2. Present Condition of Medical Supply in Regional Health Service

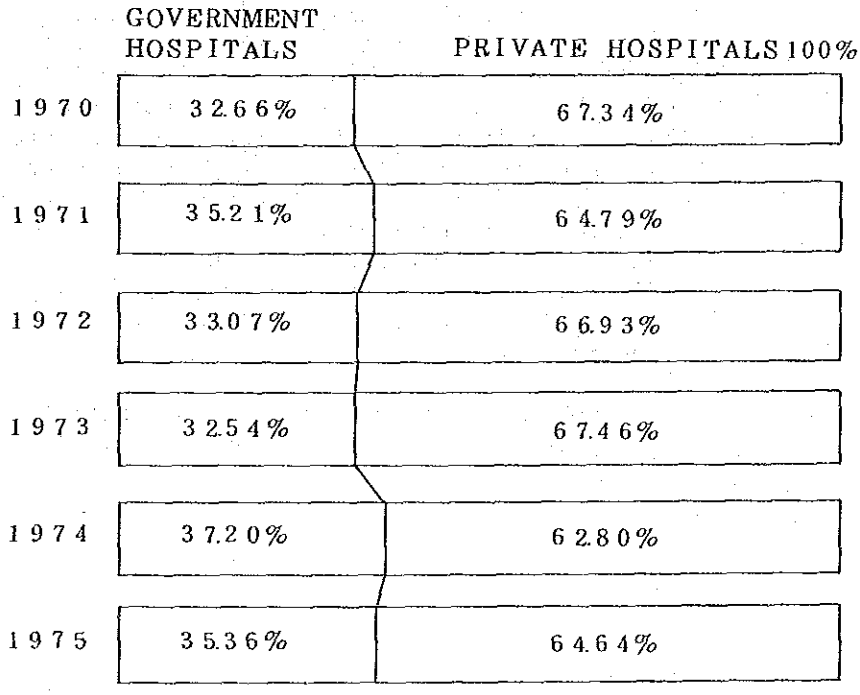
Without knowing to what degree the supply of health care available at present is filling the demand for health care raised in the last chapter, it is not possible to set regional health care improvement plan policies. In order to understand present regional health care supply conditions, the most effective method is to look at the extent to which facilities are available, the intensity of health care services, and the distribution of manpower and proceed from there.

1) Health care facilities

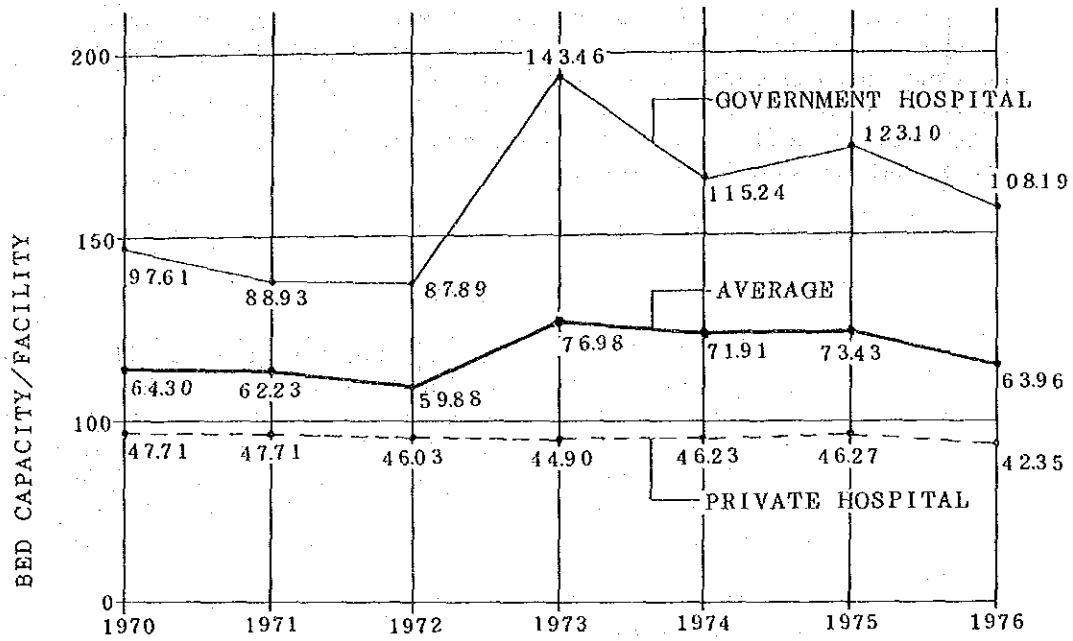
(1) Number and Scale of Health Care Facilities

In 1973 there were 813 health care facilities in the nation, or 2.02 facilities per 100,000 population. This grew to 1,038 facilities in 1976, or 2.47 facilities per 100,000 population. From 1970 to 1975 the number of private hospitals grew 1.56 times and government hospitals 1.76 times for an overall, growth rate of 1.62 times within 6 years.

Looking again at the ratio of private to government hospitals over time we have:



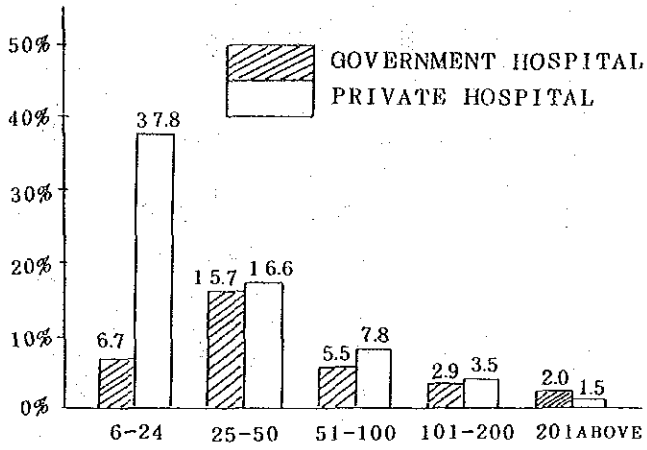
The average ratio is 35% public to 65% private. Next, looking at the scale of the health care facilities we have:



The first thing that stands out is that the average size of private hospitals has hardly changed at all, remaining within a 43 ∿ 48 bed limit, which shows that, from the point of hospital administration, the conditions for establishing large private hospitals are not yet existant. On the other hand, facilities of greatly varying scale have had to be built for government hospitals which run from rural health units with a handful of beds to 450 bed medical centers, but particularly striking growth of scale is not observable. A very gradually rising trend is seen.

Looking at the distribution of facilities according to scale, the 6 ∿ 24 bed capacity scale

hospitals are overwhelmingly private although there are many small scale government hospitals in the 25 ∿ 50 bed emergency class.



Next, looking at the number of facilities and facilities per 100,000 population for each project province, we see that only Pangasinan and Nueva Vizcaya are below the national average of 2.47 facilities/100,000 pop. with only 1.91 and 2.07 facilities/100,000 pop. respectively. On the other hand, while Batanes with 16.67 may be considered a special case, Mountain Province's 6.86, Kalinga-Apayao's 7.18 and Quirino's 6.25, and others can be said to be quite high figures. Looking at the figures broken down by region it is noticeable that Region I with 2.93 is behind Region II, with 3.35.

GOVERNMENT AND PRIVATE HOSPITALS, NUMBER
: FY 1959 60 TO FY 1975-76

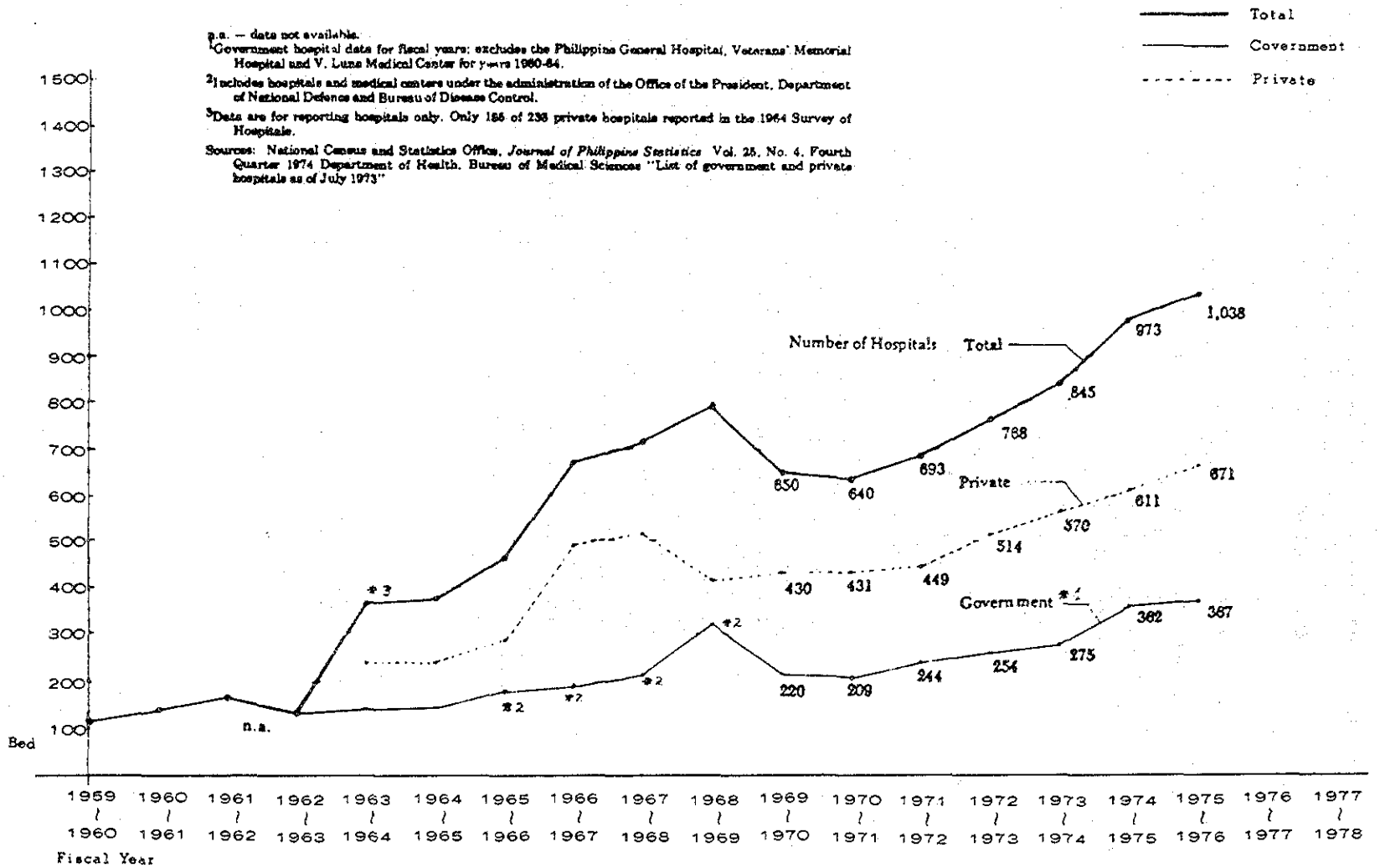
n.a. — data not available.

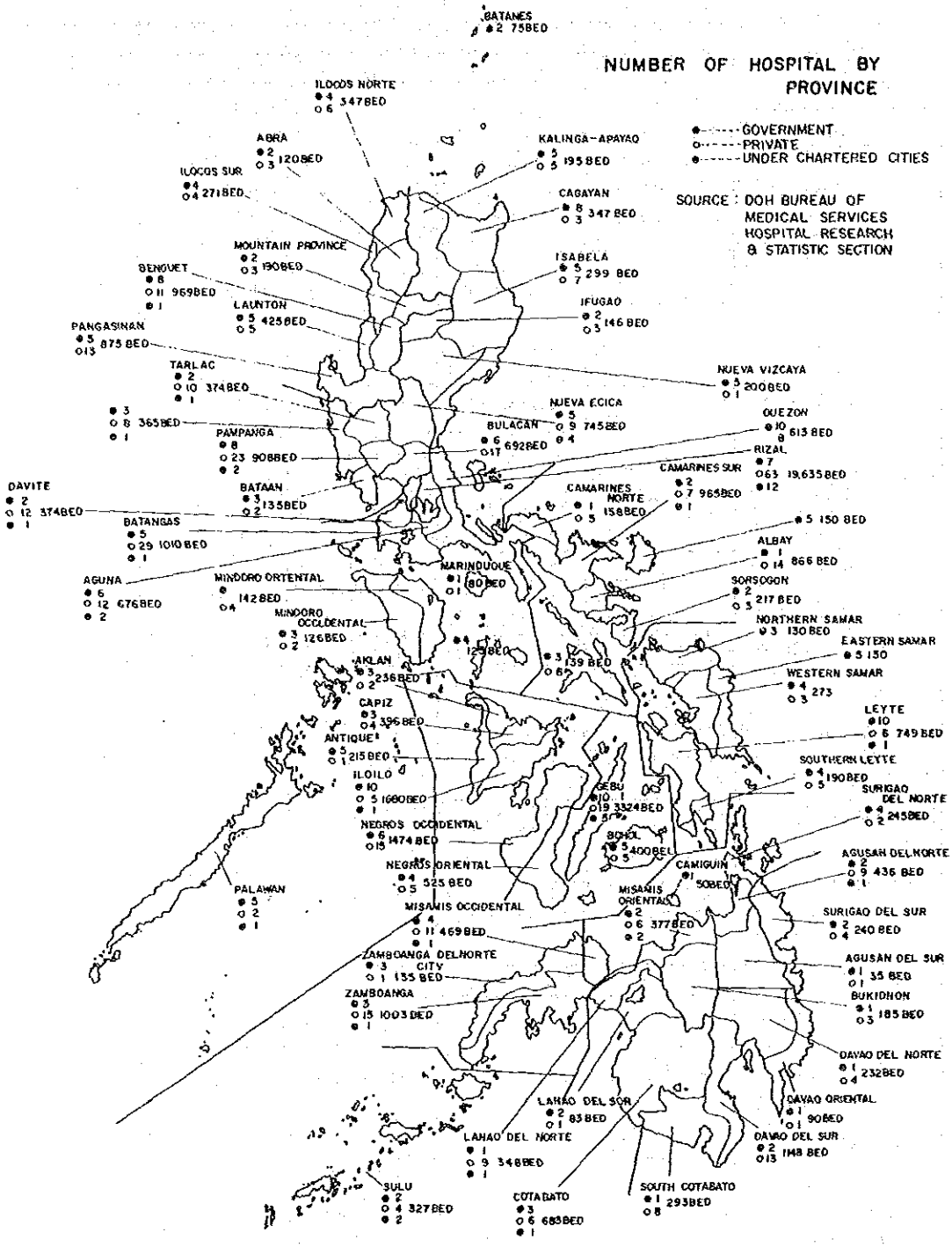
[1]Government hospital data for fiscal years; excludes the Philippine General Hospital, Veterans' Memorial Hospital and V. Luna Medical Center for years 1960-64.

[2]Includes hospitals and medical centers under the administration of the Office of the President, Department of National Defence and Bureau of Disease Control.

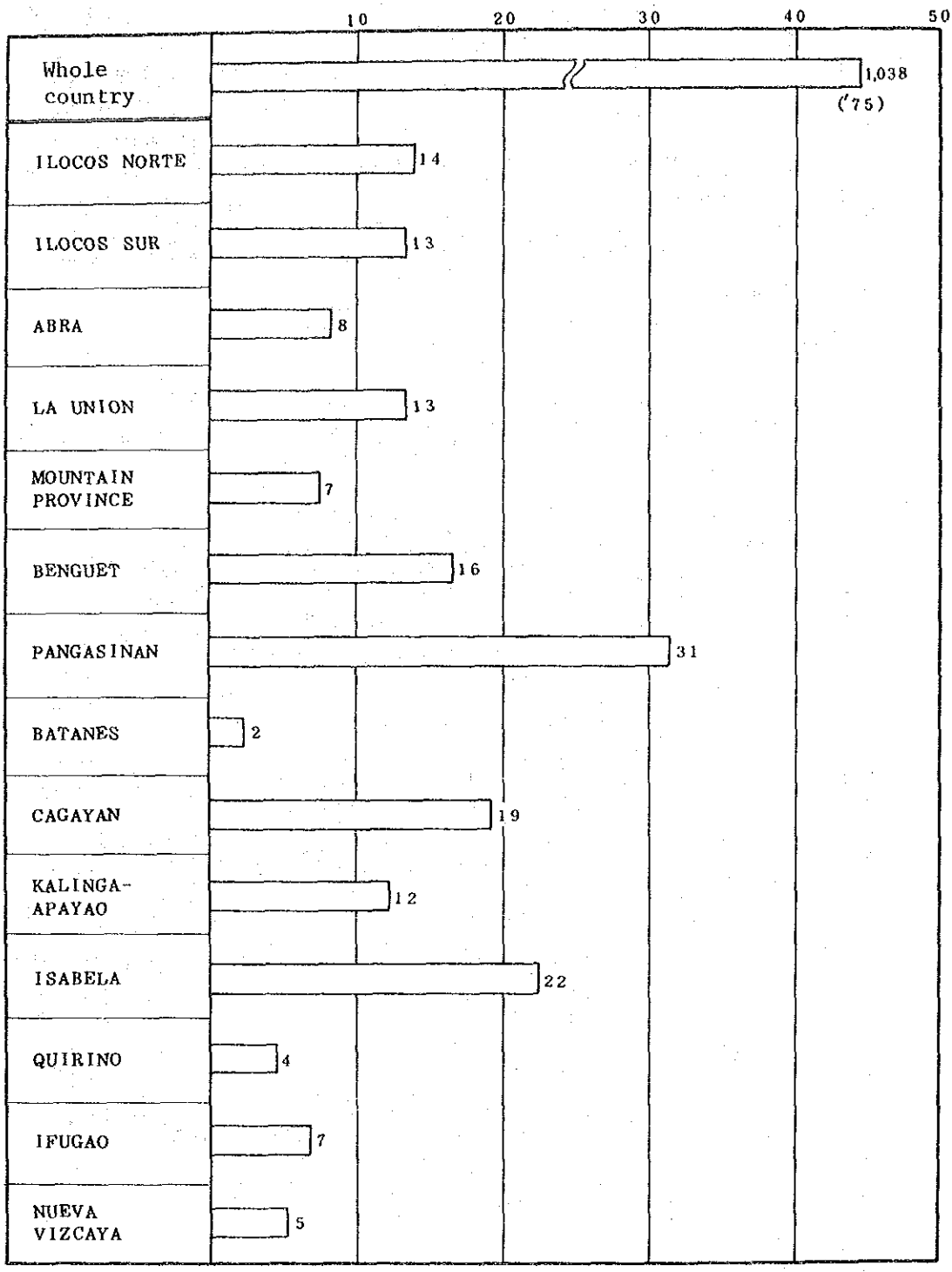
[3]Data are for reporting hospitals only. Only 186 of 238 private hospitals reported in the 1964 Survey of Hospitals.

Sources: National Census and Statistics Office, *Journal of Philippine Statistics* Vol. 25, No. 4, Fourth Quarter 1974 Department of Health, Bureau of Medical Sciences "List of government and private hospitals as of July 1973"




NUMBER OF HOSPITAL BY PROVINCE
●------GOVERNMENT
○------PRIVATE
●------UNDER CHARTERED CITIES
SOURCE : DOH BUREAU OF MEDICAL SERVICES HOSPITAL RESEARCH & STATISTIC SECTION
BATANES
ILOCOS NORTE
ABRA
KALINGA-APAYAO
ILOCOS SUR
CAGAYAN
MOUNTAIN PROVINCE
ISABELA
BENGUET
IFUGAO
LAUNTON
PANGASINAN
NUEVA VIZCAYA
TARLAC
NUEVA ECICA
QUEZON
BULACAN
PAMPANGA
RIZAL
CAMARINES SUR
DAVITE
BATAAN
CAMARINES NORTE
BATANGAS
ALBAY
MARINDUQUE
AGUNA
SORSOGON
MINDORO ORTENTAL
NORTHERN SAMAR
MINDORO OCCIDENTAL
EASTERN SAMAR
AKLAN
WESTERN SAMAR
CAPIZ
LEYTE
ANTIQUE
SOUTHERN LEYTE
ILOILO
SURIGAO DEL NORTE
CEBU
NEGROS OCCIDENTAL
BOHOL
AGUSAN DEL NORTE
NEGROS ORIENTAL
CAMIGUIN
PALAWAN
MISAMIS ORIENTAL
MISAMIS OCCIDENTAL
SURIGAO DEL SUR
ZAMBOANGA DELNORTE
AGUSAN DEL SUR
ZAMBOANGA
BUKIDNON
DAVAO DEL NORTE
LANAO DEL SUR
DAVAO ORIENTAL
LANAO DEL NORTE
DAVAO DEL SUR
SULU
SOUTH COTABATO
COTABATO

NUMBER OF HOSPITAL BY PROVINCE IN REGION I & II (1977)



(2) Hospital Bed Capacity

Since 1972 the total number of hospital beds has rapidly increased, with the 76,230 beds available in 1975 growing to 78,545 beds in 1976. This increase is primarily due to the rapid growth in the number of beds in government hospitals. Thus, while the aggregate number of beds grew by 1.85 times in the 6 years from 1970 through 1975, the number of government hospital beds increased 2.18 times. On the other hand, the private hospital beds increased no further than 1.50 times, while growing steadily, for a 50% growth rate.

Further, the number of beds per 10,000 population was 17.8 in 1975, showing a 1.63 times growth in the preceeding 6 year period. Making international comparisons, while it may be said that this ratio occupies a high place among developing countries it is still far from the level of the developed countries. Next, breaking the beds down by type, we find that of the total number of 62,939 beds in 1973, there were 9,935 tuberculosis hospital beds, 7,000 mental hospital beds, 41,062 general hospital beds and 4,942 other types of beds. Showing the percentage of the total occupied by each we have 15.8%, 11.1%, 65.2% and 7.9%, respectively, with the comparative Japanese figures being 0.7%, 14.4%, 65.4% and 19.5%, and the figures for Columbia, a country with a similar hospital bed/pop. ratio, 3.4%, 13.7%, 74.2% and 8.7%. The figures show the ratio of TB hospitals to the total to be high and that of mental hospitals to be low.

Turning our attention to the geographical breakdown of national hospital beds below -

	REGION	BEDS PER 10,000 (1973)
I	ILOCOS	13.33
II	CAGAYAN VALLEY	6.50
III	CENTRAL LUZON	7.12
IV	SOUTHERN LUZON	29.67
V	BICOL	5.81
VI	WESTERN VISAYAS	8.42
VII	CENTRAL VISAYAS	9.33
VIII	EASTERN VISAYAS	5.96
IX	WESTERN MINDANAO	4.21
X	NORTHERN MINDANAO	7.08
XI	SOUTHERN MINDANAO	5.92
	PHILIPPINE	12.55

SOURCES: DOH NATIONAL HEALTH PLAN 1975-78 Vol. 2

It can be seen that, excluding Southern Luzon, Region I occupies a position above the national average, while Region II, on the other hand, is considerably behind. When looking at hosp./pop. figures opposite results are seen, as Region II has many small scale hospitals. In order to attain the goal of 20 beds per 10,000 population, even provided there is no population growth, Region I will need to augment its present bed capacity by 1.5 times and Region II by 3 times. In looking at the figures broken down by project provinces, even excepting Batanes as a special case, Mt. Province, Benguet and Quirino are the only ones fulfilling the 20 bed/10,000 pop. goal.

GOVERNMENT AND PRIVATE HOSPITALS,
BED CAPACITY: FY 1959-60 TO FY 1975-76

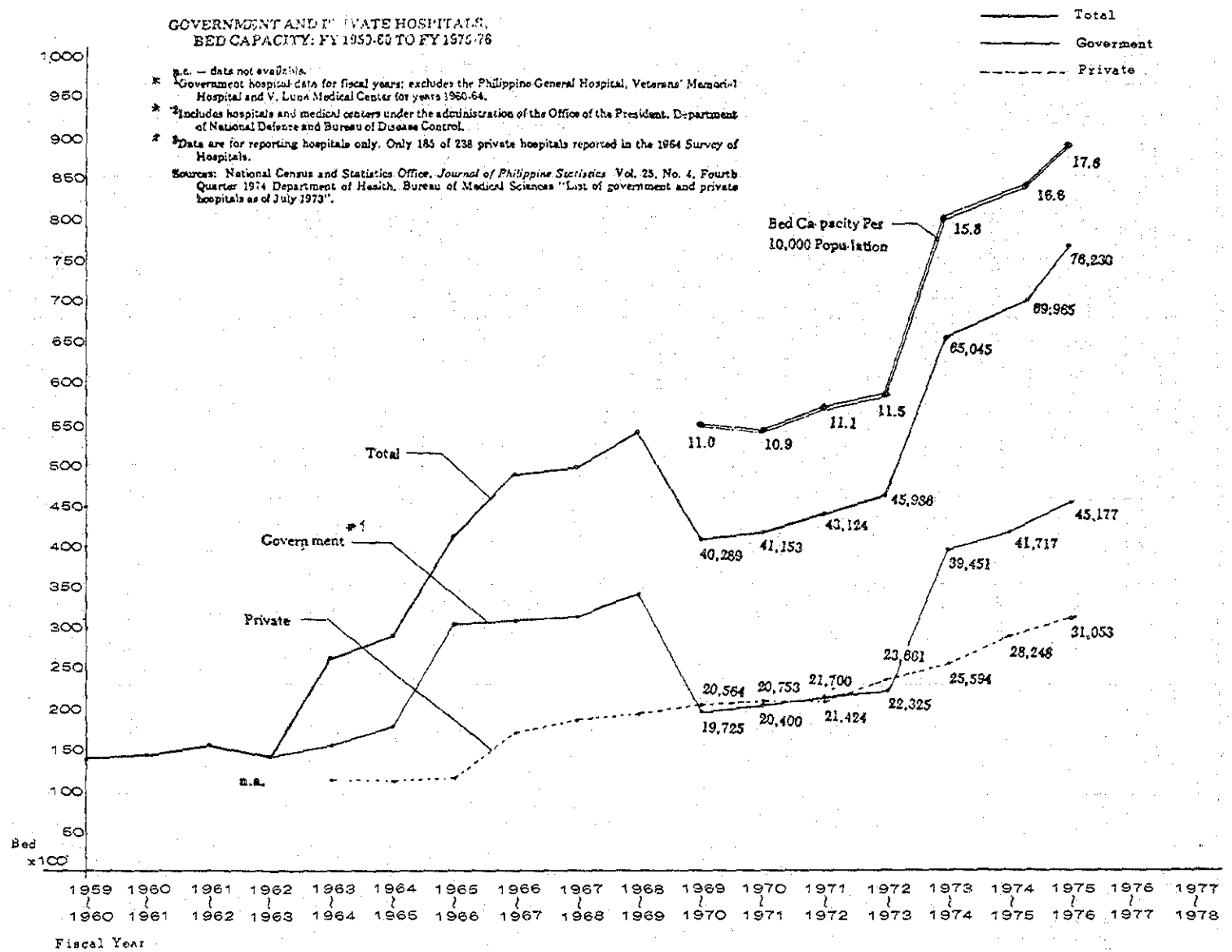
n.a. – data not available.

*1 Government hospital data for fiscal years; excludes the Philippine General Hospital, Veterans' Memorial Hospital and V. Luna Medical Center for years 1960-64.

*2 Includes hospitals and medical centers under the administration of the Office of the President, Department of National Defence and Bureau of Disease Control.

*3 Data are for reporting hospitals only. Only 185 of 238 private hospitals reported in the 1964 Survey of Hospitals.

Sources: National Census and Statistics Office, *Journal of Philippine Statistics* Vol. 25, No. 4, Fourth Quarter 1974 Department of Health, Bureau of Medical Sciences "List of government and private hospitals as of July 1973".



Selected Foreign Countries Health Care Facilities, No. of Beds, Ratio (per 10,000 pop.)

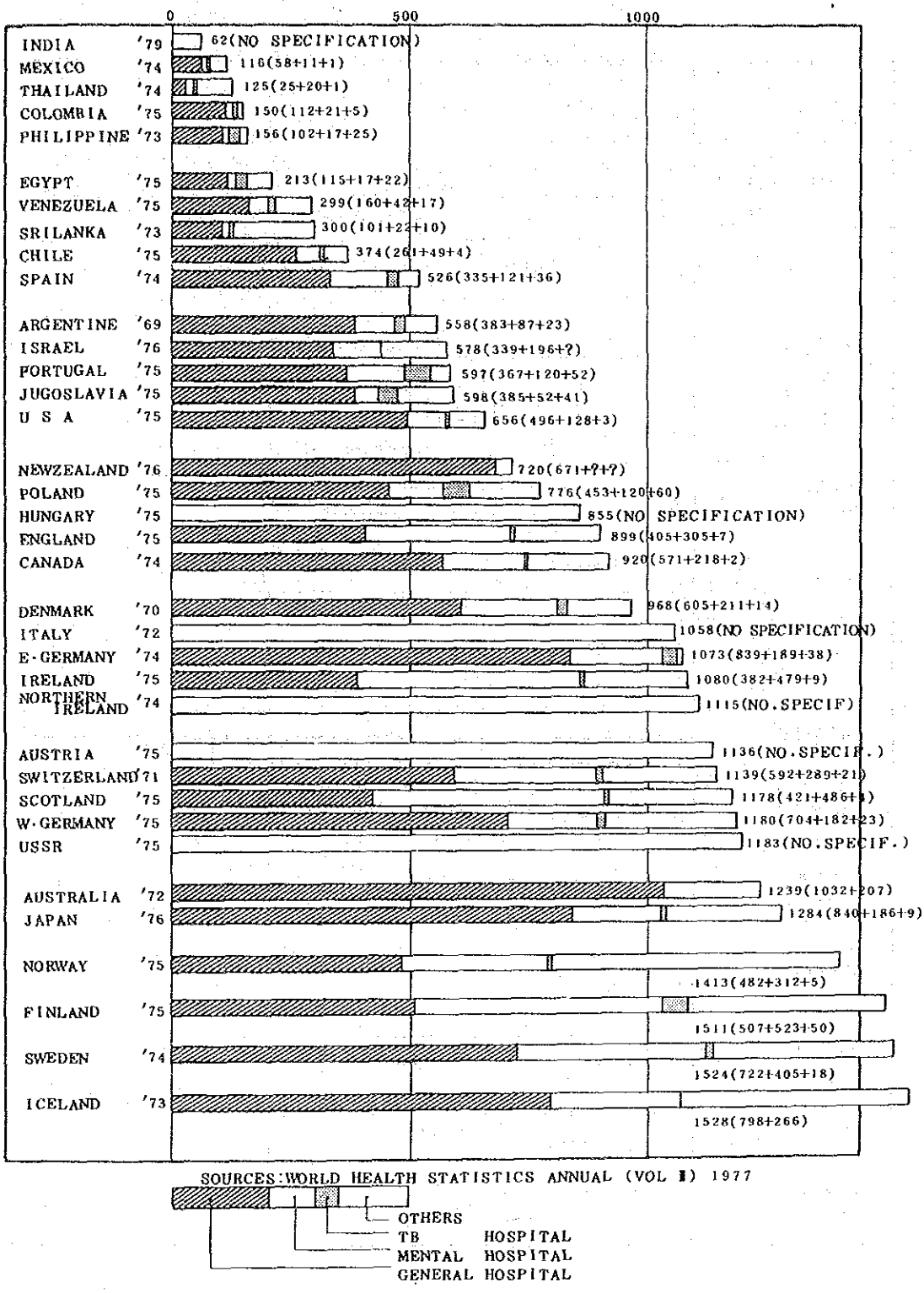
		No. of Health Care Facilities	No. of Beds				Ratio (No. of beds per 10,000 pop.)			
			Total	T.B. hospital	Mental hospital	General hospital	Total	T.B. hospital	Mental hospital	General hospital
Egypt	1975	1,454	79,399	8,128	6,230	42,654	21.3	2.2	1.7	11.5
Canada	1974	1,368	206,763	465	49,064	128,313	92.0	0.2	21.8	57.1
Mexico	"	1,575	67,363	723	6,182	33,702	11.6	0.1	1.1	5.1
U.S.A.	1975	7,336	1,401,624	5,813	272,381	1,058,453	65.6	0.3	12.8	49.6
Argentina	1969	2,864	133,847	5,434	20,847	91,730	55.8	2.3	8.7	38.3
Chili	1975	304	38,319	389	5,024	26,795	37.4	0.4	4.9	26.1
Columbia	"	825	44,642	1,521	6,132	33,143	15.0	0.5	2.1	11.2
Venezuela	"	380	35,867	2,091	5,058	19,147	29.9	1.7	4.2	16.0
Sri Lanka	1973	456	39,732	1,339	2,981	13,391	30.0	1.0	2.2	10.1
India	1969	14,286	331,633	...	...	...	6.2	...	...	...
Israel	1975	86	19,501	...	6,604	11,441	57.8	...	19.6	33.9
Japan	1976	37,486	1,451,691	9,869	209,768	949,730	128.4	0.9	18.6	84.0
Philippines	1973	813	62,939	9,935	7,000	41,062	15.6	2.5	1.7	10.2
Thailand	1974	314	51,215	584	7,483	10,322	12.5	0.1	2.0	2.5
Austria	1975	...	85,461	...	...	...	113.6	...	...	...
Denmark	1970	296	47,709	712	10,399	29,823	96.8	1.4	21.1	60.5
Finland	1975	379	71,115	2,358	19,836	23,879	151.1	5.0	52.3	50.7
France	1974	...	...	...	...	427,317	...	...	...	81.4
W. Germany	1975	3,481	729,791	14,046	66,943	435,387	118.0	2.3	18.2	70.4
E. Germany	1974	584	184,214	6,568	32,511	144,007	107.3	3.8	18.9	83.9
Hungary	1975	218	90,104	...	...	...	85.5	...	...	...
Iceland	1973	43	3,209	...	242	1,676	152.8	...	26.6	79.8
Ireland	1975	215	33,772	286	14,967	11,943	108.0	0.9	47.9	38.2
Italy	1972	2,189	575,162	...	...	...	105.8	...	...	...
Netherlands	1975	...	...	225	26,259	68,685	...	0.2	19.2	50.3
Norway	1975	866	56,636	217	8,121	19,314	141.3	0.5	31.2	48.2
Poland	"	1,265	264,103	20,474	40,944	154,141	77.6	6.0	12.0	45.3
Portugal	"	548	52,268	4,539	10,482	32,119	59.7	5.2	12.0	36.7
Spain	1974	1,261	185,218	12,693	42,493	118,152	52.6	3.6	12.1	33.5
Sweden	"	725	124,350	1,428	24,127	58,941	152.4	1.8	40.5	72.2
Switzerland	1971	440	72,268	1,353	18,068	37,564	113.9	2.1	28.9	59.2
England	1975	3,308	417,249	3,385	90,191	187,844	89.9	0.7	30.5	40.5
NE Ireland	1974	...	17,290	...	...	...	111.5	...	...	...
Scotland	1975	354	61,339	204	18,532	21,904	117.8	0.4	48.6	42.1
Yugoslavia	1975	490	127,645	8,624	11,022	82,137	59.8	4.1	5.2	38.5
Australia	1972	2,297	160,552	...	26,861	133,691	123.9	...	20.7	103.2
New Zealand	1976	322	22,596	...	...	21,078	72.0	...	...	67.1
U.S.S.R.	1975	...	3,009,200	...	...	...	118.3	...	...	...

