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ORAL HEALTHCARE

IN

MALAYSIA

Oral Health Division,
Ministry of Health Malaysia
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I. INTRODUCTION

The Malaysian government is the major provider of healthcare for its people. Other important providers contributing to the welfare of the population include the private sector and non-government organisations (NGOs).

The goal to achieve "Vision 2020" has been accepted as the national target for excellence by the whole nation in its endeavour for developed nation status.

Vision 2020

"By the year 2020, Malaysia is to be a united nation with a confident Malaysian society, infused by strong moral and ethical values, living in a society that is democratic, liberal and tolerant, caring, economically just and equitable, progressive and prosperous, and in full possession of an economy that is competitive, dynamic, robust and resilient."

Dato' Seri (Dr.) Mahathir Mohamed,
Prime Minister of Malaysia, 1991[1]

In healthcare provision, as in other areas of concern, this vision continues to be the impetus inspiring all healthcare providers to excel.

II. COUNTRY PROFILE

Location

Malaysia is located in South East Asia, between latitudes 1^{0} and 7^{0} North and longitudes 100^{0} and 119^{0} East. It comprises 13 states and the Federal Territories of Kuala Lumpur, Labuan and Putrajaya. Kuala Lumpur is the capital city with a population of approximately 3 million. The South China Sea separates the states of Sabah, Sarawak and the Federal Territory of Labuan from Peninsula Malaysia, a distance of 540 kilometres (Figure 1).

Figure 1: Map of Malaysia

The total land area of the country is 330,252 sq. km. Peninsula Malaysia, occupying an area of 131,598 sq. km. is bordered by Thailand in the north and the island nation of Singapore in the south. Sabah and Sarawak share their frontiers with Kalimantan in Indonesia and the Sultanate of Brunei Darul Salam. The Federal Territory of Labuan is located off the coast of Sabah.

System of government

Malaysia is an independent nation with a parliamentary monarchy, with the King as Head of State, and a prime minister. The Head of State is elected to the throne on a rotational basis of 5 years. Nine states are headed by a Sultanate, four by a governor and one by a mayor.

Climate

The country has a tropical climate with daily temperatures ranging from 21^0C to 32^0C throughout the year. The annual rainfall averages 200 centimetres a year and relative humidity can be as high as 90%.

Demography

In 2004, the population of Malaysia was estimated at 25.7 million of which 1.7 million are non-Malaysians. Proportions of males to females are almost equal at 50.9% to 49.1% respectively. Life expectancy is 71 years for males and 75.5 for females.

The uniqueness of Malaysia lies in its multiethnic population. The ethnic breakdown for Malaysian citizens is as follows:

Malays	54.1 %
Chinese	25.4 %
Indians/Pakistani	7.5 %
Indigenous Groups	11.7 %
Others	1.3 %

Source: Department of Statistics Malaysia 2004

Indigenous groups mainly comprise the ethnic groups of Sabah and Sarawak and the Orang Asli of Peninsula Malaysia. "Others" include Eurasians and expatriates who have chosen to make Malaysia their home. Non-citizens consist mainly of nationals from Indonesia, Philippines, Myanmar, Vietnam, Cambodia and Bangladesh who have come to seek employment in Malaysia.

The average annual population growth rate is projected at 2.1% per annum. The proportion of the population below 15 years of age was 33.3% in 2000, declining from 36.7% in 1991. Malaysia will continue to have young citizens although the median age of the population increased from 21.9 years in 1991 to 23.6 years in 2000. With increasing life expectancy, there is a corresponding increase in proportion of the elderly in the population. The proportion of those aged 65 years and above is projected to increase from 3.9% in year 2000 to 4.2% in 2005.

The population density is approximately 74 per sq. km. The urban population has increased from 26.8% in 1970 to 58.8% in 2000. This is attributed largely to urban migration in search of employment.

Diet

Rice is the staple food for the majority of the population. Dietary differences understandably exist due to socio-economic factors, cultural variations, religious dictates and individual preferences.

Consumption of sugar is high, estimated at 48.4 kg per capita per year in the year 2000[2]. With socio-economic development, the urban population is also seen to consume greater amounts of processed and refined foods.

Economy Indicators

Malaysia has five-year rolling plans first started in 1960. The country is currently into its Eighth Malaysia Plan (2001 – 2005). Long-term Outline Perspective Plans (OPP) was established in 1970. The country is into its third long-term Plan (OPP3). The National Development Policy of Malaysia is based on the principle of growth with equity. It is aimed at alleviating poverty and eliminating economic imbalances among communities and regions towards the overriding goal of national unity.

Gross National Product (GNP) annual growth rate from 1990 – 1998 was at an average of 6.4%. Gross Domestic Product (GDP) in 2003 was 5.3%. GDP is expected to increase to 7% in 2004. The manufacturing and services sectors are the leading sectors in the economy and the key contributors to growth. The services sector is expected to contribute 57.1% to the GDP while the manufacturing sector is estimated to constitute 31.8% of the GDP for 2004. The contribution of the agricultural sector to GDP has fallen from 18.7% in 1990 to only 10.5% in 2000 and about 8.2% in 2003. However, the government aims to revitalise the agricultural sector by increasing investment in agriculture and agro-based industries.

III. HEALTHCARE IN MALAYSIA – AN OVERVIEW

The Malaysian Healthcare System

The healthcare system in Malaysia involves many different agencies and organisations that may be directly, or indirectly, related to health. The Ministry of Health (MOH) acts as the primary provider, planner and organiser of medical, health and oral health services for the nation and is thus the government's lead agency for health. A Minister heads the MOH.

In recent years, the private medical sector has expanded in Malaysia's robust free market economy. Under the free enterprise system, private facilities may be set up anywhere in the country but the majority is urban-based. Many of these private enterprises focus on high-return curative care. However, the recent Second National Health and Morbidity Study (NHMS 2)[3] indicated that the private sector is contributing approximately 30% of preventive care for the population in terms of immunisation against childhood diseases, care of antenatal

mothers and routine medical examinations.

Traditional healers - the Chinese *sinseh,* the Indian *ayurvedic* healers and the Malay traditional healers - continue to play a role in the healthcare system. The MOH is working towards documenting the knowledge and regulating the practice of traditional and complementary medicine (T/CM) practitioners in the country with the setting up of a Division for T/CM within the MOH. These are efforts towards integrating T/CM into the mainstream healthcare system to harmonise modern and traditional medicine.

NGOs such as professional and civic associations and societies play a major role through community care for the elderly, the mentally ill, and for the mentally and physically challenged.

Concept and Philosophy of Health

Health is acknowledged as an integral part of the socio-economic development of Malaysia. Primary healthcare is the thrust of the Malaysian healthcare system and the country is a signatory to the Alma Ata Declaration of 1978. There is government acknowledgement that equity in health is not the purview of the health sector alone. Government policies for the poor have included targeting healthcare delivery to the economically disadvantaged and to rural populations.

The concept and philosophy of health in Malaysia is embodied in the following tenets:

- Health is a fundamental right of every Malaysian and every individual has the right to develop and lead a healthy life. With this right, there must also be a balanced individual responsibility to maintain his or her own health and the realisation that health is an asset, which must be actively acquired.
- Health is a shared responsibility of the government, the profession and the community.
- The government continues to advocate health as a social responsibility.
- Health is a public service to be made available to everyone, with equity of access, both in geographical and cost terms.
- There must be continued creation of equal opportunities for health, and efforts must be concentrated to bringing health differentials down to the lowest possible level.

Healthcare Delivery

The main bulk of healthcare is under the MOH, which provides care at three levels - primary, secondary and tertiary. There are also providers of healthcare under the Ministry of Higher Education, Ministry of Defence, Ministry of Home Affairs, Ministry of Rural and Regional Development, statutory bodies and also local authorities.

A network of health clinics provides primary healthcare to the local community. Comprehensive healthcare services are provided covering antenatal, postnatal, child health, adolescent, school health, wellness, elderly, mental health, nutrition and dietetics, home care nursing, rehabilitation, occupational health and health surveillance. The MOH oral healthcare is an integral component of these decentralised clinics. There exists an established referral system from primary to secondary and tertiary care through a network of district and urban hospitals.

The percentage allocation of the national budget for the Ministry of Health has remained fairly constant for over 30 years. The budget allocation for the Ministry of Health, Malaysia is shown in (Table 1).

Table 1: Budget Allocation, Ministry of Health Malaysia (1970 – 2003)

Year	Total National Budget (RM)	Ministry of Health		
		Allocation (RM)	% of National Budget	% of GNP
1970	3,350,900,000	216,900,000	6.41	1.51
1980	20,724,300,000	835,718,084	4.03	3.53
1990	33,405,637,300	1,623,851,780	4.86	2.14
2000	78,025,291,600	4,931,315,300	6.32	2.58
2003	109,801,554,460	7,556,006,400	6.88	3.56

Source: Finance Division, Ministry of Health Malaysia
Accounts Division, Ministry of Health Malaysia

In line with the country's Vision 2020, the Ministry of Health has formulated a Vision for Health for the country.

Vision for Health
Malaysia

"By the year 2020, Malaysia is to be a nation of healthy individuals, families and communities, through a health system that is equitable, affordable, efficient, technologically-appropriate, environmentally-adaptable and consumer-friendly, with emphasis on quality, innovation, health promotion and respect for human dignity and which promotes individual responsibility and community participation towards an enhanced quality of life."

Vision for Health

The Vision for Health provides a common goal and direction for all health and health-related concerns and is directed towards three dimensions: outcome of health initiatives, the characteristics of the desired health system and its areas of concern.

Towards the realisation of this healthcare vision, there is a need to reshape a system that is largely focused on illness, facilities and healthcare providers to one focused on wellness, people and the capacity to deliver services directly into people's homes. The MOH current focus is on lifelong wellness wherein individuals and families will be empowered to play the major role in managing their health. The focus of the future healthcare system is on people and services, with technology playing a key-enabling role.

Policies in Health

The MOH spearheaded a landmark document 'Policies in Health' in 1997. The document provides direction to all involved in health and has received support from various health and health-related agencies, both public and private. The thrust is to improve collaboration and integration among all health and health-related agencies to achieve desired national objectives of improvement in health status and quality of life of Malaysians.

The Strategic Plan for Quality in Health

Similarly, the 1998 MOH document 'The Strategic Plan for Quality in Health' will serve as the prime mover for the country's quality initiatives in health. The purpose of the document is to provide:

- a strategic plan for quality improvement efforts in health;
- a framework within which decisions may be made regarding priorities and needs in addressing quality-related issues;
- direction to the various quality improvement strategies and activities; as well as
- a strategic framework along which its operationalisation will be developed, translated and implemented at the various levels by all involved in pursuing quality in health.

The framework and impetus for all quality initiatives is towards a health system that is population-driven, customer-centred and which encourages the development of a leadership style and management system that promotes people-centredness.

