# Chapter 4

## Results of the Study

This chapter presents the results of this study in relation to costs and benefits incurred to Nopparat Rajathanee Hospital, because of the contracting out of primary medical care to private clinics. In this chapter all of the results will be identified by the incremental approach and the formulae as mentioned in chapter 3. The costs and benefits to be calculated are the costs and benefits that occurred within the one year (1994) in which the contracting out had been implemented.

Before starting to calculate costs and benefits of the contracting out programme, two situations had to be identified. Firstly, if the contracting out has not been established, the number of insured workers registered to Nopparat Rajathanee Hospital had to follow the natural trend. If that is the case, then the natural trend should follow either the national trend, the Bangkok trend or the Nopparat Rajathanee Hospital trend. There is thus a need to determine which trend is the most suitable one to represent the natural trend. The number of insured workers in the whole country and in Bangkok as shown in Table 4.1 have to be considered.

Table 4.1: Number of Insured Workers in Thailand and in Bangkok (1992-1995).

| | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|
| Thailand | 3,340,297 | 4,514,864 | 4,961,700 | 5,249,742 |
| Bangkok | 1,464,251 | 1,867,502 | 1,261,903 | 2,073,996 |

*Source: Social Security Office Ram Indra Branch.*

By following the trends of Thailand, Bangkok and Nopparat Rajathanee Hospital, the natural trends of insured workers registered with the hospital could be estimated as shown in Table 4.2:

Table 4.2: Estimated Numbers of Insured Workers Registered with Nopparat Rajathanee Hospital by Various Trend.

| | 1991 | 1992 | 1993 | 1994 | 1995 |
|---|---|---|---|---|---|
| Country Trend | | 54,580 | 73,772 | 81,074 | 85,780 |
| Bangkok Trend | | 54,580 | 69,611 | 47,037 | 77,308 |
| Nopparat Trend | 62,141 | 54,534 | 47,858 | 41,999 | 36,858 |

In this study the Nopparat Rajathanee Hospital trend was considered to represent the situation, as contracting out has not implemented. The reasons to use this trend was that the national trend and Bangkok trend include both private and public sectors for insured workers' market share. But Nopparat Rajathanee Hospital is the public sector, so it's own trend should be more appropriate. Also the trend was related to the percent market share of insured workers in the public sector (Kamolratanakul et al, 1993) as given in Table 4.3.

Table 4.3: Percent Market Share of Insured Workers (1991-1994)

| | Dec.-91 | Feb.-92 | Jan.-93 | 1994 * |
|---|---|---|---|---|
| Public Sector | 76.6 | 54 | 43.2 | 26.50 |
| Private Sector | 23.4 | 46 | 56.8 | 73.50 |
| Total | 100 | 100 | 100 | 100 |

