EQUITY IN ORAL HEALTH IN THAILAND: CASE STUDY IN KUKOT MUNICIPALITY, PRATUMTANI PROVINCE

THONGCHAI VACHIRAROJPISAN

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The purpose of this study is to study the equity in oral health in three aspects-equality in oral health status, equality in oral health utilization and equity in oral health care expenditure-between two social stratification groups in Thailand.

Systematic random sampling was used to collect 293 (male: 105, female: 188) adult subjects (40.6±6.4 y) in an urban area near Bangkok. The data was collected by oral health examination and interview questionnaire. Information about health insurance, oral health utilization and expenditure in the previous year (1999) was obtained by interview. Occupational prestige was used to classify social status into two groups: the lower (LSS) and higher social stratification (HSS).

It was found that the average annual income of LSS and HSS was 106,142 and 443,107 Baht respectively. The rate of the health insurance holders was 42.1% (LSS) and 69.7% (HSS) ($p<0.01$). The caries prevalence was 80.7% for LSS and 94.3% for HSS. Average caries experience (decay, missing and filling) was 6.7±5.7. LSS had less caries experience (5.7±5.9) than HSS (8.0±5.3). A significant difference in the component of DMFT was observed between the two groups. The rates of decay teeth (DT), missing teeth (MT), and filling (FT) were 1.7, 2.8, and 1.3 in LSS and 0.7, 2.2, and 5.0 in HSS. For periodontal status, severe periodontal disease (CPI score 3 and 4) was 47.9% and 1.21 sextants in LSS, and 29.5% and 0.57 sextants in HSS. These periodontal status was statistically significant differences ($p<0.05$)between the two groups. The rate and frequency of oral health utilization were 40.9% and 0.8 times in LSS, and 73.0% and 1.7 times in HSS. There was significant difference between the two groups ($p<0.01$). For subjects who used oral health service the total dental expenditure per person per year was similar: 2,448 (LSS) and 2,872 Baht (HSS). However a significant difference was found in the average proportion of total dental expenditure to income: 3.56% (LSS) and 0.88% (HSS) ($p<0.05$). The inequity in dental expenditure was not improved when reimbursement of health insurance was taken into account. After receiving insurance benefit, recalculated average proportion of direct out-of-pocket dental payment to income was 2.51% (LSS) and 0.62% (HSS) ($p<0.05$).

It is concluded that the LSS has more decayed teeth, higher periodontal disease and uses dental service less often than the HSS. The percentage of income spent on oral health care by the LSS was higher than that by the HSS. The present health insurance system did not work well to improve the inequity. Inequity in oral health between the LSS and HSS were found in this study.

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ธงชัย วชิรโรจน์ไพศาล : ความเป็นธรรมในเรื่องสุขภาพช่องปากของสังคมไทย กรณีศึกษาเทศบาลคูคต จังหวัดปทุมธานี (EQUITY IN ORAL HEALTH IN THAILAND: CASE STUDY IN KUKOT MUNICIPALITY, PRATUMTANI PROVINCE) คณะกรรมการควบคุมวิทยานิพนธ์ : ศิริวรรณ ไกรสุรพงศ์, M.A. , Ph.D., สุวจี กู๊ด จันทร์ถนอม M.A. , Ph.D., ศุภสิทธิ์ พรรณารุโณทัย M.A. , Ph.D. 119 หน้า ISBN 974-04-1551-2

การศึกษานี้เป็นการศึกษา ความเป็นธรรมในสุขภาพช่องปาก ใน 3 มิติ คือ ความเท่าเทียมกันของสภาวะสุขภาพช่องปาก , ความเท่าเทียมกันของการใช้บริการทันตกรรมและความเป็นธรรมในเรื่องของค่าใช้จ่ายในการใช้บริการทันตกรรม เปรียบเทียบในกลุ่มช่วงชั้นทางสังคม 2 กลุ่มในประเทศไทย กลุ่มตัวอย่างในการสำรวจประกอบด้วย ผู้ใหญ่ อายุระหว่าง 30-50 ปี จำนวน293 คน ที่อาศัยอยู่ในเขตเทศบาลคูคต จังหวัดปทุมธานี ใช้การสัมภาษณ์ข้อมูลการใช้บริการทางทันตกรรมและค่าใช้จ่ายในรอบปี พ.ศ.2542 รวมทั้งตัวแปรที่เกี่ยวข้องอื่น ๆ ร่วมกับการตรวจสุขภาพช่องปากตามแบบการสำรวจสุขภาพช่องปากขององค์การอนามัยโลก ใช้เกียรติภูมิอาชีพเป็นเกณฑ์ในการแบ่งกลุ่มช่วงชั้นทางสังคมเป็น 2 กลุ่ม กลุ่มช่วงชั้นทางสังคมสูง และต่ำ

ผลการศึกษาพบว่า กลุ่มช่วงชั้นทางสังคมสูงมีรายได้ต่อปี ระดับการศึกษาและมีหลักประกันสุขภาพ มากกว่ากลุ่มช่วงชั้นทางสังคมต่ำอย่างมีนัยสำคัญทางสถิติ พบความชุกของโรคฟันผุในช่วงชั้นทางสังคมต่ำและสูง 80.7% และ 94.3 % ตามลำดับ กลุ่มช่วงชั้นทางสังคมต่ำมีค่าดัชนีฟันผุถอนอุดเฉลี่ยต่ำกว่ากลุ่มช่วงชั้นทางสังคมสูง แต่เมื่อพิจารณาแยกดัชนี ผุ ถอน อุด ออกจากกันพบว่ากลุ่มช่วงชั้นทางสังคมต่ำมีผู้ที่ฟันผุที่ยังไม่อุดเฉลี่ย 1.7 ฟันถอน 2.8 และฟันที่อุดแล้ว1.3 ซี่ต่อคน ส่วนกลุ่มช่วงชั้นทางสังคมสูง พบผู้ที่มีฟันที่ยังไม่อุดเฉลี่ย0.7, ฟันถอน 2.2 และฟันที่อุดแล้ว 5.0 ซี่ ต่อคน สำหรับโรคปริทันต์อักเสบ พบว่ากลุ่มช่วงชั้นทางสังคมต่ำมีโรคปริทันต์รุนแรง (มีกระเป๋าปริทันต์) ชุกกว่ากลุ่มช่วงชั้นทางสังคมสูงอย่างมีนัยสำคัญ กลุ่มช่วงชั้นทางสังคมต่ำใช้บริการทันตกรรม เพียงร้อยละ 40.9 และบริการทันตกรรมเฉลี่ย 0.8 ครั้งต่อปี ในขณะที่กลุ่มช่วงชั้นทางสังคมสูง ใช้บริการทันตกรรมร้อยละ 73.0 , เฉลี่ย 1.7 ครั้งต่อปี เมื่อพิจารณาเฉพาะผู้ที่ไปใช้บริการทันตกรรมจำนวน 159 คนพบว่าสัดส่วนของค่าใช้จ่ายในการใช้บริการทันตกรรมต่อรายได้คิดเป็นร้อยละ 3.56 ในกลุ่มช่วงชั้นทางสังคมต่ำ ร้อยละ 0.88 ในกลุ่มช่วงชั้นทางสังคมสูงเมื่อคำนวนค่าใช้จ่ายในการใช้บริการทันตกรรมที่จ่ายจริง โดยหักส่วนที่สามารถเบิกคืนจากประกันสุขภาพแล้ว พบว่าความไม่เป็นธรรมในด้านค่าใช้จ่ายยังคงมีอยู่ กลุ่มช่วงชั้นทางสังคมต่ำยังคงมีค่าใช้จ่ายในการใช้บริการทันตกรรมต่อรายได้สูงกว่ากลุ่มช่วงชั้นทางสังคมสูง (ร้อยละ 2.51 และ 0.62 ตามลำดับ)

การศึกษานี้พบความไม่เท่าเทียมกันของภาวะสุขภาพช่องปาก กลุ่มช่วงชั้นทางสังคมต่ำมีฟันผุที่ยังไม่ได้อุดและมีโรคปริทันต์รุนแรงมากกว่ากลุ่มช่วงชั้นทางสังคมสูง และพบความไม่เท่าเทียมกันของการใช้บริการทันตกรรม โดยกลุ่มช่วงชั้นทางสังคมต่ำ ใช้บริการทันตกรรมน้อยกว่า สำหรับเรื่องค่าใช้จ่ยในการใช้บริการทันตกรรมมีความไม่เป็นธรรมเช่นกัน โดยกลุ่มช่วงชั้นทางสังคมต่ำจะต้องจ่ายค่ารักษาทันตกรรมเทียบต่อรายได้ในสัดส่วนสูงกว่ากลุ่มช่วงชั้นทางสังคมสูง ระบบประกันสุขภาพปัจจุบันไม่สามารถลดความไม่เป็นธรรมที่เกิดขึ้นได้ รัฐควรมีนโยบายในการใช้หลักประกันสุขภาพที่เหมาะสมเพื่อให้เกิดความเป็นธรรมในเรื่องสุขภาพช่องปากขึ้น

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CHAPTER I

INTRODUCTION

1.1Back ground

Health is one of the fundamental rights of every human being, without distinction of race, religion, political belief, and economic or social condition. World Health Organization meeting in the International Conference on Primary Health Care 1978, Alma-Alta, USSR announced to use primary health care as a strategy to achieve health for all by the year 2000 (WHO, 1978). Goal of health for all by the year 2000 was aim towards of the highest possible level of health for all citizens. However the gaps in health and health care among different social groups (socioeconomic status, gender, geographical location, ethic, religious, age, etc.) still exist throughout the world, in both developing and industrial countries (WHO, 1996). In 1995 The World Health Organization (WHO) and Swedish International Development Co-operation Agency (SIDA) first launched the concept of equity in health and health care. The goal of this WHO initiative was to promote and support practical policies and action to reduce avoidable social gaps in health and health care. Not only WHO's new policy Health for All in the 21st Century emphasized that health for all is equity but also equity is a core value of this new policy.

In Thailand the equity of health and health care were reflected from the new constitution of the Kingdom of Thailand in 1997. This constitution specifies that in the area of health care service, every citizen have equal rights to receive standard health service and the underprivileged group has rights to receive free treatment from public

health care. So government should be provide free or subsidized health care service for the poor and the underprivileged.

Oral health is one of the parts of health, so some of the welfare state as in Sweden, Japan; the goal of oral health care is that all citizens have an equal opportunity to receive oral health care to achieve the good oral health status. In Sweden, this goal is mentioned in the nation law (Tandverdslag, 1985:125 quoted in Unell, 1996:191).

There are a few studies about the gaps in oral health and oral health care among different social groups in Thailand, hence data about equity in oral health and oral health care between different socio-economic statuses is not available. The National Oral Health Survey focuses only on the oral health status and oral health utilization between different geographical regions, urban and rural area.

People who live in urban and rural area had different oral health status. Data from National Oral Health Survey in 1994 (Ministry of public health, 1995:16) shows the 35-44 years old in urban areas had more of dental caries and tooth loss than those in rural area. The people in urban area had dental caries 88.8% while 82.9% in rural area were affected. Tooth loss in urban area was higher- 4.6 teeth per person compared to 3.1 in rural area. Mean caries experiences was 7.9 teeth per person in urban and 5.6 in rural region. However periodontal disease were reverse. The severe periodontal disease (periodontal pockets) was present in 49.2% of those in urban area and 62.0% of those in a rural area. The interesting point was that the people in urban area were not a homogenous group hence which group of people in urban area had more dental disease.

Some of data from many countries showed the different of oral health status between the socio-economic groups. For example in United Kingdom, the latest national adult survey carried out in 1988 (Todd. and Lader, quoted in Watt, and Sheiham, 1998: 7) reported the oral health status that the percentage of tooth loss was different between 5 social classes. The higher social class (class I, II, III, NM) had tooth loss 14% while 32% of the lower social class (class IV, V) experienced tooth loss. The epidemiological study of the 35-75 years old in Oviedo, Spain showed different caries prevalence between the different social class groups (Alvarez-Arenal, et al 1996:17-20). The higher social class had decay, missing, and filling teeth (DMFT) of 7.6, the lower social class had DMFT 14.0.

For oral health care, National Oral Health Survey in 1994 (Ministry of public health, 1995:16) showed the different of oral health utilization between urban and rural area. The people in urban area used dental service more than rural area in each age group. The 35-44 years old people in urban area used dental service 61.8% compare to 38.8% in rural area. The type of service utilized also different. People in urban area had more fillings, scaling treatments and dentures than those in rural area. More people got dental extraction in the rural area than in the urban area. It is not clear from this data that which group of people in urban area can utilize oral health service.

Thailand health care system is based on entrepreneurial and permissive market intervention (Roemer,1991:95-97). This system does not prove accessibility of oral health care to all citizens. Hence the measurement of equity of oral health and oral health care is necessary. The degree of equity, the factors that influence the equity should be monitored in all underprivileged groups to change the policy option. The interesting point is the people in urban area are not homogenous group. What socio-

economic group in the urban are more dental disease than the other group? Case study in one urban area near Bangkok was conducted in this study.

1.2 Goal

The goal of this study was to determine equity in oral health in Kukot Municipality, Thailand.

1.3 Objective

1. To analyze equality in oral health status in term of dental caries, periodontal disease and prosthetic status.
2. To analyze equality in oral health utilization in term of number of visit dentist in last year.
3. To analyze equity in oral health care expenditure in term of oral health care expenditure per income in last year.

1.4 Research Question

Is there equity in oral health within the different social stratification group in urban, Kukot Municipality ?

1.5 Hypothesis

1. The higher social stratification group has better oral health status than the lower social stratification group.

2. The higher social stratification group use more oral health service than the lower social stratification group.
3. The higher social stratification group had proportion of oral health expenditure per income less than the lower social stratification.
4. Factors that influenced the oral health status and oral health utilization are perceived need of dental treatment, perceived disease severity and health insurance utilization.

1.6 Usefulness

1. To know oral health status and oral health utilization in the urban people with different social stratification group.
2. To know the proportion of oral health care expenditure per income of the different social stratification for social awarness and develop the suitable health care financial and health insurance system.
3. To constructed health policy to achieve equity in oral health care system

1.7 Operational Definition

1.7.1 Oral health status: Oral health status in this study was measure by a professional examination. Focus was mainly in dental caries experience, periodontal disease, tooth loss and prosthetic status using the WHO oral health survey criteria (1997). The detail of index is in the appendix.

1.7.2 Oral health utilization: The number of visits per person during the last year was use to measure oral health utilization. The period under evaluation was from March 1, 1999 to February 29, 2000

1.7.3 Social stratification: This study used occupational prestige to categorize the sample into two groups-the lower and the higher social stratification groups. If a person had more than one occupation then the occupation that corresponded to the larger time period was chosen. Criteria for classification was adapted from the study of social stratification in Thai society. (Chantavanich, 1991:157-60)

1.7.4 Equity in oral health: This study concern about equity in aspect of horizontal equity (Equality of oral health status and oral health utilization) and Vertical equity (The finance of oral health care is finance according to ability to pay). The 3 aspects in this study are

a. Equality in oral health status means the equality of dental caries, periodontal disease, and prosthetic status between the two social stratification groups.
b. Equality in oral health utilization means the equality of the frequency of dental treatment between the two social stratification groups.
c. Equity in oral health care expenditure mean the higher social stratification group have to pay proportion of oral health expenditure per income more than the lower social stratification group.

1.7.5 Oral health behavior:

a. Frequency of tooth brushing
b. Fluoride tooth paste usage
c. Dental floss usage
d. Snacking frequency

1.7.6 Personal Characteristic:

a. Predisposing factors; sex, education and social stratification

b. Enabling factors; income and health insurance

c. Perceived need of dental treatment

d. Satisfaction with oral health utilization

CHAPTER II

LITERATURE REVIEW

The topics were as follow.

2.1 Concept of Equity in Health and Health Care

2.1.1 Equity in libertarian concept

2.1.2 Equity in egalitarian concept

2.1.3 Equity in health economic concept

2.2 Concept of Social Stratification

2.3 Model of Health Utilization

2.3.1 The behavioral model of health service use

2.3.2 ICS II theoretical model

2.4 Literature Review

2.4.1 Equity in oral health status

2.4.2 Equity in oral health utilization

2.4.3 Equity in health expenditure

2.5 Conceptual Framework

2.1 Concept of Equity in Health.

Equity is an ethical concept that eludes precise definition. Synonyms are social justice or fairness, which certainly mean different things to different people at different time (Braveman, 1998: 2). Equity is not the same as equality; inequities are inequalities that are judged to be unfair.

Whitehead (1992: 431) explained the term of inequities that not all differences can be described as inequities. It refers to differences, which are unnecessary and avoidable, including conditions that are considered unfair and unjust.

World Health Organization (1996: 1) defined equity in health and health care as " equity mean that people's need, rather than their social privileges, guide the distribution of the opportunities for well-being. Social privileges is reflected by differences in socioeconomic status, gender, geographical location, ethnic/religious differences and age; other dimensions also can be very important". Pursuing equity in health and health care means try to reduce avoidable gaps in health status and health services between groups with different levels of social privilege.

In the Meeting on Policy-Oriented Monitoring of Equity in Health and Health Care at WHO headquarters in Geneva, 1997 agreed that health inequities exist when there are inequalities in health status, risk factors, or health service utilization between individuals or groups, that are unnecessary, avoidable and unfair.

Although equity will vary from country to country and from time to time depend on the ideological stance, the health economist tries to use some index to measure it (Kakwani, 1999: 2). The ideology of equity has been classified in three concepts: liberty, egalitarian, and health economic concept.

2.1.1 Equity in libertarian concept (Individualism)

Gillon (1968 quote in Wagstaff & Doorslaer, 1993a: 9) provided a summary of the various theories of social justice and health care. He explains the libertarians that respect for natural right, individual liberty and the right to life and to personal property.

In health care aspect, the individual should be responsible for his or her own illness and health care. The payment for health care depends on willingness to pay and ability to pay. This mean the rich can choose the high cost health care according to their satisfaction. Health care services seem to be the market goods not public goods.

The majority of health care providers in this concept are private providers. The government plays the minimal role in health care service system. The meaning of equity in health care is minimum standard for a poor people arranged by government hospitals. The United State of America is the country that uses liberty concept. Tobin (1970 quote in Wagstaff & Doorslaer, 1993a: 11) suggests that although American may, in principle, be concerned about inequality in access to health care, in practice the American health care system aims at bringing the health care received by the poor up to minimum standard rather than at promoting equality of access. There are two type of scheme; Medicare, for the elderly, and Medicaid, for the low-income woman, children, and disability persons.

In Thailand, the health system policy is the liberty. The role of private sector in providing and financing health care is increasing especially in the bubble economy. Government provides health care insurance for the underprivileged; Social Welfare Scheme- for poor, the elderly, disable, and children under 12 years old-, Health Care

Card Insurance- for the voluntary people. The schemes cover some type of treatment under the minimum health package.

Because of the health and medical care is a public and merit goods, not like the market goods (Keeranan, T.1997). So the liberty concept- such as free market, demand and supply concept- not suitable for equity in health. Health and medical care has special characteristic (Grand & Robinson, 1984: 14-15) such as uncertainly of demand, imperfect consumer information, supplier induce demand, and has externality.

2.1.2 Equity in egalitarian concept

These concepts compose of Utilitarian, Collectivism philosophy, Marxist and Rawlsian. All of these concepts emphasize the egalitarian.

Utilitarian emphasizes total welfare (maximizing the sum of individual utilities or welfare) with a just aggregation rule, such as that everyone should count for one and nobody more than one. The resource should be distribution according to utilitarian for maximum of total utility. Marginal utility is concern. For example, the marginal utility of medical treatment for the poor is more than the rich. Because of this adding resource that distributed to the poor will improve a lot of their health than the rich. The argument in this concept is to overlook human rights and individual freedom.

Collectivism philosophy (Titmus, 1974 quote in Heloe, 1988: 65-7) said that health is public or social responsibility. People have a duty to pay health premium and tax depending on ability to pay. The government supports medical and social service for all people. All resources should be collected to the government. The weak point of the philosophy is low efficiency, low motivation force for health care worker, poor quality of service, and lack of health providers.