IV. ORAL HEALTHCARE IN MALAYSIA

Oral healthcare in Malaysia is provided both by public and private sectors. In the public sector, the Oral Health Division is the lead agency for the dental profession. The MOH is also the lead agency in the provision of oral healthcare to the nation. A substantial contribution to care is provided by the Dental Corps of the Ministry of Defence, and the Department of Orang Asli Affairs within the Ministry of Rural and Regional Development. Dental Faculties also provide services and these include the dental faculties of Universiti Malaya (UM), Universiti Kebangsaan Malaysia (UKM) and Universiti Sains Malaysia (USM) which lie under the purview of the Ministry of Higher Education.

The private sector also makes a significant contribution, although mainly in the well-populated urban area. Private dental clinics are mainly located in state capitals and the Klang Valley (the Federal Territory of Kuala Lumpur and the state of Selangor).

1. LAWS GOVERNING THE PRACTICE OF DENTISTRY

1.1 The Dental Act 1971

All dental practitioners practising in Malaysia are governed by the Dental Act 1971.

The Dental Act 1971 of Malaysia is

> "An Act to consolidate and amend the law relating to the registration and practice of dental practitioners and for national purposes to provide for certain provisions with regard to a period of service in the public services after registration as a dental practitioner; and to make provision for purposes connected with the aforesaid matter."

The 1971 Act gave much-awaited recognition to the profession. It allowed for the establishment of Dental Council that functions as a regulatory body for the dental profession. Under the Dental Act 1971, every dental practitioner must be registered with the Malaysian Dental Council (MDC) and is required to obtain an Annual Practising Certificate (APC) in order to legally practise in Malaysia.

1.2 The Private Healthcare Facilities and Services Act 1998

The Private Healthcare Facilities and Services Act 1998 is

> "An Act to provide for the regulation and control of private healthcare facilities and services and other health-related facilities and services and for matters related hereto."

The Oral Health Division, MOH undertook an inspection exercise on certain structures and functions of dental practices in the private sector in year 2000. This pro-active move was undertaken in anticipation of the implementation of the Regulations pursuant to the Act. Under this Act, all private dental clinics will have to attain minimum standards of facilities, equipment and infection control processes in order to be registered with the Ministry of Health Malaysia.

Till 31 December 2001, a total of 1,131 premises covered by 1,322 Division 1 dental practitioners were inspected. About a quarter (24.5%) of the clinics were group practices. Overall, 95 clinics (8.4%) offered specialist services, the most common being orthodontic services followed by oral surgery.

1.3 The Atomic Energy Licensing Act 1984

The Atomic Energy Licensing Act 1984 (Act 304) is

> "An Act to provide for the regulation and control of atomic energy, for the establishment of standards on liability for nuclear damage and for matters connected therewith or related thereto."

There are two regulations that are related to this Act namely:

a) Radiation Protection (Licensing) Regulations 1986;
b) Radiation Protection (Basic Safety Standards) Regulations 1988

Under Section 15 of the Act, the Director General of Health may issue licenses on behalf of the Atomic Energy Licensing Board to any person applying to undertake an activity that is classified as for medical purposes under the Act.

The Engineering Division of the Ministry of Health regulates the practice of radiography in all medical, health and dental facilities. The Oral Health Division is currently preparing guidelines on radiation safety in dentistry for use by all dental practitioners in both government and private sectors.

2. THE MALAYSIAN DENTAL COUNCIL

The Malaysian Dental Council (MDC) was established under the Dental Act 1971. Although an independent body, administratively, the MDC is housed within the MOH and conducts its activities on the operating budget of the Oral Health Division.

Functions

The functions of the Malaysian Dental Council are:

- Registration of dental practitioners;
- Issuance of Annual Practising Certificates and Temporary Practising Certificates;
- Maintenance of the Malaysian Dental Register in two parts i.e. Division I and Division II;
- Upholding and maintaining professional standards and ethics in the practice of dentistry; and
- Exercising disciplinary jurisdiction over any registered practitioner who violates the code of professional conduct or who has committed an offence under the Dental Act 1971.

Members

The Council consists of 24 members. They are:

- The Director-General of Health Malaysia (President);
- The Director of Oral Health Malaysia (Registrar);
- Six (6) dental surgeons from among staff of dental faculties

of local institutions of higher learning and appointed by the Minister;
- Six (6) dental surgeons appointed by the Minister;
- Six (6) elected dental surgeons resident in Peninsula Malaysia;
- One (1) elected dental surgeon resident in Sabah;
- One (1) elected dental surgeon resident in Sarawak;
- One (1) elected Registered Dentist resident in Peninsula Malaysia; and
- One (1) elected Registered Dentist resident in Sabah or Sarawak.

The President appoints a senior dental officer of the MOH as Secretary of the Council.

Committees

Several committees are formed to assist the Council in its functions. These committees are:

- The Preliminary Investigation Committee (PIC)
  This committee conducts preliminary investigations into complaints or information made against registered practitioners concerning disciplinary matters. More than one PIC may be established concurrently according to need. Currently two PIC committees have been established.

- Committee of Continuing Dental Education
  This committee studies and makes proposals to improve the knowledge, skills and expertise of dental practitioners, and facilitates continuing development and evolution of the profession.

- Committee for Evaluation of Dental Qualifications
  This committee determines the criteria for evaluation of dental qualifications, conducts required evaluations, and makes the necessary recommendations to Council for decision.

- Ad-Hoc Committee On Continuing Amendment To The Dental Act 1971
  This committee periodically reviews the Dental Act 1971 and also makes proposals for amendments.

In line with the function of upholding and maintaining professional standards and ethics, the MDC ensures the following documents are distributed to all registered dental practitioners - the Code of Professional Conduct, Infection Control Guidelines, Occupational Safety and Health in the Dental Laboratory and the Position Statement on Use of Dental Amalgam.

Prior to year 2001, any Malaysian dental surgeon, on registration with the MDC and in possession of a valid Annual Practising Certificate (APC), was free to practise in either the public or the private sector. However, the Amendment to the Dental Act June 2001 pertaining to Part VII on 'Supplementary Provisions for National Purposes' imposes a three-year national service with the government. All dental graduates who register on or after 29 June 2001 are required to undergo this compulsory national service. Through this initial three-year service, a new dental graduate will be given in-depth knowledge and clinical experience. At the end of the three years, the practitioner may choose to stay on in the public sector or opt for private practice. The MDC may also issue Temporary Practising Certificates (TPC) for expatriates wishing to practise for a limited time in the country.

3. PROFESSIONAL ORGANISATIONS

The Malaysian Dental Association (MDA)

The Malaysian Dental Association evolved from its precursor organisation, the Malayan Dental Association, which was officially inaugurated in 1938. Malaya, as the country was then known, was a British Protectorate until Independence in 1957. When Malaysia was officially formed in 1963 a name change was inevitable. In 1964, the association officially became the Malaysian Dental Association (MDA).

All dental professionals may choose to be members of the MDA. In 2004, the Malaysian Dental Association has a total membership of 2,193 members representing about 85% of practising dental surgeons in the country. A large number of dedicated volunteer members staff its various sub-committees to run programmes and activities. Continuing education, promotion of social interaction among its members, upholding high professional standards and ethical and moral values are the main concerns of MDA. The association constructively contributes towards the formulation and development of oral health and related professional policies of Malaysia. The MDA also provides the forum for continuing dialogue between public, private and related industries to weigh the concerns of each in the delivery of oral healthcare.

The MDA has done the country proud on many occasions in collaborative efforts towards continuing professional development. When the First FDI-MDA Joint Convention was held in 1994 in Malaysia, there was as yet no precedent to it. Year 2004 sees this Joint Convention reaching its eleventh year. Since then, many countries in the Western-Pacific region have aspired towards such collaborative initiatives in the wake of the MDA initiatives.

The Malaysian Private Dental Practitioners' Society (MPDPS)

The Malaysian Private Dental Practitioners' Association (MPDPA) is an affiliate society to the MDA and represents private dental practitioners in the country.

Other professional organisations

Additionally, there are many other professional specialty associations such as the Malaysian Endodontic Society, the Malaysian Orthodontic Association, the Malaysian Society of Periodontology and the Malaysian Association of Oral Maxillofacial Surgeons (MAOMS). Some are affiliated to the MDA.

4. ORAL HEALTHCARE FINANCING SYSTEM

Oral healthcare in the private sector is largely on a fee-for-service basis. Although the MDA issues a dental fee schedule for private practitioners, private dental charges are very much dependent on market forces. There are few third party payment schemes. There is no national health insurance scheme in place.

Oral healthcare in the public sector is largely subsidised by government. In the public sector, pre-school children, school children up to age 17 years, antenatal mothers and civil servants, their spouses and school-going dependents below the age of 21 years, are entitled to free basic oral healthcare at public sector facilities. Other groups also entitled to free basic care are the physically-, mentally- and economically-disadvantaged groups.

Basic care includes examination and diagnoses, fissure sealants for children where necessary, restorations with amalgams, resin materials or glass-ionomer cements, extractions, prophylaxis and radiographs. For civil servants and their dependents, this entitlement extends to orthodontics and periodontal services. Basic care does not extend to dentures and other related prostheses. Denture costs at public facilities, however, are heavily subsidised.

All members of the public, regardless of income/economic means, may also access public sector facilities at highly subsidised rates. Those with proof of economic disadvantages may also be granted exemption to pay on the discretion of the public sector dentists. Dental charges for services at public facilities under the Medical Fees Act (1982) are currently being reviewed.

5. THE DENTAL WORKFORCE

5.1 Oral health professionals

The Dental Register

The Malaysian Dental Register comprises two separate lists: one for Division I Practitioners (Dental surgeons) and a second for Division II Practitioners (Registered dentists) (Table 2).

Division II Practitioners are those who were trained through an apprenticeship system in the years before and after World War 2. They were allowed to practise due to a shortage of qualified professionals. However, following the enactment of the Dental Act 1971, the Division II Register was subsequently closed in 1972. Some of these trained but unqualified dentists who were registered prior to 1972 are still practising till today. As expected, the numbers have decreased over the years. In year the 2004, there were only 74 Division II Practitioners.

Table 2: Distribution of Dental Practitioners (1970 – 2004)

Year \ Number	Division I Practitioners					Division II Practitioners
	Public Sector		Private Sector		Total	
	No.	%	No.	%		
1970	155	59.8	104	40.2	259	359
1975	373	73.9	132	26.1	505	441
1980	387	59.9	259	40.1	646	365
1985	561	53.9	480	46.1	1,041	301
1990	656	46.8	745	53.2	1,401	236
1995	748	43.0	993	57.0	1,741	164
2000	750	35.0	1,394	65.0	2,144	101
2003	992	41.0	1,426	59.0	2,418	81
2004	1,111	43.6	1,439	56.4	2,550	74

Source: Malaysian Dental Council

The Malaysian Dental Council (MDC) has a list of registrable dental qualifications under section 12(1) of the Dental Act 1971. In addition, under section 12(3) of the Dental Act is a list of dental qualifications from approved institutions, which are not directly registrable with the MDC. Those with these qualifications have to undergo two years of supervised training under the MOH before being eligible for registration to practice in Malaysia.

There is, currently, no dental specialist register in Malaysia. The MOH, however, recognises six dental specialties – oral surgery, orthodontics, periodontology, oral pathology and oral medicine, paediatric dentistry and restorative dentistry.