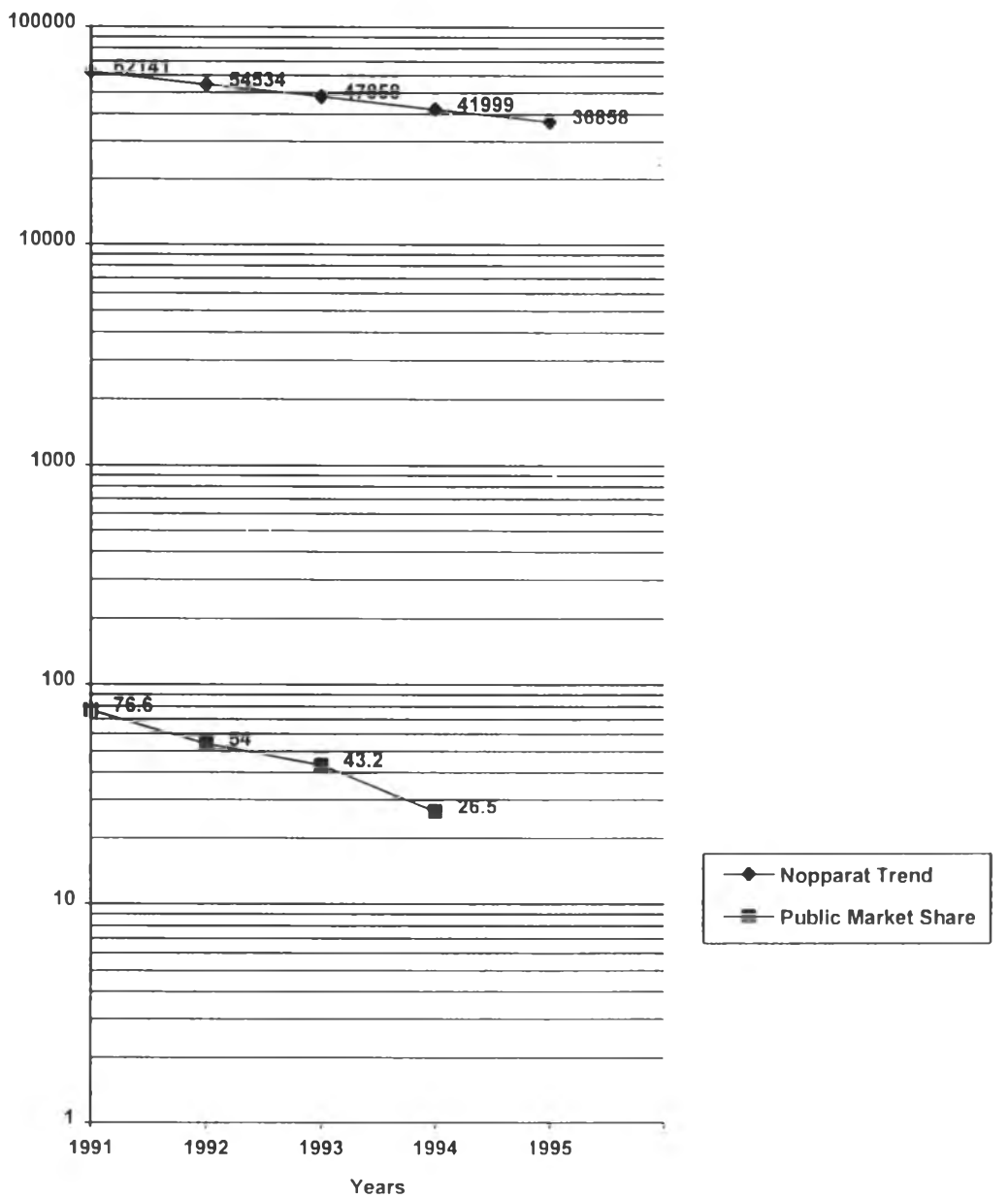
*1994 * : Estimated value*

*Source : National Social Security Office*

The public sector has lost some market share of insured workers continuously since the beginning of implementation of the social security scheme in Thailand (Kamolratanakul et al, 1993), and for Nopparat Rajathanee Hospital, if there was no contracting out primary medical care to private clinics under the social

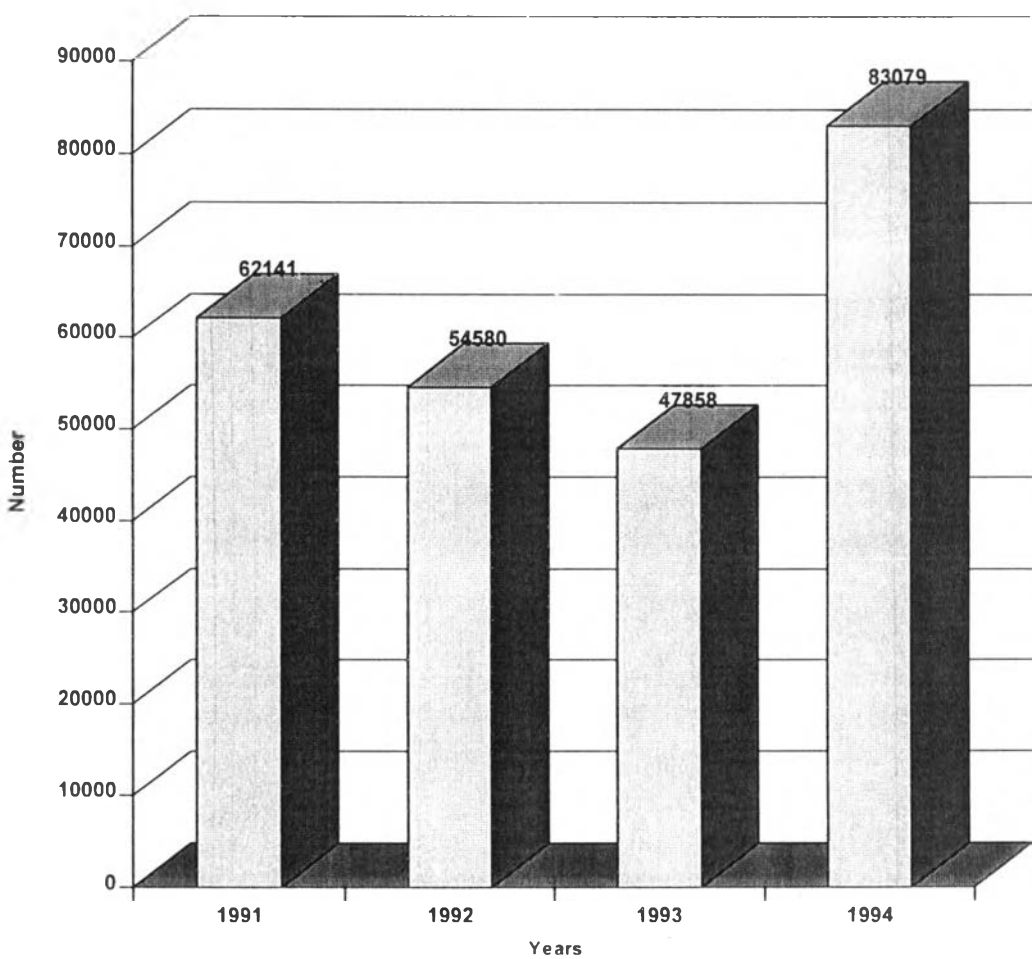
security scheme, the hospital could lose a number of registered insured workers also. Because insured workers may unsatisfied and look for other main-contractors which can provide them more convenient and more satisfaction. For more understanding look at Figure 4.1;

Figure 4.1: Estimated Number of Insured Workers registered to Nopparat Rajathanee Hospital Compared wit Percent Public Market Share of Insured Workers.