Marxists emphasize the meeting of need. The resource should be distribution according to need. And when allied with 'from each according to his ability', it is held to be a strong egalitarian position. In this concept, the men who need more should be receiving more and the man who rich should pay more too.

Rawlsian emphasizes the position of the least well off, and holds that inequalities are unjust unless they work to the advantage of the least well off. This principle tries to improve the quality of life among the least well off as much as possible. Mc Clellad (1991: 9) comments the Rawlsian concept is interesting only the least well off (20% of population). The resource distribution for the 80% of population is out of focusing. This concept is difference from utilitarian that interesting all people utility.

Welfare countries, such as Germany, Canada, Japan, use the egalitarian concept. Health care is distributed according to 'need' and financed according to 'ability to pay'. In practice, in most countries, health care is financed and delivered by a mixture of system, liberty and egalitarian concept.

2.1.3 Equity in health economic concept

The economic concept starts from the resource is limited and that human need is unlimited, so the distribution of resource should be arranged for maximum benefits. Not everyone can have all the health care they want or need, because of the limited resource (Mooney, 1983 quote in McClelland, 1991: 5). Williams (1993: 287) said that the limited health care resource should be distributed in efficiency and equity. Efficiency means the excess of output benefit over the cost or the maximum benefit that is gained from the input resource. And equity means how to distribute resource

that fairness, especially to the poor and lack of opportunity people. Because of equity is the opposite side of efficiency, so the relationship between efficiency and equity should be adjusted in balance point behalf of the agreement value. However there are few of health economic concept that interested only efficiency and ignore equity.

Mooney (1986 quote in Pannarunothai, 1999) classified the meaning of equity in health in 7 items. (1) Equality of expenditure per capita. (2) Equality of inputs per capita. (3) Equality of inputs for equal need. (4) Equality of access for equal need. (5) Equality of utilization for equal need. (6) Equality of marginal need. (7) Equality of health. In the item 3-5 there are compare equal thing with equal need that conform of horizontal equity in Culyer classification.

Culyer (1993: 305). categorizes equity in two types. Horizontal equity requires the equal treatment of equals; vertical equity requires the unequal treatment of unequal. There are some details of horizontal and vertical equity that consider in relation to health are (1) The initial or presenting state of health, (2) The need for health care, and (3) The final health state or the state of health after receiving health care. The details are showed by the following assertions:

Horizontal level 1 is persons having the same presenting state of health should be treated equally. Horizontal level 2 is persons having the same need for health should be treated equally. Horizontal level 3 is persons having the same expected final health state should be treated equally.

The Vertical levels are: Verticals level 1: Persons having a worse presenting state of health should be treated relatively favorably. Verticals level 2: Persons having a greater need for health should be treated relatively favorably. Verticals level 3: Persons having a worse expected final health state should be treat relatively favorably.

Wagstaff & Doorslaer (1993a: 15-18), health economist, interested equity in two points: equity in the finance of health care and equity in the delivery of health care. The finance of health care is finance according to ability to pay. The term of 'ability to pay' can be interpreted two ways: vertical equity and horizontal equity. Vertical equity is the persons or family has unequal ability to pay dissimilar payment for health care be required. Horizontal equity was that the persons or family has the same ability to pay the contribution is the same. The method of this equity is progressive tax system. The rich pay a larger proportion of their income on health care than the poor.

Equity in the delivery of health care is distributed according to need. It can be interpreted in terms of vertical equity and horizontal equity. In vertical equity, the requirement that persons have unequal need received the treatments in an appropriately dissimilar way. Horizontal equity was that persons have equal need receive the treatment equally.

Health economic concept in equity is different from egalitarian concept in two points. First they do not emphasize to make all people equally but want the fairness in the society and try to reduce unnecessary and an avoidable gap, while the egalitarian concept wants all people equally. Second egalitarian concept interesting the equity and ignore the efficiency, while health economist try to balance the efficiency and equity.

In this study, the researcher uses the health economist concept to measure some dimension of equity in oral health. First is 'equality in oral health status' that refers to the attainment by all people of the highest possible level of oral health status. Oral health status in this study specific in dental diseases measurement by professional, not include the oral health- related quality of life that measurement by people perceived.

Second is 'equality of oral health utilization'. Usually in the medical health, equity in health service should be measures in terms of 'Equality of utilization for equal need'. But in this study equality in oral health utilization cannot compare with equal need. The reason is natural of dental treatment need is different from health need and the limited of study design. The needs of dental treatment in this study are measured in professional judgments (normative need) and patient judgment (perceived need). Many studies show that lay people tended to perceive less oral health problems than assessment by dentist (Adulyanon, 1998: 5). In dentistry field, most of dental diseases are chronic disease and the symptom is irregular, some time absent and sometime present. Normative need show accumulate of all dental diseases in the mouth. In epidemiological data of Thai people show almost every one need at least one dental treatment. Cross-sectional study is limited to compare the treatment and the need. Normative need in oral health examination and perceived need in questionnaire survey are a present need, but dental treatment is in the past that treatment occurred and the result of treatment remain in the mouth. For example, one person has 3 decay teeth and 5 filled teeth. That mean he need 3 teeth dental treatment and he received the treatment in the past 5 teeth already. The other person has 3 decay teeth and no filled teeth. These two persons have same normative need, but treatment that they should received according to their need is in the future, not the past treatment.

The last is 'Equity in oral health expenditure'. The term of 'health care expenditure' is financing from taxation, social insurance contribution, private insurance premium, and out-of-pocket payment (Doorslaer &Wagstaff, 1993: 20). In this study, oral health care expenditure is out-of –pocket dental payment only.

2.2 Concept of Social Stratification

Social stratification can be defined as the arrangement of the members of a group or society into hierarchically ordered levels. Social stratification, in sociology, refers to the existence of inequalities between groups on the basis of wealth, power, race, income, age, prestige or some other characteristic. People in the same social stratification usually have the same lifestyle, belief, attitude and interest (Kumthornvaccha, 1994: 29) They share a similar style of life and social habits, which distinguish them from members of other social groups above and below them in hierarchy.

Societal systems of stratification take three forms: caste systems, estate systems, and social class systems. The caste system is a system of stratification in which the strata are sharply separated from one another and membership is ascriptive by birth. Caste boundaries are rigid, and there is virtually no mobility between castes. Members are born into particular castes and remain there all their lives.

In an estate system of stratification, strata are clearly distinguished from one another and membership is primary described by birth, but the boundaries are not as rigid as those dividing caste. The estate system is characteristic of feudal society.

The social class systems achieved status assumes greater importance than in a caste or estate system. A social class system is a system of stratification in which strata are differentiated on the basic of socio-economic conditions –that is, access to resource and style of life- rather than on the basic of law or custom. This arrangement may be based on a number of different but commonly interrelated criteria including wealth, occupation, education, power, and prestige (Theodorson & Theodorson, 1990: 229). The boundaries between social classes are much less clear-cut than in the case of

caste and estates. Mobility from one class to another is not prohibited as in a caste system and much more common than in a caste system.

Many theories of social stratification were developed from the mid-nineteenth century. The famous theories are Marxist Conflict Theory, Weber Social Action Theory, and Davis and Moore Functional Theory.

In Marxist Conflict Theory defines social classes in term of relationship of the classes to the mean of production. At that time the industrial revolution brought about massive change in social order. Two classes emerged in this period-the bourgeoisie (capitalists) and the proletariat (worker). Those who own factories, farms, coalmines, raw material, etc., become as the bourgeoisie. The workers who do not own the means of production are the proletarian. Factory owners exploited their workers in order to increase profits. There was an obvious and unfair split in society. Marx believed that the conflict of both social class result in a revolution of the proletariats and all mean of production would fall into public ownership. In Marx viewed economics as the independent variable, causing social stratification system. One's position to the mean of production determines his/her social class.

A later theorist, Max Weber, was influenced by Marx's work but disagreed with his theory; he thought it was too deterministic. Marx, a structuralist, believed that people were shaped by the society in which they lived. Weber, a social action theorist, believed that individuals create society by action and interaction. Marx based his view of class structure on ownership of the means of production while Weber believed it was dependant on "life chances". Life chances depended on wealth and skills; the upper class had the most advantageous life chances, and the poor (e.g. the unemployed, elderly and homeless), the least. Economic order (wealth), social order (Prestige), and

political order (Power) could determine class. Economic order composes of economic power, owner of property, and the role of production. Social order composes of prestige, reputation, honor, the special rights and social status. Political order consider with the political power, power of making decision in society. While Marx split society into two distinct classes; Weber saw that social structure was more complex. The four main strata he identified were the upper class, the middle class, the working class and the poor. Higher social class status is associated with many life-chance advantages, including greater success in school, higher self-esteem in early adolescence, less violence in the home, long life expectancy and better health (Theodorson & Theodorson, 1990: 224).

The functionalist takes the view that social stratification is both essential to the running of society and inevitable. They believe that all social phenomena exist because they have a positive function to fulfill. They described society as a living organism in which different organs with specific functions (e.g. education, work, and government) are inter-related.

Davis and Moore, functionalist sociologists, believe that society is a meritocracy- everyone has fair chance, not everyone has the same abilities or potentials, and the person get what he/she deserve. This means that people are motivated to perform tasks by the promise of a reward. The social stratification is good as inequality drives people to better themselves. Some are more importance to society than other. In addition, some positions require greater talent or training than other. Greater rewards have to be attached to the more important and more difficult positions to make sure that they are filled.

All of societies have social hierarchy, based on the possession of different qualities in different communities, and some societies are more equal than others, but none can over be completely un-stratified as there will always be inequalities due to individual difference. The sociologists use different criteria to classify social class. The most common are income, occupation, and education.

Income as an index of social stratification that has the advantage of being relatively clear-cut, readily subject to quantitative analysis, and fairly easy to ascertain compared with other measures of social stratification. The disadvantage of income index, especially in the developing countries and informal sector worker society, is hidden or unreported income, and income cannot represent the lifestyle of the same social stratification.

Education level index rarely used alone as a measure of social stratification but is commonly used in conjunction with other measure. Quite frequently, income, occupation, and education level are combined in socioeconomic index (SEI).

Occupation can be represented in two dimensions. First is dimension of economic such as salary, income, and wage. The other is dimension of status in society or occupational prestige that show the power, status, and dignity. An Ocupational hierarchy is one of the most popular criteria as a determinant of one's location in the stratification system. Occupation is the index that insert between income and education (Duncan, 1961 Quote in Chantavanich, 1998: 1).

In the United Kingdom, the social class was begun in the 1911 census with occupation index (Jacob & Plamping, 1989: 148-9). The Registrar General's classification has grouped occupations into five broad categories. First social class is Professional: accountant, chemist, dentist, lawyer, university teacher, etc. Second is

Intermediate- managerial and lower professional- engineer, farmer, manager, member of parliament, nurse, pilot, school teacher, etc. The third is skills, non-manual skilled, manual- clerical worker, drafter, secretary, shop assistant, bus driver, cook, electrician, etc. The fourth is partly skilled –bartender, bus conductor, machine operator, postal worker, etc. The last is unskilled- laborer, messenger, office cleaner, railway porter, etc.

In Thailand, There are a few studies about social stratification and do not have a national social stratification. Some study use occupational, type of employment, size of company business, position in company, and education to measure the social stratification (Chansen, 1989: 42). And some study(Areeratana, 1986: 16) classified social class with both subjective method (people self evaluation) and objective method (use occupation, income, education, number and type of belonging, and member of social group criteria).

There is one study investigated occupation to rank the prestige in Thailand (Chantavanich, 1991: 157-160). This study used the prestige score based on data collection of subjective evaluation of occupations people have given through questionnaire survey. There were 728 samples in 11 provinces in Thailand. These samples were asked to rank 89 occupations according to their esteemed prestige. The 89 occupations were grouped into 9 categories. The research finding revealed that 4 social stratifications was observed by scatter plot. The highest prestige score groups were given to occupations in professional and academic technical worker (medical doctor group, nurse, university teacher, engineer, architecture, lawyer, commission of police and arm force, etc.), and executive administrator (Member of Parliament, minister, etc.)

Occupations at the top levels in office and clerical work (accountant, civil servant, business man, etc.), sale work (shop owner, manager, assistant manager), and service work (hotel manager, bar manager, etc.) ranked second. Other occupation at the lower levels in the clerical work (bus conductor, postman, reception, etc.), sale work (grocer, retail dealer, hawker, etc.), service work (house maid, barber, guard, cooker, etc.), and arm force and police officers plus occupation in agricultural work and labor work received moderate and low prestige.

In this study, social stratification is used modification criteria from the study of Chantavanich (1991: 158-161). And adjust in two social stratifications: higher social stratification and lower social stratification. Income is not suitable to use in Thai society because of the people usually under-reported income or unreal income.

Criteria for social stratification in this study are

1. Civil servant groups (a civil servant, the state enterprise, a police, a soldier) were used the position classification to categorized.
    a. C4-C11 were the higher social stratification,
    b. C1-C3, temporary and permanent employee were the lower social stratification.

    The position classifications are the merit system of government officer reflects on high position and high work responsibility. At first time it depend on the education level and then depend on the work performance. The salary is pay follow the position, high position high salary.
2. All profession groups (a medical doctor, a dentist, a pharmacist, a nurse, a architecture, an engineer, a lawyer, judge, a public prosecutor) were the higher

social stratification. Because professional are ranked in high occupation prestige.

3. Lecturer and teacher in school, collage, or university were the higher social stratification.
4. The shop owner in every type of business including a hawker owner and a vendor's stand owner were used the present of employee to categorize.
    a. Shop owner that had an employee were the higher social stratification.
    b. Shop owner that did not have any employee or used only family labors were the lower social stratification.

    These criteria assumed that the shop owner with an employee is working in manager and administrative work.
5. The employee groups that used the authority and type of work to categorize.
    a. Administration work and had the subordinate (an executive, a manager, the head of division, a supervisor) were the higher social stratification.
    b. Operation work and did not have the subordinate (an official, a clerk, a guard, a laborer, etc) were the lower social stratification.
6. The farmer that an owner of the land were used to categorize.
    a. Farmer that had they own land were the higher social stratification.
    b. Farmer that did not have the ownership of they land were the lower social stratification.
7. All uncertainly job worker (daily laborer, a motorcycle rider to sent the passenger, etc.) were the lower social stratification.

2.3 Model of Health Utilization

2.3.1 The behavioral model of health service use (Andersen, 1995: 1-10)

This model was developed and modified more than 50 years. This model was initially developed in the late 1960s to assist the understanding of why families use health service. As that time, the relationships between 3 variables were simple. It suggests that people's use of health service is a function of their predisposition to use service, factors which enable or impede use, and their need of care. (1) Predisposing characteristics was demographic, social structure (to determine the status of person in the community that include education, occupation, and ethnicity), and health beliefs (attitude, value, and knowledge). (2) Enabling resources was personal, families and community resources. Health personnel and facilities must be available where people live and work. Then, people must have the mean and know-how to get to those services. Income, health insurance, a regular source of care, and travel and waiting times are important variable too. (3) Need for dental service in this model was perceived need and evaluated need. The perceived need will explain the care-seeking behavior, while evaluated need will be more closely related to the kind and amount of treatment.

Phase2-the model of the 1970s- was developed and added health care system and consumer satisfaction in this model. National health policy, the resources, and their organization in the health care system are important to determine population's use of service. Consumers satisfactions are compose of convenience, availability, financing, provider characteristics, and quality of health services.

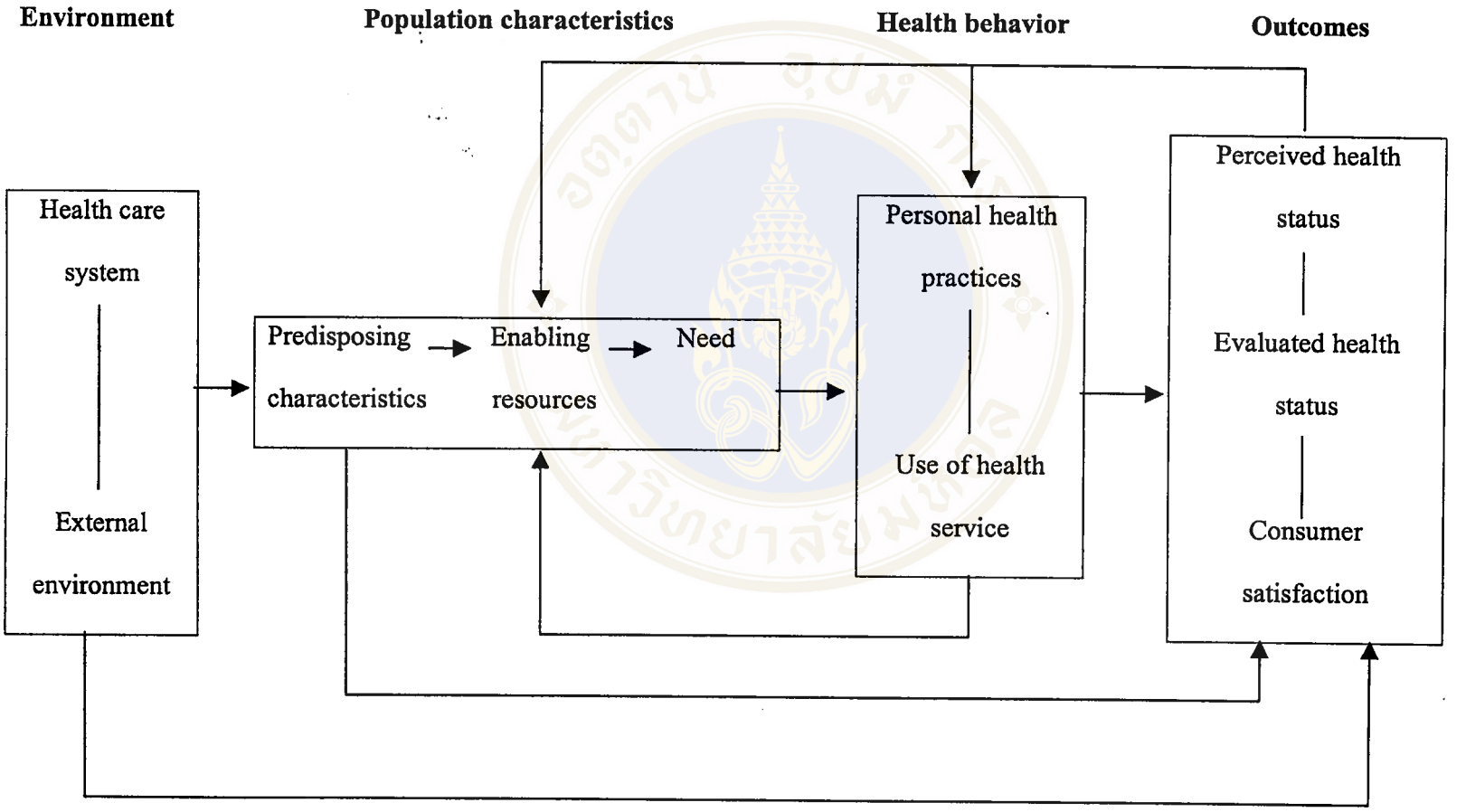


Figure.1 The behavioral model of health service use of Andersen

The model in Phase3 and 4 was more complicate and dynamic. There were feedback loops in many variables. A emerging model in 1990s was show 4 major variables, environment, population characteristics, health behavior, and outcomes. Environments were health care system and external environment. Population characteristics were predisposing characteristic, enabling resource, and need. Health behaviors were personal health practice and use of health services. Outcomes were perceived health status, evaluated health status, and consumer satisfaction. He said that implementation of this model requires more creative and challenging conceptualization; longitudinal and experimental study designs, and innovative types of statistical analyses.

However, this model was more carefully when use to explain oral health utilization. Because of dental service are less serious problems when compare with other hospital services. Therefore dental services should be explained by social structure, beliefs, and enabling factors than dental need.

Reisine (1987: 120) studied oral health utilization in staff of university by Andersen model. He analyzed with a path analysis of oral health utilization. The hypothesis were predisposing and enable resource had a direct effect on oral health utilization and had indirect effect to oral health utilization by dental need. From the study found that only the sex variable was effect on oral health utilization. Female used dental services more frequency than male. The other study found the opposite results of this study. Tennstedt, et al (1994: 211) studied oral health utilization in elderly people in United Kingdom. The factors in Andersen Model that effect the oral health utilization was perceive treatment need and attitude toward dental care.