Notes: 1) As definitions of what constitutes a "hospital" vary depending on the nation, the figures given in WHO's Hospitals and Medical Establishments with Beds were used.

2) In respect to the number of Japan's health care facilities, the figures given are for the total of hospitals and general health care clinics with beds.

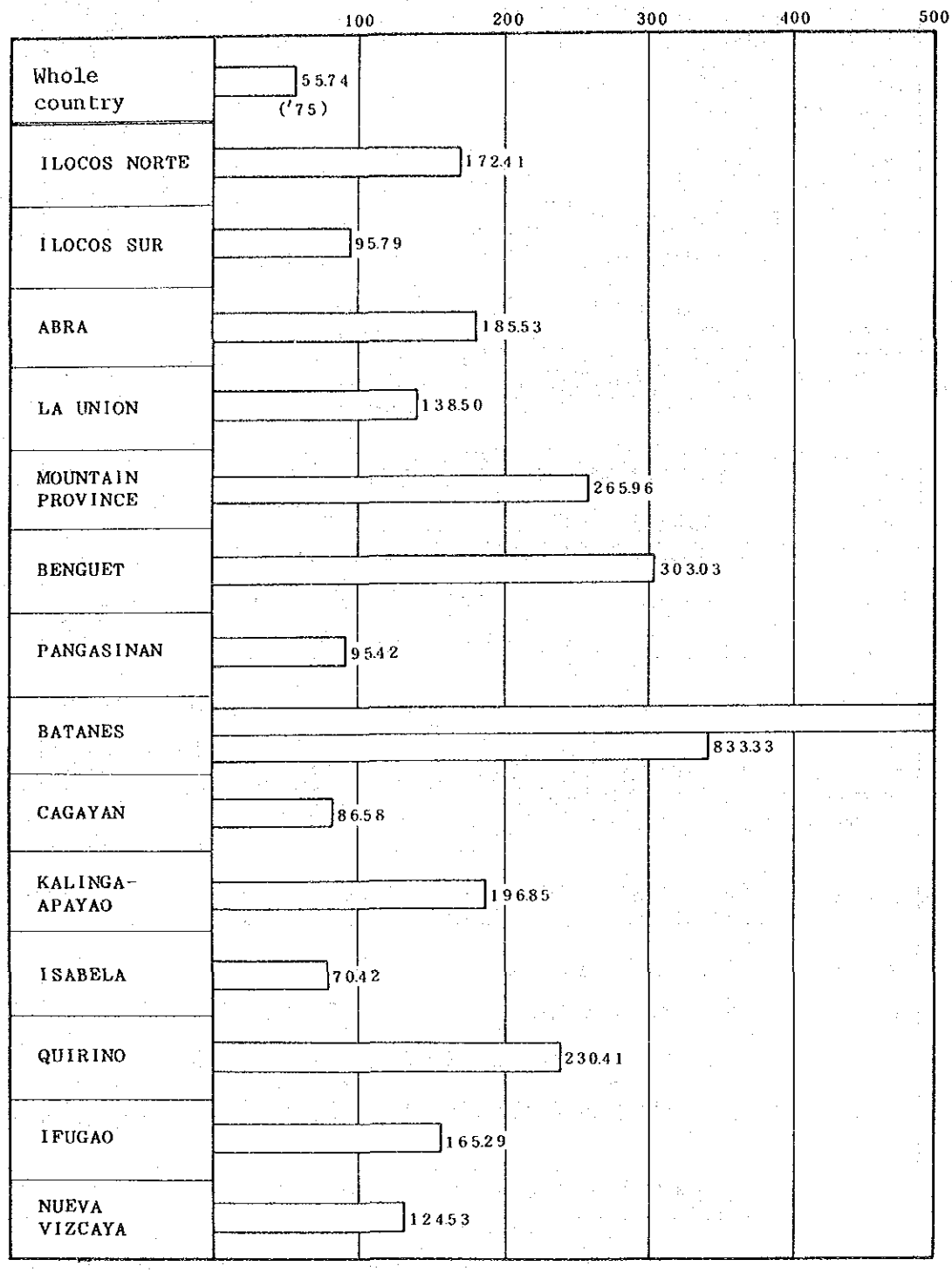
Reference: World Health Statistics Annual (Volume III, Health Personnel and Hospital Establishments) 1977

NUMBER OF BEDS BY COUNTRY: PER 100,000 POPULATION



SOURCES: WORLD HEALTH STATISTICS ANNUAL (VOL I) 1977

NUMBER OF BEDS PER 100,000 BY PROVINCE (1977)



(3) Health Care Facilities Distribution and Wide Catchment Area

Let's consider the distribution of health care facilities which we have been looking at from the added perspective of regional and geographical conditions. In order to get a grasp of the composition of Region I and II's regional health care, all of the hospitals (larger than emergency hospitals) in these Regions are marked on a map and areas roughly showing a 1 hour range, 30 minute range and 15 minute range from the hospitals by tricycle are plotted as appropriate to the scale of the hospital.

100 bed and over	Tricycle	1 hour range (within 20 km of the center)
50 ∿ 100 bed	"	30 minute range (within 10 km of the center)
50 bed and under	"	15 minute range (within 5 km of the Center)

In making this map, as much consideration as possible was given to transportation (esp. roads) and geographic conditions (rivers, mountainous land, sea coasts).

The areas where the time zones overlap, depending on the frequency of the overlap, are depicted through giving 3 different gradations for 1 layer, 2 layer and 3 layer or more.

LIST OF GOVERNMENT HOSPITALS

Region I

Name of Hospital	Location	Bed Capacity	Classification
ABRA PROVINCE:			
1. Abra Provincial Hospital	Bangued	100	General
2. La Paz Emergency Hospital	La Paz	25	General
BENGUET PROVINCE:			
3. Atok Emergency Hospital	Atok	25	General
4. Benguet Provincial Hospital	La Trinidad	100	General
ILOCOS NORTE PROVINCE:			
5. Marcos Mat. & Children's	Marcos	25	General
6. Marcos Memorial Hospital	Batac	200	General
7. Dingras Emergency Hospital	Dingras	25	General
8. Bangui Emergency Hospital	Bangui	25	General
ILOCOS SUR PROVINCE:			
9. Sinait Emergency Hospital	Sinait	25	General
10. Southern I. Sur Emergency	Tagudin	50	General
11. Gabriela Silang Mem. Hospital	Vigan	100	General
12. Jacob-Laya Emergency Hospital	Narvacan	50	General
13. Bessang Pass Emergency Hospital	Cervantes	25	General
14. Sta. Lucia Emergency Hospital	Sta. Lucia	25	General
LA UNION PROVINCE:			
15. Bacnotan Emergency Hospital	Bacnotan	25	General
16. Naguilian Emergency Hospital	Naguilian	25	General
17. La Union Provincial Hospital	San Fernando	150	General
18. Rosario Emergency Hospital	Rosario	25	General
19. Northern La Union Mat. & Children's Hospital	Nalaoan	25	General
20. Dona Gregoria Mem. Hospital	Agoo	100	General
21. Caba CHHC	Caba	10	General

Name of Hospital	Location	Bed Capacity	Classification
MOUNTAIN PROVINCE:			
22. Bontoc General Hospital	Bontoc	100	General
23. Mt. Province Gen. Hospital	Bauko	75	General
24. Barlig Emergency Hospital	Barlig	25	General
25. Besao Emergency Hospital	Besao	25	General
PANGASINAN PEOVINCE:			
26. Western Pangasinan Emerg.	Alaminos	75	General
27. Urdaneta General Hospital	Urdaneta	50	General
28. Eastern Pangasinan Emerg.	Tayug	75	General
29. Mangatarem Emerg. Hospital	Mangatarem	25	General
30. Asingan CHHC	Asingan	10	General
31. Bolinao CHHC	Bolinao	10	General
32. Umingan CHHC	Umingan	10	General
BAGUIO CITY:			
33. Baugio General Hospital & Medical Center		350	General
DAGUPAN CITY:			
34. Pangasinan Provincial & Medical Center		200	General
LAOAG CITY:			
35. Ilocos Norte Provincial Hospital		100	General
SAN CARLOS CITY:			
36. San Carlos General Hospital		150	General

LIST OF PRIVATE HOSPITALS

Region I

Name of Hospital	Location	Bed Capacity	Classification
ABRA PROVINCE:			
51. Seares Family Clinic	Bangued	40	General
52. Sta. Monica Hospital	Manabo	40	General
53. Aznar-Gorospe Clinic	Bangued	24	Special
54. Caisa Clinic	Bangued	22	General
55. Bangued Christian Hospital	Bangued	50	General
56. Clinica Bobila	Bangued	20	General
BENGUET PROVINCE:			
57. Benguet Exploratory Infirmary	Tuba	8	General
58. Our Lady of Perpetual Help	Buguias	10	General
59. Western Minelco Corp. Hospital	Atok	10	General
60. Bokod Hospital	Bokod	16	General
61. Balatok Hospital	Balatok	24	General
62. Antamok Hospital	Antamok	24	General
63. Lepanto Consolidated Hospital	Mankayan	85	General
64. Lutheran Hospital	Buguias	35	General
65. Suyoc Mines Hospital	Mankayan	18	General
ILOCOS NORTE PROVINCE:			
66. Gaoat Clinic	Batac	15	General
67. Bacarra Medical Center	Bacarra	50	General
68. Clinica San Jose	Batac	10	General
69. Gorospe Clinic & Hospital	Batac	100	General
ILOCOS SUR PROVINCE:			
70. Corpuz Clinic	Sinait	20	General
71. Candon General Hospital	Candon	20	General
72. Saruca Clinic	Bantay	13	General
73. St. Mary Hospital	Sta. Maria	16	General
74. Lahoz Clinic	Vigan	30	General
75. Cariaga Clinic	Vigan	20	General
76. Gacula Clinic	Cahden	15	General

Name of Hospital	Location	Bed Capacity	Classification
LA UNION PROVINCE:			
77. Gaerlan Clinic	Bangar	10	General
78. Martinez Clinic	Bangar	25	General
79. Lopez Clinic	Balaoan	6	General
80. Bethany Hospital	San Fernando	100	General
81. Lorma Hospital	San Fernando	100	General
82. Agoo Medical Clinic	Agoo	10	General
MOUNTAIN PROVINCE:			
83. Heald Lumber Hospital	Bauko	6	General
84. R.B. Lim Memorial Clinic	Natonin	10	General
85. St. Theodore Hospital	Sagada	30	General
PANGASINAN PROVINCE:			
86. Stella Maris Hospital	Binmaley	20	General
87. Dr. Rous Hospital	Binalonan	12	Special
88. Suyat Family Clinic	Manaoag	12	General
89. Banez Clinic	Rosales	15	General
90. Guiang Clinic	Bugallon	14	General
91. Malasiqui Comm. Hospital	Malasiqui	50	General
92. Tablada Clinic	Urdaneta	9	General
93. Ordonez Clinic	Villasis	10	General
94. Eastern Medical Clinic	Rosales	10	General
95. Saballa-Rosario Hospital	Binalonan	12	General
96. Urdaneta Doctor's Hospital	Urdaneta	100	General
97. Gualberto Clinic	Urdaneta	10	General
PANGASINAN PROVINCE:			
98. St. Jude Medical & Children's Hospital	Urdaneta	6	General
BAGUIO CITY PROVINCE:			
99. Notre Dame de Lourdes Hospital	Baguio City	95	General
100. Pines City Doctor's Hospital	Baguio City	130	General
101. Baguio Fil-Chinese General Hospital	Baguio City	25	General
102. Baguio Medical Center, Inc.	Baguio City	43	General

Name of Hospital	Location	Bed Capacity	Classification
DAGUPAN CITY PROVINCE:			
103. Cuison Clinic	Dagupan City	10	General
104. Ramos Nursery & Children's Hospital	Dagupan City	50	Special
105. Dagupan Polyclinic Hospital	Dagupan City	120	Gen. T. & T.
106. Villaflor Clinic	Dagupan City	17	General
107. Luzon Medical Center	Dagupan City	110	General
108. Nazareth General Hospital	Dagupan City	100	General
109. Pangasinan Medical Center	Dagupan City	100	General
110. J.V.F. Clinic & Lying-In Hospital	Dagupan City	55	General
LAOAG CITY PROVINCE:			
111. San Antonio Hospital	Laoag City	10	General
112. Santos Clinic	Laoag City	24	General
113. Family Hospital	Laoag City	20	General
114. Ilocos Norte Med. Center	Laoag City	25	General
115. Northern General Hospital	Laoag City	50	General
SAN CARLOS CITY PROVINCE:			
116. Virgen Milagrosa Med. Center	San Carlos City	100	General

LIST OF GOVERNMENT HOSPITALS

Region II

Name of Hospital	Location	Bed Capacity	Classification
CAGAYAN PROVINCE:			
1. Cagayan Provincial Hospital	Tuguegarao	200	General
2. Nuestra Senora de Piat Gen. Hospital	Piat	50	General
3. Matilde Olivas Mem. Hospital	Camalanuigan	25	General
4. Alfonso Ponce Enrile Mem. Hospital	Gonzaga	25	General
5. Northern Cagayan Emergency Hospital	S. Mira	25	General
6. Ballesteros Emergency Hospital	Ballesteros	25	General
7. Dona Josefa Edralin Marcos Gen. Hospital	Lasam	50	General
8. Tuao Emergency Hospital	Tuap	50	General
9. Aparri Emergency Hospital	Aparri	25	General
ISABELA PROVINCE:			
10. Isabela Provincial Hospital	Ilagan	100	General
11. Milagros General Hospital	Cabagan	50	General
12. Manuela A. Roxas Mem. Hospital	Roxas	25	General
13. Tumauini Emergency Hospital	Tumauini	50	General
14. Don Mariano Rubio Marcos General Hospital	Cauayan	50	General
15. Primo Gaffud Mem. Hospital	Echague	25	General
16. Southern Isavela General Hospital	Santiago	25	General
NUEVA VIZCAYA PROVINCE:			
17. Magsaysay General Hospital	Bambang	50	General
18. Major Ferdinand E. Marcos Veterans Regional Hospital	Bayombong	200	General
QUIRINO PROVINCE:			
19. Quirino Provincial Hospital	Cabarroguis	100	General
20. Pres. Ferdinand E. Marcos Emergency Hospital	Diffun	25	General
21. Aglipay Emergency Hospital	Aglipay	25	General

Name of Hospital	Location	Bed Capacity	Classification
KALINGA-APAYAO PROVINCE:			
22. Kalinga Apayao Provincial Hospital	Tabuk	100	General
23. Kalinga Hospital	Lubuagan	25	General
24. Kabugao Emergency Hospital	Kabugan	25	General
25. Pinukpuk Emergency Hospital	Pinukpuk	25	General
26. Western Kalinga Com. Hospital	Balbalan	25	General
27. Ama Jadsac Mem. Hospital	Pudtol	25	General
28. Juan Duyan Mem. Hospital	Rizal	25	General
IFUGAO PROVINCE:			
29. Ifugao General Hospital	Lagawe	75	General
30. Mayoyao Emergency Hospital	Mayoyao	25	General
31. Panupdupan Emergency Hospital	Lamut	25	General
32. Tinoc Emergency Hospital	Hungduan	25	General
BATANES PROVINCE:			
33. Batanes Provincial Hospital	Basco	75	General
34. Itbayat Emergency Hospital	Itbayat	25	General

LIST OF PRIVATE HOSPITALS

Region II

Name of Hospital	Location	Bed Capacity	Classification
CAGAYAN PROVINCE:			
51. Marian Clinic	Aparri	10	General
52. Ballesteros Hospital	Ballesteros	12	General
53. Dr. Estrella P. Fernandez Clinic	Ballesteros	8	General
54. L. Ramos Clinic	Ballesteros	18	Special
55. Clinica Salvacion	Ballesteros	6	Special
56. Peneyra Medical Clinic	Lal-lo	16	Special
57. Combate Clinic	Lal-lo	20	General
58. Clinica De Leon	Tuguegarao	6	General
59. Pagalilauan Clinic	Tuguegarao	6	General
60. Cagayan TB Pavilion	Tuguegarao	35	Special
ISABELA PROVINCE:			
61. Padron Medical Clinic	Aurora	10	Special
62. Dayrit Medical Clinic	Cabatuan	15	General
63. Javonillo Clinic	Cordon	14	Special
64. Bucag's Clinic	Cauayan	10	General
65. Reyes Clinic	Ilagan	10	General
66. Cruz Clinic	Ilagan	7	Special
67. Valdez Clinic	Roxas	10	General
68. Isabela Polyclinic	San Mateo	25	General
69. St. Matthew Hospital	San Mateo	15	General
70. Villarta's Clinic	San Mateo	8	General
71. Methodist Bethesda Clinic	San Mateo	15	General
72. Flores Clinic	Santiago	25	General
73. Penafrancia Hospital	Santiago	10	General
74. Cagayan Valley Sanitarium & Hospital	Santiago	57	General
75. Tumauini Medical Clinic	Tumauini	12	General
NUEVA VIZCAYA PROVINCE:			
76. St. Catherine Hospital	Bambang	25	General
77. Fr. Waffelaert Mem. Hospital	Solano	15	General
78. Aliasas Medical Clinic	Solano	10	General
QUIRINO PROVINCE:			
79. St. Vincent Hospital	Maddela	25	General

Name of Hospital	Location	Bed Capacity	Classification
KALINGA-APAYAO PROVINCE:			
80. Salegseg Medical Center	Balbalan	10	General
81. St. Martin de Porres Clinic	Pinukpuk	18	General
82. Good Samaritan Clinic	Tinglayan	10	General
83. John Rauch Mem. Hospital	Tabuk	19	General
84. St. Luke's Emergency Hospital	Tabuk	22	General
IFUGAO PROVINCE:			
85. Good News Clinic & Hospital	Banawe	16	General
86. Immaculate Concepcion Clinic	Banawe	10	General
87. St. Joseph Clinic	Kiangan	9	General

LIST OF NEW CLINICS AND HOSPITALS

(NO LICENSE YET)

Name of Hospital	Location	Bed Capacity	Classification
CAGAYAN PROVINCE:			
88. Nicolas Clinic	Gonzaga		
89. San Roque Medical Clinic	Solana		
90. Verano J. Castillo Clinic	Aparri		
91. Clinica Viloria	Camalanuigan		
92. Paguirigan Medical Clinic	Aparri		
93. Alameda Clinic	Aparri		
ISABELA PROVINCE:			
94. Albano Clinic	Cauayan		
95. Foronda Clinic	Cauayan		
96. Bitantes Clinic	San Mateo		
97. Clinica Fe	Santiago		
98. Maalab Medical Clinic	San Mariano		
99. Cabatuan Medical Clinic	Cabatuan		
KALINGA-APAYAO PROVINCE:			
100. St. Judes Clinic	Tabuk		
101. San Juan Medical Clinic	Conner		
102. Tabuk Medical Clinic	Tabuk		

DISTRIBUTION OF HOSPITAL

1. (Northern Ilocos)

REGIONAL BOUNDARY

PROVINCIAL BOUNDARY

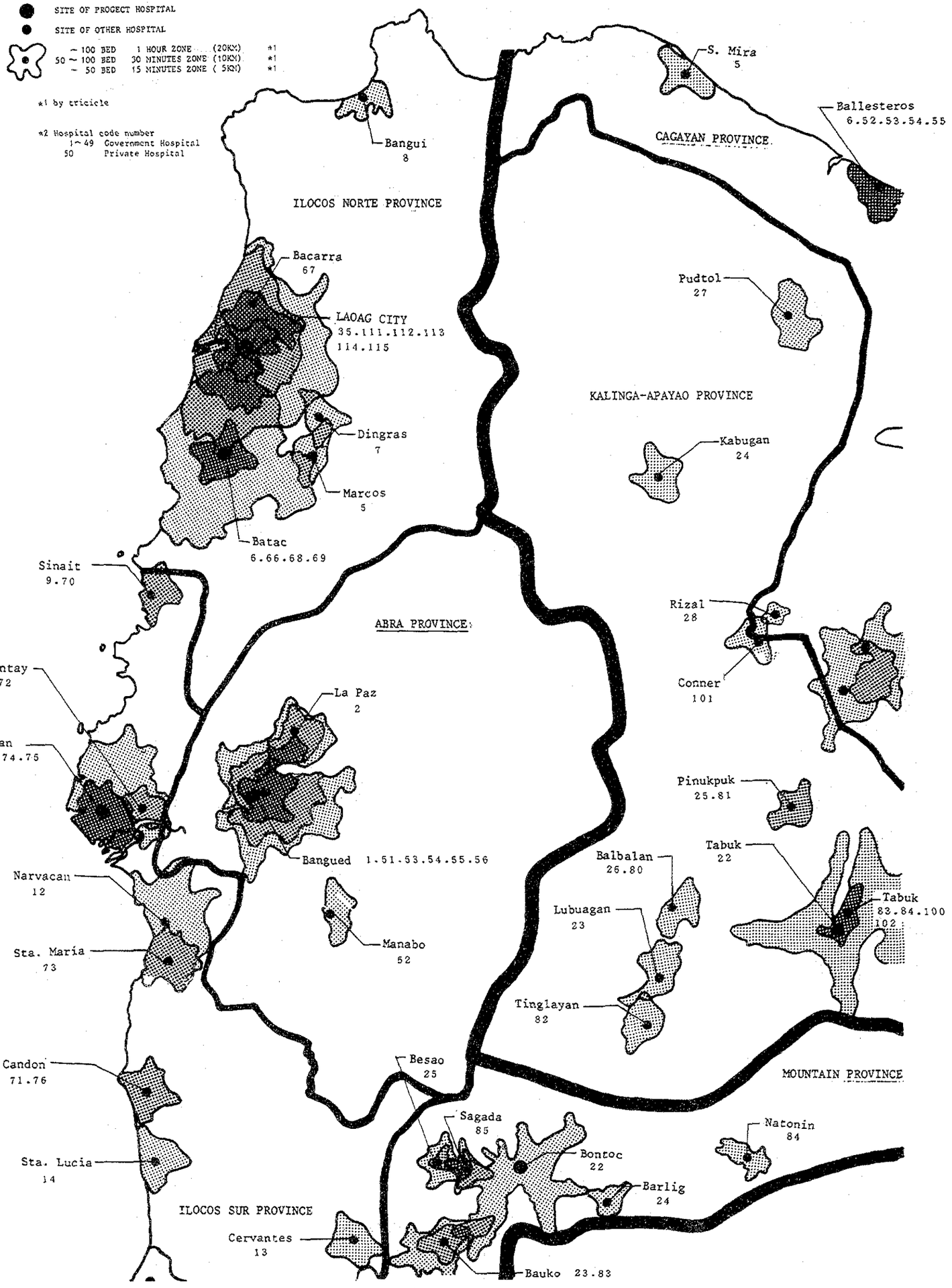
SITE OF PROGECT HOSPITAL

SITE OF OTHER HOSPITAL

~ 100 BED	1 HOUR ZONE	(20KM)	*1
50 ~ 100 BED	30 MINUTES ZONE	(10KM)	*1
~ 50 BED	15 MINUTES ZONE	(5KM)	*1

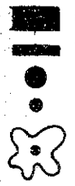
*1 by tricicle

*2 Hospital code number
1 ~ 49 Government Hospital
50 Private Hospital



DISTRIBUTION OF HOSPITAL

2. (Southern Ilocos)



REGIONAL BOUNDARY
PROVINCIAL BOUNDARY
SITE OF PROGECT HOSPITAL
SITE OF OTHER HOSPITAL

~ 100 BED	1 HOUR ZONE (20KM)	*1
50 ~ 100 BED	30 MINUTES ZONE (10KM)	*1
~ 50 BED	15 MINUTES ZONE (5KM)	*1

*1 by tricicle

*2 Hospital code number
1~49 Government Hospital
50 Private Hospital

Candon 71
Sta. Lucia 14
Besao 25
Sagada 85
MOUNTAIN PROVINCE
Cervantes 13
ILOCOS SUR PROVINCE
Tagudin 10
Bontoc 22
Mankayan 63.65
Bauko 23.83
Bangar 77.78
Abatan 117
Balaoan 79.19
Buguias 58.64
Bacnotan 15
LA UNION PROVINCE
Kapangan 37
BENGUET PROVINCE
San Fernando 17.80.81
Naguilian 16
Atok 59
Atok 3
Bokod 60
Bolinao 31
La Trinidad 4
Caba 21
Antamok 62
Agoo 20.82
BAGUIO CITY 33.99.100.101.102
Tuba 57
34.103.104.105.106 107.108.109.110
Rosario 18
Alaminos 26
DAGUPAN CITY
Tayug 28
PANGASINAN PROVINCE:
Binmaley 86
Bugallon 90
Umingan 32
Asingan 30
SAN CARLOS CITY 36.116
Urdaneta 27.92.96.97.98
Rosales 89.94
Villasis 93
Binalonan 87.95
Manaoag 88
Mangatarem 29
Malasiqui 91

DISTRIBUTION OF HOSPITAL

3. (Northern Cagayan Valley)