Secondly: the real situation is the situation in which the contracting out has been established. According to the Incremental Approach, all of the costs and benefits incurred to Nopparat Rajathanee Hospital, due to the implemented programme, had to be compared with the situation which had no contracting out to private clinics as in the first situation. In the real situation, the contracting out was established in 1993, and the number of registered insured workers at Nopparat Rajathanee Hospital has suddenly increased, although it decreased consecutively from 1991 to 1993. Then, an increasing rate of insured workers registered with Nopparat Rajathanee Hospital could be achieved by implementing contracting out primary medical care to private clinics. The number of insured workers registered with Nopparat Rajathanee Hospital over 4 year is given in Figure 4.2:

Figure 4.2: Number of Insured Worker registered to Nopparat Rajathanee Hospital



## 4.1 Incremental Costs Incurred with Nopparat Rajathanee Hospital for Implementing the Private Networks.

Many cost components were incurred by Nopparat Rajathanee Hospital when the contracting out was established in 1993. According to the incremental approach used in this study, total incremental cost for implementing contracting out was equal to 20,188,933.81 baht. The treatment charges paid to private clinics were the highest cost components, and equal to 83.10 % of all incremental costs. The lowest was the capital cost component, equal to 0.17 % only. The calculations are given in the Appendix. The detail of each cost component as capital cost, recurrent cost and treatment charges paid to networks are listed in Table 4.4:

Table 4.4: Cost Components and Incremental Cost for Implementing Contracting Out Primary Medical Care to Private Clinics in 1994.

| Cost Components | | | Expenses | % |
|---|---|---|---|---|
| Capital | Building | | 0.00 | 0.00 |
| | Equipment | | 34,044.82 | 0.16 |
| Recurrent | Personnel | | 557,695.74 | 2.66 |
| | Promotion | | 460,096.00 | 2.19 |
| | Vehicle | | 6,000.00 | 0.03 |
| | Supply | | 74,041.40 | 0.35 |
| | Utilities | Telephone | 10,000.00 | 0.05 |
| | | Post - Mail | 7,000.00 | 0.03 |
| | | Electric | 16,701.12 | 0.08 |
| | Others | Miscellaneous | 15,000.50 | 0.07 |
| | | Meeting | 250,222.08 | 1.19 |
| Treatment Charges Paid to Networks | Private networks | | 16,777,580.00 | 80.01 |
| | Supra-contractors | | 1,501,507.20 | 7.16 |
| | IPD Expenditure | | 886,156.00 | 4.23 |
| | OPD Expenditure | | 373,603.39 | 1.78 |
| Total Incremental Cost | | | 20,969,648.25 | 100.00 |

No additional cost was considered for the building. Because this study used an incremental approach; when the contracting out was implemented, the same office operated in the same area. There was no new building constructed for the office for Social Security tasks.

The large components of recurrent costs were meeting, promotion and personnel expenditure, most of them are the costs of programme management which are usually high in the public sector administration (Mills, 1993).

Almost all of the treatment charges paid to the networks were paid to private contractors, because insured workers prefer to get medical services from private clinics than from Nopparat Rajathanee Hospital.

## 4.2 Incremental Benefits Incurred by Nopparat Rajathanee Hospital for Implementing the Contracting Out Primary of Medical Care to Private Clinics.

### 4.2.1 Monetary benefits

In this study, the monetary benefits due to the contracting out are the increasing capitation payment from the National Social Security Office, for health services given to insured workers registered with Nopparat Rajathanee Hospital, compared with the capital payment received, if the contracting out was not implemented, and cost saving because of implementing the contracting out. Total Incremental benefit of the contracting out is equal to 33,564,574 baht. Capitation payment obtained is the highest share, equal to 28,037,100 baht, or 83.53 % , and cost saving is equal to 5,527,474 baht or 16.47 %, as mentioned in Table 4.5:

Table 4.5: Benefits Components and Incremental Benefit for Implementing Contracting Out Primary Medical Care to Private Clinics in 1994.

| Benefit Components | Revenue | % |
|---|---|---|
| Increasing Capitation Payment From National Social Security Office | 28,037,100.00 | 83.53 |
| Cost Saving for Treatment Charges Paid to Public Networks | 5,527,474.00 | 16.47 |
| **Total Incremental Benefit** | 33,564,574.00 | 100.00 |

### 4.2.2 Non-monetary benefits

Non-monetary benefits are the achieved benefits from the contracting out programme beyond monetary benefits. Most of them can be assessed by looking at various indicators that include:

**Equity in utilization and access to health care**

For health care services the term "equity" means patients can have access to health care equally when they need. Equity in this study means equity in utilization and access to health services for insured workers registered with Nopparat Rajathanee Hospital. According to the meaning of equity the indicators used in this study are the increasing rate of health care utilization and distribution of the networks' health facilities.

Table 4.6: Out-patient Utilization Rate (visit/person/year)

| Out-patient Utilization Rate | 1991 | % | 1992 | % | 1993 | % | 1994 | % |
|---|---|---|---|---|---|---|---|---|
| Nopparat Rajathanee Hospital | 0.14 | 66.67 | 0.23 | 56.10 | 0.17 | 13.93 | 0.15 | 9.04 |
| Nongjok Community Hospital | 0.02 | 9.52 | 0.09 | 21.95 | 0.07 | 5.74 | 0.02 | 1.20 |
| Ladkrabang Community Hospital | 0.06 | 28.57 | 0.10 | 24.39 | 0.09 | 7.38 | 0.03 | 1.81 |
| Municipal Health Centers | | | | | 0.0018 | 0.15 | 0.0024 | 0.14 |
| Private Hospital | | | | | | | 0.06 | 3.61 |
| Private Polyclinics | | | | | 0.6 | 49.18 | 0.69 | 41.57 |
| Private Clinics | | | | | 0.27 | 22.13 | 0.71 | 42.77 |
| **Total** | **0.21** | **100.00** | **0.41** | **100.00** | **1.22** | **100.00** | **1.66** | **100.00** |

From Table 4.6, in 1992, almost all of the insured workers out-patient cases had to consume health care services at the very crowded Nopparat Rajathanee Hospital out-patient department, that could affect the out-patient utilization rate, and the rate was very low (0.41 visit/person/year). But, for 1994 after implementing the contracting out primary medical care to private clinics, Nopparat Rajathanee Hospital has many Networks delivering health care services for insured workers. The number of insured workers registered with Nopparat Rajathanee Hospital has suddenly increased, almost all of the insured workers prefer to use private health

facility networks more than public networks. The out-patient utilization rate at Nopparat Rajathanee Hospital's out-patient department has decreased to 0.15 visit/person/year instead of 0.23 visit/person/year in 1992, That could create positive outcome to the hospital, since over crowding at the out-patient department has been reduced.