2.3.2. ICS II theoretical model (Chen, et al., 1997: 8-10)

This model was used in the second international collaborative study on oral health care system (ICS II) in 1997. This model is derived from an integration of existing oral health behavior and oral health status models and general health models of Andersen (1976) and Blum (1973). Oral health outcomes in this model are composing of oral health behavior, oral health status, and oral quality of life. As indicate in Figure2, the factors affecting the oral health outcomes of an individual can be categorized at two levels, the individual and the system.

The ICS II model postulates that an individual's oral health behavior (including oral hygiene practices and oral health service utilization), as the intermediate outcome variable, is affected by his or her predisposing and enabling characteristics. In the other words, characteristics such as sex, education, occupation and health beliefs "predispose" an individual to engage or not engage in certain health behavior, while enabling variables, such as income, having or not having a usual source of oral health care, residence and family size, represent conditions that might facilitate or impede the individual's practice of such behavior. Furthermore, these personal characteristics are influenced by system-level variable – socio-environmental characteristics and the oral health care system. This study was done in Germany, Japan, New Zealand, Poland, and USA that the oral health systems, political, social, and economic are very different.

In this thesis study, oral health utilization concept was adapted from Andersen and ICS II model.

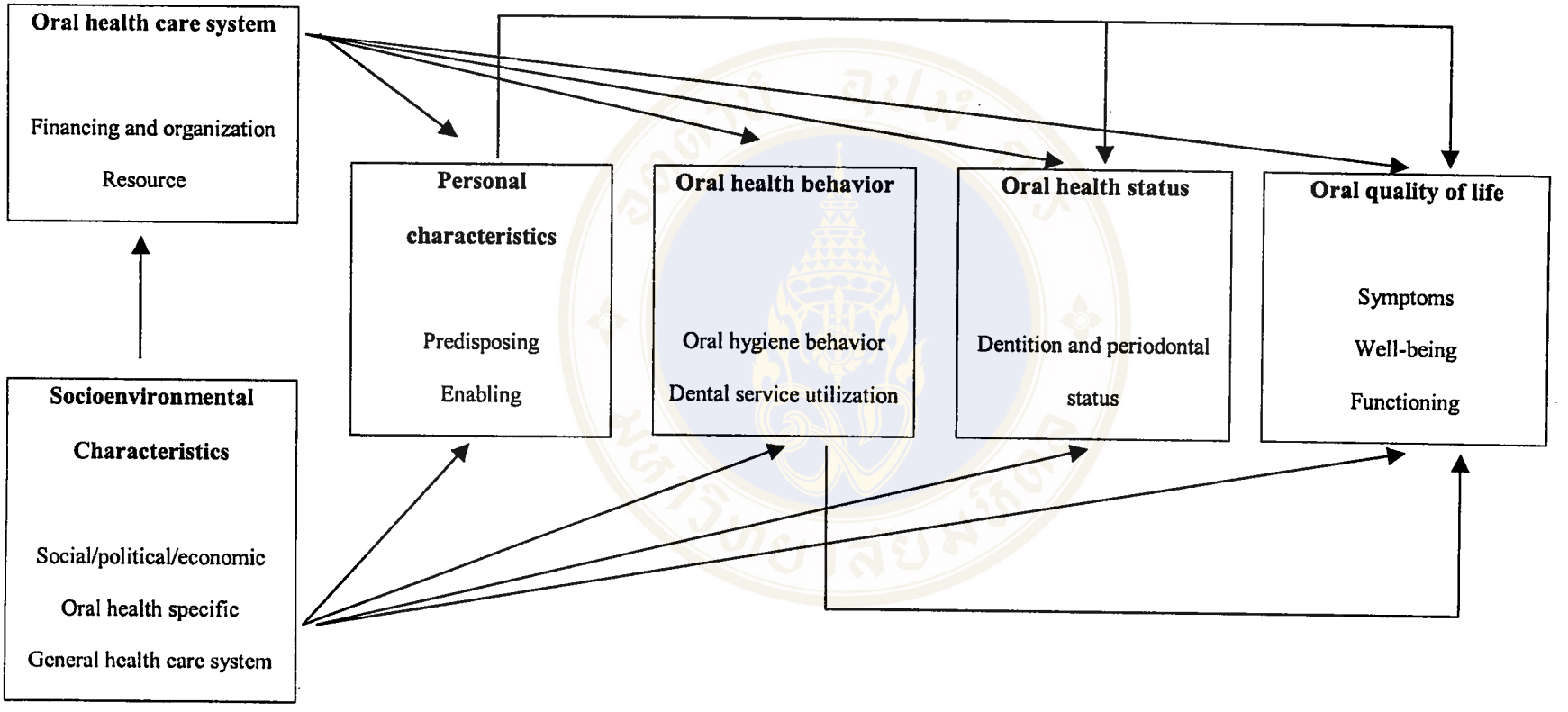


Figure.2 ICS II Theoretical model

2.4 Related Literature Review of Equity in Oral Health

2.4.1 Equality in oral health status

There were several studies in equality in oral health status. Usually the oral health status were measured in dental caries status and periodontal status.

For equality in dental caries status, there were many indexes were used depend on the researcher. In United Kingdom, the caries experience (decay missing and filling teeth) was not different in difference social class by Registrar General's classification (Dumer, et al., 1990: 37-48). Watt & Sheiham (1998: 7) found the same results but they found the percentage and number of tooth loss comparative with difference social class were a big difference. The high social class had tooth loss 14 % while the low social class had tooth loss 32 %. Numbers of tooth loss in high and social class were 7.2 teeth and 8.6 teeth, respectively.

The other study found the social class effected dental caries experience. Alvarez-Arenal, et al. (1996: 8) studied equality in dental caries in Oviedo, Spain by use the United Kingdom Registrar General's classification. The has grouped occupations into five broad categories. The dental caries experience in the high social class was 7.6, middle class was 10.0 and low class was 14 teeth per person. No difference found in decay and filling teeth but there were great difference in missing teeth in each social class. The low class had missing teeth 9.3 while the high class had only 4.2 teeth per person. This data showed the low social class had more dental caries and the major of the treatment was extraction the teeth.

Schwarz, 1985 (quote in Petersen, 1990: 154-5) studied in the labor worker in the factory in Denmark174 persons, age between 45 to 54 year old. The unskilled workers had dental caries experience more than the staff members and skilled workers.

Future more, the percentage of filling treatment in the unskilled workers is lower than the staff members.

Some studies in Denmark used the percentage of no teeth left to measure the equality of oral health status (Petersen, 1983: 162-8, Hansen, 1989 quote in Petersen, 1990: 153-4). These study used The Danish National Institute of Social Research for social classification. For the 35-44 years old people, the highest social positions (Upper-level salaried employees and large business self-employed) had no teeth left 1-12% while the lowest position (unskilled manual workers) had no teeth left 24-52%.

The study in young population in Auckland, New Zealand showed significant correlation between dental health of children and their social class (Colquhoun, 1985: 37). This study used a basic of average incomes, with weighting for occupations. The children in highest social class (Social rank 1) need filling treatment for dental caries only 25%, while children in lowest social class (Social rank 5) need 79%. He conclude that treatment need level were related to social class factors rather than to the presence or absence of water fluoridation. The reason was the wide spread of fluoride toothpaste usages.

Most of study found the relationship between social class and dental caries experience. The dental caries is multi-factorial disease. Therefore social class could explain dental caries at difference levels.

For the periodontal disease, Watt & Sheiham (1998: 7) reported the less severity of periodontal disease in the high education level people, urban residence, and female. The low education man, rural residence, and male were getting more severe periodontal disease. Schwarz (1985 quote in Petersen, 1990: 153-4) found the 45-55 years-old un-skilled workers in factory had periodontal pocket (severe type of

periodontal disease) 43%. The staff and skilled worker had only 18% of periodontal pocket.

2.4.2 Equality in oral health utilization

There were many studies about the oral health utilization in difference socio-economic group. Most of the studies showed inequality of oral health utilization. The National Center for Health Statistic of United State of American was reported in 1988 about the first dental visit (Theodorson & Theodorson, 1990: 226). The family which had income lower than 10,000 Dollar per year; only 37% of their 5-8 years old children had been visited dentists before 5 years old. But in the more 35,000 Dollar per year family, 70% of their children met the dentist before 5 years old. That showed the different of accessibility and utilization.

The same result in adult group was reported by Watt & Sheiham (1998: 8) in United kingdom. The high social class received the filling treatment 39 %, while only 18% in low social class. The both group had the same dental caries experience. In Sweden the elderly people had been studies. Unell, et al. (1996: 191-5) studied about socio-economic variable and oral health utilization of the people over 50 year old. The high socio-economic had been utilized several type of dental service more frequency than low socio-economic, but it was significant only in male.

There were few studies that showed the opposite results. Honkala, et al. (1997: 385-90) reported study of 56,605 teenagers in Finland between 1977-1995. He classified the group of teenager by the occupation of parent as an upper white-collar worker, lower white-collar worker, blue-collar worker, and farmer and classified by parent education level. There was no different of oral health utilization in those groups.

He explained that it was because of the free-charge treatment policy for the person under 17 years old or from the increasing of the government health center. The conclusion of his study was Finland had equality in oral health utilization.

In Thailand, there were no studies about the socio-economic status and oral health utilization. The data from National Oral Health Survey, 1995 showed only the different of oral health utilization between urban and rural area. The 17-19 years old people in urban area had been received dental treatment 51.5%, while 35.2% in rural area. The same result showed in 35-44 years old people. The people in urban and rural area used the dental service 61.9%, and 38.8%, respectively (The 4th Thailand national oral health survey, 1996 : 46).

2.4.3 Equity in health expenditure

Equity in health expenditure in the meaning of vertical equity is the persons or family has unequal ability to pay dissimilar payment for health care is required. The method of this equity is progressive tax system. The rich pay a larger proportion of their income on health care than the poor. In United Kingdom in 1990, poor families with the weekly income below 80 Pound spent 1.3% of their income on health care, while the richest group who had weekly income more than 650 Pound spent 4.3%. (Central Statistical Office, 1991 quote in Pannarunothai & Mill, 1997: 1781-9) This showed the progressive pattern of health care. The tax system was progressive rate and rich people have to pay more money.

In Singapore and some developing countries reported the average per capita expenditure by income quintile that richer groups spending more than poorer group (Department of Statistics, Singapore, 1990 quote in Pannarunothai & Mill, 1997:

1781-9). In Japan for the employee, they pay the health insurance tax about 8-9 % of their salary every month. The self-employed and farmer pay the health insurance tax by ability to pay (Japan Ministry of health, labour and welfare, 1998-1999).

The equity pattern of payment for health care is contrast in Thailand. The tax system is regressive and people pay the cost of health care direct by out-of-pocket. Pannarunothai & Mill (1997: 1781-9) studied the equity of out-of –pocket expenditure for health services in Phitsanulok Province, Thailand. The poorest income quintile had high annual health expenditure relative to income (21.2%), while the richest income quintile had lowest (2.1%).

2.5 Conceptual Framework

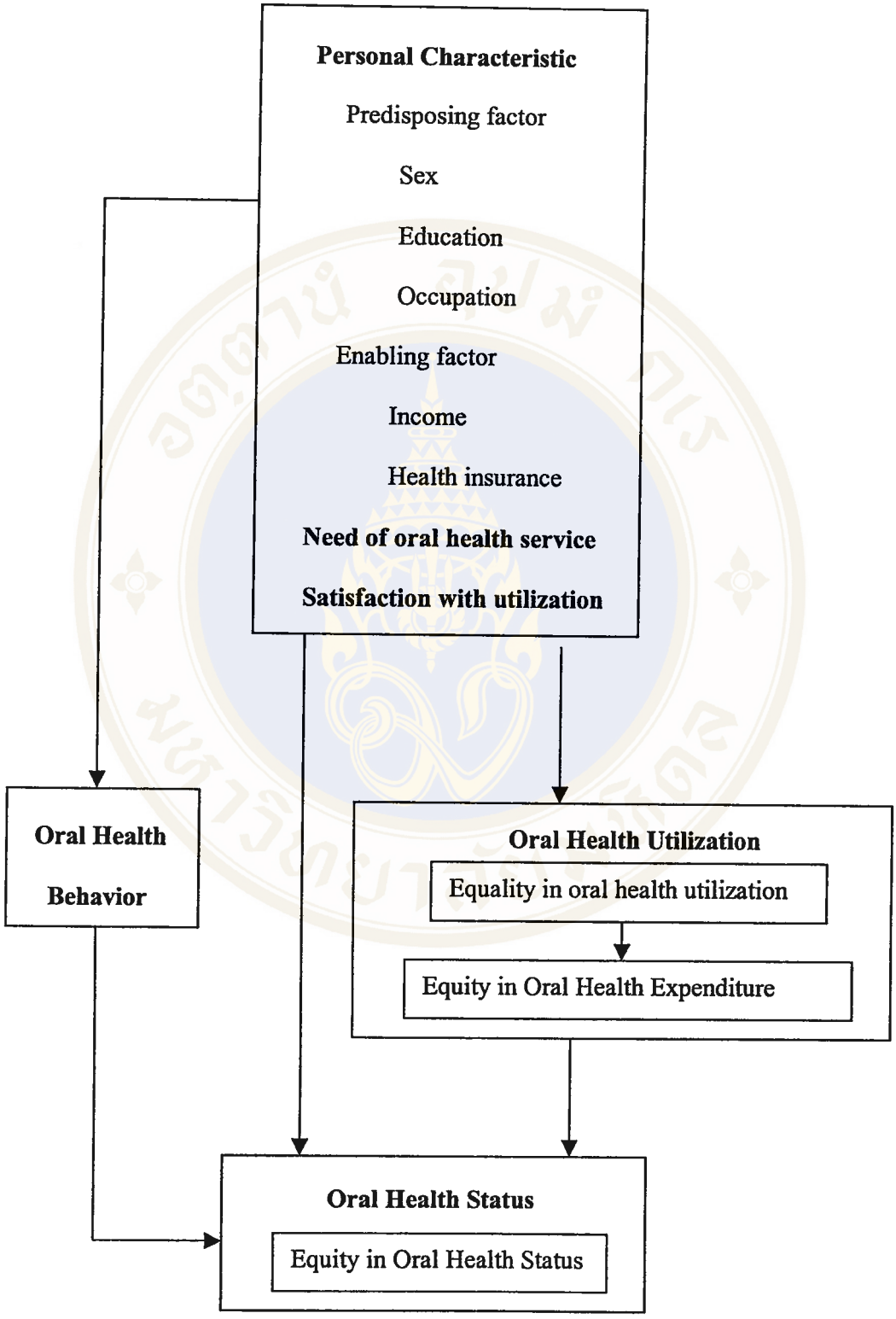
The concept of this study was measurement and comparative of oral health status, oral health service utilization, and out- of pocket oral health expenditure between two social stratifications. The health service model of Andersen and ICS II model were adopted.

Systemic level variable-, financing, organization, and resource of oral health care system, social, political, economic system, general health system- was not considered in this study. Because of that variable is the static variable in the time of study conducted in Thailand.

The individual people had each personal characteristic (sex, education, occupation, income, health insurance), need of oral health service, and satisfaction of utilization. These factors take direct effect on oral health behavior, oral health utilization, and oral health status. Furthermore these factors take indirect effect to the oral health status by the channel of oral health behavior and oral health utilization.

Oral health behavior and oral health utilization are intermediate variable for oral health status.

In oral health utilization variable, when compare between two social stratification the result are equality of oral health utilization and equity of oral health expenditure. In the same way, equality of oral health status is the oral health status variable compare between two social groups.



CHAPTER III

METHODOLOGY

This study was a cross-sectional analytic research. The structural questionnaire and oral health examination were use to collect quantitative data. Unit of analysis was individual level.

3.1 Population and Samples

This researcher selected the area that in urban area and people had various occupation by purposive selective. Populations in this study lived in part of the Kukot Municipality. This part was responsibility by Kukot Health Center (Wat Prayoondrammarama), Lummlooka District, Pratumtani Province. This area is adjacent with Donmuang District, Bangkok, Thailand. There were big market, department stores, banks, dormitory, modern real estate, government hospital, private clinic and dental clinics. Dental service providers near this area are 3 private dental clinics and 3 government hospitals. The physical accessibility of dental health service was not a problem in this area.

Population was focus in adult 30-50 years old people, exclude the disability people, who lived in this place more than one year. The reason was elderly, adult and children had different pattern of oral diseases. In addition the children received oral health program in school and had social welfare scheme for basic dental treatment. The elderly were exclude in this study because of they may acquire social welfare scheme and have different types of oral diseases.

According to Urban survey project (1999:9) the total populations in this sub-district were 8,498 persons and 3,245 households in April 30, 1999. The sub-district divides into 4 villages (village number 13, 14, 15, 16). The "village" in this study is divided by administration of Ministry of Interior, not according to actual natural socio-culture village. Actual number of household that people live was 2,262 households.

Sample size was calculated from estimation of prevalence of dental caries and percentage of oral health utilization. And choose the larger sample size. The estimate of dental caries was 88.8% (from the prevalence of dental caries in 35-44 years old in urban area Thailand, 1994), confidential interval at 95%, and deviation determines at 5%. The formula was from Robinson L, Neutons, J.J., 1987. Sample size was 114 from the calculation.

In the other hand, the percentage of oral health utilization was 61.9 (from the percentage of oral health utilization in 35-44 year old in urban area Thailand,1994) The sample size from this calculation was 253. The larger sample size was used, in this study use 300 sample size.

$$N = Z^2P(1-P)/d^2$$

N = sample size

Z = confidential interval 95% = 1.64

Case 1,P = probability of dental caries = 0.88

Case2, P = probability of oral health utilization = 0.62

d = deviation determines at 4% =0.05

Sample of this study were selected from this sub-district by systematic random sampling. Survey of house map of this area was use to selected household. The household in this area can categorize in 4 types for 4-area parts, commercial buildings, residence house, modern real estate, and dormitories or apartments for the labors. First

were commercial buildings beside Phahonlayothin road, Muangake road and Talad Sri Mum Muang road. Second were residence house beside Wichaeng alley, Wat Prayoondrammarama alley, Rompootong alley. Third were 4 modern real estate communities Sriwalee village, Pathana village, Soomboon village and Narongkit village. The last were dormitories and apartments for the labors. These categorizes done by the difference of natural social household. The people who live in the modern real estate were also different in size of the house, car, and belonging between each real estate but it take very difference when compare with the labor in dormitory and apartment. The worker in commercial building were shop owner or employee, while in residence house were various of occupation.

The map of this area is in the appendix. Sample sizes were 300 samples. Random for the beginning household and then use every 7th household by right turn and outside to inside. From each household, the interview and oral examination was taken with everyone who was 30-50 years old.

3.2 Materials

This study use oral health examination and structure interview questionnaire.

3.2.1 Oral health examination

Oral health examination criteria were adapted from the 4th World Health Organization oral health survey form, 1997. Mouth mirror and WHO periodontal probe were used to detect dental caries and periodontal disease. The examiners were two dentists and calibration examiners before fieldwork.

3.2.1.1 Calibration examiners

This study used two dentist examiners. The calibration was doing before real examinations. The dentists read the WHO criteria carefully and exam 5 adult people to set the agreement of examination.

3.2.1.2 Validity and reliability of dental examination

The validity of dental examinations was doing in 10 adult people. The expert from Dental Public Health Division, Ministry of Public Health was checking the validity.

The reliability of dental examination was consistency of measurement or repeating examination. Two dentists examined 20 people twice. The second time was 3 hours later. The kappa test used to detect reliability dental caries. This reliability was doing both intra-examiners and inter-examiners. . If the kappa test is more than 0.8, it means good agreement and 0.6-0.8 is substantial agreement.

The kappa statistic test for intra-examiners (two examiner) was 0.69. The inter-examiners were 0.89 in first examiner and 0.72 in second examiner.

3.2.2 Questionnaire form

This study used structural questionnaire form. The questionnaire had 3 parts, general information, oral health behavior and oral health utilization. This study used 2 interviewer and 2 recorders.

