

## CHAPTER 4

### RESULTS

#### PATIENTS ACCOUNTING

This study was done in April 1996 to February 1997. There were 84 ischemic stroke patients who were included in this study. The patients were randomized into 2 groups, 42 patients received the hospital rehabilitation program and 42 patients received the home rehabilitation program. There were 4 (10%) drop out patients, 2 patients in the hospital program and 2 patients in the home program lost to follow up. In the hospital program, 1 patient had a recurrent attack. In the home program, 4 patients died of unknown cause.

80 patients from the 84 patients who were included in the study group were divided into 2 groups ; 40 patients in the hospital program , 40 patients in the home program.

#### 1. DEMOGRAPHIC DATA OF PATIENT

The demographic data of the patients in the hospital and home program such as age, sex, marital status, address, etc. is presented in Table 1.

##### 1.1 Sex

There were 24 (60%) males and 16 (40%) females in the hospital program. The 95% confident interval was 44.82-75.18% males and 24.82-55.18% females.

There were 20 (50%) males and 20 (50%) females in the home program. The 95% confident interval was 34.5-65.50% males and 34.5-65.50% females.

### 1.2 Age

In the hospital, the mean age of patients was  $57.50 \pm 12.42$  years (range 28-74 years). The 95% confident interval was 53.65-61.35 years.

In the home program, the mean age of patients was  $59.57 \pm 15.71$  years (range 21-78 years). The 95% confident interval was 54.7-64.37 years.

### 1.3 Marital status

There were 1 (2.5%) single, 37(92.5%) married and 2(5%) divorced patients in the hospital program. The 95% confident interval was -2.34 - 7.34% single, 84.32-100.66% married and -1.75 -11.75% divorced.

There were 2 (5%) single, 34(85%) married and 4(10%) divorced in the home program. The 95% confident interval was -1.75 -11.75% single, 73.94-96.06% married and 0.7-19.3% divorced.

### 1.4 Education

There were 3 (7.5%) with no education, 28 (70%) primary school, 1 (2.5%) secondary school, 5 (12.5%) high school and 3(7.5%) university educated in the hospital program. The 95% confident interval was -0.66 -15.66% with no education, 55.80-84.20 primary school, -2.34-7.34% secondary school, 2.25-22.75% high school and -0.66-15.66% university educated.

There were 3 (7.5%) with no education, 29 (72.5%) primary school, 2 (5%) secondary school, 3 (7.5%) high school and 3 (7.5%) university educated in home program. The 95% confident interval was

-0.66 -15.66% with no education, 58.66-86.34% primary school, -1.75 - 11.75% secondary school, -0.66-15.66% high school and -0.66-15.66% university educated.

### 1.5 Occupation

In the hospital program, 6 (15%) patients did not have an occupation, 5 (12.5%) patients were government officers, 1 (2.5%) patient was an employee, 3 (7.5%) patients were laborers, 21 (52.5%) patients were farmers and 4 (10%) patients were in business. The 95% confident interval was 3.93-26.07% no occupation, 2.25-22.75% government officers, -2.34-7.34% employee, -0.66 - 15.66% laborer, 37.02-67.98% farmers and 0.7-19.3 business.

In the home program, 8 (20%) patients did not have an occupation, 5 (12.5%) patients were government officers, 4 (10%) patients were laborers, 21 (52.5%) were farmers, 1 (2.5%) patient was in business and 1 (2.5%) patient was a student. The 95% confident interval was 9.6-32.40% no occupation, 2.25-22.75% government officers, 0.7-19.3% laborers, 37.02-67.98% farmers, -2.34 -7.34% business and -2.34-7.34% students.

### 1.6 Address

All of the patients lived in the northeast of Thailand. Most of the patients lived in KhonKaen, 18 (45%) patients from the hospital program and 29 (72.5%) patients from the home program.

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Table 1 : Demographic data of patients

	HOSPITAL	HOME
1. SEX		
MALE	24 (60%, 44.82-75.18%)*	20 (50%, 34.50-65.50%)
FEMALE	16 (40%, 24.82-55.18%)	18 (50%, 34.50-65.50%)
2. AGE		
MEANS±SD	58.13±11.92 (28-74)** (53.65-61.35)	58.53±16.20 (21-78) (54.70-64.37)
3. MARITAL STATUS		
SINGLE	1 (2.5%, -2.34-7.34%)	2 (5%, -1.75-11.75%)
MARRIED	37 (92.5%, 84.34-100.66%)	34 (85%, 73.94-96.06%)
DIVORCE	2 (5%, -1.75-11.75%)	4 (10%, 0.7-19.3%)
4. EDUCATION		
NONE	3 (7.5%, -0.66-15.66%)	3 (7.5%, -0.66-15.66%)
PRIMARY SCHOOL	28 (70%, 55.80-84.20%)	29 (72.5%, 58.66-86.34%)
SECONDARY SCHOOL	1 (2.5%, -2.34-7.34%)	2 (5%, -1.75-11.75%)
HIGH SCHOOL	5 (12.5%, 2.25-22.75%)	3 (7.5%, -0.66-15.66%)
UNIVERSITY	3 (7.5%, -0.66-15.66%)	3 (7.5%, -0.66-15.66%)

\* = (mean, 95% confident interval)

\*\* = (minimum - maximum)

	HOSPITAL	HOME
5. OCCUPATION		
NONE	6 (15%, 3.93-26.07%)	8 (20%, 9.6-32.40%)
GOVERNMENT OFFICER	5 (12.5%, 2.25-22.75%)	5 (12.5%, 2.25-22.75%)
EMPLOYEE	1 (2.5%, -2.34-7.34%)	0 (0%)
LABORER	3 (7.5%, -0.66-15.66%)	4 (10%, 0.7-19.3%)
FARMER	21 (52.5%, 37.02-67.98%)	21 (52.5%, 37.02-67.98%)
IN BUSINESS	4 (10%, 0.7-19.3%)	1 (2.5%, -2.34-7.34%)
STUDENT	0 (0%)	1 (2.5%, -2.34-7.34%)
6. ADDRESS		
KHON KAEN	18 (45%)	29 (72.5%)
NONG-BOULUMPOO	1 (2.50%)	0 (0%)
CHAIYAPUM	4 (10.%)	0 (0%)
KARASIN	1 (2.5%)	2 (5%)
NAKORN-RAJASRIMA	1 (2.5%)	2 (5%)
LOEI	0 (0%)	1 (2.5%)
ROI-ET	4 (10%)	1 (2.5%)
MUKDAHARN	0 (0%)	1 (2.5%)
PETCHABOON	2 (5%)	0 (0%)
NAKORN-PANOM	1 (2.5%)	1 (2.5%)
SAKONNAKORN	1 (2.5%)	1 (2.5%)
MAHASARAKARM	4 (10%)	2 (5%)
UDONTHANI	2 (5%)	0 (0%)

## 2. DEMOGRAPHIC DATA OF CHIEF CAREGIVER

All of the patients, in the hospital and home program, had a chief caregiver to take care of them. The demographic data of chief caregiver in both programs is presented in Table 2.