Table 4.7: The Available Networks of Nopparat Rajathanee Hospital.

| Area | Nopparat Rajathanee Hospital Networks | | | | |
|---|---|---|---|---|---|
| | Hospital | Poly-clinic | Solo-clinic | Health center | Total |
| 1. Bung Kum | | 1 | 3 | 1 | 5 |
| 2. Min Buri | | 5 | 9 | 1 | 15 |
| 3. Nong Chok | 1 | | 3 | | 4 |
| 4. Lat Krabang | 2 | 3 | 5 | 1 | 11 |
| 5. Pravet | | 1 | 1 | 2 | 4 |
| 6. Bang Kapi | | 5 | 9 | 1 | 15 |
| 7. Lat Phrao | | | | | 0 |
| Other area | | 1 | 3 | 1 | 5 |
| **Total** | 3 | 16 | 33 | 7 | 59 |

Source: Nopparat Rajathanee Record 1994.

Table 4.8: The Route for Insured Workers to Get Treatment at the Most Convenient Health Facilities of Nopparat Rajathanee Hospital Networks.

| Area | Route (Kilometers) | | | | |
|---|---|---|---|---|---|
| | AVG. | SD | MIN. | MAX. | N |
| 1. Bung Kum | 2.50 | 1.27 | 1.00 | 5.00 | 10 |
| 2. Min Buri | 2.65 | 2.29 | 1.00 | 10.00 | 17 |
| 3. Nong Chok | 8.50 | 3.89 | 2.00 | 13.00 | 6 |
| 4. Lat Krabang | 4.53 | 4.62 | 1.00 | 20.00 | 19 |
| 5. Pravet | 5.50 | 6.36 | 1.00 | 10.00 | 2 |
| 6. Bang Kapi | 2.14 | 1.77 | 1.00 | 6.00 | 7 |
| 7. Lat Phrao | 1.67 | 0.58 | 1.00 | 2.00 | 3 |
| Summarize | 3.72 | 3.65 | 1.00 | 20.00 | 64 |

Source: Nopparat Rajathanee Hospital Survey 1993.

Table 4.9: Traveling Time for Going to Get Treatment at the Most Convenient Health Facility within the Networks.

| Area | Traveling Time (minute) | | | | |
|---|---|---|---|---|---|
| | AVG. | SD | MIN. | MAX. | N |
| 1. Bung Kum | 11.40 | 7.82 | 4.00 | 30.00 | 10 |
| 2. Min Buri | 12.37 | 7.84 | 2.00 | 30.00 | 19 |
| 3. Nong Chok | 20.71 | 9.32 | 10.00 | 30.00 | 7 |
| 4. Lat Krabang | 14.90 | 9.98 | 3.00 | 30.00 | 20 |
| 5. Pravet | 20.00 | 14.14 | 10.00 | 30.00 | 2 |
| 6. Bang Kapi | 11.57 | 5.97 | 1.00 | 20.00 | 7 |
| 7. Lat Phrao | 12.50 | 2.89 | 10.00 | 15.00 | 4 |
| Summarize | 13.96 | 8.65 | 1.00 | 30.00 | 69 |

Source: Nopparat Rajathanee Hospital Survey 1993.

The other reasons of insured workers preferring to get treatment at private networks are that it is more convenient for them to access health services, only 30 minutes to go to the private clinics the longest route is about 20 kilometers and Nopparat Rajathanee Hospital private networks are available in many places. Then, according to the definition of equity in this study, equity improvement can be achieved because insured patients can get treatment near their home/work which is easy to access. For this reason the health care utilization rate are increase.

**Services provision improvements**

Improvements of services provision could be achieved if the health care provider can make available better services than in the previous situation. The services provision improvements may be achieved by the following indicators (Table 4.10).

Table 4.10: Services Provision improvements Indicators

| Indicator | 1992 | 1994 | % Change |
|---|---|---|---|
| Average Length of Stay (day) | 8.30 | 7.8 | -5.57 |
| In-patient Utilization Rate (day/person/year) | 0.075 | 0.059 | -21.33 |
| Service Charges per OPD Visit (bath/visit) | 127.10 | 221.79 | +74.50 |
| Price of Drugs Prescription per OPD Visit (bath/visit) | 113.00 | 181.49 | +60.61 |
| Service charges per Admission Day (bath/day) | 387.62 | 639.33 | +64.94 |
| Service Charges per In-patient (bath/person) | 113.00 | 181.49 | +60.61 |

Source: Social Security Office, Nopparat Rajathanee Hospital (1994).

In 1994 after the contracting out programme was implemented. The average length of stay for insured patients was reduced by 6.02%. The in-patient utilization rate of insured patients was reduced by 21.33%. These mean insured patients stayed in the hospital shorter time than in 1992, and the rate of insured patients who had to be admitted was also reduced. But at the same time, service charges per OPD visit were increased by 74.50%, service charges of drug prescription per OPD visit was increased by 60.61%, service charges per admission day were increased by 64.94% and also service charges per in-patient increased by 55.62%. These are quite high increasing rates when compared with private clinics whose average price of drug prescription per visit for insured patients were only 53.41 baht in 1993 and 51.27 baht in 1994. But, from these results it can not be concluded either that Nopparat Rajathanee Hospital is over prescribing or that private clinics within the networks are under prescribing, because right now, the standard prescriptions are not available for the comparison. Also all of these results can not be summarized as the real effects of the contracting out programme since these are short term effects. The services provision improvements can be affected by many factors and the results may occur in the long term. Therefore long term effects should be considered in a further study, but for these short term results, particular aspect about services provision quality control within the networks can be discussed.