3.2.2.1 General information part

The content of this part consist of

a. Age in year: use the last birthday to count in full ages

b. Sex: male or female

c. Education: categorized in 3 levels of highest education, primary school or lower (0-6 years study), secondary school (7-12 years study) and undergraduate level or more (more than 12 years study).

d. Religions: Buddhist, Christian, Muslim and other.

e. Years of resident: Number of years living in this area.

f. Hometown: 5 regions of Thailand, Bangkok and Pratumtani Province.

g. Occupations: used occupational prestige criteria to classification in 2 social stratifications. (see appendix)

h. Income per month: use Baht

i. Health insurance: yes or no. If yes choose type of health insurance, Civil Servant Medical Benefit Scheme, private company, social security, Health Card Insurance, Private Insurance, Social welfare Scheme and other.

3.2.2.2 Oral health behavior

This part was focus on the oral health behavior that influences the dental caries and periodontal disease only. The questions were following.

a. Oral self-cleaning: used mouth rinsing, dental flossing, and toothpick frequency of tooth brushing and time of brushing.

b. Tooth paste: with or without fluoride

c. Sweet snack food: frequency of eating and drinking liquid, solid and slow releasing sweet snack food.

d. Sign and symptom of oral problem: sensitivity, pain, gum swelling, bleeding gum and other.

e. Health care seeking behavior for sign and symptom of oral problem

f. Oral health behavior: perceive susceptibility, perceive severity and perception of cost and benefits

3.2.2.3.Oral health service utilization

This part was evaluating the oral health service utilization.

a. Frequency of utilize oral health service

b. Type, cost and reimbursement of oral treatment

c. Type of providers

d. Degree of satisfaction

Validity and reliability of questionnaire

The content and construct validity examined by experts and thesis advisor. Then improved and adjusted this questionnaire. For reliability, used this questionnaire to ask 30 adults at the neighbor area. Use Internal consistency method (cronbach-alpha) to measure the consistency.

3.3 Collect data

The process of collecting data was following.

3.3.1 The researcher bring a letter from Faculty of Social Science and Humanities to Pratumtani Provincial Health Office for permission and co-operations of the collecting data process.

3.3.2 Training for the interviewers for clearly understands the interview process. Do the interview with the people outside the area of study for more understands.

3.3.3.Calibrating the examiner and measure the validity and reliability of oral health examination.

3.3.4 Collect the data in March 2000. Use the household face-to-face interview both in weekday and weekend. The time to collect data was 9.30 a.m. to 6.30 p.m. every day.

3.4 Statistics and analysis

This study used SPSS version 10.0E to analysis the data. The statistical use was descriptive ans analytical analysis.

1. Descriptive analysis: percentage, mean and standard division to describe the sample
2. Analytical anslysis: Because of the skewness of the independent variable- caries experience, frequency of oral health utilization, and oral health expenditure- the non-parametric statistic, the Man-Whitney U test and Kruskal- Wallis test, were used to comparative different between social stratification.. Chi-square tests were applied to test the diffeneces in ordinal and nominal variables. The non-parametric correaltion, the Spearman's Correlation test, was performed to correlated between education, social stratification and income.

CHAPTER IV

RESULTS

The study results were categorized into 6 topics.

4.1 Socio-geographic

4.2 Oral Health Behavior and Symptom

4.3 Perceive Oral Health and Perceive Need

4.4 Oral Health Status and Treatment Need

4.5 Oral Health Status and related factors

4.6 Equality in Oral Health Utilization

4.7 Equity in Oral Health Expenditure

4.1 Socio-demographic

Total sample in this study was 293 persons. Uncompleted questionnaires were excluding from this study. The female sampling population was about twice of male population (Table 1). Almost half of sampling population finished primary school level. Buddhist was the major religion. The average age was 40.0±6.4 years old. The people born in the Pratumtani Province and Bangkok were 25%, in the Central region were 25% and in the North East Region were also 25%. The high value of standard deviation of mean year resident showed that people who live in this area were varying. Some people stay for a long period and someone just immigrated in this area.

Table 1. Demographic characteristic of sample population

Demographic Characteristic		N	%
Sex	Male	105	35.8
	Female	188	64.2
Education*	Primary	129	44.2
	Secondary	86	29.5
	Undergraduate	77	26.4
Religion	Buddhist	288	98.3
	Christian	3	1.0
	Muslim	2	0.7
Hometown*	Pratumtani&BKK	84	28.7
	Central region	76	25.9
	North East region	78	26.6
	Other region	55	18.8
Age	30-34 years old	79	27.0
	35-39 years old	60	20.4
	40-44 years old	68	23.2
	45-50 years old	86	29.4
Year of resident	1-5 years	106	36.2
	6-10 years	82	28.0
	>10 years	105	35.8
Income per year**	(Bath)		
	No income	34	11.6
	1- 99,999	92	31.4
	100,000-199,999	78	26.6
	200,000-299,999	33	11.3
	>299,999	56	19.1
Occupational group			
	Civil servant	25	8.6
	Professional	9	3.1
	Lecturer &Teacher	18	6.1
	Shop owner	132	45.0
	Employee	62	21.2
	Farmer	2	0.7
	Uncertain job workers	45	15.3

The people lived in this area 1-5 years were 36.2%, lived between 6-10 years were 28.0% and people 35.8 % lived more than 10 years. Income per year was 227,231±438,419 Baht. The standard deviation of income per year shows a lot of variation of income. The minimize income was no income and the maximum income

was 6,000,000 Bath per year. For the occupational group, the shop owner, employee, and uncertain job workers were 45.0%, 21.2%, and 15.3%, respectively.

Table 2. Demographic characteristics by social stratification

Demographic Variable		Higher social stratification		Lower social stratification	
		N	%	N	%
Sex	Male	44	36.1	61	35.7
	Female	78	63.9	110	64.3
Education*	Primary	28	23.0	101	59.4
	Secondary	23	18.9	63	37.1
	Undergraduate	71	58.2	6	3.5
Religion	Buddhist	118	96.7	170	99.4
	Christian	3	2.5	0	0.0
	Muslim	1	0.8	1	0.6
Hometown*	Pratumtani&BKK	51	41.8	33	19.3
	Central region	35	28.7	41	24.0
	North East region	19	15.6	59	34.5
	Other region	17	13.9	38	22.2
Age	30-34 years old	28	23.0	51	29.8
	35-39 years old	23	18.8	37	21.7
	40-44 years old	35	28.7	33	19.3
	45-50 years old	36	29.5	50	29.2
Year of resident	1-5 years	33	27.0	73	42.7
	6-10 years	38	31.2	44	25.7
	>10 years	51	41.8	54	31.6
Income per year**	(Bath)				
	No income	6	4.9	28	16.4
	1- 99,999	9	7.4	83	48.5
	100,000-199,999	30	24.6	48	28.1
	200,000-299,999	20	16.4	11	6.4
	>299,999	57	46.7	1	0.6
Occupational groups					
	Civil servant	13	10.7	12	7.0
	Professional	9	7.4	0	0
	Lecturer &Teacher	18	14.7	0	0
	Shop owner	52	42.6	80	46.8
	Employee	30	24.6	33	19.3
	Farmer	0	0.0	2	1.2
	Uncertainly job workers	0	0.0	44	25.7

* Chi square test p=0.00 ** Man-Whitney U test p=0.00

The sample were divided into two groups by occupational prestige-the higher social stratification (HSS) and the lower social stratification (LSS). The HSS were 122 (41.6%) and the LSS were171 (58.4%). The demographic of both groups was showed in Table 2.

In both groups, HSS and LSS, demographic variable such as sex, religion, age and period of residence were not different, but education level and personal income were significantly different. The HSS had higher education level and more income than the LSS. The HSS was undergraduate level 58%, while 59.4 of the LSS was primary school level. Because the mean income per year has a large standard deviation, the non-parametric test was used to compare difference in income. Man-Whitney U test showed significantly different between the HSS and LSS. In addition, the hometowns of both groups were significantly different. The HSS were born in Pratumtani or came from Bangkok and central region of Thailand (41.8%), while the LSS came from northeast region, central region and other region of Thailand (80.7%).

Majority of the HSS were shop owners (in small company, canteen, snooker club, bakery shop, photograph shop, etc.), and employees (banker, manager, accountant, etc.) and lectures or teachers, while the LSS were shop owners (grocer, retail dealer, hawker, food seller, retail shop, etc.), employees (clerical worker, labor, etc.) and uncertainly job (daily labor, daily house maid, daily laundry, etc.). In this study the uncertainly job people were classified to the LSS, professional and lecture or teacher were classified to HSS.

Table3. Correlation between education, income and social stratification

Variable	Education	Income	Social stratification
Education	1.00	0.48*	0.52*
Income	0.48*	1.00	0.62*
Social Stratification	0.52*	0.62*	1.00

* Spearman's correlation test (2 tailed) significant at 0.01

The relationship between education, income and social stratification are shown at Table3. The Spearman's correlation test showed that three variables were positively correlation significant at p= 0.01. Correlation between social stratification and education is lower than correlation between social stratification and income. This correlation showed the dimension of economic and education status in occupational prestige criteria. The criteria of social stratification in this study was the index that insert between income and education.

Half of sampling population was covered by health insurance. The numbers of health insurance holders are significant difference between the two social groups (Table 4). The HSS was covered by one of the types of health insurance more than the LSS, 69.7 % and 42.1% respectively. Civil Servant Medical Benefit Scheme, by oneself or family, covered the HSS 33.6% and the HSS purchase the private health insurance 20.5%. The LSS covered by Civil Servant Medical Benefit Scheme 12.3% and the private health insurance holder were equal the social security holder (9.4%). The government social welfare scheme for the poor people covered only 7.0% of the LSS. (Table 4)

Figure4. Proportion of type of health insurances in HSS and LSS

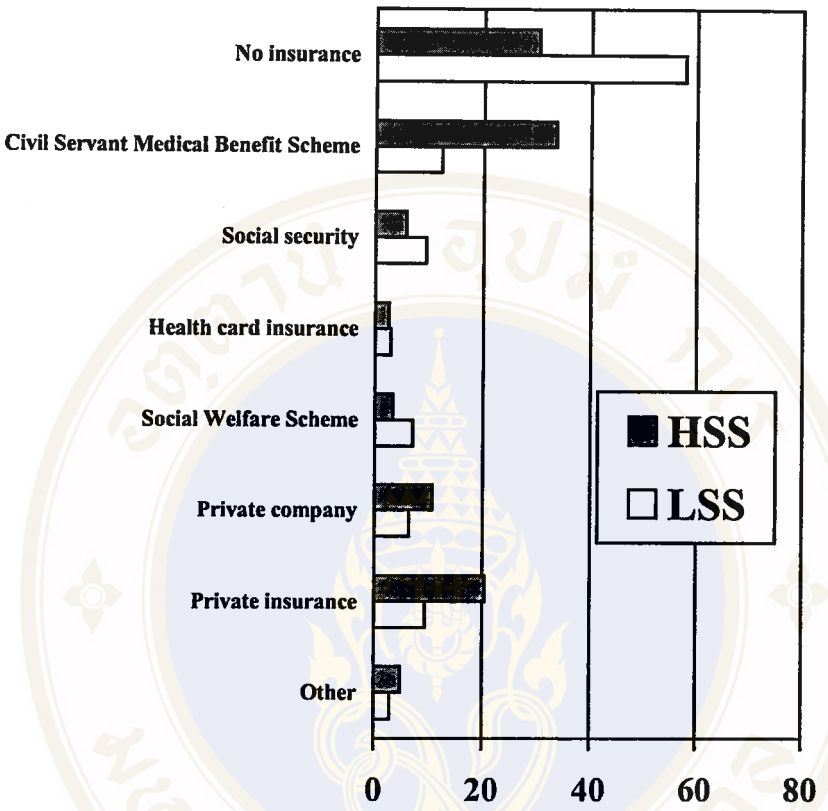


Table4. Number and percentage coverage of health insurance type in adult population in urban area, Pratumtani, Thailand by social stratification.

Items	Total		Higher Social Stratification		Lower Social stratification	
	N	%	N	%	N	%
No insurance	136	46.4	37	30.3	99	57.9
Insurance*	157	53.6	85	69.7	72	42.1
CSMBS	62	21.2	41	33.6	21	12.3
Private company	24	8.2	13	10.7	11	6.4
Social security	23	7.8	7	5.7	16	9.4
Health card insurance	8	2.7	3	2.5	5	2.9
Private insurance	41	14.0	25	20.5	16	9.4
Social welfare scheme	16	5.5	4	3.3	12	7.0
Other	11	3.8	6	4.9	5	2.9

* Chi-square significant at $p < 0.01$

4.2 Oral Health Behavior and Oral Sign & Symptom

4.2.1 Oral Health Behavior

Oral health behavior were measure according to these variables- tooth cleaning methods, use of fluoride toothpaste and sweet snack consumption shown in table 5. Most of the people in both groups were brushing teeth more than 1 time per day, usually in the morning and before bed. Both groups used fluoride toothpaste about 84 %. Frequency of tooth brushing and fluoride toothpaste usage can prevent dental caries and periodontal disease. The major difference was in the proximal teeth cleansing habit. The HSS used dental floss 22.1%, while only 3.0% of the LSS. The LSS used toothpick to clean proximal teeth more than the HSS, 48.55% and 32.8% respectively. Usually dentist suggests using dental floss to clean the proximal teeth for prevent periodontal disease. The main objective of use toothpick was to remove remained food and it may be harmful with gingival if incorrect use.

Three type of sweet snack food consumption in this study were found the similar in both group. About half of HSS and LSS have drunk soft drink, sweet drink, etc. and ate snack food sometime. The slow dissolving sweet food, the most harm to teeth compare with other sweet food, was showed better result in both groups. The HSS who never ate the slow dissolving sweet food such as candy were 47.5 % while the LSS were 51.5%.

Table5. Oral health behaviors in adult population in urban area, Pratumtani, Thailand by social stratification.

Oral health behavior	Total		Higher social stratification		Lower social stratification	
	N	%	N	%	N	%
Frequency of brushing						
> 1 time per day	273	93.2	120	98.4	153	89.5
1 time per day	18	6.1	1	0.8	17	9.9
Not regular brushing	2	0.6	1	0.8	1	0.6
Time to brushing						
Morning	290	99.0	121	99.2	169	98.8
Before bed	239	81.6	113	92.6	126	73.7
After lunch	26	8.9	15	12.3	11	6.4
Other	39	13.3	12	9.8	27	15.8
Tooth paste						
Fluoride contained	248	84.6	103	84.4	145	84.8
Non-fluoride contained	41	14.0	17	13.9	24	14.0
No use toothpaste	4	1.4	2	1.6	2	1.2
Other cleaning method						
Dental floss***	32	11.0	27	22.1	5	3.0
Tooth pick**	122	41.9	40	32.8	82	48.5
Mouth rinse	51	17.5	23	18.9	28	16.6
Other	12	4.1	3	2.5	9	5.3
Do not use anything*	77	26.5	23	18.9	54	32.0
Sweet snack food (liquid)						
Always or often	93	31.7	33	27.0	60	35.1
Sometimes	149	50.9	61	50.0	88	51.5
Never	51	17.4	28	23.0	23	13.5
Sweet snack food (solid)						
Always or often	63	21.5	23	18.9	40	23.4
Sometimes	135	46.1	61	50.0	74	43.3
Never	95	32.4	38	31.1	57	33.3
Sweet snack food (slow dissolving)						
Always or often	47	16.0	20	16.4	27	15.8
Sometimes	100	34.1	44	36.1	56	32.7
Never	146	49.8	58	47.5	88	51.5

* Chi-square test significant at $p<0.05$

* *Chi-square test significant at $p<0.01$

*** Chi-square test significant at $p<0.001$

4.2.2 Oral Sign and Symptom

Oral sign and symptom within the past one year is presented in Table 6. Sensitivity is the symptoms of early dental caries or abrasion teeth. When the tooth dentine expose to environment such as stimuli from cold water, sweet diet, or tactile stimuli, the sensitivity will be occur. Pain and gum swelling may be from the periodontal disease or dental caries that invasive to dental pulp for long time. Bleeding gum is related directly to periodontal disease.

From 293 sampling population there are 221 persons (75.4%)that had oral sign and symptoms in the last one year. Almost half of population had sensitivity and 30.4% had oral pain. Gum swelling and bleeding gum was found about one fourth of sampling population. The LSS had more oral pain, swollen gum and bleeding gums than the HSS. But the statistical significant was found only in swollen gum and bleeding gums. This finding was to confirm with the severity of periodontal disease in

Table6. Oral sign and symptom experience in the past year in adult population in urban area, Pratumtani, Thailand by social stratification.

Oral sign/symptom	Total		Higher social stratification		Lower social stratification	
	N	%	N	%	N	%
Have any symptom	221	75.4	86	70.5	135	78.9
Sensitivity	130	44.4	58	47.5	72	42.1
Dental pain	89	30.4	32	26.2	57	33.3
Gum swelling**	73	24.9	17	13.9	56	32.7
Bleeding gum*	68	23.2	19	15.6	49	28.7
Other	17	5.8	7	5.7	10	5.8

* Chi-square test significant at p <0.01

** Chi-square test significant at p <0.001

the LSS from the dental examination in the next topic (Oral health status and treatment need). There was little difference in sensitivity between both groups; the HSS had more sensitivity than the LSS. This different was not statistically significant.

4.2.3 Oral health seeking behavior

The response of oral sign or symptom was varied between the LSS and HSS (Table7-10). In table 7, for 130 sensitivity people, they chose 'did not do anything' 45.4% and chose 'see dentist' 29.2%. One fifth of sampling population was chose 'self care' such as apply with salt or toothpaste, use mouth rinse, etc. Half of the LSS did not do anything when they had sensitivity teeth and one fourth used self-care. The HSS chose 'did not do anything' 37.9%, 'see dentist at government hospital' 15.5%, and 'see dentist at private clinic' 20.7%. The result showed sensitivity was not the serious problem, both groups ignored to seek the dental treatment. However the HSS tend to see dentist more than the LSS, 36.2% and 23.6%, respectively. The other interesting point was both group chose the government hospital less than private dental clinic.

Table7. Response to sensitive teeth by social stratification.

Oral health care after sensitivity	Total		Higher social stratification		Lower social stratification	
	N	%	N	%	N	%
Did not do anything	59	45.4	22	37.9	37	51.4
Self care	27	20.8	10	17.2	17	23.6
Buy medicine	2	1.5	1	1.7	1	1.4
See dentist at government hospital	13	10.0	9	15.5	4	5.5
See dentist at private clinic	25	19.2	12	20.7	13	18.1
Other	4	3.1	4	6.9	0	0.0
Total	130	100.0	58	100.0	72	100.0

Health seeking behavior of dental pain showed in table 8. The dental pain is a serious situation, but 15% of sampling population did not do anything, especially in the LSS the percentage was higher (21.1%). The HSS went to see dentist when they pain70%, while the LSS was only 38.6 %. The HSS and LSS chose the private dental clinic more than government hospital, but the proportion was difference. The HSS who see the dentist chose private dental clinic 8 in 10, while 6 in 10 of LSS chose. The LSS used 'buy the medicine' and 'self care' to cope with pain, 21.75 % and 17.5% respectively.

Table8. Response to dental pain by social stratification.

Oral health care after pain	Total		Higher social stratification		Lower social stratification	
	N	%	N	%	N	%
Did not do anything	14	15.7	2	6.3	12	21.1
Self care	13	14.6	3	9.4	10	17.5
Buy medicine	14	15.7	2	6.3	12	21.1
See dentist at government hospital	14	15.7	5	15.6	9	15.8
See dentist at private clinic	32	36.0	19	59.4	13	22.8
Other	2	2.2	1	3.1	1	1.8
Total	89	100.0	32	100.0	57	100.0

For the Gum swelling symptom, both groups chose 'did not do anything' 41% (Table 9). The health seeking behavior-self care, buy medicine, sees dentist- were the same percentage in both groups even though the LSS had more gum swelling than HSS (Table 6)

Table9. Response to gum swelling by social stratification.

