CHAPTER 4

DATA ANALYSIS AND RESULTS

It should be mentioned at the outset that some of the characteristics of the P/P mix management cannot be specifically supported by the available data derived from this study. This is largely because of four important factors - (a) various P/P mix activities have been initiated at different period in time without any pre-determined linkages in between them; (b) many of the P/P activities are interdependent and the effects of these activities produce same output and cannot, therefore, be attributed to a single activity; (c) existing data collection in the hospital are in effect intended for the reporting requirements of various sources of funding and are therefore, difficult to pull together into a single report and justify them for one or other activities; (d) the last but perhaps the most important one is that some of the characteristics P/P mix are not simply quantifiable due to the very nature of the activities e.g. effects of the leadership qualities of the hospital director on the P/P activities.

Patients data have been collected for a period of 9 years i.e. from 1987 to 1995. In 1987, the new hospital director arrived. Since then he has been initiating series of changes in the activities and management of the hospital. Some breakdown of the patient data are missing in parts. The long duration of data is expected to provide a clear utilization pattern of the hospital after implementation of activities. However, no data prior to the implementation of the activities is available for comparison. However, interview with the community leaders and the hospital director reveal that prior to P/P mix activities there were about average daily of 50 patients in the OPD and 5-7 patients in the IPD. Economic data is more difficult to gather because its of multiple sources of income and expenditure and resultant reporting procedures. Five fiscal years data beginning from 1991 to 1995 is considered to be sufficient to give essential information concerning existing financial conditions and its future trend.

All data are collected from the Ban Paew hospital records. For the unclear or incomplete data clarification has been sought from the responsible hospital staff. Hospital staff are also interviewed on

various aspects of functioning of the hospital. Two community leaders are interviewed to gauze the opinion of the community and the people. Finally, the hospital director has been interviewed at length for additional clarification on several issues derived from the data as well as philosophical and management concepts of the hospital activities.

A chronology of events of P/P mix activities undertaken during the study period in are presented in Figure 4.1 below:

Figure 4.1: Chronology of P/P Mix Activities in Ban Paew

	Types of Services/Activities	Schedule
1	Decentralization and Autonomy of Management of the Hospital;	1990 *
2	Community Participation for the Support of Hospital Activities	1987 *
3	Community Financing -- - Donations for Hospital Operation; - Ban Paew Hospital Foundation; - Princess Mother Memorial Building Project;	 1988 * 1990 * 1990-1995
4	Beginning of Non-private Practice by the Hospital Staff but Work Overtime in the Hospital;	1990 *
5	Opening of After-hours OPD from 4:00 - 9:00 p.m. (Mid-night since 1995) and on Saturdays:	July 1992 *
6	Beginning of External Specialists' Clinics in the Hospital OPD Services;	July 1992 *
7	Opening of Dental Clinic in the OPD Services;	1993 *
8	Opening of Physical Therapy Unit;	1994 *
9	Become a Primary Contractor for SSS;	1994 *
10	Beginning of Home Health Care;	1994 *
11	Open Ban Paew - 2 Satellite OPD;	1994 *
12	Contracting Out Services to the Private - Equipment Maintenance; - Patient Food Supply;	 1995 * 1995 *
13	Opening of an ICU/Emergency Unit	Upcoming;
14	Setting up a Private CT Diagnostic Center	Upcoming;

** On-going activities*

It is obvious that the activities have been initiated at different period of time and no clear linkage can not established in between them. Although there might have been some objectives for each of these activities, they are not clearly documented and as such can not be used for the evaluation of a single activity. For these reasons, four

outcomes have been selected and analyzed in details along with their methods of measurement and the data used for the analysis. It should be emphasized here that the effects of these activities are interrelated and therefore, can not be quantified separately. The four selected outcomes are the result of many of the interrelated P/P mix activities and therefore, cannot attributed to a single one.

4.1 Accessibility and Quality of Services

Physical verifications are made on the conditions of accessibility to the hospital and its services. No attempt has been made to quantify these activities as most of these are clearly obvious from their very nature. As for the quality of care, only limited analysis are made based on the accessibility and service criteria. An indirect measurement of the quality of care can be made by observing the hospital utilization trend in the following section. A systematic interviews of the patients are conducted on the patients and staff to assess their responses (Supakankunti S., unpublished data).

4.1.1 After-hours OPD Services

Since July 1992, OPD services are kept open outside official government working hours of 8:00 - 16:00 hours during weekdays i.e. Monday through Friday. Initially it was between 16:00 and 21:00 hours but later on extended until mid-night. In addition, OPD is also kept open on Saturdays. These measures have greatly expanded time availability and access to the OPD services especially for those working class people. The positive results of the after-hours OPD service can be verified by the OPD patient statistics that shows consistent increase of both the number of OPD patients and visits.

4.1.2 Ban Paew Two Satellite OPD

Ban Paew Two Satellite OPD was opened in October 1994 at a location 12 kilometers away from the main hospital. It is located in a densely populated community and along the main highway. It provides OPD services for the same time as Ban Paew hospital. In addition, it has observation room and referral services to the main hospital. Many traffic accident patients are seen here. This is also important location to provide services to the Social Security Scheme's patients from the nearby industries. The statistics shows rapid increase in the utilization of OPD services since its opening in October 1994.

4.1.3 Less Waiting and Travel Time

As described above in the sections 4.1.1 and 4.1.2, both travel and waiting time for the patients are markedly reduced. These are very important factors that usually draw away patients to the private hospitals and according to the patients is a criteria for the quality of care in the OPD. This may be good reason why no private clinic or hospital has been developed in Ban Paew district.