### 2.1 Sex

There were 10 (25%) male caregivers and 30 (75%) female caregivers in the hospital program. The 95% confident interval was 11.58-38.42% male caregivers and 61.58-88.42% female caregivers.

There were 11 (27.5%) male caregivers and 29 (72.5%) female caregivers in the home program. The 95% confident interval was 13.66-41.34% male caregivers and 58.66-86.34% female caregivers.

### 2.2 Age

In the hospital program, the mean age of patients was  $46.02 \pm 14.23$  years (range 17-76 years). The 95% confident interval was 41.60- 50.43 years.

In the home program, the mean age of patients was  $42.35 \pm 16.31$  years (range 17-80 years). The 95% confident interval was 37.29-47.41 years.

### 2.3 Marital status

There were 6 (15%) single, 33 (82.5%) married and 1 (2.5%) divorce caregivers in the hospital program. The 95% confident interval was 3.93-26.07% single, 70.72-94.27% married and -2.34-7.34% divorce caregiver.

There were 6 (15%) single and 34 (85%) married caregivers in the home program. The 95% confident interval was 3.93-26.07% single and 73.93-96.07% married caregivers

## 2.4 Occupation

In the hospital program, 7 (17.5%) caregivers did not have an occupation, 4 (10%) caregivers were government officers, 2 (5%) caregivers were laborers, 19 (47.5%) caregivers were farmers, 5 (12.5%) caregivers were in business and 3 (7.5%) caregivers were students. The 95% confident interval was 5.72-29.28% no occupation, 0.7-19.3% government officers, -1.75-11.75% laborers, 32.03-62.97% farmers, 2.25-22.75% in business, -0.66-15.66% students.

In the home program, 2 (5%) caregivers did not have an occupation, 5 (12.5%) caregivers were government officers, 6 (15%) caregivers were laborers, 20 (50%) caregivers were farmers, 3 (7.5%) caregivers were in business and 4 (10%) caregivers were students. The 95% confident interval was -1.75-11.75% no occupation, 2.25-22.75% government officers, 3.93-26.07% laborers, 37.5-65.5% farmers, -0.66-15.66% in business and 0.7-19.3% students.

## 2.5 Relationship

In the hospital program, 2 (5%) caregivers was a parent, 25 (62.5%) caregivers were couple, 12 (30%) caregivers were sons or daughters and 1 (2.5%) caregiver was a nephew. The 95% confident interval was -1.75-11.75% a parent, 47.5-77.5% couple, 15.8-44.20% son/daughters, -2.34-7.34% nephews.

In the home program, 1 (2.5%) caregiver was a parent, 17 (47.5%) caregivers were couple, 20 (50%) caregivers were sons or daughters and 2 (5%) caregiver was nephews. The 95% confident interval was -2.34-7.34% a parent, 27.18-57.82% couple, 37.5-65.5% son/daughters, -1.75-11.75% nephews.

## 2.6 Education

In the hospital program, 3 (7.5%) caregivers did not receive education, 21 (52.5%) caregivers finished primary school, 4 (10%) caregivers finished secondary school, 8 (20%) caregivers finished

high school and 4 (10%) caregivers finished university. The 95% confident interval was -0.66-15.66% no education, 37.02-67.98% primary school, 0.7-19.3% secondary school, 9.6-32.4% high school and 0.7-19.3% university educated.

In the home program, 1 (2.5%) caregiver did not receive education, 23 (57.5%) caregivers finished primary school, 8 (20%) caregivers finished secondary school, 5 (12.5%) caregivers finished high school and 3 (7.5%) caregivers finished university. The 95% confident interval was -2.34-7.34% no education, 42.18-72.82% primary school, 9.6-32.4% secondary school, 2.25-22.75% high school and -0.66-15.66% university educated.

Table 2 : Demographic data of chief caregiver

	HOSPITAL	HOME
1. SEX		
MALE	10 (25%, 11.58-38.42%)	11 (27.5%, 13.66-41.34%)
FEMALE	30 (75%, 61.58-88.42%)	29 (72.5%, 58.66-86.34%)
2. AGE		
MEANS±SD	46.02±14.23 (17-76) (41.60-50.43)	42.35±16.31 (17-80) (37.29-47.41)
3. MARITAL STATUS		
SINGLE	6 (15%, 3.93-26.07%)	6 (15%, 3.93-26.07%)
MARRIED	33 (82.5%, 70.72-94.27%)	34 (85%, 73.93-96.07%)
DIVORCE	1 (2.5%, -2.34-7.34%)	0 (0%)



	HOSPITAL	HOME
<b>4. OCCUPATION</b>		
NONE	7 (17.5%, 5.72-29.28%)	2 (5%, -1.75-11.75%)
GOVERNMENT- OFFICER	4 (10%, 0.7-19.3%)	5 (12.5%, 2.25-22.75%)
LABORER	2 (5%, -1.75-11.75%)	6 (15%, 3.93-26.07%)
FARMER	19 (47.5%, 32.03-62.97%)	20 (50%, 37.5-65.5%)
IN BUSINESS	5 (12.5%, 2.25-22.75%)	3 (7.5%, -0.66-15.66%)
STUDENT	3 (7.5%, -0.66-15.66%)	4 (10%, 0.7-19.3%)
<b>5. RELATIONSHIP</b>		
PARENT	2 (5%, -1.75-11.75%)	1 (2.5%, -2.34-7.34%)
COUPLE	25 (62.5%, 47.5-77.5%)	17 (42.5%, 27.18-57.82%)
SON/DAUGHTER	12 (30%, 15.8-44.20%)	20 (50%, 37.5-65.5%)
NEPHEW	1 (2.5%, -2.34-7.34%)	2 (5%, -1.75-11.75%)

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	HOSPITAL	HOME
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6. EDUCATION		
NONE	3 (7.5%, -0.66-15.66%)	1 (2.5%, -2.34-7.34%)
PRIMARY SCHOOL	21 (52.5%, 37.02-67.98%)	23 (57.5%, 42.18-72.82%)
SECONDARY SCHOOL	4 (10%, 0.7-19.3%)	8 (20%, 9.6-32.40%)
HIGH SCHOOL	8 (20%, 9.6-32.40%)	5 (12.5%, 2.25-22.75%)
UNIVERSITY	4 (10%, 0.7-19.3%)	3 (7.5%, -0.66-15.66%)

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### 3. RISK FACTORS

The risk factors such as diabetic mellitus, hypertension, myocardial infarction, etc. that affected the functional outcomes is presented in Table 3.