**Quality of services improvements**

Quality of health care services could be considered from a number of aspects. The popular aspects are, to observe the response from consumers or to search for their reasons " why they prefer to consume health services from this health facility than the others?", "why this health facility is the one for them?". Then, quality improvements could be identified by the following indicators (Table 4.11-4.17).

Table 4.11: Number of Insured Workers Registered to Nopparat Rajathanee Hospital

| Year | 1991 | 1992 | 1993 | 1994 |
|---|---|---|---|---|
| No. of Insured Workers Registered | 62,141 | 54,580 | 47,858 | 83,079 |
| No. of Enterprises Registered | 405 | 406 | 430 | 1218 |

*Source; Nopparat Rajathanee Hospital report 1995*

Table 4.12: Results from the Questionnaire for The Owners of Enterprises.

| Question | Item | Percent |
|---|---|---|
| Person who gives the response | Owner of Enterprise | 9.70 |
| | Manager | 25.80 |
| | Foreman | 21.00 |
| | Other | 43.50 |
| | **Total** | **100.00** |
| First Selected Main-contractor | Nopparat Rajathanee Hospital | 90.50 |
| | Other | 9.50 |
| | **Total** | **100.00** |
| Main-contractors for Workers in the Enterprise | Only Nopparat Rajathanee Hospital | 36.50 |
| | There are other main-contractors for the workers | 63.50 |
| | **Total** | **100.00** |

Table 4.13: Registered Reasons of the Employers to Choose Nopparat Rajathanee Hospital as the Main-contractor.

| Registered Reasons | % |
|---|---|
| The Hospital locates near their factories. | 29.40 |
| Nopparat Rajathanee Hospital has private networks available. | 64.70 |
| Nopparat Rajathanee Hospital has quality of Services better than other hospitals. | 4.70 |
| The employers got some specific benefits from Nopparat Rajathanee Hospital. | 0.00 |
| There are individual relationship between employers and Nopparat Rajathanee Hospital administrators. | 0.00 |
| The Employers didn't know about there are the other hospitals available. | 1.20 |
| Others | 0.00 |
| **Total** | **100.00** |

Table 4.14: The Procedures for Employers to Select the Main-contractor.

| Procedure | % |
|---|---|
| The employers selected by their own opinion. | 9.30 |
| The enterprise's committees preferred to select. | 22.10 |
| The employers asked for the requirement of employees. | 66.30 |
| Others. | 2.30 |
| **Total** | **100.00** |

The number of insured workers registered with Nopparat Rajathanee Hospital has suddenly increased in 1994 after the contracting out programme was established: 90.50% of registered enterprises chose Nopparat Rajathanee Hospital as the first choice, to be the main-contractor for workers in their companies, 64.70% of them chose Nopparat Rajathanee Hospital because the hospital has private networks available and 66.30% of workers were asked for their requirements to assist making the employers decision for selecting the main-contractor. That means the increasing rate of the number of insured workers could be the effect of contracting out programme.

Table 15: The Satisfaction of Insured Patients about Quality of Private Networks' Services.

| Service | Mean | Std. Dev. | Min. | Max. | N |
|---|---|---|---|---|---|
| 1. Waiting Time | 2.33 | 0.64 | 1 | 3 | 55 |
| 2. Treatment Time | 2.40 | 0.53 | 1 | 3 | 55 |
| 3. Health Teaching From Health Personnel | 2.35 | 0.58 | 1 | 3 | 55 |
| 4. Sufficient Health Personnel | 2.24 | 0.64 | 1 | 3 | 55 |
| 5. Sufficient Medical and Official Equipment | 2.42 | 0.71 | 1 | 4 | 55 |
| 6. Sufficient Available Office Hours. | 2.45 | 0.66 | 1 | 4 | 55 |
| 7. The Relationship of Official and Health Personnel | 2.20 | 0.83 | 1 | 3 | 55 |
| 8. Traveling Time and Travel Expenditure. | 2.36 | 0.56 | 1 | 3 | 55 |
| 9. Overall Satisfaction | 2.42 | 0.66 | 1 | 3 | 55 |

where: **Std. Dev.** is standard deviation,
in table 4.15, 4.16 and 4.17;
4 = very good, 3 = good,
2 = fairly good and 1 = poor.

Table 4.16: The Satisfaction of Insured Patients about Quality of Nopparat Rajathanee Hospital Services Compared with Before Implementation of the Networks.

| Service | Mean | Std. Dev. | Min. | Max. | N |
|---|---|---|---|---|---|
| 1. Waiting Time | 2.05 | 0.55 | 1 | 3 | 40 |
| 2. Treatment Time | 2.15 | 0.62 | 1 | 3 | 40 |
| 3. Health Teaching From Health Personnel | 2.12 | 0.65 | 1 | 3 | 40 |
| 4. Sufficient Health Personnel | 2.07 | 0.69 | 1 | 3 | 40 |
| 5. Sufficient Medical and Official Equipment | 2.50 | 0.60 | 1 | 3 | 40 |
| 6. Sufficient Available Office Hours. | 2.30 | 0.72 | 1 | 3 | 40 |
| 7. The Relationship of Official and Health Personnel | 2.07 | 0.66 | 1 | 3 | 40 |
| 8. Traveling Time and Travel Expenditure. | 2.35 | 0.48 | 2 | 3 | 40 |
| 9. Overall Satisfaction | 2.25 | 0.74 | 1 | 3 | 40 |