4.1.4 Improved Physical Conditions in the Hospital

Ban Paew hospital has adopted the policy of private hospitals by introducing consumer friendly services in the OPD and hospital in general. OPD waiting area is wide, clean, good sitting arrangement, air-conditioned with television and most importantly, warm reception given by its staff. While these are not directly related to the technical qualities of patient care, patients tend to appreciate these activities in the private hospitals. It is very likely that the physical improvement in the OPD has contributed a lot to the increased utilization as elaborated in the following section.

4.1.5 Specialists' Clinics and Services

In line with the private hospitals, Ban Paew has hired services from the external specialists to provide surgical, orthopedics, obstetrics and gynecology, dental, internal medicine, pediatrics care in the hospital. It has, in fact, two specialists on its staff and the rest come from other government and private hospitals. The availability of these specialists has boasted the confidence and acceptability of the hospital services and therefore, overall hospital utilization. Patients are not required to travel to distant provincial or regional hospital for several types of care any more.

4.1.5 Modern Diagnostic Equipment

Like all private hospitals in Thailand, Ban Paew has installed a number of modern diagnostic equipment in the hospital e.g. Ultra-sound, portable X-ray, EKG and other laboratory and hospital equipment. Setting up of a CT Scan center at the Ban Paew Two is in progress. While high-tech equipment may raise the cost of care, it is becoming essential to have these to effectively compete with the private sector. As a whole, these equipment are certain to improve the quality of care and its acceptance by the patients.

4.1.6 Private Room Services

This is nothing new to large public hospitals in Thailand at the provincial and regional levels. They all have limited number of private paid beds. These beds are used mostly by the high income people and provide additional revenues for the running of the general wards in the hospital. Based on this concept Ban Paew has introduced 24 private rooms in 1995 and so far are being well-utilized. Effects of these beds are reflected in the inpatient data in the following section.

4.1.7 Efficient Patient Record Keeping and Better Follow-up

Patient records are kept in the files and are being computerized. This is another private activity that help the hospital for better follow up of its patients and certainly influence the quality of care. Because with proper record keeping, the doctors usually will not miss the crucial progress of the illness as well as proper line of treatment. Note that this is a concept introduced in all private hospitals in Thailand.

4.1.8 Well-Organized Referral System

Usually district community hospitals refer patients to the provincial hospitals and then to the regional and central hospitals. While this is very important for the development of the public health system, it may not be competitive with the private market if applied too rigidly. Because of several conditions many patients - especially high-income and insured - may not like to follow the same course. To address the issue Ban Paew has adopted a flexible approach of referring patents to the desired level both in public and private sectors sometimes by-passing normal route. These measures are more acceptable to the patients as well as hospital staff.

4.2 Hospital Utilization

Hospital utilization has been measured by the number of patients and enrollment of clients in the insurance schemes e.g. SSS and HCS and finally indirectly comparing with the collection of hospital revenues. Patient data has also been compared with the Krathum Baen community hospital in the same province with almost similar socio-economic conditions and population.

Patient data has been divided into two distinct groups - OPD and IPD - as usually recorded in the hospital and are presented in the appendix. Although they are separate activities, they are interdependent in many ways. For example, if OPD services are busy they will find out some patients who require IPD care for effective management. For the convenience of discussion, these two groups are discussed separately in the following sections.

4.2.1 In-patients data

In-patient data from 1987 to 1995 are provided in Table 4.1.1 in the following page. Additional Figures 4.1.1, 4.1.2, 4.1.3, 4.1.4 and 4.1.5. are provided in the annex for better clarification. Number of patient admissions have increased from 1,611 in 1987 to 9,655 in 1995 or 500% growth during the nine years study period.

As shown in Table 4.1.1 the increase of inpatient number has been very rapid during 1988 to 1990 which coincide with the arrival of the new hospital director and beginning of changes in the management of the hospital. Then there have been three years of plateau during 1990 to 1992, perhaps because of the over-saturation of bed occupancy rate. It should be noted here that until 1992, officially it had only 30 beds capacity. Following the increase in the bed capacity from 30 beds to 60 beds in 1993, number of IPD patients jumped up by about 25% in the year. Bed occupancy rate in 1992 has reached up to 327% and then dropped to 175% in 1993. In 1994, number of IPD patients remain almost same as 1993, because of high bed occupancy rate of 185%. In 1995, hospital beds capacity has been expanded to 90. As a result, sharp increase of 35% is observed in 1995. This is certainly due to the opening of the new hospital wards and expansion of the private beds.

The number of inpatient days closely followed the pattern of number of patients. But the average patient hospitalization days dropped 4.2 days in the late 80s to 3.5 days in the 90s. This may be due to better quality of care or changes in the epidemiological pattern during this period. In any case, this is a remarkable achievement for a community level hospital. From the limited available data, it can be observed that in 1992, bed occupancy was 327% of the official 30 beds capacity. In 1993 and 1994, official bed capacity was elevated to 60 beds but bed occupancy rate was 175% and 185% respectively. However, in 1995 bed occupancy rate dropped to 123% because of increased bed capacity to 90.