Dentist to Population Ratio

The overall dentist to population ratio for Malaysia stands at 1 to 10,032 in year 2004 (Table 3).

Table 3: Dentist to Population Ratio by Region: Malaysia (1980 – 2004)

Region / Year	1980	1990	2000	2004
Peninsula Malaysia				
Population:	11,188,100	14,667,000	17,670,092	20,455,900
Dentist:	592	1,289	1,967	2,330
Ratio	1: 18,899	1: 11.379	1: 8,983	1: 8,779
Sabah				
Population:	1,003,847	1,479,000	2,519,906	2,862,300
Dentist:	19	49	79	114
Ratio	1: 52,815	1: 30,184	1: 31,897	1: 25,108
Sarawak				
Population:	1,294,846	1,807,353	2,012,616	2,262,700
Dentist:	35	63	98	106
Ratio	1: 36,996	1: 28,688	1: 20.536	1: 21,346
MALAYSIA				
Population:	13,486,433	17,953,353	22,202,614	25,580,900
Dentist:	645	1,401	2,144	2,550
Ratio	1: 20,877	1: 12,815	1: 10,356	1: 10,032

Source: Population is based on Mid-year Population from the Department of Statistics Malaysia
Dentist numbers from the Malaysian Dental Council
Dentist: Population Ratio calculated based on figures for Division I Dental Practitioners only.

This ratio is calculated based on Division I practitioners' figures. There are great discrepancies in this ratio between the different regions of Malaysia. The greatest concentration of dental professionals has always been in Peninsula Malaysia, a result of the history of the country's development.

Public-private distribution

In year 2004, there were 2,550 Division I practitioners actively practising in the country. There were more dental practitioners in the private sector (1,439) than in the public sector (1,111) with the private to public distribution at 56.4% to 43.6% respectively. While favouring the public sector in the past, the balance has tipped in favour of the private sector since 1989 (Figure 2). With the large majority of private practitioners concentrated in urban areas, this disparity of public-private sector is a major equity issue in terms of access to oral health services especially in the rural areas. However, with the reintroduction of compulsory service in June 2001 and recruitment of contract dental officers, the gap has narrowed.

The number of private practitioners has grown steadily. The areas of most consistent growth of the private sector are in the urban states of Selangor, the Federal Territory of Kuala Lumpur, Penang and Johore.

All Division II practitioners are in private practice.

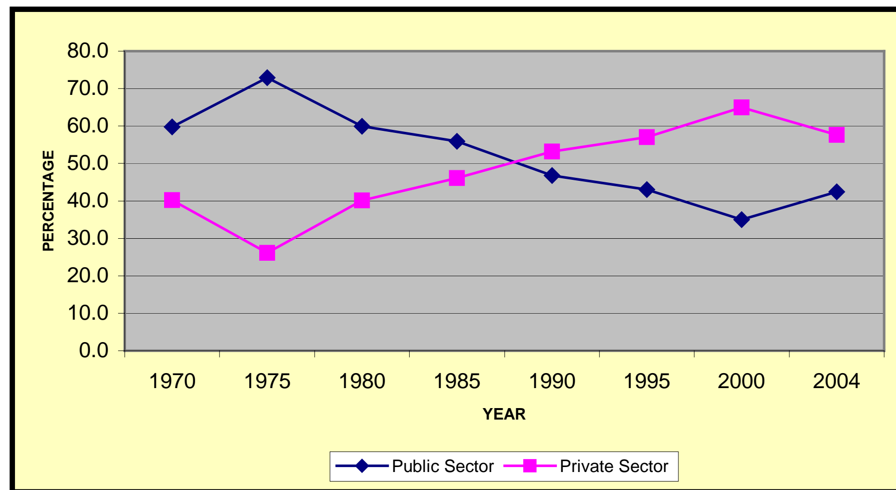


Figure 2: Trend of Public-Private Distribution of Dental Practitioners: Malaysia (1970– 2004)

Source: Oral Health Division, Ministry of Health Malaysia

Gender distribution of dental practitioners

Overall there were more female dental practitioners in 2004. However there were an inverse proportion of males and females in the public and private sector, with more males in the private sector and more females in the public sector. Details on distribution of dental practitioners in active practice by gender in year 2004 are shown in (Table 4).

Table 4: Distribution of Dental Practitioners in Active Practice by Gender (2004)

Category	Sector	Gender		Total
		Male	**Female**	
Division I Practitioners	Private	849 (59.0%)	590 (41.0%)	1,439
	Public	8280 (25.2%)	831 (74.8%)	1,111
	Sub-total	**1,129 (44.3%)**	**1,421 (55.7%)**	**2,550**
Division II Practitioners	Private	66 (88.9%)	8 (11.1%)	74
	TOTAL	**1,195 (45.5%)**	**1,429 (54.5%)**	**2,624**

Source: Malaysian Dental Council

Ethnic group distribution of practitioners

Due to the plurality of the Malaysian population, distribution of practitioners by ethnic group is often of interest. Overall, Malays comprised 43.3% of Division I practitioners, Chinese 35.8%, Indians/Pakistani 19.1% with 1.8% grouped under 'Others'.

The majority of public sector practitioners were Malays (71.1%), while more than 50% of those in the private sector were Chinese (Table 5).

Table 5: Distribution of Dental Practitioners in Active Practice by Ethnic Group (2004)

Category	Sector	Ethnic Group				Total
		Malay	Chinese	Indian/Pakistani	Others	
Division I Practitioners	Private	315 (21.9%)	751 (52.2%)	347 (24.1%)	26 (1.8%)	1,439
	Public	790 (71.1%)	161 (14.5%)	139 (12.5%)	21 (1.9%)	1,111
	Sub-total	1,105 (43.3%)	912 (35.8%)	486 (19.1%)	47 (1.8%)	2,550
Division II Practitioners	Private	-	73 (98.6%)	-	1 (1.4%)	74
	TOTAL	**1,105 (42.1%)**	**985 (37.6%)**	**486 (18.5%)**	**48 (1.8%)**	**2,624**

Source: Malaysian Dental Council

5.2 Dental Allied Health Personnel

Dental nurses

Dental nurses are operating allied health personnel in Malaysia. They were introduced in 1948 based on the New Zealand dental nurse model. Their employment is restricted to the government sector where they function under the supervision of a public sector dentist.

Training is provided at the Dental Training College Malaysia in Penang.

Dental nurses deliver oral healthcare to school children below the age of 17 years. Their services have greatly enhanced the coverage of school children in the country. Those with post-basic training are based in specialist clinics.

Dental technologists

In the public sector, dental technologists were formerly known as dental mechanics and later as dental technicians, prior to their re-designation as 'dental technologists' in 1999.

Formal training for public sector dental technologists has been at

the Dental Training College Malaysia in Penang since 1951. However, unlike the dental nurses, trained dental technologists may operate in both the public and private sectors. There is also a group of dental technologists in the private sector who do not undergo any formal training. They provide a network of support services to dental practitioners mainly in the private sector.

In the public sector, the dental technologist is part of the dental team. The role of the dental technologist in the public sector is unique to Malaysia. They are responsible for the fabrication and repair of dental prostheses and appliances, and simple repairs and maintenance of dental equipment. Some are also trained in the fabrication of other types of prostheses for facial reconstruction.

Dental Surgery Assistant (DSA)

The DSA is non-operating personnel who assist the dentist in his/her clinical work. DSAs in the public sector undergo formal training at the Dental Training College Malaysia in Penang. A component of their training is distance learning at practical training centers in dental clinics. However, formal qualification is not mandatory for those who function as chair-side assistants in the private sector. They are often trained on-the-job.

Apart from being responsible for daily maintenance of the dental surgery and rendering chair-side assistance to the dentist, the DSA is also responsible for registration of patients and record keeping in the clinic. They have been trained in computerisation of patient records since 1994.

Other Supporting Groups

In the public sector, the health attendant and the motor vehicle driver are acknowledged members of the dental team. The health attendant provides support in patient care while the driver is an essential part of the team in outreach programmes.

6. DENTAL EDUCATION IN MALAYSIA

6.1 Dental Professional Training

The targeted dentist to population ratio for Malaysia for year 2020 is 1 dentist: 4,000 population. With current dentist to population ratio at 1 to 9,748 at the end of 2004, Malaysia needs a high output of dental graduates to meet its current and future needs. In the public sector, development projects to meet the oral health needs of Malaysians have superseded the output of dental practitioners.

Dental graduates are trained at three local universities – Universiti Malaya (UM), Universiti Kebangsaan Malaysia (UKM) and Universiti Sains Malaysia (USM). The first Dental Faculty was established at UM, Kuala Lumpur in 1972 with the first batch of 30 Bachelor of Dental Surgery students graduating in 1976. The number of graduates increased to 58 in 2004.

In 1996, the four-year curriculum was extended to five years to incorporate the scope of community dentistry. In line with this change, all three dental faculties now offer five-year degree programmes.

The Dental Faculty of UKM was established in 1997. The first batch of 20 students graduated in 2002. The number of graduates increased to 48 in 2004. Twenty-nine pioneer students graduated from the School of Dental Sciences USM in 2004 with the Doctorate in Dental Surgery.

About 30 dental graduates return from abroad every year. Most of them are trained in the United Kingdom, Australia, New Zealand, Canada, United States of America, Indonesia, Middle East, Japan, Taiwan, India and Pakistan.

Currently, a few private institutions of higher learning plan to offer dental training.

The Dental School of the University of Malaya was established in 1927 as part of the King Edward VII College of Medicine, Singapore. It had its first intake of seven students in 1929 for its four-year course. In 1949, it officially became a department within the Faculty of Medicine in Singapore. Subsequent rapid expansion of the University of Malaya then led to the establishment of an autonomous division in Kuala Lumpur. Legislation was passed in 1961 founding the University of Malaya in Kuala Lumpur and the initial base in Singapore became the University of Singapore in 1962. Malaysian students attended the Dental Faculty, University of Singapore until the establishment of the first dental faculty in Universiti Malaya in 1972. In 1997, the Dental Faculty of Universiti Malaya gained recognition from the General Dental Council, Great Britain.

6.2 Post-graduate Training

In 1994, Universiti Malaya first offered dental specialty training in dental public health through its Master in Community Dentistry (MCD) programme. Since 2000, specialty training has been expanded to include the Master in Clinical Dentistry (MClinDent) programmes in oral surgery, periodontology, oral pathology and oral medicine, paediatric dentistry, restorative dentistry and master in orthodontics. Currently, USM also offers a Master of Community Medicine (Oral Health) course, which specialises in public health. In 2003 UKM started its first post-graduate training in orthodontics.

Scholarships are also offered for post-graduate training in recognised institutions abroad.

6.3 Dental Allied Health Personnel Training

Dental nurses, dental technologists and dental surgery assistants are trained at the Dental Training College Malaysia in Penang. This is the only institution that trains dental auxiliaries for the public sector. The College was established in 1949 with an initial intake of five trained staff nurses who subsequently graduated in 1950.