Oral health care after gum swelling	Total		Higher social stratification		Lower social stratification	
	N	%	N	%	N	%
Did not do anything	30	41.1	7	41.2	23	41.1
Self care	13	17.8	3	17.6	10	17.9
Buy medicine	11	15.1	2	11.8	9	16.1
See dentist at government hospital	6	8.2	2	11.8	4	7.1
See dentist at private clinic	10	13.7	2	11.8	8	14.3
Other	3	4.1	1	5.9	2	3.6
Total	73	100.0	17	100.0	56	100.0

Health seeking behavior of bleeding gum was different from the other symptom. The sampling population that chose 'did not do any thing' was very high (70.6%). This data showed this was an unserious symptom. Only 5% of sampling population went to see dentist when they had bleeding gum.

Table10. Response to bleeding gum by social stratification.

Oral health care after bleeding gum	Total		Higher social stratification		Lower social stratification	
	N	%	N	%	N	%
Did not do anything	48	70.6	14	73.7	34	69.4
Self care	12	17.6	3	15.8	9	18.4
Buy medicine	1	1.5	0	0	1	2.0
See dentist at government hospital	1	1.5	1	5.3	0	0.0
See dentist at private clinic	3	4.4	0	0	3	6.1
Other	3	4.4	1	5.3	2	4.1
Total	68	100.0	19	100.0	49	100.0

4.3 Perceived Oral Health and Perceived Need of Dental Treatment

Perceive oral health and perceived need of dental treatment in the HSS and LSS were not significantly different (table 11). These were subjective data from the people viewpoint.

Table11. Perceived oral health and perceived need of dental treatment in adult population in urban area, Pratumtani, Thailand by social stratification.

	Total		Higher social stratification		Lower social stratification	
	N	%	N	%	N	%
Perceive oral health						
Good	67	23.3	28	23.3	39	23.6
Fair	133	46.3	60	49.2	73	44.2
Bad	87	30.3	34	27.9	53	32.1
Perceive need of dental treatment						
High	86	29.9	42	34.4	44	26.5
Middle	87	30.2	40	32.8	47	28.3
No need	115	39.9	40	32.8	75	45.2

Chi-square for perceive oral health = 0.802

Chi-square for perceive need of dental treatment = 4.648

The sampling population perceived of oral health in the 'fair'46.3% and perceived need of dental treatment in the 'middle need' 30.2%.

The HSS had more perceived need than the LSS, 67.2% and 54.8% respectively but no statistic significant. The type of perceived need of dental treatment in sampling population were scaling (29.5%), filling (18.7%), and oral health examination (16.3%). The types of perceived need of dental treatment were different in both groups. The HSS had more perceived need for filling, scaling and oral health examination, while the LSS had more perceive need for extraction, root canal treatment, and prosthetic treatment (table 12).

Table12 . Number and percentage of each perceive need of dental treatment in adult population in urban area, Pratumtani, Thailand by social stratification.

Perceive need of dental treatment	Total		Higher social stratification		Lower social stratification	
	N	%	N	%	N	%
No perceived need	115	39.9	40	32.8	75	45.2
Have perceived need	173	60.1	82	67.2	91	54.8
Extraction	18	6.2	7	5.7	11	6.6
Filling	54	18.7	28	22.9	26	15.7
Root canal treatment	3	1.0	1	0.8	2	1.2
Scaling	85	29.5	41	33.6	44	26.5
Prosthetic	12	4.2	2	1.6	10	6.0
Oral examination	47	16.3	27	22.1	20	12.0
Other	25	8.7	15	12.3	10	6.0

Total population was 288 persons and had 5 missing case

Comparative of perceived need of dental treatment and professionally defined treatment need was show in table 13. The perceived needs of dental treatment , from the lay people, were lower than the treatment need from the opinion of dentist. For example, the demand of prosthetic treatment from lay people were only 4.2%, while the dentist opinion prosthetic treatment need were 53.6%. The same results of lower perceived need of dental treatment was found in both the HSS and the LSS group.

Table13. Percentages of perceive need of dental treatment and professionally defined treatment need in adult population in urban area, Pratumtani, Thailand by social stratification.

Dental treatment	Total		Higher social stratification		Lower social stratification	
	Perceive need of dental treatment %	Professionally Defined treatment need %	Perceive need of dental treatment %	Professionally Defined treatment need %	Perceive need of dental treatment %	Professionally Defined treatment need %
Extraction	6.2	19.8	5.7	10.7	6.6	26.3
Filling	18.7	75.8	22.9	68.9	15.7	80.7
Root canal treatment	1.0	5.4	0.8	4.9	1.2	5.9
Scaling	29.5	58.3	33.6	68.0	26.5	51.5
Prosthetic	4.2	53.6	1.6	49.1	6.0	56.7

However the agreement between the perceive need of dental treatment and professionally defined treatment need were very low. The kappa statistical were used to detect the agreement of both need. The result showed in table 14 that all type of treatment need were not agreement. Because the kappa substantial agreement are 0.6-0.8. This mean that the lay people dental treatment need were not the same as the dentist treatment need. Especially in filling, scaling and prosthetic treatment need, almost half of sample had professionally defined treatment need but the people perceive no need of dental treatment (Table 15)

Table 14 The kappa statistical agreement between the perceive need of dental treatment and professionally defined treatment need in adult population in urban area, Pratumtani, Thailand by social stratification.

	Total	Higher social stratification	Lower social stratification
Extraction	0.20	0.41	0.07
Filling	0.14	0.15	0.14
Root canal treatment	0.11	-0.02	0.17
Scaling	0.03	0.02	0.04
Prosthetic	0.08	-0.05	0.18

Table 15 Comparison between the perceive need of dental treatment and professionally defined treatment need in adult population in urban area, Pratumtani, Thailand

	Total	Professionally defined need and person perceived need		Professionally defined no need and person perceived no need		Professionally defined need and person perceived no need		Professionally defined no need and person perceived need	
		N	%	N	%	N	%	N	%
Extraction	173	8	4.6	129	74.6	26	15.0	10	5.8
Filling	173	46	26.6	40	23.1	79	45.7	8	4.6
Root canal treatment	173	1	0.6	159	91.9	11	6.3	2	1.2
Scaling	173	82	47.4	6	3.5	82	47.4	3	1.7
Prosthetic	173	10	5.8	81	46.8	80	46.2	2	1.2

4.4 Equality in Oral Health Status and Treatment Need

4.4.1 Equality in Oral Health Status

4.4.1.1 Dental Caries

Dental caries, periodontal disease, and prosthetic status were examined in this study. The means percentage of population affected with dental caries (% DMFT) in HSS was more than LSS (94.3% and 80.7%). The amount - the prevalence - of dental caries in an individual (DMFT) also followed the same pattern. Table 14. showed the DMFT in both groups. The HSS had DMFT 7.95 (±5.26), and the LSS had 5.74 (±5.86). It means the HSS had more caries experience than the LSS, and the difference was significant. The dental caries variable was not a normal distribution (Kolmogorov-Smirnov Z test =0.00) therefore the non-parametric was used.

Table16. Mean DMFT, DT, MT and FT by social stratification.

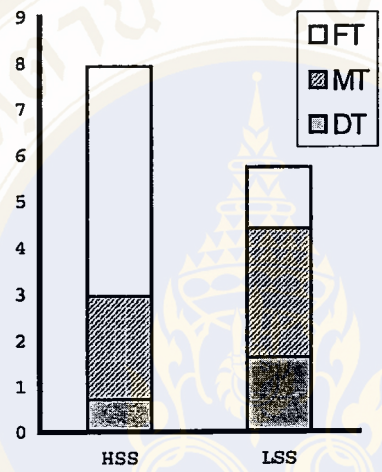
Dental caries (Teeth per person)	Total	Higher social stratification	Lower social stratification
DMFT *	6.66±5.71	7.95±5.26	5.74±5.86
DT*	1.26±2.02	0.72±1.17	1.65±2.39
MT	2.55±3.50	2.24±3.06	2.77±3.78
FT*	2.85±3.81	4.98±4.35	1.33±2.43

* Man-Whitney U test at p= 0.000

However each part of DMFT was different. The LSS had more untreated dental caries (DT) (1.65 ±2.39) compared with the HSS (0.72±1.17), significant difference. The treated teeth with filling were dramatizing difference, 4.98±4.35 teeth in the HSS and 1.33±2.43 teeth in the LSS. The HSS receive more dental filling than

the LSS. The missing teeth in both groups were not different. In another way, most of dental caries in the HSS had been treated only 0.72±1.17 teeth were untreated.

Figure5. Mean DMFT, FT, MT, and DT by the HSS and LSS



Equality of oral health status measure with dental caries index was varying from the index usage. If we used Decay Missing and Filling Teeth (DMFT) index, the HSS had more caries experience. If we used Decay Teeth (DT) index, the HSS had less untreated decay. If we used Missing Teeth (MT) index, the HSS had same tooth loss when compare to the LSS. The conclusion was the HSS had more caries experience but most of them had been treated with filling treatment. This showed inequality in dental caries treatment.

4.4.1.2 Periodontal disease

Periodontal disease was assessed using Community Periodontal Index (CPI) to measurements in percentage and sextant of the mouth. Periodontal status are used for

this assessment: (1) presence or absence of gingival bleeding, (2) supra- or subgingival calculus, (3) periodontal pockets-subdivided into shallow (4-5mm) and deep (6mm or more). The percentage of CPI means percentage of population affected with periodontal disease (calculate from highest score of each person). The sextant of CPI means the number of sextants in the mouth that had periodontal disease in different stage. (See appendix).

The preferable level of periodontal status is normal (CPI= 0). In the HSS and the LSS group had a very few people who had normal periodontal status. Gingivitis, presence of gingival bleeding, (CPI = 1 and 5) was found in LSS 32.2% and in HSS only 21.3%. Gingivitis is the early stage of periodontal disease and showed the inflammation of gingival tissue. The efficient tooth brushing and dental flossing method can decrease the gingival bleeding. The LSS had more early stage of periodontal disease than the HSS.

Table17. Periodontal status (maximum score for each person) in adult population in urban area, Pratumtani, Thailand by social stratification. (Using Community Periodontal Index)

Community periodontal index		Total	Higher social stratification	Lower social stratification
CPI= 0	Normal	1.4	2.5	0.6
CPI= 1	Bleeding	0.0	0.0	0.0
CPI= 2	Calculus	30.7	46.7	19.3
CPI= 5	Bleeding with calculus	27.6	21.3	32.2
CPI= 3	Swallow pocket	27.6	20.5	32.7
CPI= 4	Deep pocket	12.6	9.0	15.2

Chi-square test significant at $p < 0.001$

Note: the row of CPI=1 did not calculate in Chi-square

Dental calculus without bleeding showed the stone deposit on the teeth without inflammation, while the dental calculus with bleeding showed the inflammation process of gingival tissue. If the person can clean the plaque deposit efficiently, the sign of inflammation will disappear. The HSS had the dental calculus with bleeding less than the LSS (21.3% and 32.2%). In the other hand, the HSS had the dental calculus without bleeding more than the LSS (46.7% and 19.3%). This data showed the LSS had a bad oral hygiene.

The present of dental calculus with or without bleeding (CPI = 2 and 5) in LSS had more dental calculus than HSS, 68.0% and 51.5% respectively. The treatment of dental calculus was to remove all dental stone from the teeth with 'scaling' technique. The LSS need more scaling treatment than the HSS.

Table18. Percentage of periodontal pocket in adult population in urban area, Pratumtani, Thailand by social stratification. (Use Community Periodontal Index)

Periodontal pocket	Total		Social stratification			
			Higher		Lower	
	N	%	N	%	N	%
No pocket	175	59.7	86	70.5	89	52.0
Pocket	118	40.3	36	29.5	82	48.0

Chi-square test significant at $p < 0.01$

The periodontal pocket mean the more severity of periodontal disease that bone around the teeth was destroyed. Table 16 shows that the LSS had severe periodontal disease than the HSS. 48.0% of the LSS had periodontal pocket (CPI= 3 or 4), while 29.5% of the HSS had. The difference was significant at $p<0.01$. The LSS had more severe of periodontal disease than the HSS.

Table19. Sextant of periodontal status in adult population in urban area, Pratumtani, Thailand by social stratification. (Using Community Periodontal Index)

Community periodontal index		Total	Higher social stratification	Lower social stratification
CPI= 0	Normal*	0.24	0.43	0.10
CPI= 1	Bleeding	0.06	0.08	0.04
CPI= 2	Calculus*	3.25	3.98	2.72
CPI= 5	Bleeding with calculus*	1.28	0.85	1.59
CPI= 3	Swallow pocket*	0.69	0.40	0.89
CPI= 4	Deep pocket	0.26	0.17	0.33
CPI= 9	Missing*	0.22	0.08	0.30
	Total	6.00	6.00	6.00

* Man-Whitney U test at $p< 0.01$

The CPI can be measured in sextants. The mouth is divided into 6 sextants defined by tooth numbers. The upper arch is 3 sextants and the lower arch is 3 sextants. The HSS had more normal (CPI=0), bleeding (CPI=1), and calculus (CPI=2) sextants than the LSS, but the statistic significant only in normal and calculus (table 14). Bleeding with calculus (CPI=5), swallow pocket (CPI=3) and deep pocket (CPI=4) in LSS were more than in the HSS. But it was statistical significantly different only calculus and shallow pocket. These results showed the HSS had more normal and calculus sextant than the LSS, while the LSS had more severe of periodontal disease (swallow pocket) and calculus with bleeding than the HSS.

Table 20 shows that the LSS had severe periodontal pocket in sextant more than the HSS. 1.24, and 0.57 sextants, respectively. The difference was significant at $p<0.01$. The LSS had more severe of periodontal disease than the HSS

Table20. Sextant of periodontal pocket in adult population in urban area, Pratumtani, Thailand by social stratification. (Use Community Periodontal Index)

Community periodontal index	Total	Higher social stratification	Lower social stratification
No Pocket	4.83	5.35	4.46
Have Pocket	0.95	0.57	1.24
Exclude sextant (less than 2 teeth present)	0.22	0.08	0.30
Total	6.00	6.00	6.00

* Man-Whitney U test at $p < 0.01$

Equality of oral health status measure with periodontal status index can concluded that the HSS had less severe periodontal disease (both in prevalence and sextant) than the LSS.

4.4.1.3 Prosthetic status

Prosthetic status was determined base on the percentage of prosthetic appliance in the mouth. If the person loosed any teeth in the mouth , an area without the presence of teeth are call edentulous area. The data is shown in table 21.

Table 21. Upper edentulous arch status in adult population in urban area, Pratumtani, Thailand by social stratification.

Upper prosthetic status	Total		Social stratification			
			Higher		Lower	
	N	%	N	%	N	%
No edentulous area and no prosthesis need (Dentate)	184	62.8	83	68.0	101	59.1
Have any edentulous area and with or without prosthesis	109	37.2	39	32.0	70	40.9
Total	293	100	122	100	171	100

For the upper arch, the sample population who had any edentulous area were 37.2% of population. The HSS had upper edentulous area less than the LSS 32.0%

and 40.9%, respectively. This shown the HSS had a more dentate people. For the people who had upper edentulous area someone had a good prosthetic already, someone had a bad prosthesis, and someone did not have prosthesis. This data wa shown in Table 22

Table22. Upper prosthetic status in adult population in urban area, Pratumtani, Thailand by social stratification.

Upper prosthetic status	Total		Social stratification			
			Higher		Lower	
	N	%	N	%	N	%
Already have prosthesis and no prosthesis need	34	31.2	19	48.7	15	21.4
Already have prosthesis but need the new one.	16	14.7	3	7.7	13	18.6
Have an edentulous area and need prosthesis	59	54.1	17	43.6	42	60.0
Total	109	100	39	100	70	100

About half of people who had upper edentulous area do not have any prosthesis. This status in HSS was only 43.6%, while the LSS was 60.0%. The LSS who had the prosthesis but need the new one was 18.6%, higher than the HSS. This upper prosthetic status shows almost half of the HSS who have edentulous area had a good quality denture, while only one fourth of the LSS who have edentulous area had a good quality denture.

The lower arch showed the different results from upper arch. The percentage of edentulous-wore or not wore denture-in lower arch was 53.6% of sampling population, higher than upper arch. This data showed tooth lost in lower arch were occurred more often than the upper arch. There were no different of percentage of edentulous-wore or not wore denture-in lower arch between the HSS and LSS.(Table 23)

Table23 Lower edentulous arch status in adult population in urban area, Pratumtani, Thailand by social stratification.

Lower prosthetic status	Total		Social stratification			
			Higher		Lower	
	N	%	N	%	N	%
No edentulous area and no prosthesis need (Dentate)	136	46.4	55	45.1	81	47.4
Have any edentulous area and with or without prosthesis	157	53.6	67	54.9	90	52.6
Total	293	100	122	100	171	100

The people who had lower edentulous area do not have any prosthesis were 85.3%. This percentage was higher than upper arch because of the people decided to wear the upper denture for esthetic reasons. In addition to the lower denture usually have a stability and retention problem. The LSS had higher percentage than the HSS, 91.1% and 77.6% respectively.

This lower prosthetic status showed one fourth of the HSS who have edentulous area had a good quality denture, while only 5.6% of the LSS who have edentulous area had a good quality denture.

Table24. Lower prosthetic status in adult population in urban area, Pratumtani, Thailand by social stratification.

Lower prosthetic status	Total		Social stratification			
			Higher		Lower	
	N	%	N	%	N	%
Already have prosthesis and no new prosthesis need	18	11.5	13	19.4	5	5.6
Already have prosthesis but need the new one.	5	3.2	2	3.0	3	3.3
Have an edentulous area and need prosthesis	134	85.3	52	77.6	82	91.1
Total	157	100	67	100	90	100

4.4.2 Oral Treatment Need (Professionally defined treatment need)

The treatment needs by the viewpoint of dentist were shown in table 25. Only 1 out of 293 persons had no treatment needs. The other people (292 persons) need any type of dental treatment by dentist opinion. The need of periodontal treatment was 98.6%, operative treatment 88.7% and prosthetic treatment 53.6 %. The LSS required more operative, prosthesis, and periodontal treatments than HSS (83.0%-72.1%, 56.7%-49.1%, 99.4%-97.5%). The HSS need more scaling treatment than the LSS but need less periodontal pocket treatment than the LSS. It was explained that the HSS need simple treatment of periodontal disease while the LSS need the complicate treatment of periodontal disease.

Table25. Professionally defined treatment need in adult population in urban area, Pratumtani, Thailand by social stratification.

Professional treatment need	Total		Higher social stratification		Lower social stratification	
	N	%	N	%	N	%
No treatment need	1	0.3	1	0.8	0	0.0
Need operative, prosthetic or Periodontal treatment	292	99.7	121	99.2	171	100.0
Need operative treatment	260	88.7	88	72.1	142	83.0
Extraction	58	19.8	13	10.7	45	26.3
Filling	222	75.8	84	68.9	138	80.7
Crown	8	2.7	4	3.3	4	2.3
Root canal treatment	16	5.4	6	4.9	10	5.9
Need prosthetic treatment	157	53.6	60	49.1	97	56.7
One prosthesis (upper or lower arch)	100	34.1	46	37.7	54	31.6
Both upper and lower arch	57	19.5	14	11.5	43	25.1
Need periodontal treatment	289	98.6	119	97.5	170	99.4
Scaling	171	58.3	83	68.0	88	51.5
Periodontal pocket treatment	118	40.3	36	29.5	82	48.0

The LSS required more extraction, filling, and root canal treatment than the HSS. For the dental prosthesis, the HSS need one prosthesis (upper or lower prosthesis) and the LSS need both upper and lower prosthesis.

4.5 Oral Health Status and related factors

4.5.1 Dental caries and related factors

Dental disease, both of dental caries and periodontal disease, were known as behavioral disease. The major causes of these diseases were related with oral heath behavior, tooth brushing behaviors, dietary behavior. Daily lifestyle and gender were factors that related with those oral health behavior. In this study area, hometown of sampling population may represented the oral health lifestyle. Data in table 26. showed people who born in Bangkok and Pratumtani province had more caries experience than other region. The same results were found both in HSS and LSS. On the other hand, The analysis of caries experience component shown decay and missing teeth in each home town not statistical different, both in HSS and LSS. This mean the caries experience depended on the hometown while untreated dental caries did not depend on the hometown, but depend on the social stratification that shown in table 16.

People who born in north east region had less caries experience than other region. This lowest caries experience also found in the north east region people in the National Oral Health Survey(1994). Average year of resident of people who born in north east region were 6.9$\pm$6.1 years. Hence the oral health behaviors lifestyle did not change even though they move to resident here for a period of time.