REGIONAL BOUNDARY

PROVINCIAL BOUNDARY

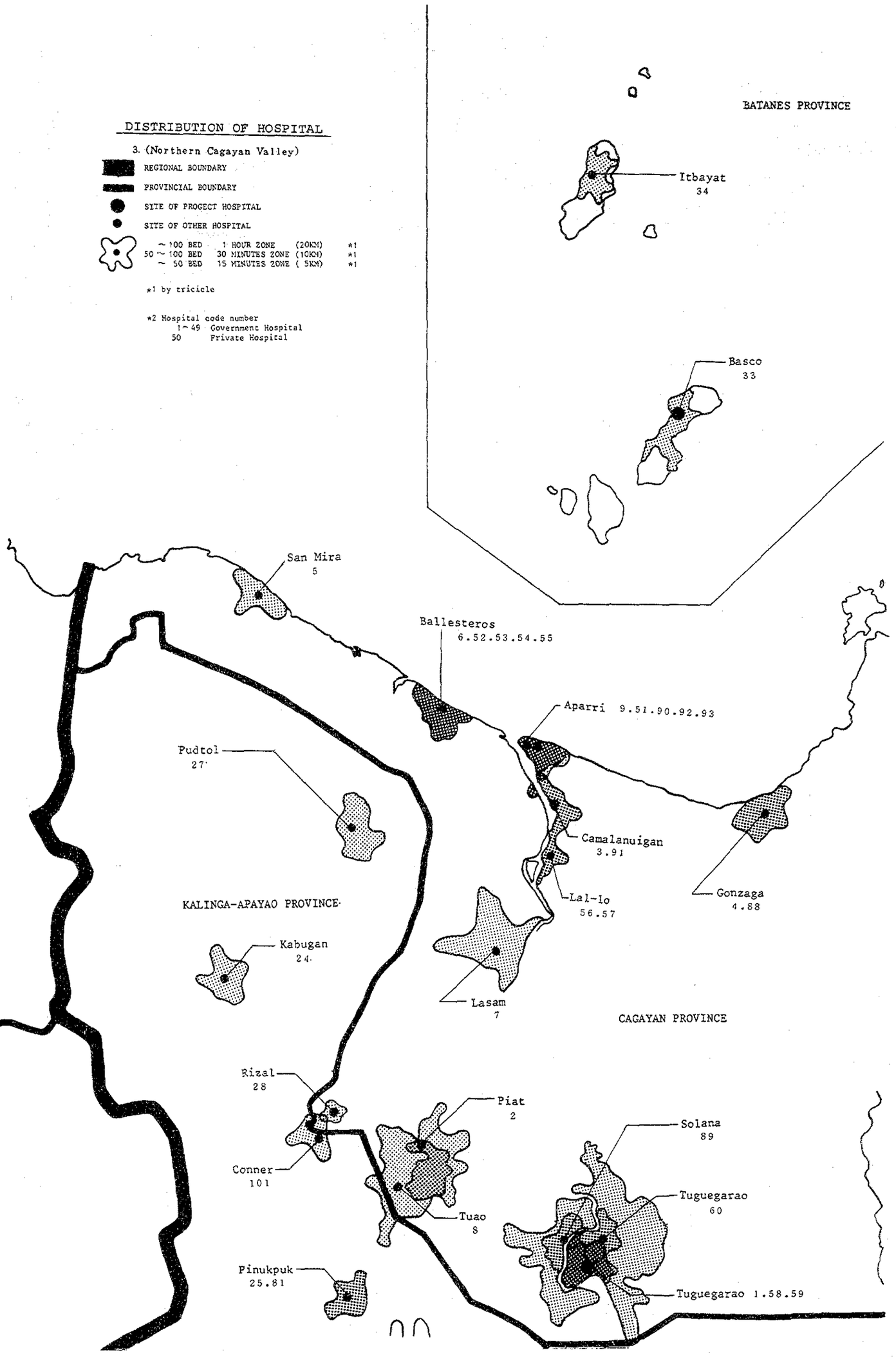
SITE OF PROGECT HOSPITAL

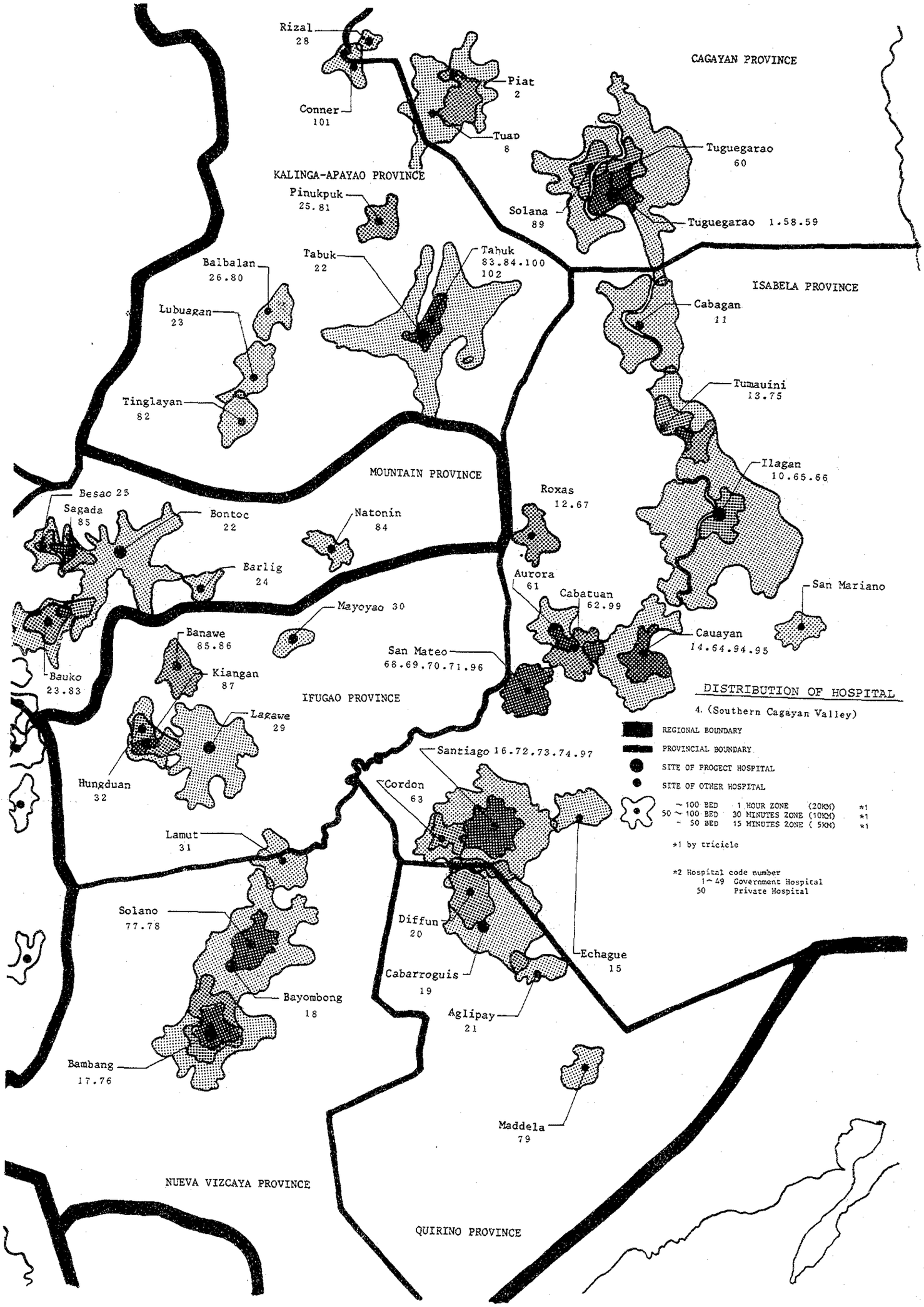
SITE OF OTHER HOSPITAL

~ 100 BED	1 HOUR ZONE (20KM)	*1
50 ~ 100 BED	30 MINUTES ZONE (10KM)	*1
~ 50 BED	15 MINUTES ZONE (5KM)	*1

*1 by tricicle

*2 Hospital code number
1 ~ 49 Government Hospital
50 Private Hospital




Rizal
28
Conner
101
Piat
2
Tuao
8
KALINGA-APAYAO PROVINCE
Pinukpuk
25.81
CAGAYAN PROVINCE
Tuguegarao
60
Solana
89
Tuguegarao 1.58.59
Balbalan
26.80
Tabuk
22
Tabuk
83.84.100
102
ISABELA PROVINCE
Cabagan
11
Lubuagan
23
Tinglayan
82
Tumauini
13.75
MOUNTAIN PROVINCE
Ilagan
10.65.66
Roxas
12.67
Besao 25
Sagada
85
Bontoc
22
Natonin
84
Barlig
24
Aurora
61
Cabatuan
62.99
San Mariano
Mayoyao 30
Banawe
85.86
San Mateo
68.69.70.71.96
Cauayan
14.64.94.95
Bauko
23.83
Kiangan
87
IFUGAO PROVINCE
Lagawe
29
Hungduan
32
Santiago 16.72.73.74.97
Cordon
63
Lamut
31
Solano
77.78
Diffun
20
Echague
15
Cabarroguis
19
Bayombong
18
Aglipay
21
Bambang
17.76
Maddela
79
NUEVA VIZCAYA PROVINCE
QUIRINO PROVINCE
DISTRIBUTION OF HOSPITAL
4. (Southern Cagayan Valley)
REGIONAL BOUNDARY
PROVINCIAL BOUNDARY
SITE OF PROGECT HOSPITAL
SITE OF OTHER HOSPITAL
~ 100 BED 1 HOUR ZONE (20KM) *1
50 ~ 100 BED 30 MINUTES ZONE (10KM) *1
~ 50 BED 15 MINUTES ZONE (5KM) *1
*1 by tricicle
*2 Hospital code number
1~49 Government Hospital
50 Private Hospital

Looking carefully at the completed hospital distribution maps, the following type of wide catchment area becomes readily apparent.

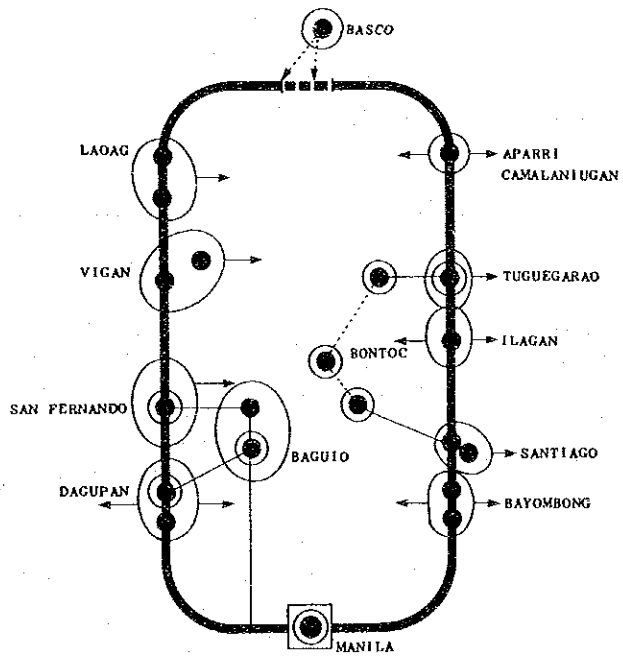
Today there are already many places where the catchment areas have multiple nuclei and the hospitals have closely linked their health care services together. Moreover, there is already a health care services overlap and the people in the area are able to select from among several health care facilities. It is normal for not only the tertiary health care supplying government hospitals to coexist in this fashion but for many private hospitals as well. Trunk roads tying together the nuclei serve fairly well for the tri-cycle centered transport vehicles.

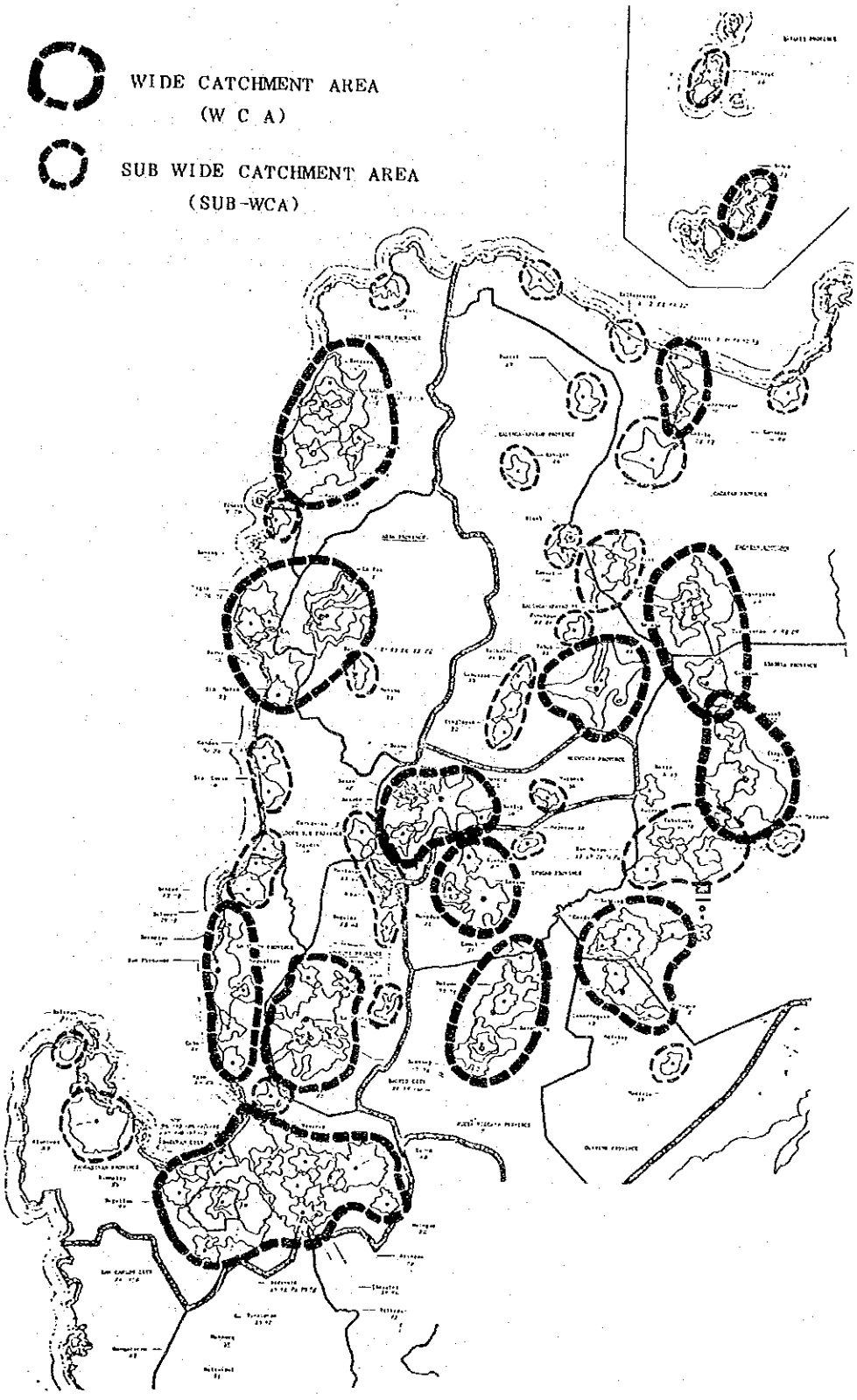
Areas left out of these wide catchment areas are covered by sub-wide catchment areas which may be seen here and there. In many cases, these sub-wide catchment areas are positioned between some wide catchment areas, and thus often serve to tie together the wide catchment areas via the linking trunk lines. But, there are many cases of distant, independently operating sub-wide catchment areas as well. It is relatively easy for the wide catchment area to be organically linked to its central medical care facility(s) but in the case of the sub-wide catchment area promoting such a close link up is difficult. The 19 project hospitals, as provincial level hospitals, all are included in these wide catchment areas and serve in the same capacity as the central hospitals.

	Area Name	Nucleus City	Central Hospital
REGION I:	PANGASINAN WCA	DAGUPAN SAN CARLOS	PANGASINAN PH. SAN CARLOS PH
	BENGUET WCA	BAGUIO LA TRINIDAD	BAGUIO GH & MC BENGUET PH
	LA UNION WCA	SAN FERNANDO, BANGAR	LA UNION PH.
	ILOCOS SUR-ABRA WCA	VIGAN BANGUED STA MARIA	GABRIELA SILANG PH ABRA PH
	ILOCOS NORTE WCA	LAOAG, BATAC	ILOCOS NORTE PH DON MARIANO MARCOS MEMORIAL HOSP.
	BONTOC WCA	BONTOC, BAUKO	BONTOC PH

Area Name	Nucleus City	Central Hospital
REGION II:		
CENTRAL CAGAYAN WCA	TUGUEGARAO CABAGAN	CAGAYAN PH
NORTHERN CAGAYAN WCA	APARRI, LAL-LO CAMALANIUGAN	APARRI EH CAMALANIUGAN EH
BATAC WCA	BATAC	KALINGA-APAYAO PH
ISABELA WCA	ILAGAN TUMAUINI	ISABELA PH
SAN TIAGO WCA	SANTIAGO DIFFUN CABARROGUIS	CAGAYAN. VALLEY SANITARIUM & HOSPITAL QUIRINO PH
IFUGAO WCA	LAGAWE BANAWE	IFUGAO PH
NUEVA VIZCAYA WCA	BAYOMBONG BAMBANG	MAJ.F. MARCOS VETERAN HOSP. NUEVA VIZCAYA PH
BATANES	BASCO	BATANES PH

Diagramming the above mentioned wide catchment area gives the below.




WIDE CATCHMENT AREA
(W C A)
SUB WIDE CATCHMENT AREA
(SUB-WCA)

2) Medical Personnel

(1) Physicians

The most serious problem facing the supply side of health care services in the Philippines is the shortage of physicians particularly in rural areas. Though inadequate facilities for environmental hygiene is also a problem, it is clear that the level of supply in medical services will never be improved unless the problem of the shortage of physicians is solved.

The shortage of physicians greatly restricts the health care services provided by provincial public hospitals, and the growth of the number of patients comes to a halt irrespective of the demand for medical services. In some cases, it is reported, the number of patients who were compelled to discharge themselves without being cured completely or those who could not receive treatment though they wanted it increased, resulting ultimately in an extremely low utilization ratio for the hospital facilities because of the shortage of physicians. For instance, since one of the two physicians had to be away for childbirth, the medical capacity of the district concerned fell drastically, increasing the burden of the other physician beyond the limit.

It is clear that such a situation, coupled with the relatively low salaries of physicians, will result in an even more acute shortage of physicians at provincial hospitals. Even in advanced countries, many physicians are reluctant to take up provincial appointments, thus causing a shortage of physicians. Therefore, fundamental reform is an extremely difficult task. However, it is still possible to start in a more realistic form as outlined below.

a) A substantial increase in physicians' salaries at public hospitals;

b) Young resident physicians are to be obliged to serve in provincial hospitals for a limited period of time;

c) Efforts are to be made to raise the level of health care services so that young resident physicians with a keen intellectual appetite will be able to gain experience particularly with an improvement in the medical equipment;

d) Creation of better living environment at provincial hospitals to make provincial appoints more attractive for physicians particularly with the construction of living quarters for them.

Unless improvement is made in this problem of supply, the most serious in medical services, by taking measures to achieve the objectives listed above, fundamental improvement in medical services cannot be hoped for.

The number of physicians per 100,000 population was 32 in 1977 in the case of the Philippines; this was markedly low compared with the level in advanced countries. If the target is set at about 40 per 100,000 for the time being and efforts are made to correct the unbalanced distribution of physicians in the country, the present level may be raised by 20% for the whole country, by 50% in Region I and by nearly 100% in Region II.

Even with 40 physicians per 100,000 population, man-to-man training for each resident physician in each medical department cannot be hoped for; but the presently serious situation is expected to show at least some improvement. The idea of legalizing provincial appointments of resident physicians which the Survey Team heard in various parts of the country during the field survey is not an ideal approach in the long run. In reality, however, it is probably what those concerned with provincial medical services have long been waiting for, and the realization of the idea may be considered desirable.

However, the method of employing nurses other than resident nurses, unlicensed physicians and hilots after brief training as physicians cannot be recommended, though it may meet the provincial demand for medical services for the time being, as it will lower the level of medical services in the long run, resulting in a serious problem. If, for some reason, this method has to be adopted, their training should rather be geared to counter-measures against infectious diseases and malnutrition. Further, the strategy should include the training of qualified physicians for carrying out the difficult task of dealing with the problem of geriatric health care which is bound to arise following the expected change in the distribution of diseases in the future.

(2) Dental surgeons

As with physicians, the shortage of dental surgeons is being acutely felt. Since it is not directly linked with death, it tends to be overlooked. Dental education and treatment of school children are particularly important. Since these are to be under the care of the Regional Health Office, Provincial Health Office and its subordinate facilities at the primary level responsible for preventive medicine, we will not go into details here. Part of the dental treatment at provincial public hospitals has shown a marked tendency to depend upon dental assistants. Since a rapid increase in demand for dental treatment is anticipated with social development in the future, there is an urgent need for their training.

(3) Nurses

At present, it is relatively easy to recruit nurses in the Philippines; but their flight overseas is not a desirable situation from the national point of view. At the present level of public hospitals it is not so necessary to increase the number of registered nurses; it will be adequate to increase nursing attendants by 30%. At the regional level, however, it will be necessary to increase both by about 50%. A more important task will be to induce nurses to stay on at the primary level.

(4) Paramedical technicians

Another important problem is the shortage of paramedical technicians. However, this problem is not due to the shortage of technicians in number but to the lack of employment opportunities. In view of their flight overseas and to other industries, there is an urgent need for providing them with places of employment. This has to be carried out after considering two important tasks: the present one of dealing with infectious diseases and the one of dealing with geriatric health care in the future.

In dealing with infectious diseases, laboratory test technicians and assistants are to be increased drastically. In order to make arrangements to improve not only normal examinations but also chemical tests and pathological tests at some hospitals and also to adopt preventive measures against infectious diseases in hospitals, preservation and control of

vaccines for inoculation use is to be carried out. Further, hospitals have great responsibilities for isolating the disease-causing agent, reporting accurately on it, and checking outbreaks to minimum.

Further, as measures against tuberculosis, X-ray equipment installed in hospitals may have to be used for mass X-ray and portable X-ray equipment for travelling examinations; and they require more technicians.

In respect to geriatric health-care, though there are not many patients at provincial hospitals at present, it is important to provide training for geriatric diseases such as cancer at this stage; this will create employment opportunities for technicians who appear to be too many at present. For these reasons, increase in the number of biophia and radiology technicians should probably be considered.

The number of social workers also needs to be increased from the viewpoint of strengthening the functions already existing in hospitals to deal with malnutrition and family planning.

Selected Foreign Countries' Health Care Services Related Personnel

Numbers and Ratio (personnel/10,000 pop.)

		Actual number					Ratio (personnel/10,000 pop.)			
		Physician	Dentist	Pharmacist	Midwife	Nurse	Physician	Dentist	Pharmacist	Nurse
Egypt	1975	8,037	2,447	2,405	7,423	12,460	2.2	0.7	0.6	3.3
Canada	"	39,104	8,922	...	...	172,000	17.1	3.9	...	75.3
Mexico	1974	31,571	1,879	112	634	40,998	5.4	0.3	0.0	7.1
U.S.A.	"	350,111	107,320	...	4,300	1,349,000	16.5	5.1	....	63.7
Argentina	1973	53,684	4,629	668	2,905	23,333	22.1	1.9	0.3	9.6
Brazil	1972	59,573	31,664	17,153	...	24,315	6.0	3.2	1.7	2.5
Chili	1975	4,414	1,345	313	...	22,838	4.3	1.3	0.3	22.3
Columbia	1973	10,625	3,150	1,200	...	12,114	4.6	1.4	0.5	5.2
Venezuela	1975	13,608	3,497	3,315	...	28,853	11.3	2.9	2.8	24.1
Sri Lanka	1972	3,251	280	1,355	3,586	6,458	2.5	0.2	1.0	5.0
India	1975	146,000	9,100	66,360	58,200	93,000	2.4	0.2	1.1	1.6
Israel	1973	9,143	2,487	2,032	663	...	28.7	7.8	6.4	...
Japan	1974	126,822	40,630	74,431	26,867	346,756	11.6	3.7	6.8	31.6
Philippines	1975	13,480	4,241	4,685	10,866	8,519	3.2	1.0	1.1	2.0
Thailand	"	5,000	652	1,913	6,277	21,432	1.2	0.2	0.5	5.1
Austria	"	15,702	1,464	2,892	1,148	27,343	20.9	1.9	3.8	36.3
Denmark	1972	8,114	3,800	1,400	400	40,160	16.3	7.6	2.8	80.4
Finland	1975	6,701	3,254	5,491	1,071	34,011	14.2	6.9	11.7	72.3
France	"	77,882	25,272	30,471	9,050	265,642	14.7	4.8	5.9	50.2
W.Germany	1974	120,260	31,613	24,787	5,958	222,932	19.4	5.1	4.0	35.9
E.Germany	1975	31,300	7,720	3,054	...	...	18.6	4.6	1.8	...
Hungary	"	21,127	2,461	4,289	2,208	49,927	20.0	2.3	4.1	47.4
Iceland	1973	343	122	100	159	1,029	16.3	5.8	4.8	49.0
Ireland	1975	3,772	905	1,976	3,100	15,600	12.1	2.9	6.3	49.9
Italy	1973	109,166	...	37,689	18,375	...	19.9	...	6.9	...
Netherlands	1975	21,825	4,350	2,900	854	44,000	16.0	3.2	2.1	32.2
Norway	"	6,886	...	1,435	704	29,500	17.2	...	3.6	73.6
Poland	"	58,226	15,949	21,871	14,061	129,690	17.1	4.7	6.4	38.1
Portugal	"	11,101	489	3,043	...	18,178	12.7	0.6	3.5	20.7
Spain	"	55,000	3,446	18,592	4,220	...	15.5	1.0	5.2	...
Sweden	1974	13,260	7,180	9,780	620	58,030	16.3	8.8	12.0	71.1
Switzerland	1975	11,466	2,582	...	...	...	17.9	4.0	...	...
England,Wales	1974	64,600	14,200	14,987	18,658	184,687	13.1	2.9	3.0	37.5
NE. Ireland	1975	2,321	...	609	1,214	8,333	15.1	...	4.0	54.2
Scotland	"	8,688	1,724	3,298	3,331	25,117	16.7	3.3	6.3	48.2
Yugoslavia	1974	24,920	4,793	4,190	6,073	46,860	11.8	2.3	2.0	22.2
Australia	1972	17,972	5,265	...	...	...	13.9	4.1	...	...
New Zealand	1975	4,110	1,046	2,374	...	18,779	13.3	3.4	7.7	60.8
U.S.S.R.	"	733,700	51,600	...	...	1,232,000	28.8	2.0	...	48.4

Note (1) Please notice that definitions of what constitutes a physician, dentist, pharmacist, midwife and nurse varies from country to country.

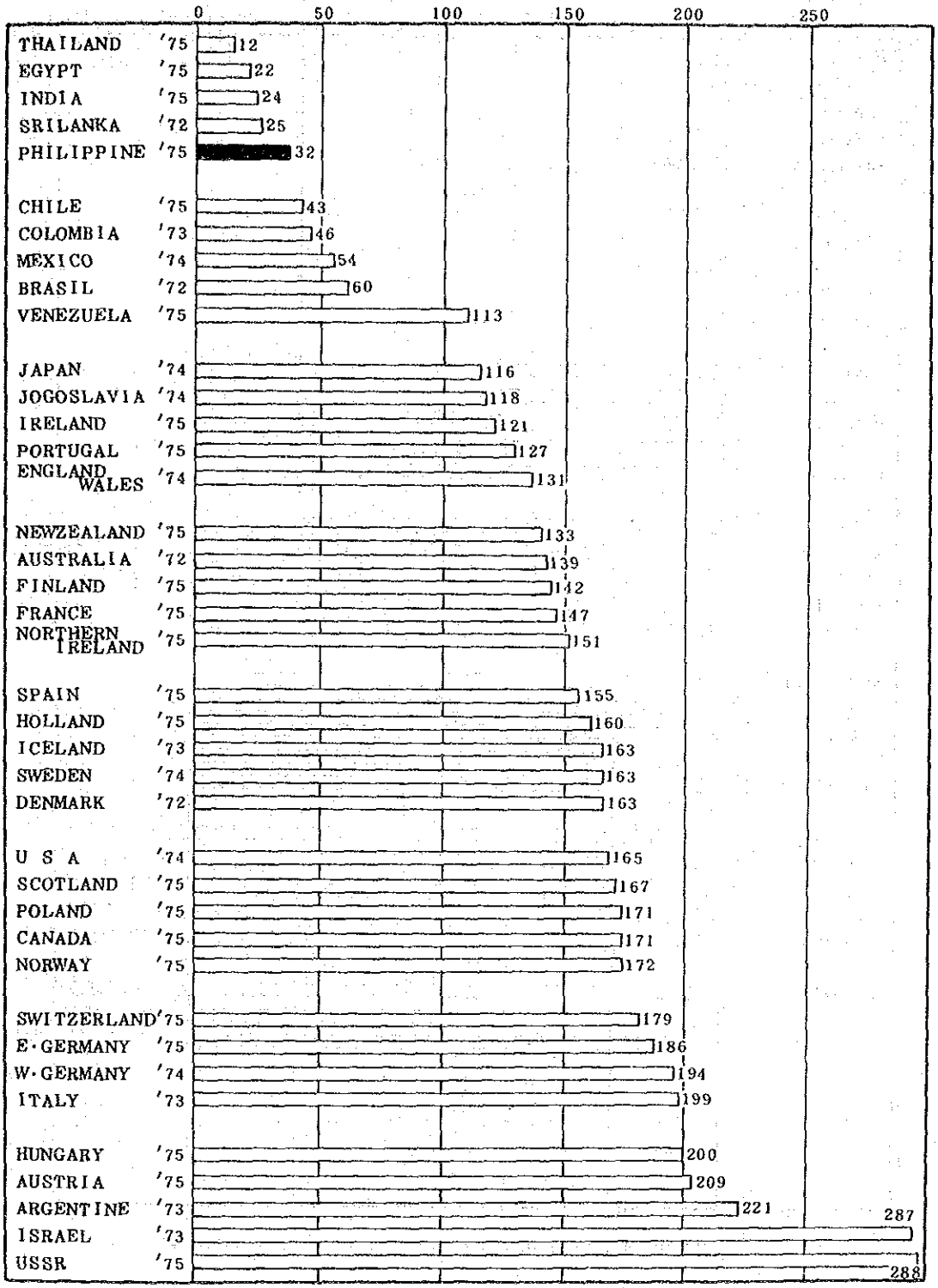
(2) The method for obtaining figures on the number of personnel was in some countries to count the working personnel, whereas in others just the number of persons possessing such qualifications. Japan uses the former method.

(3) As a rule persons in the military service were not included.

(4) Nurses, midwives, that is midwives with nurse qualifications, are listed as nurses. Nurse assistants are included but nursing - auxiliaries are not.

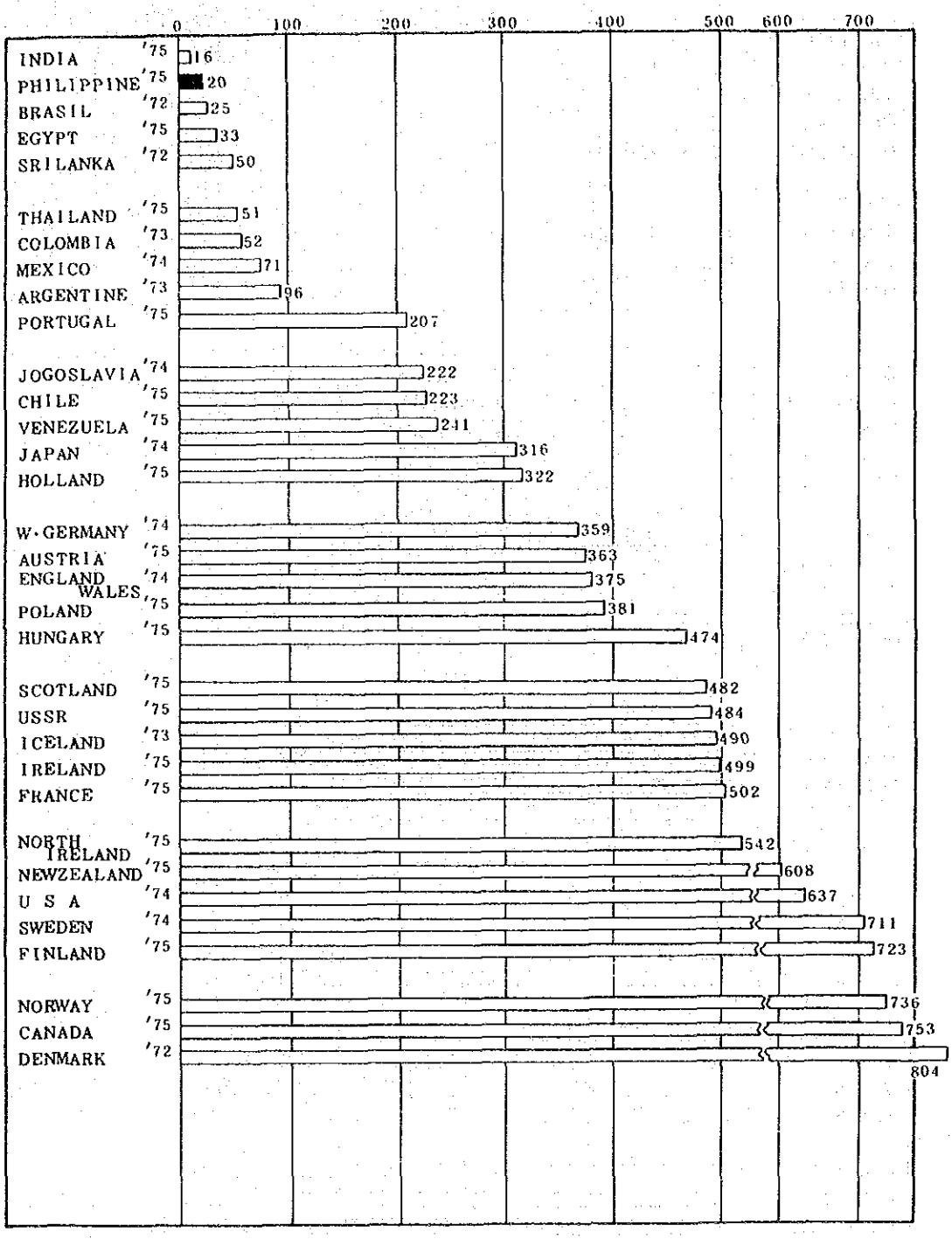
Reference - World Health Statistics Annual (Volume III, Health Personnel), 1977