Table 4.1.1: Inpatient Statistics in Ban Paew Hospital

Patients	**1987**	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**
No. of Patients	1,611	2,763	3,618	5,215	5,305	5,875	7,330	7,158	9,655
No. of Patient days	6,761	11,240	16,246	21,956	22,964	21,530	22,944	24,273	36,386
Growth of # Patients (%)	n.a.	71.51	30.94	44.14	1.73	10.74	24.77	−2.35	34.88
Growth of Patients Days (%)	n.a.	66.25	44.54	35.15	4.59	−6.24	6.57	5.79	49.90
Bed Capacity	30	30	30	30	30	30	60	60	90
Avg Daily Census	n.a.	n.a.	n.a.	n.a.	n.a.	98	105	111	111
Bed Occupancy Rate (%)	n.a.	n.a.	n.a.	n.a.	n.a.	327	175	185	123
(Approximate Breakdown of the Patients by Department)									
General Medicine	n.a.	n.a.	n.a.	n.a.	n.a.	2,818	3,292	3,492	5,482
General Surgery	n.a.	n.a.	n.a.	n.a.	n.a.	588	524	625	1,264
Orthopedics	n.a.	n.a.	n.a.	n.a.	n.a.	36	74	88	205
Obstetrics	n.a.	n.a.	n.a.	n.a.	n.a.	1,093	2,125	1,437	1,497
Gynecology	n.a.	n.a.	n.a.	n.a.	n.a.	143	156	104	186
Eye/ENT	n.a.	n.a.	n.a.	n.a.	n.a.	15	9	10	33
Pediatrics	n.a.	n.a.	n.a.	n.a.	n.a.	1,533	1,521	1,412	1,166
Dental	n.a.	n.a.	n.a.	n.a.	n.a.	1	9	1	4
District Population	82,802	83,630	84,432	84,932	85,800	90,364	90,751	91,713	93,057
% Growth of Population	n.a.	1.00	0.96	0.59	1.02	5.32	0.43	1.06	1.47
Inpatients as % of Population	1.95	3.30	4.29	6.14	6.18	6.50	8.08	7.80	10.38

n.a. = not avaialble

With the opening of the new hospital building, bed capacity expanded to official 90 beds in 1995 that reduced the occupancy rate to 123% in that year. This consistent expansion of the bed capacity and especially introduction of private beds have boasted inpatient admissions and greater increase in the revenues collected from the patients. The high bed occupancy rate indicate demands for hospitalized care.

Another important finding of the inpatient data is the changes in certain type of morbidity's. From the available data of the last four years in 1992 to 1995 (see Table 4.1.1), surgical patients doubled and orthopedics cases increased by 5.5-folds. General medicine patients have also increased by about 90%. Interestingly, obstetrics patients remain static whereas pediatric admissions have actually dropped by 24%. This situation although known in general throughout the country, is certainly important to be documented for future planning purposes.

4.2.2 Out-patients data

The OPD data are provided in Table 4.1.2 in the following page. Additional Figures 4.1.6, 4.1.7, 4.1.8 and 4.1.9. are provided in the annex for detailed analysis. Table 4.1.2 shows the total number of OPD patients and visits for the period of 1987 to 1995. During this period, the annual total number of OPD patients increased from 9,632 in 1987 to 49,819 in 1995 or 417% growth in nine years study period.

Year to year growth of number of OPD patients are calculated in the same Table 4.1.2 . There have been impressive growth in 1988 - 1990, the period right after the arrival of the new hospital director. In 1991, the growth has somewhat reduced because of staff adjustment in the hospital. But in the following years of 1992 - 1995, number of OPD patients have grown significantly following opening of the after-hours OPD in 1992 and satellite OPD in 1994.

Average daily OPD attendance is also presented in the Table 4.1.2. It shows that in 1987, a daily average of about 80 patients compared to 520 patients in 1995. The latter is important in a sense that it provides indication of workload in the OPD on a daily basis. This helps to explain the expansion of the OPD facilities and locations.

Table 4.1.2: OPD Patient Statistics in Ban Paew Hospital

Patients	1987	1988	1989	1990	1991	1992	1993	1994	1995
No. of OPD Patients	9,632	14,738	18,737	21,870	19,145	20,939	25,671	32,547	49,819
# of OPD Patient Visits*	20,748	27,859	48,969	58,541	52,699	59,671	83,451	118,127	159,838
Growth of OPD Patients (%)	n.a.	53.01	27.13	16.72	−12.46	9.37	22.60	26.79	53.07
Growth of Patient Visits (%)	n.a.	34.27	75.77	19.55	−9.98	13.23	39.85	41.55	35.31
Avg Daily OPD Patient Visits	69	93	163	195	176	199	278	394	533
No. of All Clients**	n.a.	n.a.	n.a.	n.a.	n.a.	22,886	29,644	39,303	58,613
# of Visists of All Clients	n.a.	n.a.	n.a.	n.a.	n.a.	67,727	100,327	139,007	188,996
Avg Daily All Clients Visits	n.a.	n.a.	n.a.	n.a.	n.a.	226	334	463	630
(Approximate Breakdown of the New Patient Visits*)									
General Medicine	n.a.	n.a.	n.a.	n.a.	n.a.	29,013	46,832	67,472	84,655
General Surgery	n.a.	n.a.	n.a.	n.a.	n.a.	10,028	11,954	15,434	25,694
Orthopedics	n.a.	n.a.	n.a.	n.a.	n.a.	427	759	1,863	4,646
Obstrectics	n.a.	n.a.	n.a.	n.a.	n.a.	2,135	2,103	2,700	3,995
ENT	n.a.	n.a.	n.a.	n.a.	n.a.	477	924	1,427	1,886
Pediatrics	n.a.	n.a.	n.a.	n.a.	n.a.	11,135	12,510	18,286	21,155
Eye	n.a.	n.a.	n.a.	n.a.	n.a.	1,045	1,645	2,547	3,844
Dental	n.a.	n.a.	n.a.	n.a.	n.a.	5,133	6,718	9,427	10,920
Population	82,802	83,630	84,432	84,932	85,800	90,364	90,751	91,713	93,057
Population Growth Rate	n.a.	1.00	0.96	0.59	1.02	5.32	0.43	1.06	1.47
Outpatients as % of Population	11.63	17.62	22.19	25.75	22.31	23.17	28.29	35.49	53.54