There were 14 (35%) diabetic mellitus in the hospital program and 8 (20%) diabetic mellitus in the home program. The 95% confident interval was 20.22-49.78% in the hospital program and 19.6-32.40% in the home program.

There were 13 (32.5%) hypertension in the hospital program and 10 (27.5%) hypertension in the home program. The 95% confident interval was 17.98-47.02% in the hospital program and 13.66-41.34% in the home program.

There were 4 (10%) myocardial infarction in the hospital program and 5 (12.5%) myocardial infarction in the home program. The 95% confident interval was 0.7-19.3% in the hospital program and 2.25-22.75% in the home program.

There was 4 (10%) valvular heart disease in the hospital program and 5 (12.5%) valvular heart disease in the home program. The 95% confident interval was 0.7-19.3% in the hospital program and 2.25-22.75% in the home program.

There was 1 (2.5%) transient ischemic attack in the hospital program and 1 (2.5%) transient ischemic attack in the home program. The 95% confident interval was -2.34-7.34% in the hospital program and -2.34-7.34% in the home program.

There was 1 (2.5%) heavy smoker in the hospital program and 2 (5%) smoker in the home program. The 95% confident interval was -2.34-7.34% in the hospital program and -1.75-11.75% in the home program.

#### 4. NEUROLOGICAL STATUS

The neurological status of patients were presented in Table 4.

##### 4.1 Speech disorders

In the hospital program, 9 (22.5%) patients had normal speech, 6 (15%) patients had motor aphasia, 2 (5%) patients had sensory aphasia, 1 (2.5%) patient had global aphasia and 22 (55%) patients had dysarthria. The 95% confident interval was 9.56-35.44% normal speech, 3.93-26.07% motor aphasia, -1.75-11.75% sensory aphasia, -2.34-7.34% global aphasia and 39.58-70.42% dysarthria.

In the home program, 14 (35%) patients had normal speech, 7 (17.5%) patients had motor aphasia, 1 (2.5%) had sensory aphasia, 1 (2.5%) had global aphasia and 17 (42.5%) had dysarthria. The 95% confident interval was 20.22-49.78% normal speech, 5.72-29.28% motor aphasia, -2.34-7.34% sensory aphasia, -2.34 - 7.34% global aphasia, 27.18-57.82% dysarthria.

#### 4.2 Side of hemiplegia

There were 22 (55%) right and 18 (45%) left hemiplegic patients in the hospital program. The 95% confident interval was 39.58-70.42% right and 29.58-60.42% left hemiplegia.

There were 21 (52.5%) right and 19 (47.5%) left hemiplegic patients in the home program. The 95% confident interval was 37.02-67.98% right and 32.03-62.94% left hemiplegia.

#### 4.3 severity

There were 8 (20%) patients had complete hemiplegia and 32 (80%) patients had incomplete hemiplegia in the hospital program. The 95% confident interval was 9.6-32.4% complete and 67.60-92.40% incomplete hemiplegia.

There was 6 (15%) patients had complete hemiplegia and 34 (85%) patients had incomplete hemiplegia in the home program. The 95% confident interval was 3.93-26.07% complete and 73.93-96.07% incomplete hemiplegia.

#### 4.4 Joint proprioception sensation

There were 6 hospital program patients and 5 home program patients who could not be evaluated for joint proprioception sensation because of speech disorders.

In the hospital program, 13 (38.23%) patients had a loss of joint proprioception sensation and 21 (61.76%) had normal sensation. The 95% confident interval was 21.90-54.56% loss of sensation and 45.43-78.09% normal sensation.

In the home program, 9 (25.71%) patients had a loss of joint proprioception sensation and 26 (74.28%) had normal sensation. The 95% confident interval was 11.23-40.19% loss of sensation and 59.80-88.76% normal sensation.

Table 3 : Risk factors of patients

	HOSPITAL	HOME
DM.	14/40 (35%, 20.22-49.78%)	8/40 (20%, 19.6-32.40%)
HT.	13/40 (32.5%, 17.98-47.02%)	11/40 (27.5%, 13.66-41.34%)
MI.	4/40 (10%, 0.7-19.3%)	5/40 (12.5%, 2.25-22.75%)
VALVULAR HEART DIS.	4/40 (10%, 0.7-19.3%)	5/40 (12.5%, 2.25-22.75%)
TIA.	1/40 (2.5%, -2.34-7.34%)	1/40 (2.5%, -2.34-7.34%)
SMOKING	1/40 (2.5%, -2.34-7.34%)	2/40 (5%, -1.75-11.75%)

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Table 4 : Neurological status of patients

	HOSPITAL	HOME
1. SPEECH DISORDERS		
NORMAL	9 (22.5%, 9.56-35.44%)	14 (35%, 20.22-49.78%)
MOTOR APHASIA	6 (15%, 3.93-26.07%)	7 (17.5%, 5.72-29.28%)
SENSORY APHASIA	2 (5%, -1.75-11.75%)	1 (2.5%, -2.34-7.34%)
GLOBAL APHASIA	1 (2.5%, -2.38-7.34%)	1 (2.5%, -2.34-7.34%)
DYSARTHRIA	22 (55%, 39.58-70.42%)	17 (42.5%, 27.18-57.82%)
2. SIDE OF HEMIPLEGIA		
RIGHT	22 (55%, 39.58-70.42%)	21 (52.5%, 37.02-67.98%)
LEFT	18 (45%, 29.58-60.42%)	19 (47.5%, 32.03-62.97%)
3. SEVERITY		
COMPLETE	8 (20%, 9.6-32.40%)	6 (15%, 3.93-26.07%)
INCOMPLETE	32 (80%, 67.60-92.40%)	34 (85%, 73.93-96.07%)
4. JT. PROPRIOCEPTION		
SENSATION		
LOSS	13 (38.23%, 21.90-54.56%)	9 (25.71%, 11.23-40.19%)
NORMAL	21 (61.76%, 45.43-78.09%)	26 (74.28%, 59.80-88.76%)

## 5. OUTCOMES

### 5.1 Functional outcomes

There were 5 (12.5%) dependent and 35 (87.5%) independent patients in the hospital program. The 95% confident interval was 2.25-22.74% dependent and 77.25-97.75% independent patients.