NUMBER OF PHYSICIANS BY COUNTRY: PER 100,000 POPULATION



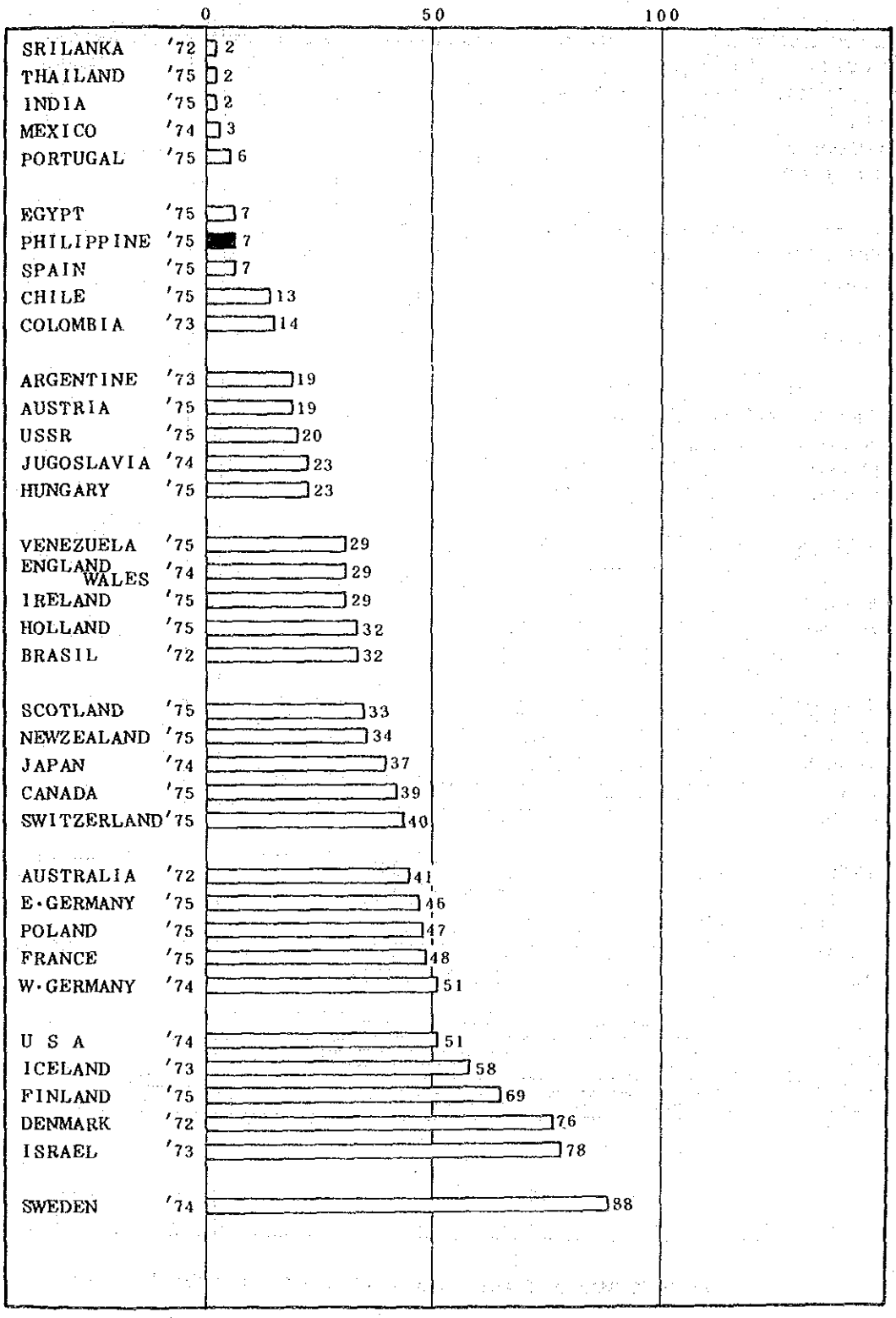
SOURCES:WORLD HEALTH STATISTICS ANNUAL (VOL ∎) 1977

NUMBER OF NURSES BY COUNTRY: PER 100,000 POPULATION



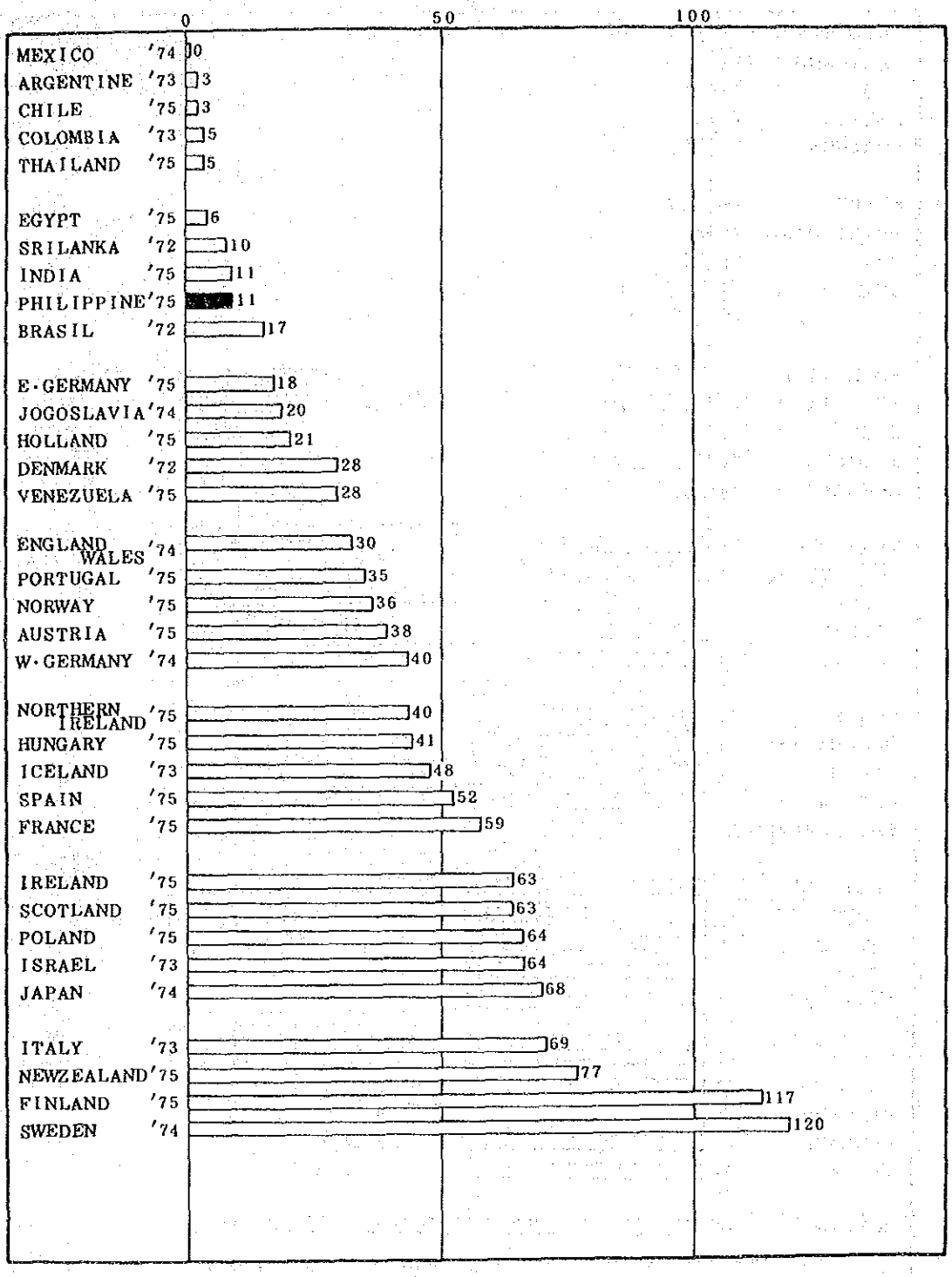
SOURCES:WORLD HEALTH STATISTICS ANNUAL(VOL I)1977

NUMBER OF DENTISTS BY COUNTRY: PER 100,000 POPULATION



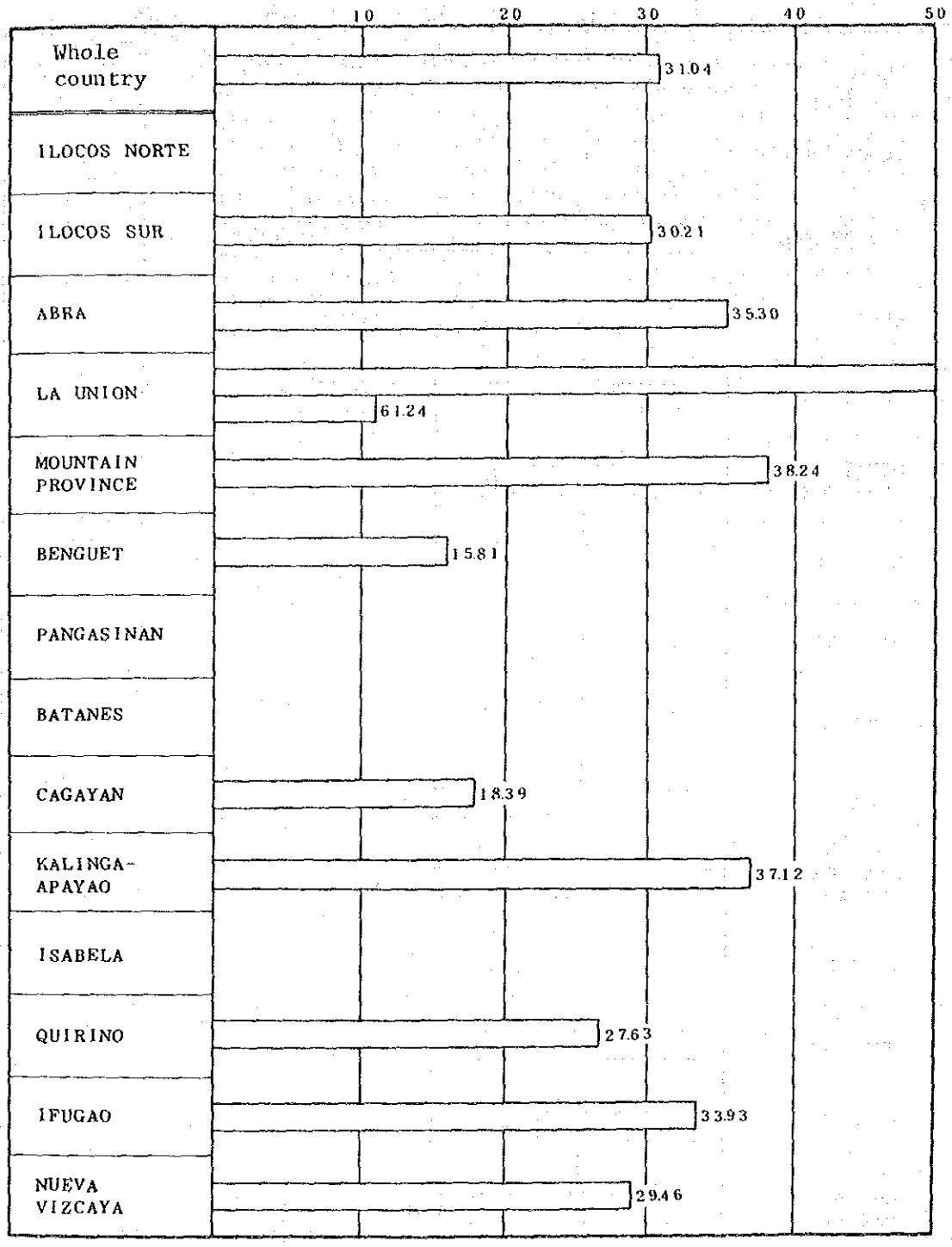
SOURCES:WORLD HEALTH STATISTICS ANNUAL (VOL I) 1977

NUMBER OF PHARMACIST BY COUNTRY: PER 100,000 POPULATION

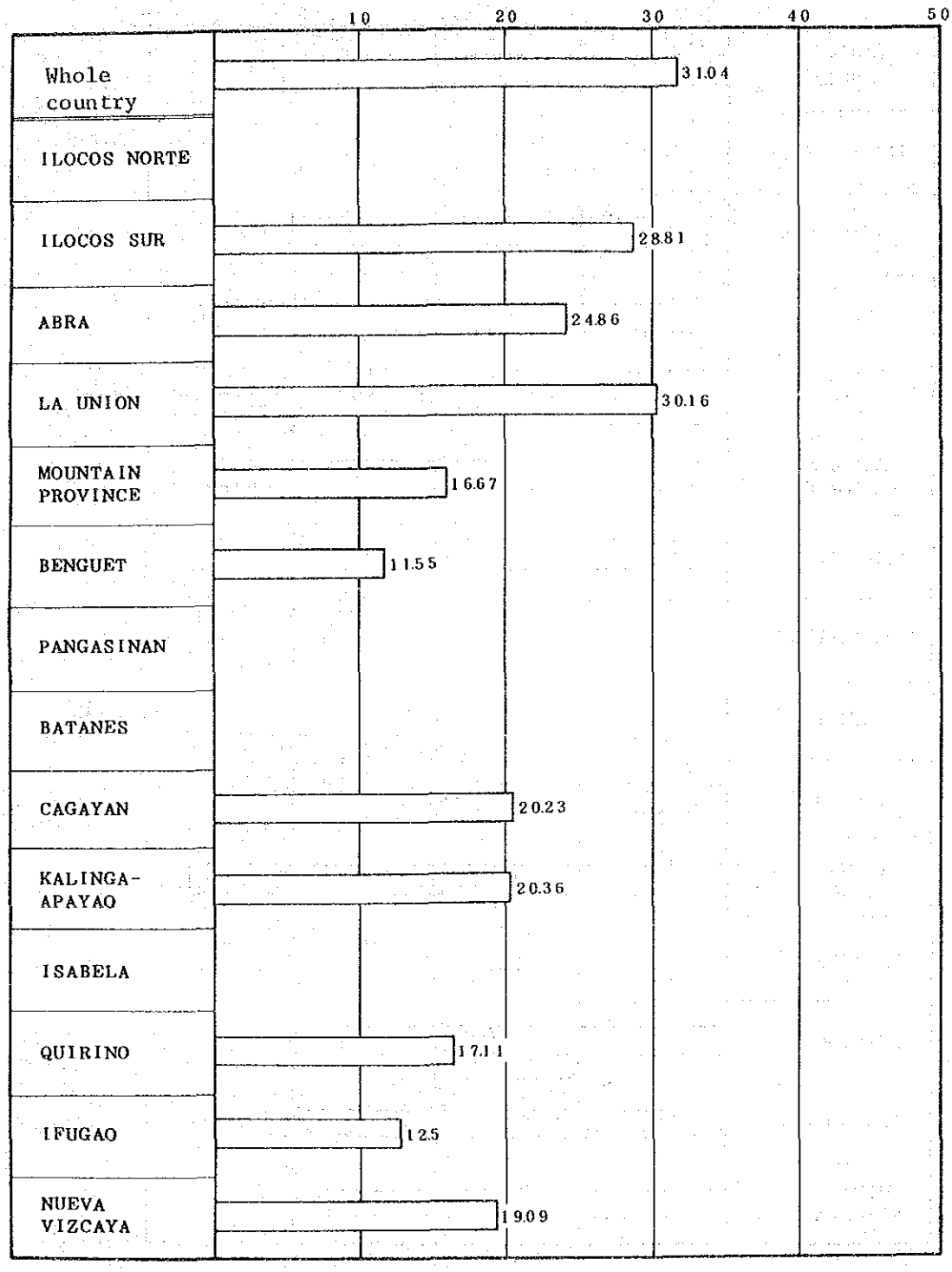


SOURCES:WORLD HEALTH STATISTICS ANNUAL (VOL Ⅱ) 1977

NUMBER OF NURSES PER 100,000 BY PROVINCE (1977)



NUMBER OF PHYSICIANS PER 100,000 BY PROVINCE (1977)



3) Bed Occupancy Rate and Average Stay

(1) Bed Occupancy Rate

The ideal occupancy rate is said to be 85%. The percentages of 80-90 percent which is close to this ideal occupancy rate are shared by the three hospitals of La Union, Isabel and Quirino. The hospitals whose bed occupancy rate is 100 or exceeds this percentage are Pangasinan, Benguet and Nueva Vizcaya. At hospitals with low rates, seasonal or transitional excessive occupancy was sporadically noted during the survey period. The Benguet, Batanes and other hospitals are considerably crowded, some of the inpatients sleeping on the corridor.

OCCUPANCY RATE

NAME OF HOSPITAL	$\times 10^3$ NEW ADMISSION	day AVERAGE STAY	% OCCUPANCY RATE INFORMED	% ACTUAL	% AUTHOR-IZED	% FINAL
Pangasinan	15.5	5.3	125.4	84.9	112.5	98.7
Bontoc	(4.8)*	3.7	86.0	48.7	48.7	48.7
Baguio	12.4	9.0	90.0	87.4	122.8	105.1
Benguet	3.6	7.3	92.0	60.5	72.0	66.3
La Union	7.5*	6.1	106.0	83.6	83.6	83.6
Abra	2.1	7.0	75.0	36.6	40.3	38.5
Gabriela Silang	5.3	4.5	80.0	74.3	65.3	69.8
Don M. Marcos	2.7	5.0	56.0	37.0	18.5	27.8
Ilocos Norte	6.4	4.0	85.0	43.0	70.1	56.6
Cagayan	10.0	5.0	80.0	68.5	68.5	68.5
Kalinga-Apayao	4.0*	6.0	70.0	65.8	65.8	65.8
Aparri	1.2	6.0	95.9	61.6	78.9	70.3
Isabela	6.8	4.2	74.9	78.2	78.2	78.2
Quirino	5.1	5.5	73.0	95.0	76.8	85.9
Ifugao	2.7	5.0	49.6	49.3	49.3	49.3
Maj. F. Marcos	5.3	5.0	84.0	63.1	36.3	49.7
Nueva Vizcaya	4.0	6.0	95.0	117.4	131.5	124.5
Batanes	2.6*	7.0	80.0	66.5	66.5	66.5

1. * 1977
2. ( ) Total Discharge, DOH Comprehensive Hospital Survey
3. New Admission; Average Stay, Informed Occupancy rate Field Survey Questionnaire, 1978.
4. Actual occupancy rate = $\frac{\text{New Admission} \times \text{average stay}}{\text{Actual Bed Capacity} \times 365}$

   Authorized occupancy rate = $\frac{\text{New Admission} \times \text{average stay}}{\text{Authorized Bed Capacity} \times 365}$

   Final occupancy rate

   $= \frac{\text{actual occupancy rate} + \text{authorized occupancy rate}}{2}$

(2) Future Changes in Average Stay

It is extremely difficult to know changes in the future average stay, but the average stay is an indispensable factor for an assessment on the scale of beds. From the present tendency, a trial computation will be attempted on the basis of the following hypothesis.

a. Changes in Rate of Inpatients

The present ratio of inpatients by department for Regions I and II change as indicated in the following table, and it is surmisable that the same or similar changes may also take place for the whole of the Philippines. If these changes continue in the future -- particularly till 1990, the department of obsterics and gynecology will register the highest rate, bringing about a change in the order of the departments of internal medicine, pediatrics and surgery.

(Hypothetic conditions)

* The signs for a rise in the number of hospital deliveries will remain as they are.

* No additional hospitals specializing in baby delivery will be set up in the countryside.

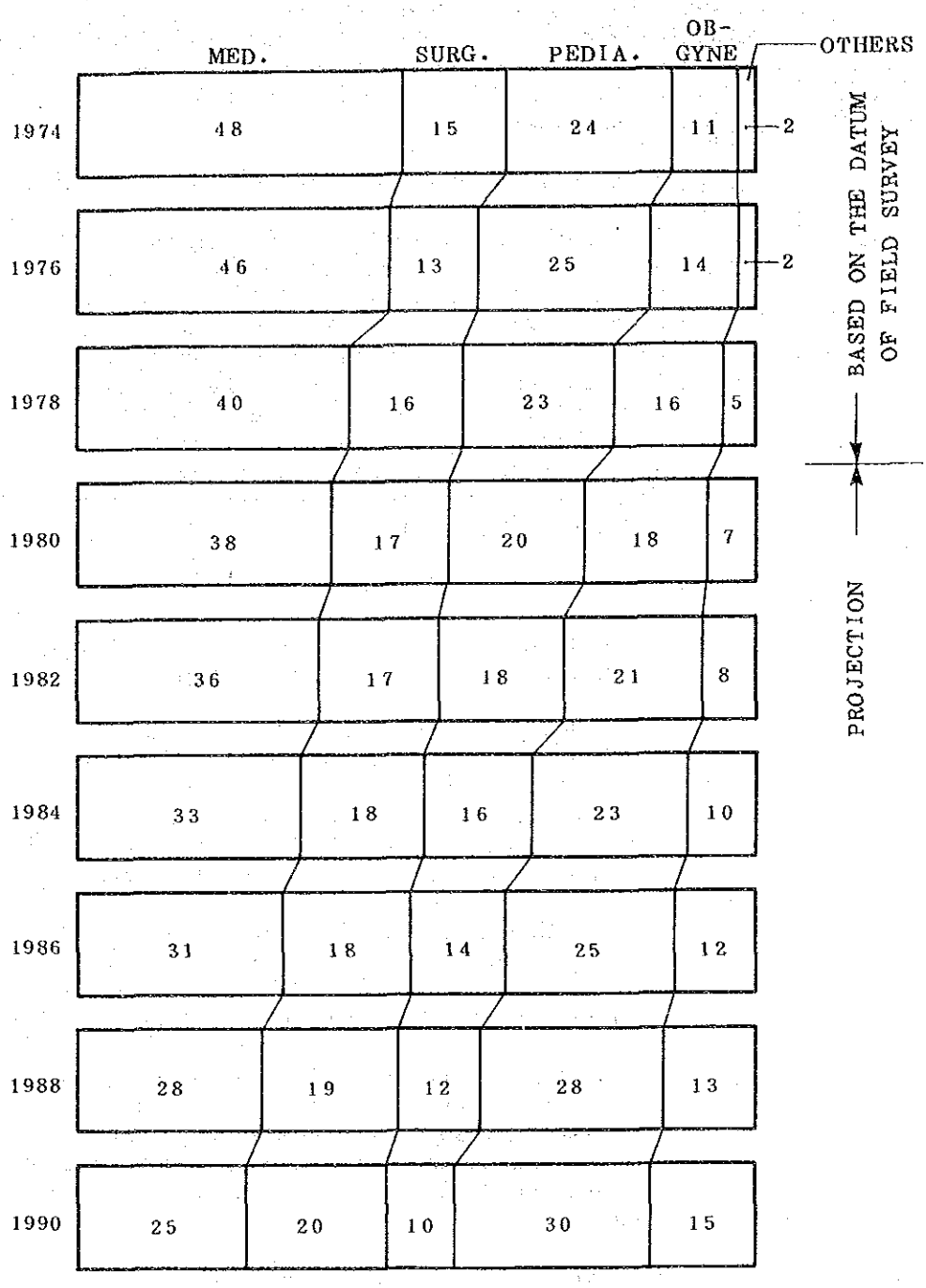
* There will be a gradual change in the pattern of diseases, and the share of the departments of medicine and pediatrics will decrease.

* The share of the department of pediatrics will sharply decrease due to a decrease in the number of cases with contagious diseases and malnutrition and a dissemination of family planning.

* There will be a gradual rise in the share of the department of surgery. Particularly, there will be a rise in the number of traffic accidents, necessiating the sophistication of surgical operations and increasing the number of orthopedic cases.

* There will also be a rise in the share of other departments (particularly, EENT, orthopedics, dentistry, psychiatry, etc.)

PROJECTION OF DISTRIBUTION OF IN PATIENT FY 1974~1990



b. Changes in Average Stay

On the basis of the findings of the latest survey, the average stay for all departments may be estimated at about 5.6 days for all departments in 1978. By department, internal medicine accounts for six days, surgery eight days, obsterics and gynecology three days, and others six days. The average stay at the TB and psychiatric inpatients' quarters is extremely long in the light of the nature of the diseases. The patients with malnutrition and contagious diseases who should stay relatively long actually stay relatively short, because of complicated factors, such as the less development of the health and medical care system and poverty with which parents are unable to stay at the bed over long periods, in addition to the factors associated with the acceptance of the hospital (particularly, a shortage of manpower and budget).

With due consideration given to a decrease of contagious diseases, evolution of the health and medical care system, increase of hospital deliveries, increase of Caeserean operations, sophistication of surgical operations and acceptance of cases by local hospitals, increases in the average stay for each department are roughly estimated as indicated in the following table.

Given the above-premised conditions:

Inpatient ratio by department		(Average Stay)
FY 1978 → 1990		FY 1978 → 1990
Int. MED.	40% → 25%	6 days → 8 days
Surg.	16% → 20%	8 days → 10 days
Pedia.	23% → 10%	5 days → 7 days
OB-Gyne	16% → 30%	3 days → 4 days
Others	5% → 15%	6 days → 8 days

c. Average Stay Values in Future

If the number of inpatients at a given hospital a year is P, the average stay S, the bed occupancy rate R and the number of beds R,

$$B = \frac{P \times S}{R \times 365}$$

If the number of inpatients is P_M for the department of medicine, P_S for the department of surgery, P_P for the department of pediatrics, P_{OB} for the department of obsterics, and P_O for other departments.

	FY 1978	---	FY 1990
P_M	$= 0.40P$	---	$0.25P'$
P_S	$= 0.16P$	---	$0.20P'$
P_P	$= 0.23P$	---	$0.10P'$
P_{OB}	$= 0.16P$	---	$0.30P'$
P_O	$= 0.05P$	---	$0.15P$

$$B(1978) = \frac{(0.40\times6)+(0.16\times8)+(0.23\times5)+(0.16\times3)+(0.05\times6)\times P}{R \times 365}$$

$$= 5.61 \times \frac{P}{R \times 365}$$

$$B(1990) = \frac{(0.25\times8)+(0.20\times10)+(0.10\times7)+(0.30\times4)+(0.15\times8)\times P'}{R' \times 365}$$

$$= 7.10 \times \frac{P'}{R' \times 365}$$

so that the average stay would be 5.61 to 7.10 days, about 1.5 days longer.

3. Estimation of Medical Demand

1) Assessment on Required Number of Beds

There are many ways of making an assessment on the required number of beds, but here estimates on the future population of the surrounding area (which does not necessarily coincide with the catchment area but consist of the municipalities which presumably produce a great impact on changes in the number of each subject hospital's patients with due consideration paid to the location and other factors of other nearby hospitals) and changes in the number of patients at each subject hospital will be used to observe annual changes in the ratio of the population of the surrounding area to the number of patients at each subject hospital.

On the rough assumption that the construction period of this project will extend from 1980 to 1985, it is desirable to make an estimate for the subsequent 10 years, but an estimate for a long period of 10 years is difficult to make and entails many risks. Particularly, prudence is required for the construction of semi-permanent facilities. As there are cases in which unnecessarily too big or small facilities have been constructed, it is important in terms of planning to make an estimate five years ahead and to make an adjustment, if necessary, after the passage of the five years. Under the existing plan, attempts will be made to make an estimate on the number of patients in 1990 and make a calculation so that 60% of the patients may be hospitalized with due consideration given to changes in the structure of diseases -- particularly, drops in the prevalence of contagious diseases, the opening of other public and private hospitals in the surrounding area and other factors. In this case, however, plans will be worked out so that enough space may be set aside even in the worst case for the accommodation of patients, the number of whom corresponds to about 40% of the planned number of beds.

$$B = \frac{P \times r \times 0.6 \times \text{average days of stay}}{\text{bed occupancy rate} \times 365 \text{ days}}$$

where B is the planned number of beds, P is the estimated population of a given subject hospital in 1990 and r is the rate of the number of patients at the subject hospital. The manipulation of each parameter is elucidated below:

(1) The annual number of patients at a subject hospital will be computed according to the method which has earlier been described, and the NEDA Commission on Population's Population Dimension of Planning will be used to check dynamic population changes. However, as

these data have been prepared on the basis of the census conducted in May 1970, an attempt will be made to estimate dynamic population changes is each area on the basis of the findings of the census performed in 1975, and of the high, medium and low assumptions, the one which is closest to the changes will be put to use. The surrounding area of each subject is enumerated below, and the estimated population is given in brackets.

Pangasinan MC (low assumption)

11 municipalities and one city: Binamley Calasiao Dagupan City, Lingayen Malasizui Manaoag Mangaldan Mapandan Pozurrubio San Fabian San Jacinto and Santa Barbara

Bontoc PH (low assumption)

Eight municipalities: Bontoc Barlig Bauko Besao Sabanga Sadanga Sagada and Tadian

Baguio MC & GH (low assumption)

Baguio City and all 13 municipalities of Benguet Prefecture

Benguet PH (low assumption)

Five municipalities: La Trinidad, Atok, Kapangan, Sablan and Tublay

La Union RH (medium assumption)

Six municipalities: San Fernando, Bacontan, Bauang, Naguilian, San Gabriel and San Juan

Abra PH (low assumption)

14 municipalities: Bangued, Bucay, Danglas, Dolores, Langangilang, Lagayan, Langidan, La Paz, Penarrubia, Piddigan, San Isidro, San Quintin and Tayum

Gabriela-Silang PH (high assumption)

Seven municipalities: Bantay, San Ildefonso, San Vicente, Santa, Santa Catalina, Santo Domingo and Vigan

Don Mariano Marcos Memorial Hospital (low assumption)

Seven municipalities: Batac, Currimao, Espiritu, Paoay, Pinili, San Nicolas and Sarrat

Ilocos Norte PH (low assumption)

Seven municipalities: Bacarra, Dingras, Laoag, Pidding, San Nicolas, Sarrat and Vintar

Cagayan RH (low assumption)

Six municipalities: Alcala, Amulung, Enrile, Iguig, Solsana and Tugugarao

Kalinga Apayao PH (high assumption)

Six municipalities: Allacapan, Aparri, Buguey, Comalaniugan, Lal-lo and Santa Teresita

Isabela PH (low assumption)

Seven municipalities: Gamu Ilagan Magsaysay Naguilian Reina Mercedes Tumanuini and Benito Soliven

Quirino PH (high assumption)

Four municipalities: Cabarroguis, Aglipay, Maddela and Saguday

Ifugao PH (low assumption)

Three municipalities: Lagawe, Hungduan and Kiangan

Maj. F. Marcos Veteran Memorial Hospital (high assumption)

Four municipalities: Bayombong, Bagabag, Solano and Villa Verde

Nueva Vizcaya PH (high assumption)

Three municipalities: Aritao, Bambang and Dupax

Batanes PH (high assumption)

Four municipalities: Basco, Ivana, Mahtao and Uyugan

In respect to the number of patients at each subject hospital, the data gained from the latest survey and the values obtained from the DOH's comprehensive survey will be described side by side.

(2) Average Stay

The average stay has been checked on the basis of the data of the latest survey. It is difficult to

estimate future increases, but a rough estimate will be made with due consideration given to annual changes in the number of patients at each department.

(3) Bed Occupancy Rate

It is hypothesized that the bed occupancy rate would consistently remain at 85% in the future.