n.a. = not available ** Patient plus other beneficiaries

Number of OPD visits are shown in the same Table 4.1.2, the trend of which closely follow the number of OPD patients. In the initial period patients used visit OPD twice on average but later on the pattern changed to about three visits or more per patient. This could be indication of better follow up and perhaps, acceptance of the services. During the period of 1992 -1995, distribution of increase of patients have been uneven among various departments. While General Medicine and General Surgery and Orthopedics have grown almost 2.5-folds, Obstetrics and Pediatrics have just doubled.

All the above data concludes improved OPD utilization during the past years under study when series of P/P Mix management have been introduced in Ban Paew hospital.

4.2.3 Comparison between the patient and population growth

The Tables 4.1.1 and 4.1.2 above. These show the relation between the population and utilization of hospital services - both IPD and OPD respectively. Population growth remains stable at around 1% per year except in 1992 it is reported to be around 5%. The latter may be due to census artifact or internal migration to the district due recent industrialization. The number of migrants are not exactly known but should be as high as other districts in the province and is not thought to be an important burden in the district.

During the study period, the annual total number of OPD patients increased from 9,632 in 1987 to 49,819 in 1995 or 417% growth in nine years study period. During the same period population in the district has grown merely by 12.4%. That is a remarkable growth in the OPD coverage for the population. More precisely, in 1987, 11.63% of the population have visited OPD compared to 53.54% in 1995. These figures however, could not exclude double or more visits by some patients or patients coming from outside the district.

Number of patient admissions have increased from 1,611 in 1987 to 9,655 in 1995 or 500% growth during the nine years study period. During the same time population in the district has grown by only 12.4%. Or in another words, in 1987, 1.95% of the population have got admission in the hospital compared to 10.38% in 1995. The growth of the population coverage have been consistent throughout study period (see Table 4.1.1 above). These figures, however, could not

exclude double or more admissions of some patients or people coming to the hospital from outside the district.

The population coverage figures give a strong indication to the expansion of both OPD and IPD services by about five-folds over last nine years. In absence of any other significant health services - both public and private - these are very good indication of the better equitable care for the whole population.

4.2.4 Enrollment in Health Insurance Schemes

a. Free Health Care Schemes:

There are many health insurance schemes in Thailand, a brief summary of which has been presented in the Table 1.1. Most of these schemes are to provide free health care to various vulnerable groups e.g. low income people, elderly population, religious persons, war veterans, disabled population, village headmen, village health workers and children under-12 years of age. These schemes are assessed at the central level and financed from public revenues through the national budget system. Enrollment into these schemes are managed by various ministries along with the MOPH. Needless to mention that the funding is not sufficient to support all the care they need and therefore, the community hospitals are expected to raise ;ocal funds to supplement expenditure for these people.

b. Health Card Scheme (HCS):

Two health insurance schemes have the earning potential for community hospitals. The first is the 'Health Card Scheme' which is not necessarily a profitable scheme in most instances. During 1993 - 1995 Ban Paew has registered the following number of holder families in the district.

Table 4.2.1: Enrollment in the Health Card Scheme in Ban Paew

Year	Number of Cards	Revenue (Baht)
1993	1,572	786,000
1994	3,412	1,706,000
1995	3,015	1,507,500

It should be noted here that there a number of problems concerning the Health card scheme especially that of its financial

implications. This is one of the many reason why this particular scheme is not expanding in the district or elsewhere in the country.

c. Social Security Scheme (SSS)

This is, perhaps, a financially viable scheme for both private and public sector health care providers that has begun in 1992 in the country. At the beginning Ban Paew used to service SSS patients as a secondary contractor. Since 1994, Ban Paew community hospital has become a primary contractor for the SSS, a great step for any district level hospital. Since then it has continued to enroll more clients for two consecutive years. The available enrollment data for the year 1995 is presented in Table 4.2.2 below. In one year period number of enrollment in the scheme has increased by 46% but more importantly, consistent throughout the year. In fact, in beginning of 1996 this rate of enrollment have accelerated further.

Table 4.2.2: Social Security Scheme Enrollment in Ban Paew Hospital, Year 1995

Month	Jan	Feb	Mar	April	May	June
Clients	6,415	6,776	7,213	7,506	7,654	7,933
Month	July	August	Sept	October	Novem	Decem
Clients	8,250	8,594	9,012	9,189	9,269	9,382

No enrollment data is available for the year 1994. But it can be indirectly calculated from the hospital revenue earned from the SSS that it has achieved a similar fit in 1994 too. The revenue earned in 1995 is 45% more than that of 1994 signifies higher enrollment in 1995 or a sign of positive growth. This highly competitive scheme provide added justification of acceptance of the services by the industrialists and the patient as well.

