

I. Introduction

Health insurance in Thailand particularly, voluntary insurance, is still under early development and has yet to seriously address the question of equity. Health care expenditure in the last five years has increased rapidly without clear evidence of increased quality of care. The increase in provision of private health services has raised the question of the high cost of care and the efficient allocation of resources. Only high income groups can afford and access a better quality of care. This widens the gap of inequality. Health systems are complicated and thus need the state to play an appropriate role in the health sector. Musgrove (1996) concluded that in general government can employ five different instruments to affect private market outcomes: creating and disseminating information, regulating private activity, mandating certain actions by individuals or firms, financing health-related services or delivering those services through public facilities and staff.

At present there are various government plans in Thailand that aim at solving problems in the health sector. A number of health insurance schemes were initiated and now are under reconsideration. Economic systems and socio-economic pattern have been changed rapidly, creating inequalities among regions and populations and making problems more complex. Health is no exception; indeed, health planning must be done carefully to ensure relevant health care appropriate to each group. Although Thailand has a variety of health insurance plans and objectives to finance health care cost and provide health security for the Thai population, nonetheless, there is a large population, especially the poor and lower opportunity groups, not covered by any insurance schemes. Moreover, the current variety of health insurance schemes creates problems in term of equity and efficiency among the schemes as well. It is difficult to unify these schemes. The health card program (HCP), a voluntary prepaid rural health insurance scheme initiated by Ministry of Public Health (MOPH) in Thailand in 1983, has been implemented in all provinces in the country with many adjustments. This scheme targets the near poor and middle income classes in rural areas and will target the urban poor in the near future. The success of the project is still unclear.

There are two distinct types of health insurance coverage in some countries, such as USA and Canada, medical expense coverage and disability income coverage. This study emphasizes only the medical expense coverage which provides benefits to help the insured to pay for the medical treatment for sickness or injury. A case of injury relating to a car accident will be covered primarily by Car Accidental Insurance. The voluntary health insurance discussed here concentrates only on the Health Card Program, not on Private Health Insurance, since the insured in the latter case are the upper-middle and high income groups who can afford the premiums. The population coverage of private health insurance was only 1% of the total population in 1992 and the increasing trend is not high. The objective of this paper has been to assess the future potential for application of voluntary health insurance, the Health Card Program, in Thailand by utilizing the data collected in Khon Kaen where the recent program was implemented. This study indicates the problem, development and health service capability in the application of a voluntary health insurance (health card) scheme, identifies factors influencing health card project outcomes: *i.e.*, accessibility, sustainability and efficient use of resources, investigate the health card purchase and dropout patterns, and

evaluates the factors affecting the discrimination between health card purchase and non-purchase and also affecting dropouts from the continued health card member groups. The results of the study will provide more understanding of how the program perform and thus how to sustain it more efficiently find alternative ways to improve it.

II. Background

The Thai Economy

Thailand is a tropical country in Southeast Asia with a total population of 59.5 million in 1995. Of these, 29.7 million are male. In 1991 a total population was 56.2 million, of which 18.7% lived in urban areas. The data shown in Table 1 describes some important indicators. First, Thailand's economic structure is changing toward more industrialization, as reflected by the increase in the share of manufacturing and services products and the corresponding decrease in the share of agricultural products in the Gross Domestic Product (GDP). GDP increased about 7-9% annually during the late 1980s and 1990s. This not only affects labour structure, income distribution, and socio-economic patterns but also disease patterns. Income distribution in Thailand continued to grow more inequitable, while poverty incidence has significantly lessened. Second, the household consumption pattern did not change greatly from 1968 to 1994 except for a 70% increase in transport and communication consumption. This reflects the increase in the urban population. The long-term process of development and structural change also affects the process of urbanization in Thailand (Supakankunti, 1994). Overall, unbalanced development has been reported, widening regional inequalities and generating a complexity of urban problems (Chalamwong and Douglas, 1992). One primary purpose of urban health planning is to ensure relevant health care to groups in need, and the urban poor in particular (Buisai, 1995). This requires more careful consideration because the transition poses difficult questions for planners in all areas. Many of the key issues in this field are relevant to the general effects of changing policies.

Table 1: Selected Socio-Economic and Health Indicators (25 Baht:U.S. \$)

Year	1983	1988	1995
Population (million)	49.5	54.5	59.5
Year	1983	1988	1994
GNP per capita (US\$)	736.16	1,130.24	2,400.32
Composition of GDP at 1988 prices(%)	1980	1989	1994p
Agriculture	20.2	15.8	11.5
Mining and Quarrying	0.8	1.6	1.6
Manufacturing	23.1	26.7	30.4
Construction	4.6	5.5	6.4
Services	51.3	50.4	50.1

Table 1 (continued)

Source of average annual household income, whole kingdom, 1992

Wage and salary	39.0		
Profit, non-farm	18.5		
Profit from farming	12.6		
Property income	1.5		
Current transfer	5.8		
Income-in-kind	21.1		
Other money receipts	1.5		
 Share of total household monthly expenditure(%)			
Year	1968	1988	1994
Food, alcoholic beverages, tobacco	41.9	40.3	34.7
Clothing and footwear	6.2	6.2	5.7
Housing	23.4	24.3	23.1
Medical and personal care	6.1	6.0	6.0
Transport and communication	9.1	9.7	15.4
Education, recreation, misc.	5.4	4.9	5.3
Non-consumption expenditure	7.9	8.6	9.8
 Ratio of population to health service personnel			
Year	1975	1988	1993
Physician	8,466	4,881	4,279
Dentist	65,018	32,911	20,939
Pharmacist	22,160	14,931	12,357
Nurse	3,349	1,076	792
Midwife	6,692	4,942	5,543
 Number of general services hospitals and hospital beds ¹			
Year	1982	1988	1992
Government hospitals	518	728	796
Beds	54,374	66,444	69,965
Private hospitals	164	174	223 ²
Beds	6,738	8,515	13,051 ³

Table 1 (continued)

Life expectancy at birth (years), 1980-2015

¹ Including state enterprise and municipality hospitals

² 28% increase in number of private hospital within 4 years

³ 53% increase in number of private hospital beds within 4 years

Year	Male	Female			
1980-1985	62.60	68.05			
1985-1990	64.35	69.30			
1990-1995	65.85	70.55			
1995-2000	67.35	71.80			
2000-2005	68.35	72.80			
2005-2010	69.35	73.55			
2010-2015	70.10	74.30			
Average annual growth of population (%)	1980-1988 1.9	1988-2000 1.3			
Year	1970	1980	1990	1992	
Crude birth rate (per 1,000 pop.)	33.30	22.99	16.98	16.69	
Crude death rate (per 1,000 pop.)	6.51	5.29	4.48	4.76	
Infant mortality rate (per 1,000 live births)	25.50	13.30	8.00	7.50	
Year	1960	1970	1980	1992	
Human development index	0.373	0.465+	0.551	0.798	
Life expectancy at birth (years)				68.70	
Adult literacy rate (%)			93.80		
Mean years of schooling				3.90	
Literacy index				0.94	
Schooling index				0.26	
Educational attainment				2.14	
Real GDP per capita(PPP\$)				5,270	
Adjusted real GDP per capita				5,144	

Source: Adapted from NSO 1986a; NSO 1988a; World Development Report 1993; Human Development Report 1995; Thailand Public Health 1995; Thailand in Figures 1996.

The Thai economy took an unexpected downturn in 1996. The National Economic and Social Development Board (NESDB) estimated economic growth for 1996 would be 6.8%, the first year of below 8% growth since 1993, in fact, the lowest in a decade. Exports, the engine of economic growth, slowed during 1996 and the overall exports of the country were not doing well. The Bank of Thailand expected that the 1996 export growth would be 0.5% or zero, compared with 23.6% growth in 1995. Import growth declined also during 1996. The slow growth in imports alone cannot improve the country's current account deficit. In early December 1996, the NESDB estimated the deficit for the whole of 1996 would be 385 billion baht, or 8.3% of the GDP, compared with 8.1% of the GDP for 1995. *The deficit remains an economic problem of major concern.* The poor performance of the Thai economy in 1996 was attributed to zero export growth, political instability and incompetence, and the tight monetary policy (Terdudomtham, 1996). These posed questions of how to

sustain growth and how to solve the consequent problems. The health sector, particularly health care financing, will have a serious problem in terms of sources of finance as well as the efficiency and sustainability of the voluntary health insurance program.

Prospects for the Thai Economy

In sum, most economists and exporters predict that Thai exports will increase in 1997. The NESDB estimated 14% but most research houses are more conservative at 8-11.5%. The performance of the Thai economy is related to government policies and government competence, the expansion of world trade and the trade agreement between Thai and the other major trade partners.

With growing exports and a reduction of interest rates, private investment and manufacturing production are expected to pick up in 1997. The NESDB has forecast overall growth of 7.2% in 1997. However, the current account deficit remains of major concern. The government is likely to try to reduce it by encouraging saving through provident and pension funds. *The government appears to be heading for a deficit in the 1997 fiscal year for the first time after nine consecutive years of surpluses.* In sum, the Thai economy in 1997 looks somewhat mixed. Exports are likely to improve and economic growth may reach 7%, which is relatively high when compared with that of other developing countries. But deficits in the current account and government budget cast an ominous shadow (Terdudomtham, 1996).

Income Distribution

Kakwani and Krongkaew (1996) analysed the income distribution using the result of the 1994 Socio-economic Survey (SES) conducted by the National Statistical Office that was made available during the last quarter of 1996. In sum, the report shows that income of Thais has started to rise substantially since the latter half of the 1980s. But 1986 was one of the worst years for the majority of Thai farmers when the plunge in the price of rice caused hardship in the farm sector throughout the country. *In fact, the average income of the rural people, especially in the Northeast, actually declined in absolute terms compared to the previous year.* But there was an improvement for Thailand in 1987, with tremendous success in its external sector led by export growth and increases in foreign direct investment and revenue from foreign tourists. At least until 1994 the Thai people across the board had enjoyed a sustained increase in their income, both through a direct effect as well as a trickle-down effect of economic expansion. However, *it has been known that the poor in Thailand are found mainly in rural areas, especially in the Northeast* (Kakwani and Krongkaew, 1996). If the income of the rural poor increases, the poverty incidence or the proportion of the poor must fall. This is true if the criteria for cutting off income being used to classify the poor from the non-poor remains the same. Thus the problem concerns the definition of the poverty lines, which must be improved in order to classify the real poor.

Incidence of Poverty, 1988-1994

Table 2: Percentage of the Poor

	1988	1990	1992	1994
North	31.6	22.8	24.7	12.6
Municipal areas	11.5	7.3	3.6	3.0
Sanitary districts	29.0	15.6	13.2	7.0
Villages	34.1	25.4	28.5	14.4
Northeast	42.1	33.5	38.0	22.8
Municipal areas	13.7	15.0	10.3	4.1
Sanitary districts	24.6	17.8	23.8	15.5
Villages	45.0	35.7	40.7	25.1
Central	21.7	17.2	11.7	7.5
Municipal areas	5.6	5.6	1.2	3.7
Sanitary districts	13.2	16.4	6.4	4.0
Villages	25.6	19.2	14.2	8.8
South	35.6	29.5	21.9	19.0
Municipal areas	11.3	11.0	6.9	3.9
Sanitary districts	21.3	23.8	10.8	10.0
Villages	40.9	33.1	25.4	22.3
Bangkok	2.7	3.2	1.9	0.6
Bangkok vicinity	7.0	3.0	1.7	1.2
Municipal areas	7.4	3.8	0.7	0.0
Sanitary districts	2.6	1.6	1.8	1.5
Villages	8.8	2.3	3.0	1.5
Whole kingdom	29.9	23.5	23.1	14.3
Municipal areas	5.9	5.6	3.0	1.8
Sanitary districts	19.8	16.0	12.6	8.5
Villages	37.4	29.2	29.8	18.7

Source: Kakwani, N. and Krongkaew, M. 1996.