ESTIMATED . BED CAPACITY

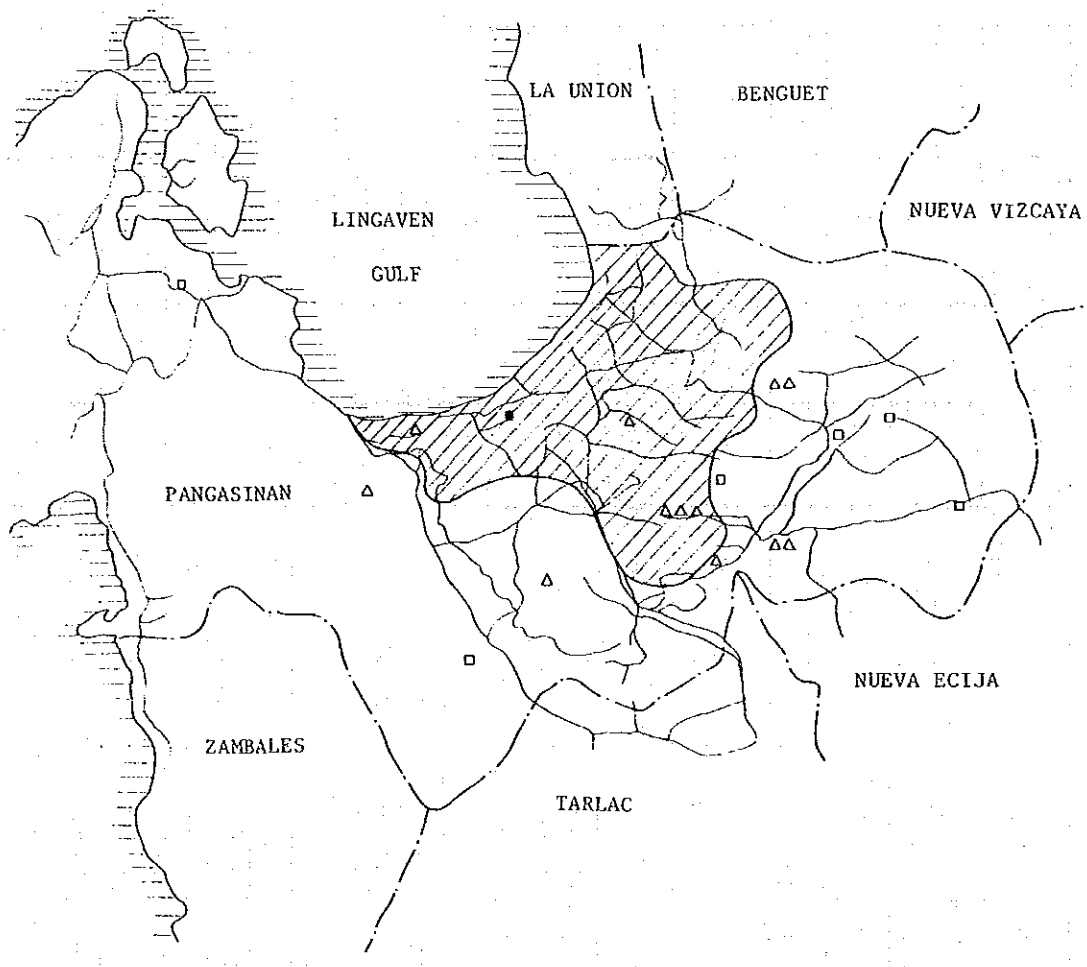
Region	Hospital	Present		Project			Increase (D-B)	Memo
		A. Authorized	B. Actual	C. Demand	D. Assessment			
I-1	Pangasinan MC	200	265	450	450	(300)	185	
I-2	Bontoc PH	100	100	200	100		0	
I-3	Baguio MC	350	249	450	450	(300)	201	
I-4	Benguet PH	100	119	200	100	(100)	-19	
I-5	La Union RH	150	150	300	250	(200)	100	
I-6	Abra PH	100	110	100	100		-10	Actual bed capacity is roughly estimated. Further check is necessary.
I-7	Gabriela Silang PH	100	88	200	100		12	
I-8	Don Mariano Marcos MH	200	100	300	100		0	
I-9	Ilocos Norte PH	100	163	200	200		37	
II-1	Cagayan RH	200	200	300	300		100	
II-2	Cagayan Mental H	-	-	144	150		150	
II-3	Kalinga-Apayao PH	100	100	100	100		0	
II-4	Cagayan PH	25	32	100	100		68	
II-5	Isabela PH	100	100	200	150	(100)	50	
II-6	Quirino PH	100	73	100	100		27	
II-7	Ifugao PH	75	75	100	100		25	
II-8	Maj. F. Marcos VH	200	115	200	150		35	
II-9	Nueva Vizcaya PH	50	56	100	100		44	
II-10	Batanes PH	75	75	100	75		0	
	Total	2,325	2,170	3,844	3,175		1,005	

PANGASINAN

■ PANGASINAN PROVINCIAL HOSPITAL

LEGEND ■ PROJECT HOSPITAL
■ PROJECT HOSPITAL
□ OTHER PUBLIC HOSPITAL
△ PRIVATE HOSPITAL
---PROVINCIAL BOONDARY
——— MAIN ROAD
▨ SURROUNDING AREA

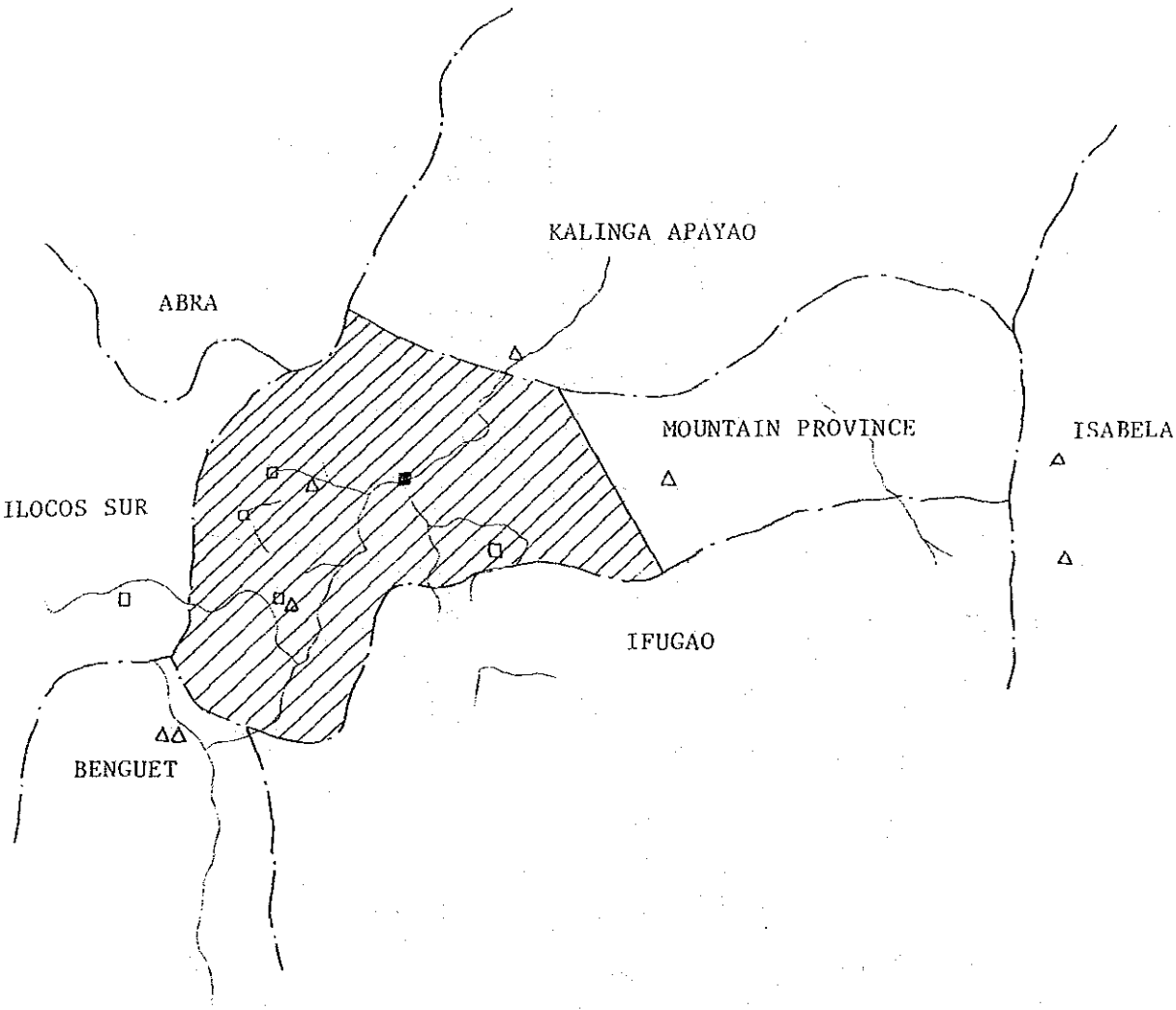
SURROUNDING AREA OF PANGASINAN PH



MOUNTAIN PROVINCE

■ BONTOC PROVINCIAL HOSPITAL

SURROUNDING AREA OF BONTOC PH

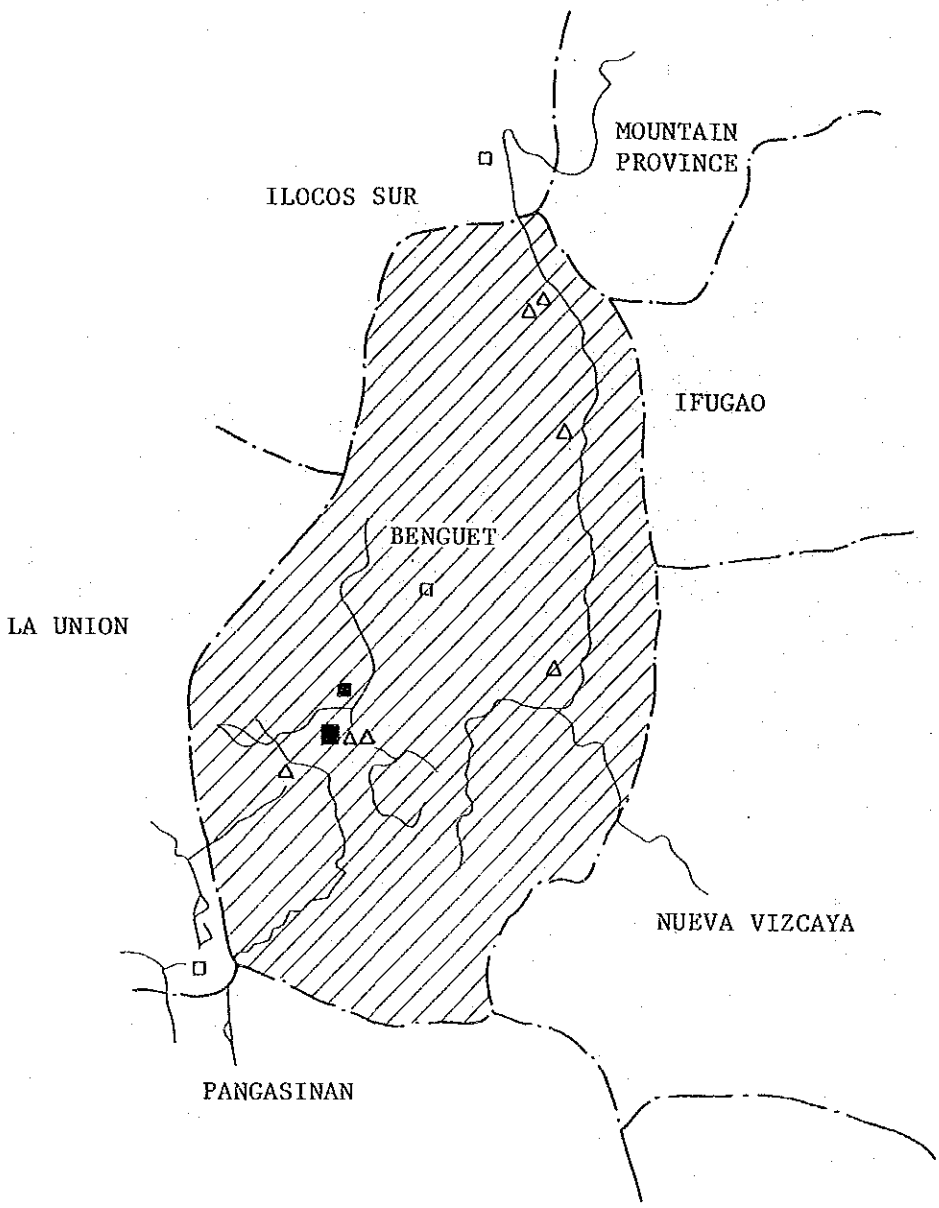


BENGUET

■ BAGUIO GENERAL HOSPITAL & MEDICAL CENTER

■ BENGUET PROVINCIAL HOSPITAL

SURROUNDING AREA OF BAGUIO GH & MC

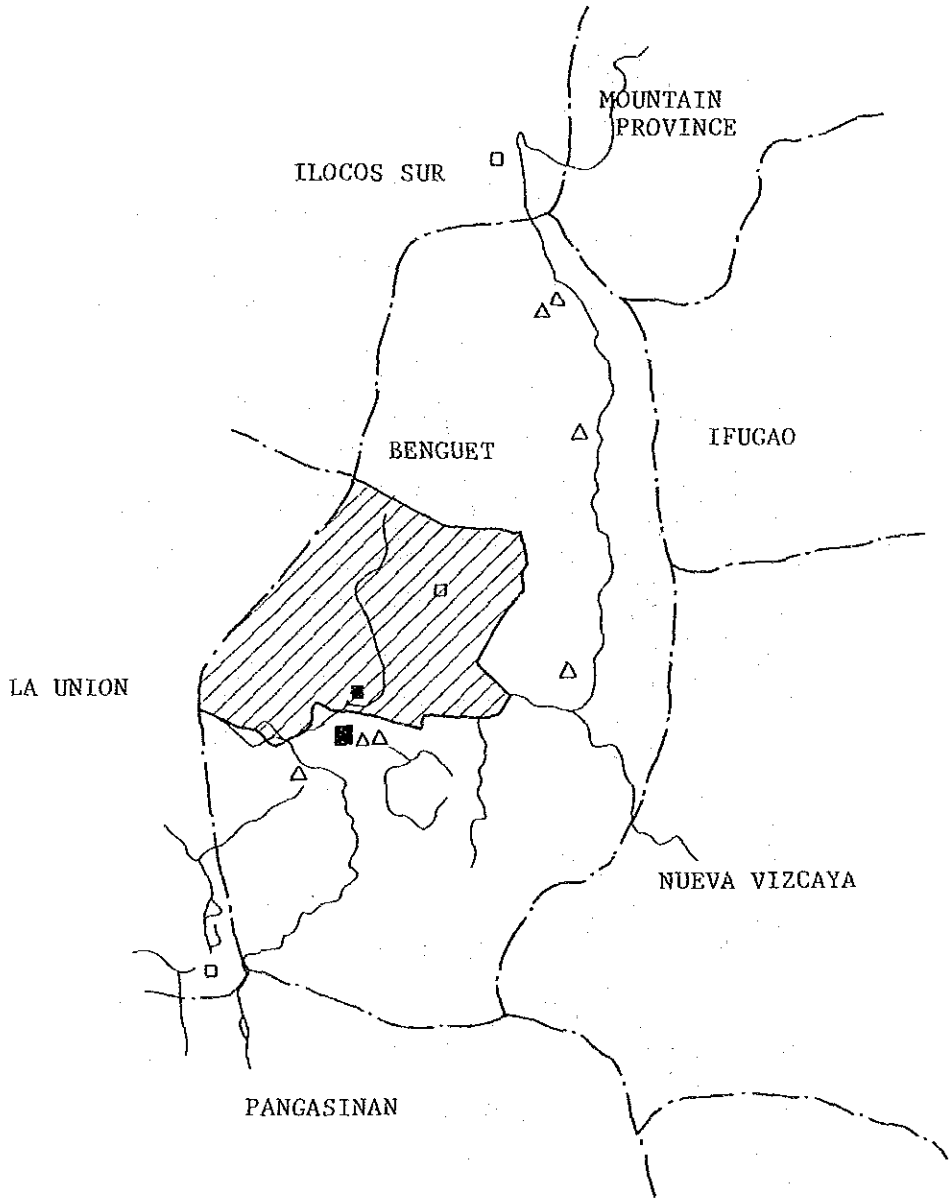


BENGUET

■ BAGUIO GENERAL HOSPITAL & MEDICAL CENTER

▪ BENGUET PROVINCIAL HOSPITAL

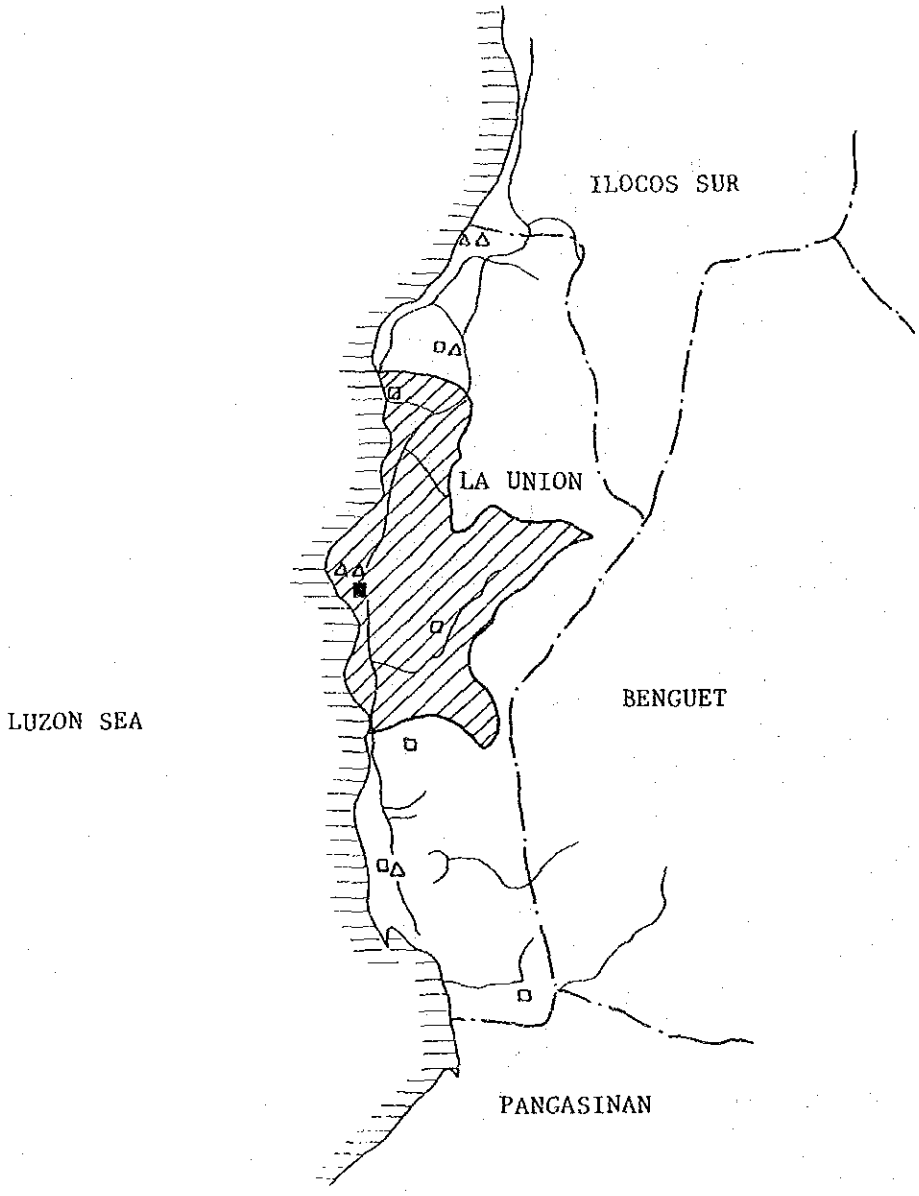
SURROUNDING AREA OF BENGUET PH



LA UNION

■ LA UNION PROVINCIAL HOSPITAL

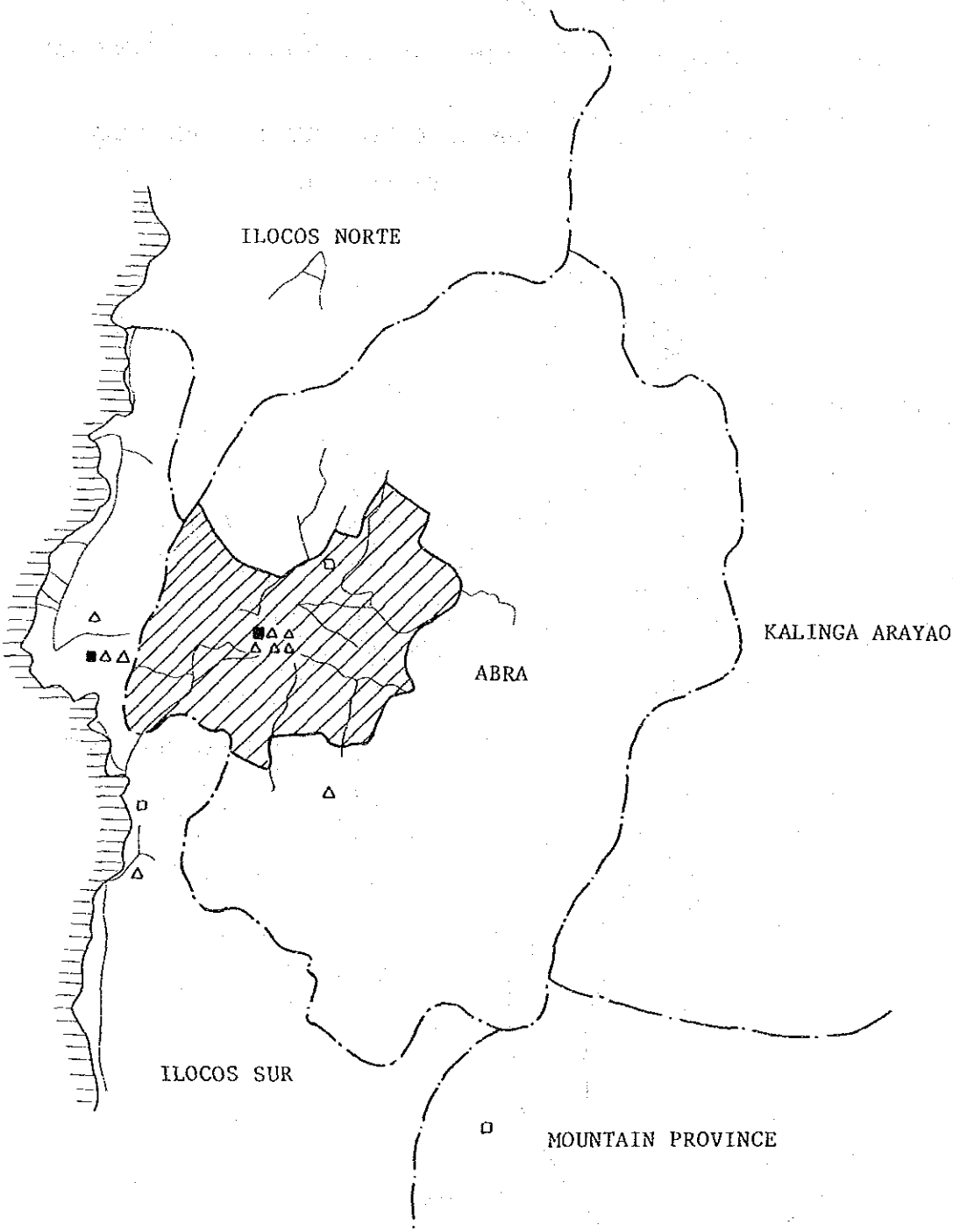
SURROUNDING AREA OF LA UNION PH

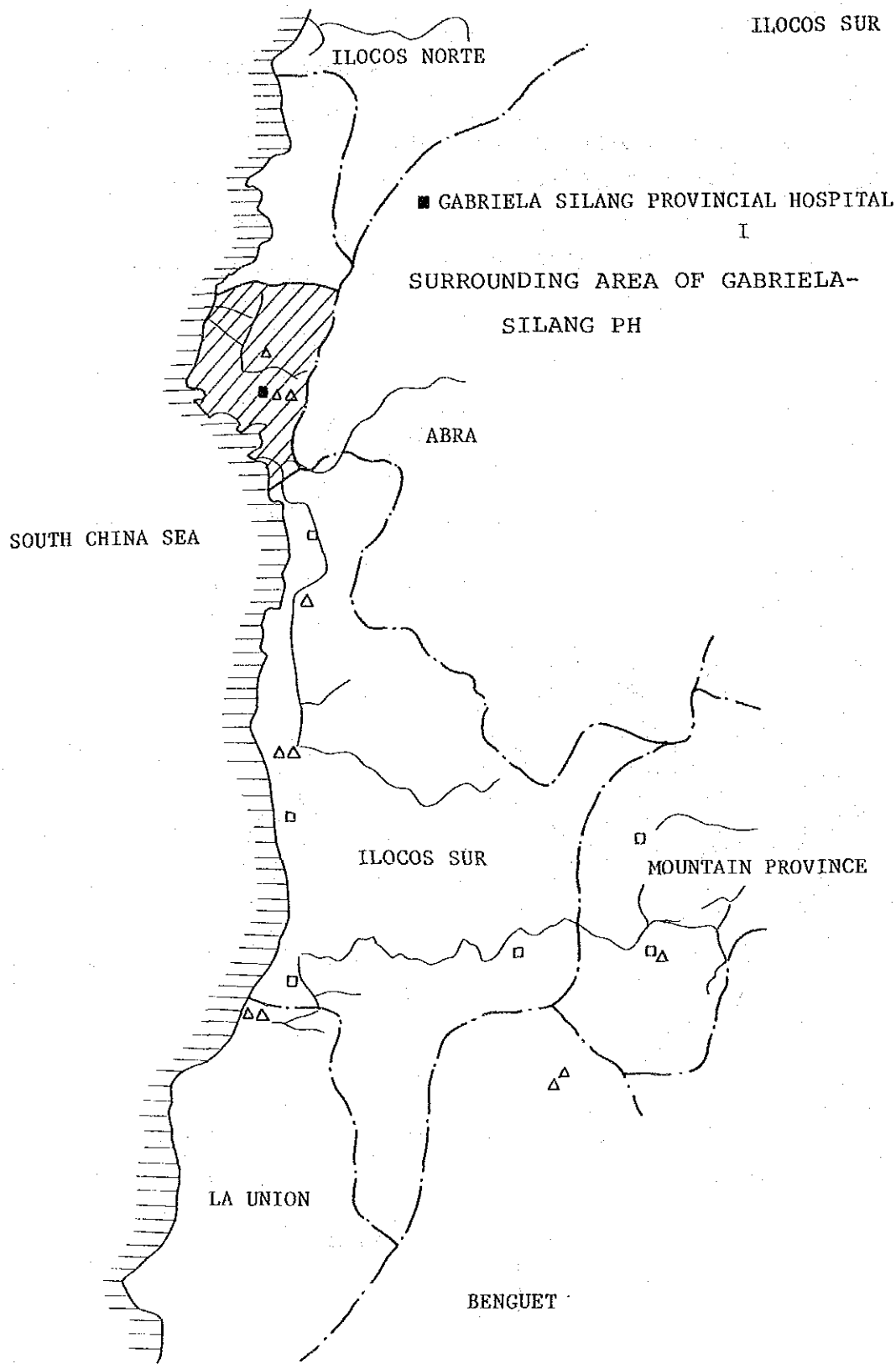


ABRA

■ ABRA PROVINCIAL HOSPITAL

SURROUNDING AREA OF ABRA PH



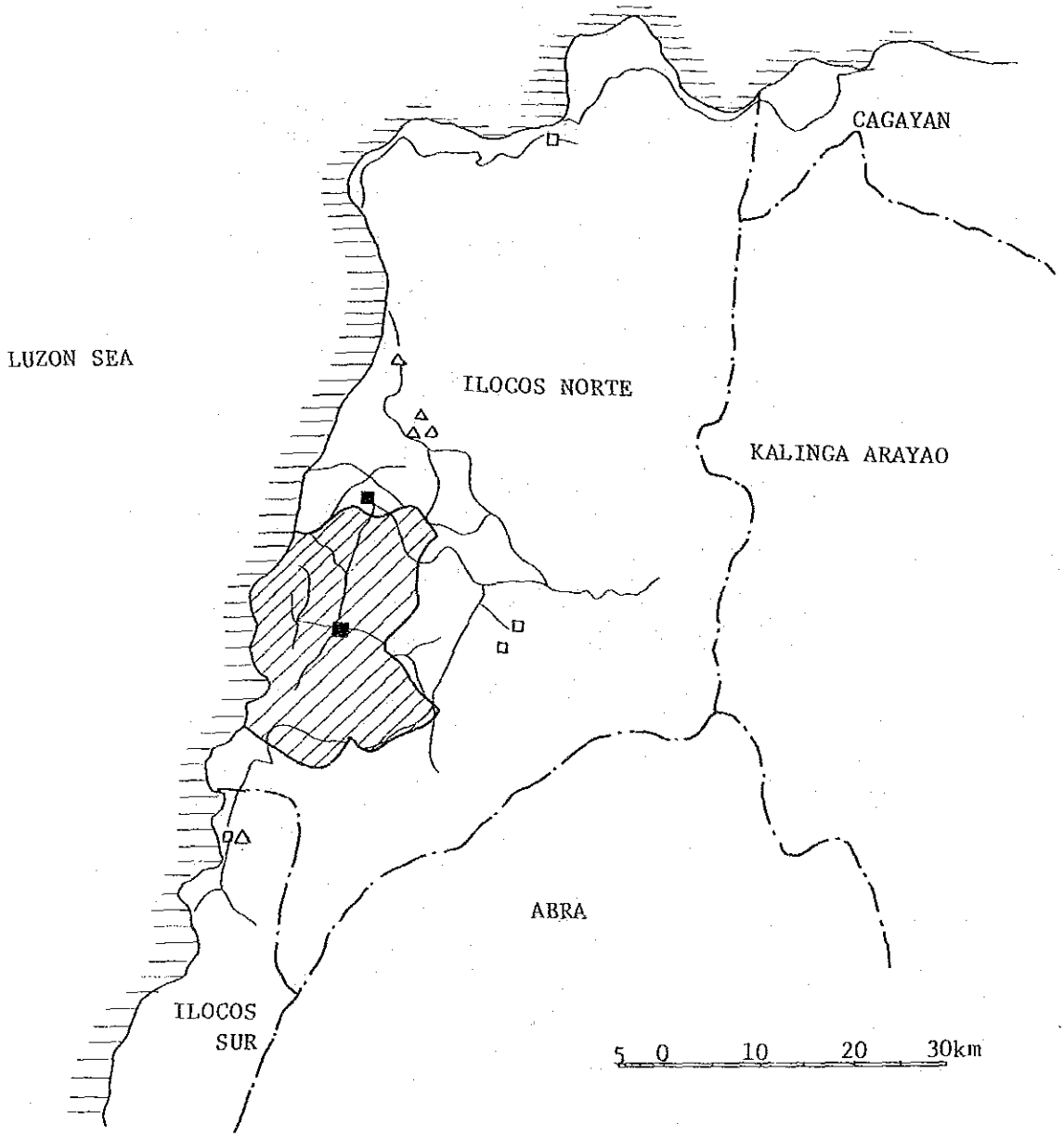

ILOCOS SUR
ILOCOS NORTE
GABRIELA SILANG PROVINCIAL HOSPITAL
I
SURROUNDING AREA OF GABRIELA-
SILANG PH
ABRA
SOUTH CHINA SEA
ILOCOS SUR
MOUNTAIN PROVINCE
LA UNION
BENGUET