Table 4.17: The Satisfaction of Insured Patients about Quality of Nopparat Rajathanee Hospital Services , by Employers of Enterprises Registered After Implementing the Networks.

| Service | Mean | Std. Dev. | Min. | Max. | N |
|---|---|---|---|---|---|
| 1. Waiting Time | 2.34 | 0.68 | 1 | 4 | 44 |
| 2. Treatment Time | 2.48 | 0.66 | 1 | 4 | 44 |
| 3. Health Teaching From Health Personnel | 2.32 | 0.64 | 1 | 3 | 44 |
| 4. Sufficient Health Personnel | 2.25 | 0.61 | 1 | 3 | 44 |
| 5. Sufficient Medical and Official Equipment | 2.41 | 0.66 | 1 | 3 | 44 |
| 6. Sufficient Available Office Hours. | 2.64 | 0.75 | 1 | 4 | 44 |
| 7. The Relationship of Official and Health Personnel | 2.32 | 0.80 | 1 | 4 | 44 |
| 8. Traveling Time and Travel Expenditure. | 2.30 | 0.55 | 2 | 3 | 44 |
| 9. Overall Satisfaction | 2.43 | 0.66 | 1 | 3 | 44 |

Despite the increasing rate of the number of insured workers registered with Nopparat Rajathanee Hospital might be the effect of establishing the contracting out programme, due to workers being satisfied with the available private networks of the hospital. But as for the satisfaction with the quality of services, both for private clinics and for Nopparat Rajathanee Hospital, it is only fairly good. Therefore Nopparat Rajathanee Hospital has to improve the quality of services and try to find the ways to control quality of private networks. Otherwise the hospital may lose a number of insured workers because there are many networks right now and the workers may choose the one that can give them more satisfaction.

### 4.3 Administrative Efficiency Analysis.

Administrative efficiency requires a conducive environment that stimulates and forces managers to used the most efficient methods for producing good health outcomes (Williams, 1992). Administrative efficiency can be assessed by considering the various aspects, e.g. the national social security office which belong to Ministry of Labour and Social Welfare tries to encourage public main-contractors to establish their networks or sub-contractors in order to provide health services for insured workers under the social security scheme. The Ministry of Public Health as the policy maker for public hospitals also tries to reduce the complex regulations within the bureaucratic style by decentralization strategy, then public hospital managers are given freedom to manage and decide the ways to allocate budgets within their hospitals, which means government fiscal policy constraint is reduced. Managers of public hospital thus receive incentives to manage their hospitals more effectively. But, other things should be considered, including rewards for administrative personnel because those personnel usually work harder than others. As found in this study, administrative personnel for social security in Nopparat Rajathanee Hospital have longer working hour more than should be. Dr. Cheirnchai Tangtastasawadi, the secretary of the hospital's social security services improvement committee, who acts as the office director, has to work in the hospital around 2,846.4 hours per year while normal working hours for government officers should be 2,280 hours per year, i.e. 24.84% more. His assistant works 2,806.8 hours per year, i.e. 23.11% more than average. Both of them do not have any monetary reward and they never ask for it because they prefer to look at the success of their tasks, that is their non-monetary reward (Tangtatsawadi and Songthong, 1996), but from an administrative efficiency point of view this is quite a serious situation because since a lot of competition occurs, it is possible for them to move to work with a private hospital which gives them greater monetary reward. Another administrative inefficiency is low incentive recruitment of new administrators due to the low monetary rewards and shortage of manpower in the hospital, so that few want to work with this task.

According to Nopparat Rajathanee Hospital's viewpoint expressed in this study, administrative improvements can be achieved in terms of government encouragement, unconstrained fiscal policy and administrative freedom due to decentralization strategy, but also required an other considerations such as administrators reward which has not yet been assessed and which the hospital has to solve.

## 4.4 Financial Efficiency Analysis.

Financial efficiency analysis is one of the objectives in this study To achieve financial efficiency, only monetary benefits are calculated, the indicators to be considered are net benefit, cost recovery, and benefit-cost ratio. Most of these indicators are assessed as follows:

### 4.4.1 Net Benefit

Both incremental cost and incremental monetary benefit obtained are considered. The difference between incremental monetary benefit and incremental cost, is the net benefit. According to the results of this research, net benefit is equal to 12,594,925.75 baht, as mentioned below:

Net Benefit = (Incremental Benefit - Incremental Cost) > 0

Net Benefit = (33,564,574 - 20,969,648.25) > 0

= 12,594,925.75 > 0

To determine whether the project should be implemented, or not, depends on the result of Net Benefit. If the result was more than "Zero", that project could be implemented. The Net Benefit to Nopparat Rajathanee Hospital for contracting out primary medical care to private clinics in 1994, was more than zero. Therefore the contracting out could be continued, but with respect to financial efficiency, more indicators should be considered.

### 4.4.2 Benefit - Cost Ratio

Benefit-cost ratio was one of the indicators used to measure the financial efficiency. This indicator can be achieved by looking at the quotient between incremental monetary benefit and incremental cost. The benefit-cost ratio in this research was 1.66. To get this value, the following process had to be conducted:

Benefit - Cost Ratio = (Incremental Benefit/Incremental Cost) > 1

Benefit - Cost Ratio = (33,564,574 / 20,969,648.25) > 1

= 1.60 > 1

The programme could be accepted, if the Benefit - Cost Ratio is > 1. That means the programme is considered worthwhile to implement. Thus, the contracting out programme passed the financial efficiency test.