Kakwani and Krongkaew (1996) adjusted the poverty line for Thailand by taking into account three important factors that determine the new poverty cut-off income: sex and age of the people, family size and region. Table 2 presents the incidence of poverty in Thailand in 1988, 1990, 1992 and 1994 using the new poverty lines. In 1988 for the whole kingdom, poverty incidence was estimated at 29.9%. It still showed poverty incidence falling a little from 29.9% in 1988 to 23.5% in 1990, and to 23.1% in 1992 and declining dramatically to 14.3% in 1994. The decline of poverty incidence was most pronounced in the rural Northeast where the percentage of the poor fell from 40.7% in 1992 to 25.1% in 1994. This is because the new poverty lines are more sensitive to price changes, particularly *food prices which are major expenditure items for the poor*, than the old lines (Kakwani and Krongkaew, 1996).

Income Inequality

In Thailand, from the 1960s to 1992, there was an improvement in poverty incidence but inequities in the distribution of income continued to grow. Table 3 shows measurements for the income distribution in Thailand.

Table 3: Income Share by Quintile Groups

Unit: baht/person/month

	1988	1990	1992	1994	1996
Quintile 1	4.60	4.20	3.94	3.99	4.49
Quintile 2	8.13	7.38	7.02	7.29	7.88
Quintile 3	12.46	11.50	11.06	11.60	12.10
Quintile 4	20.66	19.26	18.95	19.60	20.14
Quintile 5	54.16	57.67	59.04	57.52	55.38
T/B ratio	11.8	13.7	15.0	14.4	12.3
Gini coefficient	0.485	0.522	0.536	0.525	0.497

Source: Kakwani, N. and Krongkaew, M. 1996.

Table 3 shows an increasing trend of income inequality among the Thai population from 1988 to 1992 by all three measures of income distribution. The T/B ratio, which reflects the superior income position of the richest quintile, increased from 11.8 to 15.0 during the same period. The Gini coefficient was shown to have increased from 0.485 in 1988 to 0.536 in 1992. From the previous years, the increasing income inequality trend was common until 1994. The period from 1992 to 1994 was the special period of adopting a policy of "spreading prosperity from the center to the countryside". The result of the 1994 SES on income distribution of the Thai population shows an improvement in income distribution in Thailand in 1994 for the first time in almost three decades of continuous measurement. The Gini coefficient for 1994 confirms this with the value of 0.525 compared to 0.536 in 1992 (Kakwani and Krongkaew, 1996).

Many government agencies had tried to streamline their regional and rural expenditures to make them more effective towards income augmentation or poverty alleviation. *Rural industrialization policy has begun to work both as a result of investment promotions and as a result of lower-cost conditions of the countryside.* The increase in employment opportunities and income of the rural people behaves like a twin engine that reduces poverty and income inequality at the same time (Kakwani and Krongkaew, 1996). The changing in socioeconomic pattern also has an impact on type and cost of care, disease pattern and health insurance making problems more complex.

Insurance

The Thai insurance industry did well in 1996 as reported by Keeratipipatpong (1996) below.

The Thai insurance industry did well in 1996 on the back of life and casualty and property businesses that notched up 16-17% growth. If the industry maintains this growth, it expects gross premiums to exceed 60 billion baht by 1997. Non-life insurance also performed satisfactorily, especially in the automobile business, for which growth for 1996 was estimated at 18.8%, boosting the overall growth of non-life business to 16.79% by the end of 1996, according to the research and planning division of Thai Reinsurance Plc. With premiums from both insurance businesses expected to combine to total more than 120 billion baht in 1997, consumers are eager to see more competition in the industry and more effective consumer protection regulations.

The 1992 law requires non-life insurance companies to maintain their capital fund at not less than 10 percent of all net premiums received for the last calendar year or not lower than 30 million baht. Nine insurance companies, of which four operate non-life insurance, and five health insurance, are currently reported short of capital funds. *Limits in allowable services have caused a number of health insurance businesses to be in this situation.* To solve the problem, the department is considering allowing these companies to broaden/diversify their products beyond health. The issue of new insurance licenses is still ensnared in politics and no decision has yet been made, although names of qualified applicants were reported as far back as 1995 (Keeratipipatpong, 1996).

Table 4: Insurance Premiums (Jan-Sep 1996)

	Life Insurance	Accidental Insurance	Health Insurance	Total	Industry	Group	Gross Premiums
AIA	14,016.77	2,086.57	2,401.73	18,505.07	0.00	574.02	19,079.10
Total	27,126.37	2,879.95	2,986.51	32,992.83	5,011.71	1,528.20	39,532.74

Source: Insurance Department

The US-based American International Assurance Co. (AIA), the only foreign life insurance branch in Thailand, has maintained its top position for another year to controlling almost 50% of the total premiums of 39.53 billion baht in the first nine months of this year. AIA's gross premiums from the period were 19.09 billion baht while 20.43 billion baht in premiums were accounted for by 12 local companies.

Slow Growth for Non-Life Business

Non-life insurance in 1997 is forecast to expand by 14.78%, a slight drop from the 1996 growth, which was 16.76%. Auto insurance is expected to produce the highest portion of growth, with 47.81 billion baht in gross premiums, expected to rise by 15.8% over the 1996; followed by fire insurance, with 10.24 billion baht, a rise of 10.9%, miscellaneous insurance

9.74 billion baht, or 14.2%, and marine insurance 3.33 billion baht, 13.4%. Thai Reinsurance Plc said the expansion will be based mainly on a GDP of 5,597.28 billion baht, with exports worth 1,713 billion baht and imports of 2,602.8 billion baht. The total number of plants in 1997 is expected to be 103,907 and the population will be 61.14 million.

Another major problem occurring in insurance industry is the problem of agent efficiency. The productivity per agent is low when compared to that of international insurance companies. For example, productivity per head in Japan's casualty and property insurance industry in 1995 was 23 million baht, meaning one agent could produce up to 23 million baht in premiums per annum. The runner-up was Switzerland (21 million baht), France (20 million baht), Germany (19.8 million baht), the US (15.8 million baht), Britain (13.8 million baht) and Thailand (2.8 million baht). The research said the shortage may be addressed by boosting the efficiency of personnel and modernizing operations (Keeratipipatpong, 1996).

Health Delivery System and Health Care Financing in Thailand

Health Delivery System

To analyze health care financing, it is necessary to understand the health delivery system and health service utilization pattern as well. Table 5 shows the consistent trend in choice of outlets used by ill individuals. From 1970-85, there was an increasing expectation and use of public outlets staffed by physicians and a decreasing trend in using self-prescribed drugs and traditional medicines, or attendance of healers. This reflects the aim of the Fifth National Health Development Plan (1982-86) to achieve one hundred percent district coverage in the country and the three-year compulsory service programme at MOPH district hospitals imposed on all medical graduates in 1972. The consequence was an increase in the number of hospitals and doctors at the district levels, which undoubtedly began to meet the previously unmet demand for health services in rural areas, and led to a significant three-fold increase in the use of public hospitals in 1985 compared with in 1979 (Tangcharoensathien, 1995).

Table 5: Health Service Utilization Pattern for Reported Ill Persons Comparing Different Surveys

Choice of Outlet	1970	1979	1985
No treatment	2.7	4.2	-
Traditional Medicine/Healers	7.7	6.3	2.4
Self-prescribed drugs	51.4	42.3	28.6
Public health centers	4.4	16.8	14.7
Public hospitals	11.1	10.0	32.5
Private clinics/hospitals	22.7	20.4	21.8

Source: Tangcharoensathien (1995) originally from Health Planning Division, MOPH.
1970,1979; Institute for population and Social Research, Mahidol University, 1988.

Moreover, when looking at the employment status and type of health service utilizations in 1986 it is clear that the percentage of health service utilization by self treatment was highest in all occupational groups. Between the professional & administration groups and those of farmers&miners there were some differences in proportions, *i.e.*, self treatment was more than 50 % in the farmers' group but was lower than 50% in the professional group. The professional group has relatively much higher use of private clinics and hospitals than the farmer group, while utilization rate in public facilities were similar.

Trends in Health Expenditure

In 1987, 5.7% of the GNP was spent on health, including private household payments and public health expenditures. Health expenditure has been steadily increasing at a higher rate than the growth of the GNP. In 1984, a 12% real term increase in health expenditure was due to the high capital investment for constructing district hospitals as stated above. By the year 2000, the projected health expenditure will be 8.1% of the GNP. Per capita health expenditure will be three times that of 1987 and will be as high as in developed countries (Tangcharoensathien, 1995).

Table 6: Trend of Total per Capita Health Expenditure (Public and Private Spending)
 (1987 prices) (25 Baht:US\$)

Year	% of GNP on health	Per capita expenditure (Baht)	% increase health expenditure	% GDP growth
1978	3.4	680	-	-
1979	3.6	710	4.4	5.05
1980	3.9	738	3.9	4.57
1981	4.2	798	8.1	5.96
1982	4.6	864	8.3	3.90
1983	4.8	939	8.7	6.76
1984	5.2	1,052	12.0	6.65
1985	5.6	1,132	7.6	3.40
1986	5.6	1,192	5.3	4.30
1987	5.7	1,282	7.6	7.74
Projected				
2000	8.1	3,718		

Source: Modified from Tangcharoensathien (1995) originally from Social Development Project Division, NESDB 1990.

Note: The GDP growth rate in 1988 and 1989 is 12.0% and 10.8% respectively.

Source of Health Care Financing

Percent source of health care financing in 1984, 1986 and 1987 at 1987 prices is shown in Table 7, demonstrating trends in sources of finance during the past decade. Public sources of funding play a minor role in financing health services with a decreasing trend from 27.9% of total health expenditure in 1984 to 24.2% in 1987. The most important source is private out-of-pocket expenditures by households, with an increasing trend from 69.3% in 1984 to 73.2% in 1987. It must be noted that some of the private household expenditures on health could be reimbursed from Ministry of Finance, for government employees and dependents, while others may be reimbursed from employers. Among the public services, the MOPH is the major provider of the country, providing comprehensive health care mainly in areas outside the Bangkok Metropolis (Tangcharoensathien, 1995). Private household expenditures on health were mainly to pay for curative care either through user fees at government facilities or charges at private clinics and drug stores.

**Table 7: Percent Source of Health Care Financing in 1984, 1986 and 1987
at 1987 Prices**

Sources of funding	1984	1986	1987
Public sources:	27.9	26.0	24.2
MOPH	17.4	15.3	14.1
Other ministries	6.9	6.5	6.0
Public employee medical benefits	3.6	4.2	4.1
Workmen's compensation fund	0.5	0.4	0.4
State enterprise employee medical benefits	0.8	0.9	0.8
Private insurance	0.8	0.7	0.7
Foreign aid	0.8	0.8	0.7
Private households	69.3	71.2	73.2
Total: Percent	100.0	100.0	100.0
Million Baht	53,032.9	62,099.9	67,771.3

Sources: Nittayaramphong and Tangcharoensathien, 1994 originally from Health Planning Division, MOPH; National Accounts; Workmen's Compensation Fund, Ministry of Labour and Social Welfare; The Controller-General's Department, Ministry of Finance; Financing Health Service and Medical Care in Thailand, 1987 report, MOPH.

Table 8: Budget Expenditures Classified by Program, Fiscal Years 1994-1996

Unit:million baht

Program	1994	1995	1996
Budget expenditures (Percent)	625,000	715,000	843,200 (100.0)
-Economic development	127,846.4	149,114.3	186,788.3 (22.15)
-Social development	243,404.2	277,923.7	353,363.7 (41.91)
-Education	124,457.9	137,641.4	169,560.7 (20.11)
-Public Health	44,335.0 (7.09)	52,372.7 (7.33)	63,452.2 (7.53)
-Social services	74,611.3	87,909.6	120,350.8 (14.27)
-Maintenance of national security and maintenance of internal peace and order	125,063.9	131,886.1	148,304.3 (17.59)
-General services	70,172.7	111,345.1	106,751.7 (12.66)
-Debt services	58,512.8	44,730.8	47,992.0 (5.69)

Source: Bureau of the Budget, Office of the Prime Minister.