ILOCOS NORTE

SURROUNDING AREA OF DON MARIANO MARCOS MEMORIAL HOSPITAL

■ DON MARIANO MARCOS MEMORIAL HOSPITAL

■ ILOCOS NORTE PROVINCIAL HOSPITAL

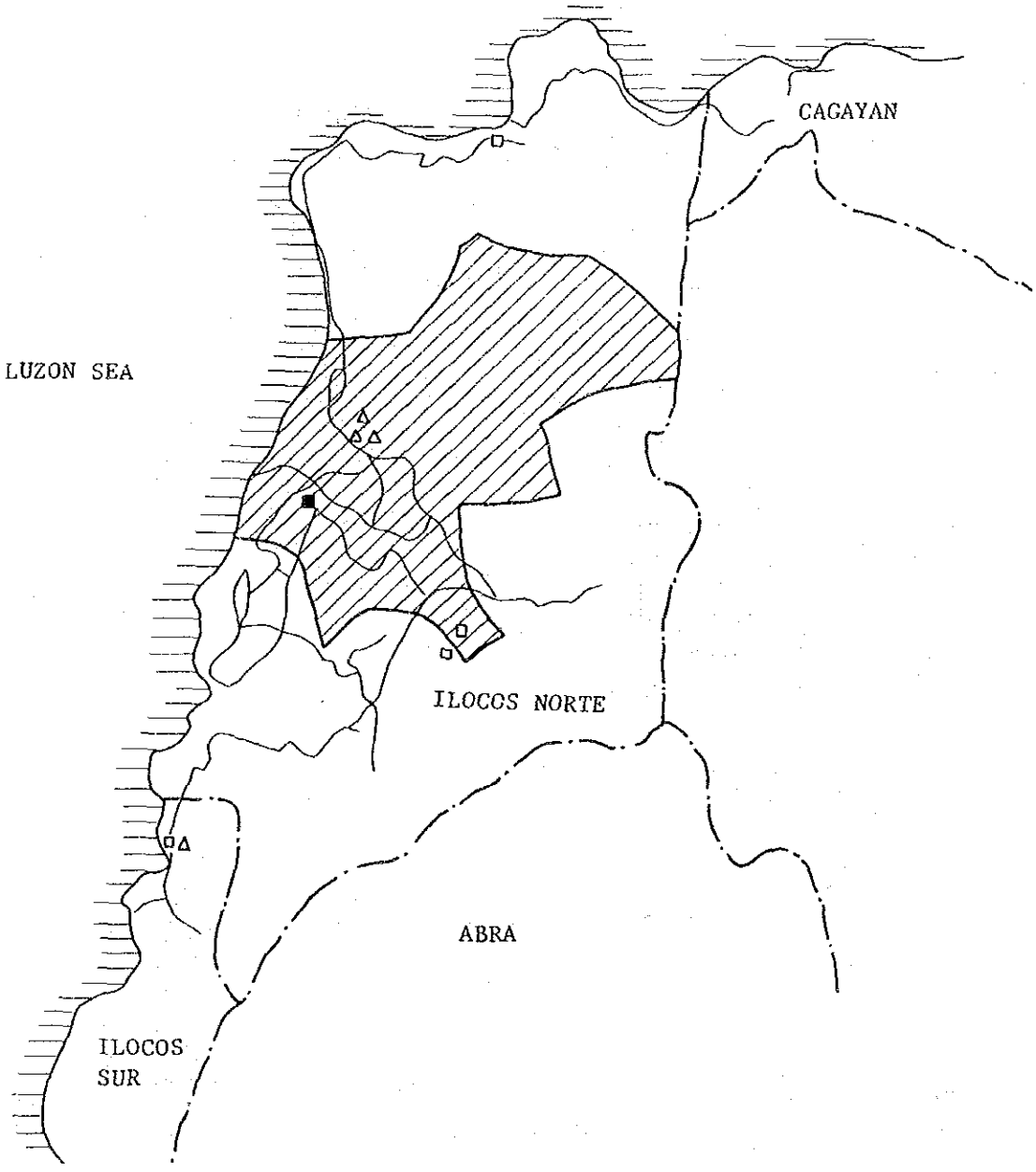


ILOCOS NORTE

SURROUNDING AREA OF ILOCOS NORTE PH

■ DON MARIANO MARCOS MEMORIAL HOSPITAL

■ ILOCOS NORTE PROVINCIAL HOSPITAL

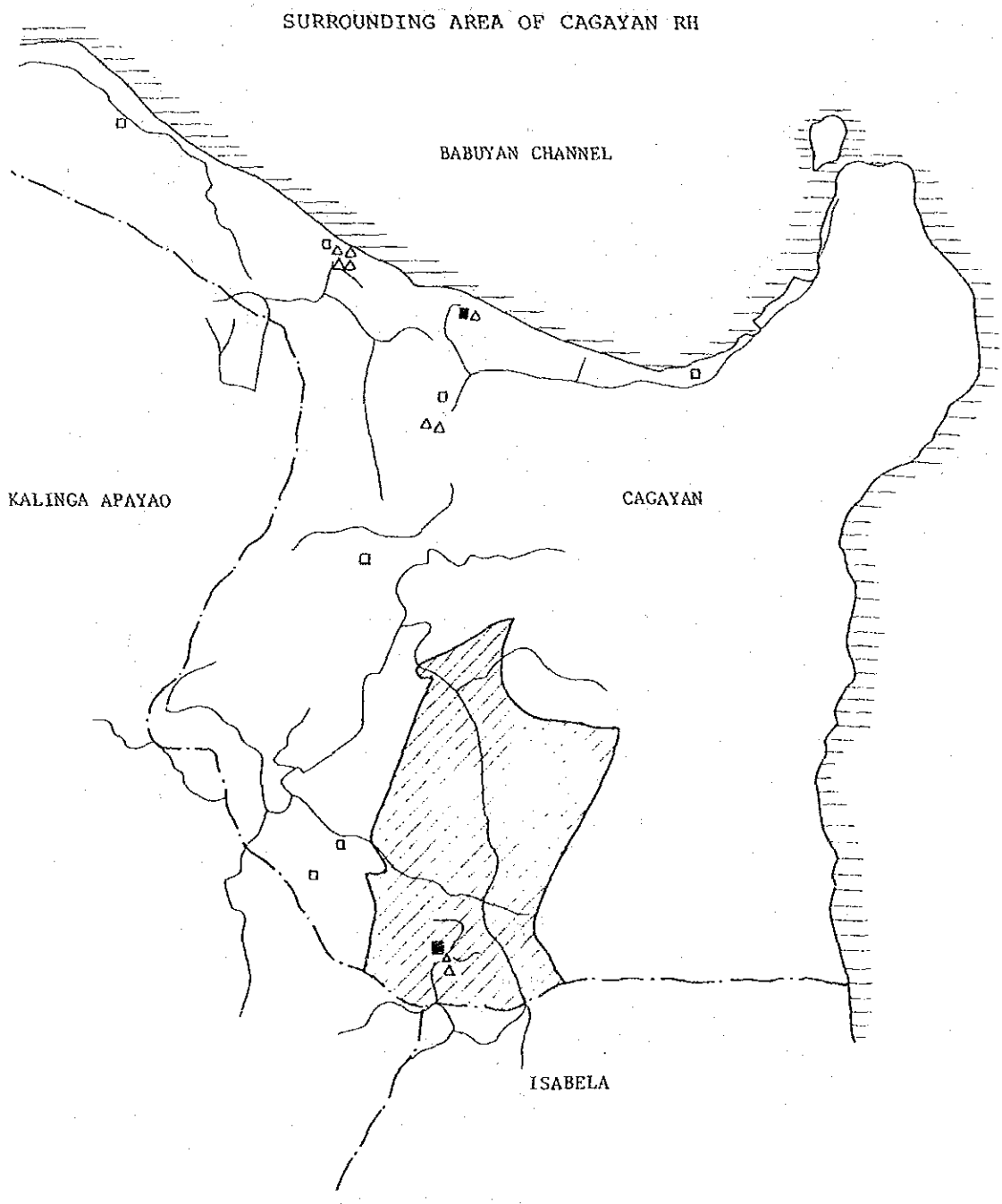


CAGAYAN

■ CAGAYAN REGIONAL HOSPITAL

● APARRI EMERGENCY HOSPITAL

SURROUNDING AREA OF CAGAYAN RH

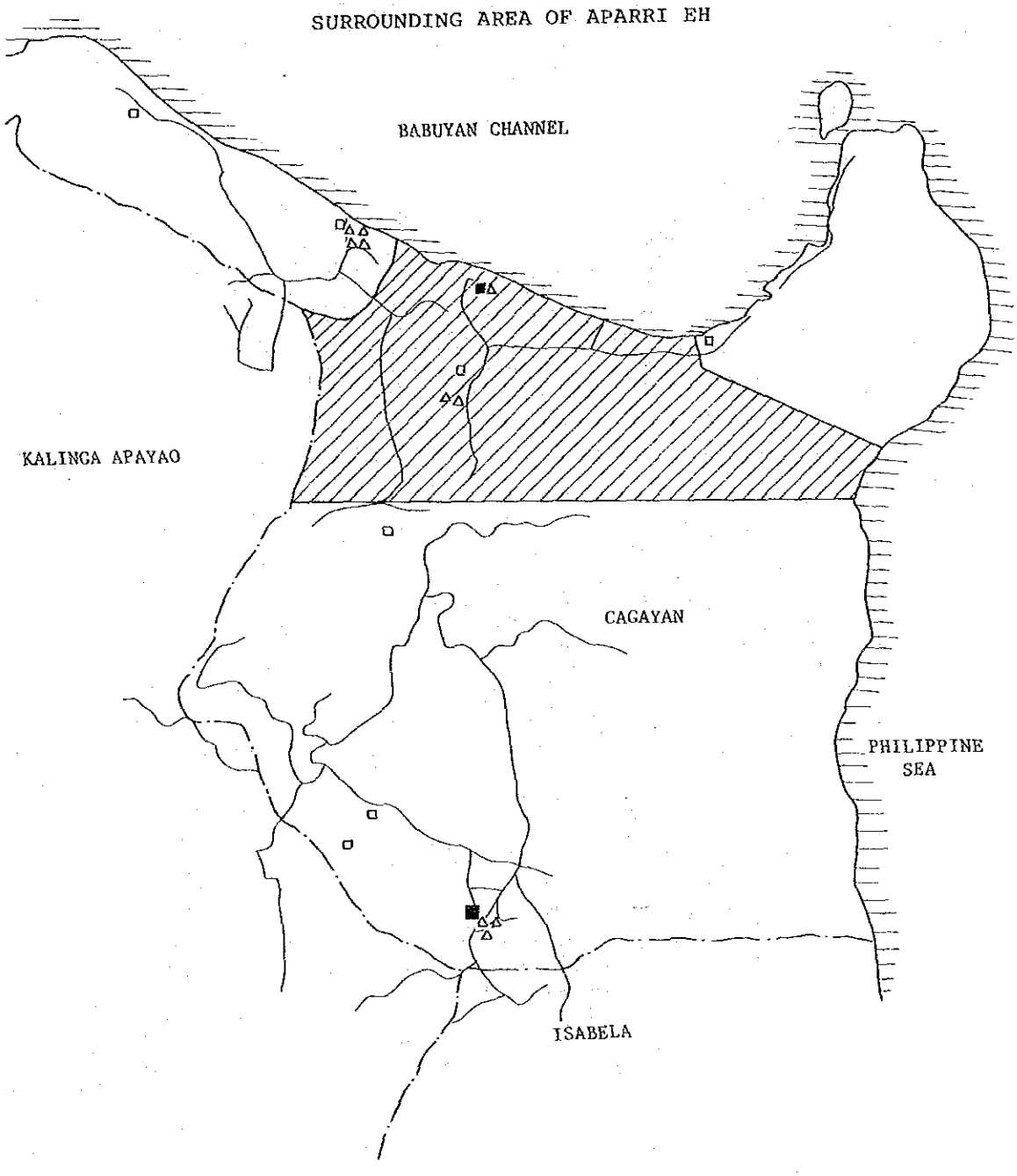


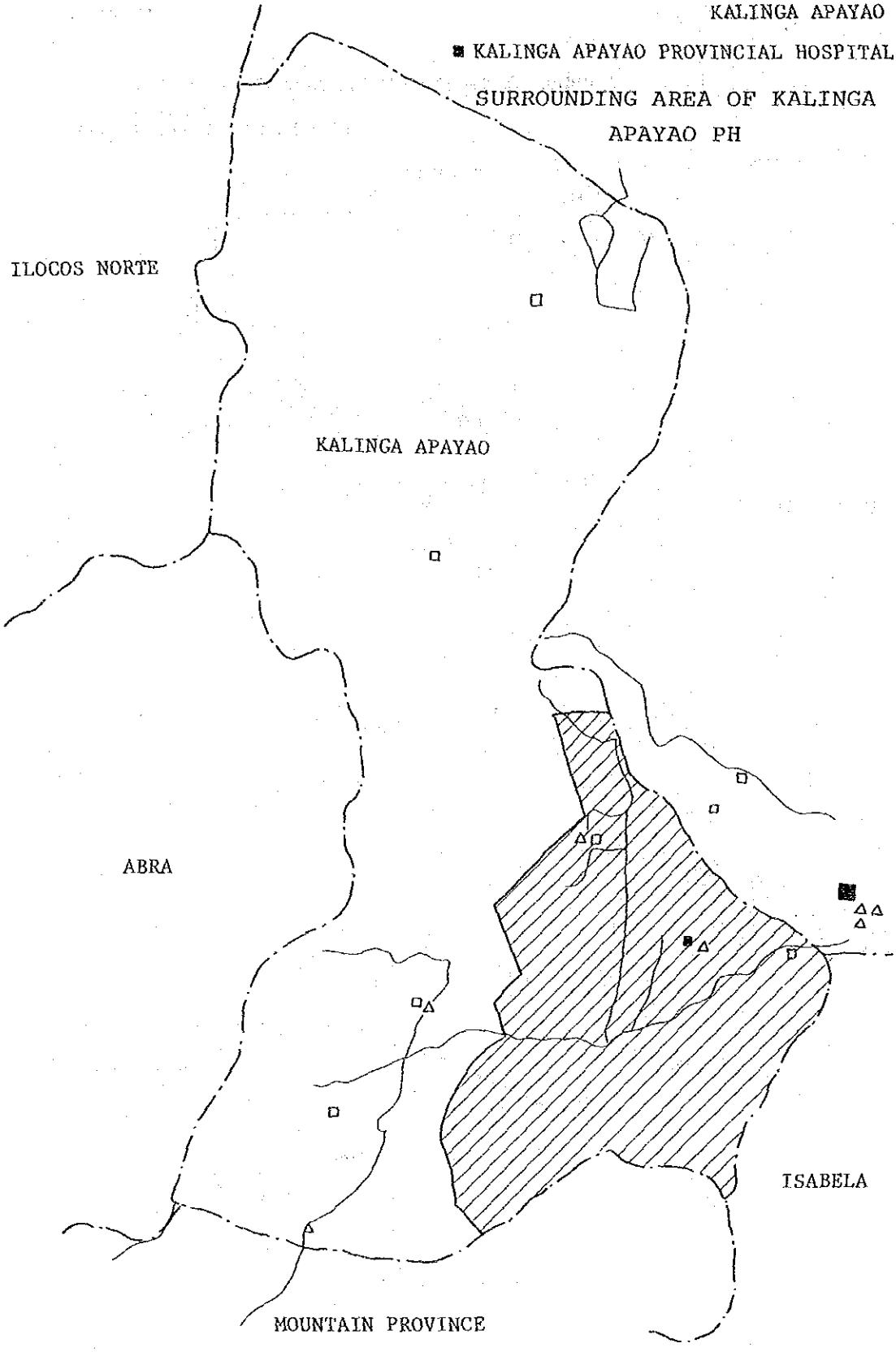
CAGAYAN

■ CAGAYAN REGIONAL HOSPITAL

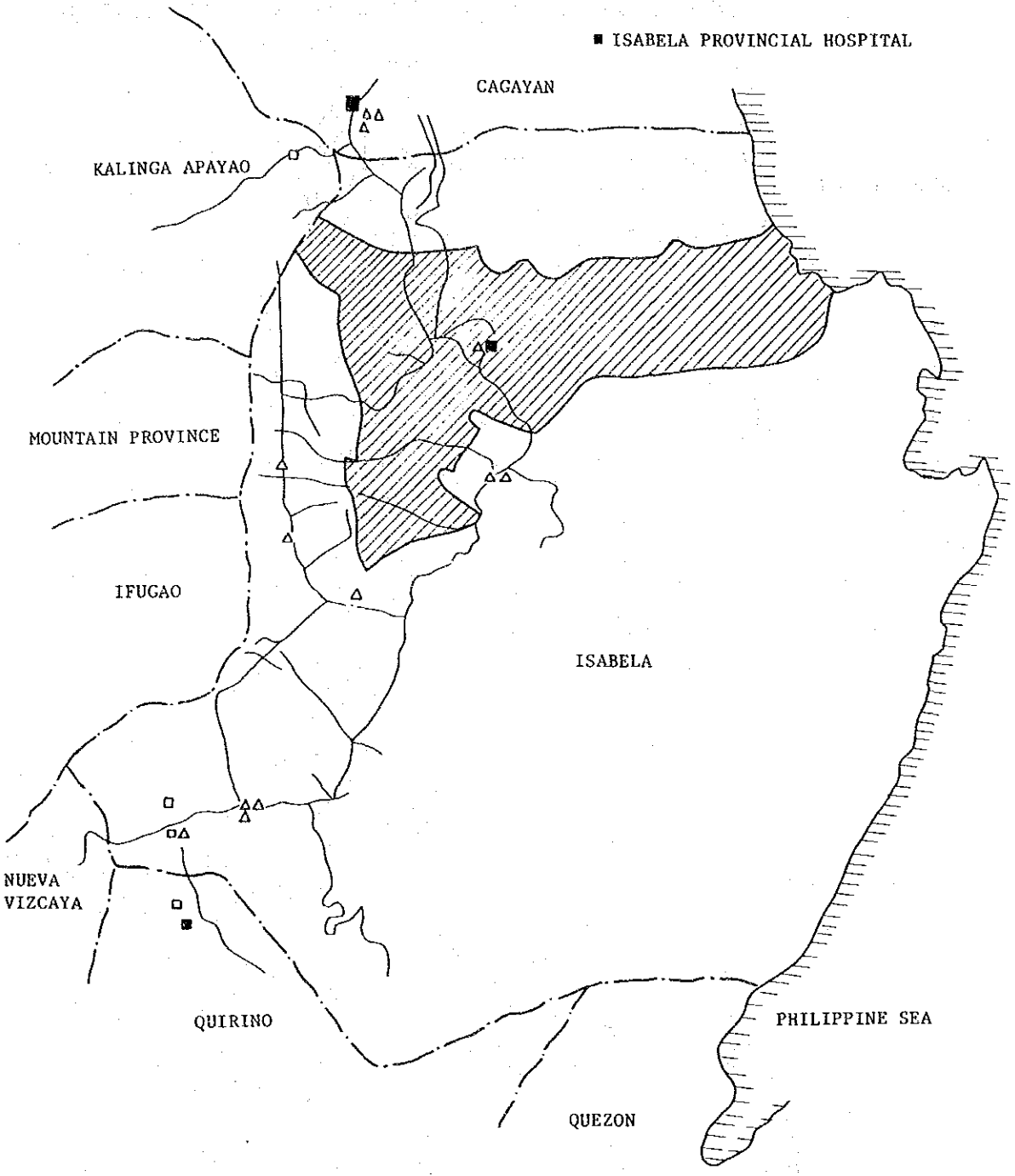
▪ APARRI EMERGENCY HOSPITAL

SURROUNDING AREA OF APARRI EH



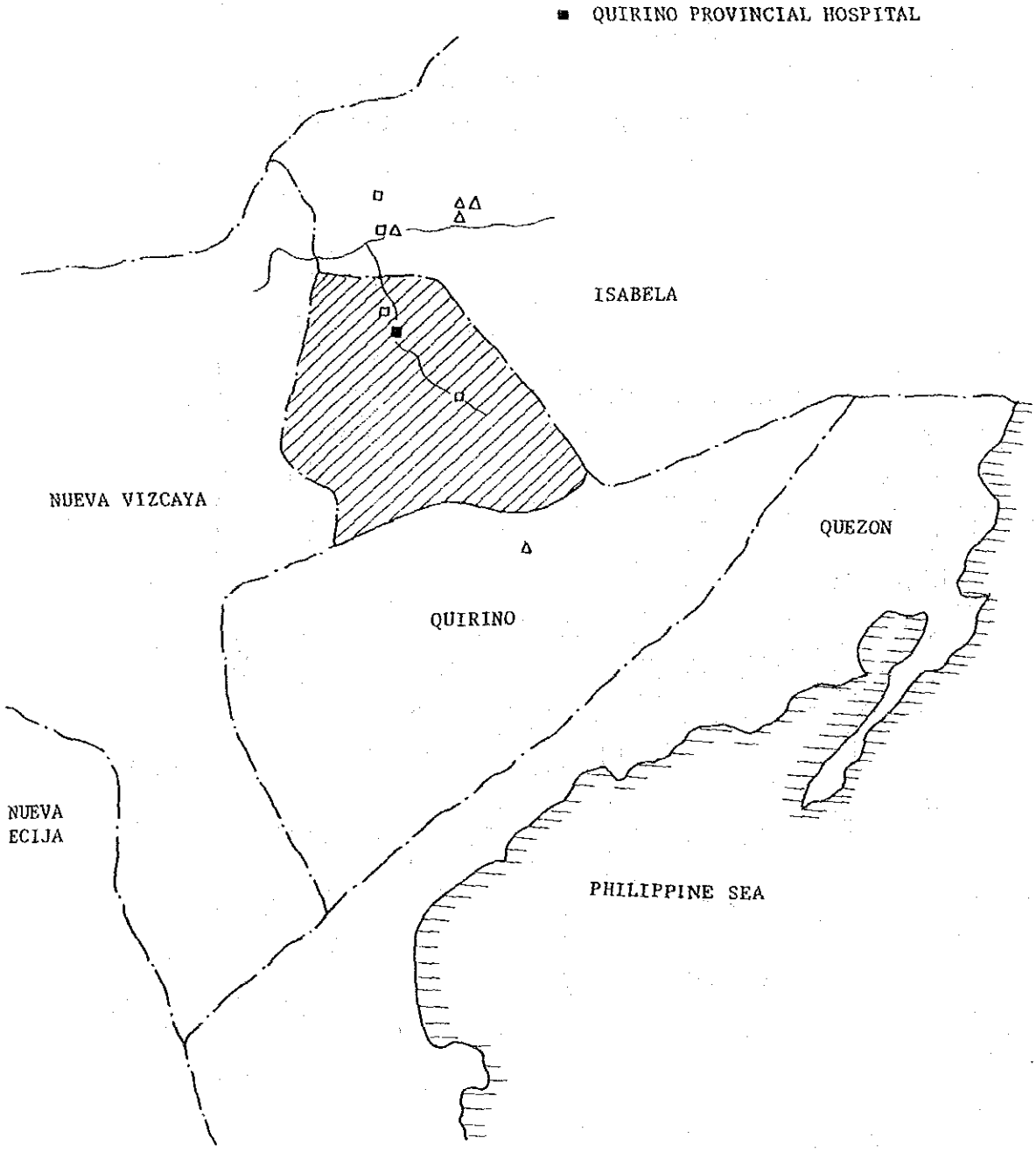

KALINGA APAYAO
KALINGA APAYAO PROVINCIAL HOSPITAL
SURROUNDING AREA OF KALINGA APAYAO PH
ILOCOS NORTE
KALINGA APAYAO
ABRA
ISABELA
MOUNTAIN PROVINCE