4.2.5 Comparison Ban Paew and Krathum Baen Hospital

Krathum Baen is a neighboring district of Ban Paew in the same province of Samut Sakhon located closer to the Provincial city and Bangkok. It has similar number of population as Ban Paew but in recent years has grown up to 100,000+ in 1995 compared to Ban Paew's 93,057. Most of the population growth is attributable to the internal labor migration due rapid industrialization of the district. Its industrial sector is much stronger than that of Ban Paew and as result, its economy is reasonably better too. Because of its close

proximity and similarity in the demographic and economic situations, it might be reasonable to compare its health utilization to that of Ban Paew community hospital. It should be noted here that Krathum Baen has been consistently using the policies and principles of a usual community hospital in the similar socio-economic conditions as that of Ban Paew and has not employed any serious attempt to change the existing system.

The results of comparison of Ban Paew and Krathum Baen community hospitals are presented in the Table 4.3.1 and 4.3.2. Additional Tables and Figures are provided in the annex. Table 4.3.1 compares the number of OPD patients and number of OPD visits in Ban Paew and Krathum Baen hospitals. Number of OPD patients has grown steadily in Ban Paew by 417% in nine years beginning in 1987 compared to mere 17.5% in Krathum Baen. Similarly, number of OPD visits have grown by 670% in Ban Paew compared to minus 12% in Krathum Baen for the same period. In fact, in earlier years Krathum Baen has more OPD patients than Ban Paew. In 1992, both of them almost same number of patients and visits. From then on Ban Paew has raced away and the gap has consistently widened towards the later part of the study period signifying the loss of patients' confidence on Krathum Baen hospital and the resultant under-utilization.

Table 4.3.1: Comparison of Out Patient Statistics in Ban Paew Community Hospital

Data Variables	1987	1988	1989	1990	1991	1992	1993	1994	1995
Number of OPD Patients	9,632	14,738	18,737	21,870	19,145	20,939	25,671	32,547	49,819
Number of OPD Visits	20,748	27,859	48,969	58,541	52,699	59,671	83,451	118,127	159,838
% Growth of OPD Patients	n.a.	53.01	27.13	16.72	−12.46	9.37	22.60	26.79	53.07
% Growth of OPD Visits	n.a.	34.27	75.77	19.55	−9.98	13.23	39.85	41.55	35.31

Krathum Baen Community Hospital

Number of OPD Patients	24,110	22,352	22,243	24,456	24,191	19,607	18,932	22,529	28,331
Number of OPD Visits	52,882	46,871	45,889	46,531	47,218	59,454	38,278	45,687	46,177
% Growth of OPD Patients	n.a.	−7.29	−0.49	9.95	−1.08	−18.95	−3.44	19.00	25.75
% Growth of OPD Visits	n.a.	−11.37	−2.10	1.40	1.48	25.91	−35.62	19.36	1.07

n.a. = not available;

Table 4.3.2: Comparison of Inpatient Statistics in Krthum Baen Community Hospital

Table 4.3.1: Comparison o	1987	1988	1989	1990	1991	1992	1993	1994	1995
Number of Inpatients	4,580	4,777	5,213	5,873	5,879	5,726	6,292	5,613	8,165
Number of Inpatient Days	21,736	22,376	22,462	24,963	26,347	24,252	30,679	27,731	24,033
% Growth of Inpatients	n.a.	4.30	9.13	12.66	0.10	−2.60	9.88	−10.79	45.47
% Growth of Inpatient Days	n.a.	2.94	0.38	11.13	5.54	−7.95	26.50	−9.61	−13.34
Ban Paew Community Hospital									
Number of Inpatients	1,611	2,763	3,618	5,215	5,305	5,875	7,300	7,158	9,655
Number of Inpatient Days	6,761	11,240	16,246	21,956	22,964	21,530	22,944	24,273	36,386
% Growth of Inpatients	n.a.	71.51	30.94	44.14	1.73	10.74	24.26	−1.95	34.88
% Growth of Inpatient Days	n.a.	66.25	44.54	35.15	4.59	−6.24	6.57	5.79	49.90

n.a. = not available;

Similar comparisons are made between the IPD patient statistics in Ban Paew and Krathum Baen hospitals as presented in the Table 4.3.2 with additional Figures 4.3.5 - 4.3.8 in the annex. With the exception of 1995, there have been very little growth of the number of IPD patients in Krathum Baen where Ban Paew have shown impressive growth throughout . Ban Paew has started very low in 1987 and then overtaken Krathum Baen in 1992 and has maintained the trend until 1995. Number of inpatient days in Krathum Baen shows some inconsistencies especially during the last four years of the study period . The average inpatient admission days are up to five days compared to around four days or less in Ban Paew. This could be indication of census artifact or longer duration of treatment that are needed in Krathum Baen hospital. While the latter is a general indication of poor case management or differences in the epidemiological pattern in most instances, it could not be adequately examined in Krathum Baen. All in all, inpatient days have grown very little in Krathum Baen when compared to Ban Paew for the nine years duration signifying under-utilization of the 60 beds capacity.

Overall, both the IPD and OPD statistics of Krathum Baen show poor development for nine years period especially when these are compared with the growth rate achieved by Ban Paew hospital. In fact, Krathum Baen has more people and economic activities than that of Ban Paew. From these consideration, it can be safely concluded that hospital utilization of Ban Paew is much better than the neighboring Krathum Baen district.

4.2.6 Hospital Revenue

Increased Revenue from the Patient Services is an indirect indication of better utilization of the hospital. This can be seen in the following section that income from the cash charges has consistently increased over years. Usually middle and high income people are paying cash. So higher revenue collection from the patients is a good indicator for them. It does not, however, provide indication for the low income or free care patients.