There was 8 (20%) dependent, 28 (70%) independent patients and 4 (10%) dead patients in the home program. The 95% confident interval was 9.6-32.40% dependent, 58.40-81.60% independent and 0.7-19.3% dead patients

There was no statistical significant difference between two groups ( exact test,  $p = 0.064$  ) (Table 5)

### 5.2 Time to independent stage

The mean time to independent stage of the hospital program was  $1.77 \pm 1.55$  months. The 95% confident interval was 1.283 - 2.256 months.

The mean time to independent stage of home program was  $2.31 \pm 2.12$  months. The 95% confident interval was 1.613 - 2.999 months.

There was no statistical significant difference between the two groups ( t test,  $t = 1.258$ ,  $p = 0.210$  ). (Table 6)

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Table 5 : Functional outcome

	HOSPITAL	HOME	STAT.TEST
DEPENDENCE	5 (12.5, 2.25-22.74%)	8 (20%, 9.6-32.40%)	exact test p= 0.064
INDEPENDENCE	35 (87.5%, 77.25-97.75%)	28 (70%, 58.40-81.60%)	
DEATH	0 (0%)	4 (10%, 0.7-19.3%)	
TOTAL	40(100%)	40(100%)	

Table 6 : Time to independent stage

	HOSPITAL	HOME	STAT.TEST
1 MONTH	27	24	t test t = 1.258 p = 0.210
2 MONTHS	6	3	
3 MONTHS	2	0	
5 MONTHS	0	1	
MEANS±SD.	1.77±1.55	2.31±2.12	



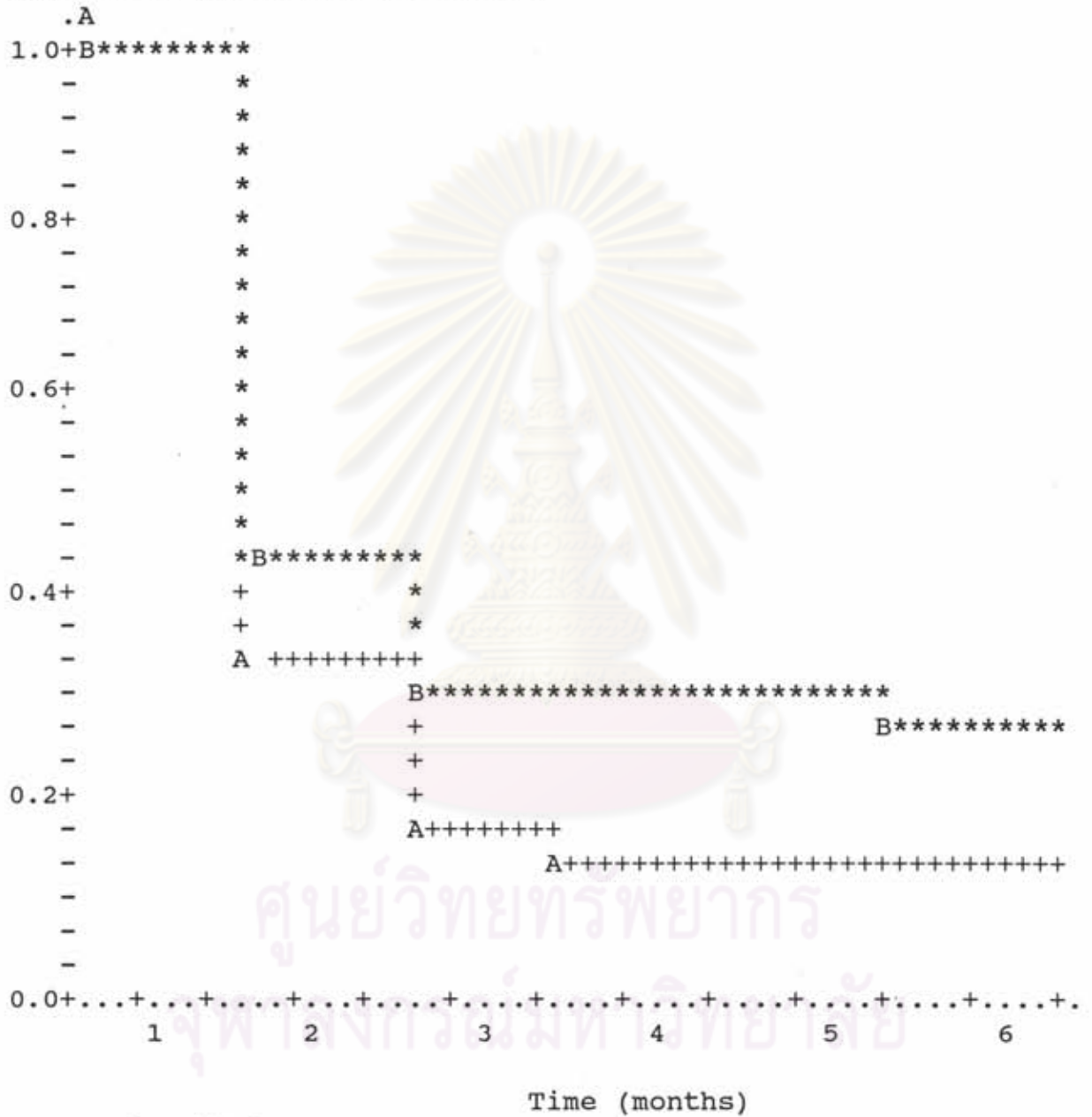
### 5.3 Survival analysis

The 84 patients were analyzed by survival analysis. The event was independent stage. Death, recurrent attack, loss to follow up, dependent stage were marked as censor. The survival analysis is presented in table 7 and the two survival curves are presented in Figure 1. There was no statistical significant difference between the two groups ( Generalized Wilcoxon (Breslow) = 0.899 , p = 0.343 ).

Table 7 : Survival analysis of hospital and home program

TIME (month)	PATIENTS	EVENT	CENSOR	CUMULATIVE SURVIVAL	SE.	95% CI.
<b>HOSPITAL PROGRAM</b>						
1	42	27	3	0.3571	0.0739	0.3571±0.1448
2	12	6	0	0.1786	0.0634	0.1786±0.1243
3	6	2	0	0.1190	0.0545	0.1190±0.1068
6	4	0	4	0.1190	0.0545	0.1190±0.1068
<b>HOME PROGRAM</b>						
1	42	24	5	0.4286	0.0764	0.4286±0.1497
2	13	3	1	0.3297	0.0772	0.3297±0.1513
5	9	1	0	0.2930	0.0768	0.2930±0.1505
6	8	0	8	0.2930	0.0768	0.2930±0.1505

Cumulative proportion surviving



A = hospital program  
 B = home program

Figure 1 : survival curve of both programs

### DEMOGRAPHIC DATA OF DEAD PATIENTS

All dead patients were in the home program. The cause of death was unknown. The demographic data of dead patients were presented in Table 8.