In 1996, of the total baht 843,200 million government budget, 9.1% was for agriculture, 10.2% for transportation and communication, 20.1% for education, 14.3% for social services, 12.8% for maintenance of national security and 7.53% for public health. The budget for health remained consistent at the rate of 7.1-7.5% of the total public spending in the period 1994-1996, compared to 4.1-4.5% in the previous decade. All expenses are financed by the government's receipts comprised of revenue and borrowings. In fiscal year 1996, of the total baht 843,200 million government's estimated receipts, 87.4% was from taxes, 7.0% income from state enterprises, 3.0% income from sales of assets and services and 2.6% from miscellaneous income. Only 36.56% of government tax revenue came from personal income tax and corporate income tax. All indirect tax accounted for 71.31%: general sales tax 30.54%; export/import duties 18.09% and specific sales tax 21.98% (calculated from Thailand in figures, 1996).

Health Insurance Development

Health insurance is a means of financial protection against the risk of unexpected and expensive health care. In countries like Thailand, where the use of government health services is heavily subsidized, governments are implicitly covering the risk of incurring high cost care. This limits the demand for more explicit types of risk-sharing arrangements. Explicit forms of health insurance are widespread in the industrialized or middle income countries. In some countries, such as Canada, Japan, and most European countries, coverage is compulsory and universal and the insurance programme is financed from either general government revenue or payroll taxes. In the USA, insurance coverage is voluntary, administered by third parties, and not universal and is usually financed by a combination of employer and employee contributions. The expansion of health insurance coverage is usually intended to increase health sector revenues, reduce financial barriers to care, and improving the efficiency of resource allocation and use (Kutzin, 1995). How to achieve the universal coverage when the proportion of the population in the formal sector is relative low, for example in a country like Thailand, is one of the major problems in expanding coverage.

Health insurance schemes in Thailand can be classified into 3 types : welfare and fringe benefit, compulsory, and voluntary health insurance as discussed below by Piyaratn and Janjaroen (1994) and Tangcharoensathien and Suphachutikul (1993).

There are 4 health insurance schemes in the welfare and fringe benefit category : Civil Service Medical Benefit Scheme (CSMBS), Free Medical Care for the Low Income Household Scheme (FC/L), Free Medical Care for the Elderly Scheme (FC/E) and School Health Insurance Scheme (SHI). The CSMBS, initiated in 1980, aims to provide medical care benefits to civil servants and employees, retired pensioners, and their dependents. Dependents include parents, spouses and up to 3 children under 20 years old. Benefits of this scheme include medical consultations, medical treatment, operations and other therapeutic care, drugs, inpatient care and obstetric delivery expenses. The total population coverage is estimated to be 6.4 million or 11% of the total Thai population in 1993.

The FC/L was initiated in 1975 with the twin objectives of creating more equitable access to health services and improving the health status of the poor. The target populations are single persons with income less than baht 2,000 or \$80 per month, baht 24,000 or \$960 per year, and married couples with income less than baht 33,600 or \$1,344 per year per person. The benefits are free medical services from public outlets and hospitals. The population coverage is 11.7 million or 21% of the total population in 1993.

The FC/E was implemented in 1992 with the aim of increasing accessibility to health services and improving the health status of the elderly. The target population is those citizens 60 years old and above who are not covered by other schemes. The benefits include outpatient and inpatient care provided at public facilities. The population coverage was 3.5 million or 6% of the total population in 1993.

Finally SHI, the school health insurance scheme, guarantees medical service to school children from grade 1 to grade 9 (around 6 - 14 years old). The population coverage in this

scheme was 6.7 million or 11.5% of the total population in 1993. The benefits cover outpatient and inpatient care at public service units. In some areas, dental services are also provided.

Compulsory insurance consists of 3 insurance schemes : Workmen Compensation Scheme (WCS), the Social Security Scheme (SSS) and Car Accidental Insurance (CAI). The WCS was introduced in 1974. The objectives of the scheme are to protect workers from illness, injuries, death and disability caused by work or work-related conditions. The target population are employees in firms with more than 10 workers. Benefits include medical compensation for work-related illness and injuries, temporary and permanent disability benefits, survivor's pension, funeral grants and rehabilitation expenses. Population coverage in 1992 was 2.8 million which was 5% of the total population.

The SSS was enacted in 1990 and implemented in February 1991. The objectives are to protect workers from non-occupational illness and injuries, and to compensate for maternity, disability and death. The target population are firms with more than 10 employees. Population coverage was 3.8 million or 7% of the total population in 1993.

The CAI scheme was implemented in 1992, with the main objectives of guaranteeing medical treatment for victims of vehicular accident. In theory or by law every vehicle owner, including motorcycle owners, must have this insurance; in practice many are uninsured.

Two health insurance schemes are voluntary: the Voluntary Health Insurance Scheme (VHIS), and Private Health Insurance (PHI). The PHI scheme was introduced in 1978 when Thai Medical and Health Company Limited was established. Its main objective was to improve security and provide better health care, often by combining life insurance and medical insurance for people in the upper-middle and high income groups who can afford the premiums. Population coverage was only 0.6 million or 1% of the total population in 1992.

The last scheme is VHIS, commonly known as the Health Insurance Card Scheme, first introduced as the Health Card Project in 1983. The three main objectives of this scheme are to promote community development under the primary health care program, foster the rational use of health services via a referral system, and increase health resources based on a community financing concept. The Voluntary Health Insurance Scheme has been continuously monitored and evaluated. Frequent adjustments of its strategies and objectives have included voluntary risk-sharing with cost-recovery in addition to service provision (Table 9). The target population are the near poor and middle income class in rural areas or those which can afford a premium. At present, the price of a health insurance card is baht 1,000 or \$40 per year per household of not more than 5 members. A Household contributes half of the price and the other half is subsidized by general tax revenue through the Ministry of Public Health. The benefits include outpatient care for illness and injuries, inpatient care, and mother and child health services. There is no limit on utilization of the services. The beneficiaries, however, can only go to health care provider units under the Ministry of Public Health. The first contact is either the health center or community hospital ; patients must then follow a referral line for higher levels of care. There is a specific time for card selling at

each health card cycle. At present the cycle is one year and the specific time for card selling depends on the seasonal fluctuations in income. The premium is collected when cash incomes are highest for example, when crops are harvested. In 1992 the population coverage by the health card program was 3.6 million or about 5% of the total population.

Table 9: Modification of Health Card Program: Rational, Objectives and Activities

	1983	1984-1986	1987-1991	1992-present
Rationale	1.MCH+FP (Community Financing) 1.MCH+FP 2.Referal System	1.PHC 1.PHC 2.Referal System 3.Integrated Services 4.MOPH decentralized decision making to provincial level 5.Community Financing 6.To reduce OP visits at provincial hospital	PHC+ Voluntary Health Insurance -To provide security to the people -PHC	Voluntary Health Insurance -To provide security to the people -Coverage all services
1.1 Implementing area	7 provinces 18 villages 1.Khon Kaen 2.Roei 3.Lamphun 4.Nakhon Sawan 5.Phetchaburi 6.Ratchaburi 7.Songkhla	1.At each provinces selecting 2 villages from one sub-district 2.Chiang Mai (GTZ) -In 1984 implementing in 4 districts,6 sub-districts and 33 villages -In 1985 whole province	At each provinces selecting 3 villages from 8 sub-districts in each district	68 provinces
1.2 Coverage	N/A	34% of population 55% of households	36% of households	20% of population 21% of households

Table 9 (continued)

	1983	1984-1986	1987-1991	1992-present

1.3 Type and price of card	-Medical care and MCH \$8 -Medical care \$4 -MCH \$4	-Family \$8 -MCH \$4	-Family \$12 -Individual \$8 -MCH \$4	Family \$20 (member<5) (MCH included) (Individual is an options)
1.4 Criteria for card using	-	8 episodes (Ceiling :\$80 per episode)	6 episodes (Ceiling: \$80 per episode)	No limit
1.5 Level: health card fund	Village	Village	Village	-District -Province
1.6 Subsidy	N/A	N/A	\$13.5 per card	\$20 per card
1.7 Share of health card fund	-	-Health service unit 75% (-Health center 15% -Community hospital 30% -Provincial and Regional hospital 30%) - health personal 10% - program managing 15%	N/A	-Health service unit : 80% -Incentive & Adm.: 20% of total monetary amount of card sales revenue (the formula differs slightly from year to year)

Source: Modified from Throngpan Singkaew (1995:19-21)

Summary Information on Health Card Program

The Health Card Program, introduced in 1983, is based on the risk sharing of health expenditure with no cost sharing in a voluntary health insurance prepayment scheme. Ideally, in a prepayment/insurance scheme, members enroll when healthy and only those who fall ill make use of services. The success of risk sharing in prepayment/insurance schemes depends upon the enrolling of a large enough number of people to ensure a sufficient pooling of risks.

Mechanisms for community financing of health resources, one of HCP's 3 main objectives, include revolving drug funds, nutrition funds, and other funds, which at present are health card funds. The health card program was gradually implemented in rural areas and later in 1985 started in some urban areas of six pilot provinces. The MOPH health facilities

are responsible for providing care to health card holders. During the HCP implemented nationwide before 1992, the MOPH decentralized decision-making to the provincial level allowing health agencies to define their own prices for health cards and policies of disease coverage, number of episodes, number of members, the level of compensation to providers, and the percentage of HCF kept in community. The number of members covered by a card varies by provinces but the premium is generally the same (Tangcharoensathien, 1995). In 1995 there were many adjustments in the program. Some of these were that no HCF is kept in the community, maximum number of members per card is 5, no limit is set on the number of episodes and no ceiling on health care expense. The price of a card is fixed at baht 500 (\$20 in 1995). MOPH set a general formula for allocating HCF, *i.e.*, to compensate the providers, for administrative cost and for incentives to sell cards, but kept decentralized decision-making at the provincial levels allowing those levels to design details of HCF allocation. In 1985-86, there was strong support from MOPH for the Health Card Program. In 1986, the program was described to the parliament as a key strategy towards a voluntary health insurance. Unfortunately, HCP has been a low priority for support by MOPH from 1989 until 1995. This reflects the overall HCP situation during 1988-1992. In 1990, the area coverage rate (%) in terms of population by HCP was 4.49 in 1988 and decreased to 2.6 in 1992. HCP covered 20.3% of village in 1988 increase to 33.6% in 1992; 48.2% of subdistricts in 1988 decrease to 30.2% in 1992; covered 79.7% of districts in 1988 decrease to 58.8% in 1992 (Health Insurance Office report, 1992; Kiranandana and Apairatr, 1990).

Assessments and Studies of HCP

Demand for health cards has changed over time due to various factors in both the demand and supply side, particularly government health policies. There are likewise many studies on the performance of the program.

The Health Card Program in Chiang Mai is the pilot phase of a national health insurance system in Thailand. In 1985, 1986 and 1988, the pilot project for the health Card Program and Social Research Institute (SRI) of Chiang Mai University conducted three household surveys. The survey investigate household health care expenditure and utilization patterns, health card knowledge, attitudes of the target groups regarding the health card system and fund management. In 1988, Adeyi studied the Health Card Program in Chiang Mai and found three main factors affecting health card purchase: the expectations of free treatment, reduced waiting time at referral centers and subsidized drugs. Since the present program has many changes, some of these factors may no longer affect the health card purchase

The main reason for buying a health card has been examined in various studies. Kiranadana (1990) evaluated the HCP situation using a national census of all HCFs and health facilities and found that the main reason was not to ensure future coverage for the possible illness of a household member, but either awareness that a family member was currently becoming sick, or influence from others. In 1994, Suriya Veeravongs analysed the HCP in the Phuket province and found that the influencing factors of health card purchase were: coverage by alternative health insurance, accessibility to health care, card purchaser's place of origin and sex, age of the household head, level of education of household head and

religious group affiliation, marital status of the household head, number of household members, number of sick household members, and problems experienced with health expenditure. In summary, the reasons to buy a card are economic conditions, benefits of the program, family size, presence of illness in the family, expectation of received health care, and the way the program is publicized (Hongvivatana et al., 1986; Santampol, 1990; Mahasith, 1986; Bunyanupong et. al., 1990; Supakankunti et. al., 1996). When HCP has been implemented in its current revised form (1995 to date), the research question arises: what are the current reasons for a household to buy the health card ? These problems of moral hazard and adverse selection are also found in other countries which have similar programs. For example, in Burundi, if insurance is sold for short periods to accommodate families' fluctuations in income, then people may buy the "health card" entitling them to services only when they are already sick or can anticipate a medical need (McPake, Hanson and Mills, 1993).