### 4.4.3 Break event point

In this study break event point means the quantity of an important variable that could effect incremental cost and incremental monetary benefit, calculated by taking the least number of that variable, that could make incremental cost balance incremental monetary benefit. Capitation payment from national social security office is the most important variable because it consumed 83.53% of monetary benefit components. Then, break event point could be calculated by looking at the least number of insured workers registered with Nopparat Rajathanee Hospital that can make incremental cost equal to incremental monetary benefit:

So, break event point;

$$\text{Incremental Cost} = \text{Incremental Monetary Benefit}$$

$$20{,}969{,}648.25 = (682.50 \times Q) + 5{,}527{,}474$$

$$Q = 22{,}626 \text{ persons}$$

where: 682.50 is the capitation payment per insured workers subtracted by 2.5% (for MOPH Social Security Fund)

"Q" is the increasing number of insured workers registered to Nopparat Rajathanee Hospital above the natural trend of Nopparat Rajathanee Hospital 1994.

Then the least number of insured workers registered with Nopparat Rajathanee Hospital that the hospital has to achieve is 64,625 persons (41,999 + 22,626). therefore this number of registered insured workers could make incremental monetary benefit equal to incremental cost.

Looking at it an other way, if cost components are considered, the biggest share is the treatment charges paid to private networks, then it is necessary to consider the highest amount of money paid for the private network that can make

incremental cost equal to incremental monetary benefit, according to the following calculation:

Break event point:

$$\text{Incremental Cost} = \text{Incremental Monetary Benefit}$$

$$C + R + T_1 + T_2 + T_3 + T_4 = 33{,}564{,}574.00 \text{ baht}$$

$$3{,}411{,}353.81 + T_1 = 33{,}564{,}574.00 \text{ baht}$$

$$T_1 = 29{,}372{,}505.75 \text{ baht}$$

where: C is the Capital Cost in 1994

R is the Recurrent Cost in 1994

$T_1$ is the Estimated Treatment Charges paid to Private Networks

$T_2$ is the Treatment Charges paid to Supra-contractors

$T_3$ is the Increase in IPD Expenditure

$T_4$ is the Increase in OPD Expenditure

All of these components mentioned above are incremental costs in 1994.

Therefore the estimated highest expenditure that could be paid to private networks equaled 29,372,505.75 baht, if other components could be controlled to be constant. For this amount of expenditure, incremental cost will equal to incremental monetary benefit, that means Nopparat Rajathanee Hospital has no profit, the Net benefit is equal to zero and Benefit-Cost Ratio is equal to one. By following the network type of treatment and the estimated highest expenditure for private networks, the expressible expense for each type of treatment can be known i.e. the expandability of treatment charges for new episodes could be 250.83 baht, that for follow up with drugs could be 73.87 baht, for follow up with drugs with injection could be 147.74 bath, for dressing wounds could be 44.32 baht and for chronic diseases could be 243.59 baht per visit, as shown in table 4.18.

Table 4.18: Estimated Expandable Expenditure for Each Type of Treatment.

| Type of Treatment | AVG. Exp. | % No. of Pt. | % Exp. | Est. Exp. | Est. No. of Pt. | Est. EVE |
|---|---|---|---|---|---|---|
| New Episode | 169.77 | 89.97 | 93.51 | 27,465,520.41 | 109,500 | 250.83 |
| Follow up + Drugs | 50.00 | 2.16 | 0.66 | 194,360.93 | 2,631 | 73.87 |
| Follow up + Injection | 50.00 | 0.54 | 0.16 | 48,348.49 | 654 | 73.87 |
| Follow up + Drugs + Inject. | 100.00 | 1.20 | 0.74 | 216,601.24 | 1,466 | 147.74 |
| Dressing + Drugs + Inject. | 130.00 | 0.06 | 0.05 | 13,827.67 | 72 | 192.07 |
| Dressing + Drugs | 80.00 | 0.87 | 0.43 | 125,319.29 | 1,060 | 118.19 |
| Dressing + Injection | 80.00 | 0.03 | 0.01 | 3,867.88 | 33 | 118.19 |
| Dressing | 30.00 | 1.83 | 0.34 | 98,630.92 | 2,225 | 44.32 |
| Refer | 50.00 | 0.10 | 0.03 | 8,702.73 | 118 | 73.87 |
| Chronic Diseases | 164.87 | 1.83 | 1.84 | 541,251.68 | 2,222 | 243.59 |
| By Items | 257.49 | 1.42 | 2.23 | 656,074.51 | 1,725 | 380.42 |
| Total | 163.35 | 100.00 | 100.00 | 29,372,505.75 | 121,706 | 241.34 |

### 4.4.4 Sensitivity Analysis

In this study, cost components are calculated by using public prices, but from the economic view point, opportunity cost is the principal concept, that is resources value which used for another purpose (Warner and Luce, 1982). Sensitivity analysis is conducted by entering concept of opportunity cost. The component of cost which can be so changed is personnel cost, because all of the personnel have opportunity to work with either public or private sectors. That means that opportunity costs for them are higher than the personnel cost that has been calculated in this study, since private personnel costs are higher than public personnel costs (Nittayarumphong and Tangcharoensathien, 1994). Therefore, opportunity of personnel cost are assumed to increase four times and then, fiscal efficiency has to be analyzed again by following the same calculation process as for fiscal efficiency analysis. After personnel cost has been changed, all fiscal efficiency analysis results are also changed as mentioned below;

Total incremental cost = 22,642,735.47 bath

Net monetary benefit = 10,921,838.53 bath

Benefit-cost ratio = 1.48

Break event point :

- Minimum number of registered insured workers = 67,076 persons

- Highest treatment charges that can be paid to private networks
= 27,699,418.53 bath

Event personnel cost is increased four times, but fiscal efficiency indicators are still positive in sign. That means personnel costs of this programme can fluctuate and Nopparat Rajathanee Hospital has the ability to invest more in personnel.