#### 1. Sex

There were 2 (50%) males and 2 (50%) females in the dead patients.

#### 2. Age

The mean age of dead patients was  $69.00 \pm 2.16$  years (range 66-71 years).

Table 8 : Demographic data of dead patients

DEAD PATIENTS	
1. SEX	
MALE	2 (50%)
FEMALE	2 (50%)
2. AGE	
MEAN $\pm$ SD	$69.00 \pm 2.16$ (66-71)

### RISK FACTORS OF DEAD PATIENTS

There were 3 hypertensive but no diabetic, myocardial infarction, valvular heart disease, transient ischemic attack, smoking patients in the dead patients. (Table 9)

Table 9 : Risk factors of dead patients

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DEAD PATIENTS		
DM.	0/4	(0%)
MI.	0/4	(0%)
HT.	3/4	(75%)
VALVULAR	0/4	(0%)
HEART DIS.		
TIA.	0/4	(0%)
SMOKING	0/4	(0%)

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DM.= Diabetic mellitus

MI.= Myocardial infarction

HT.= Hypertension

TIA. = Transient ischemic attack

#### NEUROLOGICAL STATUS OF DEAD PATIENTS

The neurological status of dead patients were presented in Table 10.

##### 1. Speech disorders

There were 2 (50%) normal, 1 (25%) motor aphasia, 0 (0%) sensory aphasia, 0 (0%) global aphasia and 1 (25%) dysarthria in the dead patients.

##### 2. Side of hemiplegia

There were 4 (100%) left hemiplegic patients and no right hemiplegic patients in the dead patients.

### 3. Severity

There were 1 (25%) complete and 3 (75%) incomplete hemiplegic patients in the dead patients.

### 4. Joint proprioception sensation

In the dead patients group, 3 (75%) patients lost of proprioception sensation, 1 (25%) patients had normal sensation.

Table 10 : Neurological status of dead patients

DEAD PATIENTS	
1.SPEECH DISORDERS	
NORMAL	2 (50%)
MOTOR APHASIA	1 (25%)
SENSORY APHASIA	0 (0%)
GLOBAL APHASIA	0 (0%)
DYSARTHRIA	1 (25%)
2.SIDE OF HEMIPLEGIA	
RIGHT	0 (0%)
LEFT	4 (100%)
3.SEVERITY	
COMPLETE	1 (25%)
INCOMPLETE	3 (75%)
4.JT. PROPRIOCEPTION SENSATION	
LOSS	3 (75%)
NORMAL	1 (25%)

### DEMOGRAPHIC DATA OF PATIENTS WHO LOST TO FOLLOW UP

There were 2 patients who lost to follow up in the hospital program and there were 2 patients who lost to follow up in the home program. The demographic data of patients who lost to follow up was presented in Table 11.

#### 1. Sex

There were 1 (50%) male and 1 (50%) female in the hospital program and there were 2 (100%) males in the home program.

#### 2. Age

The mean age of patients who lost to follow up in the hospital program was  $49.50 \pm 10.60$  years and the mean age of patients who lost to follow up in the home program was  $43.50 \pm 3.54$  years.

Table 11: Demographic data of patients who lost to follow up

	HOSPITAL	HOME
1. SEX		
MALE	1 (50%)	2 (100%)
FEMALE	1 (50%)	0 (0%)
2. AGE		
MEAN $\pm$ SD	$49.50 \pm 10.60$	$43.50 \pm 3.54$

### RISK FACTORS OF PATIENTS WHO LOST TO FOLLOW UP

There were 2 (100%) hypertensive, 2 (100%) diabetic, no myocardial infarction, valvular heart disease, transient ischemic attack and smoking patients in the hospital program.

There were 1 (50%) hypertensive, 1 (50%) diabetic, no myocardial infarction, valvular heart disease, transient ischemic attack and smoking patients in the home program.

(Table 12)

Table 12 : Risk factors of patients who lost to follow up

	HOSPITAL	HOME
DM.	2/2 (100%)	1/2 (50%)
MI.	0 (0%)	0 (0%)
HT.	2/2 (100%)	1/2 (50%)
VALVULAR	0 (0%)	0 (0%)
HEART DIS.	0 (0%)	0 (0%)
TIA.	0 (0%)	0 (0%)
SMOKING	0 (0%)	0 (0%)

DM.= Diabetic mellitus

MI.= Myocardial infarction

HT.= Hypertension

TIA. = Transient ischemic attack

#### NEUROLOGICAL STATUS OF PATIENTS WHO LOST TO FOLLOW UP

##### 1. Speech disorders

There were 2 (100%) dysarthria in the hospital program and there were 1 (50%) motor aphasia and 1 (50%) dysarthria in the home program.

##### 2. Side of hemiplegia

There were 1 (50%) right and 1 (50%) left hemiplegic patients in the hospital program. There were 1 (50%) right and 1 (50%) left hemiplegia patients in the home program

### 3. Severity

There were 2 (100%) incomplete hemiplegic patients in both hospital and home programs.

### 4. Joint proprioception sensation

In the hospital program, 2 (100%) patients had normal sensation and in the home program, 1 (100%) patient had a normal sensation.

Table 13: Neurological status of patients who lost to follow up

	HOSPITAL	HOME
<b>1. SPEECH DISORDERS</b>		
NORMAL	0 (0%)	0 (0%)
MOTOR APHASIA	0 (0%)	1 (50%)
SENSORY APHASIA	0 (0%)	0 (0%)
GLOBAL APHASIA	0 (0%)	0 (0%)
DYSARTHRIA	2 (100%)	1 (50%)
<b>2. SIDE OF HEMIPLEGIA</b>		
RIGHT	1 (50%)	1 (50%)
LEFT	1 (50%)	1 (50%)
<b>3. SEVERITY</b>		
COMPLETE	0 (0%)	0 (0%)
INCOMPLETE	2 (50%)	2 (0%)
<b>4. JT. PROPRIOCEPTION SENSATION</b>		
LOSS	0 (0%)	0 (0%)
NORMAL	2 (100%)	1 (100%)



## COST EFFECTIVE ANALYSIS

The cost effective analysis was performed to compare the hospital and home program. It was analyzed from the view point of patients and hospital.

