප් සාමාජිකයන්ගේ (Qs. Community members)

1). කේන්ද්‍රීය කටයුතු වන ප්‍රධාන කාර්යයන් කුමනවා?

- ප්‍රධාන
- ප්‍රධාන

2). ඉන් මගින් කෙරුණ ප්‍රධාන කාර්යයන් කුමනවා?

- ප්‍රධාන කටයුතු
- ප්‍රධාන

3). කේන්ද්‍රීය කටයුතු වන ප්‍රධාන කාර්යයන් කුමනවා?

- ආය
- ප්‍රධාන

4). කේන්ද්‍රීය කටයුතු වන ප්‍රධාන කාර්යයන් කුමනවා? ආය/ප්‍රධාන :

- ප්‍රධාන → a). කේන්ද්‍රීය කටයුතු වන ප්‍රධාන කාර්යයන් කුමනවා?
- b). කේන්ද්‍රීය කටයුතු වන ප්‍රධාන කාර්යයන් කුමනවා?
- c). කේන්ද්‍රීය කටයුතු වන ප්‍රධාන කාර්යයන් කුමනවා? ආය/ප්‍රධාන
- d). කේන්ද්‍රීය කටයුතු වන ප්‍රධාන කාර්යයන් කුමනවා?

5). කේන්ද්‍රීය කටයුතු වන ප්‍රධාන කාර්යයන් කුමනවා? ආය/ප්‍රධාන :

- ප්‍රධාන → a). කේන්ද්‍රීය කටයුතු වන ප්‍රධාන කාර්යයන් කුමනවා?
- b). කේන්ද්‍රීය කටයුතු වන ප්‍රධාන කාර්යයන් කුමනවා? ආය/ප්‍රධාන / ප්‍රධාන

6). කේන්ද්‍රීය කටයුතු වන ප්‍රධාන කාර්යයන් කුමනවා? (ප්‍රධාන කාර්යයන්) ආය/ප්‍රධාන :

7). කේන්ද්‍රීය කටයුතු වන ප්‍රධාන කාර්යයන් කුමනවා?

- ප්‍රධාන
- ප්‍රධාන
- ප්‍රධාන

8). කේන්ද්‍රීය කටයුතු වන ප්‍රධාන කාර්යයන් කුමනවා? ආය/ප්‍රධාන :

9). ප්‍රධාන කාර්යයන් කුමනවා? ආය/ප්‍රධාන :

Appendix D

- Back translations of Khmer draft to English

Translated Questionnaires

Questionnaires for dental nurses

General information

- 1. Name:
- 2. Date of birth:
- 3. Sex: (Male/Female)
- 4. Year of dental nurse graduation:
- 5. Village/commune....., District....., Province.....
- 6. What is the distance between your office to referral hospital (km)?
- 7. Do you still work as dental nurse, presently? Yes/No (if no, go to Q.60)
- 8. If no, why?
- 9. Do your community people know that you can treat dental diseases? Yes/No
- 10. If yes, how do they know?
- 11. If no, why?

Treatment services

- 12. Yesterday (working days), how many patients did you serve?

General:.....

Dental:.....

- 13. Generally, how many patients come to you every day?

General:.....

Dental:.....

- 14. Yesterday, how many hours did you work?.....

- 15. Every day, how many hours do you work?

- 16. Yesterday, what dental problems did you experience?

Age	Sex	Symptoms	Diagnosis	Treatment Duration (minutes)
.....				
.....				
.....				

- 17-Generally, what dental problems do you usually experience?

Symptoms	Diagnosis	Treatment	Treatment duration (minutes)
.....			
.....			
.....			

18. How often do you treat the following problems?

	Often	Sometimes	Occasionally
- Extract permanent teeth			
- Extract primary teeth			
- Fillings:			
- Cleaning teeth:			
- Suturing			
- Dental hygiene instruction:			
- Others:			

19. Percentage of patients with oral diseases:

- Children:.....%
- Adolescent:..... %
- Adults:.....%
- Elderly:.....%

20. How often do you meet the following patient conditions?

	Often	Sometimes	Occasionally
- Facial swellings			
- Oral ulcers			
- Gum diseases			
- Local swelling gum			
- Others			

21. How often do you meet the following difficult cases?

	Often	Sometimes	Occasionally
- Unable to extract teeth.			
- Local anesthetic failed.			
- Teeth or roots brake during extraction			
- Others			

22. How do you deal with these difficult cases?

.....

