ORAL HEALTH FINANCING IN UNIVERSAL COVERAGE SYSTEM IN THAILAND

Dr. PHENKHAE LAPYING

DENTAL HEALTH DIVISION
DEPARTMENT OF HEALTH
MINISTRY OF PUBLIC HEALTH

GRANTED BY HEALTH SYSTEM RESEARCH INSTITUE, THAILAND

2001

Preface

The purposes of this study was to analyze oral care expenditure and forecast the national oral care expenditure when the Universal Coverage System is extended full scheme. The expenditure composes of household and public expenditure. According to limitation of existing data, the public expenditure including welfare schemes was analyzed by two methods. The first was based on the 1996-998 National Health Account. Another method was using public oral care cost of the 6 provinces in budget year 2000 and blowing up to be the national level. The duration of this study was between June- October 2001.

Special thanks to the Health System Research Institute, Thailand for the grant. I have also benefited from some officers who kindly gave me the special data which most helpful for my work. They are Mrs.Pairow Limsameur at National Statistic Office for Household expenditure by items, officials at Bureau of Trade and Economic Indices for Price indices and at National Economic and Social Development Board for GDP, Ms.Kanda Wanitwongwan at Social Security Office, MOL for Dental expenditure claimed, Ms.Krisana Pornputhichai at Health Insurance Office, MOPH for Budget of Public Assistance Scheme, Dr.Samrit Srithamrongsawat at Health Insurance Office, MOPH for 1998 National Health Account, and Mrs.Arunluk Worawat and Ms.Nontawan Wongkhaun at Dental Health Division, Department of Health for General data. Other very important groups are dental personnel in Yasothorn, Payao, Yala, Nakprnsawan, Samuthsakorn and Prathumthani as the list would be specially mentioned as co-contributors my work. Without them, this research can not be performed. Finally, I am very grateful to Dr.Viroj Tangcharoensathien who provided helpful suggestion.

Dr.Phenkhae Lapying

November, 2001.

Executive summary

Thai state started to provide free public health welfare including oral care named the Low Income Card Scheme that was administered by the Ministry of Public Health (MOPH) since 1975 and further developed other schemes to extend the coverage. The most recent public health policy is Universal Coverage Scheme (UCS) to tentatively cover all Thai citizens who have never been covered by any health insurance scheme. After having recently experienced since April 1, 2001 in 6 provinces[1] and in other 15 provinces since June 1, the UCS has been very fast implemented nationwide on October 1, 2001. The Public Assistant and Health Card Scheme under MOPH was merged to the UCS.

Starting on October 1, 2002, therefore there are 3 major health insurance schemes in Thailand which are the CSMBS administered by the Ministry of Finance (MOF), the SSS administered by MOL and the UCS run by MOPH.

Oral care treatment was basically provided in these schemes while prevention has served the children group by starting the incremental dental care program since 1977 then has been replaced with the Oral Health Surveillance Program in Primary School in 1988. The children therefore have received the most comprehensive oral care comparing to others.

In 1999, topical fluoride was added in the HCS and the treatment formerly identified only extraction and filling has been extended to cover all dental and gingival treatments (Health Insurance Office, 1999). While the CSMBS has never provided acrylic denture benefit and the MOF excluded the crown benefit (Ministry of Finance, 1999). This causes the HCS has same oral care benefit as the CSMBS while the caries prevention and acrylic denture make the HCS to be superior than the CSMBS and others.

Principally, the benefit of UCS[2] is based on the HCS and is added later. Therefore the UCS seems to have the greatest oral care benefit to avoid being the inferior scheme but does not relate to the budget. Meantime, the Social Security Fund (SSF) holder provides only basic treatments as free addition oral care benefit to avoid increasing contributions.

Not only the benefits among schemes are different but also budget allocation and payment system. Even the HCS has the most superior oral care benefit but the annual budget for all health benefit including oral care was capitation 1,000 Baht/card [3] and being 1,500 Baht/card since fiscal year 1999. Average per capita budget allocation for the PAS was 337 Baht in fiscal year 2000 which was 287, 247, 247, 534, 810, 835 and 860 Baht/person for children, low income, laid off worker, veteran, disabled, priest and elderly, respectively (Health Insurance Office,2001). The different budgets among them are caused by different weight[4] of each population group. Since the fiscal year 2001, the per capita budget of UCS is 1,202 Baht equally among 3 target groups which are treatment, promotive/preventive service

---

[1] These provinces were formerly implemented a specific project administered by the Health Insurance Office, MOPH, named the *Reforming Payment Mechanism to Hospital and Primary Care Network under the Public Assistant Program in Six Provinces* between fiscal year 1999-2001.

[2] However, the root canal treatment is excluded from the benefit.

[3] A card covered a family but not higher than 5 persons.

[4] Because of the different crude health utilization among population groups

and capital investment. The budget for the treatment is 934 Baht [5] while 175 Baht is for promotive and preventive service. The remaining 10% of treatment cost or 93 Baht is compensated the capital cost. The oral disease treatment and denture service are identified to be OP care while fit-fissure sealant and topical fluoride are preventive care. As other high cost care, the fee for denture making can be reinsured from the reinsured fund.

For the CSMBS, payment for public out patient care is out-of-pocket paid by the beneficiaries and can totally reimburse unlimitedly from the MOF and the providers can directly reimburse for inpatient care from the MOF. Differently, employers in the SSS have to pay out-of-pocket for oral care and can reimburse from SSF beneath the ceiling 200 Baht/visit and 400 Bah/year.

These differences cause people realize unfairness and lead people try to have several benefits that subsequently reduce the efficiency of oral care system. The important is that most oral services have operation costs impressively higher than outpatient care. Moreover, dental caries and late periodontal disease could be treated by several types of services or procedures which various costs. Therefore oral health system ought to be considered apart from medical care system for clearly situation evaluation and for public-private mixed provision in recent future since in the private sector, most of dental clinics are apart from medical clinics. Unfortunately, neither national information nor the provincial information system of the utilization and cost has been established. This study therefore would like to contribute the estimation methods of national oral care expenditure leading to national budgeting basis from the existing data as well as explore the inequity on oral health.

The purposes of this study are to develop a fundamental budget system of oral care system in Thailand beneath universal coverage system from the current situation and then forecast the national oral care expenditure when the insurance is extended full scheme. The public expenditure including welfare schemes and household expenditure were analyzed to perform the national expenditure. The two methods analyzing public oral care expenditure were presented. The first method was based on the 1996-1998 National Health Account. Another method was blowing up public oral care cost of the 6 provinces in budget year 2000 to be national level. These provinces started the Universal Coverage Scheme since April 1, 2001. The duration of this study was between June- November 2001.

The important findings from the study could be divided in 6 areas:

1. Household expenditure for oral care

Oral care expenditure paid by the household was subject to the household income. The very low proportion of total household consumption though oral diseases are still very high prevalence among Thai people reflected the low level of utilization. Even oral care expenditure in 1996 was highest (about 26.5 Baht/person) but it was only 0.10 % of total household consumption. The 1998-2000 slightly decreasing trend (0.15, 0.13 and 0.11 %) in higher proportion than in 1996 whether the absolute expenditures in 1998-2000 were lower showed that Thai household utilized oral care as a **necessary good**. Even the 1997 economic crisis has effected Thai households but decreasing rate of oral care expenditure was lower and slower than overall consumption because of its necessity therefore the proportion suddenly

[5] The treatment budget is divided to be 574, 303, 32 and 25 Baht for out patient, in patient, high cost and accidental/emergency care, respectively.

increased in 1998 then very slightly decreased. Low level consumption may be caused of psychological cost and impression of its high cost of oral care.