The College currently has an intake of about 140 trainee dental nurses annually. The training for both dental nurses and dental technologists takes three years. In 1996,

the certificate courses were recognised as equivalent to a diploma, a much-awaited incentive for continued presence of dental allied health personnel in the public sector. Both three-year diploma programmes comprise two years of theory and practical in the College followed by eight months of field training at accredited dental training centres. The last four months is at the College where trainees prepare for their final examinations.

In 1998, expanded and extended duties of dental nurses and dental technologists in specialty areas were introduced, in addition to their utilisation in primary oral health care. A total of 76 dental nurses and 46 dental technologists were trained in various field as shown in (Table 6):

Table 6: Post- Basic Training of Dental Nurses and Dental Technologists

Post basic / Year	Dental Nurses	Dental Technologists
1998	Paediatric Dentistry (14)	-
1999	Orthodontics (22)	-
2000	-	Oral Surgery (23)
2001	-	Orthodontics (23)
2002	Periodontology (17)	-
2003	Paediatric Dentistry (8)	-
2004	Oral Surgery (15)	-

Source: Oral Health Division, Ministry of Health Malaysia

It was apparent after World War 2 that there was a need for development of a dental service that catered for the child population. The population below the age of 18 years then formed 50% of the population and the oral health status of this group was described as 'appalling'. Qualified dentists in Malaysia then numbered only 205, with a dentist to population ratio of 1 to 34,000.

New Zealand had pioneered the use of dental nurses in its public health service in the 1920s but no other country had implemented such a service. The Malaysian government was confident that the use of dental nurses would complement the role of dentists, towards cost-effectively meeting the oral health needs of the young generation. This was in spite of the initial misgivings expressed by the dental fraternity. Dental nurses are now in the forefront of provision of oral healthcare for school children.

The provisos for the dental nurses scheme were that:

- *their training be directed to a limited range of diagnostic, curative and preventive procedures;*
- *they should confine their routine work to children aged between 4 - 12 years;*
- *they shall work within the confines of the public sector only.*

In 1975, the duties of the dental nurse were expanded to include procedures for anterior teeth. In 1976, their scope of coverage was revised to cover school children up to the age of 17 years.

Prior to 1982, dentists trained dental surgery assistants (DSA) on-the-job. A Formal two-year training for DSAs only began in 1982. Intake then was 40 trainees a year. In 1993, the training module was changed to one of distance learning and with this move; the intake was increased to about 140 trainees a year. The intake was further increased to 280 per year in 1998 in line with the increase of dental graduates.

7. ORAL HEALTHCARE OPERATIONALISATION

In the Ministry of Health, the oral healthcare programme is divided into three components, namely primary, specialist and community oral healthcare.

The large public sector participation in the delivery of oral healthcare gave rise to different modalities of operationalisation of services, apart from the confines of the traditional clinic set-up associated with the private sector. Within the public sector, there exist clear lines of referral from primary to specialist oral healthcare.

The MOH strategies in the implementation of oral healthcare in the country are:

- Increasing oral health awareness of the community through oral health promotion and education;
- Fluoridating public water supplies at an optimum level of 0.5 ppm;
- Providing clinical preventive oral healthcare services to all school children in need;
- Improving inter-agency and inter-sectoral collaboration and co-operation;
- Providing quality oral healthcare services, which are easily accessed, suitably utilised and technologically-appropriate;
- Providing maximum coverage to identified priority groups;
- Rendering the maximum number of school children orally-fit;
- Providing specialist oral healthcare services to those in need of these services and
- Collecting and analysing data, as well as undertaking research aimed at improving the quality of the oral healthcare services provided.

7.1 Primary Oral Healthcare

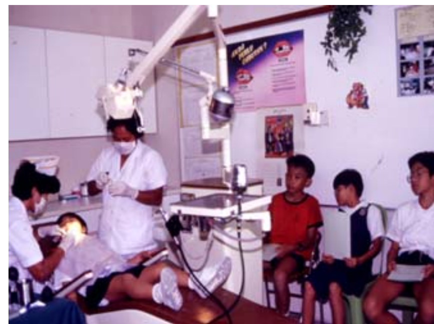
7.1.1 Pre-school Programme

This programme, launched in 1984, covers five to six-year-old children attending kindergartens and pre-schools. The services include promotive, preventive and curative activities.

The aim is to instil oral health awareness and control of oral diseases so as to maintain good oral health among children.

7.1.2 School Dental Service

Government dental services started essentially as a school dental service in the 1950s. Subsequently, a comprehensive and systematic incremental dental care programme was introduced in 1985. The aim is to render school children orally fit before they leave school.



The service is provided via school dental clinics, school dental centres, mobile dental clinics and mobile teams.

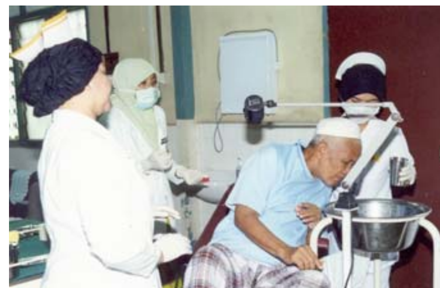
7.1.3 Antenatal Programme

Since 1970s, an oral health programme for antenatal mothers has been in place. Antenatal mothers attending maternal and child health clinics for their check-ups are given oral health education and dental examination.

They are also eligible for free dental treatment at government dental clinics.

7.1.4 Elderly Programme

An oral healthcare programme was started in 1993 for the institutionalised elderly. The programme has now been extended to include those attending dental clinics (MOH) and community day-care centres.



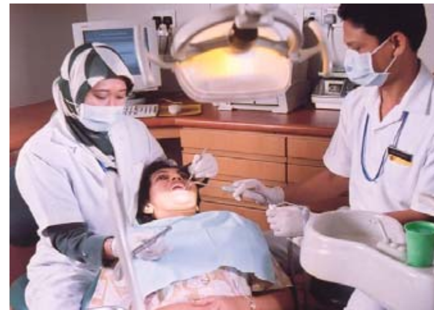
The aim of the programme is to enhance quality of life of the elderly through improving their oral health.

7.1.5 Programme for Children with Special Needs

In 1993, a programme for children with special needs was launched. Some healthcare providers are being specially trained to manage these children.

This is in line with Vision 2020 and the Vision for Health towards the development of a caring society.

7.1.6 Outpatient Services



All primary healthcare facilities provide general outpatient care. Basic treatment such as simple restorations, extractions, scaling and dentures are provided.

Patients requiring more complex treatment are referred to dental specialists.

7.2 Specialist Oral Healthcare

Referral systems from primary to specialist oral healthcare exist in both public and private sectors. Specialist care available within the dental service, Ministry of Health is categorised into six disciplines - Oral Surgery, Orthodontics, Periodontology, Oral Pathology and Oral Medicine, Paediatric Dentistry and Restorative Dentistry. Forensic Dentistry will be included in the near future (Table 7).

Table 7: Dental Specialists, Ministry of Health Malaysia

Dental Specialty Discipline	Number of Specialists 2000	Number of Specialists 2004
Oral Surgery	32	34
Orthodontics	28	31
Periodontology	8	9
Paediatric Dentistry	8	13
Oral Pathology and Oral Medicine	2	5
Restorative Dentistry	-	2
TOTAL	**78**	**94**

Source: Oral Health Division, Ministry of Health Malaysia

Oral Surgery and Paediatric Dentistry	The dental specialists in these disciplines are hospital-based. They are involved in the treatment of injuries and abnormalities related to the oromaxillofacial area, the former for adults and the latter for children up to the age of 16 years.
Oral Pathology and Oral Medicine	Currently, there are five specialists in the field of Oral Pathology and Oral Medicine in the Ministry of Health. These specialists are based at the Stomatology Unit, Institute for Medical Research, Kuala Lumpur as well as other hospitals. They are involved in consultations for oral medicine and conduct histopathological investigations for reports.
Orthodontics, Periodontology and Restorative Dentistry	Treatment in these three disciplines is provided at the main dental clinics. The orthodontist treats cases of malocclusion and dento-facial anomalies. The periodontist undertakes treatment of complex periodontal cases. The restorative specialist renders complex restorative care.

7.3 Community Oral Healthcare

7.3.1 Fluoridation

Fluoridation as a national primary prevention initiative is monitored by the MOH, although water supply is the purview of individual states.

Fluoridation of public water supplies as a public health measure in Peninsula Malaysia was accepted as government policy in 1972. By 2003, 244 water treatment plants have been supplied with "fluoride feeders" benefiting over 62.3% of the population. The programme is being consolidated and expanded.

Several factors contribute to the success of the fluoridation programme in the country:

- Political commitment;
- An extensive infrastructure of piped public water supply, reaching 87% of the total population and
- Continued collaboration and co-operation between the Ministry of Health and various water authorities

7.3.2 Oral Health Promotion

There are collaborative efforts between public and private sectors and the oral healthcare industry with regards to oral health promotion. Collaborative efforts in oral health promotion extend to all groups within the population although the emphasis is on the younger generation under the public sector.

Since the inception of "Healthy Lifestyle Campaigns" with its yearly themes by the MOH in 1991, there has been a review into the dissemination of oral health messages. Holistic approaches, with integration of oral health messages into other health messages have been emphasised.

7.3.3 Oral Cancer Screening Programme

In Malaysia, there are a number of unique characteristics pertaining to oral precancer and cancer. Although prevalence is low at 0.04%, oral lesions have been found to be predominantly occur among some identified communities. The ethnic Indian group comprises about 8% of the population, yet about 60% of oral lesions are found among communities of ethnic Indian origin. There is also a higher prevalence of associated "precursor" lesions found among Indian and Indigenous groups.while ethnic origin is cited, it is acknowledged that such communities practice risk habits found to be associated with oral lesions; namely quid chewing, tobacco use and alcohol consumption.

Based on these factor, Primary Prevention and Early Detection of Oral Precancer and Oral cancer Programme was launched in 1996 and reviewed in 2002. This programme is a primary prevention programme targeted at captive groups. The aim of this programme is to raise awareness and educate individuals about primary prevention and early detection of oral pre-cancer and cancer.

7.3.4 School-Based Fissure Sealant Programme

This is a clinical preventive school-based programme, targeting children at risk to occlusal caries. It was implemented nationwide in 1999. In 2003, the guidelines were reviewed in line with the need to monitor the impact of the programme on overall caries pattern and decline in Malaysia.

7.4 Dental Facilities

Through the country's Five-Year Development Plans, the MOH has been able to establish a comprehensive network of health facilities. Dental clinics form part of health facility complexes or are stand-alone outlets. The MOH is thus the largest agency in oral healthcare delivery, operating through a large network of decentralised dental facilities of different types (Table 8).