### DECISION ANALYSIS

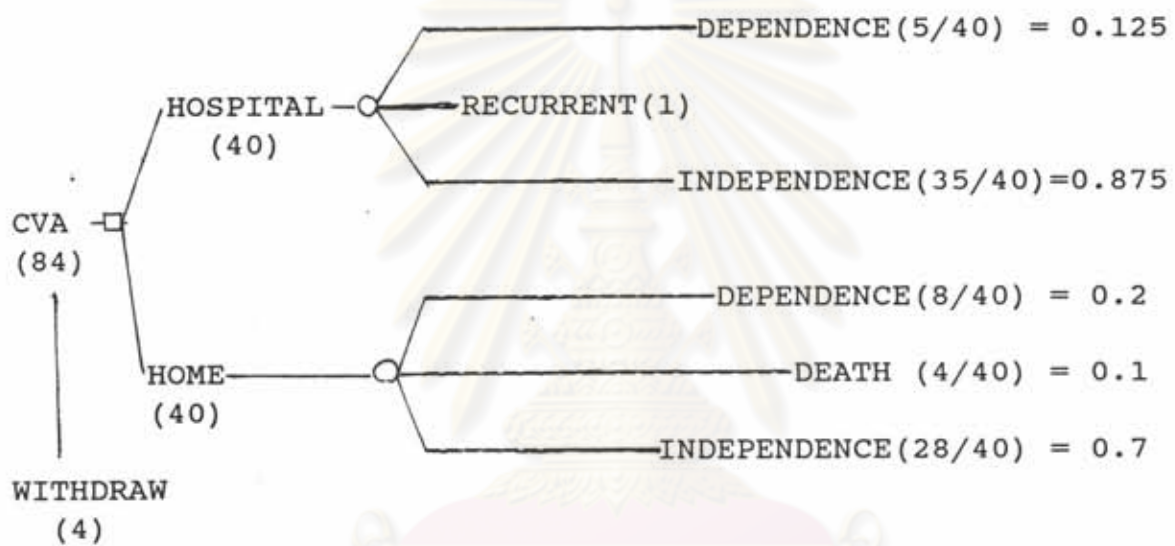


Figure 2 : decision tree

#### Type of cost

#### 1. Direct cost

##### 1.1 Medical cost

- Hospitalization cost
- Medication cost
- Physical therapy cost
- Occupational therapy cost

- 1.2 Non medical cost
  - Travel expense
- 2. Indirect cost
  - 2.1 Caregiver cost
  - 2.2 Mortality cost
  - 2.3 Morbidity cost

#### FROM THE VIEW POINT OF PATIENT

##### Direct cost

##### 1.1 Medical cost

All the patients were studied at Srinagarind Hospital, a Government Hospital. The hospital charge was lower than the real cost. From the patient's perspective, the cost of treatment was calculated from the money that patient paid to the hospital so I used hospital charges to analyze cost effectiveness.

##### 1.1.1 Hospitalization charge

Srinagarind hospitalization charge = 20 Baht/day.

The average time to independent stage was  $1.77 \pm 1.55$  months. The total hospitalization charge was 1.77 months x 30 days x 20 Baht/day = 1,062 Baht.

##### 1.1.2 Medication charge

Medication for stroke patient = 30 Baht/day

Vitamin B<sub>1-6-12</sub> 1 tablet three times per day

Aspirin 1 tablet one time per day

The total medication charge was 1.77 months x 30 days x 30 baht/day = 1,593 Baht.

### 1.1.3 Physical therapy charge

Physical therapy : exercise, ambulation training.

Physical therapy charge = 25 Baht/visit (1/2 hour).

The total physical therapy charge was 1.77 months x 30 days x 25 baht/visit = 1,327 Baht.

### 1.1.4 Occupational therapy charge

Occupational therapy : activity of daily living training.

Occupational therapy charge = 25 Baht/visit.

The total occupational therapy charge was 1.77 months x 30 days x 25 Baht/visit = 1,327 baht.

### 1.2 Nonmedical cost

Travel expenses of home program patient = 500 Baht/follow up.

All of the patients lived in the north east of Thailand. Most of them lived in KhonKaen. Due to disability, they could not go to hospital by bus alone. They went to the hospital by rented car. The cost of car rental with one driver and oil, round trips: go and return, was 500 Baht per follow up. The average times to independent stage of home program was  $2.31 \pm 2.12$  months. They needed 3 follow ups.

Total expense cost =  $500 \times 3 = 1,500$  Baht

### Indirect cost

#### 1. Caregiver cost

Hospital program: Although the patients received treatment by hospital staff, they still needed one relative to take care and to give psychological support all day. The caregiver lost a chance to work. Most of the caregivers were farmers. Thai minimal labor cost was 135 Baht/day. The average hospital time to independent stage =  $1.77 \pm 1.55$  months. The total indirect cost of hospital program caregiver was 1.77 months x 135 Baht/day x 30 days = 7,169 Baht.

Home program: The caregivers were farmers who worked at home. They lost 1/2 hour for physical therapy, 1/2 hour for occupational therapy, 1 hour for nursing care. The total care time was 2 hour/day. Thai minimal labor cost was 135 Baht/day. They worked 8 hour/day so the labor cost = 16.88 Baht/hour. The average time to independent stage =  $2.31 \pm 2.12$  months. The total cost of home program caregiver was 2.31 months x 30 days x 16.88 Baht/hour x 2 hour = 2,340 Baht.

### 2. Mortality cost

Home program: The death rate was 4/40 (0.1) . The average age was  $69.00 \pm 2.16$  years. Thai people retire at 60 years so the mortality cost can not be calculated.

Hospital program: There was no dead patient. The mortality cost would not be calculated.

### 3. Morbidity cost

Hospital program: The dependence rate was 5/40 (0.125). The average age of the dependent patients in the hospital program was  $65.50 \pm 11.64$  years. The average life expectancy of Thai people was 68 years so I estimated 2.50 years for the caregiver to take care of them. The labor cost was 135 Baht/day. The caregiver took 3 hours to care for the patients at home (16.88 Baht/hour, 50.64 Baht/day). The indirect cost of the caregiver was 50.64 Baht x 2.50 years x 365 days x 0.125 = 12,014 Baht.

Home program: the dependent rate was 8/40 (0.2) . The average age of the dependent patients in the home program was  $67.80 \pm 7.57$  years. There was 0.2 years for the caregiver to take care of them. The indirect cost of the dependent patient was 135 Baht/day x 0.2 years x 365 days x 0.2 = 739 Baht.