2. Public oral care utilization in six provinces

In fiscal year 2000, the average utilization rate and per capita frequency of the 6 provinces were 10.24 % and 0.16 visit/person, respectively. Notably, people in rural area such Yasothorn, Yala, Payao and Nakornsawan could access the public oral care better than in urban area such Prathumtani.

In fiscal year 2001, overall the utilization rate and per capita frequency increased slightly (10.42 % and 0.17 visit, respectively). Sketchy consideration here is that other factors may affected access to oral care rather than sole dental personnel number.

Public oral care provision is expected to play important role in early phase of the UCS even the productivity is limited. Average 0.17 visit of oral care utilized by a person of the six provinces in 2001 is an evidence of this situation. Therefore the provision should be productively improved as well as allowed the private sector serving the increasing demand.

3. Public oral care cost in six provinces

In fiscal year 2000, the average full cost of the hospitals was 280 Baht/visit or 413.61 Baht/recipient at utilization rate 10.24%. Among hospital size, number of dental personnel, number of recipient and number of visit, the cost variation mainly related to number of visit rather than other factors. Moreover, the number of visit did not solely varied to number of dental personnel.

However, these evidences do not totally conform to general theory that the higher productivity makes the lower cost. This study could not gain type of oral care mostly provided in each hospital. Type of oral care may reflect severity of the disease and complication and directly reflected to oral care cost. Therefore it is not fair to compare the cost among hospitals when only crude utilization was gained.

4. Public and welfare oral care expenditure

Calculation the 2000 national oral care expenditure of public sector and welfare schemes from the 6 provinces, two assumptions were needed. Accessibility of oral care of people in other 70 provinces of the country as well as the productivity and unit cost of oral care were assumed to be same as the 6 provinces.

While the household spending was decreasing since 1998, the public and welfare expenditure increased instead. This trend reflected important role of the public policy on health insurance including oral care beneath economic stagnation.

If the UCS really provides the accessibility beneath the 6-province contexts, the utilization will represent both public and private demand therefore the budget should cover both public and household expenditure which would be 59.50 Baht/person at 2000 price (the public expenditure was 42.35 Baht/person at 2000 price). But sole public facilities can not provide total oral care respond to people therefore private sector may be necessary for the provision towards efficiency. As previous oral care utilization was very low so every year adjustment for appropriate provision and budgeting is needed to serve incremental demand of society.

5. Oral care expenditure

The combination of oral care expenditure of public and welfare and household out of pocket oral care expenditure performed national oral care expenditure. The oral care expenditure of public sector and welfare schemes was analyzed by 2 methods: to extract the expenditure from 1996 and 1998 National Health Account and to blow up from the 6 provinces. From 1996 to 1998, national oral care expenditure at 1994 price was increasing 0.17 % but only 0.01 % increasing of proportion to the Gross Domestic Product. While national health expenditure decreased 8.16 %, the oral care expenditure proportioned to the health expenditure therefore increased 0.15 % in 1998. Per capita expenditure at current price showed a different figure since national oral care expenditure decreased 1.81 % from 46.35 Baht/person in 1996 to be 50.70 Baht/person in 1998. Adjusting to be 1994 price, the per capita expenditure decreased from 43.04 Baht/person in 1996 to be 42.27 in 1998 or 1.81 % decreasing. Consideration sources of expenditure, household's direct payment was greater than public's both in absolute number and per capita. Notably, per capita household payment decreased 4.02 % from 1996 while the public expenditure increased 1.68 %.

Blowing up from the 6 provinces, the per capita and absolute public expenditures were calculated then combined with household expenditure to be nation oral care expenditure. The per capita nation oral care expenditure in 2000 analyzed by this method was 64.43 Baht/person at 2000 price or 50.98 Baht/person at 1994 price.

6. Sensitivity analysis of oral care expenditure

Since the UCS started in 2001 and may facilitate the access to public oral care especially when the scheme allows public-private mixed provision to cover population extensively. Therefore the expenditure may closely vary to the utilization. The sensitivity analysis was conducted to forecast the expenditure when the utilization rate changed and other factors were constant. At 2000 price, when the utilization rate were between 10.24-15.00 per 100 population, per capita national oral care expenditure were 64.43-84.12 Baht which were public expenditure 42.35-62.04 Baht. The expenditure would increase 4 Baht per person when the utilization rate increasing was 1 %.

Policy recommendations

There are two main areas should be intently done for oral health insurance system towards equity and efficiency :

1) The information system embedded in routine working system to administer and self-monitor proper provision and financing are needed. At facilities based, the cost accounting and computerized utilization data are required to be accumulated the provincial or area information. Specific provincial data will be further used to finance the province particularly.

Since oral services have various costs due to type of the care, the utilization data should demonstrate types of the care which not only provide the information of accessibility but also present qualitative aspect of the care and personnel's workload.

2) To meet the equity purpose, adjusting the different schemes being close to be the same should be based on the oral health need rather than the social or work status. However the collective financing have to be based on the capacity to pay. Indeed, personal oral care seems to be only main part in oral health insurance

and oral health promotion is apart considered. The inequity may explicitly exist since the care is based on the service system that tentatively avails for urban or municipal people rather than the rural. Community strengthening to participate in all dimensions (such as to direct, administer, monitor and regulate both provision the care and oral health promotion program in communities may be hopefully way for equity improvement. At least 3 expected consequences could be addressed here which are increasing accessibility to the care, the schemes would particularly respond each area and the oral health status improvement would be real and sustainable. Nevertheless, people will depend on professional care leading to the high cost problem but improper oral health.

CONTENTS

ORAL HEALTH FINANCING IN UNIVERSAL COVERAGE SYSTEM IN THAILAND [1]

Rationale

Thai state started to provide free public health welfare including oral care named the Low Income Card Scheme that was administered by the Ministry of Public Health (MOPH) since 1975 and further extended to cover other vulnerable groups to be the Public Assistant Scheme (PAS). In 1983, the Project of Mother and Child Health Development Fund had been established and in 1994, it was finally developed to be voluntary Health Card Scheme (HCS) for persons who never had any health insurance (Health Insurance Office, 1998).

There are two medical insurance schemes for employed groups. Civil servants and state enterprise officers as well as their dependents such parents, spouse and children are automatically included in non-contributory Civil Servant Medical Benefit Scheme (CSMBS). The Social Security Scheme (SSS) is compulsory for workers in firms having more than 10 employees and financed by equal contributions from employees, employers and the government. The SSS has provided dental benefit additionally since 24 January 1997 without increasing the contributions (Social Security Office, 1997).

The most recent public health policy is Universal Coverage Scheme (UCS) to tentatively cover all Thai citizens who have never been covered by any health insurance scheme. After having recently experienced since April 1, 2001 in 6 provinces[2] and in other 15 provinces since June 1, the UCS has been very fast implemented nationwide on October 1, 2001. The UCS merging to PAS and HCS therefore covers 4 target groups: the vulnerable groups, community leaders, persons who formerly never have any health insurance and persons who formerly hold health card expiring in this fiscal year then automatically included in the scheme. In addition, the scheme also covers unskilled-alien workers who legally registered under the Ministry of Labour and Social Welfare (MOL).