Table 8: Dental Facilities, Ministry of Health Malaysia (1970 – 2003)

Type of Facility / Year	1970	1980	1990	2000	2003
Main Dental Clinic	48	87	119	138	142
Dental Clinic in Health Centre	33	88	155	204	231
Dental Clinic in Health Centres Phase I	157	241	240	221	211
Dental Specialist Clinic in Hospital	14	16	19	38	57
School Dental Clinic	120	431	636	787	845
School Dental Centre	6	13	22	21	21
Mobile Dental Clinic	13	13	10	8	17
Mobile Dental Team	0	49	100	204	212
Others	7	14	28	37	37

'Others' include pre-school mobile teams, dental clinics in educational institutions, dental clinics in Maternal and Child Health Clinics and other institutions.
Source: Information and Documentation System Unit, Ministry of Health Malaysia

The various types of dental facilities available are as follows:

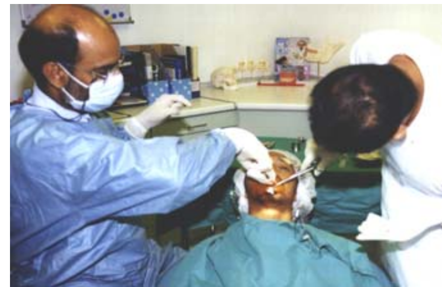
Main Dental Clinic

This is an urban clinic with dental officers, dental nurses and other personnel who form the dental team. All main dental clinics provide general outpatient care. Some main clinics may also provide specialist care in orthodontics, periodontology and restorative dentistry.

Dental Clinic in Health Centre

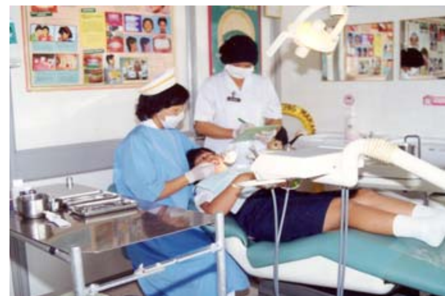
In a move to provide integrated, seamless care, dental clinics form part of the health clinic complex. Oral healthcare services are provided as part of the integrated services, which include medical outpatient and family health services. Provision of oral healthcare is by dental officers and dental nurses.

Hospital-based Dental Specialist Clinic



Three (3) dental specialities are based in the hospital. The oral surgeon provides specialist care in the oromaxillofacial area. The paediatric dental specialist provides specialist care for children. Some hospitals also provide oral pathology and oral medicine services.

School Dental Clinic



This facility is located in selected primary and secondary government schools. Provision of oral healthcare is by dental officers and dental nurses.

School Dental Centre

This is a dental facility catering to a cluster of schools. It may be within the school compound or in the vicinity of a school or a health centre.

Mobile Dental Team

The mobile dental team delivers oral healthcare services to school children, even to those in remote areas of the country. The team provides services using portable equipment.

Pre-school Mobile Dental Team

Pre-school mobile teams carry out oral health promotion, preventive and curative activities in pre-school classes and kindergartens. Children who require further treatment are either treated in the school or referred to the nearest dental clinic.

Mobile Dental Clinic

The mobile dental clinic is a "dental clinic on wheels." It is used in schools where space is limited and for community projects.

Other Facilities

Dental clinics are also found in specific establishments such as the Kuala Lumpur Police Training Centre, prisons, educational institutions and various other centres. Treatment by dental officers is on a regular visiting basis.

Armed Forces Dental Facilities

The next largest provider of oral health services in the public sector is the Armed Forces with 34 dental clinics distributed throughout the country. The Armed Forces Dental Service also has three mobile dental clinics.

Ministry of Education

Dental Faculties also provide services and these include the dental faculties of Universiti Malaya, Universiti Kebangsaan Malaysia (UKM) and the Universiti Sains Malaysia (USM) which lie under the purview of the Ministry of Higher Education.

Department of Orang Asli Affairs, Ministry of Rural and Regional Development

An outreach approach utilising mobile dental teams are used to provide oral healthcare to Indigenous peoples in the interior of Peninsula Malaysia.

8. ORAL HEALTH COVERAGE AND UTILISATION

8.1 Coverage

The MOH shoulders the major responsibility of providing oral healthcare for the Malaysian population. The focus of public sector oral health programmes is on target groups – pre-school children, primary and secondary school children, antenatal mothers and the socially-, physically- and economically-disadvantaged groups. The increase in the elderly population above age 60 years has also led to the implementation of oral healthcare programmes for this group.

The purview of care for children is thus under the public sector, while the purview of adult oral healthcare lies mainly with the private sector. Coverage by other public sector dental facilities is also targeted to identify groups.

Oral Health Services, MOH

Under the MOH, a comprehensive and systematic Incremental Dental Care Programme, introduced in 1985, focuses on progressive coverage of school children in the country. The aim is to render them orally fit when they leave school through gradual but cumulative improvement in their oral health status. Since its implementation, the programme has brought significant improvement in the oral health status of school children. Increasing attendance by target group from 1985 to 2003 for MOH dental facilities is presented in (Figure 3).

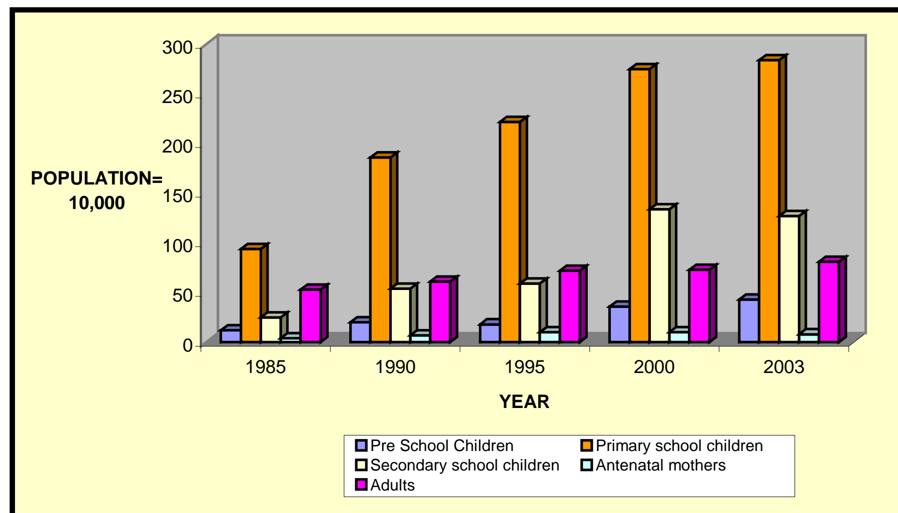


Figure 3: Attendance by Target Group, Ministry of Health Malaysia (1985 – 2003)
Source: Oral Health Division, Ministry of Health Malaysia

In year 2003, the MOH school dental programme reached 95.7% and 67.1% of enrolled primary and secondary school children respectively. Of those rendered care, 96.6% and 90.5% of primary and secondary school children respectively, were rendered orally fit. The major contributing factor to this increase is in the coverage of primary school, which has risen from 37.2% in 1984 to 89.9% in 2003.

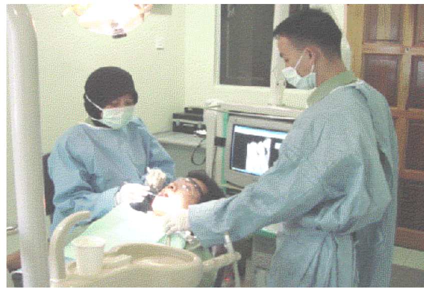
Dental Service Malaysian Armed Forces

During the Pre-Independence days, the British Army provided dental treatments for local military personnel and their families. The Dental Services Federation Army was formally sanctioned in November 1957. It was subsequently amended to Armed Forces Dental Services and officially raised on 1st October 1958.

Dental Service Malaysian Armed Forces (DSMAF) provides service not only to military personnel and their families but also to a certain extent, veterans and civilians. Its focus is on the attainment and maintenance of combat readiness and fighting fitness of troops. The roles of DSMAF are:

- In peacetime, to provide comprehensive dental service for MAF members and their families, to others by priority, towards a good physical, mental and social well being;

- In wartime, to provide dental services to ensure combat readiness and maintenance of fighting strength by providing first aid and early treatment to "save life and limb", resuscitate, stabilise and minimise permanent incapacitation. For non-battle injuries, to prevent loss of manpower and man-hours from duty stations by undertaking active dental cover programmes to as far forward troop locations as possible.



DSMAF has expanded to cope with the increasing demands for dentistry. Where in its beginnings only outpatient care was provided, DSMAF has now progressed to have specialists in Public/Community Health Dentistry, Oral and Maxillofacial Surgery, Orthodontics, Periodontology, Restorative Dentistry, Prosthetics, Forensic and Oral Medicine and Oral Pathology.

DSMAF has been part of the Malaysian military contingent on a number of peacekeeping missions - United Nation missions to Namibia (one dental team 1989 – 1990), Cambodia (two teams 1992 – 1994), Somalia (three teams 1993 – 1995) and Bosnia Herzegovina (four teams 1993 – 1995) and NATO in Bosnia (three teams 1996 - 1998). Each dental team comprised a dental officer, two dental assistants (or an assistant and a hygienist) and a dental technician.
The teams rendered dental treatments to Malaysian soldiers, those of friendly forces and local civilians during the missions, thus contributing towards global dental health and awareness.

Oral Health Services, Department Of Orang Asli Affairs, Ministry of Rural and Regional Development

The Health and Medical Division of Orang Asli Affairs in the Ministry of Rural and Regional Development provides dental services to the indigenous people. The department was set up in 1953 for reasons of national security to render health services to the Orang Asli residing in the interiors of Peninsula Malaysia.

Basic oral healthcare and dental education are rendered either at clinics or as outreach programmes. Dental professionals are seconded from the Ministry of Health but the department recruits the auxiliaries.

Oral Health Services, Ministry of Higher Education

At the dental faculties of Universiti Malaya (UM), Universiti Kebangsaan Malaysia (UKM) and Universiti Sains Malaysia (USM), dental students provide dental treatment to patients as part of their educational programme. There are dental clinics within the faculties that cater to students, staff and a limited number of the public.

Other universities such as the International Islamic University, and the Universiti Teknologi MARA also have dental clinics that cater to their staff and student population.

8.2 Utilisation of Dental Services

Under the MOH, there has been a steady increase in utilisation of oral health services since 1985. However, due to public sector constraints, oral healthcare facilities under the MOH can only serve about one-quarter of the Malaysian population annually. In year 2000, 25% of the population utilised MOH oral healthcare facilities. However, the percentage has dropped to 22.8% in 2003 (Figure 4). There is no official monitoring of utilisation of the private sector.