The reasons not to buy a card have been studied also and identified as follows: trend of the number of card users decreases because people do not have enough money to pay for the card (Tantiseranee, 1986); because of the health workers, or that the referral system is not efficient (Mahasith, 1986); because they do not receive enough information about the card (Chariyalertsak, 1990); because they have alternative health insurance, never used a previous card, no one sells the card, or it is difficult to use card (Manopimok, 1995).

The attitude of households toward the program is a main factor for program sustainability. Hongvivatana and Manopimok (1991) found that more than 50% of the people know about the benefits of the program. When there were changes in the price of the card, including the benefits and criterias for card using in 1993, more than 50% of the people know about the changes. Nonetheless, between card users and non-users there was a significant difference, with the card user group having better knowledge than the non-user group.

Behaviour of card users had been examined in various studies but there is no clear evidence of the changes in behaviour before and after the implementation of the program. Also the episodes of card use and the referral systems have been studied in various ways. Even though the health center and community hospital can screen patients before referring them to a higher level, Kiranandana and Apairatr (1990) found that more than 50% of the patients at community and regional hospitals did not follow the referral system. The health center bypass rate (without a referral letter) was 52% for outpatients (OPs) and 40% for inpatients (IPs) respectively. Health centers could screen 62% of the OP consultations (38% were referred) while community hospitals could screen up to 97% of the OP visits, with only 3% referred. These findings are consistent with those in other studies, which have found that people still do not follow the referral system (Rabkhawn, 1986; Pungprasertsilp et. al., 1987).

The sustainability of the program also depends on program financial viability which is in turn dependent upon relatively stable and adequate demand to ensure a sufficient pooling of risks. Therefore, the cost of providing health care at all levels, usage rates, and utilization patterns of card holders apart from purchase pattern have been studied. Different unit costs in different regions and years from several studies are shown in Table 10.

Table 10: Unit Cost at Health Service Unit Used by Health Card Member
 (unit: Baht)

Case Studies	Index	Health Service Units			
		Health center	Com. Hosp.	Prov. Hosp.	Reg. Hosp.
Ratchaburi (1985)	Cost/outpatient visit	23.61	77.35	86.11	-
	Cost/inpatient day	-	283.85	466.25	-
Ubon- Ratchathani (1984)	Cost/outpatient	10.11 ¹	69.31 ⁴	-	137.34
		7.17 ²	60.01 ⁵	-	-
		15.09 ³	63.10 ⁶	-	-
	Cost/inpatient	-	733.99 ⁴	-	1431.34
		-	419.04 ⁵	-	-
		-	556.09 ⁶	-	-
Chiang Mai* (1987)	Cost/visit	23.85	66.12	52.62	-
	Cost/admission	-	364.15	724.99	-
	Cost/green card/year				
	-outpatient	74.87	112.40	4.21	-
	-inpatient	-	29.13	28.96	-
Chiang Mai** (1987)	Cost/visit	26.11	67.27	50.39	-
	Cost/green card/year				
	-outpatient	65.28	107.63	9.07	-
	-inpatient	-	27.30	77.84	-
(1988)	Cost/visit	30.44	64.60	76.01	-
	Cost/green card/year				
	-outpatient	32.27	38.76	28.88	-
	-inpatient	-	39.28	91.21	-
Chiang Mai*** (1996)	Cost/outpatient	100	182	212	-
	Cost/outpatient visit	34	96	118	-
	Cost/inpatient	-	1,100	1,102	-
	Cost/inpatient day	-	303	522	-

Table 10 (continued)

Case Studies	Index	Health Service Units			
		Health center	Com. Hosp.	Prov. Hosp.	Reg. Hosp.

9 Provinces (samples)	Cost/person/year	9.98	34.27	17.84	17.74
	Cost/card/year	36.71	114.84	79.09	79.09

Note: District in Ubon Ratchathani:

1. *Sa Tuek*
2. *Non Rung*
3. *Som Sa Ard*
4. *Tra Karn Puech Phol*
5. *Khueng Nai*
6. *Dech Udom*

Source: Ratchaburi : Chaisak Permpoonwatanasuk (1985)

Ubon Ratchathani: Penjant Pradabmuk (1984)

Chiang Mai*: Thai-German Technical Cooperation for Health (1987)

Chiang Mai**: Health Card Program in Chiang Mai (1989)

Chiang Mai***: Pravuth Vechrak (1996)

Sample of 9 Provinces: Vachiraphan Chantamars (1989)

Cost recovery has been studied in various regions and years. The cost recovery for community and provincial hospitals is still quite low, *i.e.*, Permpoonwatanasuk (1985) looked at cost recovery in the Ratchaburi province and found it to be 32.62-47.76%; while in the Health Card Program in Chiang Mai (1989) it was 31 and 39 in 1987 and 1988 (only material cost). Kiranandana and Apairatr (1990) found the cost recovery for drugs was 40% for community hospitals and 46% for provincial hospitals. Manopimoke (1995) found that for outpatients at community and provincial hospitals cost recovery was 60% and 59% respectively, for average of 70%. The inpatient, average, was 54%, and cost recovery at health center was 108%.

The card usage rate from the Thai-German Technical Cooperation for Health (1987) found that the averages of outpatient visit per case at health center, community hospital and provincial hospital were 0.5, 0.38 and 0.12 respectively. Kiranandana and Apairatr (1990) found on average, in a health card fund, 207 outpatient visits were made, 44% at a health center, 33% at a community hospital, and 23% at a provincial hospital (nine inpatients were admitted to the hospitals). Thus, the health card usage rate was 6.63 services per card per year.

The success of the program depends on several factors implicit in health service utilization and health card purchasing patterns, as well as government policy: personal health management, the effectiveness of HCP, and community participation. A review of this scheme identified four critical factors for success: (1) strong government support; (2) managerial capability and supervision by local health staff; (3) strong community involvement and capacity; and (4) administrative simplicity of the scheme (Wibulpolprasert, 1991 cited in Kutzin, 1995). Before 1995, the main difference between HCP and other health insurance

programmes was that the financial management of the HCP was in the hands of responsible committees at village level, under the supervision of health workers. The committee could manage revenue collected as a revolving fund for income generating activities initiated by villagers to promote PHC (Veeravongs, 1994). According to the records, some villages had success in managing the fund, while some encountered many problems. Therefore, this was removed under the most recent form of the HCP. The committee now is at the district and provincial level and cannot use the fund for income generating. Besides this change the price and type of card and the criteria for card using have been changed. Therefore, this study is different from previous studies, which analysed the former program.

III. Methods

Study Area

Khon Kaen province has had, and has developed, experience with voluntary health insurance since 1983. In 1995 Thailand had 76 provinces in total. Khon Kaen is a large province located in the northeastern part of the country. In 1995 it had a population of 1,652,030, population rank per total was 4/76, and population per square kilometer was 152. The population age structure in the year 2000 has been estimated for age groups 0-9, 10-19, 20-39, 40-59, and 60+ as 19.0, 19.1, 37.0, 18.0, and 6.9 respectively. Its area accounts for 10,886.0 Sq.Kms. and area rank per total was 15/76. For the economic status: Khon Kaen's Gross Provincial Product (GPP) in 1993 was 38,688.0 million baht. GPP rank per total was 12/73 and GPP per capita was 23,519 baht. The industry which has the highest share in the GPP is the wholesale & retail trade sector with growth in the transport, communication and service sectors and decrease in the agriculture sector. Khon Kaen was designated a major city in the Northeastern part of Thailand along the country development plan. In the province there are a regional university and several public health facilities: 1 regional hospital, 7 specialist centers/health services, 19 community hospitals, 212 health centers and 1 municipality health center. There are also many private clinics and hospitals.

The card project involved in this study was implemented in 6 districts in Khon Kaen Province. The target population was identified by research team and the provincial health office. The provincial and district health officers and research team went to the 6 districts to explain the program to the communities and also to investigate the readiness of the communities. A sample of one thousand households from the target population were selected by health officers. In this study, investigations were conducted first to examine differing characteristics of card purchasers and non-users and also of card dropouts and continuing card users. There are four groups of households in the sample: (1) individuals who had not purchased a health card over the period 1993-1995, or **card non-purchase**; (2) individuals who had purchased a health card for the first time in 1995, or **new card purchase**; (3) individuals who had repurchased a health card, or **continued card purchase**; and (4) individuals who had not repurchased a health card, or **health card dropouts**. Further examination of the attitudes towards the health card program of card and non-card users at health centers and community hospitals will be carried out, using information from the questionnaires.

Data Sources

This paper is based in part on the data collected from the research project on voluntary health insurance in Khon Kaen province. The project implemented in Khon Kaen was a pilot project, the main objective of which was to provide health insurance for the uninsured in the province in order to achieve universal coverage. The study period was 1994-1995. The unit of study was households in selected rural areas. Health officers at both provincial and district levels were trained to conduct field interviews in 6 districts (study areas). There were four types of questionnaires used in the study:

- (1) interview questionnaire of subdistrict and village leaders, volunteer health workers;
- (2) interview questionnaire of households in the sample areas;
- (3) interview questionnaire about the attitude toward the program of card and non-card users; and
- (4) cost data obtained from the health center and community hospital.

Besides these primary data there is secondary data also, namely the statistics of card usage rate at all levels, utilization rates, retrospective reimbursement from providers, and the number of insured and uninsured in the province before and after the implementation of the program, by type of insurance schemes. Data from the reports from each district in which the card project was implemented also used in the study.

The primary data of household and health facility consists of :

- (1) socio-economic information, *i.e.*, number of household member, marital status, gender, age, number of dependents, number of unemployed member, use of alternative health insurance, education, occupation, income, type of expenditure and income, problem of health care payment, presence of illness (in reference period : past 3 months), number of members having chronic illness;
- (2) health care seeking behaviour, *i.e.*, choice of providers, type of communication, health card knowledge, decision to buy health card;
- (3) health care services utilization, *i.e.*, health card utilization rate, hospital utilization rate;
- (4) source of health care financing , *i.e.*, out-of-pocket, relative, health insurance;
- (5) attitude of the target groups regarding the health card system; and
- (6) utilization rate and reimbursement of health care expenditure from providers.

Analytic methods

This study employed both qualitative and quantitative methods. The data were entered from the interview questionnaire into coding form and verification of the database carried out using the spreadsheet software. Data processing involved use of the statistical package for Social Science (SPSS/PC+, Marija J. Norusis/SPSS Inc., 1993).

The analysis of the data involved the investigation of the factors influencing health card purchase and dropout pattern including continuity of card use as well as attitude of card users. The non parametric test, *i.e.*, Chi-square statistic and parametric t-test statistic were used initially to identify the various variables in both socio-economic and psychological factors. These significant factors will provide more understanding of demographic and socio-economic pattern between card purchase and non-purchase groups, and of subsequent repurchase and non-repurchase groups. The logistic regression model was then used to identify significant predictors of health card purchase and non-purchase pattern as well as the continuation of card purchase. Card utilization patterns and attitudes toward the health card will also be analysed for a better understanding of the future prospect of voluntary health insurance in Thailand.

Results

The total number of response households was 1005. The number of households that reported having not purchased a health card at any time over the 1993 to 1995 period was n= 495 (49.3%) as *non-card purchase*, leaving n=510 (50.7%) as *card purchase*. Of the 510 card purchase n=297 (58.2%) as *new card purchase*, n=132 (25.9%) as *continued card purchase*, and n=81 (15.9%) as *health card dropout* (no longer card holders).

Description of the Data

The demographic, socio-economic and cultural characteristics of card purchase and non-purchase, and of subsequent repurchase, non-repurchase groups are shown in Table 11-13 (more are in appendix).