.....

23. How often do you experience the post-treatment problems, such as the following?

	Often	Sometimes	Occasionally
- Bleeding			
- Swelling			
- Dry hole			
- Others			

24. How do you deal with these problems?

	1=Treatment by yourself	2=Refer to other places	3=Give medicine
- Bleeding	1	2	3
- Swelling	1	2	3
- Dry hole	1	2	3
- Others	1	2	3

25. How do you sterilize your treatment equipment?

- Cooker with pressure
- Autoclave
- Burn with alcohol
- Boil with water
- Others

26. Do you change treatment instruments for each patient? Yes/No

27. If not, why?

Prevention activity:

28. Do you implement preventive program for school children?

- Yes
- No (if not, go to Q. 35)

29. If yes, how many schools that have preventive programs? Schools.

30. What are the preventive programs that are implementing at school?

- Brush teeth
- Rinse with fluoride solution
- Oral health education
- Other activities (please describe).....

31. How often do you monitor these programs?

	1=once per week,	2=once per month,	3=once per 3 months,	4=> 3 months
- Brush teeth	1	2	3	4
- Rinse with fluoride solution	1	2	3	4
- Oral health education	1	2	3	4
- Others activities		1	2	3 4

32. How do you score the program?

	Very good	Good	not good
- Brush teeth			
- Rinse with fluoride solution			
- Oral health education			
- Other activities			

33. What materials do you use in the program?

34. Where do you receive these materials?

- Ministry of health
- Non-governmental organisation
- Other sources

Equipment and materials

35. Are your dental equipments still good? Yes/No

36. If no, why?

37. How many dental materials do you use within three months?

- Anesthetic:.....Ampoules
- Needles:.....Needles
- GIC:.....Boxes
- Cotton:.....packages
- Gloves:.....pairs
- ZOE:.....bottles
- Others:.....

38. Where does these materials come from?

- Ministry of health
- Non-organisational organisation
- From market or pharmacy
- From other places (please describe)

39. Do you regularly receive these materials? How many times in a year?

40. Did you ever not receive the materials? Yes/No

41. If yes, what do you actually do?.....

Working environment and support

42. At your health center (hospital), do you have separate dental clinic? Yes/No

43. Do you have dental chair? Yes/No

44. Does your boss (hospital director, health center manager) support your dental activity?

	No	Little	Much
- Spiritual support.			
- Financial support.			
- Other types of support			

45. What other supports do you need from your manager?

46. Do you have good relationship with dentist at your workplace? Yes/No
47. Why?.....
48. After your graduation, did you ever participate in seminars or conference in order to promote your dental knowledge? Yes/No
49. If yes, how many times.....in what year.....
50. Under what subject? Please describe:
-
-

Other activities

51. Do you provide dental service outside your workplace?
- Yes → where?.....
- No
52. If yes, what are the treatments?
- Extracting teeth
 - Filling
 - Cleaning
 - Other (eg. Denture), please describe:
- Where did you learn these cases?.....
53. How much do you charge?
- Extracting teeth.....Riels
 - Filling.....Riels
 - Cleaning.....Riels
 - Other activities.....Riels

Community needs assessment

54. What are the main dental health problems in the community?
-
55. What are the causal factors for these problems?
-
56. Do you have any roles in the prevention of dental health problem in your community?
-

Administration

57. Do you record each patient's condition?
- Symptoms Yes/No
 - Diagnosis Yes/No
 - Treatment Yes/No

58. Do you prepare?

- Monthly report Yes/No
- Yearly report Yes/No

59. To where do you send these reports? please describe:

.....
.....

Comments

60. Please range score from 1 to 5

1	2	3	4	5	
Not satisfied				Very satisfied	
Are you satisfied with your dental job?	1	2	3	4	5

61. If you chose 1 or 2, why are not you satisfied with this job?

.....

62. Please range from 1 to 5

1	2	3	4	5
Not self-confidence				Very confident

How do you feel presently that you can perform the following roles?