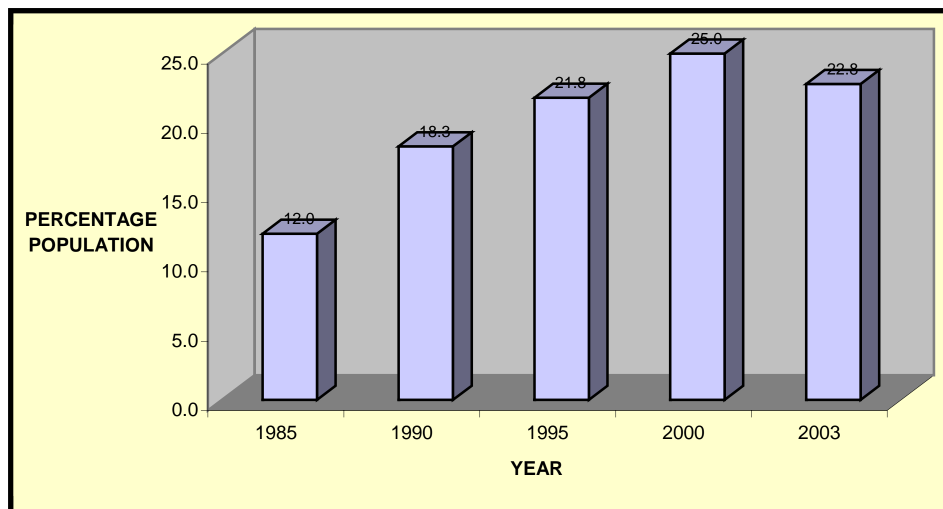


Figure 4: Utilisation of Oral Healthcare Facilities, Ministry of Health Malaysia (1985 – 2003)
Source: Oral Health Division, Ministry of Health Malaysia

A National Household Health Expenditure Survey undertaken in 1996 (NHHES '96)[4] yield figures on utilisation of dental services on a weighted population representing 2.6 million persons in 1.6 million households. As expected, a substantial proportion (30.6%) of reported dental episodes* within the last one year was related to school children under the MOH.

**A dental episode was defined as an event (dental visit) when an individual receives care for any disease or condition occurring or manifested in the mouth.*

Excluding dental episodes reported under the school programme, NHHES '96 reported 65% of dental episodes at private facilities and 35% at public facilities. High rates of utilisation were observed among the Chinese, females, adults aged 18-64 years, persons with tertiary education and the richest 20% of the population.

The data from an adult survey in 2000[5] on those aged 15 years and above shows that among the study population, 25.2% had visited a dentist in the last year while 46.4% had made oral health visits within the last two years. More than 6% had never had dental examination or treatment.
Among respondents aged 15-19 years, a large majority (85.7%) utilised government facilities. This is not unexpected due to the extensive coverage of the Incremental Dental Care Programme under the MOH. Of the study population 50.0% utilised public sector dental facilities with 43.0% utilising the private sector. A higher proportion of urban respondents, those above 30 years of age, and those with tertiary education utilised private facilities. However, when further asked as to the choice of facilities should there be no constraints, more than 66.0% would prefer public sector facilities due to the "reasonable fees," " the good facilities and equipment" and the "convenient location." The most common reasons for preferring private facilities were "short waiting time" and "convenient hours"

9. ORAL HEALTH STATUS

9.1 Caries Profile

Pre-school Children

Baseline data on the oral health status of 5-year-old pre-school children was obtained through the Dental Epidemiological Survey of Pre-school Children in Malaysia 1995[6]. The closest comparative data prior to this were on 6-year-olds from the school children surveys of 1970[7] and 1988[8]. Caries prevalence in deciduous dentition was found to be 87.1% in 1995. A survey in 1997[9] found prevalence to be 80.9% among 6-year-olds. There appears to be a general decrease in caries severity in deciduous dentition (Figure 5).

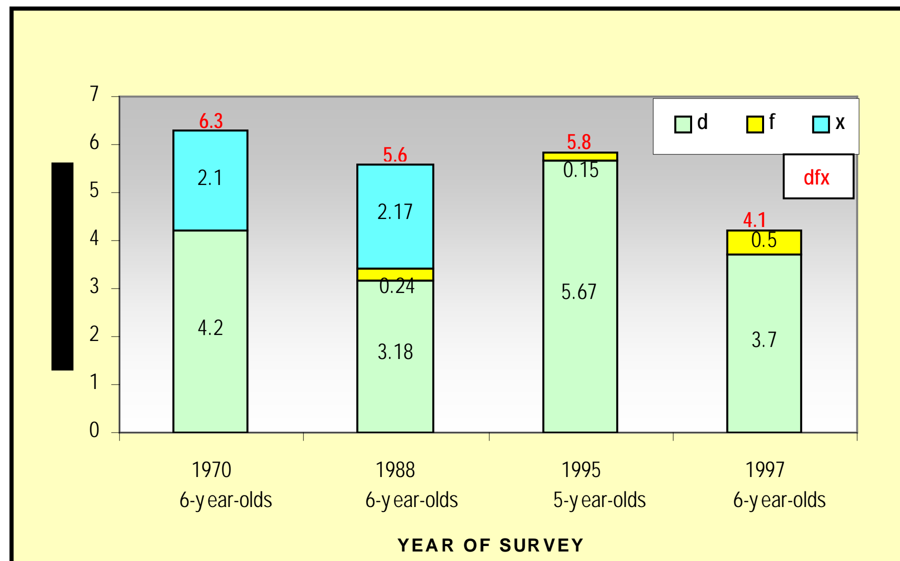


Figure 5: Comparison of d,f,x Components in Deciduous Dentition (1970, 1988, 1995 and 1997 Surveys)
Source: Oral Health Division, Ministry of Health Malaysia

School Children

A comparison of caries experience (mean DMFX) over 18 years between 1970[7] and 1997[9], indicates a 57.0% decrease in caries experience among 12-year-olds and a 41.7% decrease among 16-year-olds (Figure 6). The ethnic Indian group has persistently shown lower caries experience compared to the other ethnic groups.

The school children survey in 1997[9] documented, for the first time that almost 80% of caries were found in about 30% of 12-year-olds. It also demonstrated changing caries patterns. More than 70% of caries were found to occur on occlusal surfaces of molars. Data from this survey was the basis for an integrated school dental programme for fissure sealants launched nation-wide in year 1999 under the Ministry of Health.

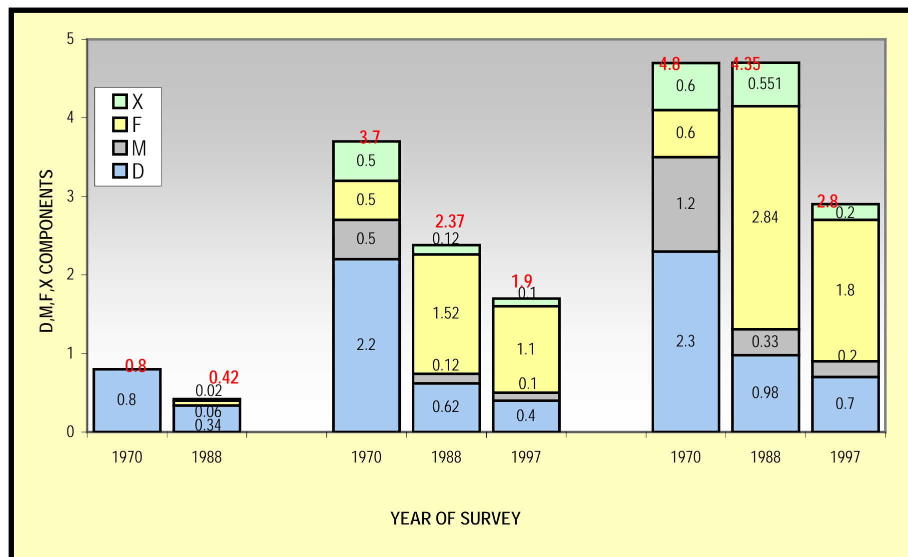


Figure 6: Caries Experience (DMFX) of 6-, 12- and 16-year-olds Peninsula Malaysia (1970, 1988 and 1997 Surveys)
Source: Oral Health Division, Ministry of Health Malaysia

A comparison of impact indicators utilised in assessing programme performance also shows an improvement in the percentages of 12- and 16-year-olds who are caries-free (DMFX = 0), and in 12-year-olds with DMFX $\leq$ 3 (Figure 7).

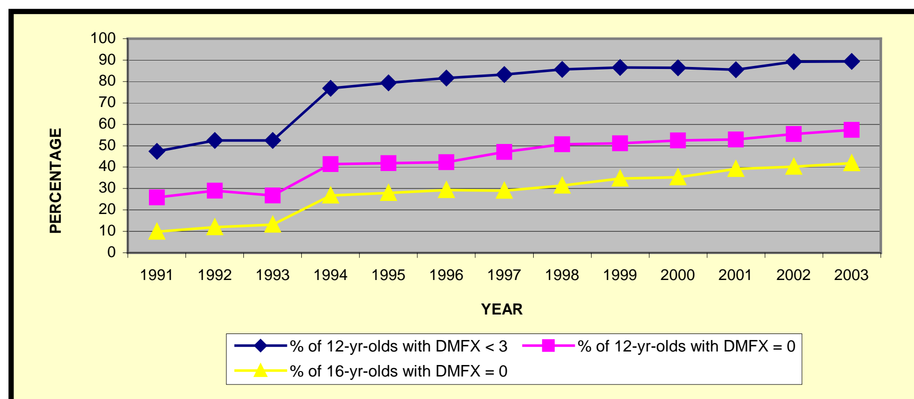


Figure 7: Impact Indicators for 12- and 16-year-olds (1991 – 2003)
Source: Oral Health Division, Ministry of Health Malaysia

Adults

There have been three large-scale surveys on adults undertaken in 1974[10], 1990[11] and 2000[5]. The 1974 survey only covered adults in West Malaysia, and the 1990 survey is thus considered the baseline survey for Malaysia. For adults, comparison of data from 1974, 1990 and 2000 indicated almost similar caries prevalence - 95.0%, 94.6% and 90.3% respectively. Conversely there has been increasing proportions of caries-free adults between the ages of 15 to 34 years (Figure 8).

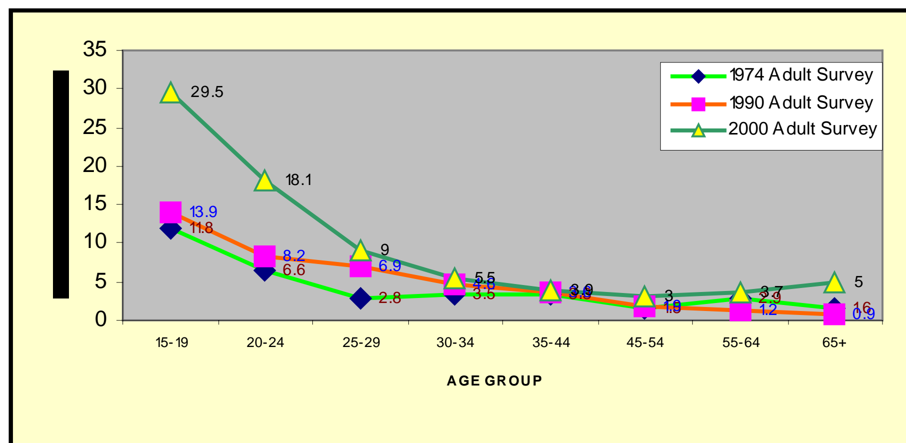


Figure 8: Percentage Caries-free Adults by Age Group (1974, 1990 and 2000 Adult Surveys)

Source: Oral Health Division, Ministry of Health Malaysia

Generally, a reduction in severity was observed with corresponding reduction in the respective components of the DMFX(T) index (Figure 9). The greatest reduction in mean DMFX(T) between the baseline survey of 1990 and 2000 is in the age range of 15 to 29 years, averaging a decrease of about 35%.