Starting on October 1, 2002, therefore there are 3 major health insurance schemes in Thailand which are the CSMBS administered by the Ministry of Finance (MOF), the SSS administered by MOL and the UCS run by MOPH.

The medical benefits of these schemes are converged since each fund holder competitively concerns in benefit package provision and quality and efficiency improvement of the scheme.

In contrast, oral care has not been sincerely concerned because of its high cost. The UCS covers the most oral benefit to avoid being the inferior scheme but does not relate to the budget. Meantime, the Social Security Fund (SSF) holder provides only basic treatments as free addition benefit to avoid increasing contributions.

Most of oral care treatment was basically provided in these schemes while prevention has served the children group by starting the incremental dental care program since 1977 then has been replaced with the Oral Health Surveillance Program in Primary School in 1988. The children therefore have received the most comprehensive oral care comparing to others.

In 1999, topical fluoride was added in the HCS and the treatment formerly identified only extraction and filling has been extended to cover all dental and gingival treatments (Health Insurance Office, 1999). While the CSMBS has never provided acrylic denture benefit and the MOF excluded the crown benefit (Ministry of Finance, 1999). This causes the

---

[1] Granted by the Health System Research Institute, Thailand

[2] These provinces were formerly implemented a specific project administered by the Health Insurance Office, MOPH, named the *Reforming Payment Mechanism to Hospital and Primary Care Network under the Public Assistant Program in Six Provinces* between fiscal year 1999-2001.

HCS has same oral care benefit as the CSMBS while the caries prevention and acrylic denture make the HCS to be superior than the CSMBS and others.

Even the HCS has the most superior oral care benefit but the annual budget for all health benefit including oral care was capitation 1,000 Baht/card [3] and being 1,500 Baht/card since fiscal year 1999. Average per capita budget allocation for the PAS was 337 Baht in fiscal year 2000 which was 287, 247, 247, 534, 810, 835 and 860 Baht/person for children, low income, laid off worker, veteran, disabled, priest and elderly, respectively (Health Insurance Office,2001). The different budgets among them are caused by different weight[4] of each population group. Since the fiscal year 2001, the per capita budget of UCS is 1,202 Baht equally for each target group which is divided in to 3 groups for treatment, promotive/preventive service and capital investment. The budget for treatment is 934 Baht [5] while 175 Baht is for promotive and preventive service. The remaining 10% of treatment cost or 93 Baht is compensated the capital cost.

For the CSMBS, payment for public out patient care is out-of-pocket paid by the beneficiaries which can totally reimburse unlimitedly from the MOF and the providers can directly reimburse for inpatient care from the MOF. Differently, employers in the SSS have to pay out-of-pocket for particular oral care and can reimburse from SSF beneath the ceiling 200 Baht/visit and 400 Bah/year. Annual claims for oral care in the SSS were 45.61, 105.94, 131.67 and 139.91 million Baht in 1997, 1998, 1999 and 2000 which the per capita were 7.50, 19.55, 23.18 and 24.08 Baht/person, respectively (appendix table 1).

Principally, the benefit of UCS is based on the HCS and is added later. Therefore the UCS should have the greatest oral care benefit but its written treatment benefit is only extraction, filling and scaling which is lesser than the former HCS and CSMBS as described above. Moreover, budget allocation and payment system are also different among schemes which can be summarized in table A. Not only the differences cause people receive unfair oral care but also lead people trying to have several benefits which subsequently reduce the system efficiency.

The important is that most oral services have operation costs impressively higher than outpatient care. Moreover, dental caries and late periodontal disease could be treated by several types of services or procedures which various costs. Therefore oral health system ought to be considered apart from medical care system for clearly situation evaluation and for public-private mixed provision in recent future since in the private sector, most of dental clinics are apart from medical clinics. Unfortunately, neither national information nor the provincial information system of the utilization and cost has been established. This study therefore would like to contribute the estimation methods of national oral care expenditure leading to national budgeting basis from the existing data as well as explore the inequity on oral health.

---

[3] A card covered a family but not higher than 5 persons.

[4] Because of the different crude health utilization among population groups

[5] The treatment budget is divided to be 574, 303, 32 and 25 Baht for out patient, in patient, high cost and accidental/emergency care, respectively. As other high cost care, fee for denture making can be reinsured from the reinsured fund.

Table A. Oral health benefit among Health Insurance Schemes in fiscal year 2002

Scheme	Target group	Benefit	Condition	Financing	Payment
1. CSMBS	• Government and state enterprise officers • Children aged 0-18 yr., <= 3 persons • Parents	Oral examination, preventive care, dental and gingival treatment	• Particular public provider • Fully direct reimbursement	General tax through MOF	FFS
2. SSS	Employee in formal sector	Full mouth scaling, filling and extraction	Direct reimbursement with ceiling 200 B./visit and 400 B./year	SSF (equally contributed from Government, employer and Employee)	FFS
3. UCS	Who not included in 1. and 2.	Oral examination, topical fluoride, fit-fissure sealant, pulpotomy, pulpectomy, extraction, filling, scaling, acrylic-based denture for nutritional purpose	• Starting from a main contractor • Referral system	General tax through MOPH	1,052 Baht [a)] is capitated budget per person particular for outpatient and preventive care while inpatient care is DRGs allocated. The high cost and emergency & accidental cares are special reimbursed from the Reinsure fund.
3.1 Vulnerable gr. • Priest • Veteran • Aged 0-12 yr. • Elderly • Disabled • Unemployed • Low income	• Aged 60+ yr. • Physical or mental disability • Laid off workers • Monthly income < 2,800 B./ household or < 2,000 B./person		Do not copay 30 B./visit		
3.2 Not vulnerable	• Not included in 1., 2. and 3.1		Copay 30 B./tx. Visit but do not copay for promotive & preventive services		
3.3 Alien workers	• registered unskilled alien workers				1,052 Baht [a)] and particular 300 B. for health examination for a legal registration

a) Working group for preparation the Universal Coverage Scheme 2001. The total budget is 1,202 Baht.

Source : Derived from Lapying, P. 2001: 9.

Objectives

1. To analyze amount and trend of national oral care expenditure beneath existing pluralistic health insurance system
2. To estimate national oral care expenditure when the insurance system completely covers private oral care provision

Methodology

1. Sets of data from various sources were reviewed and analyzed as shown in Table B.

Table B. Sets and sources of data used in this study

Data set/Type	Method	Document	Source
1.Household expenditure 1.1 Total consumption 1.2 Oral health goods 1.3 Oral care	• Calculate from household expenditure in 1988, 1990, 1992, 1994, 1996, 1998, 1999 and 2000 • Adjust with Consumer Price Index, Personal Care Price Index and Medical Price index	Report of the 1988, 1990, 1992, 1994, 1996, 1998, 1999 and 2000 Household Socio-economic Survey: Whole Kingdom	National Statistical Office 1989- 2001.
2.Public and welfare oral care expenditure 2.1 from national data 2.2 from the data of 6 provinces • Unit cost • Accessibility and frequency of Utilization	• Pick up from public and all welfare expenditure on oral care • Recalculate from the cost of Dental department in the 6 provinces • Calculate hospital and provincial data of utilization to be rate per 100 person and per capita data	• National health account in Thailand in 1996 and 1998 • Report of public health care cost beneath the reforming payment mechanism to hospital and primary care net-work under the public assistant program in 6 provinces • Special Report for this study from 6 provinces	• Pongpanit, S. et al. 2000. • Disayakom, K. and Thonimitr, D. 2001. • The Provincial Public Health Office and hospitals in the 6 provinces 2001.
3. Price indices	To adjust the value of expenditure	1988, 1990, 1992, 1994, 1996, 1998, 1999 and 2000 Price indices	Bureau of Trade and Economic Indices 2001
4. Population	To calculate per capita data	Population Projections for Thailand 1990-2020	National Economic and Social Development Board1995.