Table 26. Mean of caries experience(DMFT) and component by hometown and social stratification in adult population in urban area, Pratumtani, Thailand

Group	Hometown	DMFT		DT	MT	FT
		Mean	SD			
Total	Bangkok and Pratamtani	8.6*	5.1	1.2	2.7	4.7*
	Central region	7.5	5.1	1.5	3.0	2.9
	North-east region	4.7	5.9	1.2	2.1	1.3
	Other region	5.3	6.0	1.1	2.2	2.0
HSS	Bangkok and Pratamtani	9.3*	5.0	0.7	2.4	6.2*
	Central region	7.4	4.6	0.9	2.2	4.3
	North-east region	5.9	5.2	0.7	2.1	3.1
	Other region	7.3	6.5	0.5	2.0	4.8
LSS	Bangkok and Pratamtani	7.5*	5.2	1.9	3.2	2.3*
	Central region	7.6	5.6	2.1	3.7	1.8
	North-east region	4.3	6.1	1.4	2.2	0.8
	Other region	4.4	5.5	1.3	2.3	0.8

* Kruskal-Wallis significant at P<.05

However the people who had difference hometown had a different personal characteristics. For example, the people who born in Bangkok and Pratumtani had undergraduate education level 48.2%, while the other region had only 14.1-21.1%. The people who born in Bangkok and Pratumtani also used oral health care service 65.5%, while other region only 38.4-56.6%. The average filling teeth in the people

who born in Bangkok and Pratumtani were 4.7, while the other region were 1.35-2.94 teeth per person.

Gender were also related with dental caries status .Female had more caries experience, missing teeth and filling teeth than male in HSS and LSS groups. The caries experience status, missing teeth and filling teeth were statistically different significant.

Table 27. Mean of caries experience(DMFT) and component by gender and social stratification in adult population in urban area, Pratumtani, Thailand

Group	Sex	DMFT		DT	MT	FT
		Mean	SD			
Total	Male	4.9*	4.6	1.1	1.7*	2.1*
	Female	7.7	6.0	1.4	3.0	3.3
HSS	Male	6.0*	4.0	0.7	1.3*	4.0*
	Female	9.0	5.5	0.7	2.8	5.5
LSS	Male	4.0*	4.9	1.3	1.9*	0.8*
	Female	6.7	6.2	1.8	3.2	1.7

* Kruskal-Wallis significant P< 0.05

4.5.2 Periodontal disease and related factors

Periodontal disease were closely related with tooth brushing behavior and cleanness of teeth . There were many report that female had better oral hygiene than male and people in urban area had less periodontal disease than rural area. The number of periodontal pocket people in each hometown were differences . People who born

in Bangkok and Pratumtani had periodontal pocket only 25.0%, while the other region were 43-48 %.(Table 28)

Table. 28 Number and percentage of periodontal pocket people by hometown

	Total	Periodontal Pocket	
		N	%
Bangkok and Pratamtani	84	21	25.0
Central region	76	37	48.7
North-east region	78	34	43.6
Other region	75	26	47.3

The people in HSS or LSS who born in Bangkok and Pratumtani were also had low percentage periodontal pocket than the other region. This mean that people who born in Bangkok and Pratumtani, even though in HSS or LSS were also had law periodontal pocket. This finding were opposite with caries prevalence data that people who born in Bangkok and Pratumtani had more caries prevalence than other region. The lifestyles of people may influence on oral hygiene behavior.

Periodontal pocket were weak related with genders. Male had more periodontal pocket than female but no statistically difference, male 44.7 % and female 37.7% of periodontal pocket people. In the HSS and LSS also found the same results (Table 29).

Table 29. Number and percentage of periodontal pocket people by gender and social stratification in adult population in urban area, Pratumtani, Thailand

	Total			HSS			LSS		
	Total	N	%	Total	N	%	Total	N	%
Male	105	47	44.7	44	14	31.8	61	33	54.1
Female	188	71	37.7	78	22	28.2	110	49	44.5

4.6 Equality in Oral Health Utilization

About half of sample population was use oral health utilization in the previous year. But oral health service utilization of the both groups were different (table 30). The HSS used oral health service 73.3%, while the LSS used only 40.9%. Frequencies of service utilization were also difference. The HSS usually used dental service 1 time (28.7%) or 2 times (29.5%) while the LSS used dental service 1 time were 25.7%.

Table30. Oral health utilization in adult population in urban area, Pratumtani, Thailand during the previous year by social stratification

Frequency of oral health utilization (times)	Total		Higher social stratification		Lower social stratification	
	N	%	N	%	N	%
No use	134	45.7	33	27.0	101	59.1
Use	159	54.3	89	73.3	70	40.9
1 time	79	27.0	35	28.7	44	25.7
2 times	48	16.4	36	29.5	12	7.0
3 times	12	4.1	6	4.9	6	3.5
4 times	5	1.7	3	2.5	2	1.2
More than 5	15	5.1	9	7.4	6	3.5
Total	293	100.0	122	100.0	171	100.0

Mean of oral health care utilization with in one year were significantly different between both groups. The HSS used the service for 1.7 time and the LSS used for 0.82 times (Table 31). The HSS utilized more oral health service than the LSS in the previous year. This showed inequality of oral health service utilization.

Table31. Mean of frequency of oral health utilization in adult population in urban area, Pratumtani, Thailand during the previous year by social stratification

Population group	Mean of frequency of use
Total	1.19±1.96
Higher social stratification	1.70±2.20
Lower social stratification*	0.82±1.69

*Man-Whitney U test p=0.000

Types of oral health service are shown at table 30. For each type of utilization, the HSS utilized more service than LSS, especially for filling, pulp treatment and scaling (statistically different significant).

Table32. Type of oral health service utilization in adult population in urban area, Pratumtani, Thailand during the previous year by social stratification

Oral health service utilization	Total		Higher social stratification		Lower social stratification	
	N	%	N	%	N	%
No use	134	45.7	33	27.0	101	59.1
Use*	159	54.3	69	73.0	70	40.9
Extraction	45	15.3	21	17.2	24	14.0
Filling*	57	19.4	38	31.1	19	11.1
Pulp Treatment*	16	5.5	11	9.0	5	2.9
Scaling*	65	22.2	48	39.3	17	9.9
Prosthodontic	16	5.5	10	8.2	6	3.5
Examination	5	1.7	2	1.6	3	1.8

* Chi-square test significant p< 0.05

The HSS received scaling treatment (39.3%), filling (31.1%) and extraction (17.2%), while the LSS received extraction (14.0%) and filling (11.1%). This data showed the LSS received the extraction more than other treatment may be cause by pain symptom. The HSS received scaling treatment more than other treatment. Usually the scaling treatment was cause by esthetic and social factor reason, not from the pain of teeth.

The both groups used oral health provider near this area 42.6%. The percentage of the LSS who used oral health service in this area was same as the HSS. There was surprise that the LSS used private dental clinic more than the government hospital. In Thailand the dental price in private clinic was higher than government hospital. However the HSS used private dental clinic almost 3 times of government hospital, while the LSS was 1.5 times.

More than half of people in both groups used the dental service outside this area. Some people used the dental service near the work place in Bangkok, another used the modern dental clinic in the department store. The distance was not influence the choosing of dental providers.

Table33. Type of provider to utilization in adult population in urban area, Pratumtani, Thailand during the previous year by social stratification

Type of provider	Total		Higher social stratification		Lower social stratification	
	N	%	N	%	N	%
In this area	88	42.6	37	43.0	29	42.0
Government hospital	22	14.2	10	11.6	12	17.4
Private dental clinic	44	28.4	27	31.4	17	24.6
Out of this area	89	57.4	49	57.0	40	58.0
Total	155	100.0	86	100.0	69	100.0

Most of the people who utilized the oral health service were satisfied in mode of transportation, waiting time period before treatment, cleanliness of dental clinic,

and service of staff and dentist (Table 34). The items that unsatisfactory were cost of treatment. The HSS that had more income than the LSS was unsatisfied in cost of treatment 34.5%, while the LSS was 27.5%.

Table34. Satisfactions of oral health utilization in both public and private provider in adult population in urban area, Pratumtani, Thailand during the previous year by social stratification.

Satisfactions items	Total		Higher social stratification		Lower social stratification	
	N	%	N	%	N	%
Mode of transportation						
Satisfied	151	96.8	84	96.6	67	97.1
Fairly satisfied	1	0.6	0	0.0	1	1.4
Unsatisfied	4	2.6	3	3.4	1	1.4
Waiting period before treatment						
Satisfied	133	85.3	75	86.2	58	84.1
Fairly satisfied	6	3.8	1	1.1	5	7.2
Unsatisfied	7	10.9	11	12.6	6	8.7
Cleanliness of dental clinic						
Satisfied	144	92.3	79	90.8	65	94.2
Fairly satisfied	6	3.8	4	4.6	2	2.9
Unsatisfied	6	3.8	4	4.6	2	2.9
Service of dental staff						
Satisfied	144	93.6	80	92.0	66	95.7
Fairly satisfied	6	3.8	4	4.6	2	2.9
Unsatisfied	4	2.6	3	3.4	1	1.4
Dentists service						
Satisfied	148	94.9	81	93.1	67	97.6
Fairly satisfied	6	3.8	4	4.6	2	2.9
Unsatisfied	2	1.3	2	2.3	0	0.0
Cost of treatment						
Satisfied	100	64.1	54	62.1	46	66.7
Fairly satisfied	7	4.5	3	3.4	4	5.8
Unsatisfied	49	31.4	30	34.5	19	27.5

4.7 Equity in Oral Health Expenditure

The oral health expenditure in this study were out of pocket expenditure, not include public and welfare oral care expenditure. General characteristic of oral health utilization and oral health expenditure were showed in table 35. Mean of oral health expenditure per person and mean of frequency of oral health utilization were calculated in two population base, whole population and people who used oral health care service. For whole population base, the HSS paid the money for dental treatment 2,095 Baht, while the LSS paid 1,001 Baht. The HSS used dental service 1.7 times per year, while the LSS used 0.82 times per year

Table 35 General characteristic of oral health utilization and oral health expenditure in adult population in urban area, Pratumtani, Thailand within the past year by social stratification.

	Total	HSS	LSS
Number of sampling population	293	122	171
Number of oral health utilization population	159	89	70
Sum of oral health expenditure (Baht)	426,930	255,590	171,340
Sum of utilization frequency (Times)	348	207	141
Mean of oral health expenditure per person (Whole population)	1,457 ± 5,418	2,095 ± 5,432	1,001 ± 5,378
Mean of oral health expenditure per person (People who used oral health care service)	2,685 ± 7,137	2,872 ± 6,190	2,448 ± 8,226
Mean of oral health expenditure per time (People who used oral health care service)	905 ± 1,584	1,109 ± 1,962	644 ± 943
Mean of frequency of oral health utilization (Whole population)	1.19 ± 1.96	1.70 ± 2.20	0.82 ± 1.69
Mean of frequency of oral health utilization (People who used oral health care service)	2.19 ± 2.21	2.32 ± 2.27	2.01 ± 2.14

In the other hand, for the people who used oral health care service 159 person, the HSS paid the oral health expenditure 2,872 Baht, while the LSS paid 2,448 Baht. The HSS used dental service 2.3 times per year, while the LSS used 2.01 times per year. Mean of oral health expenditure per time in the HSS was 1,109 Baht, while in the LSS was 644 Baht.

The distribution of oral health expenditure before reimbursements were showed in table 36.There were very wide range of oral health care expenditure. The maximum were 60,400 Baht. About half of the LSS group pay oral health care expenditure less than 500 Baht, while 28.1% of the HSS group pay oral health care expenditure more than 2,499 Baht.

Table 36 Distribution of oral health care expenditure in adult population who use oral health care service in urban area, Pratumtani, Thailand within the previous year by social stratification.

Oral health care expenditure (Baht)	Total		HSS		LSS	
	N	%	N	%	N	%
<500	55	34.6	21	23.6	34	48.6
500-999	41	25.8	21	23.6	20	28.5
1,000-1,499	16	10.1	11	12.4	5	7.2
1,500-1,999	6	3.8	4	4.4	2	2.9
2,000-2,499	8	5.0	7	7.9	1	1.4
>2,4999	33	20.1	25	28.1	8	11.4
Total	159	100	89	100	70	100

Table37. Income and oral health care expenditure in adult population in urban area, Pratumtani, Thailand within the past year by social stratification.

Item	Total		Higher Social Stratification		Lower Social stratification	
	Mean	SD.	Mean	SD.	Mean	SD.
Yearly income (Baht)**	358,309	530,918	437,854	669,729	91,359	72,302
Oral health care payment in one year (Bath) Ns.	2,685	7,137	2,872	6,191	2,448	8,226
Out-of-pocket payment in one year (Bath) Ns.	1,844	5,723	1,894	3,655	1,780	7,612
Reimbursement money in one year (Bath) Ns.	842	3,368	987	3,573	668	3,013
Proportion of income used for oral health care in one year*	1.97	6.55	0.88	1.57	3.56	9.97
Out-of-pocket payment per income in one year*	1.38	5.71	0.62	1.27	2.51	8.77

(Calculate from person that used oral health serrvice 159 persons)

Ns. Not significant

* Mann-Whitney U test significant at $p<0.05$

** Mann-Whitney U test significant at $p<0.001$

The proportion of income utilized for oral health care was used to measure equity in oral health expenditure. Table 37 showed the data of 159 persons who use oral health service in the last one-year. The income per year was highly significant different between two social groups. However the standard deviation were high too. Total dental expenditure per person in one year was almost the same: 2,448 (LSS) and 2,872 (HSS) Baht. However a significant difference was found in the average proportion of total dental expenditure to income: 3.56% (LSS) and 0.88% (HSS) ($p<0.05$). This means that the LSS spend more money for dental treatment than the

HSS when compare to their income. This inequity was not even worse when reimbursement of health insurance was taken into account. After receiving insurance benefit, recalculated average proportion of direct out-of-pocket dental payment to income was 2.51% (LSS) and 0.62% (HSS) ($p<0.05$).

CHAPTER V

DISCUSSION

5.1 Problem in the data collection process

An important for any study design is ensuring that a representative sample is obtained in order to reveal the true picture of the general population. In this study, the sampling method was a multistage systematic random sampling. The interview and oral health examination was conducted by type of living place for avoiding bias.

The real situation was not easy to collect every 7th house. One of the problem was low percentage of co-operative from the HSS who live in modern real estate. The reseacher could not collect the data in the very big house because of they aware about security although the researcher show the identification card of lecturer from Faculty of Dentistry, Chulalongkorn University. Some of them did not believe that the lecture from that university would collect the data with this method. Some of them allowed only interview and rejected the oral examination process because of they were a shame of oral examination. In the medium modern real eatate, Soomboon and Narongkit village, the reseacher used the next house instead when the sampling house owner was not permit to collect data. The small house was more easy to get the data. Therefore the HSS sampling in this study was less than the LSS. The percentage of the HSS and LSS may not represent the total proportion of the HSS and LSS in the total population.

In the luxury modern real estate, Sriwalee village, the reseacher could not collected any data. The reason that the sampling reject was they shamed about oral

health examination or aware about security. This problem was solve by use the informal ralationship of one staff in health center to her friend house in this village. After collect data in this house, the researcher ask for help to introduce the neigborhood or friend house. The introduction was done by telephone or direct met. Some time the introducer wrote the map of they friend house. With this relationship chain method, the data can be collected in Sriwalee village. This method was not systematic randomization but call 'specific sampling'. Some of bias may be occur because of some sample sizes were closely with health center staff.

The other problem was the time to collect data. This study collected data in the daytime. For the commercial buling, it was a working time therefore the reseacher had to wait. In the living place such as village and alley the data had to collect in the weekend or in the evening of weekday. Because of the people went to work in another place. For the apartment or dormitory, collected data in the day time were also difficult. The labour worker sleep in daytime and wake up in the evening to do the fresh market job. Many of labour worker were non registered in the government office. Some one live in this area more than 5 years but the registration name was in their home town.

Usually in the oral health survey study, oral examination was conducted in the health center or the fixed place. In addition to the people came to that place by appointment. The quality and consistency of oral examination was acceptable. In this study the other weak point was consistency of oral examination that was conducted in the sample house. Sometime the light was not sufficeint to good quality of examination.

5.2 Socio-demographic

In Thailand the social gap between the poor and the rich is very wide. This study area showed the typical social gap. The labour worker, grocer, and hawker lived crowed in the one room in apartment or small house. The environment of living place did not encourage the good health. This scene was very different from luxury car, many electrical appliance and convenience thing in the big house. Health and oral health also different. The different of education and income per year between two social stratification were confirmed by field work data.

The sample of this study was more female than male because of the method of collecting data in daytime. Female were stayed in house and do some work in daytime. These study results represent only some part of population.

Health insurance schemes in Thailand classified in 4 major scheme, Social Welfare Scheme, Civil Servant Medical Benefit Scheme, Compulsory Social Insurance (Social Security Scheme) , and Voluntary Health Card insurance. In 1996, 63% of total population were insured, 30% by Social Welfare Scheme (for the poor, the elderly, children under 12 and disabled), 13% by Civil Servant Medical Benefit Scheme (CSMBS), and 6% by the Social Security Scheme for private sector employees. Voluntary Health Card insurance covered some 13% of the population. Percentage of insured people in this study was 53.6% lower than the national data (63%). The HSS was covered by any type of insurance more than the LSS, 69.7% and 42.1%, respectively. This different was statistical significant. This data showed the uneffectivness of health insurance scheme in Thailand. The social welfare scheme in this study was very low (5.5%)compare with the national data (30%). Because of this scheme in national data are provider not only the poor but also for the elderly,

children under 12 and disabled people. Comparative between national data and this study did not suitable because of this study sample were 30-50 years old.

Different pace of economic and insurance development results in pluralistic in term of benefit package, source of finance and provider payment mechanism. Oral health benefit package in each type of health insurance scheme are also different. Extraction, filling, scaling, oral surgery and posterior acrylic denture for Social Welfare Scheme and Voluntary Health Card insurance. Extraction, filling, scaling, oral surgery, peiodontal treatment, root canal treatment, and single crown for Civil Servant Medical Benefit Scheme. Extraction, filling, scaling for Social Security Scheme and limited at 400 Baht per year. Most of scheme insurer have to received treatment in the government hospital only (except Social Security Scheme insurer).

Private insurance and private company insurance were 14.0% and 8.2% in this study. Both of them usally not cover oral health care. Therefore the factor of health insurance was not fit to explain the oral health utilization.

To compare with the welfare countries, such as Japan that seem to be the homogenous and non-social class society, the universal health coverage insurance program were promote the equity in oral health. All Japanese have equal access to medical care service including dental service. Patient s are free to choose medical and dental provider. The source of financial are from insurance progressive premium tax. Co-payment are 20-30% of dental fee. The price of dental treatment are the same both in public and private provider.(Japan Ministry of Health, Labour and Welfare, 1999)

Oral health behavior in this study showed the similar results with National oral health survey 1994 in 35-44 years old. 93.5 % of the people who lived in urban area brushed their teeth more than 1 time per day and 93.2 % in this study. However the

frequency of tooth brushing do not represent the quality of tooth brushing. Hence the data still showed high gingivitis and periodontal disease. Gingivitis and periodontal disease are decrease with the high efficeincy tooth brushing. For the perscentage of non-fluoride tooth paste use was 14.5% and 14.0% in national data and this study, respectively. Sample people in this study used dental floss (11.0%) and tooth pick (41.9%) more than national data (6.5% and 34.1%). The possible reason that this study could get the data from high social stratification. Thai National Oral Health Survey did not used the in-home approch, therefore the highest and lowest social stratification did not include in that survey.

Proximal cleansing method is key menthod to reduce gigivitis and periodontal disease. The HSS used dental floss seven-folds of the LSS. The quality of dental floss usage is also important to decrease the disease but this study did not collect the quality of usage. It was very difficult to check the efficeincy of tooth brushing and floss using in the field work. People always has their private maner.

Sweet food eating habit also the same results compare with national data. The liquid sweet food -soft drink, sweet drink-was very common in adult population (drink always 31.3% and sometimes 50.9%). The slow dissolving food -candy, buble gum- was not popular (eat always 16.0% and sometimes 34.1%). The national data showed high percentage of candy consumtion was found in young adults and children.