Table 11 : Demographic and Socio-Economic Characteristics of Health Card New Purchase and Health Card Non-Purchase

Demographic Socio-Economic Characteristics	Health Card Non-Purchase (495)	Health Card New Purchase (297)
Marital Status		
- <i>Single/widowed/divorced</i>	2.4	2.7
- <i>Married</i>	97.6	97.3
Educational level **		
- <i>Lower 6 grade</i>	87.1	93.9
- <i>Higher</i>	12.9	6.1
Number of household members		
- <i>Under 5</i>	66.9	70.2
- <i>6 and above (average)</i>	33.1 (5.03)	29.8 (5.01)
Average number of employed member	2.32	2.83
Average household income/baht/year	60,253.17	50,580.00
Presence of illness***		
- <i>Yes</i>		
- <i>No</i>	47.5 52.5	57.2 42.8
Number of sick members with chronic illness		
- <i>None</i>	78.4	78.5
- <i>1-2</i>	20.6	21.5
- <i>More than 2</i>	1.0	0.0
Family economic problems during sickness of family members		
- <i>Have problems</i>	13.6	17.5
- <i>Never have</i>	86.4	82.5

Note: *p<.05, **p<.01 and ***p<.001

Table12: Demographic and Socio-Economic Characteristics of Health Card Dropout

and Continued Card Purchase

Demographic Socio-Economic Characteristics	Health Card Dropout (81)	Continued Card Purchase (132)
Marital Status		
- <i>Single/widowed/divorced</i>	4.9	3.1
- <i>Married</i>	95.1	96.9
Educational level		
- <i>Lower 6 grade</i>	87.5	93.1
- <i>Higher</i>	12.5	6.9
Number of household members		
- <i>Under 5</i>	63.0	71.8
- <i>6 and above (average)</i>	37.0 (5.15)	28.2 (4.86)
Average number of employed member	2.52	2.88
Average household income/baht/year	44,964.35	52,207.26
Presence of illness**		
- <i>Yes</i>	48.1	66.7
- <i>No</i>	51.9	33.3
Number of sick members with chronic illness		
- <i>None</i>	82.7	77.3
- <i>1-2</i>	16.0	19.7
- <i>More than 2</i>	1.2	3.0
Family economic problems during sickness of family members		
- <i>Have problems</i>	13.5	15.4
- <i>Never have</i>	86.5	84.6

Note: *p<.05, **p<.01 and ***p<.001

Table13: Demographic and Socio-Economic Characteristics of Health Card Non-Purchase and Dropout Groups

Demographic Socio-Economic Characteristics	Health Card Non-Purchase (495)	Health Card Dropout (81)
Marital Status		
- <i>Single/widowed/divorced</i>	2.4	4.9
- <i>Married</i>	97.6	95.1
Educational level		
- <i>Lower 6 grade</i>	87.1	87.5
- <i>Higher</i>	12.9	12.5
Number of household members		
- <i>Under 5</i>	66.9	63.0
- <i>6 and above (average)</i>	33.1 (5.03)	37.0 (5.15)
Average number of employed member	2.32	2.52
Average household income/baht/year	60,253.17	44,964.35
Presence of illness		
- <i>Yes</i>	47.5	48.1
- <i>No</i>	52.5	51.9
Number of sick members with chronic illness		
- <i>None</i>	78.4	82.7
- <i>1-2</i>	20.6	16.0
- <i>More than 2</i>	1.0	1.2
Family economic problems during sickness of family members		
- <i>Have problems</i>	13.6	13.5
- <i>Never have</i>	86.4	86.5

Note: *p<.05, **p<.01 and ***p<.001

Table14: Demographic and Socio-Economic Characteristics of Health Card Non-Purchase and Health Card Purchase: Dropout/ Continued/ New Purchase Groups

Demographic Socio-Economic Characteristics	Health Card Non-Purchase (495)	Health Card Purchase (510)
Marital Status		
-Single/widowed/divorced	2.4	3.2
-Married	97.6	96.8
Educational level **		
-Lower 6 grade	87.1	92.7
-Higher	12.9	7.3
Number of household members		
- Under 5	66.9	69.4
- 6 and above (average)	33.1 (5.03)	30.6 (4.99)
Average number of*** employed member	2.32	2.80
Average household income/baht/year**	60,253.17	50,099.12
Presence of illness***		
-Yes	47.5	58.2
-No	52.5	41.8
Number of sick members with chronic illness		
-None	78.4	78.8
-1-2	20.6	20.2
-More than 2 (average)	1.0 (0.23)	1.0 (0.22)
Family economic problems during sickness of family members		
-Have problems	13.6	16.3
-Never have	86.4	83.7

Note: *p<.05, **p<.01 and ***p<.001

Results shown in Tables 11-13 may be interpreted in different ways, since the program has undergone many changes such as in price and type of card, card usage criteria, and financial management, as stated above. Some characteristics between the health card non-purchase and new card purchase groups are different. The results show that compared to the non-purchase group, those in the health card new purchase group were older, had a higher average number of employed members in the family, a higher percentage of presence of illness, a higher percentage of having family economic problems during sickness of family members; and had a lower level of education and household income per year. Only two of these factors are significant, namely educational level and presence of illness.

In addition, among health card dropout group and continued health card purchase group, the results show that compared to the health card dropout group, the continued card purchase group tended to get married at a higher rate, have a lower educational level, a higher average number of employed members in the family, a smaller number of household members, a higher household income per year, more members with chronic illness, a higher percentage of presence of illness, a higher percentage of having family economic problems during sickness of family members, and a higher percentage of card using. But only one factor is significant, which is presence of illness. Interestingly, these findings are consistent with the above comparison between health card non-purchase and health card new purchase groups except for the data on income per year, marital status, and number of sick members with chronic illness.

Between the health card non-purchase group and the health card dropout group, the results show that compared to the health card non-purchase group, the health card dropout group had a lower income per year, and also a lower number of sick members with chronic illness. As expected, there were no significant differences between these groups, both groups had a similar characteristics and they did not purchase the card at present year.

It is important to note that the association between chronic illness and health card purchase or insurers has been previously observed. For example, Hongvivatana et.al. (1986) found that there was significantly more chronic illness in a health card user family, as did Veeravongs (1994). But in this study even though there were differences: a higher percentage of sick members with chronic illness in the new health card purchase group than in the non-purchase group, likewise a higher percentage in the continued card purchase group than in the health card dropout group, and also higher in the health card non-purchase group when compared with the health card dropout group, there were no significant differences between any of these groups. After testing for the mean of numbers of chronic illness in the family between the health card non-purchase group and the combined other three groups, there was no significantly difference also.

For further investigation of the factors influencing the purchase pattern, the response households were grouped into 2 groups: the non-purchase (never purchase) group and the purchase either current or continued purchase group. From Table 14, the results show that when the non-purchase group was compared to the purchase (currently purchase, continued and dropout) group, the purchase group were older, had a higher average number of

employed members in the family, a higher percentage of presence of illness, a higher percentage of having family economic problems during sickness of family members; and had a lower average income per year and educational level. In terms of access to health facilities (appendix), the results show that the purchase group has more convenient access to a community hospital when needed than the non-purchase group, and no different access for other place, such as health centers, private clinic/hospitals. Only four of these factors are significant, namely educational level, income per year, number of employed members in family and presence of illness.

Interestingly, the significant factors between the health card non-purchase group and the health card new purchase group are educational level and presence of illness. The latter factor also was significant between the health card dropout and continued card purchase group and between the purchase and non-purchase groups. As expected, it was not significant between the health card non-purchase and the health card dropout group. This strongly confirms the problem of adverse selection among health card purchase and non-purchase groups. The family with presence of illness tended to purchase and repurchase the health card. This crucial finding indicates a factor that will jeopardise the sustainability of the HCP in the future if the program continue to be implemented without improvement.

Some of the psychological factors affecting card use were found to be particularly related to the continued and dropout groups. The continued card purchase group reported greater knowledge regarding the referral system, greater seeking treatment, greater convenience in buying card, greater use of the health card, and greater satisfaction in using a card. They were more likely to have been persuaded by a health officer rather than a HCF committee or village leaders to buy a health card. Receiving clear explanation about the card in advance from a health officer, they were able to make a decision to buy a card immediately. They had better access to health centers while those in the card dropout group had better access to a community hospital. Finally, they wanted to buy a card, although no one persuaded them when compared to the dropout group which has a higher percentage of having been persuaded to buy a card at home. But only few factors are significant, *i.e.*, convenient access to health care, persuaded to buy a card by health officer, received clear advance information about health card by health officer, used health card last year, satisfaction with health card, and had persuaded neighbour to buy a card. These factors clearly demonstrate how to make card holders continue to buy a card next year. The effort needs active health officers who will explain about the health card, but it also depends on how convenient people are to health care and what experience card use they have had.

Logistic Regression Model

In the first part of the analysis, the factors which influence the card purchase and non-purchase were identified by using t-test and Chi-square analyses. The analysis was performed separately for the following 4 pairs:

- (1) the non-purchase and purchase group;
- (2) the health card dropout and continued card purchase group;

- (3) the non-purchase and new card purchase group; and
- (4) the non-purchase and health card dropout group.

Only 5 significant demographic and socio-economic factors were identified, namely, educational background, number of employed member in the family, household income per year, presence of illness, convenient access to health care, *i.e.*, health center, community hospital, private health facilities, provincial hospital. These factors were included in the logistic regression models to estimate their relationships to the following health card purchase patterns: (1) the non-purchase versus purchase (dropout/continued/new purchase) group, (2) the non-purchase and health card dropout group versus continued and new card purchase group, (3) the non-purchase versus new card purchase group, (4) the health card dropout versus continued card purchase group, and (5) the new card purchase and continued card purchase versus health card dropout group. In the models 4 and 5, nine more factors were added to estimate the pattern of card purchase. The additional factors added were: who persuaded to buy a card, *i.e.*, health officer, village health volunteer, village leader; who explained clearly about health card; health card usage; satisfaction with the health card; persuaded neighbour to buy a health card.

The following factors were used to estimate the various models of the logistic regressions to identify the best set of predictors for each models:

- Marital Status
 - Single/widowed/divorced
 - Married
- Age in years
 - Lower than 40
 - 41 and above
- Educational level
 - No School/ Primary
 - Secondary
 - Higher
- Proportion of employed persons to total family members
- Household income
 - Less than 33,600 baht
 - More than 33,600 baht
- Presence of illness
- Number of sick members with chronic illness in the family
- Family economic problems during sickness of family members
- The most convenience place to access health care
 - Health center
 - Community hospital
 - Private hospital/private clinic/drug store
 - Others
- Who influenced on card purchase
 - Village health volunteer

- Health center personnel
- Village head
- Others
- Previously who explained clearly and in advance about health card program
 - Village health volunteer
 - Health center personnel
 - Village head
 - Others
- How they persuaded you to buy a card
 - Arrange meeting at village
 - Come to your home
 - None
 - Others
- Who make a decision to buy a health card
 - Household head
 - Spouse or household members
- Card bought from whom
 - Village health volunteer
 - Health center personnel
 - Village head
 - Others
- Health card usage
- Satisfaction with the card
- Persuaded neighbors to buy a card

The coefficients of the logistic regression model:

In logistic regression the probability of an event occurring such as card purchase can be directly estimated from the model. For the case of multiple independent variables, the logistic regression model can be written as

$$\text{Prob (card purchase)} = \frac{1}{1 + e^{-Z}}$$

where Z is the linear combination

$$Z = B_0 + B_1 X_1 + B_2 X_2 + \dots + B_p X_p$$

The probability of the event not occurring is estimated as

$$\text{Prob (not purchase)} = 1 - \text{Prob (purchase)}$$

X_i are the independent variables in the model, such as the demographic-socio economic factors or psychological factors among health card purchasers and non-purchasers. The interpretation of the logistic regression coefficient is not straightforward as in the regression model. The logistic model can be rewritten in terms of the odds of an event occurring. The odds of an event occurring are defined as the ratio of the probability that it will occur to the probability that it will not. The value of the coefficient for each variable indicates the changes

in the log odds when the value of a particular variable changes by one unit and the values of the other independent variables remain the same (SPSS/PC+, Marija J. Norusis/SPSS Inc., 1993).