SURROUNDING AREA OF ISABELA PH



QUIRINO

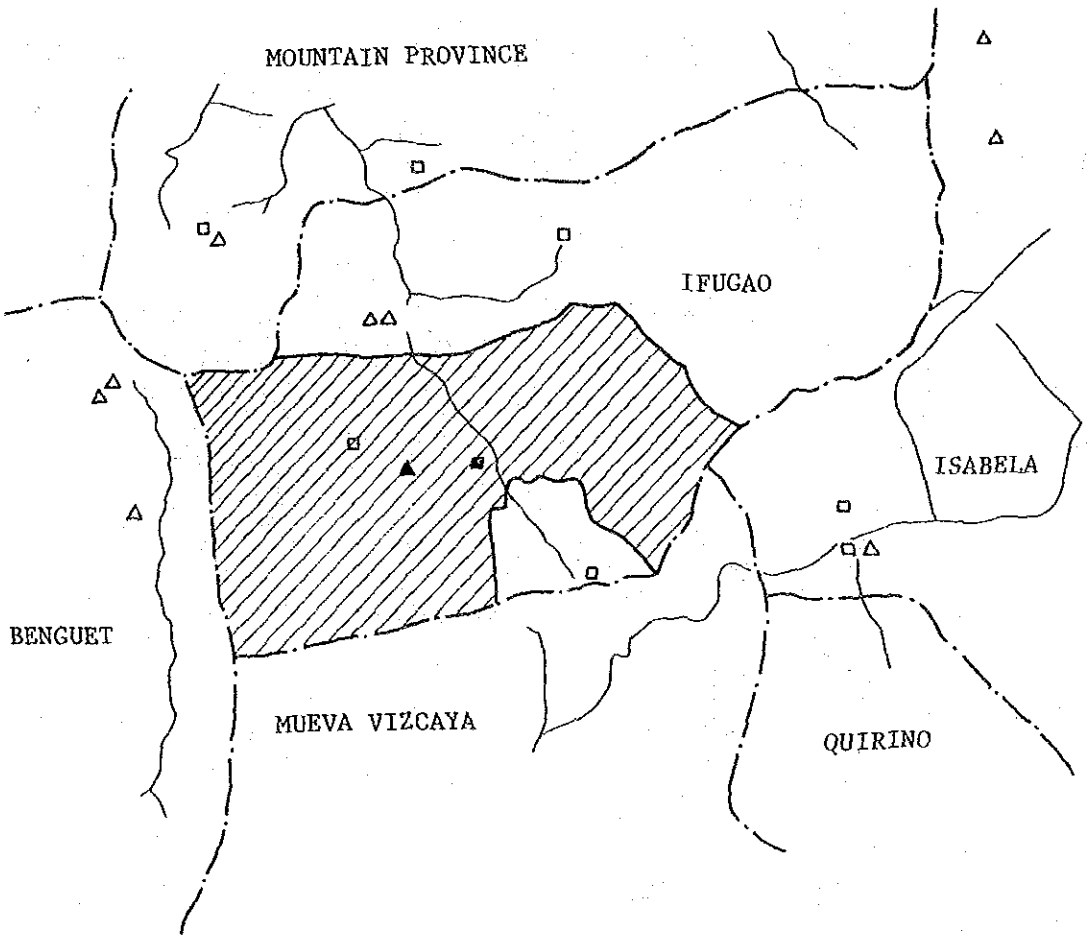
SURROUNDING AREA OF QUIRINO PH



IFUGAO

■ IFUGAO PROVINCIAL HOSPITAL

SURROUNDING AREA OF IFUGAO PH

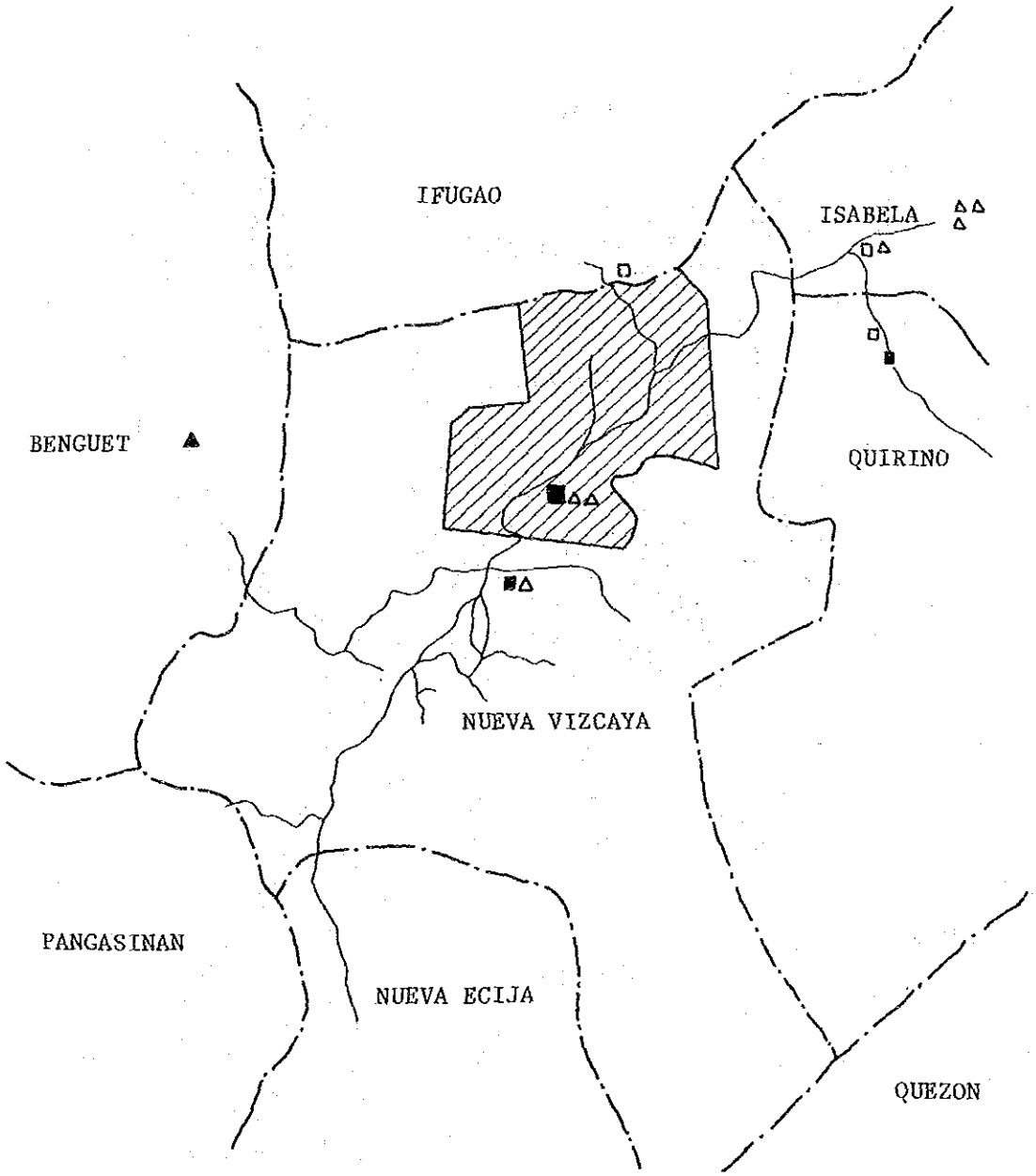


NUEVA VIZCAYA

■ MAJ MARCOS VETERAN MEMORIAL HOSPITAL

■ NUEVA VIZCAYA PROVINCIAL HOSPITAL

SURROUNDING AREA OF MAJ. F. MARCOS
VETERAN MEMORIAL HOSPITAL

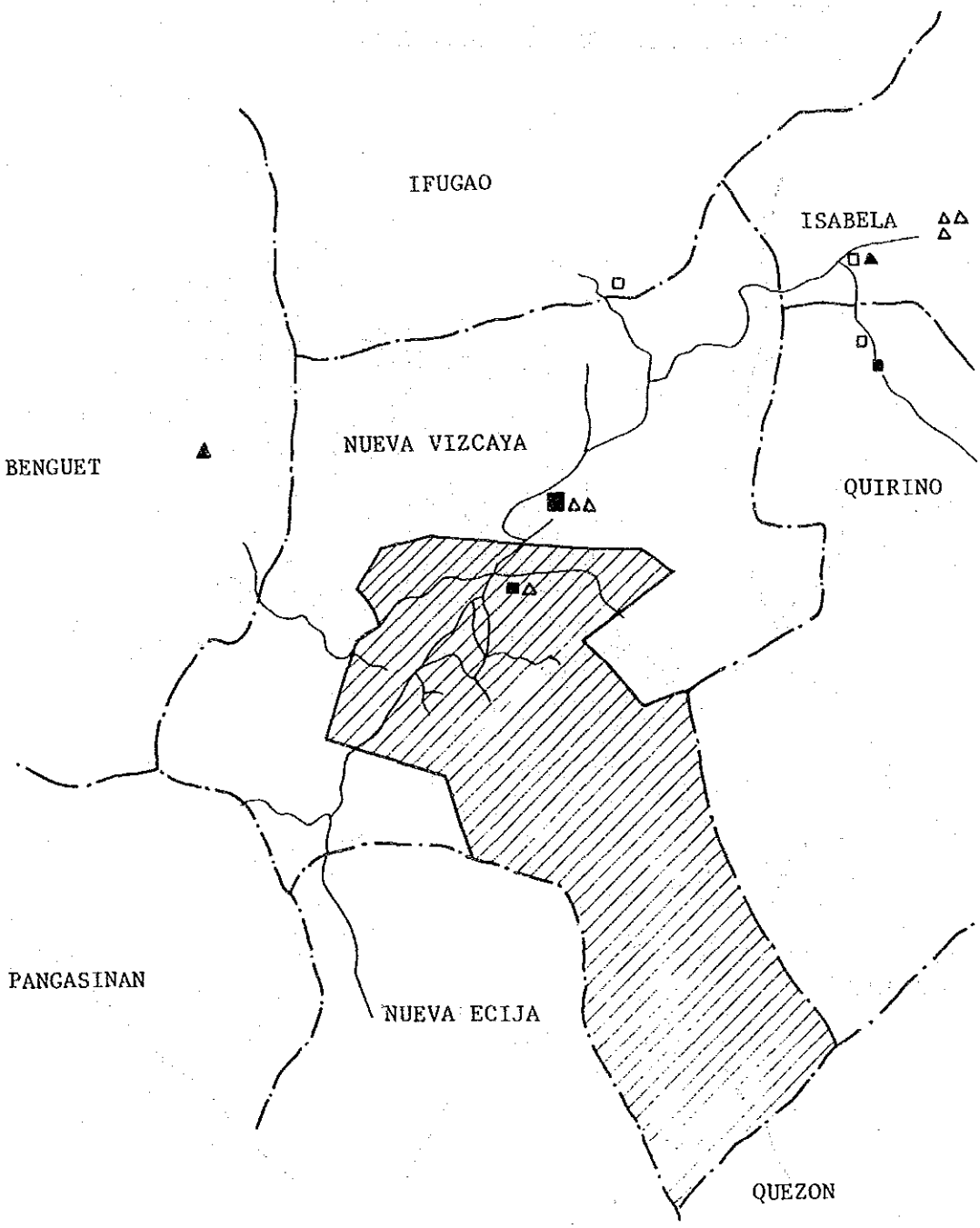


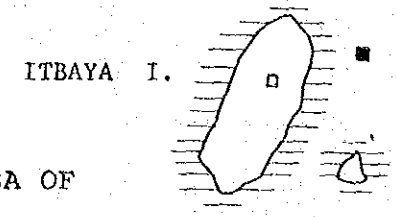
NUEVA VIZCAYA

■ MAJ MARCOS VETERAN MEMORIAL HOSPITAL

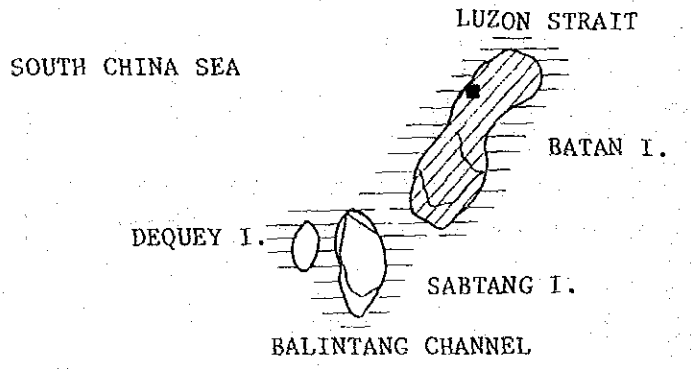
■ NUEVA VIZCAYA PROVINCIAL HOSPITAL

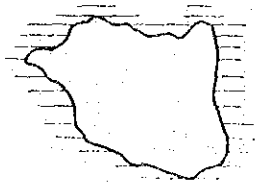
SURROUNDING AREA OF NUEVA VIZCAYA PH

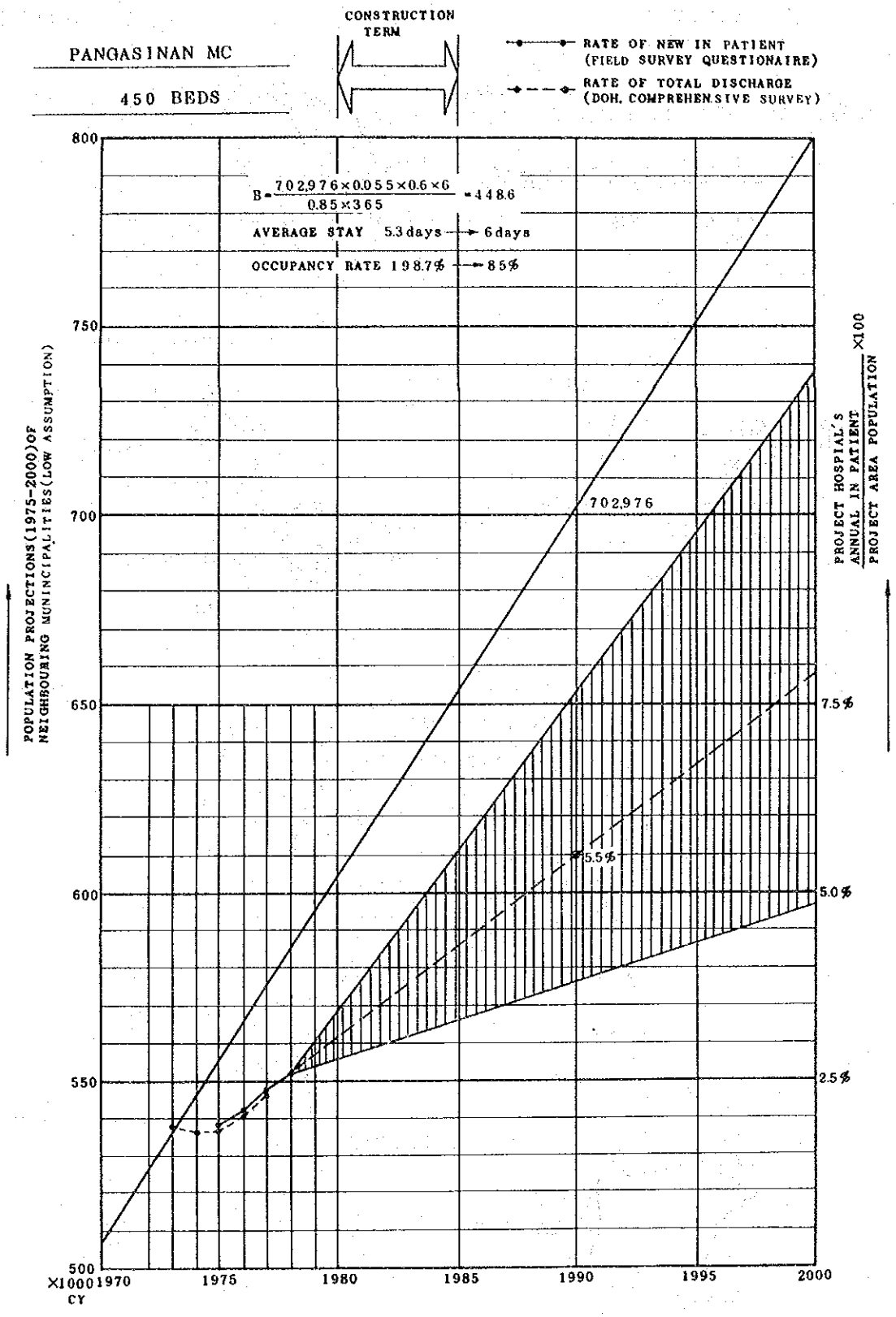


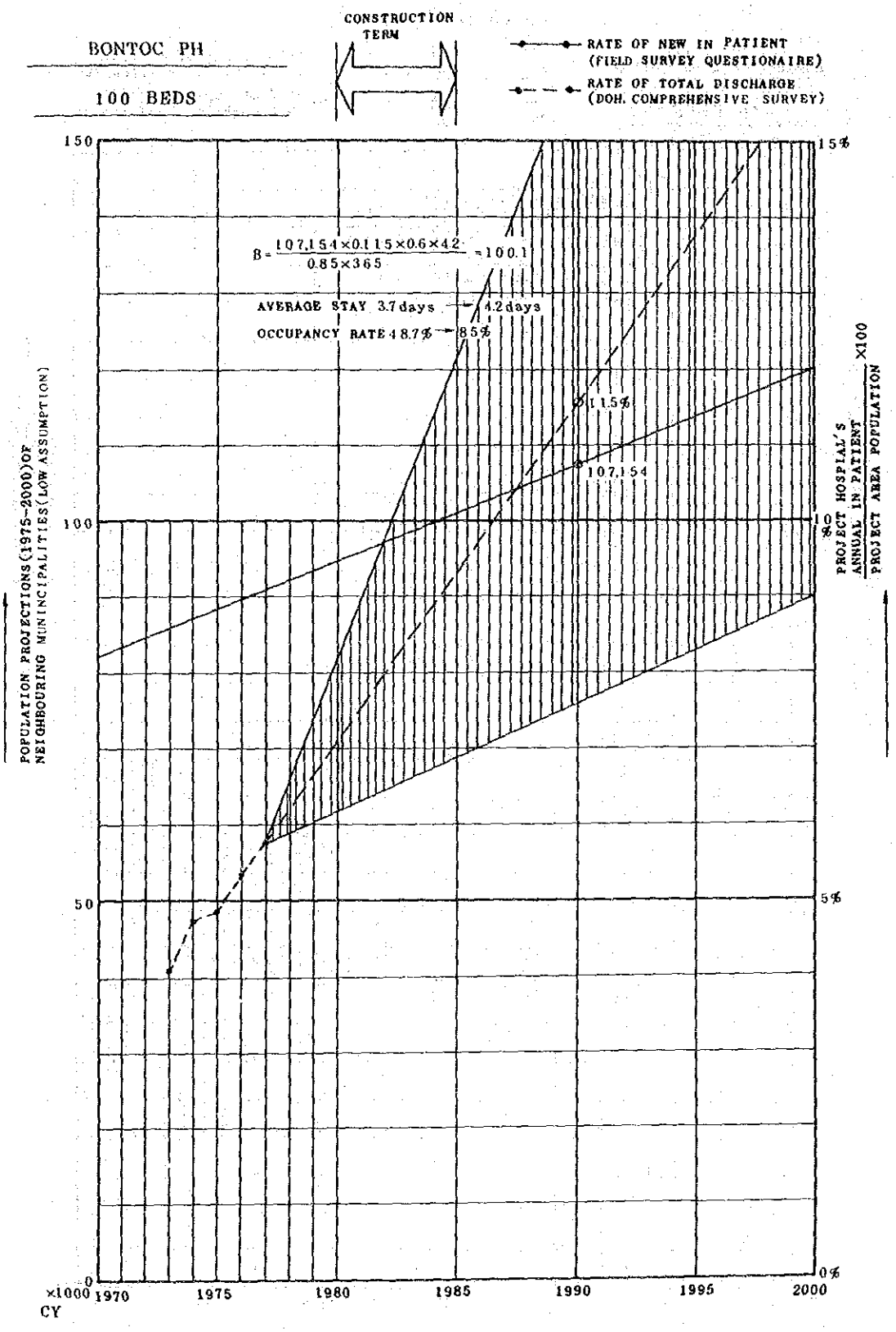


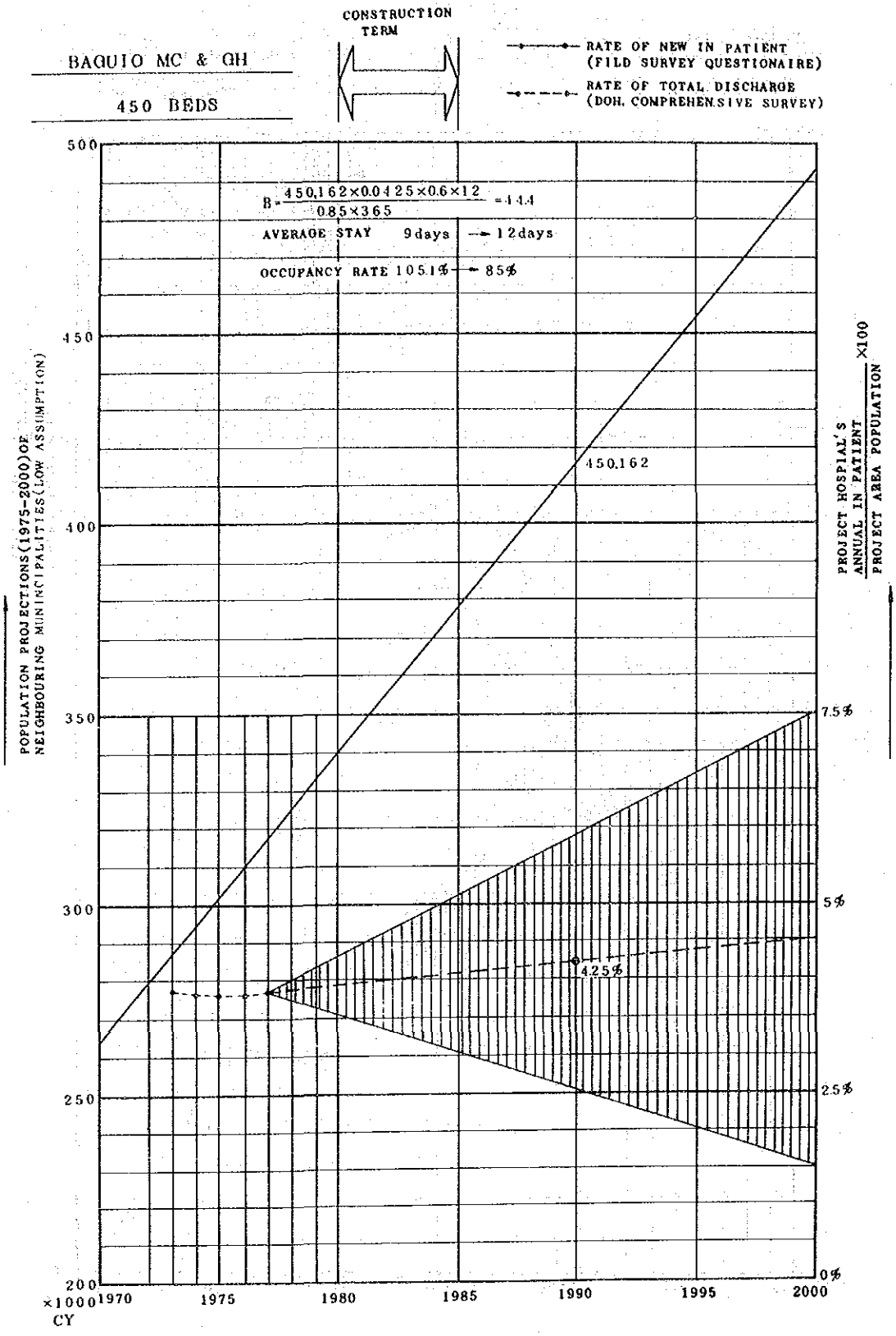
SURROUNDING AREA OF
BATANES PH

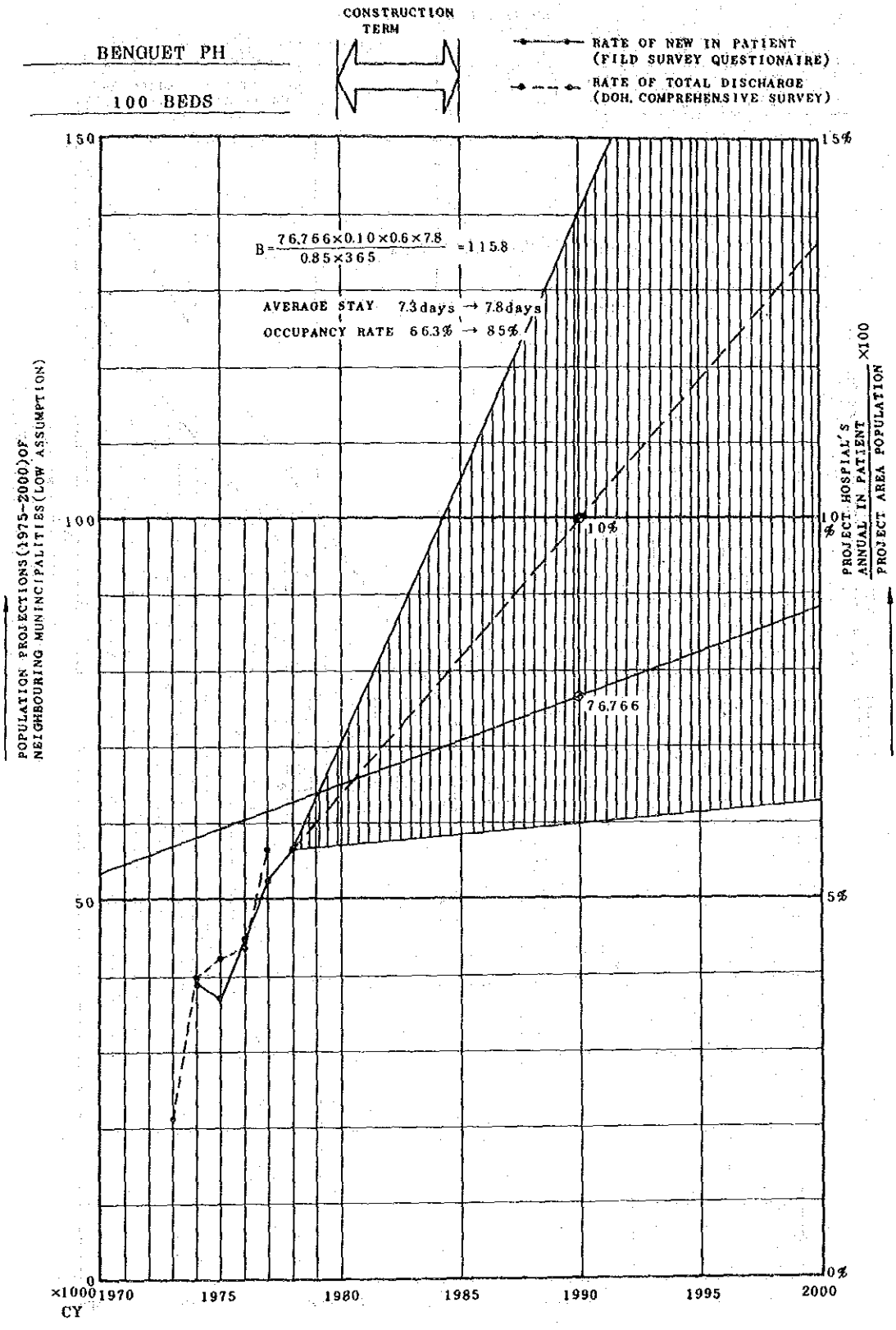


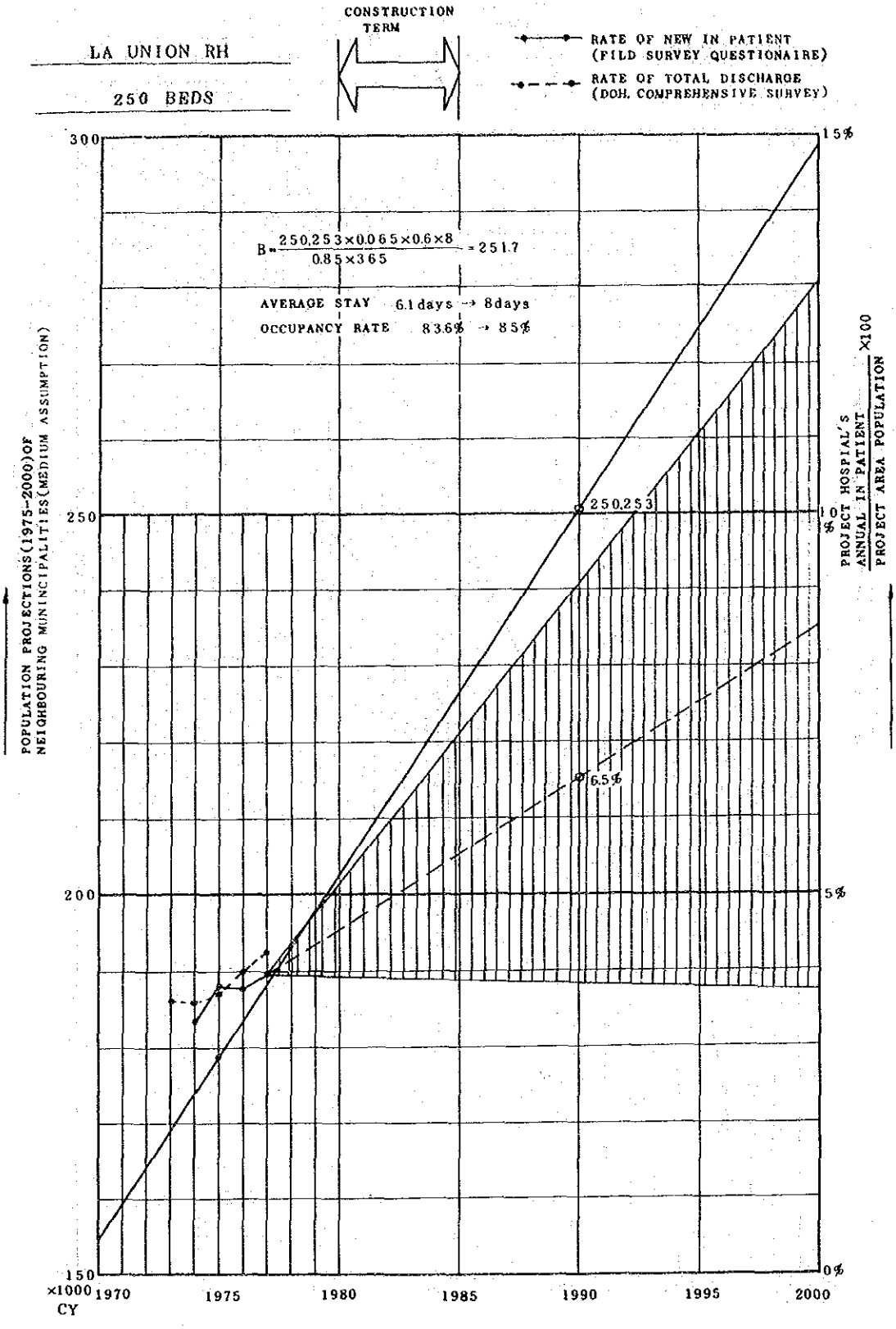


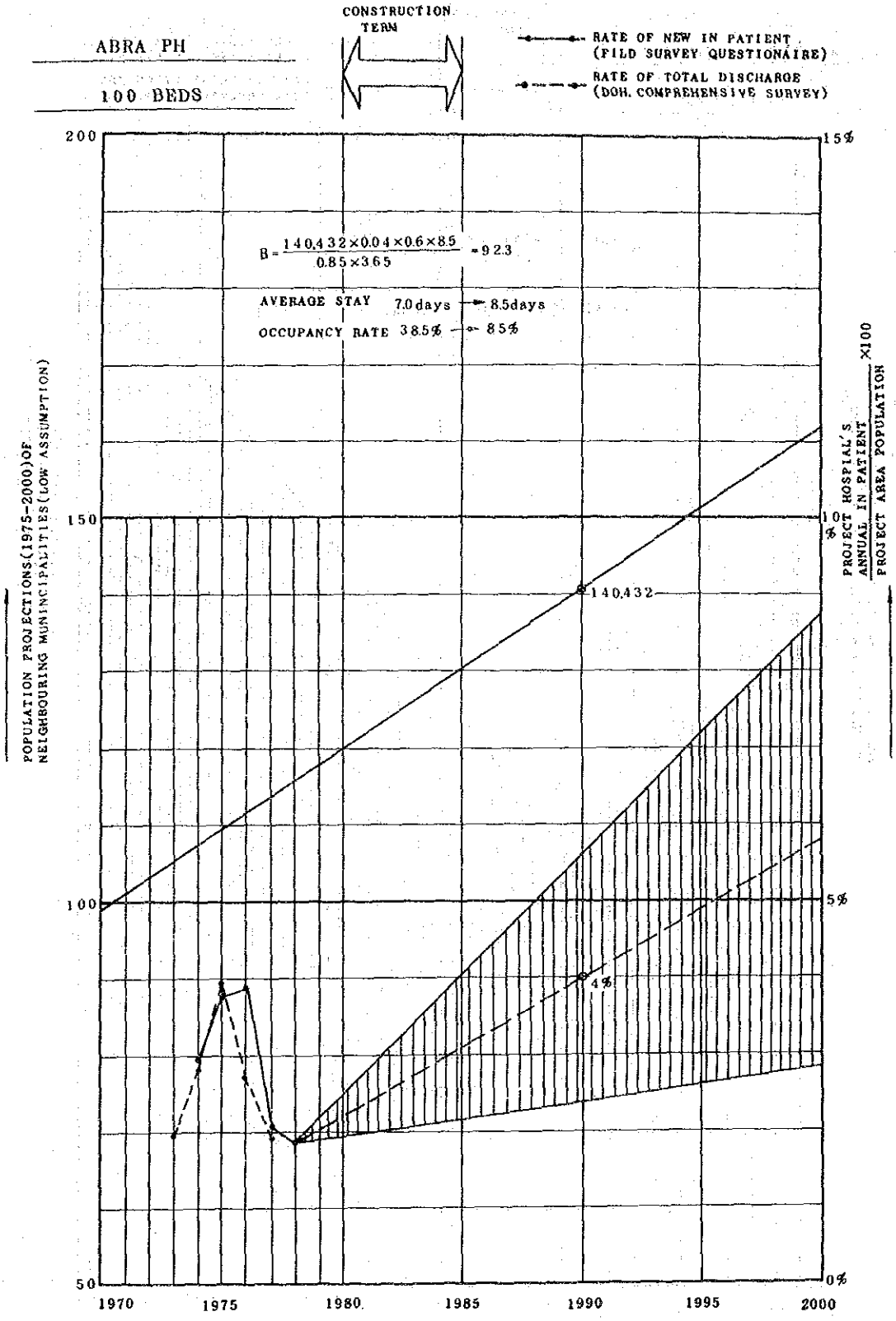

PANGASINAN MC
450 BEDS
CONSTRUCTION TERM
RATE OF NEW IN PATIENT (FIELD SURVEY QUESTIONAIRE)
RATE OF TOTAL DISCHARGE (DOH, COMPREHENSIVE SURVEY)
B = 702,976×0.055×0.6×6 / 0.85×365 = 448.6
AVERAGE STAY 5.3 days → 6 days
OCCUPANCY RATE 198.7% → 85%
POPULATION PROJECTIONS(1975-2000)OF NEIGHBOURING MUNICIPALITIES(LOW ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL IN PATIENT / PROJECT AREA POPULATION ×100
702,976
7.5%
5.5%
5.0%
2.5%
800
750
700
650
600
550
500
×1000
1970
1975
1980
1985
1990
1995
2000
CY

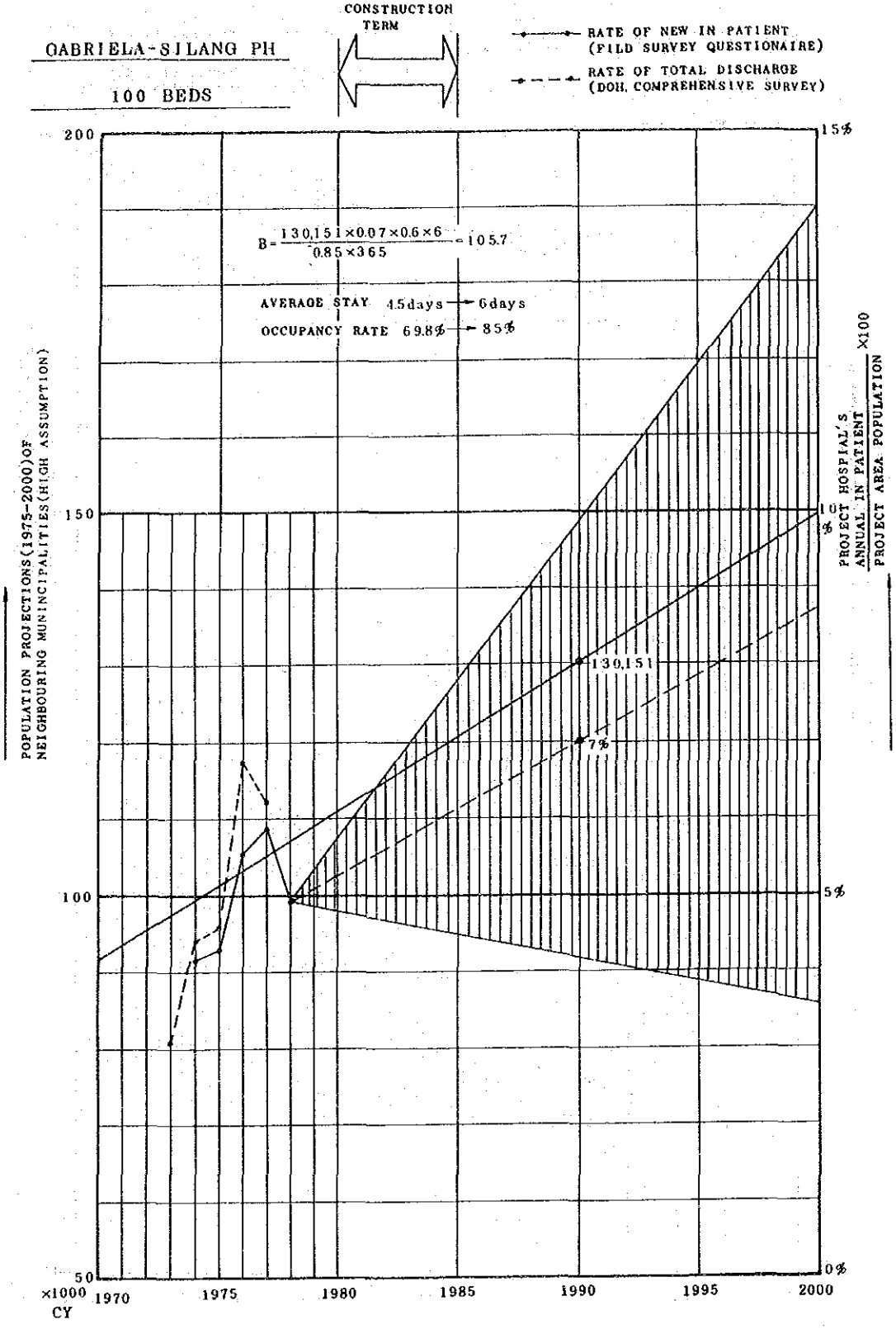

BONTOC PH
100 BEDS
CONSTRUCTION TERM
RATE OF NEW IN PATIENT (FIELD SURVEY QUESTIONAIRE)
RATE OF TOTAL DISCHARGE (DOH. COMPREHENSIVE SURVEY)
$B=\frac{107,154\times0.115\times0.6\times4.2}{0.85\times365}=100.1$
AVERAGE STAY 3.7days → 4.2days
OCCUPANCY RATE 48.7% → 85%
11.5%
107,154
POPULATION PROJECTIONS(1975-2000)OF NEIGHBOURING MUNICIPALITIES(LOW ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL IN PATIENT / PROJECT AREA POPULATION ×100
%
150
100
50
0
15%
10%
5%
0%
×1000
CY
1970
1975
1980
1985
1990
1995
2000

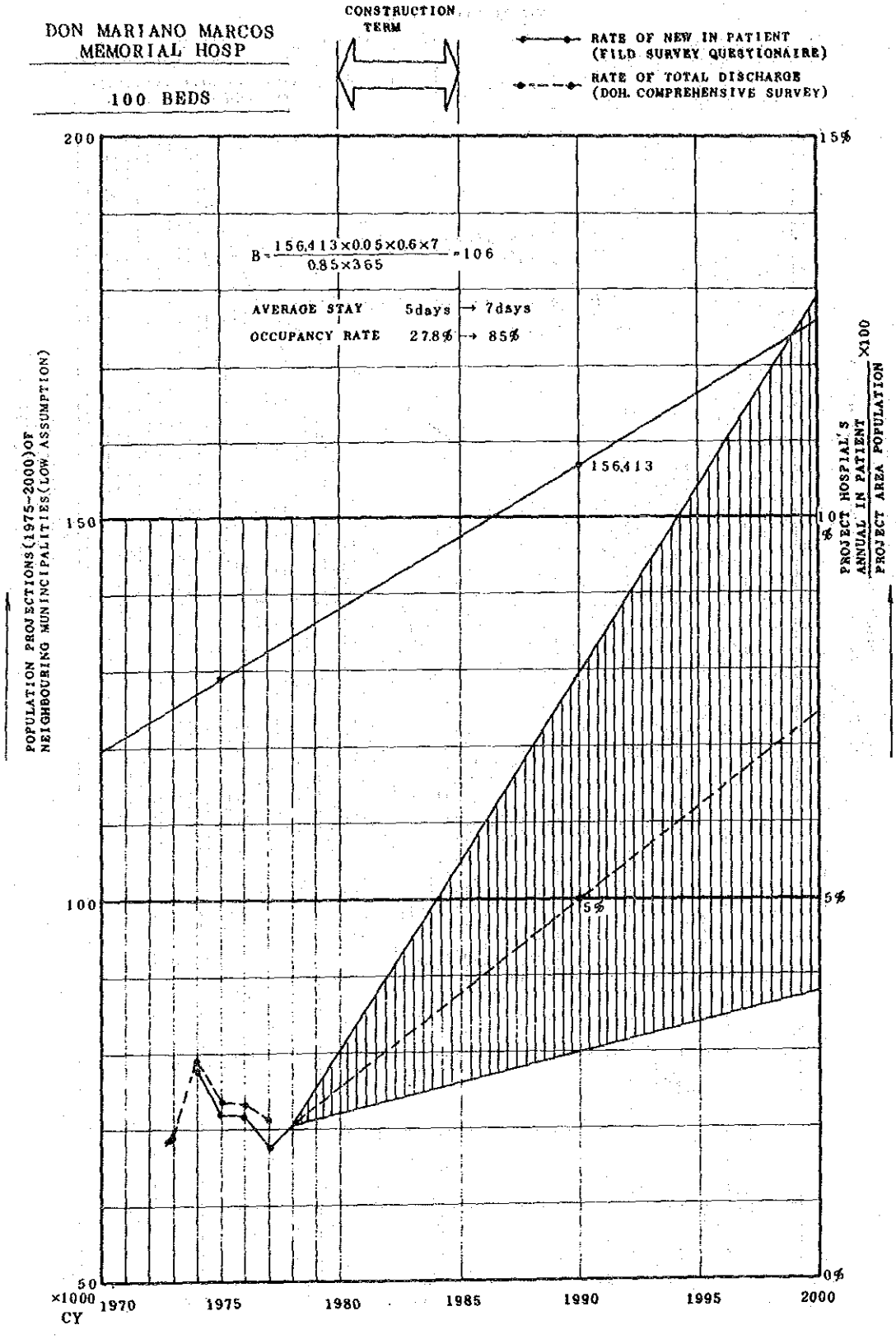

BAGUIO MC & GH
450 BEDS
CONSTRUCTION TERM
RATE OF NEW IN PATIENT (FILD SURVEY QUESTIONAIRE)
RATE OF TOTAL DISCHARGE (DOH. COMPREHENSIVE SURVEY)
B = 450,162×0.0425×0.6×12 / 0.85×365 = 44.4
AVERAGE STAY 9days → 12days
OCCUPANCY RATE 105.1% → 85%
450,162
4.25%
7.5%
5%
2.5%
0%
POPULATION PROJECTIONS (1975-2000) OF NEIGHBOURING MUNICIPALITIES (LOW ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL IN PATIENT / PROJECT AREA POPULATION ×100
500
450
400
350
300
250
200
×1000
1970
1975
1980
1985
1990
1995
2000
CY