- Ask personal history	1	2	3	4	5
- Diagnosis	1	2	3	4	5
- Deal with difficult cases	1	2	3	4	5
- Extraction	1	2	3	4	5
- Treat bleeding	1	2	3	4	5
- Deal with cases of post treatment	1	2	3	4	5
- Implement community program	1	2	3	4	5
- Implement school program	1	2	3	4	5

63. Please range from 1 to 5

1	2	3	4	5
Lack of skills				skillful

Did dental nursing class provide you enough skills to practice the following tasks?

- Ask personal history	1	2	3	4	5
- Diagnosis	1	2	3	4	5
- Deal with difficult cases	1	2	3	4	5
- Extraction	1	2	3	4	5
- Treat bleeding	1	2	3	4	5
- Deal with cases of post treatment	1	2	3	4	5
- Implement community program	1	2	3	4	5

- | | 1 | 2 | 3 | 4 | 5 |
|--|---|---|---|---|---|
| - Implement school program | | | | | |
| 64. Do you know what is the obstacle that prevents you from practicing your skills? Yes/No | | | | | |
| 65. If yes, please describe..... | | | | | |
| 66. Do you have any comments? | | | | | |

Questionnaires for Hospital/Health Center Directors

1. What do you think of the presence of dental nurses in your health center, hospital?
-Very beneficial
-Not necessary
2. Why? Please describe.
.....
3. How do you delegate activities of dental nurses who have two roles?
4. How do you support dental care activities? Please describe:
.....
5. In your own opinion, how do you score dental treatment?
- Don't know

-	1	2	3	4	5
	Not good				Very good
6. Do you know that there are oral dental health programs in schools? Yes/No/Don't know
7. If yes, how are the programs successful? In your opinion, please range from 1 to 5.
- Don't know

-	1	3	3	5	5
	Failed				Very successful
8. In your health center (hospital), do you have adequate equipment for dental services? Yes/No
9. Do you receive daily work sheet of dental nurses? Yes/No
10. Do you have any plan for the oral health activities in your community? Yes/No
11. If yes, please describe:
12. Do you have any comments in regard to oral health?
.....

Questionnaires for Community Members

1. How is your general health?
 - Good
 - Not so good
2. What about your teeth, how are they?
 - Good
 - Not so good
3. If good, did you ever have any dental problems?
 - Yes
 - No (→ go to Q. 5)
4. Did dental nurse treat you? Yes/No
 - If yes, →
 - a). How were the symptoms?.....
 - b). What did dental nurse do?
 - c). Are you satisfied with that treatment? Yes/No
 - d). For how long did you have to wait for the treatment?.....minutes
5. Do you know that there are dental nurse at health center/hospital? Yes/No
 - If yes, →
 - a). How do you know?
 - b). Do nurses provide good dental care services? Yes/No/Don't know
6. How far is there from your home to health center? Km.
7. How do you go there?
 - On foot
 - Bicycle
 - Motobikes
 - Other means:
8. Are your teeth important for your life? Yes/No
9. If yes, why?

.....

Appendix E

- The Ministry of Health permission letter



KINGDOM OF CAMBODIA

NATION- RELIGION- KING

MINISTRY OF HEALTH

Phnom Penh. Date : 22 / 01 / 2002

No. 14 / 2002 / DG. H. HRD

Willem Van Dis
Country Director ICC
#47A, Street 386, PO Box 612
Phnom Penh, Cambodia

Dear Sir,

Subject: Survey of the effectiveness of the Dental Nurse Training Program graduates

I am writing to refer to your letter of the 26th December 2001 related to the above-mentioned subject. The Ministry of Health has a great pleasure to inform you that the Ministry has no objection to your request to conduct a survey of the effectiveness of the Dental Nurse Training Program graduates.

Thank you very much for your cooperation.