2. National oral care expenditure was a combination of the public and welfare expenditure and that of the household out-of-pocket. The public and welfare expenditure including that of the benefit provided in private business and non-profit organization. According to the information limitation, the public and welfare expenditure was analyzed by 2 methods. First, it was picked up from the 1996 and 1998 National Health Account (Pongpanit et al., 2000). Another method, oral care cost and utilization data of the 6 provinces[6] beneath a specific project (the Reforming Payment Mechanism to Hospital and Primary Care Network under the Public Assistant Program in 6 Provinces) was used to blow up to be national level. These 2 methods were summarized as Figure A.

[6] The project was implemented in 6 provinces: Prathumthani, Samuthsakorn, Nakornsawan, Payao, Yasothorn and Yala between fiscal year 1999-2001.

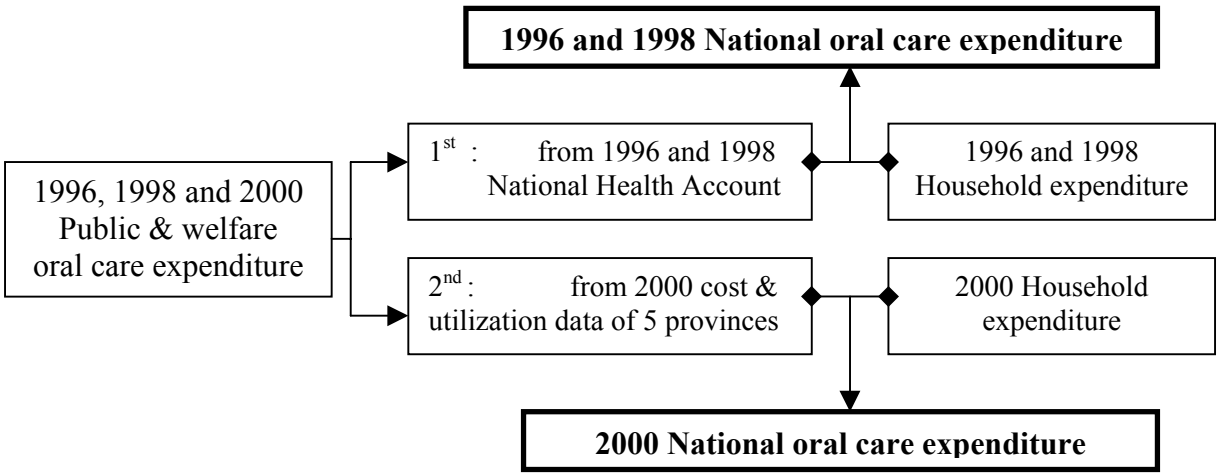

Figure A. National oral care expenditure from two methods of analysis of public and welfare expenditure

Results

1. Household expenditure for oral care

The consumption expenditures of Thai households were from the 2-year national survey of the National Statistical Office but since 1998 the survey has been done every year to monitor the impact of economic crisis. To avoid the effect of money inflation among the years, adjustment by price indices were done which 1994 was the indexed year. The per capita expenditure was calculated from dividing the household expenditure by number of household members.

As shown in Table 1, per capita total consumption excluding food and beverage of Thai household at 1994 price was increasing from 1988 to 1996 then decreased to be nearly constant [7] as well as the expenditure of toothbrush/paste and cigarette. Oral care expenditure was quite different from others since the peak was highest in 1992 and 1996 (about 26.5 Baht) then the trend was respectively decreasing to be 18.5 Baht in 2000.

Even the per capita oral care expenditure varied and decreased since 1998. Its proportion to total consumption was very low comparing to other proportions as presented in Table 2. The proportion also hardly changed from 1998-2000 between 0.15-0.11 % of total consumption expenditure while the tooth brush/paste and cigarette proportion were 0.53-0.54 % and 1.60-1.56 %, respectively.

2. Public oral care utilization

The utilization and population data were collected from every public facilities in the 6 provinces. As shown in Table 3, in fiscal year 2000, people in Yasothorn province had highest oral care accessibility (15.26%) then Payao (11.39%) and Prathumtani was the lowest (5.57%). Considering of per capita utilization in the year, people in Yasothorn still had highest per capita frequency (0.35 visit/person/year) and Prathumtani province was still the lowest (0.08). Notably, people in rural area such Yasothorn, Yala, Payao and Nakornsawan could access the public oral care better than in urban area such Prathumtani. The average utilization rate and per capita frequency of the 6 provinces was 10.24 % and 0.16 visit/person, respectively.

In fiscal year 2001 the data of Payao province is not available yet. The order from highest to lowest utilization was same as that of 2000. In overall the utilization rate and per capita frequency increased slightly (10.42 % and 0.17 visit, respectively) but decreased in Samuthsakorn and Yala. Sketchy consideration here is that other factors may affected access to oral care rather than sole dental personnel number.

3. Public oral care cost

Public oral care cost of the 6 provinces in fiscal year 2000 is shown in Table 4. The data were drawn from some public hospitals in each province and presented in 2 groups: community and central/general hospitals due to classification of the Permanent Secretarial Office, MOPH. The cost values were from the study of Disayakom and Thonimitr 2001[8] and information of utilization was directly checked with the dental department of each hospital as well as number of dental personnel. The data of Samuthsakorn hospital was excluded because the data collection time was different from others and recalculations of the unit cost of each hospital, each group of hospital and total hospitals were done. (see more details in Appendix Table 2).

Average full cost of community hospitals was 240.15 Baht/visit or 313.39 Baht/recipient at utilization rate 9.23 %. Of the central/general hospitals, average full cost was 329.21 Baht/visit or 580.99 Baht/recipient at utilization rate 10.47 %. And the average cost of these hospitals was 280 Baht/visit or 413.61 Baht/recipient at utilization rate 10.24%.

---

[7] Effected from the economic crisis in 1997.

[8] Limitation about completeness and bias might found in data collection, allocation criteria determination and else in the cost study could affect this study too.

Looking in the community hospitals, the lowest full cost was 172.73 Baht/visit (Kudchum hospital) and the highest was 459.50 Baht/visit (Tharnto hospital). For the central/general hospitals, the lowest and the highest full cost were 157.89 and 704.99 Baht/visit at Baetong and Payao hospitals, respectively. Sketchy considering among the factors present in the table, the cost variation seemed to close to 'visit' rather than others.