Table 14 : Cost effectiveness from the view point of patient

	HOSPITAL	HOME
1. Direct cost		
hospitalization	1,062	-
medication	1,593	1,593
physical therapy	1,327	-
occupational therapy	1,327	-
travel expense	-	1,500
2. Indirect cost		
caregiver cost	7,169	2,340
mortality cost	-	-
morbidity cost	12,014	739
<b>TOTAL (Baht)</b>	<b>24,492</b>	<b>6,172</b>

Hospital program, the independent rate was  $35/40 = 0.875$ .

Home program, the independent rate was  $28/40 = 0.7$ .

The cost effectiveness of hospital program

$$= 24,492 / 0.875 = 27,990 \text{ Baht/case.}$$

The cost effectiveness of home program

$$= 6,172 / 0.7 = 8,817 \text{ Baht/case.}$$

#### FROM THE VIEW POINT OF THE HOSPITAL

The patients who stayed in the Government hospital were subsidized by the Government. From the view point of the hospital, the real cost would be calculated as follows.

## Direct cost

### 1. Room cost

Vatanasapt's study (1993)<sup>23</sup> showed Srinagarind hospital rehabilitation room cost was 364.99 Baht/day/case. The average time to independent stage in hospital was 1.77 months. The total room cost was 1.77 months x 30 days x 364.99 Baht/day/case = 19,380 Baht.

### 2. Doctor's fee

The minimum salary of rehabilitation doctor was 11,120 Baht/month, 556 Baht/days, 69.5 Baht/hour. The treatment time was 1/2 hour. The doctor's fee was 69.5 Baht/hour x 1/2 hour x 1.77 months x 20 days = 1,230 Baht.

### 3. Nursing care cost

The minimum salary of nurse was 6,360 Baht/month, 212 Baht/day, 26.5 Baht/hour. The nursing care time was 1 hour/day. The nursing care cost 26.5 Baht x 1.77 months x 30 days = 1,407 Baht.

### 4. Physical therapy cost

The minimum salary of physical therapy cost was 6,360 Baht/month, 26.5 Baht/hour. The physical therapy time was 1/2 hour. The physical therapy cost 26.5 Baht x 1/2 hour x 1.77 month x 20 days = 469 Baht.

### 5. Occupational therapy

The minimum salary of occupational therapy was 6,360 Baht/month, 26.5 Baht/hour. The occupational therapy time was 1/2 hour. The occupational therapy cost 26.5 Baht x 1.77 month x 20 days = 469 Baht.

## Indirect cost

## 1. Mortality cost

The mortality cost from the view point of the hospital was the same as from the view point of patient. The mortality cost can not be calculated.

## 2. Morbidity cost

The morbidity cost from the view point of the hospital was the same as the view point of the patient. The mortality cost of the hospital program patients was 24,492 Baht. The mortality cost of home program patients was 6,172 Baht.

Table 15 : Cost effectiveness from the view point of hospital .

	HOSPITAL	HOME
DIRECT COST		
Room cost	19,380	-
Doctor cost	1,230	-
Nurse cost	1,407	-
Physical therapy cost	469	-
Occupational cost	469	-
INDIRECT COST		
Mortality cost	-	-
Morbidity cost	12,014	739
TOTAL (Baht)	34,969	739

Hospital program, the independent rate was  $35/40 = 0.875$ .

Home program, the independent rate was  $28/40 = 0.7$ .

The cost effectiveness of hospital program

$$= 34,969 / 0.875 = 39,964 \text{ Baht/case.}$$

The cost effectiveness of home program

$$= 739 / 0.7 = 1,055 \text{ Baht/case.}$$

### SENSITIVITY ANALYSIS

#### 1. Dependent rate

From the view point of the patient, the sensitivity analysis of dependent rate is presented in Table 16 and from the view point of Srinagarind hospital, the sensitivity analysis of dependent rate is presented in Table 17.

The sensitivity analysis of dependent rate from the view point of patient and Srinagarind Hospital show that the cost of treatment of hospital program is more expensive than home program and it depends on the dependent rate.

Table 16 Sensitivity analysis of dependent rate from the view point of patient at Srinagarind Hospital

DEPENDENT RATE	COST EFFECTIVENESS	
	HOSPITAL	HOME
0.10	27,213	7,440
0.20	39,626	8,817
0.30	59,017	10,551
0.40	84,871	13,042



Table 17: Sensitivity analysis of dependent rate from the view point of Srinagarind Hospital

DEPENDENT RATE	COST EFFECTIVENESS	
	HOSPITAL	HOME
0.10	36,184	474
0.20	52,722	1,057
0.30	73,984	1,788
0.40	102,333	2,790

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COST EFFECTIVENESS  
(BAHT)

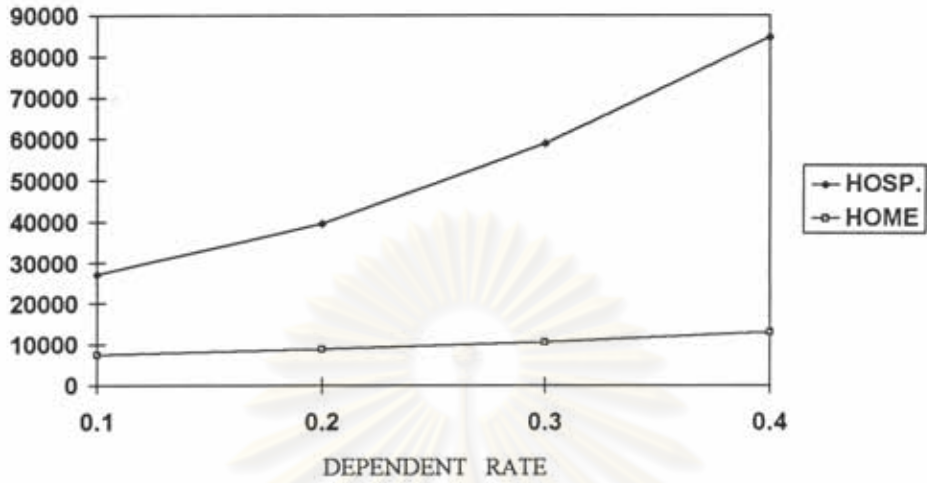


FIGURE 3 : SENSITIVITY ANALYSIS OF DEPENDENT RATE FROM THE VIEW POINT OF PATIENT

COST EFFECTIVENESS  
(BAHT)