Another component that should be subjected to sensitivity analysis, is the increasing number of insured workers registered with Nopparat Rajathanee Hospital from hypothetical number in the situation that contracting out is not established. The hypothetical number could be over and under in estimation. In this study under-estimation is considered because it might affect monetary benefit more than over-estimation, e.g. the capitation payment from the national social security office to the hospital, might be higher than it should be. Then to analyze the sensitivity, the estimated number of insured workers is assumed to increase by 10%, that means the hypothetical number has been changed from 41,999 persons to 46,199 persons.

Almost all indicators of fiscal efficiency analysis are changed, when the hypothetical number has been changed. Those include:

Total incremental monetary benefit = 30,689,074.00 baht

Net monetary benefit = 9,719,425.75 baht

Benefit-cost ratio = 1.46

Break event point :

- Minimum number of registered insured workers = 41,999 persons

- Maximum treatment charges can be paid to private networks
= 27,286,702.19 baht

The results of fiscal efficiency are still positive, although the hypothetical number has been changed. That outcome supports the proposition that the fiscal efficiency of this programme is high, i.e. this programme has fiscal feasibility (Nittayarumphong et.al, 1995).

## 4.5 Technical Efficiency Analysis

Technical efficiency requires ways to provide health care services by the most cost-effective method, then the following indicators are included:

Table 4.19: Indicators for Technical Efficiency Analysis

| Indicator | | 1994 |
|---|---|---|
| Nopparat Rajathanee Hospital | Average charges per out-patient visit (bath) | 221.79 |
| | Drugs prescription cost per out-patient visit (bath) | 181.49 |
| Private clinics | Average charges per visit(bath) | 163.35 |
| | Drugs prescription cost per visit (bath) | 51.27 |

*Source: Social Security Office, Nopparat Rajathanee Hospital, 1994.*

The most cost-effective method to provide health services is contracting them out to private clinics, which costs only 163.35 baht per visit, while health services provided by Nopparat Rajathanee Hospital consume around 221.79 baht per out-patient visit and the drug prescriptions cost per out-patient visit at the hospital is 181.49 baht, compared with drug prescription cost per visit at private clinics of only 51.27 baht. This assumes treatment outcomes are the same. Providing health services at contracted private clinics is more technically efficient than the hospital providing them. But, something should be remembered when contracting out is implemented. The administrative costs of contracting out, is quite high; according to this study, almost 7% of total incremental costs is the administrative costs that include most of capital costs, recurrent costs also monitoring and supervision costs. So the administrators should find the way to reduce these costs.

## 4.6 Impacts on services provision

In contracting out primary medical care, the most important are the private clinics, because they are the largest group of service providers within the networks. That can create many impacts on the networks. Thus their attitude should be studied to learn the optimum ways to control or manage the networks.

Table 4.20: The Attitude of Private Clinic Within Networks

| Question | Answer | % |
|---|---|---|
| Type of clinics | Poly-clinic | 38.90 |
| | Solo-clinic | 61.10 |
| **Total** | | **100.00** |
| As the networks of Nopparat Rajathanee Hospital, is it important for your clinic? | Yes. | 55.60 |
| | No. | 44.40 |
| **Total** | | **100.00** |
| Are the payments for clinics appropriate? | yes. | 72.20 |
| | no. | 27.80 |
| **Total** | | **100.00** |
| How long clinics have to wait for payment from Nopparat Rajathanee Hospital? | one week | 0.00 |
| | two weeks | 0.00 |
| | three weeks | 5.60 |
| | four weeks | 44.40 |
| | > four weeks | 50.00 |
| **Total** | | **100.00** |
| What about waiting time? | suitable | 61.10 |
| | has to improve | 38.90 |
| **Total** | | **100.00** |
| How many main-contractor clinic has? | more than one | 55.60 |
| | only Nopparat. | 44.40 |
| **Total** | | **100.00** |
| What about the payments from other main-contractors when compare with Nopparat Rajathanee main-contractor? | higher | 16.70 |
| | equal | 41.70 |
| | lower | 41.70 |
| **Total** | | **100.00** |
| Do you satisfy with Nopparat Rajathanee main-contractor's regulation? | yes. | 88.90 |
| | no. | 11.10 |
| **Total** | | **100.00** |

The results from the questionnaire for private networks of Nopparat Rajathanee Hospital showed that 61.15 % are solo-clinics, another 38.9% are poly-clinics, 55.6% consider to maintain network status is important for them, but 44.4% think it is not important. 72.2% accept the payment given by the main-contractor as a suitable amount of money. For 27.8% who do not agree with the payment but they are still in the network because they get other additional benefits i.e. they can promote their clinic through insured patients or the number of patients who visit their clinics can be increased because insured patients' relatives who go to get treatment with insured patients.

## 4.7 Impacts on services utilization

Impacts of implementing the contracting out programme from the consumer's side, can be defined in many ways such as insured workers utilization and satisfaction, already mentioned in services quality improvement. But the important one is the potential of changing to an other scheme utilization rate. The one that should be considered is workman's compensation scheme. Because the target populations of the social security scheme and workman's compensation scheme are the same group, when the contracting out programme is implemented for insured workers under the social security scheme, that is easy for them to assess. Then, it is possible for someone who has a health problem which is related to work but they try to consume health services from their social security benefits because it is easy to assess. Evidence is not available from this study but the matter should be purpose.