Comparison of data between the 1990 and 2000 surveys in Malaysia show a reduction in edentates in each identified age group. There appears to be a marked increase in the edentulous from the age of 35 years onwards.

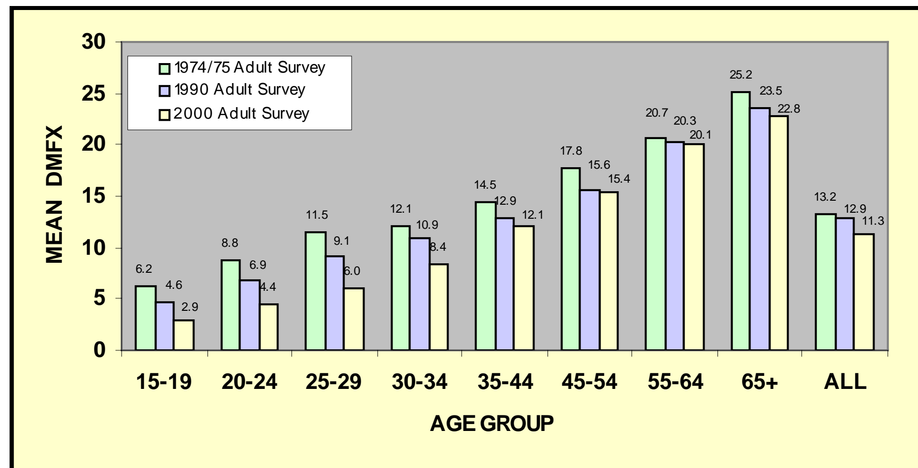


Figure 9: Caries Experience (DMFX) by Age Group (1974, 1990 and 2000 Adult Surveys)

Source: Oral Health Division, Ministry of Health Malaysia

9.2 Enamel Opacities Status

Past local studies utilising the Developmental Defects of Enamel (DDE) Index have reported prevalence of enamel opacities in fluoridated areas ranging from 72.5%[12] to 90.7%[13] among 11-12 year-olds, 76.4% among 12-15 year-olds[14] and 67.1% among 16-year-olds[15]. However, the nation-wide survey undertaken in 2000 gives an overall prevalence of 56.0% among the 16 years old school children (Table 9)

Table 9: Studies on Prevalence of Enamel Defects in Malaysia Utilising the Modified Developmental Defects of Enamel (DDE) Index

Area	Age (Yrs)	Sample Size	Prevalence of DDE		Authors
			Mouth	Tooth	
Johore state	11 –12	2,388	83.1%	29.9%	Dental Division Johore[16]
Petaling Jaya	11 –12	1,024	72.5%	40.0%	Razak and Hussein 1986[12]
Federal Territory Kuala Lumpur	11 – 12	957	90.7%	45.1%	Noriah et al.1997[13]
Pulau Pinang	12 – 15	229	76.4%	19.1%	Majid et al. 1996[14]
Pulau Pinang	16	1,024	67.1%	64.5%	Sujak 1996[15]
Malaysia	16	4,085	56.0%	21.8%	Oral Health Division 2000[9]
Pasir Gudang, Johore	21 –47	203	75.6%	13.1%	Majid et al.1995[17]

The first study utilising Dean's Index of Fluorosis in 1971[7] reported that fluorosis was absent among 6-18 year-old school children. A study on 12-13 year-olds in a fluoridated community in 1991[18] found that 54.0% of subjects were "norma," 44.5% had "questionable to mild" fluorosis. Only 0.1% was found to be in the 'severe' category. The derived Community Fluorosis Index (CFI) was 0.46 making fluorosis of 'borderline' public health significance.

However, in a 1999 study on 16-year-olds with continuous residence history in fluoridated and non-fluoridated urban areas found fluorosis prevalence of 74.7% in fluoridated areas and 14.2% in non-fluoridated areas[19]. Among affected subjects in the fluoridated areas, 94.1% were coded a Dean's Score of "questionable to mild." The majority (53.6%) was in the 'very mild' category. With a derived CFI score of 0.95, fluorosis is considered of 'slight' public health significance in fluoridated areas. (Table 10).

Table 10: Studies on Prevalence of Fluorosis in Malaysia Utilising the Dean's Index of Fluorosis

Age (Yrs)	Sample Size	Fluorosis Prevalence (%)	Dean's Fluorosis Score					CFI Score	Authors
			Normal	Questio-nable	Very Mild	Mild	Mode-rate	Severe	
			0	1	2	3	4	5	
6 - 18	15,197	None (Pen. M'sia)	-	-	-	-	-	-	Dental Division 1971[7]
12 - 13	1,519	46.0% (F area)	54.0%	13.2%	25.7%	5.6%	1.4%	0.1%	Rashidah and Ishak 1991[18]
16 - 17	2,153	74.7% F areas	25.3%	12.4%	40.1%	17.8%	4.2%	0.2%	Oral Health Division 1999[19]
	756	14.2% Non-F areas	85.8%	11.2%	2.5%	0.4%	-	-	

F = fluoridated, Non-F = non-fluoridated

9.3 Periodontal Profile

Using criteria from the Community Periodontal Index of Treatment Needs (CPITN) in the 1990 and 2000 dental epidemiological survey of adults, of the total examined, 7.2% and 9.8% were free from periodontal disease respectively. The proportion requiring oral hygiene instructions (TN1) was 92.8% and 87.4%, those requiring scaling (TN2) were 88.1% and 83.2%, and only 6.0% and 5.5% required complex periodontal treatment (TN3). Of the 15-19 years age group, 16.9% were classified as "periodontally healthy". The findings of the study indicate some improvement in periodontal profile. The figures on periodontal treatment need for specific age groups from the 1990 and 2000 study are shown in (Table 11).

Table 11: Periodontal Treatment Need by Age Group (1990 and 2000 Adult Surveys)

Age Group	Year	No. examined	No. of dentate	Treatment Need			
				% TN 0	% TN 1	% TN 2 (Mean no. of sextants)	% TN 3 (Mean no. of sextants)
15 – 19	1990	1,928	1,928	16.9	83.1	72.7 (2.2)	0.3 (0.0)
	2000	1,639	1,639	25.9 26.1	74.0	63.9 (1.9) 63.5(2.7)	0.1 (0.0)
35 – 44	1990	2,644	2,452	4.6	95.4	92.5 (3.6)	8.5 (0.2)
	2000	2,329	2,258	5.2	93.8 94.7	91.0 (3.6) 91.9 (2.7)	7.5 (0.0)
65+	1990	815	354	4.2	95.8	95.2 (3.0) 95.0 (2.8)	16.4 (0.3)
	2000	896	508	2.6 2.4	76.8 76.6	75.2 (2.3)	8.9 (0.1)
ALL	1990	13,740	12,305	7.2	92.8	88.1 (3.2)	6.0 (0.1)
	2000	10,891	9,932	9.8	87.4	83.2 (3.0)	5.5 (0.08)

Source: Oral Health Division, Ministry of Health Malaysia

9.4 Oral Precancerous and Cancerous Lesions

The number of new cases of oral cancer detected annually in Malaysia from 1967 to 1991 was 150 – 200[20]. It has been suggested that the numbers are probably 1.5 to 2 times higher. In 1998, oral cancers accounted for 7.1% of cancer deaths reported for Ministry of Health facilities[21]. Of these, about 60% occur in the Indian ethnic group, who comprise only 7 - 8% of the population. A higher occurrence of oral precancerous lesions has also been noted among the Indigenous (Other Bumiputera) groups in the states of Sabah and Sarawak[22].

Oral cancer is not a notifiable disease in Malaysia and there is a dearth of incidence data. Hirayama in 1966[23] quoted 3.1 per 100,000 occurrences for Peninsula Malaysia. This figure is not representative of incidence rates by ethnic group. A pilot study in Kelantan[24] from 1994 – 1998 quoted an age standardised incidence rate of oral cancer adjusted to world population of 1.13 $\pm$ 0.15 per 100,000 among Kelantanese Malays. There is need for further studies on incidence rates in Malaysia.

In Malaysia, betel quid chewing has been suggested as the most important risk factor[20]. A 1996 study by Tan[25] showed that Indians in estate communities have a 6- to 7-fold propensity for betel quid chewing habit and a 4-fold predilection for alcohol consumption. The study found that primary prevention and screening had a positive influence on 16.9% of the population examined.

In 1997, the Oral Health Division, Ministry of Health initiated a high-risk strategy of Primary Prevention and Early Screening and Detection of Oral Precancer and Oral Cancerous Lesion. This programme is aimed at Indian Estate Communities as well as at indigenous groups identified as having a predilection for high-risk habits to oral

lesions. Subjects selected are those age 20 years or more. Findings of 1997-2000 screening shows that of 6,799 cases examined, 5.9% presented with oral lesions at time of examination. The proportion of subjects with oral lesions appeared to increase with increasing age. The highest proportion presenting with oral lesion was among the Indian/Pakistani group (6.5%) and appears to be more common in females (7%) as compared to males (4.3%) within the identified communities. (1)

Over the 20-year period data (1974-1994), it would seem as though there was an increase in prevalence of lesions – from 5.5% that was inferred in 1974 (2) to that of 9.6% for oral lesions in 1993/1994. However, based on this targeted strategy, the prevalence of oral lesions (5.9%) seems to be lower in the general population in 1993/1994 (3).

10. QUALITY IMPROVEMENT INITIATIVES IN DENTISTRY

The MOH launched its Quality Assurance Programme (QAP) in 1985 to monitor and facilitate evaluation of the quality of services provided. The Oral Health Division QAP started in 1992 with nine (9) indicators under the National Indicator Approach (NIA). The sensitivity of indicators and standards are reviewed annually, and standards set are adjusted accordingly. Indicators are also developed and monitored by the respective districts and hospitals under the District-Specific and Hospital-Specific Approaches.

In 1995, a nationwide Client Satisfaction Survey was conducted in eighty dental clinics. The results showed that 95% of patients expressed satisfaction with the Dental Service.

Other quality improvement efforts have been undertaken by various departments and facilities under the Ministry of Health. Of relevance to dentistry are those pertaining to:

- Clinical audit;
- Clinical Practice Guidelines (CPG);
- Corporate culture (caring culture, teamwork and professionalism within the Ministry of Health;
- Total Quality Management (TQM);
- Client charter;
- Innovations;
- Quality Control Circles (QCC) and
- MS (Malaysian Standards) ISO 9001:2000.

As yet the quality assurance mechanisms do not encompass the private sector. However, with the proposed regulations to the Private Healthcare Facilities and Services Act 1998, private dental clinics will have to conform to minimum standards in facilities, equipment and infection control procedures.

11. HEALTH MANAGEMENT INFORMATION SYSTEMS

The developments of the Health Management Information Systems (HMIS) in the Ministry of Health has evolved from merely an information system for management decision to a system for patient care and information system for managers and health care providers.

For the oral healthcare services, the standalone Electronic Oral Health Clinical application system named as *Sistem Maklumat Kesihatan Pergigian (SMKP)* was implemented to selected clinics in the different states. A technical assessment and evaluation of the existing SMKP system was made in 2002. It was found there were some limitations in the application system so the expansion of *SMKP* to all dental clinics in the country was therefore not feasible.