Oral health symptom in this study also showed the same situation with national data. This study found sensitivity (44.4%)and swelling gum (24.9%) similar as national data (43.6% and 28.8%), respectively. The dental pain in this study (30.4%) was lower than national data (45.5%). The possible reason that the appointment method to oral health examination in national survey might bias with the pain

experience people. The LSS had gum swelling and bleeding gum more than the HSS. This two symptom are represent the symptom of periodontal disease.

The social stratification criteria in this study had some weak point. First, the higher position classification in civil servant group not only had a more occupational prestigue but also had the meaning of higher responsibility that related with the education levels and the length of work in the organization. The dental disease is a age specific disease that the older had more decayed and periodontal pockets than the younger. Second, There were some occupations that difficult to classified and had to use researcher judegment, for example the person who had two occupation in the same time, employee and partner of the business company. Third, this study modified the 4 levels of occupational prestige from Chantavanich (1999:157-60) to 2 level of social stratification. Hence the new setting criteria may not represent the real occupational prestigue and some occupational should be in the middle level between HSS and LSS. This study criteria may be crude for social classification. However this index had a high correlate with education level and income, correlation were 0.52 and 0.62, respectively. The combine index between income, education level, and occupational prestige may be the suitable indicator for social stratification in the future.

In conclusion, the social aspect, insurance coverage, oral health behavior and oral health symptom of sample population were similar to national data of 35-44 years old people who lived in urban area. The LSS had more periodontal symptom and less proximal cleaning than HSS. This finding was get along with periodintal disease data that the LSS had more severe periodontal disease than LSS.

5.3 Equality in Oral Health Status

5.3.1 Dental Caries

In present, oral health was measured in two aspects, oral health related quality of life and oral disease. Oral health related quality of life is a subjective index, measured from the perceived oral health status. In this study, the oral health disease was used to measure oral health status. Dentist examined the dental and oral cavity and reported as caries experience (decay, missing and filling teeth – DMFT), untreated decay (decay teeth – DT), or tooth loss (missing teeth – MT). Some researcher used the proportion of $^{DT}/_{DMFT}$ or $^{MT}/_{DMFT}$. This study used DMFT, DT and MT to measure oral health status.

Dental caries is a multi-factorial disease. Sweet food and snack dietary, oral hygiene, fluoride use, quality and quantity of saliva, micro bacterial in oral cavity and etc. are cause of dental caries. In National oral health survey, 1994 reported caries experience in 35-44 years old people in Urban 88.9% and 7.9 teeth per person. Dental caries experience in rural area was less percentage and number than urban area (82.9% and 5.6 teeth per person). This study conducted in urban area with two social stratifications. The results showed the HSS had more caries experience than the LSS, 94.3%, 7.9 teeth per person, compared with 80.7% and 5.7 teeth per person. The number of dental caries experience in the HSS was very similar to the people in urban area in national survey. On the other hand, caries experience in the LSS was very similar to caries experience in rural area. It might be that some of the LSS were the immigrants from the rural area. They still had the same life styles and oral behaviors.

This finding was different from the other study. Watt & Sheiham (1998: 7) reported caries experience in different social status was the same. Alvarez-Arenal, et al (1996: 8) and Schwarz, (1985 quote in Petersen, 1990: 154-5) found the higher social class has less caries experience than the lower class.

The major component of caries experience in the HSS was filling, and in the LSS was untreated decay. This meant that most of the caries experience in the HSS was treated by filling already. Therefore, the caries experience index may not the suitable index to measure equality in oral health status. The untreated decay in the LSS was more than the HSS. The other study (Petersen, 1990: 154) found the same as this study but one study (Alvarez-Arenal, et al. 1996: 8) found no different between social class.

Tooth loss in this study was not different between the HSS and the LSS. The other study found the lower social class had tooth loss more than the higher social class (Dumer, et al., 1990: 37-48, Watt & Sheiham, 1998: 7, Alvarez-Arenal, et al., 1996: 8, and Petersen, 1990: 254-5).

The reason that the HSS had tooth loss equal to the LSS in this study may be caused from many reasons. Thai people, both social stratifications, believed that extraction was a simple, convenience and cheap treatment that could help them from pain. Root canal treatment, compared with extraction, was more difficult, need more visit and very experience although the tooth could be kept. The awareness to keep the teeth in the mouth was low in this population.

The dental caries index are the accumulated, experience index. The filling and missing component shown the experience treatment of dental caries. The caries experience index (DMFT) should be suitable to explain the all caries accumulation in

the people. While the untreated dental caries index (DT)shown the present of dental caries that had a meaning of unmet dental treatment. Hence the index suggested to use for monitoring equality in oral health status is untreated decay teeth. This mean the HSS and LSS should received the treatment when they teeth had an decay. The other two index, filing teeth (FT) and missing teeth (MT), are compose of treatment procedures (filling and extraction).

5.3.2 Periodontal disease

Periodontal disease was measured in many level scales of community periodontal index. The researcher decided to use absence and present periodontal pocket to measure equality in oral health status. Because of periodontal pocket was severe stage of periodontal disease which bone structure around teeth was destroyed and this stage was irreversible stage.

The finding that the LSS had more severe periodontal disease than the HSS was similar to the other studies (Schwatz, 1985 and Watt & Sheiham, 1998: 7). In Thailand national oral health survey data showed that people in rural area had more periodontal pocket than urban area both in percentage and sextant, 62.0% of rural residents had periodontal pocket with average 1.8 sextants, while 49.2% and 1.3 sextants in urban residents. This figure was also similar to this study, 48.8% of the LSS had periodontal pocket with 1.24 sextants, while 29.5% and 0.57 sextants in the HSS. The reason that the HSS had very low periodontal pocket may be the quality of tooth brushing and frequency of dental floss usage. The HSS visited dentist for scaling treatment in high percentage than the LSS. This showed the awareness and good oral

health behavior in the HSS. However the HSS still had high need for scaling treatment.

5.3.3 Prosthetic status

No other study reported prosthetic status to measure equality in oral health status. National oral health survey used percentage of people who need denture. But in this study, the researcher used percentage of good denture wear in the people that had edentulous area. Because this index showed denture status in edentulous people. For the edentulous people, the HSS wore upper denture 48.7%, lower denture 19.4%, while the LSS wore denture only 21.4% in upper arch and 5.6% in lower arch. The status of prosthetic use in the HSS was better than the LSS. The percentage of wearing denture in lower arch was low in both groups because the need of patient was low. The tooth loss in upper arch usually happened in anterior teeth, hence percentage of upper denture wearing was high. Besides esthetic, the other reason was wearing lower denture made them more annoyed than wearing upper denture.

The relationships between perceived need and professional defined need showed very low value in kappa statistic. This finding also the same result in other studies (Ainamo, 1972: 615-9, Barenthin, 1977: 281, Reisine and Bailit, 1980:597). The professional defined need base on a high standard criteria of dental disease, if the patients had disease they had to have treatment need. The lay people did not known the disease, they concerned only the symptom of dental disease. In this study results shown about 50% of lay people did not need filling, scaling and prosthetic but professional defined that they should receive treatment. Because of this treatment did not treat the painful stage of disease. In the other hand, some people had a high

threshold of painful symptom, some had a very awareness of oral health. Hence the perceived need of each people were subjective and variety, depend on the experience, socialization, environment, and lifestyles.

The definition of health and disease are different view points of lay people and professional. The other way to measure lay people oral health status that more subjective and base on people perceived than professional criteria, oral health related quality of life, were interested in this decade. One of the oral health related quality of life index, the oral impacts on daily performances (OIDP), was study in Khon Kaen and Chaeng Mai Province (Adulyanon, Vourapukjaru, Sheiham, 1996:385-9 and Srisilapanan, Sheiham, 2001:102-8). These index measure nine physical, psychological and social performances of oral health. The new era of measure oral health status may be reduce the gap between the perceive need of people and professional defined need.

5.4 Equality in oral health utilization

The finding of equality in oral health utilization between two social stratifications was similar to the other studies. The higher social class had less barrier to receive the dental treatment. The low social class, poor and lack of chance people, had less accessibility and less utilization (Watt & Sheiham, 1998: 8, Unell, et al., 1996: 191-5). In highly industrialized countries, utilization of dental services is reported to be lower among disadvantaged population group than other groups. In these groups, a substantial number of persons tend to visit the dentists mainly for symptomatic reasons (Petersen & Holst, 1995: 367).

Particularly in developing countries, utilization of dental service has been found to be lower in rural area than in urban area. The lower utilization in rural area is ascribed to less availability of dentists, longer traveling distances and waiting time, and cultural factors that present barriers to seeking care. In Thailand National Oral Health Survey found the similar result, 61.9% of 35-44 years old people in urban had been visited dentists, while 38.8% of people in rural area had.

In most countries, the socioeconomic gradient in utilization of dental service is still well documented, not only in terms of a relatively lower frequency of dental visits for low-income groups or less-educated persons, but also in relation to a lower consumption of preventive services and relatively higher consumption of radical treatment services (Petersen & Holst, 1995: 367). This study found that the HSS utilized preventive treatment such as scaling, filling, more percentage than the LSS, 30-39% and 10-11%, respectively.

The expensive treatment such as pulp treatment and prosthetic were also utilized by the HSS more than the LSS, 8-9% and 3-4%, respectively. It was surprised that the HSS in this study also utilized extraction more than the LSS, but the different was not big, 17.2% and 14.0%, respectively. This meant that people in this study, both social stratifications, believed that extraction was acceptable treatment.

5.5 Equality in oral health expenditure

No study was reported about equality in oral health expenditure formerly. Data collection was conducted from recall memory in previous years, may be some mistaken, particularly in the persons who visited dentist many visits. Some dental treatment took several visits and payment in each visit also different.

Oral health system in Thailand use out-of-pocket payment system. The patient pays directly to dentist. This system does not encourage the equality in oral health expenditure. The HSS and LSS pay the same amount of money while receiving the same treatment at the same place. Although the government hospital provides a cheap price of dental care, the service is limited by manpower. The LSS utilizes oral health care in private dental clinic more than government hospital (24.6% and 17.4%, respectively). Long waiting time and less quality of hotel service may be the reason.

Oral health insurance with third party should be gained the equality in oral health expenditure. But this study found the LSS had low number of health insurance, especially social welfare scheme for poor people. Therefore, after reimbursement, the inequity in oral health expenditure still occurred.

Thai Government had a new policy with Universal Coverage in Health Care in the year 2001. The first phase was done in 6 provinces, in April 2001 and expanded to 21 provinces in June 2001. The patient pays only 30 Baht for one visit dental treatment in government hospital (co-payment). This system may gain equality in oral health utilization but does not reduce inequity in oral health expenditure because payment system does not depend on the ability to pay. The poor and rich pay equally 30 Baht for one treatment. Source of financing comes from general tax. The tax system in Thailand is also inequity. Income tax collected by level of income is few. The specific sale tax and value added taxes that are collected by the amount of consumption are major. The equity of oral health expenditure should be progressive rate by tax or insurance premium.

The other problem that causes inequality in oral health utilization is dental manpower in government sector. 51.3% of Thai dentists in 1994 are private sectors.

The lack of manpower are the important problem in dental public health. The dentist per population in Thailand in 1999 were 1:9,436, while in the developing countries had better dentist per population ratio. For example, dentist per population in 1989 in United State of America was 1:1,724, Germany 1:1,351, New Zealand 1:2,709 (Chen, et al., 1997) The dental patients in 21 provinces who join universal coverage program are increasing. The low social class also has a barrier to receive dental treatment in government hospital. The private sector should join with this program. The financing problem and payment method for private sector should be considerably discussing.

CHAPTER VI

CONCLUSION AND RECOMMENDATION

6.1 Conclusion

This study investigated equality in oral health status, equality in oral health utilization, and equity in oral health expenditure between two social stratification groups, higher and lower social stratification. Occupational prestige was used to classify social stratification instead of income. Because of the informal sector worker usually under-reported income and had hidden income in developing countries.

Multi-stage systematic random sampling was used to collect adults' subjects in the urban area near Bangkok. Four type of households- commercial building, residence house, modern real estate, and dormitories or apartments- were used. Oral health examination and questionnaire interview were used to collect data.

For dental caries, the untreated decay (DT) is the suitable index to measure equality in oral health status because it shows the disease that does not receive any treatment. Hence there are inequality in dental caries that the HSS had untreated decay more than the HSS. Even though the LSS had less caries experience than the HSS. The number of tooth loss was the same in the LSS and the HSS.

Equality in oral health status in the meaning of periodontal disease shows the LSS had severe periodontal disease (periodontal pocket) than the HSS both in prevalence and sextants.

Equality in oral health status in the meaning of prosthetic status shows the LSS who had edentulous area wear the denture less than the HSS both with upper and

lower denture. For the upper arch, about half of the HSS who have edentulous area had a good quality denture, while only one fourth of the LSS who have edentulous area had a good quality denture. For the lower arch, one fourth of the HSS who have edentulous area had a good quality denture, while only few of the LSS who have edentulous area had a good quality denture.

The perceived need of people and professional define need in dental treatment shown no relationship. The dentist used a disease criteria to determine the treatment need, while the lay people used their own experience.

Equality in oral health utilization showed the HSS utilized more oral health service than the LSS in the previous year both in percentage and frequency. However the perceived needs of dental treatment , from the lay people, were not agreement with treatment need from the opinion of dentist

Equity in oral health expenditure showed the subject who used oral health service in the previous year, the percentage of income spent for oral health service by the LSS was higher than that by the HSS. After receiving insurance benefits and recalculated average proportion of direct out-of-pocket dental payment to income, the LSS also paid more than the HSS.

The finding of this study showed the inequity in oral health in the area of study. The LSS had more disease (untreated decay teeth and severe periodontal status), more oral disability (did not wear denture after tooth loss), less dental service utilization, and spent money for dental treatment as a percentage of income more than the HSS.

For the dental caries, the HSS had caries experience more than the LSS but almost of dental caries had been treated with filling and extraction. This showed the

health care system in Thailand did not provide the opportunity for the lower social stratification.

6.2 Recommendation

Health and oral health is a human right that all people should get the highest possible level of health and oral health. The government policies and actions have to promote and support the equity of oral health. The compulsory oral health insurance with the third party payment is one of the methods that can solve this problem. The universal health coverage program will improve the equality of oral health utilization. The health insurance premium and tax that charge by ability to pay will improve the equity of oral health expenditure. In the welfare countries, such as Japan, the universal health coverage insurance program were promote the equity in oral health. All Japanese have equal access to medical care service including dental service. Patients are free to choose medical and dental provider. The source of financial are from insurance progressive premium tax. Co-payment are 20-30% of dental fee. The price of dental treatment are the same both in public and private provider.(Japan Ministry of Health, Labour and Welfare, 1999)

Oral health promotion and preventive program for all citizens are important. The oral hygiene instruction, tooth brushing instruction and proximal cleansing should be emphasize especially in the lower social stratification group. The dental caries prevention program such as fluoride usage, dietary counseling are usefulness for the higher social stratification, who had high caries prevalence.

Because this study was the first its kind on the equity in oral health; hence the definition and index for measurement were not exact agreement . The oral health

related quality of life index are the index that represent the people perceive of oral health. The certain age group such as teenager or elderly people are also interesting. The oral health expenditure should be collecting more exact in each visit of treatment. The dental caries and periodontal disease index are accumulation index and the social stratification can be change from one class to another class. So the longitudinal study is recommended to investigate the incidence of dental disease along a period of time.

The qualitative method such as focus group technique should be use in next study for interpret how and why people think and act their oral health behavior and oral health utilization.

The low perceived treatment need in all treatment need, especially in filling, scaling, and root canal treatment, are the major problem for oral health utilization. These kind of treatment are useful for keep the teeth remain in the mouth. The future research should be find the way to gain the people perceived need, both in HSS and LSS.

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Appendix

1. Dental caries index: Decay Missing Filling Teeth (DMFT)

DMFT describes the amount - the prevalence - of dental caries in an individual. DMFT is means to numerically express the caries prevalence and are obtained by calculating the number of Decay (D), Missing (M), and Filled (F) in teeth (T). It is thus used to get an estimation illustrating how much the dentition until the day of examination has become affected by dental caries. It is either calculated for 28 (permanent) teeth, excluding 18, 28, 38 and 48 (the "wisdom" teeth) Thus:

- How many teeth have caries lesions (incipient caries not included)?
- How many teeth have been extracted?
- How many teeth have fillings or crowns?

The sum of the three figures forms the DMFT-value. For example: DMFT of 4+3+9=16 means that 4 teeth are decayed, 3 teeth are missing and 9 teeth have fillings. It also means that 12 teeth are intact. If a tooth has both a caries lesion and a filling it is calculated as D only. A DMFT of 28 is maximum, meaning that all teeth are affected. % DMFT means percentage of population affected with dental caries. %D means percentage with untreated decayed teeth. %M means percentage of extracted teeth due to dental caries. %F means percentage of treated dental caries with filling or crown.

2. Community Periodontal Index (CPI)

2.1 Indicators: Three indicators of periodontal status are used for this assessment:

1. presence or absence of gingival bleeding
2. supra- or subgingival calculus
3. periodontal pockets-subdivided into shallow (4-5mm) and deep (6mm or more).

A specially designed lightweight CPI probe with a 0.5-mm ball tip is used, with a black band between 3.5 and 5.5 mm and rings at 8.5 and 11.5 mm from the ball tip.

2.2 Sextants: The mouth is divided into sextants defined by tooth numbers: 18-14, 13-23, 24-28, 38-34, 33-43, and 44-48. A sextant should be examined only if there are two or more teeth present and not indicated for extraction. (Note: This replaces the former instruction to include single remaining teeth in the adjacent sextant.)

2.3 Index teeth: For adults aged 20 years and over, the teeth to be examined are: #17 or #16, #11, #26 or #27, #36 or #37, #31, and #46 or #47 The two molars in each posterior sextant are paired for recording, and if one is missing, there is no replacement. If no index teeth or tooth is present in a sextant qualifying for examination, all the remaining teeth in that sextant are examined and the highest score is recorded as the score for the sextant. In this case, distal surfaces of third molars should not be scored.

For subjects under the age of 20 years, only six teeth - 16,11, 26, 36, 31 and 46 - are examined. This modification is made in order to avoid scoring the deepened sulci associated with eruption as periodontal pockets. For the same reason, when examining children under the age of 15 are examined, pockets should not be recorded, i.e. only bleeding and calculus should be considered.

2.4 Sensing gingival pockets and calculus: An index tooth should be probed, using the probe as a "sensing" instrument to determine pocket depth and to detect subgingival calculus and bleeding response. The sensing force used should be no more than 20 grams. A practical test for establishing this force is to place the probe point under the thumb nail and press until blanching occurs. For sensing subgingival calculus, the lightest possible force that will allow movement of the probe ball tip along the tooth surface should be used.

When the probe is inserted, the ball tip should follow the anatomical configuration of the surface of the tooth root. If the patient feels pain during probing, this is an indicative of the use of too much force.

The probe tip should be inserted gently into the gingival sulcus or pocket and the total extent of the sulcus or pocket explored. For example, the probe is placed in the pocket at the disto-buccal surface of the second molar, as close as possible to the contact point with the third molar, keeping the probe parallel to the long axis of the tooth. The probe is then moved gently, with short upward and downward movements, along the buccal sulcus or pocket to the mesial surface of the second molar, and from the disto-buccal surface of the first molar towards the contact area with the premolar.

A similar procedure is carried out for the lingual surfaces, starting distolingually to the second molar.

2.5 Examination and recording: The index teeth, all remaining teeth in a sextant where there is no index tooth, should be probed and the highest score recorded in the appropriate box. The codes are:

0 = Healthy

1 = Bleeding observed, directly or by using mouth mirror, after probing

2 = Calculus detected during probing, but all the black band on the probe visible

3 = Pocket 4 - 5 mm (gingival margin within the black band on the probe)

4 = Pocket 6 mm or more (black band on the probe not visible)

X = Excluded sextant (less than two teeth present)

9 = Not recorded

2.4 Usage:% CPI means percentage of population affected with periodontal disease (calculate from highest score of each person. The sextant of CPI means the number of sextants in the mouth that had periodontal disease in different stage.