This study could not gain type of oral care mostly provided in each hospital Type of oral care may reflect severity of the disease and complication and directly reflected to direct oral care cost and cost of related revenue productive care. Lack of the information, only non-revenue productive care cost (NRPCC) which reflects to the value of resources supported the care would be considered for partial efficiency management because the NRPCC is usually constant and does not vary to severity of disease and complicated treatment. The first 3 community hospitals having highest NRPCC were Tharnto, Krokpra and Thanyaburi which the costs were 82.14, 79.55 and 66.39 Baht/visit, respectively. Among central/general hospital, Payao hospital had highest NRPCC which was 150.89 Baht/visit.

4. Public and welfare oral care expenditure

Calculation the 2000 national oral care expenditure of public sector and welfare schemes from the 6 provinces data (Table 3 and 4) was demonstrated in Table 5 which two assumptions were needed. Accessibility of oral care of people in other 70 provinces of the country as well as the productivity and unit cost of oral care were assumed to be same as the 6 provinces.

Per capita national public and welfare oral care expenditure in 2000
= unit cost (Baht/person) * utilization rate
= 42.35 Baht/person at 2000 price or = 32.53 Baht/person at 1994 price
When multiply to total population in 2000 (63,405 thousand persons), the national expenditure = 2,062.56 and 2,685.20 million Baht at 1994 and 2000 price respectively.

5. Oral care expenditure

The combination of oral care expenditure of public and welfare and household out of pocket oral care expenditure from Table 1 performing national oral care expenditure was presented in Table 6. The oral care expenditure of public sector and welfare schemes was analyzed by 2 methods: to extract the expenditure from 1996 and 1998 National Health Account (Pongpanit, et al. 2000) and to blow up from the 6 provinces which revealed in Table 5.

From 1996 to 1998, national oral care expenditure at 1994 price was increasing 0.17 % but only 0.01 % increasing of proportion to the Gross Domestic Product. While national health expenditure decreased 8.16 %, the oral care expenditure proportioned to the health expenditure therefore increased 0.15 % in 1998. Per capita expenditure at current price showed a different figure since national oral care expenditure decreased 1.81 % from 46.35 Baht/person in 1996 to be 50.70 Baht/person in 1998. Adjusting to be 1994 price, the per capita expenditure decreased from 43.04 Baht/person in 1996 to be 42.27 in 1998 or 1.81 % decreasing.

Consideration sources of expenditure, household's direct payment was greater than public's both in absolute number and per capita. Notably, per capita household payment decreased 4.02 % from 1996 while the public expenditure increased 1.68 %.

Blowing up from the 6 provinces, the per capita and absolute public expenditures were calculated as Table 5 then combined with household expenditure to be nation oral care expenditure as presented in Table 6. The per capita nation oral care expenditure analyzed by the method was 64.43 Baht/person at 2000 price or 50.98 Baht/person at 1994 price.

6. Sensitivity analysis of oral care expenditure

Since the UCS started in 2001 and may facilitate the access to public oral care especially when the scheme allows public-private mixed provision to cover population extensively. Therefore the expenditure may closely vary to the utilization. The sensitivity analysis was conducted to forecast the expenditure when the utilization rate changed and other factors were constant, as shown in Table 7. At 2000 price, when the utilization rate were between 10.24-15.00 per 100 population, per capita national oral care expenditure were 64.43-84.12 Baht which were public expenditure 42.35-62.04 Baht. The expenditure would increase 4 Baht per person when the utilization rate increasing was 1 %.

Table 1 Per capita total consumption, oral health and tobacco expenditure of Thai household at 1994 price

Items	1988	1990	1992	1994	1996	1998	1999	2000
Total consumption [a] (B./person/year)	16,644.0	19,012.1	21,812.3	23,895.8	26,612.1	16,414.7	16,497.9	16,275.6
Oral care [b] (B./person/year)	9.9	13.5	26.5	23.1	26.4	25.3	21.4	18.5
Tooth brush- paste [c] (B./person/year)	71.4	74.6	82.5	88.4	92.1	87.6	89.9	88.6
Tobacco- cigarette [d] (B./person/year)	295.5	295.5	380.9	293.7	418.4	262.1	271.7	253.8
Consumer Price Index	75.0	83.7	92.1	100.0	112.0	127.8	128.2	130.2
Medical care Price Index	66.5	74.8	85.5	100.0	105.0	114.7	117.6	119.7
Personal good and service Price Index	81.3	87.4	93.5	100.0	106.8	122.8	127.3	131.3
Tobacco- alcoholic beverage Price Index	75.0	85.2	90.5	100.0	110.9	150.0	155.2	156.3
Population (10^3 person)	54,3 26.0	55,839.0	57,294.0	58,713.0	60,003.0	61,201.0	61,806.0	62,405.0

[a] not include food and beverage, adjusted with consumer price index

[b] adjusted with medical care price index

[c] adjusted with personal good and service price index

[d] adjusted with tobacco and alcoholic beverage price index

Source : 1) Total consumption, oral care and tobacco- cigarette expenditure were from National Statistical Office 1989- 2001. Report of the 1988, 1990, 1992, 1994, 1996, 1998, 1999 and 2000 Household Socio-economic Survey: Whole Kingdom
2) Tooth brush- paste expenditure was from National Statistical Office 2001.
3) Price Indices were from Bureau of Trade and Economic Indices 2001.
4) Population was from National Economic and Social Development Board1995. Population Projections for Thailand 1990-2020

Table 2 Proportion of per capita oral health and cigarette expenditure to total consumption at 1994 price

Proportion to total consumption* (%)	1988	1990	1992	1994	1996	1998	1999	2000
Oral care	0.06	0.07	0.12	0.10	0.10	0.15	0.13	0.11
Tooth brush- paste	0.43	0.39	0.38	0.37	0.35	0.53	0.54	0.54
Tobacco- cigarette	1.78	1.50	1.75	1.23	1.57	1.60	1.65	1.56

* calculated by using the data from table 1.

Table 3 Utilization of public oral care of the 6 province in fiscal year 2000 compared to 2001.

Provinces	2000					2001				
	Dental personnel [a] (person)		Population (person)	Rate (/100 person)	Per capita (visit/ person)	Dental personnel [a] (person)		Population (person)	Rate (/100 person)	per capita (visit/ person)
	Dentist	DT nurse				Dentist	DT nurse			
Payoa	16	25	511,616	11.39	0.14	na	na	na	na	na
Prathumtani	27 [b]	26	654,701	5.57	0.08	24 [b]	24	654,701	6.27	0.09
Samuthsakorn	14	19	428,814	9.07	0.12	14	19	428,814	7.32	0.10
Yala	23	18	442,300	11.82	0.18	23	22	446,224	11.23	0.18
Yasothorn	19	27	553,982	15.26	0.35	16	26	554,818	16.09	0.37
Nakornsawan	32	31	1,125,283	9.80	0.13	37	49	1,125,437	10.90	0.15
Total	131	146	3,716,696	10.24	0.16	130	165	3,209,994	10.42	0.17

[a] particularly worked in the province in the year

[b] excluded dentists of the faculty of Dentistry, Thamasat University

Table 4 Public oral care unit cost and utilization in the six provinces in fiscal year 2000