In 2003, the Oral Health Division took an initiative to pilot test a customized network system of an Oral Health Clinical and Information System (e SMKP) in Selangor. The enhanced (e SMKP) system was found to be functional and useful to the patient and the staff. The system was approved for implementation.

In 2004, the HMIS Dental sub-system reporting formats were reviewed and changes made will be incorporated in the Oral Health Clinical and Information System (eSMKP). It is hoped that ICT can support the oral healthcare services programme to provide quality and efficient services to the people in the country.

12. ORAL HEALTH RESEARCH

Research in the Oral Health Division comes under the purview of the Oral Health Research Unit. As with all other research in the Ministry of Health, oral health research is also bound by the rules and regulations of research of the Standing Committee on Research in the Ministry of Health.

The major sources of funding for research activities are:

i) National Intensification of Research in Priority Areas (IRPA) funds of the Ministry of Science and Technology, for research of high national priority or have potential for commercialisation addressing the needs of industry or enhancing national socio-economic potential;

ii) The Ministry of Health Research Grants to fund research in areas which are of importance for supporting and enhancing health services but do not fall within the objectives and priorities of the IRPA programme namely the Major Research grant (MRG) for sums exceeding RM10, 000.00 or the Small Research Grants (SRG) for allocations of less than RM10, 000.00;

iii) The Vote-F Research Grants of the Universiti Malaya particularly for MOH personnel undertaking post-graduate degrees, and

iv) The annual operating budget.

12.1 Clinical Research

These are researches on diagnosis, therapy, drugs, risk of conditions and/or therapies and the quantification of such. Oral clinical research projects are undertaken by specialists in various clinical disciplines both within the Ministry of Health and in the dental academia of the three dental faculties in the country.

12.2 Dental Epidemiological Surveys

Dental surveys on common dental diseases and oral health-related behaviour are, as recommended by WHO, carried out on a regular basis on prescribed (normally 10-year) intervals on the index age groups. These surveys are of greatest importance in the planning and evaluation of oral healthcare services. To date, 15 surveys have been undertaken on a national basis.

12.3 Health Systems Research (HSR)

Health Systems Research is carried out to provide the necessary data for informed decision-making. It is the integration of epidemiological, sociological, economic and other analytical sciences in the study of health services. The HSR activities within the Oral Health Division, MOH are of three categories:

i) State /district level oral health HSR projects

These are HSR projects identified and implemented by each state to meet their own research needs.
From 1999-2004, the Oral Health Division had received a total of 295 proposals of HSR projects from the 14 states, Hospital Kuala Lumpur and the Dental Training College in Penang. The completed projects have resulted in 57 reports/abstracts, 24 presentations and 10 publications.

ii) National level oral health HSR projects

Several projects were felt to be of wider concern and thus were taken up on a national level by the Oral Health Division, Ministry of Health. The projects coordinated by the Oral Health Research Unit, often in collaboration with other agencies and the enlistment of dental officers in several states are:

a. Risk Factors for Fluorosis among 16-Year-Olds

   This is a spin-off project from the 1999 study on “Fluoride Enamel Opacities among 16-year-olds.” Analysis was subsequently undertaken by two post-graduate dental students from USM Kubang Kerian in 2003. The report has been submitted for publication.

b. Cost Analysis of Private Primary Care Services in Malaysia

This 2002 study was a collaborative project with the Division for Medical Practice, MOH, UKM and the Primary Care Doctors' Organisation of Malaysia (PCDOM) and was conducted under instruction of the Honourable Health Minister. Data was handed over to the Public Health Institute for further analysis under the directive of the Director-General for Health. The report is currently being written.

c. Cross-Cultural Adaptation and Validation of the English Version Geriatric Oral Health Assessment Index (GOHAI) for Use in Malaysia

This 2002 – 2003 project was conducted in collaboration with the Clinical Research Center (CRC), MOH and the Dental Faculty, University Malaya. The study has formulated a cross-culturally equivalent Malay version of the GOHAI for use in the country.

d. Oral Health Knowledge, Attitudes, Perception and Behaviour of Young Adults

This is one of two projects for 2003 tabled at the 2002 Ministry's Research Dialogue and is a collaborative project with the Institute for Health Systems Research (IHSR). The pilot study has been conducted and findings of this are being analysed.

e. Mercury Exposure in Dental Health Personnel

This project was also tabled at the 2002 Research Dialogue and was taken up by the Environmental Health Research Centre, Institute for Medical Research with funding from the MRG of the MOH.

The aims of this project were to determine mercury exposure levels in dental health personnel compared to non-exposed health personnel and to identify relationships between working conditions/practices and the levels of urinary mercury.

f. Clinical Pathways in Oral Healthcare

This is a study on "clinical pathways" in collaboration with the Department of Community Dentistry, Universiti Malaya. The processes of care for six procedures have been defined. It is hoped that data collection will yield cost estimation data for the procedures.

g. A Referral Protocol for Orthodontics Waiting List

This is a nationwide project concerning government dental officers' current practices in orthodontic referrals. The project is undertaken by a team of dental public health officers with assistance from the Institute for Health Systems Research.

iii) Oral HSR projects identified centrally but assigned to identified states

Several projects had been initiated by the Oral Health Division but are carried out by identified states including:

- Handling of dental mercury by dental personnel / Compliance to Code of Dental Mercury Hygiene Practice (Malacca);
- Fluoride levels in mineral / bottled water (Sabah) and
- Fluoride levels in toothpaste (Sarawak)

V. FUTURE CHALLENGES

Healthcare System

Realisation of the eight health service goals will result in achieving the vision for health. These goals are:

1. Wellness focus
2. Person focus
3. Informed person
4. Self-help
5. Care provided at home or close to home
6. Seamless, continuous care
7. Services tailored as much as possible
8. Effective, efficient and affordable services

It is an individual and community responsibility to make right choices for their lifestyles. The population should have access to the right information and education at the right time and be involved in their own health care. They must have access to promotive and preventive activities and are able to seek consultation to maintain health and early treatment of sickness.

Healthcare systems are facing major challenges as they struggle to meet rising demand with limited resources. Increase in population, rising consumer expectations, advancement in technologies, increase in life expectancy are some of the major concerns in system transformation. Consumer empowerment towards wellness focus and a wide range of services close to home are issues to be addressed.

Rising Healthcare Costs

Since independence in 1957, the Ministry of Health has made great progress in improving access to primary healthcare through an extensive network of health facilities. The population not only has physical access to primary healthcare but financial access as well, with payment for treatment set at nominal rates. Treatment for secondary and tertiary care is heavily subsidised.

It is clear that the focus on curative services increases health cost and place intolerable strains on the nation's economy. The

impending Health Financing Scheme seeks to shift and share the financial burden with the private sector.

Oral healthcare financing will be equally affected. Oral health plans and related insurance schemes are envisioned to be commonplace in the near future. The government has pledged responsibility for care of the disadvantaged.

It is envisioned that there will be a shift towards cost effective strategies to contain cost that concentrates on the preventive and promotive aspect of healthcare, support individual and family in making lifestyle choices that maintain health and provide services that support maintenance of health.

Advances in Communication Technology

Consistent with Malaysia's Vision 2020, the nation's healthcare is to be transformed from industrial age medicine to information age medicine. With this tremendous emphasis on ICT in the country, the challenge lies in harnessing the power of information and multimedia technologies to transform the delivery of healthcare for improved health outcomes. These developments have included Telehealth, "paperless" hospitals and "seamless" care.

The Telemedicine Blueprint delineates the government's vision for the future Malaysian healthcare system and outlines the role of multimedia technologies towards achieving that vision. This vision includes promoting a lifelong focus on wellness, with technology as a key-enabler. To reflect the wide scope encompassed within that vision, the terminology Telehealth has been adopted. There are four applications:

- Health Online Service to deliver health information to the public;
- Continuing Medical Education (CME);
- Lifetime Health Plan; and
- Teleconsultation.

There is a place for dentistry in Telehealth. Realising the enormous potential to be derived from ICT, the oral health service has taken steps to utilise this technology to improve oral healthcare management.

Advances in Dentistry

Rapid advances in technology have also affected the face of dentistry in Malaysia. There is tremendous pressure to utilise contemporary equipment and materials to not only improve efficiency but also enhance patient comfort, the quality of care delivered, and personnel productivity. The dental service continues to assess and invest in new appropriate technology to improve service delivery to the population.

Today's technology means restorations last longer and look more natural. The intraoral camera, laser-assisted whitening and digitalised radiology are some of the advances that makes dentistry exciting and more informative.

Rise in Consumer Expectations

The average Malaysian today has higher expectations in life as a result of education. They are already seeking redress from the law to protect their rights and privileges. In oral healthcare, clients appear to be more aware of options for treatment and seem to be more concerned with aesthetics. Education has elevated receptiveness to advice on self-care. Greater consumer expectations necessitate strict infection control in the clinical and surgical environment.

The dental service, of necessity, needs to be vigilant to these trends. Due consideration has to be given to curative and rehabilitative treatment modalities, especially in the area of specialist care. Regional dental laboratories, which cater to the fabrication of more sophisticated fixed and removable prostheses as well as ceramic restorations, have been established. Concerted efforts have also been made to upgrade equipment and materials for more stringent infection-control within the clinical environment.

Service Standards

Putting standards to services will ensure quality care for the public. However, setting standards is only one element of quality strategy. This practical way to manage performance is of little value if they are not measured, evaluated, compared and improved continuously. Identifying quality elements, the process, outcome, structure requirements and performance indicators are elements of best practice in oral health.

Increase in Ageing Population

A higher proportion of health-conscious ageing population will mean a greater number within this group retaining their natural teeth and demanding more care. Treatment modalities will have to cater to the elderly, taking into consideration their frailty and possible medically compromised conditions.

The National Oral Health Plan for 2010

In 1999, the dental fraternity developed the National Oral Health Plan for 2010. The Plan was developed to provide direction to all agencies involved, in oral health with the common goal of improving the oral health status and quality of life of Malaysians. The Plan hopes to ensure that all health and health-related agencies involved play their respective roles. The focus of the National Oral Health Plan for year 2010 is on strategies to achieve goals set for four oral conditions: dental caries, periodontal conditions, oral malignancies and injuries and trauma. The Plan was subsequently presented to other

stakeholders in oral health in year 2001.

The challenge lies in mobilising all parties for unified actions towards common goals. In broad terms, this will mean sharing of information and resources to create sustained smart partnerships between agencies.

VI. CONCLUSION

There has been tremendous improvement in oral health status of the population over the past three decades. Malaysia together with the rest of the world is facing rapid changes in its approach to the new millennium. These changes affect all aspects of its people's lives. The healthcare scenario in general, and the dental service in particular, will have to rise to face these challenges to ensure availability and access to oral healthcare is not compromised, and that the oral health status of the population will continue to improve.

The Concept and Philosophy of Health in Malaysia is adapted from the Ministry of Health Malaysia document "Eighth Malaysia Plan (2001-2005) – Policies, Objectives and Strategies'. Planning and Development Division, Ministry of Health Malaysia, October 1999.

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