Table15: Variables that Predict Health Card Purchase Groups (Dropout/ Continued/ New Purchase Group) versus Non-Purchase Group

Variable	Coefficient	Standard Error	Significance	Exp(B) Odds Ratio
Marital Status	-.5037	.4657	.2794	.6043
Age	-.2103	.1613	.1925	.8103
Gender	.0904	.1561	.5625	1.0946
Educational level				
-Primary*	1.9664	.8259	.0173	7.1448
-Secondary	1.5521	.8568	.0701	4.7215
Proportion employed to total in family***	1.3242	.3006	.0000	3.7591
Household income	.0854	.1512	.5721	1.0892
Presence of illness**	.4342	.1485	.0035	1.5437
Number sick with chronic illness	-.1246	.1085	.2507	.8829
Economic problems during sickness	.1459	.2045	.4756	1.1571
Most convenient access to health care:				
-Health center	-.4701	.2418	.0518	.6249
-Community hospital*	-.5889	.2860	.0395	.5549
-Private clinic/hospital	-.5080	.3898	.1925	.6017
Constant	-1.3344	1.2141	.2717	

Table16: Variables that Predict Health Card Non-Purchase and Dropout Group

versus Continued and New Card Purchase Group

Variable	Coefficient	Standard Error	Significance	Exp(B) Odds Ratio
Marital Status	.2438	.4530	.5905	1.2761
Age	.0509	.1633	.7553	1.0522
Gender	-.1357	.1571	.3879	.8731
Educational level				
- <i>Primary</i>	-1.5715	.8180	.0547	.2077
- <i>Secondary</i>	-.8610	.8556	.3143	.4228
Proportion employed to total in family***	-1.3062	.2990	.0000	.2709
Household income	.1287	.1518	.3963	1.1374
Presence of illness***	-.4791	.1494	.0013	.6194
Number sick with chronic illness	.0609	.1069	.5691	1.0628
Economic problems during sickness	-.1305	.2038	.5221	.8777
Most convenient access to health care:				
- <i>Health center</i>	.0663	.2327	.7757	1.0686
- <i>Community hospital</i>	.3754	.2832	.1851	1.4555
- <i>Private clinic/hospital</i>	-.0356	.3843	.9261	.9650
Constant	2.1606	1.2097	.0741	

Table17: Variables that Predict Health Card Non-Purchase versus New Card Purchase Group

Variable	Coefficient	Standard Error	Significance	Exp(B) Odds Ratio
Marital Status	-.4555	.5445	.4028	.6341
Age	-.1687	.1916	.3787	.8448
Gender	.2531	.1846	.1703	1.2880
Educational level				
-Primary	2.1061	1.1061	.0569	8.2165
-Secondary	1.5160	1.1458	.1858	4.5537
Proportion employed to total in family***	1.3741	.3473	.0001	3.9514
Household income	-.0150	.1766	.9323	.9851
Presence of illness**	.4563	.1714	.0077	1.5783
Number sick with chronic illness	-.1831	.1406	.1929	.8327
Economic problems during sickness	.2075	.2317	.3704	1.2306
Most convenient access to health care:				
-Health center	-.1631	.2944	.5795	.8495
-Community hospital	-.1441	.3429	.6743	.8658
-Private clinic/hospital	.0392	.4414	.9293	1.0399
Constant	-2.5256	1.4979	.0918	

Note: * p<.05, **p<.01 and ***p<.001

Table 18: Variables that Predict New and Continued Health Card Purchase versus Health Card Dropout Group

Variable	Coefficient	Standard Error	Significance	Exp(B) Odds Ratio
Marital Status	.8795	.7761	.2571	2.4097
Age	.7301	.3828	.0565	2.0752
Gender	-.3930	.3537	.2666	.6750
Education*	-1.0567	.4879	.0303	.3476
Proportion employed to total in family	.9026	.5944	.1289	2.4661
Household income*	-.7027	.3145	.0255	.4953
Presence of illness	.0563	.3322	.8655	1.0579
Number sick with chronic illness	.1857	.2729	.4962	1.2041
Economic problems during sickness	-.0156	.4383	.9717	.9846
Most convenient access to health care:				
- <i>Health center</i>	.3431	.4308	.4258	1.4093
- <i>Community hospital</i>	.1615	.5560	.7715	1.1753
- <i>Private clinic/hospital</i>	1.3580	1.1370	.2323	3.8885
Persuader in HC purchasing:				
- <i>Village health volunteer</i>	-1.5924	.8627	.0649	.2034
- <i>Health center personnel</i>	-1.0464	.9475	.2694	.3512
Person who explained the benefit of HCP				
- <i>Village health volunteer</i>	.7036	.6208	.2571	2.0209
- <i>Health center personnel</i>	.6029	.6424	.3480	1.8275
How persuaded to buy card:				
- <i>Arranged meeting</i>	-.6678	.5553	.2291	.5128
- <i>Came to home*</i>	-1.2362	.5941	.0375	.2905
Who made decision to buy card				
Card bought from health center personnel	.5010	.4119	.2238	1.6504
Health card usage	.0261	.3450	.9396	1.0265
Persuaded neighbors to buy card	.3508	.3901	.3684	1.4202
Satisfaction with card	-.0560	.2597	.8292	.9455
Constant	1.4217	2.1623	.5108	

IV. Discussion

Results from the various models of the health card groups described above are interesting and should prove valuable from several aspects. Table 15 to 18 show that the

statistically significant factors distinguishing purchase groups (dropout, continued and newly purchase groups) from non-purchase groups are educational level, proportion of employed persons to total family members, presence of illness, and a convenient community hospital. Interestingly, the significant differences related to purchase patterns in the current year between currently non-purchase (never purchase and dropout groups) and currently purchase (continued and newly card purchase) are the first three as well, but the fourth, the most convenience place in access to health care, is no longer significant in the model. This is consistent with the model of card purchase between the non-purchase and newly purchase groups. The finding clearly and strongly demonstrates that health card purchase in Khon Kaen in the current year is influenced by the following three factors: *proportion of employed to total in family, education and presence of illness*. The last factor demonstrates the problem of adverse selection in the program, particularly significant since the health card program was introduced in the country in 1983 and Khon Kaen was one of 7 provinces in the implementing areas in that year, has thus had experience with voluntary health insurance, and has undergone development of its program throughout the years.

The various previous studies of card purchase patterns showed the important factors for card purchase to be *gender, age, chronic illness, alternative health insurance, family size, income, and health service satisfaction*. Veeravongs (1994) found that females tended to purchase health cards more than males because this related to greater maternal and child health care card use, and that there was also, an association between gender and chronic illness. Another important factor is family size which some researchers have indicated (Veeravongs, 1994; Hongvivatana and Manopimoke, 1986; Suwanteerangul, 1992). This was not confirmed in this study since many aspects of the program have been changed. The gender and family size factor were not statistically significant perhaps because the average Thai family size is 5 persons and the sample shows on average household size is 5 also. More importantly, the health card is now a household card which allows 5 members per card. The family size factor was also not significant between groups, as tested above. Therefore, the proportion of employed persons to total family members factor was selected in estimating the model, to reflect the dependency among the family members. Interestingly, it was one of the significant factor found in this study. The households which had a higher proportion of employed persons tended to purchase more cards than the households with a lower proportion. This might be because the former can afford the price of the card which must be prepaid, although the income factor was not of overall significance in this study. *The proportion of employed to total in family* factor might represent the income class, a higher proportion reflects the lower income class which tended to buy health cards. This would also relate to alternative insurance schemes such as the Elderly Scheme (FC/E) and the School Health Insurance Scheme (SHI) since unemployed persons in the family might be eligible for these schemes. Moreover, most of the employed persons in rural areas are not covered by any of the health insurance schemes.

As stated above, income was not shown to be a strong determinant of card purchase. This was confirmed by Veeravongs (1994). However, other studies have found that economic status was a significant indicator of the ability to purchase a health card (Hongvivatana and Manopimoke, 1986; Tantiserani and Prompakdi, 1988). There was not much difference in income among households in this study, the subjects of which were rural

residents, even though there were observable trends by income among the groups, e.g. in the dropout group tended to have incomes lower than the continued card purchase group.

The other significant factor is *education*. Those with lower levels of education tended to purchase cards, since lower education means lower income and thus usually not covered by any of the health insurance schemes. The only health insurance which these persons are eligible for is the health card program. The number of members with *chronic illness in the family, marital status, age, and problems with health expenditures* were not significant to determine card purchase in this study.

The *satisfaction with health services* factor was indicated in previous studies as a determinant factor for card purchase, but in this study the factor was not significant. The results found little difference, among households and found most to be satisfied with the services. This is discussed in detail below.

It was difficult to make a comparison between studies since the studies were of different areas and conducted at different times. Of most importance, however, are the differences in health card rationale, type and price of card, criteria for card use, health card fund management, government subsidies, and share of the health card fund.

Continuity of Card Purchase

The sustainability of the program depends on various factors and a very important factor is satisfaction of the card users to continue to buy in the next year. The findings indicate that the continuity of card purchase in the study was associated with these factors: marital status, lower levels of education, number of employed in the family, income, presence of illness, problems with health expenditure, most convenient place to access health care, health card usage, persuaded household to buy card at home, health center personnel, and persuaded neighbour to buy card. Of these, the significant factors were *persuaded neighbour to buy card, age, education, income, health center personnel explained clearly about card, persuaded household to buy card at home*.

To analyze the satisfaction with health care services of card users requires more data therefore, this study utilized the data from *another set of questionnaires* which was distributed when program had been implemented for one year. *The sample is health care seekers at health center and community hospitals: possession or non-possession of a health card*. They were interviewed about their attitudes toward the health card program when seeking care at health centers and community hospitals and about their health- seeking behaviours in the past 3 months. Below is the summary of demographic and socio-economic characteristics between individuals who held cards and did not hold cards.

Table19 : Demographic and Socio-Economic Characteristics of Health Care Seekers* by Whether or Not They Possess Health Card

Demographic Socio-Economic Characteristics	Health Card (Non-possession)	Health Card (Possession)
---	-------------------------------------	---------------------------------

	(464)	(500)
Marital Status		
- <i>Single/widowed/divorced</i>	15.1	12.8
- <i>Married</i>	84.9	87.2
Educational level ***		
- <i>Lower 6 grade</i>	79.6	87.8
- <i>Higher</i>	20.4	12.2
Number of household** members		
- <i>Under 5</i>	72.9	70.2
- <i>6 and above (average)</i>	27.1 (4.78)	29.8 (5.07)
Gender		
- <i>Male</i>	35.3	38.6
- <i>Female</i>	64.7	61.4
Average household income/baht/year	63,453.84	58,572.21
Average household expenditure/baht/year	41,099.33	39,401.24
Average household health expenditure/baht/year	4,294.71	3,945.20
Average proportion of total expenditure to total income	.7372	.9477
Average proportion of health expenditure to total expenditure	.1157	.1123

Note: * Patients who visited health center or community hospital

Table 19 (continued)

Demographic Socio-Economic Characteristics	Health Card (Non-possession) (464)	Health Card (Possession) (500)
Presence of illness**		

<i>-Yes</i>		
<i>-No</i>	42.1	52.0
(average)	57.9 (.4213)	48.0 (.5200)
Having chronic illness		
<i>-Yes</i>	19.5	25.2
<i>-No</i>	80.5	74.8
Family economic problems during sickness of family members**		
<i>-Have problems</i>	38.4	30.2
<i>-Never have</i>	61.6	69.8
Most convenient place to access health care		
<i>-Health center</i>	75.1	81.0
<i>-Community hospital</i>	16.5	15.2
<i>-Private clinic/hospital***</i>	8.0	2.8
<i>-Others</i>	0.4	1.0
Type of chronic illness	(86)	(127)
<i>-Diabetes</i>	38.0	62.0
<i>-High blood pressure</i>	58.8	41.2
<i>-Ashma/respiratory</i>	39.4	60.6
<i>-Others</i>	38.9	61.1
Seek care**		
<i>-Yes</i>	69.9	78.6
<i>-No</i>	30.1	21.4

Note: * p<.05, **p<.01 and ***p<.001

Table 20: Frequency of Card Used Among Card User Group

N=451

Card Usage Rate	Frequency	Percent
Never used	19	4.2
1-5	313	69.4
6-10	91	20.2
More than 10	28	6.2

Among the health card users there were 483 responded and below are some characteristics of how they used cards.