4.3 Equity and Efficiency of Services

4.3.1 Free Health Care

According to the government policy free health care is provided to the low income people, elderly population, children under-12 years age, religious groups, war veterans, disabled population, village headmen and village health volunteers. In 1995, about 11% OPD and 10% IPD patients have received full free treatment. An additional 30% patients paid only part of the charges. This is a sharp contrast with the pure private hospital where most of these people would have no access in normal circumstances.

4.3.2 Population Coverage

Table 4.1.1 shows that there has been very significant improvement in the coverage of health care for the population. In 1987, 1.96% population was admitted in the hospital. Since then more and more people utilized IPD services and by 1995, up to 10.38% population was admitted. This particular statistics prove that although people were ill in the past, they probably did not use public hospital services.

Similarly, the number of OPD patients' coverage has also expanded from 11.63% in 1987 to 53.54% of total population in 1995. It is possible that in the past these people used to take traditional medicine, self-medication, private care or no care at all. But one must be cautious here that 53% of the population visiting OPD in a year may be an indication of over-utilization of services that should be investigated further.

Unit Cost of health care (e.g. per OPD visit or per IPD day, although not calculated in this study) is expected to have dropped as evidenced by the higher number of users if compared to the marginal increase of cost for the services. As a result, charges in the hospital can be kept much lower compared with its private counterparts. The lower cost of care will encourage higher utilization of the hospital.

Non-private practice policy by the hospital staff provides extra time to the staff for better attention to development of the hospital activities. If staff are satisfied with their overtime payment and other benefits then this policy is also expected to reduce 'brain drain' in the long run.

4.4 Economic Evaluation

Accounting cost has been used for the economic evaluation of the hospital. This is because of lack of sufficient data for the calculation of economic cost especially that of capital costs as most of it have come from the community donations.

Economic data are gathered for five fiscal years from 1991 to 1995 each of which begins in October of the previous year and ends in September of the same year. For example, fiscal year 1991 begins in October 1990 and ends in September 1991. All data come out of hospital accounting records and/or financial reports submitted to the responsible offices. There are three broad sets of accounting records in the hospital each of which is coming from different sources and are recorded in slightly different formats for their reporting purposes. The collection of hospital revenue and expenditure are presented in the following section followed by a closing section on the cost-recovery and annual balance sheet.

4.4.1 Hospital Revenue

Annual income (revenue) of the hospital is presented in the Table 4.4.1 along with a comparative analysis of three sources of finance. In five years period, the revenue of the hospital has grown by more than 250% in current price.

a. Patient Service Charges:

In recent years, service charges has become the most important component of the revenue for the hospital. It comes directly from the patients services in the OPD, IPD and other diagnostic and therapeutic services. The earning from the patient services have grown steadily during the study period, from 31% of the total revenue in 1991 to 52 % in 1995. In the current value it has grown about five-folds in five years. In 1994 and 1995, it has overtaken the share of government funds, the other major component of hospital income.

Table 4.4.1: Annual Income of Ban Paew Community Hospital

Sources of Income	1991	1992	1993	1994	1995	ALL YEARS
1. From Patients' Services	**5,700,345**	**9,615,115**	**10,637,642**	**15,668,555**	**25,069,761**	**66,691,418**
(As Percent of Total)	**30.85**	**37.98**	**29.91**	**37.52**	**50.37**	**39.03**
% Growth per Year	**n.a.**	**68.68**	**10.63**	**47.29**	**60.00**	
1.1. Patients' Cash Charges	5,636,905	7,332,356	8,883,023	10,102,731	17,909,139	49,864,154
1.2. Social Security Scheme	n.a.	2,242,931	931,103	3,786,540	5,479,107	12,439,681
1.3 Health Card Revenue	n.a.	n.a.	786,000	1,706,000	1,507,500	3,999,500
1.4. Interests on deposits	63,440	39,828	37,516	73,284	174,015	388,083
2. Government Contribution	**8,320,110**	**10,516,114**	**11,364,695**	**15,074,278**	**17,855,454**	**63,130,651**
(As Percent of Total)	**45.03**	**41.54**	**31.95**	**36.10**	**35.87**	**36.94**
% Growth per Year	**n.a.**	**26.39**	**8.07**	**32.64**	**18.45**	
2.1. Staff Salaries	7,046,910	7,196,574	7,200,865	8,009,860	9,658,144	39,112,353
2.2. Operational costs*	1,113,200	1,701,540	2,160,830	2,655,350	3,472,740	11,103,660
2.3. Utilities*	160,000	162,000	271,500	499,200	618,000	1,710,700
2.4. Special Funds*	n.a.	1,456,000	1,487,500	3,047,568	3,137,570	9,128,638
2.5. Special Projects*	n.a.	n.a.	244,000	862,300	969,000	2,075,300
3. Community Financing	**4,456,207**	**5,183,485**	**13,563,616**	**11,018,694**	**6,846,633**	**41,068,635**
(As Percent of Total)	**24.12**	**20.48**	**38.14**	**26.38**	**13.76**	**24.03**
% Growth per Year	**n.a.**	**16.32**	**161.67**	**−18.76**	**−37.86**	
3.1. Princess Mother Memorial Proj**	3,207,852	4,853,053	12,253,129	8,207,329	4,764,736	33,286,099
3.2. Hospital Foundation	1,000,000	n.a.	1,000,000	n.a.	1,000,000	3,000,000
3.3. Donations for Opeatation	248,355	330,432	310,487	2,811,365	1,081,897	4,782,536
GRAND TOTAL	**18,476,662**	**25,314,714**	**35,565,953**	**41,761,527**	**49,771,848**	**170,890,704**
% Growth per Year	**n.a.**	**37.01**	**40.50**	**17.42**	**19.18**	**243.35**