Hospitals [a]	Hosp. Size (bed)	District population (person)	Public personnel) [b] (person)		Recipient		Utilization		RSC [c] (B./visit)	NRPC [d] (B./visit)	MCC [e] (B./visit)	Full Cost [f]	
			Dentist	Dt. nurse	Person	Visit	rate (%)	Per capita visit				(B./visit)	(B./person)
Pong hosp.	30	54,657	1	2	4,920	6,544	0.12	9.00	231.39	57.25	53.85	285.24	379.40
Maejai hosp.	30	37,924	1	2	5,231	6,704	0.18	13.79	198.44	57.13	67.76	266.20	341.16
Nong-suae hosp.	30	45,950	2	2	3,900	3,937	0.09	8.49	304.98	59.80	2.21	307.19	310.10
Thanyaburi hosp.	60	67,739	2	1	4,573	6,397	0.09	6.75	232.43	66.39	15.04	247.48	346.19
Tharnto hosp.	30	19,127	1	2	2,700	2,984	0.16	14.12	410.86	82.14	48.65	459.50	507.84
Bannagsata hosp.	30	48,245	2	2	4,279	6,284	0.13	8.87	268.82	52.14	8.92	277.74	407.88
Krathumban hosp.	90	69,417	3	3	5,232	6,273	0.09	7.54	230.88	60.78	77.93	308.81	370.25
Kudchum hosp.	30	67,690	1	2	5,922	7,577	0.11	8.75	151.41	25.49	21.32	172.73	221.00
Mahachanachai hosp.	30	59,655	0	2	5,361	7,060	0.12	8.99	158.18	34.32	23.50	181.67	239.25
Nong-bua hosp.	60	72,455	1	3	7,303	9,984	0.14	10.08	167.55	40.72	7.11	174.66	238.78
Krokpra hosp.	30	36,359	2	2	3,887	6,379	0.18	10.69	297.33	79.55	9.31	306.64	503.23
Banpottpisai hosp.	60	93,911	2	3	8,754	11,452	0.12	9.32	178.36	28.66	4.04	182.41	238.62
Tatako hosp.	60	72,039	1	3	6,745	8,218	0.11	9.36	199.89	49.64	5.29	205.18	249.99
Mean of the community hosp.		**745,168**	**19**	**29**	**68,807**	**89,793**	**0.12**	**9.23**	**216.21**	**49.64**	**23.93**	**240.15**	**313.39**
Payao hosp.	393	106,429	4	-	6,502	8,528	0.08	6.11	670.48	150.89	34.51	704.99	924.66
Prathumtani hosp.	312	115,233	5	-	10,349	15,628	0.14	8.98	264.11	29.91	34.39	298.49	450.75
Yala hosp.	497	87,685	6	-	7,103	17,556	0.20	8.10	209.98	53.79	11.48	221.46	547.37
Baetong hosp.	180	28,337	4	-	4,594	9,438	0.33	16.21	148.82	47.56	9.07	157.89	324.38

Hospitals [a]	Hosp. Size (bed)	District population (person)	Public personnel) [b] (person)		Recipient		Utilization		RSC [c] (B./visit)	NRPC [d] (B./visit)	MCC [e] (B./visit)	Full Cost [f]	
			Dentist	Dt. nurse	Person	Visit	rate (%)	Per capita visit				(B./visit)	(B./person)
Yasothorn hosp.	346	55,912	7	-	12,650	21,555	0.39	22.62	361.73	34.00	3.86	365.59	622.95
Mean of the central/general hosp.		**393,596**	**26**	**-**	**41,198**	**72,705**	**0.18**	**10.47**	**312.68**	**53.37**	**16.53**	**329.21**	**580.99**
Mean of total hospitals		**3,716,696**	**165**	**145**	**380,613**	**599,948**	**0.16**	**10.24**	**259.37**	**51.31**	**20.63**	**280.00**	**413.61**
Median of total hospitals												**249.70**	**325.56**

[a] There is a hospital in each district and there are 7, 8, 7, 9, 13 and 3 districts in Payoa, Prathumtani , Yala, Yasothorn, Nakornsawan and Samuthsakorn province respectively. The hospitals addressed in the table were only the samples of costing study. Pong, Maejai and Payao hospitals ; Nong-suae, Thanyaburi and Prathumtani hospitals ; Tharnto, Bannagsata, Yala and Baetong hospitals ; Krathumban hospital ; Kudchum, Mahachanachai and Yasothorn hospitals ; and Nong-bua, Krokpra, Banpottpisai and Tatako hospitals have been in Payao, Prathumtani, Yala, Samuthsakorn, Yasothorn and Nakornsawan province respectively.

[b] particularly worked in the hospital in the year

[c] Routine service cost = direct cost of dental health department + non revenue productive care cost

[d] Non revenue productive care cost was from non revenue producing cost center

[e] Medical care cost = revenue productive care cost

[f] Full cost = RSC + MCC

Source : 1. The cost values were recalculated by using the amount from Disayakom, K. and Thonimitr, D. (2001) which excluded Samuthsakorn hospital because of different time of data collection.

2. The data of oral care utilization, public dental personnel and population are from the provincial public health office and hospitals.

Table 5 The 2000 oral care expenditure of public sector and welfare schemes blew up from the 6 provincial data

Items		2000 price	1994 price
Oral care cost	B./ person	413.61	
Utilization rate	/100 person	10.24	
Public and welfare expenditure			
• Per capita	B./person	42.35	32.53
• Total [a]	10^6 Baht	2,685.20	2,062.56

[a] Per capita expenditure was multiplied with population number (63,405 thousand person)

Table 6 Oral health expenditure analyzed by two methods

Expenditure	1996		1998		% change[a]	2000	
	Current price	1994 price	Current price	1994 price		Current price	1994 price
1st METHOD							
Total health (10^6 B.)	171,470.83	153,098.96	179,689.15	140,601.84	-8.16		
Oral care							
Per capita (B./person)	46.35	43.04	50.70	42.27	-1.81		
• Public & welfare [b]	18.65	16.66	21.66	16.95	1.68		
• Household	27.70	26.38	29.04	25.32	-4.02		
Absolute no. (10^6 B)	2,781.34	2,582.36	3,102.71	2,586.72	0.17		
• Public & welfare [c]	1,119.42	999.48	1,325.43	1,037.11	3.76		
• Household [d]	1,661.92	1,582.88	1,777.28	1,549.50	-2.10		
Proportion (%)							
• To total health		1.69		1.84	0.15		
• To GDP [e]		0.06		0.07	0.01		
2nd METHOD							
Oral care							
Per capita (B./person)						64.43	50.98
Public & welfare						42.35	32.53
Household						22.08	18.45
Absolute no. (10^6 B)						4,020.75	3,181.16
Public & welfare [f]						2,642.85	2,030.03
Household [f]						1,377.90	1,151.13

[a] percent change of the 1994 price

[b] divided total public & welfare oral care expenditure by population number in 1996 and 1998 (60,003 and 61,201 thousand persons respectively)

[c] from Pongpanit, S. 2000.

[d] multiplied oral care expenditure in 1996 and 1998 from table 1 with population number (60,003 and 61,201 thousand persons, respectively)

[e] 1996 and 1998 Gross Domestic Product = 4,622.83 and 4,628.43 Billion Baht respectively which adjusted with CPI to be 1994 price = 4,127.50 and 3,709.10 Billion Baht respectively

[f] multiplied per capita value with population number = 63,405 thousand persons

Table 7 The sensitivity analysis of the 2000 oral care expenditure on utilization rate at 2000 price

Per capita expenditure (B./person)	Utilization rate (person/100 population)						
	10.24	10.42	11.00	12.00	13.00	14.00	15.00
Total	64.43	65.18	67.58	71.71	75.85	79.99	84.12
• Public & welfare	42.35	43.10	45.50	49.63	53.77	57.91	62.04
• Household [a]	22.08	22.08	22.08	22.08	22.08	22.08	22.08

[a] When the household utilize oral care in a constant level and their accessibility to oral care under schemes are increasing, the out-of-pocket expenditure should decrease and the public expenditure tends to increase instead. But if they also increase the overall utilization, the out-of-pocket may increase or decrease according to type of the additional service.