Types of Health Service Facility visited with health card

	Frequency	Percent
-Health Center	360	74.5
-Community Hospital (10 beds)	36	7.5
-Community Hospital (30 beds)	35	7.2
-Community Hospital (60 beds)	44	9.1
-Provincial Hospital	2	0.4
-Regional Hospital	6	1.2

Types of illness

	Frequency	Percent
-Fever, cough, flu	324	67.1
-Ulcer	75	15.5
-Others	84	17.4

Satisfaction with the service received

	Frequency	Percent
-Satisfied	458	94.8
-Not satisfied	25	5.2

Reasons for dissatisfaction with the service received

	Frequency	Percent
-Quality of care	8	27.6
-Behaviour of the staff	3	11.1
-Quality of drug received	1	3.7
-Longer waiting time than the others	3	11.1
-Referral system	17	63.0
-Others	3	11.1

Willing to buy card next year

	Frequency	Percent
-Yes	443	89.5
-No	12	2.4
-Undecided	40	8.1

Payment for card

	Frequency	Percent
-Yes	443	89.5
-No	12	2.4
-Undecided	40	8.1

-Pay in full amount	458	92.5
-Pay in installment	33	6.7
-Others	4	.8

Results in Table 19 show that the statistically significant factors related to health card users and non-card users are *education, number of household members, presence of illness, problems with health expenditure, the most convenient place to access health care, and seek care when sick*. Card users tended to have a lower education, a lower average income per year, a lower health expenditure per year but in term of the proportion of total expenditure to the total income is higher. Moreover, card users had not much problems with health expenditure, and had more members in the family, more presence of illness, more chronic illness, sought more care when sick, and had a health center as the most convenience place of access. This shows that the health card eased their health expenditure burden, despite the fact that there was more illness among card users. The proportion of health expenditure to total expenditure on average was not different when compared with non-card users. Nonetheless there remained a problem of adverse selection among card users.

Table 20 shows that 70% of card holders have used the cards for 1-5 times, while only 4.2 % has never used it. And 74.5% of card users tended to visit health center while 23.8% visited the community hospitals with a common illness such as fever, cough, flu and ulcer. Interestingly, 94.8% were satisfied with health services leaving only 5.2% not satisfied. Of those not satisfied, 63% had dissatisfaction with the referral system and 28% with the quality of care. Of the sample, 90% will purchase a health card again next year. Since this is related to the problem of illness, they definitely will utilize health cards.

To improve the program what is required to know is what factors influence the health card utilization pattern.

Table 21: Health Care Seeking Pattern in the Past 3 Months Among Card Users and Non-Card Users

	Percent of Health Care Seekers at Difference Facilities	Number of Visit (average)	Drug Expenditure(Baht) (average)

	Card Users (500)	Non- Card Users (464)	Card Users (500)	Non-Card Users (464)	Card Users (500)	Non- Card Users (464)
Sick but no treatment	16.4	18.6	-	-	-	-
Self Prescription	12.0	19.5	2.16	2.37	89.00	72.80
Sick and have treatment at private clinics and hospitals	5.8	8.2	2.47	2.11	252.86	241.94
Sick and have treatment at health center	50.0	41.5	2.49	2.35	61.02	47.06
Sick and have treatment at public hospitals	18.6	14.4	2.32	2.46	645.42	257.02

The results from Table 21 show that non-card users tended to have no treatment when sick, have more self prescription and sought care at private clinics or hospitals, but sought care at health centers and public hospitals less than the card users. This health care seeking pattern among card users and non-card users strongly supports the importance of accessibility to health care among the card user group. However, it still leaves the risk sharing and card utilization pattern problems to consider in order to make the program more sustainable and efficient. Therefore, the health card utilization patterns will be studied in detail to provide more information on card usage.

The main purposes of estimating the health card utilization patterns were twofold: (1) investigate the factors affecting the frequency of card use through a multiple regression model; (2) investigate the factors affecting the use or non-use of health card through a logistic regression model.

The variables listed below were selected in estimating the health card utilization patterns.

- Marital Status
- Gender
- Educational level
- Number of household members
- Proportion of total household expenditure to total income
- Proportion of total household health expenditure to total expenditure
- Presence of illness
- Having chronic illness
- Family economic problems during sickness of family members
- Most convenient place to access health care

Results

(1) Multiple Regression Model:

Variable	B	SE	Beta	T	Sig T
Chronic	1.622212	.563359	.156944	2.880	.0043
Health center	1.915122	.593073	.175999	3.229	.0014
(Constant)	2.613482	.555544		4.704	.0000

This model shows that the significant factors related to card usage rate are having chronic illness and convenient access to a health center. This is not surprising since the chronically ill will seek care regularly and usually at a health center located in the village near their homes, where they will use cards. This is related to the problem of adverse selection in the program.

(2) Logistic Regression Model:

Table 22: Variables that Predict Health Card Usage Among the Card Users

Variable	Coefficient	Standard Error	Significance	Exp(B) Odds Ratio
Marital Status	.0245	1.0413	.9812	1.0248
Gender	.3981	.6898	.5639	1.4889
Age	-.0275	.0325	.3973	.9728

Educational level	1.2836	.9249	.1652	3.6097	
Number of family members	.0262	.1986	.8950	1.0266	
Proportion of total household expenditure to total income	.0270	.1618	.8673	1.0274	
Proportion of total household health expenditure to total expenditure	.2636	2.7682	.9241	1.3016	
Presence of illness*	1.8629	.8417	.0269	6.4422	
Having chronic illness	-.4791	.8084	.5534	.6193	
Family economic problems during sickness of family members	.8375	.8334	.3160	2.3064	
Most convenient place to access health care:					
-Health center	1.9755	1.4112	.1616	7.2100	
-Community hospital	1.2323	1.4958	.4100	3.4292	
Constant	.4165	1.8298	.8200		

The results from Table 22 show that the significant factor related to card use is the presence of illness; the others are not statistically significant. This confirms once again the problem of adverse selection in the program since the one who has the presence of illness tended to buy a card and affected the card usage.

In addition, other models were estimated in order to investigate the impact of having or not having card to the health care seeking behaviour among the households. Interestingly, the results show that possession or non-possession of a health card was not a significant factor at the beginning of the program. But when the program had been implemented for one year, among health care seekers, possession of a health card was a significant reason to visit the health centers or community hospitals. This evidence strongly supports the importance for card holders of accessibility to health care. Problems concern the risk sharing among the target population and card overutilization. The problem of card overutilization, confirmed in

this study, has implications for the sustainability and efficiency of the program. The results show that among card users 41.6% tended to visit health facilities more than before having a card, 48.4% same as before, only 7.2% less than before, and 2.8% do not remember.

Attitudes Toward the Health Card Program Among Card Holders and Non-Card Holders

Among the health care seekers, card holders and non-card holders at health centers and community hospitals were interviewed about their attitudes toward the health card program. The main results are shown in Table 23-24 below.

Table 23: Attitudes Toward Health Card Program of Card Holders and Non-Card Holders

Context	Card Holders					Non-Card Holders				
	Level of Scale					Level of Scale				
	1	2	3	4	5	1	2	3	4	5
Prior knowledge about HCP	11.2	44.2	31.2	12.4	1.0	4.3	24.0	41.5	21.7	8.5
Card seller explained clearly about HCP limits and benefits	13.2	64.1	17.6	4.7	.4	5.2	37.8	34.7	16.9	5.4
Satisfaction with explanation	12.0	55.8	29.6	2.2	.4	4.3	31.5	40.8	19.6	3.8

Benefits of health card to family	33.5	53.0	12.8	.2	.4	11.9	26.9	28.5	24.0	8.7
Price of card (500 baht) is appropriate	23.6	44.7	29.1	2.2	.4	14.8	38.3	35.9	9.2	1.8
Coverage for 1 year appropriate	18.9	42.6	30.2	6.9	1.4	11.7	38.1	35.9	12.2	2.0
Worried will receive substandard medical services when using card	4.3	15.4	27.8	37.1	15.4	5.0	19.9	39.7	27.5	7.9
Worried about the possible longer waiting time for care when using card	3.1	11.0	40.7	32.8	12.4	2.7	17.8	42.9	28.0	8.6
Worried about expected low quality of drug received with card	3.7	15.5	27.7	38.5	14.7	4.3	18.7	37.5	29.1	10.4
Will buy card next year	41.2	33.5	22.2	2.0	1.0	15.3	25.3	37.5	14.7	7.2

Note: Level of scale: Level 1 being most likely (very satisfactory) and level 5 being most unlikely (very unsatisfactory)

Table 24: Attitudes Toward Health Card Program of Card Holders and Non-Card Holders: Mean Score

Context	Card Holders	Non-Card Holders
	Mean Score	Mean Score
Prior knowledge about HCP	2.479	3.063
Card seller explained clearly about HCP limits and benefits	2.150	2.795
Satisfaction with explanation	2.233	2.872
Benefits of health card to family	1.809	3.092
Price of card (500 baht) is appropriate	2.112	2.448
Coverage for 1 year appropriate	2.294	2.546

Worried will receive substandard medical services when using card	3.440	3.135
Worried about the possible longer waiting time for care when using card	3.138	3.219
Worried about expected low quality of drug received with card	3.450	3.226
Will buy card next year	1.882	3.269

Card holders had greater prior knowledge about the health card program before health officers explained it to them than did non-card holders, and had more satisfaction with the explanations from health officers. This confirms the idea that knowledge of the health card was a strong determinant of card purchase. Even more important, the attitude about the usefulness of the health card to them or their family was different in the 2 groups. The card holders group had greater satisfaction with the health card than the non-card holders group, and the card holders groups tended to be satisfied with the price of the card more than were the non-card holders group. This strongly explained with the attitude of card holders that they will buy a new card next year while non-card holders were not likely to buy. It is important to note that the decision to purchase a health card was not dependent solely on the price of the card but was influenced by other factors such as the quality of drugs received, the quality of medical services provided and whether the subjects have alternative health insurance. This study found that the problem of expectations about substandard medical services, low quality of drugs, and longer waiting time for care with cards were similar in the 2 groups except that the non-card holders tended to worry more than the card holders group.

Even though some studies have indicated that health service satisfaction is the most important factor influencing the use of health services and dissatisfaction among health card users was one significant factor influencing the dropout group (Adeyi, 1988; Silapasawan, 1989; Suwanteerangkul, 1992). This was not confirmed with the study by Veeravongs (1994) which found that both continuing card users and dropouts were satisfied with their current health service and there were no differences between them in terms of card knowledge obtained from village health volunteers and health card committee members. This study had similar findings as stated above. Actually, knowledge regarding the benefits of the program, better knowledge about the principle of health insurance and the health system among the households are more important to the program in terms of the efficient use of resources, encouragement of households to participate in the program, and the sustainability of the program.

In organizing a voluntary health insurance program there are important implications concerning the allocation of resources used and the technical efficiency with which they are used. These relate to the type of medical services provided in the program, its referral system, the use of medical technologies, and mechanisms to allocate the resources. Some studies have shown similar problems in organizing health insurance particularly for rural populations. Economic pressure is key to bringing about health care financing reform in various countries, and one way is through the health insurance schemes, either compulsory or voluntary. It is important to realize that the existence of any scheme will be unstable if the scheme attracts a

special subset of the population with unusually high health care costs or with greater sickness.

Health Card Fund

The current formula to allocate HCF to compensate providers and for administrative costs is set at 80% and 20% of the monetary amount of health card sales revenue (this differs slightly from year to year). The revenue is generated by health card sales (\$20 per card) and subsidized \$20 per card from the government budget. After one year of implementing the health card program in Khon Kaen, operating cost data at health centers and community hospitals in 6 districts were collected; including the utilization rate with these data will provide better understanding about the health card fund and its viability.

Health Card Utilization Rate:

Utilization Rate	Health Center		Community Hospital	
	Card	Case	Card	Case
Out Patient	3.2	0.72	3.11	0.7
In Patient	-	-	0.17	0.04
In Patient Days	-	-	0.66	0.15

Operating Cost:

At community hospitals, the unit cost per case for inpatients is 1,356 baht and the unit cost per visit for outpatients is 168 baht. At health center, the unit cost per case is 71 baht and the unit cost per visit is 37 baht.