** major construction costs

n.a. = not available

The Table 4.4.1 also compares the various components of the patients' service charges. Out-of-pocket payment or cash charges has become the main source of income throughout the study period that has actually tripled in five years period. Most of the cash charges come from the profits on drugs and supplies and lately, from the private room charges. This out-of-pocket payment may not be the best option for sustainable health care financing. Nonetheless, in absence of other suitable alternatives, it has taken an important role in Ban Paew. In 1994, when Ban Paew has become a primary contractor for the SSS's health care, it has acquired another important source of earning for the hospital. In 1995, SSS scheme has provided a healthy 5.5 million Baht or 11% of total revenue for the hospital. Health card scheme and community donations, though less significant, remain useful contributors to the hospital financing. It must be mentioned here that the out-of-pocket payment and SSS patients, both have high profit margin.

b. Government Contribution:

In the early years, government contribution has been dominant component of the hospital finance. In current values, it has almost doubled in five years period. But as the other form of financing e.g. patients' charges and community financing have expanded greater than this. As a result, government share of the hospital financing remain steady at around 35% of the total revenue. Another important factor is that government contribution has grown up to 35% in certain years which is much higher than the growth rate of national GDP or to that matter, budget of the MOPH. It appear that the MOPH has allocated higher share of budget for Ban Paew hospital when compared with other community hospitals in the country. Table 4.4.1 shows the breakdown of the government contribution to the hospital. Salaries are main government contribution. In 1991, it was 75% of the total budget which in 1995 has dropped to 54%. Other components of government contributions are for the partial payment for the running of the hospital and some special funds and projects.

c. Community Financing:

As indicated earlier that the government budget is insufficient for the functioning of quality health care. To improve the financial situation, Ban Paew hospital has turned to generate supplementary

funding from the community people, organizations and institutions. There are three forms of community financing (see Table 4.4.1) in the hospital. First, cash donations for the hospital operation. This is usually not a large sum but is very useful for the running of certain hospital activities under supervision of the hospital director. Second, a hospital foundation that collect cash donations and deposit full amount in a interest bearing account. So far, only three million Baht has been collected in this fund. Only interests from this account may be used by the hospital. Third, the Princess Mother Memorial Project initiated in 1992 for the construction of new hospital building. This has raised up to 32 million Baht in cash until its completion in 1995. Many other in-kind donations also have contributed for the furnishing and functioning of the new building as well as other functions of the hospital. Because of completion of the Princess Mother Memorial project, no significant community financing is forthcoming and as a result, overall community financing has sharply dropped in 1995 when compared with previous three years. But the experience shows that it is possible to raise large sum of community financing in Ban Paew especially for the one time capital investments.

4.4.2 Hospital Expenditure

Hospital expenditure is used as a dummy cost because of unavailability of full economic costs. These expenditures are recorded and reported by the hospital management according to the needs of their funding sources. There are some important variations among different sources of expenditure that are again, related to the sources of income. Like hospital revenues, hospital expenditures are classified into three broad groups as presented in Table 4.4.2. But because point 3.1 of the table i.e. Princess Mother Memorial Project is a special major construction project, it has been excluded in the Table 4.4.2A that closely reflects the operational cost of the hospital. In fact, throughout the study much emphasis has been placed on the operational costs of the hospital and their sources of income because these are considered more important for the financial sustainability.

Table 4.4.2: Annual Expenditure (in Baht) of Ban Paew Community Hospital

By Sources of Income	1991	1992	1993	1994	1995
1. From Patients' Services*	**6,075,627**	**9,587,954**	**9,267,327**	**16,261,572**	**24,898,686**
(As Percent of Total Expenditure)	**34.51**	**38.42**	**28.18**	**41.12**	**52.40**
1.1. Temporary Staff Salaries	568,286	672,524	698,988	865,840	1,432,589
1.2. Overtime payment for staff	531,055	1,488,680	1,931,335	3,339,685	6,471,540
1.3. Hospital utilities	102,481	216,340	248,627	542,556	814,190
1.5. Medicine and Supplies	4,532,116	4,743,749	4,182,580	5,426,488	7,432,863
1.6. Medical Equipment and Food	244,377	223,301	669,217	2,164,990	2,204,068
1.7. Building, Water & Elecricity Maintn	54,050	52,785	53,300	52,852	504,667
1.8. Others	43,262	253,172	252,537	246,452	405,334
1.9 Payment for SSS Patients**	n.a.	1,937,403	1,230,743	3,622,709	5,633,435
2. From Government Contribution	**8,320,110**	**10,516,114**	**11,364,695**	**15,074,278**	**17,855,454**
(As Percent of Total Expenditure)	**47.26**	**42.14**	**34.56**	**38.12**	**37.58**
2.1. Staff Salaries	7,046,910	7,196,574	7,200,865	8,009,860	9,658,144
2.2. Operational costs	1,113,200	1,701,540	2,160,830	2,655,350	3,472,740
2.3. Utilities	160,000	162,000	271,500	499,200	618,000
2.4. Special Funds	n.a	1,456,000	1,487,500	3,047,568	3,137,570
2.5. Special Projects	n.a	n.a	244,000	862,300	969,000
3. From Community Financing	**3,207,852**	**4,853,053**	**12,253,129**	**8,207,329**	**4,764,756**
(As Percent of Total Expenditure)	**18.22**	**19.45**	**37.26**	**20.76**	**10.03**
3.1 Princess Mother Project***	3,207,852	4,853,053	12,253,129	8,207,329	4,764,756
3.2 Hospital Foundation	n.a	n.a	n.a	n.a	n.a
3.3 Donations for Hosp Operation	248,355	330,432	310,487	2,811,365	1,081,897
Grand Total	17,603,589	24,957,121	32,885,151	39,543,179	47,518,896