Discussion and summary

The discussion and summary of this study beneath the imperfection of existed information system composes of the equity issue, methodology and results which divided into 3 parts : oral care consumption, cost and budget.

1. The equity issue

Not only the difference among insurance schemes induces people receive unfair oral care beneath existing benefit, budget and financing but trying to be in several insurance schemes also subsequently reduces the system efficiency. For the utilization inequity, only a rural evidence clearly reported the utilization among different insured groups and uninsured when excluding the elderly and child group to control the influence of age, the CSMBS beneficiary had the most filled and missing teeth but least decayed tooth (Lapying 2001). Moreover, both central and local governments also inequitably invested on the structure of oral health system and promotion programs which municipalities gained greater budget than rural areas as well as among regions that Bangkok and vicinity gained greater budget than others (Lapying 1999).

2. The methodology based on the imperfection of existed information

As other developing countries, lack of complete information system in national, provincial and hospital levels, this quantitative initiation would be questioned about the completion and representative depended on validity and reliability and randomization of the original data. The national information systems such as oral care price index and utilization are not formally established yet. In the hospital level, cost-accounting system and computerized database of oral care utilization are not installed nationwide. The available national utilization data is only from the 5-year oral health survey which is crude and not in yearly situation. Therefore the provincial data from a specific project was used instead and checking back to the hospitals for validity was done.

However the average cost of the 6 provinces were only mean value of the cooperated hospitals which did not really represent real provincial data. In addition, many assumptions used in blowing the data up to be national level were reminded us to be aware.

Even the two methods of expenditure calculation can not be compared really but they provided compatible figures which will be discussed as following.

3. The results

Oral care consumption

Oral care expenditure paid by the household was subject to the household income. The very low proportion of total household consumption though oral diseases are still very high prevalence among Thai people reflected the low level of utilization. Even oral care expenditure in 1996 was highest but it was only 0.10 % of total household consumption. The 1998-2000 slightly decreasing trend (0.15, 0.13 and 0.11 %) in higher proportion than in 1996 whether the absolute expenditures in 1998-2000 were lower showed that Thai household utilized oral care as a **necessary good** which the price elasticity of mixed oral care demand in a Thai rural area was 0.8 and tooth extraction was an inferior good since E_{income} of extraction = -0.28 (Lapying,P. 2001:124-126). Even the 1997 economic crisis has effected Thai households but decreasing rate of oral care expenditure was lower and slower than overall consumption because of its necessity therefore the proportion suddenly

increased in 1998 then very slightly decreased. Low level consumption may be caused of psychological cost and impression of its high cost of oral care.

Public oral care provision is expected to play important role in early phase of the UCS even the productivity is limited. Average 0.17 visit of oral care utilized by a person of the six provinces in 2001 is an evidence of this situation. Therefore the supply side should be productively improved as well as allowed the private sector serving the increasing demand.

Oral care cost

Among hospital size, number of dental personnel, number of recipient and number of visit as revealed in Table 4, the cost variation mainly related to number of visit rather than other factors. Moreover, the number of visit did not solely varied to number of dental personnel. Such Kudchum hospital had equal dental personnel to Pong hospital but had higher provision. These two hospitals provided higher oral care than Thanyaburi hospital even they had lower number of dentist and being smaller hospitals. However, these evidences do not totally conform to general theory that the higher productivity makes the lower cost since Pong hospital had lower cost than Thanyaburi. Important reminder here is that only crude utilization could be collected from each hospital therefore it is not fair to compare the cost among hospitals.

Per capita budget

While the household spending was decreasing since 1998, the public and welfare expenditure increased instead. This trend reflected important role of the public policy on health insurance including oral care beneath economic stagnation.

If the UCS really provides the accessibility beneath the 6-province contexts, the utilization will represent both public and private demand therefore the budget should cover both public and household expenditure which would be 59.50 Baht/person at 2000 price. But sole public facilities can not provide total oral care respond to people therefore private sector may be necessary for the provision towards efficiency. As previous oral care utilization was very low so every year adjustment for appropriate provision and budgeting is needed to serve incremental demand of society.

Recommendations

At least two main areas should be intently prepared for oral health insurance system towards equity and efficiency :

1) The information system embedded in routine working system for administration and self-monitoring in provision and financing are needed. At facilities based, the cost accounting and computerized utilization information system are required to accumulate to be provincial information. Specific provincial data in the contexts of efficiency and quality improvement will be further used to finance the province particularly.

Since oral services have various costs due to type of the care, the utilization data should demonstrate types of the care which not only provide the information of accessibility but also present qualitative aspect of the care and workload.

2) To meet the equity purpose, adjusting the different schemes being close to be the same should be based on the oral health need rather than the social or work status. However the collective financing have to be based on the capacity to pay. Indeed, personal oral care seems to be only main part in oral health insurance and oral health promotion is apart considered. The inequity may explicitly exist since

the care is based on the service system that tentatively avails for urban or municipal people rather than the rural. Community strengthening to participate in all dimensions (such as to direct, administer, monitor and regulate both provision the care and oral health promotion program in communities may be hopefully way for equity improvement. At least 3 expected consequences could be addressed here which are increasing accessibility to the care, the schemes would particularly respond each area and the oral health status improvement would be real and sustainable. Nevertheless, people will depend on professional care leading to high cost problem but improper oral health.

References

Disayakom, K. and Thonimitr, D. (2001). Report of Public Health Care Unit Cost of the fiscal year 2000 Beneath the Reforming Payment Mechanism to Hospital and Primary Care Network under the Public Assistant Program in 6 Provinces. (in Thai)

Health Insurance Office. (1998). The Public Assistant Program. A working paper presented in the meeting for reforming Health Card Project on 3rd June 1998, Ministry of Public Health. Mimeographed. (in Thai)

Health Insurance Office. (1998). The 1998 Health Card Project. Ministry of Public Health. Mimeographed. (in Thai)

Health Insurance Office. (1999). The collection of Regulation, Order, Promulgation, and letter and the Revolving Fund of Health Card. Ministry of Public Health. pp.26 . (in Thai)

Health Insurance Office 2001. The 2000 budget of 70 provinces (excluding the 6 provinces beneath the Reforming Payment Mechanism to Hospital and Primary Care Network under the Public Assistant Program)

Lapying,P. (1999). Oral Health Financing in Thailand. Th.J.DPH. 4(2) 7-35. (in Thai)

Lapying,P. (2001). The Demand Analysis of Oral Care in Rural Area : A Case Study of Uthong District, Suphanburi. Ph.D.Thesis in Medical and Health Social Sciences, Faculty of Graduate Studies : Mahidol University, Thailand. pp. 5-9, 100-126.