3. Prosthetic status

Prosthetic status was determined base on the percentage of prosthetic appliance in the mouth. The criteria is absent or present of prothetic and need or no need the prothetic separate by upper arch and lower arch. Therefore there are 4 type if prosthetic status

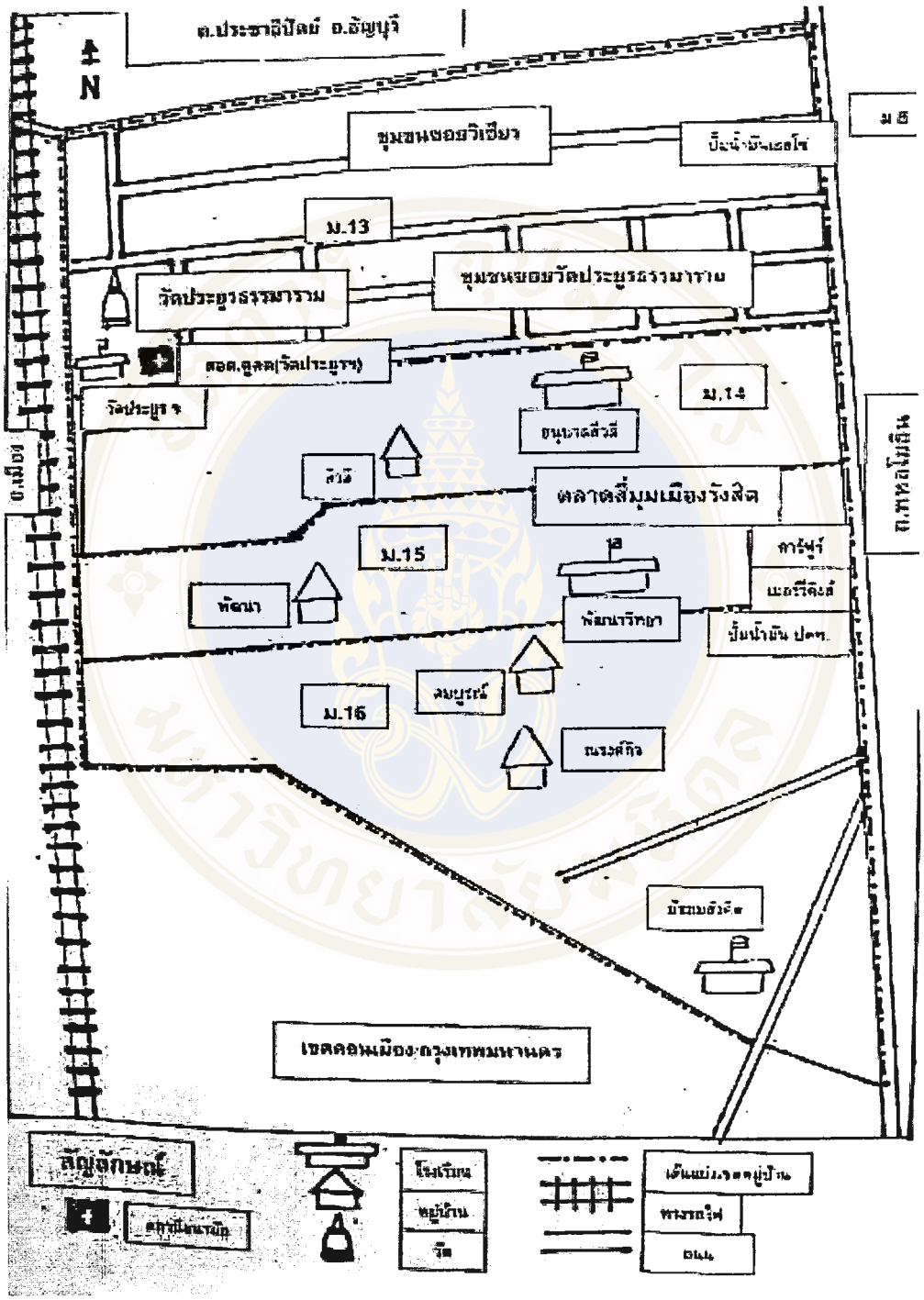
3.1 No edentulous area and no prosthesis need: This mean the person had no tooth loss and no need to wear denture.

3.2 Already have prosthesis and no prosthesis need: This mean there are some tooth loss but already wear the denture. The quality of prothesis is still good.

3.3 Already have prosthesis but need the new one: This mean there are some tooth loss and already wear the denture. The quality of prothesis is not good. Therefor need to wear the new prosthetics.

3.4 Have an edentulous area and need prosthesis: This mean there are some tooth loss and not wearing the denture. Therefor they need the denture prosthetic.

4. Map of study area



5.Questionnaire

แบบสัมภาษณ์ ความเป็นธรรมในเรื่องสุขภาพช่องปาก

หมายเลขแบบสอบถาม.....

เวลาเริ่มสัมภาษณ.....

เวลายุติสัมภาษณ.....

ผู้สัมภาษณ์.....วันที่.....รวมเวลาที่ใช้.....นาที

ชื่อผู้ให้สัมภาษณ์.....บ้านเลขที่.....ตรอก/ซอย.....

แบบสัมภาษณ์นี้ให้สัมภาษณ์กับผู้ที่อายุ 30-50 ปีที่อาศัยอยู่ในครัวเรือนมามากกว่า1 ปี โดยสุ่มสัมภาษณ์ทุกคนในครัวเรือนที่อยู่ในขณะนั้น แบบสัมภาษณ์นี้ประกอบด้วย 3 ส่วน

<u>ส่วนที่ 1 ข้อมูลส่วนบุคคล</u>

1. อายุ.....ปี

2. เพศ

( ) ชาย ( ) หญิง

3. การศึกษาสูงสุด

( ) ไม่ได้เรียน ( ) ไม่จบประถมศึกษา

( ) ประถมศึกษา ( ) มัธยมศึกษา

( ) ปวช./ปวส. ( ) ปริญญาตรีหรือสูงกว่า

4. ศาสนา

( ) พุทธ ( ) คริสต์

( ) อิสลาม ( ) อื่นๆ ระบุ.....

5.ท่านอยู่อาศัยในบ้านนี้มา.....ปี (ระยะเวลาที่อยู่อาศัย)

6. ภูมิลำเนาเดิมมาจากจังหวัด.....

( ) ปทุมธานี ( ) กรุงเทพมหานคร

( ) ภาคกลาง ( ) ภาคเหนือ

( ) ภาคใต้ ( ) ภาคตะวันออกเฉียงเหนือ

( ) ภาคตะวันออก ( ) ภาคตะวันตก

7. อาชีพในปัจจุบัน

( ) ปัจจุบันไม่ได้ทำงาน เนื่องจาก

( ) เป็นแม่บ้าน (ถ้าเป็นแม่บ้านให้ถามอาชีพเดิมก่อนเป็นแม่บ้าน)

( ) ยังหางานทำไม่ได้

( ) อื่นๆ ระบุ.....

( ) ปัจจุบันทำงานโดยประกอบอาชีพหลัก คือ

( ) กลุ่มวิชาชีพอิสระ เช่น แพทย์ ทันตแพทย์ สัตวแพทย์ วิศวกร สถาปนิก ผู้พิกพากษา อัยการ ทนายความ

( ) ข้าราชการ ระบุระดับ.....

( ) ลูกจ้างประจำในระบบราชการ

( ) พนักงานรัฐวิสาหกิจ ระบุระดับ.....

( ) ทหาร ตำรวจ ระบุยศ.....

( ) นักวิชาการ อาจารย์ในมหาวิทยาลัย ครูและอาจารย์ในโรงเรียน

( ) ผู้ประกอบการค้า (เป็นเจ้าของกิจการ)

( ) เจ้าของธุรกิจ มีลูกจ้างจำนวน.....คน

( ) หาบเร่แผงลอย

( ) พนักงานที่ได้รับเงินเดือนประจำ

( ) ผู้จัดการ ผู้บริหาร หัวหน้าฝ่าย หัวหน้าแผนก

( ) พนักงานปฏิบัติงาน พนักงานขาย เสมียน

( ) ช่างฝีมือ พนักงานโรงงาน ยาม พนักงานรักษาความปลอดภัย พนักงานเสริฟอาหาร คนรับใช้ตามบ้าน พนักงานขับรถ ฯลฯ

( ) งานเกษตรกรรม

( ) มีที่ดินเป็นของตนเอง.....ไร่

( ) ไม่มีที่ดินของตนเอง รับจ้างทำเกษตรกรรม

( ) งานที่มีรายได้ไม่ประจำ รับจ้างรายวัน เช่น กรรมกรรับจ้างรายวัน ช่างต่างๆ มอเตอร์ไซด์รับจ้าง รับจ้างเด็ดพริก รับจ้างซักผ้า ฯลฯ

8. รายได้ทั้งหมดระบุโดยประมาณต่อเดือน.....บาท

9. ปัจจุบันท่านมีหลักประกันสุขภาพดังต่อไปนี้หรือไม่

( ) สวัสดิการข้าราชการ (จากตนเอง คู่สมรส หรือบุตรที่รับราชการ)

( ) สวัสดิการพนักงานรัฐวิสาหกิจ

( ) สวัสดิการจากบริษัทเอกชน

( ) ประกันสังคม

( ) บัตรประกันสุขภาพของรัฐ

( ) ประกันสุขภาพเอกชน

( ) สวัสดิการผู้มีรายได้น้อย(บัตร สปร.)

( ) อื่นๆ ระบุ.....

( ) ไม่มีหลักประกันใดๆ

ส่วนที่ 2 พฤติกรรมสุขภาพช่องปาก

1. การดูแลสุขภาพช่องปาก

1. ปกติท่านทำความสะอาดฟันของท่านอย่างไร (เลือกได้ 1ข้อ)

( ) ไม่ได้ทำอะไรเลย (ข้ามไปถามข้อ 4)

( ) บ้วนปากเพียงอย่างเดียว ไม่ได้แปรงฟัน

( ) แปรงฟันเป็นบางวัน

( ) แปรงฟันสม่ำเสมอทุกวัน วันละครั้ง

( ) แปรงฟันสม่ำเสมอทุกวัน วันละ 2 ครั้ง หรือมากกว่า

( ) อื่นๆ ระบุ.....

2. ท่านแปรงฟันเวลาใดบ้าง (เลือกได้มากกว่า 1 ข้อ)

( ) ตื่นนอนตอนเช้า

( ) ก่อนเข้านอน

( ) หลังอาหารกลางวัน

( ) อื่นๆ ระบุ.....

3. ยาสีฟันที่ท่านใช้เป็นประจำ (ถ้าใช้หลายยี่ห้อให้ระบุยี่ห้อที่ใช้บ่อยที่สุด)

( ) ยาสีฟันผสมฟลูออไรด์ ระบุ.....

( ) ยาสีฟันที่ไม่มีฟลูออไรด์ ระบุ.....

( ) ไม่ได้ใช้ยาสีฟัน

4. นอกเหนือจากการแปรงฟันแล้ว ท่านทำความสะอาดฟันด้วยวิธีอื่นๆเพิ่มเติมหรือไม่ (ตอบเฉพาะข้อที่ใช้เป็นประจำ(ใช้มากกว่า 4 วันใน1สัปดาห์) และ เลือกได้มากกว่าหนึ่งข้อ)

( ) ไม่ได้ทำ

( ) ใช้เส้นใยในล่อนขัดฟัน

( ) ใช้ไม้จิ้มฟัน

( ) ใช้น้ำยาบ้วนปาก

( ) อื่นๆ ระบุ.....

5. ของกินเล่นที่ท่านชอบกินเป็นประจำ ได้แก่อะไร และกินบ่อยเพียงใด

	บ่อย	บางครั้ง	ไม่กินเลย
5.1 เครื่องดื่มที่มีน้ำตาล(น้ำหวาน น้ำอัดลม ฯลฯ)			
5.2 แป้งและน้ำตาลที่เป็นของแข็ง (ขนมกรอบบรรจุถุง ขนมปัง คุกกี้ เค็ก ฝอยทอง ฯลฯ)			
5.3 น้ำตาลที่ละลายช้า (ลูกอม ยาอม หมากฝรั่ง ฯลฯ)			

หมายเหตุ "บ่อย" หมายถึง กินมากกว่า 4 วันใน1 สัปดาห์ "บางครั้ง" หมายถึงกิน1 -4 วันใน 1 สัปดาห์

2. อาการในช่องปาก

1. ในรอบปีที่ผ่านมา ท่านมีอาการภายในช่องปากหรือไม่

( ) ไม่มีอาการ

( ) มีอาการเสียวฟัน เวลาที่ท่านมีอาการเสียวฟันแล้ว ท่านทำอย่างไร (ให้เลือกข้อที่ทำเป็นประจำเพียงข้อเดียว)

( ) ปล่อยให้หายเอง

( ) รักษาด้วยตนเอง เช่น อมเกลือ เอายาหม่องทา ฯลฯ

( ) ซื้อยามารับประทานด้วยตนเอง

( ) ไปรักษากับทันตแพทย์ที่โรงพยาบาล

( ) ไปรักษากับทันตแพทย์ที่คลินิกเอกชน

( ) รักษาโดยวิธีอื่นๆ

( ) มีอาการปวดฟัน เวลาที่ท่านมีอาการเปวดฟันแล้ว ท่านทำอย่างไร (ให้เลือกข้อที่ทำเป็นประจำเพียงข้อเดียว)

( ) ปล่อยให้หายเอง

( ) รักษาด้วยตนเอง เช่น อมเกลือ เอายาหม่องทา ฯลฯ

( ) ซื้อยามารับประทานด้วยตนเอง

( ) ไปรักษากับทันตแพทย์ที่โรงพยาบาล

( ) ไปรักษากับทันตแพทย์ที่คลินิกเอกชน

( ) รักษาโดยวิธีอื่นๆ

( ) มีอาการเหงือกบวมหรือฟันโยก เวลาที่ท่านมีอาการเหงือกบวมหรือฟันโยก แล้วท่านทำอย่างไร (ให้เลือกข้อที่ทำเป็นประจำเพียงข้อเดียว)

( ) ปล่อยให้หายเอง

( ) รักษาด้วยตนเอง เช่น อมเกลือ เอายาหม่องทา ฯลฯ

( ) ซื้อยามารับประทานด้วยตนเอง

( ) ไปรักษากับทันตแพทย์ที่โรงพยาบาล

( ) ไปรักษากับทันตแพทย์ที่คลินิกเอกชน

( ) รักษาโดยวิธีอื่นๆ

( ) มีอาการเลือดออกเวลาแปรงฟัน เวลาที่ท่านมีอาการเลือดออกเวลาแปรงฟันแล้วท่านทำอย่างไร (ให้เลือกข้อที่ทำเป็นประจำเพียงข้อเดียว)

( ) ปล่อยให้หายเอง

( ) รักษาด้วยตนเอง เช่น อมเกลือ เอายาหม่องทา ฯลฯ

( ) ซื้อยามารับประทานด้วยตนเอง

( ) ไปรักษากับทันตแพทย์ที่โรงพยาบาล

( ) ไปรักษากับทันตแพทย์ที่คลินิกเอกชน

( ) รักษาโดยวิธีอื่นๆ

( ) มีอาการอื่นๆ เวลาที่ท่านมีอาการดังกล่าวแล้ว ท่านทำอย่างไร
(ให้เลือกข้อที่ทำเป็นประจำเพียงข้อเดียว)
( ) ปล่อยให้หายเอง
( ) รักษาด้วยตนเอง เช่น อมเกลือ เอายาหม่องทา ฯลฯ
( ) ซื้อยามารับประทานด้วยตนเอง
( ) ไปรักษากับทันตแพทย์ที่โรงพยาบาล
( ) ไปรักษากับทันตแพทย์ที่คลินิกเอกชน
( ) รักษาโดยวิธีอื่นๆ

2. ขณะนี้ท่านคิดว่าสุขภาพช่องปากของท่านเป็นอย่างไร
( ) สุขภาพช่องปากดีมาก
( ) สุขภาพช่องปากดี
( ) สุขภาพช่องปากปานกลาง พอใช้ได้
( ) สุขภาพช่องปากไม่ดี
( ) สุขภาพช่องปากแย่มาก ไม่ดีเลย

3. ท่านคิดว่าในขณะนี้ (สัปดาห์นี้) ท่านต้องการที่จะไปรับบริการทันตกรรมหรือไม่
( ) ต้องการมาก
( ) ต้องการปานกลาง
( ) ไม่ต้องการ (ไม่ต้องถามคำถามถัดไป ให้ข้ามไปถามส่วนที่ 3)

4. ถ้าท่านต้องการไปรับบริการทันตกรรม ท่านต้องการไปใช้บริการทันตกรรมอะไรบ้าง
( ) ถอนฟัน
( ) อุดฟัน
( ) รักษารากฟัน
( ) ขูดหินปูน
( ) ใส่ฟันปลอม
( ) ตรวจฟัน
( ) อื่นๆระบุ.....

ส่วนที่ 3 การใช้บริการทางทันตกรรม

1. ท่านไปใช้บริการทันตกรรมในรอบ 1 ปีที่ผ่านมาหรือไม่ (1 มกราคม 2542 ถึง 31 ธันวาคม 2542)
( ) ไม่เคยไปใช้บริการ เนื่องจาก (ตอบได้มากกว่า 1 ข้อ และไม่ต้องถามคำถามถัดไป)
( ) ไม่มีอาการ หรือ ไม่ได้เป็นโรคฟัน
( ) ค่ารักษาแพง หรือ ไม่มีเงินไปรักษา
( ) สถานบริการอยู่ไกล
( ) สถานบริการไม่น่าเชื่อถือ
( ) เสียเวลาคอยนาน หรือ เจ้าหน้าที่บริการไม่ดี

( ) ไม่มีเวลา ลาหยุดพักงานไม่ได้

( ) กลัวการทำฟัน

( ) กลัวติดโรคจากการทำฟัน

( ) ไม่รักษาก็หายเองได้

( ) อื่นๆระบุ.....

( ) เคยใช้บริการทันตกรรม ระบุจำนวนครั้งที่ใช้บริการ.....

2. ในรอบปีดังกล่าว ท่านไปใช้บริการทันตกรรมอะไรบ้าง ค่าใช้จ่ายเท่าใด (โดยประมาณ)

( ) ถอนฟัน ค่าใช้จ่าย.....บาท

( ) อุดฟัน ค่าใช้จ่าย.....บาท

( ) รักษารากฟัน ค่าใช้จ่าย.....บาท

( ) ขูดหินปูน ค่าใช้จ่าย.....บาท

( ) ใส่ฟันปลอม ค่าใช้จ่าย.....บาท

( ) ตรวจฟัน ค่าใช้จ่าย.....บาท

( ) อื่นๆระบุ..... ค่าใช้จ่าย.....บาท

3. ท่านได้ใช้สิทธิในการเบิกค่าทำฟันจากหลักประกันสุขภาพต่างๆหรือไม่

( ) ไม่ได้เบิกค่าทำฟัน

( ) ใช้สิทธิเบิก.....บาท

4. สถานบริการที่ท่านใช้บริการคือ (ถ้าใช้บริการมากกว่า 1 แห่ง ให้เลือกแห่งที่ใช้บริการเป็นประจำ)

( ) โรงพยาบาลประชาธิปัตย์

( ) โรงพยาบาลธัญญารักษ์

( ) โรงพยาบาลภูมิพล

( ) คลินิกกุลนิธิทันตแพทย์

( ) คลินิกบัวทันตแพทย์

( ) คลินิกหมอมวลชน

( ) อื่นๆ ระบุ.....

5. ท่านคิดว่าท่านพึงพอใจต่อสถานบริการที่ท่านใช้บริการเพียงใด

	พอใจ	เฉยๆ	ไม่พอใจ
5.1 การเดินทางมาสถานบริการ			
5.2 เวลาที่ต้องคอยก่อนรับบริการ			
5.3 ความสะอาดของสถานบริการ			
5.4 การบริการของเจ้าหน้าที่			
5.5 การบริการของทันตแพทย์			
5.6 ราคาค่าบริการทางทันตกรรม			

BIOGRAPHY

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INSTITUTION ATTENDED Chulalongkorn University, 1984-1990
Doctor of Dental Surgery
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Diploma in Clinical Science
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2000- Present

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