Yours sincerely, *[Signature]*



SECRETARY OF STATE

[Signature]
DI MAN BUNHENG

Appendix F

- Data value codes

Variable codes and value codes of questionnaires for dental nurses

Variable	Variable codes	Value	Value codes
ID	NID		
AGE	AGE	Year of Birth	e.g. 1970
SEX	SEX	Male	M
		Female	F
YEAR OF GRADUATION	YGRAD	Year of graduation	e.g. 1998
PROVINCE	PROV	Battambang	BTB
		Kampong Cham	KCH
		Kampong Chhnang	KCHH
		Kampong Speu	KSP
		Kampong Thom	KTH
		Kmpot	KPOT
		Kandal	KDAL
		Prey Veng	PREY
		Pursat	PUR
		Takeo	TAK
INTERVIEWER	INTERV	Tepirou Chher	TEPI
		ICC Staff	ICC
		AOI Staff	AOI
QUESTION 6	H FAR	Number of kilometres	e.g. 02 km
QUESTION 7	WORKING	Yes (100% dental activities)	2
		Yes (bi-functional duties)	1
		No	0
QUESTION 8	WHY8	Many duties/not enough staff	BUSY
		No dental chair	CHAIR
		Further education	EDU
		N/A	NA
QUESTION 9	P KNOW	Yes	1
		No	0

QUESTION 10	HOW10	Health staff/immunization program Authority: village leader... Word of mouth Other	HCS LEADER WOM OTHER
QUESTION 11	PATIENTS	Number of patients	e.g. 02
QUESTION 12	HOURS	Number of hours/day	e.g. 06
QUESTION 13	PROBLEMS	Caries Gingivities Abscess (swollen face) Pulpitis	CARI PERIO FACE PULP
QUESTION14 a. Extraction of permanent teeth b. Extraction of deciduous teeth c. Restoration	EXO	Often Sometimes Rarely Never	3 2 1 0
	EXO1	Often Sometimes Rarely Never	3 2 1 0
	RES	Often Sometimes Rarely Never	3 2 1 0
	SCAL	Often Sometimes Rarely Never	3 2 1 0
	SUTURE	Often Sometimes Rarely Never	3 2 1 0
	OHE	Often Sometimes Rarely Never	3 2 1 0
d. Scaling			
e. Suturing			
f. Individual OHE			

g. Other services	OTHERS		Often	3	
			Sometimes	2	
			Rarely	1	
			Never	0	
			% children % adult	e.g. 30% e.g. 70%	
QUESTION 15	PROP CHILDREN PROP ADULT				
QUESTION 16 a. Swollen face	SWOLLEN		Often	3	
			Sometimes	2	
			Rarely	1	
			Never	0	
b. Ulcers inside cheeks and lips	ULCER		Often	3	
			Sometimes	2	
			Rarely	1	
			Never	0	
c. Periodontal diseases	PERIO		Often	3	
			Sometimes	2	
			Rarely	1	
			Never	0	
d. Localized gum swellings (gum boils)	GUM BOILS		Often	3	
			Sometimes	2	
			Rarely	1	
			Never	0	
e. Other problems	OTH16		Often	3	
			Sometimes	2	
			Rarely	1	
			Never	0	
QUESTION 17 a. Teeth are difficult to extract	DIFFIC		Often	3	
			Sometimes	2	
			Rarely	1	
			Never	0	
b. Failed local anaesthesia	FAILA		Often	3	
			Sometimes	2	
			Rarely	1	
			Never	0	

c. Teeth/roots broken during extraction	BROKEN	Often Sometimes Rarely Never	3 2 1 0	
d. Other difficulties	OTH17	Often Sometimes Rarely Never	3 2 1 0	
QUESTION 18	MANAGE DIF	Refer to dentist continue treatment N/A	REFER CONTINUE NA	
QUESTION 19 a. Haemorrhage	HAEM19	Often Sometimes Rarely Never	3 2 1 0	
b. Swelling	SWEL19	Often Sometimes Rarely Never	3 2 1 0	
c. Dry socket	DRYS19	Often Sometimes Rarely Never	3 2 1 0	
d. Filled teeth abscess	F ABS19	Often Sometimes Rarely Never	3 2 1 0	
e. Fillings fall out or fracture	FALL19	Often Sometimes Rarely Never	3 2 1 0	
f. Other problems	OTH19	Often Sometimes Rarely Never	3 2 1 0	