* includes Community Donations for Hospital Operation as Shown in # 3.3; n.a. = not available;

** Patient charges but not necessarily the actual cost; *** major construction expenditures;

Table 4.4.2A: Annual Operational Expenditure of Ban Paew Hospital

By Sources of Income	**1991**	**1992**	**1993**	**1994**	**1995**
1. From Patients' Services*	5,827,272	9,257,522	8,956,840	13,450,207	23,816,789
(As Percent of Total Expenditure)	40.48	46.05	43.41	42.92	55.71
% Growth per Year	n.a.	58.87	−3.25	50.17	77.07
2. From Government Contribution	8,320,110	10,516,114	11,364,695	15,074,278	17,855,454
(As Percent of Total Expenditure)	57.80	52.31	55.08	48.11	41.76
% Growth per Year	n.a.	26.39	8.07	32.64	18.45
3. From Community Financing	248,355	330,432	310,487	2,811,365	1,081,897
(As Percent of Total Expenditure)	1.73	1.64	1.50	8.97	2.53
% Growth per Year	n.a.	33.05	−6.04	805.47	−61.52
Total Operational Expenditures	**14,395,737**	**20,104,068**	**20,632,022**	**31,335,850**	**42,754,140**

n.a. = not available;

a. Expenditures out of patient charges

As indicated in the previous section, charges from the patient services is an important source of income for the hospital (see Tables 4.4.2 and 4.4.2A). Since 1991, there has been consistent increase in the share of this source of expenditure and constitutes up to 52% of the total expenditure made in 1995. Share of operational expenditure from this source has increased from 41% in 1991 to 56% in 1995. That means the hospital is becoming more reliant on the service charges. From the Table 4.4.2 it can also be seen that much of this money is spent on the purchase of medicine and supplies e.g. 31% in 1995. This is crucial as government fund for medicines is almost negligible for the needs of the hospital. Second important component is the salaries for the temporary staff and overtime payment for all staff. Overtime payment has dramatically increased following the opening of after-hours OPD services and satellite OPD. This is also an important component to maintain non-practicing status of the hospital staff as well as after-hours activities which are the vital ingredients of the P/P mix. Payment for the SSS patients is shown as another important source of expenditure. In fact, much of this payment is made to the Ban Paew hospital itself at the rate of usual patient charges which may not necessarily be the actual cost incurred to the hospital. It is assumed that there is a good profit margin from this scheme.

Some components of the expenditure is oddly mixed up for unknown reasons e.g. patient food with the medical equipment or hospital supplies with the hospital utilities. The accounting system should be carefully reviewed in line of the normal financial practices in the hospitals.

b. Government expenditures

All government funds are reported to have been spent as indicated in the budget paper without any change in the line items. Table 4.4.2A shows gradual decrease of the share of government fund for the operation of the hospital and has reached only 42% in 1995 in comparison to 58% in 1991. Government funds are mostly spent on staff salaries and benefits that must be continued for the survival of the hospital.

4.4.3 Effects of the P/P mix On Ban Paew Economy

Some important observations can be made about the effects of P/P mix on the hospital economy.

- Hospital income has increased by 162% in current price in last five years. Revenue collected from the patient services has grown by 340% in five years. This strong growth is directly related to the improved utilization of the hospital services caused by one or more of the P/P mix activities e.g. after-hours OPD, private beds in the hospital, enrollment into the Social Security Schemes etc.

- Government funding for the hospital has grown by 115% during the study period which is much less than revenue from the patients. Even then such growth is considered high if compared with the economic growth of the country. There may be some special favor given by the MOPH towards financing this hospital.

- While community financing has shown some impressive results, much of it is rightfully spent on the capital investment and very little on the operational cost of the hospital. The drop of the community financing in the year 1995 is attributable to the completion of the Princess Mother Memorial Project i.e. construction of a new hospital building. But experience show that it is possible to raise additional fund from the community in Ban Paew when the needs arise.

- Like the incomes, expenditures of the hospital have also increased at the same pace, thus making a very little accounting profit i.e. about 5%. In fact, it is not the intention of the hospital to make large amount of profit but to keep up healthy financing for the ongoing activities.

- Staff salaries are coming from the government fund which look quite secure. But the overtime payment which is a key success in keeping up the staff motivation and non-practice policy remains dependent on the direct income from the patient services. This is also an important factor to maintain the quality of care and to that matter, higher rate of hospital utilization.

- From the available data, it has not been possible to analyze cost benefit of any specific activities. This should be one area that require further analysis for the future development of the hospital.

- Cost-recovery from the patient services account for 40.49% in 1991, that has increased up to 55.71% in 1995. In between these years, cost-recovery has been maintained at about 44% of the total expenditure. The rest of the hospital financing is derived from the transferred accounts of government and the community.

- Finally, it can be shown that despite the rapid growth of both income and expenditure, the hospital maintained a healthy economic balance. Much attention should be given to the consolidation of these activities and economic sustainability to support them.