When card usage rates in this study are compared to those in the previous study (Kiranadana and Apairatr, 1990) the rates per case for outpatient visits at health centers and community hospitals are higher by as much as 50% and 94% respectively. The rates per card for outpatients at health centers and community hospitals are also higher by 15% and 48% respectively. Likewise, the card usage rate for inpatients is higher both per case and per card, but not by such a high percentage. Nonetheless, considering the difficulties in comparing with other studies and the present study directly, as they were conducted in different areas, times, and most importantly, under different rationales, types, card prices, and criteria for card usage, the average card usage rate per card for all services at health centers and community hospitals was not greatly differ.

However, the results did show that under the new criteria for card use, with no limit on episodes and with the first contact either a health center or community hospital depending on convenient location, the rate of usage is increasing greatly, especially at community hospitals. This results in the major workload and cost of care being borne by community hospitals. The

cost of care compared to unit cost in Chiang Mai in the same year revealed a similar pattern. The data show that providers, health centers and community hospitals, need to reimburse their expenses (based on price schedules rather than cost) in amounts greater than the health card fund committee can allocate from the fund, which is financed from the total monetary amount of card sales revenue alone. The collected data shows that health centers and community hospitals can receive only 58% of their reimbursement (the government subsidy was not included in this statistic because there was a delayed subsidy from the government in 1996). The existing program formula is set at 80% of the total monetary amount of card sales revenue. If no subsidy from government was allocated to the providers the expense would be borne by providers. There is a problem of equity concerned since only the health card holders are better off if community hospitals must subsidize card holders by their own revenue.

It is essential that the formula of reimbursement from HCF to compensate providers should be developed. HCF should establish reimbursement agreements with public hospitals based on a combination of expected outputs and costs, and all agreements might contain either a cost or a volume ceiling. This policy must be developed for the country as a whole to assist the HCF committee in each province to apply a standard criteria for allocation of funds.

Program Sustainability

In Khon Kaen province there were a series of meetings during year of this study between the research team, provincial health officers and district health officers, including the health care providers in the province. In the meetings there were discussions of how to organize the program, how to improve the program, problems in the field, government policy, budget, and how to sustain the program. The discussions give valuable suggestions for improving the existing program in areas such as program management, marketing management, financial management, and quality of services.

1. Program management:

- Build up an effective organization at all provincial and district levels. Problems may arise in the large district areas.

- Make the health card project more prominent among the various ongoing projects being implemented in the province.

- Improve the objectives and plan more efficiently.

- Create positive attitudes towards the health card program among managers and officers at all levels of the health system. Encourage effective coordination among health officers at all levels of the system to promote greater knowledge and better understanding of the health card program. This will help address the problem of providers being reluctant to participate in the program because of insufficient reimbursements. The public facilities under MOPH must participate, even though some of them are unwilling. This indicates the problem of coordination among health officers at all levels.

- Make the health insurance information system more effective.

2. Marketing:

- Work toward a goal of 100% coverage in an appropriate way.

- Improve marketing strategies, for example, using the social marketing concept.
- Develop a serious and continuous advertising campaign for the health card program.
- Create incentives to sell the health card.

3. Financial management:

- Establish monitoring committees at all levels.
- Improve the regulation of monitoring committees.
- Set penalty rules.
- Abandon the installment payment for health cards.

4. Quality of services:

- Strengthen the health care service units to achieve a high quality of care.
- Create good attitudes towards provider : provide services of equity and merit.

These problems are similar to those in other countries where voluntary health insurance for rural people is implemented. Dave (1991) studied the community and self-financing in voluntary health programmes in India and found that there is mixed success with financing efforts. The financing methods, including user charges, community-based prepayment schemes, fund raising, commercial schemes and in-kind contributions can be further strengthened with better planning, management, monitoring and evaluation. Chabot et. al. (1991) studied national community health insurance at village level and found that the experience of a voluntary levy scheme in Guinea Bissau may be feasible and manageable in rural parts of Africa, if the village population is allowed to decide on the amount of money and method of collection and if the government supports the scheme by guaranteeing sufficient drugs, low prices, and effective control measures. A review of case studies carried out by the Bamako Initiative in five countries noted that the extension of insurance coverage to rural populations is a strategy that can improve equity (McPake, Hanson, and Mills, 1993).

The main problem areas concerned in the program are as follows:

- (1) Program management: marketing, financial, quality of care;
- (2) The adverse selection or self selection problem, i.e., how to increase the number of people enrolled to ensure a sufficient pooling of risks;
- (3) Operational policies: choices about the type of services included in the program, number of episodes per card, reimbursement from providers, and effective referral systems; and
- (4) Communications: providing people with greater knowledge and better understanding of HCP, i.e., sustainability (strong promotion of the program).

Problems of program management are related to the effectiveness of health officers, government health policies, many adjustments in the program as stated above. The problem of risk sharing with no cost sharing needs a sufficient number of people or communities participating in the program. Households have been encouraged to participate in the program in various ways:

(1) *the percentage of HCF kept in community (village)*. In 1984-1986, there were village committees responsible for selling the health cards and collecting premiums. These funds were kept at the village as a HCF with a minimum enrollment base of 35% of the households in each village was required to ensure risk sharing. These committee also manages revenue collected as a revolving fund for income generating activities initiated by villagers to promote PHC. A fixed of 75% of HCF is reimbursed to compensate the providers in the referral line at the end of the year. In FY 1987, premium collected were baht 182.9 million and the approximate medical expenses were baht 267.5 million (Tantiserani and Prompakdi, 1988, cited in Tangcharoensathien, 1995) compare to total health card fund decreased to baht 81.3 million in 1992. This also related to the inconsistent support by the MOPH to the program as stated above reflects to an inadequate sales promotion. At present the HCF are kept at district and provincial level and no income generating from the funds;

(2) *the renewability of unused cards* (1985), which was abolished in the subsequent years; and

(3) *no limit of criteria for card using* from 1992 to present, there has been no limitation imposed about the number of episodes and no ceiling on expenses per episode.

The problem of adverse selection/ self selection or selection bias is a common problem in voluntary health insurance schemes. In this study, this problem is quite apparent. The research results show that the presence of illness was one of the significant factors related to card purchase and card utilization pattern. This suggests that the selection bias from this source may influence card purchase.

There is bypassing of health centers due to peoples' perception of the low quality of services provided there. In any case free services were provided to card holders at all levels in the referral line, and thus card holders chose free services at hospitals rather than at health centers. Some studies (Hongvivatana et. al., 1986) have suggested that the cost-sharing, either deductible or a fixed percent of the bill (co-insurance), should be imposed at community hospitals and higher levels but not at health center. This would encourage greater use at the subdistrict level and more rational use of higher unit cost care at higher levels and would also generate more revenue to the providers. On the other hand, it might deter the demand for cards. The renewability of unused cards (1985), which was abolished in subsequent years, was a successful incentive for avoiding unnecessary use of health cards. In the present program, the first contact in which the card holders can choose is either a health center or community hospital which might be one factor influencing health card holders bypass the health centers as stated above.

The problem of case-based reimbursement of providers, which is a retrospective reimbursement in the program, requires substantial administrative capacity and a highly developed information infrastructure. HCF should be aware of the sophisticated nature of such system, when establishing reimbursement agreements with public hospitals based on a combination of expected outputs and costs.

Finally, a continuing problem of the HCP is disseminating the knowledge about HCP and better understanding of health insurance in principle among the Thai people. This needs

consistent sales promotions and/or strong annual campaigning about the HCP, a problem apart from that of the frequent adjustments in the program.

V. Conclusions and Recommendations

Although, the health card program has been implemented for almost 15 years and has undergone many adjustments, the success of the project is still unclear. Thailand's economic structure is changing towards more industrialization with multiple impacts on the society. The transition poses difficult questions to planners and affects many key issues in the health sector. The country faces many problems such as how to increase or at least sustain the economic growth, income distribution, political instability and incompetence. The overall performance of the economy remains a major concern. Likewise, in the health sector financing is still the main problem. The objective of this paper was to assess the future potential for application of voluntary health insurance, the Health Card Program scheme, in Thailand by utilizing data collected in Khon Kaen where the recent program was implemented. This study has indicated the problems, development and health service capability in the application of the Health Card Program, identified factors influencing project outcomes, investigated the card purchase and dropout pattern, and evaluated the factors affecting the discrimination between health card purchase, non-purchase and dropouts from continued health card member groups. The results of the study will provide more understanding of how the program performs and how to sustain it more efficiently, as well as suggesting alternative ways to improve it. Both qualitative and quantitative statistical techniques have been applied to provide complimentary approaches to investigating the factors affecting the performance of the program.

The research results show that the statistically significant factors related to new card purchase and non-purchase groups are education level and presence of illness. Between the health card dropout and continued card purchase groups, the significant factor is again the presence of illness. Moreover, there were 4 significant factors related to non-card users and card users: educational level, income per year, number of employed members in family, and presence of illness.

A study of health card purchase patterns and health card utilization patterns (health utilization behaviour) demonstrates clearly and strongly that health card purchase in Khon Kaen has been influenced by the following factors: proportion of employed persons to total family members, education and presence of illness. The last factor confirms the problem of adverse selection in the program, particularly significant in the health card program implemented in Khon Kaen, since the program was introduced in the country and that province in 1983, giving Khon Kaen extensive experience with voluntary health insurance and its development throughout the years.

The sustainability of the program depends on various factors, one of which is a level of satisfaction among card users that leads them to continue to buy in the next year. The findings indicate that the continuity of card purchase in the study was associated with the following factors: age, education, income, and obtained knowledge on HCP from health

center personnel. Moreover, the card holders who had been persuaded to buy a card at home, and had persuaded neighbour too buy a card, were more likely to be continued users.

This study also investigated the health care seeking pattern among card users and non-card users. The results indicate clearly the importance of accessibility to health care among the card user group. However, the program still has the risk sharing and card utilization pattern problems to consider in order to become more sustainable and efficient. The results also show that the significant factors related to card usage rate are having chronic illness and convenient access to a health center. This is not surprising since the chronically ill will seek care regularly.

Recommendations

The uninsured have to pay out of pocket for medical services either in public or private facilities. A proper voluntary health insurance is a choice for people, especially for the poor, who are not covered by any schemes and are thus not protected to financial difficulties with the high cost of care. The health card program can be a choice for these people, who are in rural areas or some urban areas. To expand this program for urban residents would need many adjustments because there are no community hospitals provided in such areas, only municipal health centers, provincial hospitals and regional hospitals. The cost of care and types of care are different.

If the existing health card program continues to be implemented without any adjustments as suggested above, it might destabilize the whole health system. This study suggests another possibility to adjust the program as a compulsory program. It could be implemented in rural areas as a community-based compulsory insurance scheme. The services in the program would cover catastrophic cases only, the household would pay out-of pocket for outpatient care because the various studies including the present study show that the cost of such care is not very high. Especially, the low income household will eligible for FC/L scheme which provide free medical care for the low income household scheme. Aside from that there must be an essential package of health services provided free at the public facilities to guarantee basic care to the people. Given the low probability of hospitalization and the compulsory enrollment, premium will be low and affordable. For the urban areas it must be linked to health services facilities now provided and will require more information and further studies to establish. This might be an alternative way to assist the uninsured for high cost care.

To summarize, the findings reported in this study show that improvements to the existing health card program require:

- (1) need of efficient and consistent health policy;
- (2) need to revise criterias for card using such as number of episodes, type of services, ceiling on expenses, and effective referral system (problem of the bypassing of health centers);

(3) need to develop the reimbursement agreements with public hospitals based on a combination of expected outputs and costs to assist the HCF committee to allocate fund to compensate the providers;

(4) need subsidy from government budget;

(5) strengthening public health service units; and

(6) secure the health card program as the base for universal health insurance.

Finally, the findings in this study can provide more information on HCP performance and its prospects in the future beyond a pilot project of voluntary health insurance, a prepayment with no cost sharing scheme. The project aims to achieve the universal coverage which the government has taken as its goal. It is hoped that the results and recommendations emerging from the careful investigations in this paper may assist policy makers to improve and to expand the existing health card program as the base for universal insurance.

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