QUESTION 20 a. Haemorrhage b. Swelling c. Dry socket d. Filled teeth abscess e. Fillings fall out or fracture f. Others	HAEM20	Try to solve by yourself Refer to elsewhere give medicine	1 2 3	
	SWEL20	Try to solve by yourself Refer to elsewhere give medicine	1 2 3	
	DRYS20	Try to solve by yourself Refer to elsewhere give medicine	1 2 3	
	F ABS20	Try to solve by yourself Refer to elsewhere give medicine	1 2 3	
	FALL20	Try to solve by yourself Refer to elsewhere give medicine	1 2 3	
	OTH20	Try to solve by yourself Refer to elsewhere give medicine	1 2 3	
QUESTION 21 a. Pressure cooker b. Autoclave c. Oven d. Wipe with alcohol e. Burn with alcohol	PR COOKER	Often Sometimes Rarely Never	3 2 1 0	
	AUTOCL	Often Sometimes Rarely Never	3 2 1 0	
	OVEN	Often Sometimes Rarely Never	3 2 1 0	
	W ALCOL	Often Sometimes Rarely Never	3 2 1 0	
	B ALCOL	Often	3	

f. Boil in water	BOIL	Sometimes	2	
		Rarely	1	
		Never	0	
g. other methods	OTH21	Often	3	
		Sometimes	2	
		Rarely	1	
		Never	0	
		Often	3	
		Sometimes	2	
		Rarely	1	
		Never	0	
	PCGOOD	Yes	1	
		No	0	
QUESTION 22		Yes	1	
QUESTION 23	STERILISE	No	0	
QUESTION 24	NEEDLE24	Number of times	e.g. 01	
QUESTION 25	STER25	Clean+sterilize	CLEAN	
		N/A	NA	
QUESTION 26	LA26	Yes	1	
		No	0	
QUESTION 27	GLOVE27	Number of times	e.g. 01	
QUESTION 28	STER28	Clean+sterilize	CLEAN	
		N/A	NA	
QUESTION 29	PREV29	Yes	1	
		No	0	
QUESTION 30	WHY30	lack of preventive materials	MATERIAL	
		No budget to go to school	BUDGET	
		No support from the leaders	SUPPORT	
		No plan/program schedule	PLAN	
		Too many duties/no time	BUSY	
		N/A	NA	
QUESTION 31	SCHO31	Number of schools	e.g. 01	
QUESTION 32	TYPE32	Tooth brushing	TB	
		Fluoride mouth rinse	FLUO	
		Oral health education	OHE	
		Others	OTH	

QUESTION 33 a. Tooth brushing b. Fluoride mouth rinse c. Oral health education e. Other activities	TBRU33	Once a week Once a month Once in three month > 3 months	1 2 3 4	
	MRINSE33	Once a week Once a month Once in three month > 3 months	1 2 3 4	
	OHE33	Once a week Once a month Once in three month > 3 months	1 2 3 4	
	OTH33	Once a week Once a month Once in three month > 3 months	1 2 3 4	
	TBRU34	very good good poor	VG G P	
	MRINSE34	very good good poor	VG G P	
	OHE34	very good good poor	VG G P	
	OTH34	very good good poor	VG G P	
	YEARS35	Number in years	e.g. 01	
	CONTINUE	Yes No	1 0	
	INSTRUMENT	Yes No	1 0	
QUESTION 34 a. Tooth brushing b. Fluoride mouth rinse c. Oral health education e. Other activities	QUESTION 35			
	QUESTION 36			
	QUESTION 37			

QUESTION 38 a. Local anaesthesia b. Dental needles c. Glass ionomer cement d. Cotton e. Glove f. Zinc oxide eugenol	LA38	# of cartridges # of needles # of boxes # of rolls # of pairs # bottles(packs)	e.g. 100
	DNEEDLE38		e.g. 50
	GIC38		e.g. 01
	COTTON38		e.g. 01
	GLOVE38		e.g. 100
	ZOE38		e.g. 01
QUESTION 39 a. Local anaesthesia b. Dental needles c. Glass ionomer cement d. Cotton e. Glove f. Zinc oxide eugenol	LA39	MoH NGOs Buy from market	1 2 3
	DNEEDLE39	MoH NGOs Buy from market	1 2 3
	GIC39	MoH NGOs Buy from market	1 2 3
	COTTON39	MoH NGOs Buy from market	1 2 3
	GLOVE39	MoH NGOs Buy from market	1 2 3
	ZOE39	MoH NGOs Buy from market	1 2 3
	REGULAR SUPPLIES	# of times per year	e.g. 04
	RUN OUT	Yes No	1 0
	WHAT TO DO	Buy from market N/A Others	1 2 3
	ROOM	Yes No	1 0
	CHAIR	Yes No	1 0
QUESTION 40			
QUESTION 41			
QUESTION 42			
QUESTION 43			
QUESTION 44			