Lapying,P. , Srithamrongsawat, S. and Pornputthichai, K. (2001). The Qualitative Study on the Evaluation of Reforming Payment Mechanism to Hospital and Primary Care Network under the Public Assistance Program in Six Provinces. Granted by WHO Thailand # 000137.

Ministry of Finance. (1999). The Official Letter, Ref. No. กค 0526.5/ ว. 41 on June 8, 1999. Subject : Reimbursement of treatment fee.

National Statistical Office. (1999-2001). Report of the 1988, 1990, 1992, 1994, 1996, 1998, 1999 and 2000 Household Socio-economic Survey: Whole Kingdom. (in Thai)

Office of the National Economic and Social Development Board. (1995). Population Projections for Thailand 1990-2020. (in Thai)

Ponpanit, S. et al. (2000). National Health Account in Thailand 1996, 1998. Health System Research Institute, Ministry of Public Health, National Statistic Office, National Economic and Social Development Board and Public Health Collage, Chulalongkorn University. (in Thai)

Siamwala, A. et al. (2001). The proposal on health insurance beneath universal coverage system. Health System Research Institute. (in Thai)

Social Security Office. (1997). The second promulgate about criteria and rate of compensation of accidental and sick benefit unrelated to work on 10 January 1997. (in Thai)

Working group for preparation Universal Coverage System. (2001). The guideline of the Universal Coverage System in Transitional Period (draft). Ministry of Public Health. (in Thai)

APPENDIX

Table 1 The reimbursement and utilization of dental benefit beneath the Social Security Scheme

Items	1997	1998	1999	2000
Number of insured (person)	6084,822	5418,182	5679,567	5810,140
Reimbursement				
• Amount (million Baht)	45.61	105.94	131.67	139.91
• Claim (case)	236,562	541,651	671,090	711,687
• Per calim (Baht/case)	192.80	195.59	196.20	196.59
• Per capita (Baht/person)	7.50	19.55	23.18	24.08
Utilization rate (per 100 persons)				
• If utilized 1 visit/year	3.89	10.00	11.82	12.25
• If utilized 2 visit/year	1.94	5.00	5.91	6.12
• If utilized 3 visit/year	1.30	3.33	3.94	4.08

Table 2. Public oral care unit cost and utilization in the six provinces in fiscal year 2000

Hospitals / Provinces	Hosp. size	Public personnel (person)		Population : public personnel		Utilization		DC [1]	NRPPC [2]	MCC [3]	Full Cost [3]
	(bed)	Dentist	Dt. nurse	Dentist	Dt. nurse	Person	Visit				
Pong hosp.	30	1	2	54,657	27,329	4,920	6,544	1,139,602.46	374,632.12	352,389.79	1,866,624.36
Maejai hosp.	30	1	2	37,924	18,962	5,231	6,704	947,344.44	382,973.89	454,280.48	1,784,598.81
Payao hosp.	393	4	0	26,607	-	6,502	8,528	4,431,054.34	1,286,771.32	294,333.94	6,012,159.60

Hospitals / Provinces	Hosp. size	Public personnel (person)		Population : public personnel		Utilization		DC [1]	NRPPC [2]	MCC [3]	Full Cost [3]
	(bed)	Dentist	Dt. nurse	Dentist	Dt. nurse	Person	Visit				
Payao province [5]		**16**	**25**	**31,976**	**20,465**	**58,251**	**73,381**				
Nong-suae hosp.	30	2	2	22,975	22,975	3,900	3,937	965,277.25	235,418.85	8,701.66	1,209,397.76
Thanyaburi hosp.	60	2	1	33,870	67,739	4,573	6,397	1,062,167.68	424,716.78	96,237.16	1,583,121.62
Prathumtani hosp.	312	5	0	23,047	-	10,349	15,628	3,659,962.96	467,505.05	537,370.06	4,664,838.08
Prathumtani province [4]		**27**	**26**	**10,733**	**26,188**	**36,439**	**49,705**				
Tharnto hosp.	30	1	2	19,127	9,564	2,700	2,984	980,904.12	245,095.45	145,157.73	1,371,157.29
Bannagsata hosp.	30	2	2	24,123	24,123	4,279	6,284	1,361,656.18	327,632.02	56,031.61	1,745,319.81
Baetong hosp.	180	4	0	7,084	-	4,594	9,438	955,700.46	448,859.57	85,624.43	1,490,184.46
Yala hosp.	497	6	0	14,614	-	7,103	17,556	2,742,082.91	944,361.48	201,522.74	3,887,967.14
Yala province [5]		**23**	**18**	**19,230**	**24,572**	**52,275**	**79,520**				
Kudchum hosp.	30	1	2	67,690	33,845	5,922	7,577	954,082.78	193,162.81	161,509.78	1,308,755.38
Mahachanachai hosp.	30	0	2	-	29,828	5,361	7,060	874,435.45	242,285.95	165,897.11	1,282,618.51
Yasothorn hosp.	346	7	0	7,987	-	12,650	21,555	7,064,099.00	732,925.51	83,297.65	7,880,322.16
Yasothorn province [5]		**19**	**27**	**29,157**	**20,518**	**84,516**	**194,386**				
Nong-bua hosp.	60	1	3	72,455	24,152	7,303	9,984	1,266,273.66	406,527.34	71,011.30	1,743,812.30
Krokpra hosp.	30	2	2	18,180	18,180	3,887	6,379	1,389,191.00	507,474.23	59,376.40	1,956,041.62
Banpottpisai hosp.	60	2	3	46,956	31,304	8,754	11,452	1,714,405.64	328,210.92	46,286.90	2,088,903.47
Tatako hosp.	60	1	3	72,039	24,013	6,745	8,218	1,234,788,06	407,929.97	43,433.51	1,686,151.54
Nakornsawan province [5]		**32**	**31**	**35,165**	**36,299**	**110,229**	**150,029**				

Hospitals / Provinces	Hosp. size (bed)	Public personnel (person)		Population : public personnel		Utilization		DC [1]	NRPPC [2]	MCC [3]	Full Cost [3]
		Dentist	Dt. nurse	Dentist	Dt. nurse	Person	Visit				
Krathumban hosp.		3	3	23,139	23,139	5,232	6,273	1,067,031.25	381,283.88	488,853.24	1,937,168.36
Samuthsakorn province [5]		**14**	**19**	**30,630**	**22,569**	**38,903**	**52,927**				
Sum of the community hosp.		**19**	**29**	**39,219**	**25,695**	**68,807**	**89,793**	14,957,159.97	4,457,243.21	2,149,166.67	21,563,670.83
Sum of the central/general hosp.		**26**	**0**	**15,138**	**-**	**41,198**	**72,705**	18,852,899.67	3,880,422.93	1,202,148.82	23,935,471.44
Total of 6 provinces		**165**	**145**	**22,525**	**25,632**	**380,613**	**599,948**	**3,810,059.64**	**8,337,666.14**	**3,351,315.49**	**45,499,142.27**

1 DC = direct cost of dental department

2 NRPCC = non revenue productive care cost

RSC = routine service cost = DC + NRPCC

3 MCC= medical care cost = revenue productive care cost (RPCC)

4 full cost = RSC + MCC

5 There are 7, 8, 7, 9, 13 and 3 hospitals under the Permanent Secretarial Office, MOPH in Payao, Prathumtani , Yala, Yasothorn, Nakornsawan and Samuthsakorn province respectively. The hospitals addressed in the table were the samples of costing study.