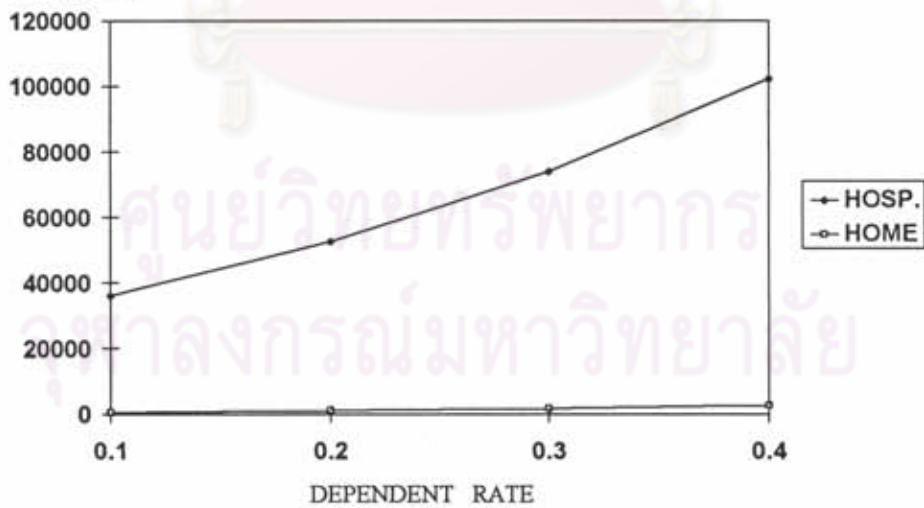


FIGURE 4 : SENSITIVITY ANALYSIS OF DEPENDENT RATE FROM THE VIEW POINT OF HOSPITAL

## 2. Time to independent stage

From the view point of the patient, the sensitivity analysis of time to independent stage is presented in Table 18 and from the view point of Srinagarind hospital, the sensitivity analysis of time to independent stage is presented in Table 19.

The sensitivity analysis of time to independent stage from the view point of patient and Srinakarind hospital show that the cost of treatment in the hospital is more expensive than the home program and the cost of treatment in the home program does not depend on time into independent stage .

Table 18 Sensitivity analysis of time to independent stage from the view point of patient at Srinagarind Hospital

TIME (MONTH)	COST EFFECTIVENESS	
	HOSPITAL	HOME
1	21,787	4,501
1.5	25,816	6,583
2	29,844	7,949
2.5	33,873	10,030

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Table 19 Sensitivity analysis of time to independent stage from the view point of Srinagarind Hospital

TIME (MONTH)	COST	EFFECTIVENESS
	HOSPITAL	HOME
1	28,553	1,056
1.5	35,966	1,056
2	43,374	1,056
2.5	50,792	1,056

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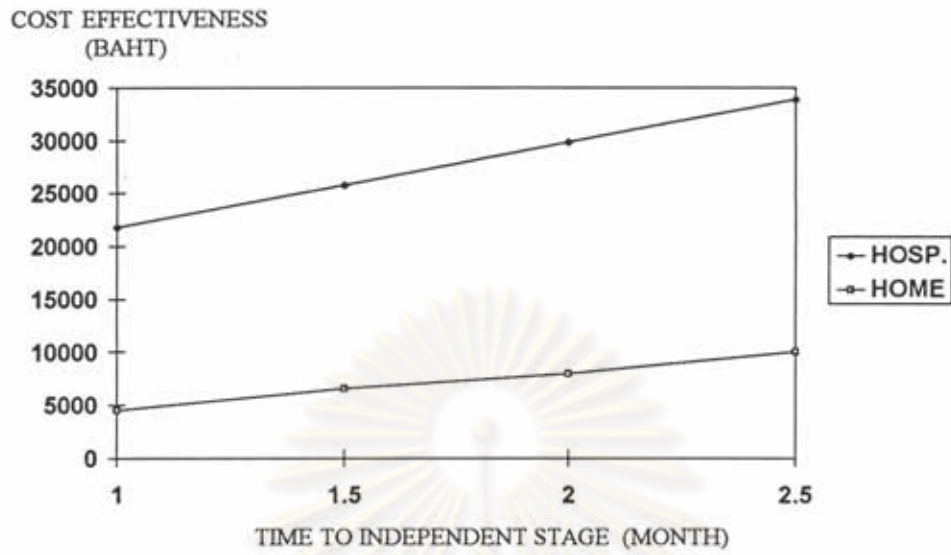


FIGURE 5 : SENSIVITY ANALYSIS OF TIME TO INDEPENDENT STAGE FROM THE VIEW POINT OF PATIENT

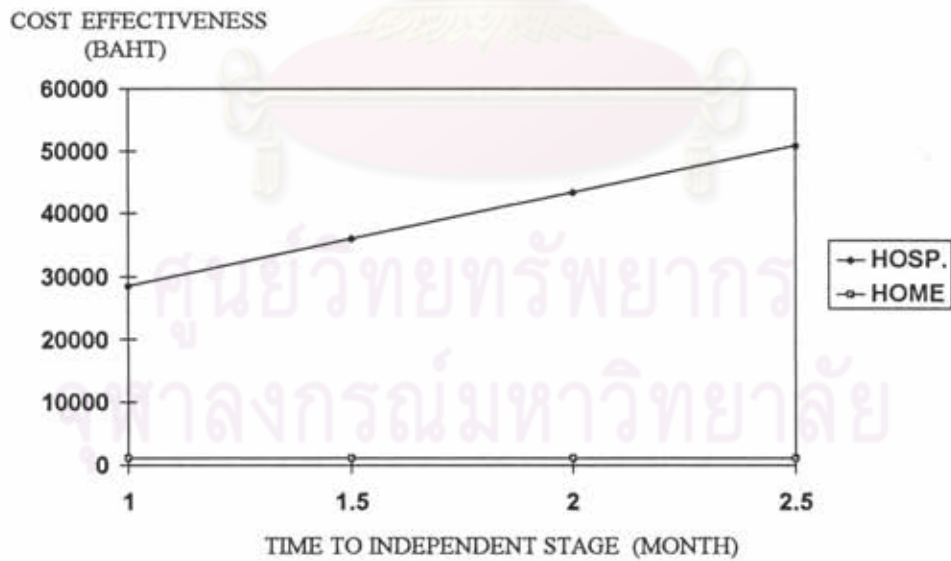


FIGURE 6 : SENSIVITY ANALYSIS OF TIME TO INDEPENDENT STAGE FROM THE VIEW POINT OF HOSPITAL