QUESTION 45 a. Moral	MORAL	None	0	
		A little	1	
		A lot	2	
b. Budget	BUDGET	None	0	
		A little	1	
		A lot	2	
c. Other	OTH45	None	0	
		A little	1	
		A lot	2	
QUESTION 46	FARSUPPORT	Arrange outside support	SUPPLIES	
		Dental duty only/reduce duties	DUTY	
		Moral/encouragement	MORAL	
		N/A	NA	
		Others	OTH	
QUESTION 47	RELATIONSHIP	Yes	1	
		No	0	
QUESTION 48	WHYYES	Refer patients	REFER	
		Working together	WORK	
		N/A	NA	
	WHYNOT	Others	OTH	
		No dentist	NODENT	
QUESTION 49	WORKSHOP	Others	OTH	
		N/A	NA	
QUESTION 50	HOWMANY	Yes	1	
		No	0	
QUESTION 51	TOPICS	# of times attended	e.g. 01	
		Review lecture	REVIEW	
		Supine position+ART	ART	
		Discuss problems/solving	SOLVING	
QUESTION 52	PRIVATE PRAC	Not remember	NA	
		Yes	1	
QUESTION 53	TREATMENT TYPE	No	0	
		Extraction	EXO	
		Restoration	RES	

a. Who teach you?	TEACHER	Scaling Prosthetic Root canal therapy Traditional healer Dentist	SCA PROS ROOT TRAD DENTIST
QUESTION 54	COMM PROB	Dental caries Gum diseases N/A Others	CARIES GUMD NA OTH
QUESTION 55	CAUSES	Lack of knowledge about OH Poor oral hygiene Lack of oral health education Low incomes/low SES Others	K HYGIENE OHE SES OTH
QUESTION 56	DN ROLE	Give dental health education Treat simple problem Others	DHE TREAT OTH
QUESTION 57	REC SIGNS	Yes No	1 0
b. Diagnosis	REC DIAG	Yes No	1 0
c. Treatment procedure	REC TREAT	Yes No	1 0
QUESTION 58	REPORT M	Yes No	1 0
a. Monthly	REPORT Y	Yes No	1 0
b. Annually	REPORT GO	Operational district Others	OD OTH
QUESTION 59	LIKE JOB	Not at all	1
QUESTION 60			2 3 4 5
QUESTION 61	WHY61	Very much N/A	

h. Implementing school program	SCHOOL62	Very incompetent Very expert	1 2 3 4 5	
QUESTION 63				
a. Taking a history	HISTORY63	Not develop this skill	1 2 3 4 5	
b. Making diagnosis	DIAGN63	Developed sufficient skill Not develop this skill	1 2 3 4 5	
c. Doing restoration	REST63	Developed sufficient skill Not develop this skill	1 2 3 4 5	
d. Extracting teeth	EXO63	Developed sufficient skill Not develop this skill	1 2 3 4 5	
e. Managing haemorrhage	HAEMO63	Developed sufficient skill Not develop this skill	1 2 3 4 5	
f. Treating a complication case	COMCASES63	Developed sufficient skill Not develop this skill Developed sufficient skill	1 2 3 4 5	

g. Implementing community program	COMMPRO63		Not develop this skill	1 2 3 4 5	
			Developed sufficient skill		
h. Implementing school program	SCHOOL63		Not develop this skill	1 2 3 4 5	
			Developed sufficient skill		
QUESTION 64	ANYBARRIERS		Yes	1	
			No	0	
QUESTION 65	BARRIERS		Insufficient materials/instruments	INSUF	
			lack of supporting from top leaders	SUPPORT	
			Too many duties	BUSY	
			No dental chair/dental unit	CHAIR	
			N/A	NA	
			Others	OTH	
QUESTION 66	ANYCHANGE		Proper plan for OH program	PLAN	
			More staff for HC/reduce duties	STAFF	
			Budget for community/school activities	BUDGET	
			Good equipment/dental chair	CHAIR	
			Enough materials/instruments/supplies	MATERIAL	
			N/A	NA	
QUESTION 67	COMMENTS		Need sufficient materials/instruments	MATERIAL	
			Continuing support after training	SUPPORT	
			Expenditure to community/school	BUDGET	
			Seminars/workshops	SEMINAR	
			Need more skill: root canal therapy	SKILL	
			N/A	NA	

Variable codes and value codes of questionnaires for health centre managers

Variable	Variable codes	Value	Value codes
ID	MID		
PROVINCE	PROV	Battambang	BTB
		Kampong Cham	KCH
		Kampong Chhnang	KCHH
		Kampong Speu	KSP
		Kampong Thom	KTH
		Kampot	KPOT
		Kandal	KDAL
		Prey Veng	PREY
		Pursat	PUR
		Takeo	TAK
QUESTION 1	USEFUL	Very useful	1
		Unnecessary	0
QUESTION 2	WHY	serve people	SERVE
		multisectorial service at HC	MULTI
QUESTION 3	BIFUNC	Service on demand	SERVICE
		Special days in week	SPEC
		100 % as dental nurse	100%
QUESTION 4	SUPPORT	Encouragement+moral support	MORAL
		Inform community member	ANNOUN
		Arrage outside support	OUTSIDE
		Budget support	BUDGET
QUESTION 5	TREAT	Don't know	0
		Not at all well	1
			2
			3
			4
		Extremely well	5
QUESTION 6	SCHOOL	Yes	1
		No	0
		Don't know	2

QUESTION 7	SUCCESS	Don't know Not successful	0 1 2 3 4 5
QUESTION 8	SUPPLIES	Highly successful Yes No	1 0
QUESTION 9	JOB	Yes No	1 0
QUESTION 10	ANY PLAN	Yes No	1 0
QUESTION 11	PLAN	OHE for community OHE for school For both school and community Others	COMM SCHO BOTH OTH
QUESTION 12	COMMENT	Materials/supplies Instruments/Equipments Further education/more skill needed Seminars/workshop Proper plan for oral health program	SUPPLIES EQUIP SKILL SEMINAR PLAN

Variable codes and value codes of questionnaires for community members

Variable	Variable codes	Value	Value codes
ID	PID		
Sex	SEX	Male Female	M F
AGE	AGE	Age in years	e.g. 33
PROVINCE	PROV	Battambang	BTB
		Kampong Cham	KCH
		Kampong Chhnang	KCHH
		Kampong Speu	KSP
		Kampong Thom	KTH
		Kampot	KPOT
		Kandal	KDAL
		Prey Veng	PREY
		Pursat	PUR
		Takeo	TAK
PLACE OF INTERVIEW	PINTER	At home	HOME
		At health center	HC
QUESTION 1	HEALTH	Good Not so Good	1 0
QUESTION 2	TEETH	Healthy Not so healthy	1 0
QUESTION 3	GUMS	Healthy Not so healthy	1 0
QUESTION4	PROBLEM	Yes No	1 0
QUESTION 5	HEALER	Dental nurse	DN
		Traditional healer	TRAD
		Dentist	DENTIST
		Self	SELF
		Others	OTH
QUESTION 6 a. Location of treatment b. Type of treatment	LOCATION	At health center	HC
		At DN home/private clinic	HOME
	TYPE	Extraction	EXO
		Restoration	RES

c. Satisfaction with that treatment			Scaling Prosthetic Root canal therapy	SCA PROS ROOT
	OK		Yes No	1 0
	WAIT		Minutes	e.g. 10
	COST		Riels = US\$	e.g. 4000 Riels = US\$1.00
	PREV		Yes No	1 0
QUESTION 7		ANYDN	Yes No	1 0
a. How do you know?	HOW		Health center staff told Relative told Neighbour told	HCS RELY NEIGHB
	SERVICE		Don't know Yes No	2 1 0
QUESTION 8		SCHOOL	Don't know Yes No	2 1 0
QUESTION 9		DISTANCE	Kilometers	e.g. 02 km
QUESTION 10		TRAVEL	By foot By bicycle By motorbike Other transportations	FOOT BIKE MBIKE OTHER
QUESTION11		IMPORTANT	Yes No	1 0
QUESTION 12		MAST	Yes No	1 0
a. Mastication				
b. Aesthetic		AEST	Yes No	1 0
c. General health		GOODH	Yes No	1 0
d. Good breath		GOODB	Yes No	1 0
e. Good speech		GOODSP	Yes No	1 0