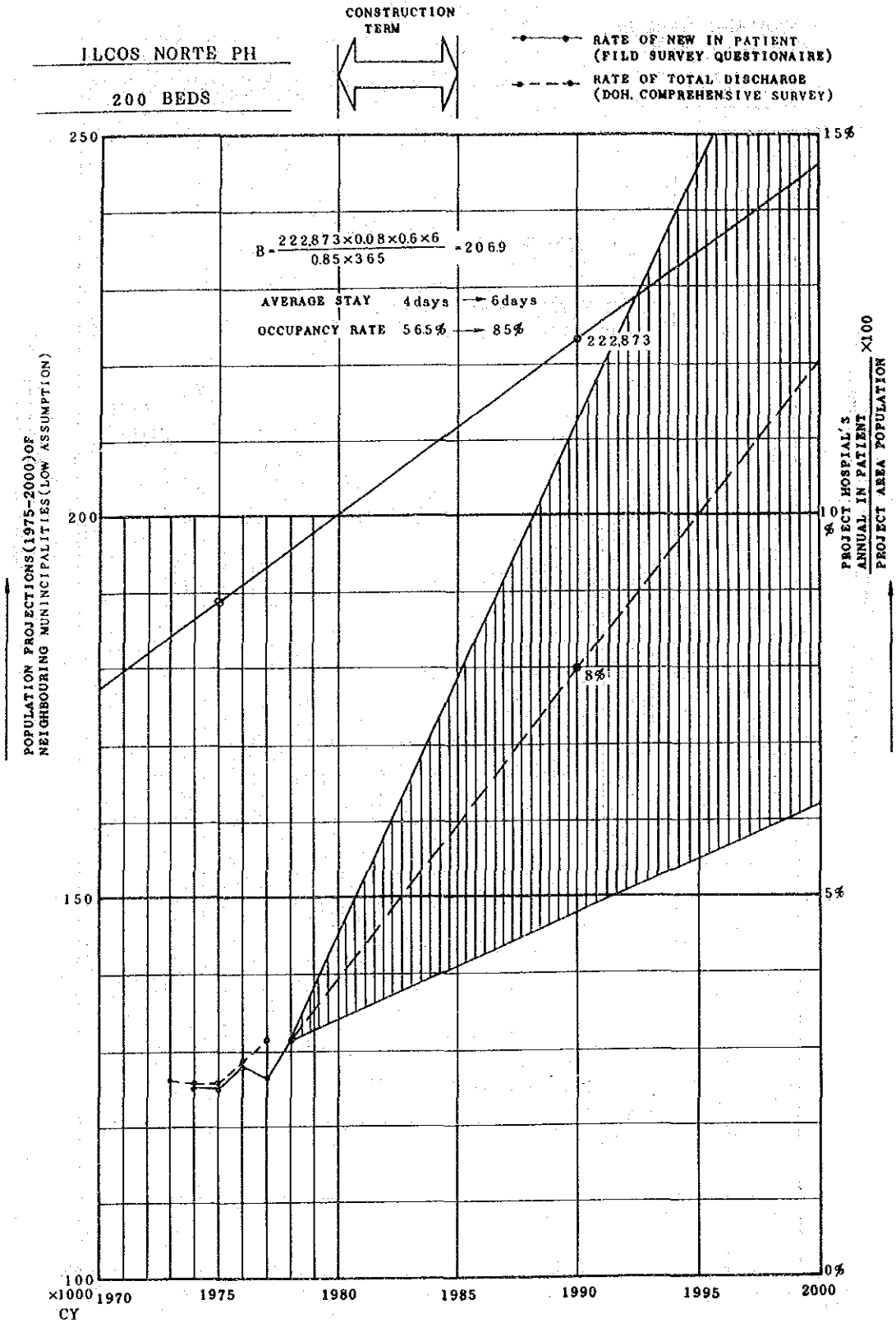

BENGUET PH
100 BEDS
CONSTRUCTION TERM
RATE OF NEW IN PATIENT (FILD SURVEY QUESTIONAIRE)
RATE OF TOTAL DISCHARGE (DOH. COMPREHENSIVE SURVEY)
$B=\frac{76,766\times0.10\times0.6\times7.8}{0.85\times365}=115.8$
AVERAGE STAY 7.3days → 7.8days
OCCUPANCY RATE 66.3% → 85%
10%
76,766
POPULATION PROJECTIONS(1975-2000)OF NEIGHBOURING MUNINCIPALITIES(LOW ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL IN PATIENT / PROJECT AREA POPULATION ×100
150
100
50
0
15%
10%
5%
0%
×1000
CY
1970
1975
1980
1985
1990
1995
2000

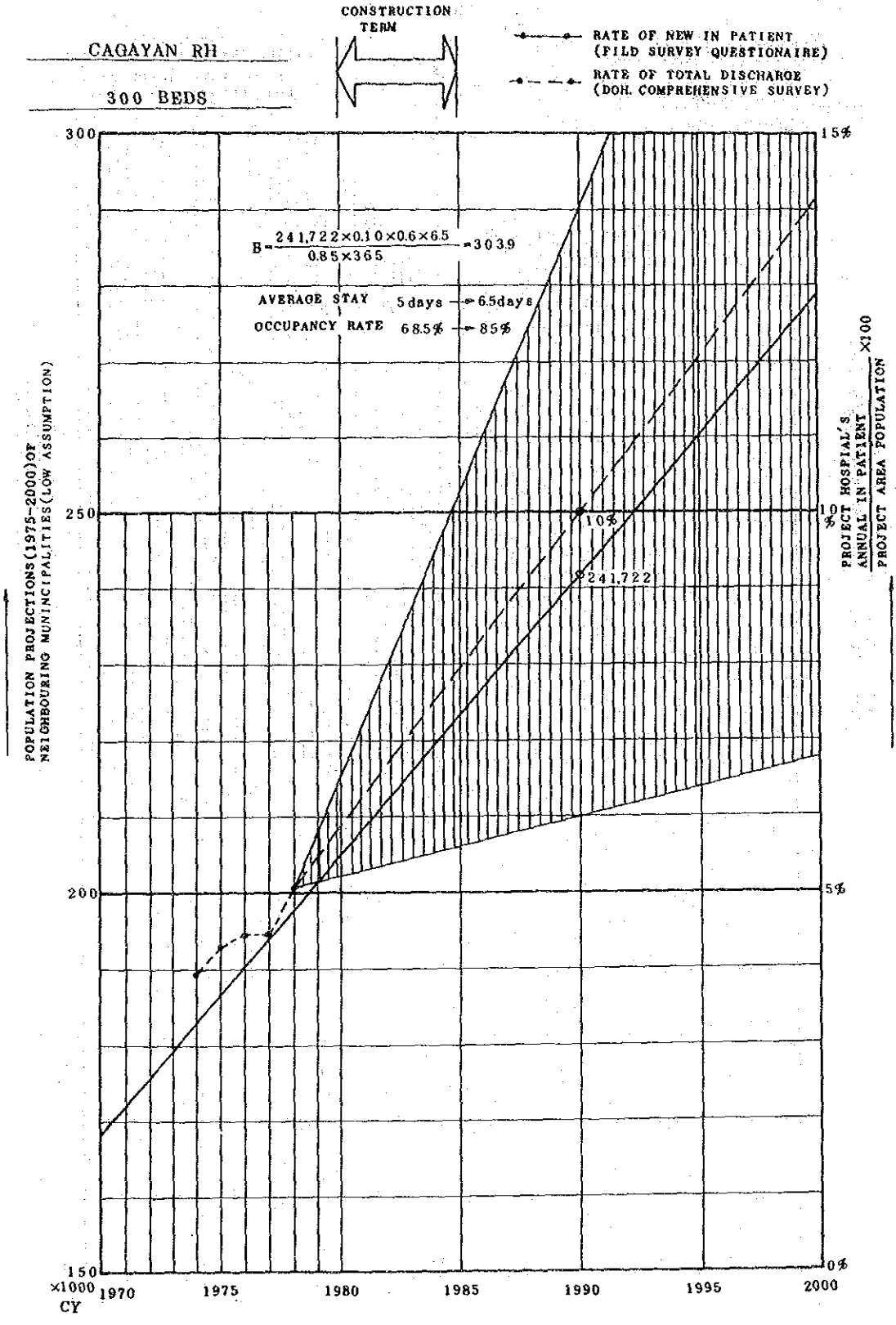

LA UNION RH
250 BEDS
CONSTRUCTION TERM
RATE OF NEW IN PATIENT (FILD SURVEY QUESTIONAIRE)
RATE OF TOTAL DISCHARGE (DOH. COMPREHENSIVE SURVEY)
$B=\frac{250,253\times0.065\times0.6\times8}{0.85\times365}=251.7$
AVERAGE STAY 6.1days → 8days
OCCUPANCY RATE 83.6% → 85%
250,253
6.5%
POPULATION PROJECTIONS(1975-2000)OF NEIGHBOURING MUNICIPALITIES(MEDIUM ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL IN PATIENT / PROJECT AREA POPULATION ×100
300
250
200
150
15%
10%
5%
0%
×1000
1970
1975
1980
1985
1990
1995
2000
CY

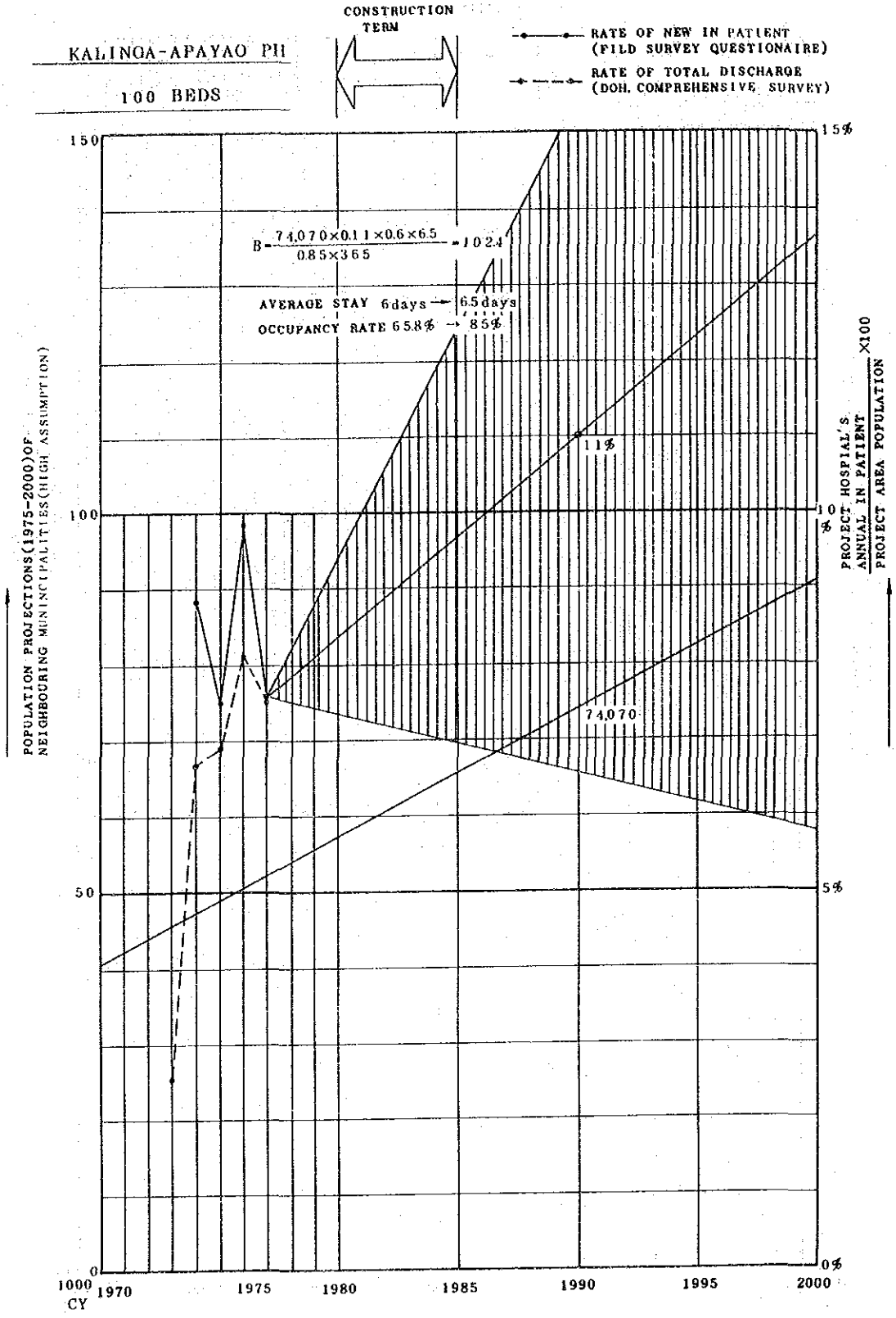

ABRA PH
100 BEDS
CONSTRUCTION TERM
RATE OF NEW IN PATIENT (FILD SURVEY QUESTIONAIRE)
RATE OF TOTAL DISCHARGE (DOH. COMPREHENSIVE SURVEY)
B = 140,432×0.04×0.6×8.5 / 0.85×365 = 92.3
AVERAGE STAY 7.0days → 8.5days
OCCUPANCY RATE 38.5% → 85%
POPULATION PROJECTIONS(1975-2000)OF NEIGHBOURING MUNINCIPALITIES(LOW ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL IN PATIENT / PROJECT AREA POPULATION ×100
200
150
100
50
15%
10%
5%
0%
140,432
4%
1970
1975
1980
1985
1990
1995
2000

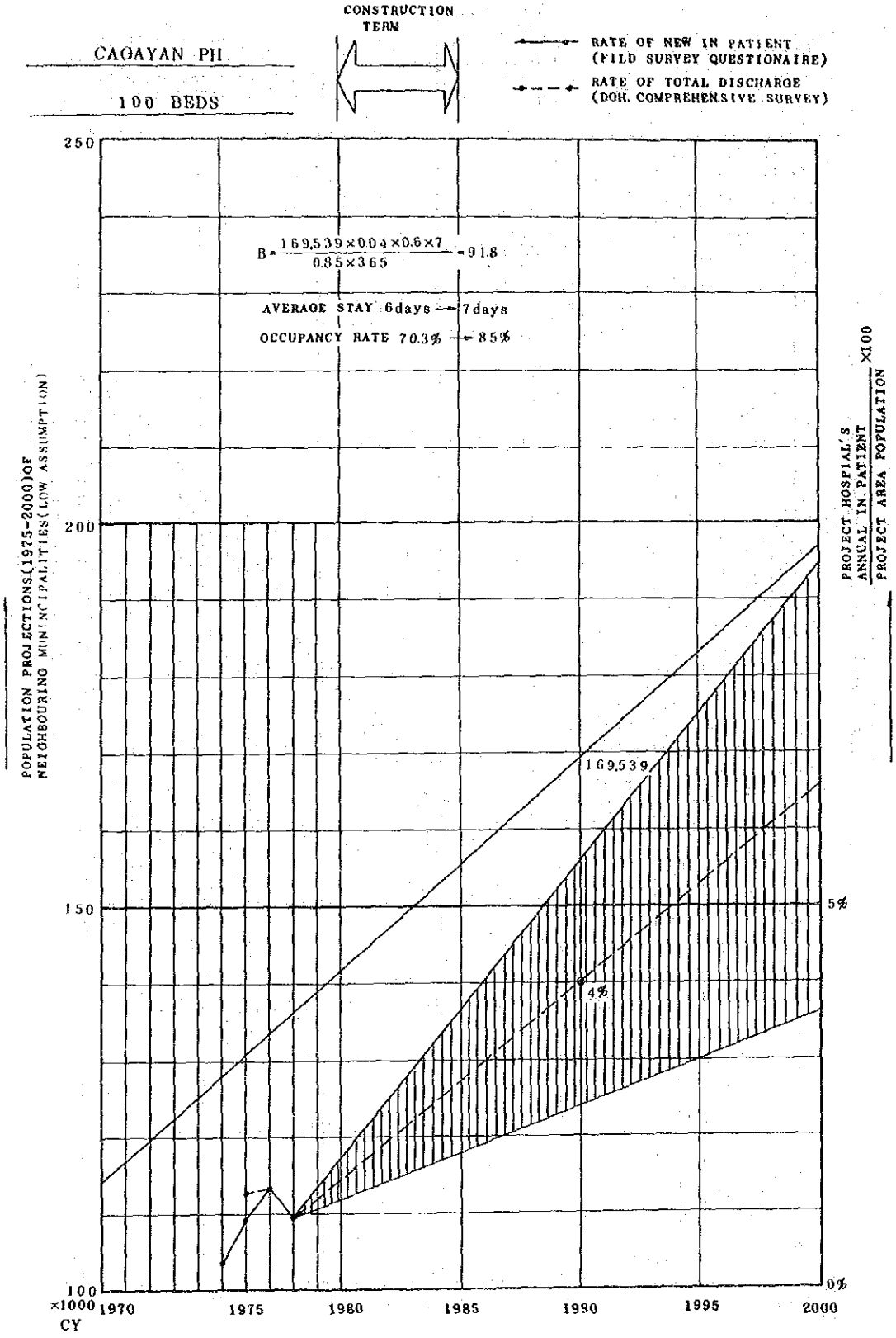

GABRIELA-SILANG PH
100 BEDS
CONSTRUCTION TERM
RATE OF NEW IN PATIENT (FILD SURVEY QUESTIONAIRE)
RATE OF TOTAL DISCHARGE (DOH, COMPREHENSIVE SURVEY)
B = 130,151×0.07×0.6×6 / 0.85×365 = 105.7
AVERAGE STAY 4.5days → 6days
OCCUPANCY RATE 69.8% → 85%
POPULATION PROJECTIONS(1975-2000)OF NEIGHBOURING MUNINCIPALITIES(HIGH ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL IN PATIENT / PROJECT AREA POPULATION ×100
130,151
7%
200
150
100
50
15%
10%
5%
0%
×1000
CY
1970
1975
1980
1985
1990
1995
2000

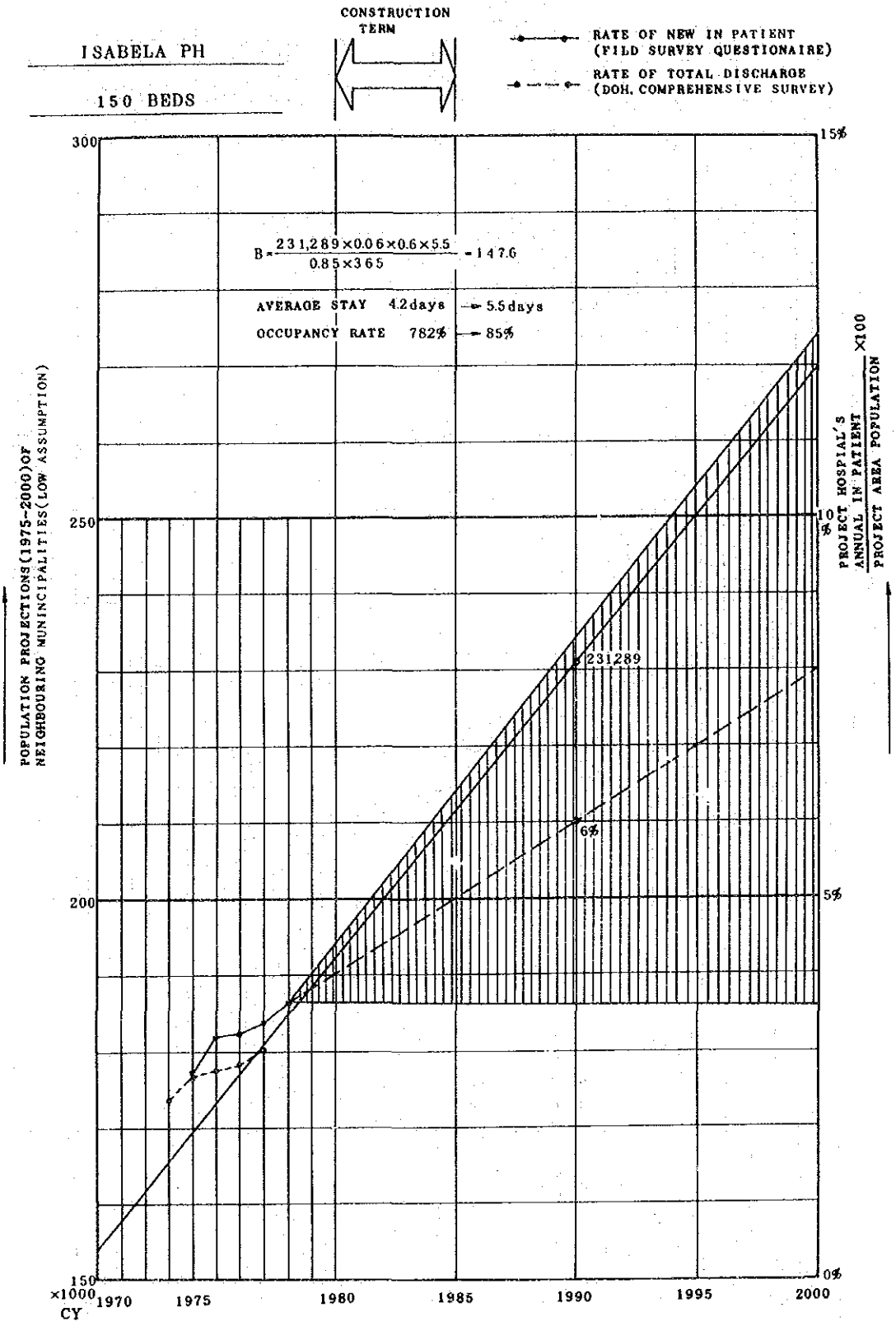

DON MARIANO MARCOS MEMORIAL HOSP
100 BEDS
CONSTRUCTION TERM
RATE OF NEW IN PATIENT (FILD SURVEY QUESTIONAIRE)
RATE OF TOTAL DISCHARGE (DOH. COMPREHENSIVE SURVEY)
$B = \frac{156,413 \times 0.05 \times 0.6 \times 7}{0.85 \times 365} = 106$
AVERAGE STAY 5days → 7days
OCCUPANCY RATE 27.8% → 85%
156,413
5%
POPULATION PROJECTIONS(1975-2000)OF NEIGHBOURING MUNINCIPALITIES(LOW ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL IN PATIENT / PROJECT AREA POPULATION ×100
200
150
100
50
15%
10%
5%
0%
×1000
CY
1970
1975
1980
1985
1990
1995
2000

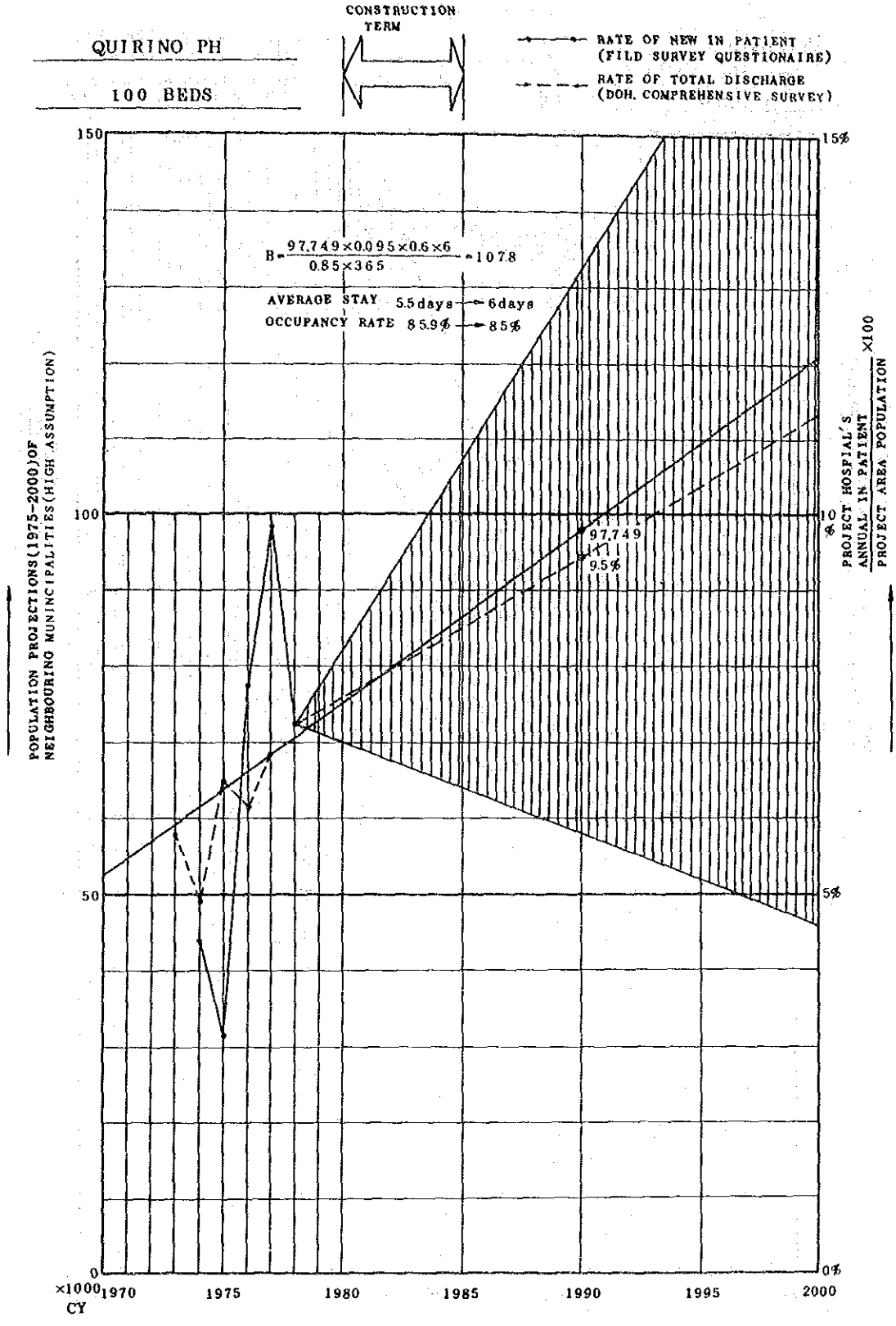

ILCOS NORTE PH
200 BEDS
CONSTRUCTION TERM
RATE OF NEW IN PATIENT (FILD SURVEY QUESTIONAIRE)
RATE OF TOTAL DISCHARGE (DOH. COMPREHENSIVE SURVEY)
B = 222,873×0.08×0.6×6 / 0.85×365 = 206.9
AVERAGE STAY 4days → 6days
OCCUPANCY RATE 56.5% → 85%
222,873
85%
POPULATION PROJECTIONS(1975-2000)OF NEIGHBOURING MUNINCIPALITIES(LOW ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL IN PATIENT / PROJECT AREA POPULATION ×100
250
200
150
100
×1000
15%
10%
5%
0%
1970
1975
1980
1985
1990
1995
2000
CY

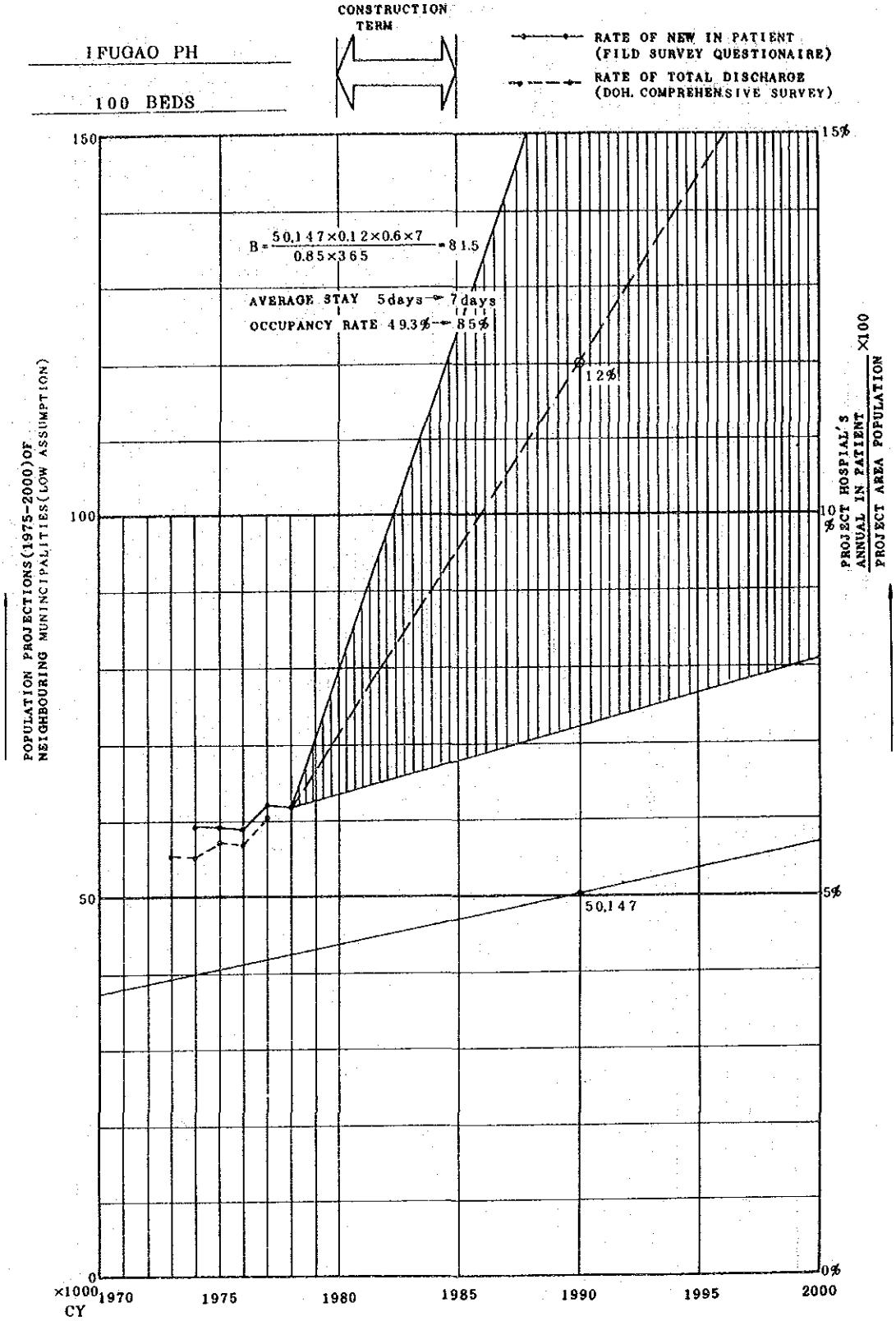

CAGAYAN RH
300 BEDS
CONSTRUCTION TERM
RATE OF NEW IN PATIENT (FILD SURVEY QUESTIONAIRE)
RATE OF TOTAL DISCHARGE (DOH. COMPREHENSIVE SURVEY)
B=241,722×0.10×0.6×6.5/0.85×365=303.9
AVERAGE STAY 5days → 6.5days
OCCUPANCY RATE 68.5% → 85%
241,722
10%
POPULATION PROJECTIONS(1975-2000)OF NEIGHBOURING MUNINCIPALITIES(LOW ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL IN PATIENT / PROJECT AREA POPULATION ×100
300
250
200
150
15%
10%
5%
0%
×1000
CY
1970
1975
1980
1985
1990
1995
2000

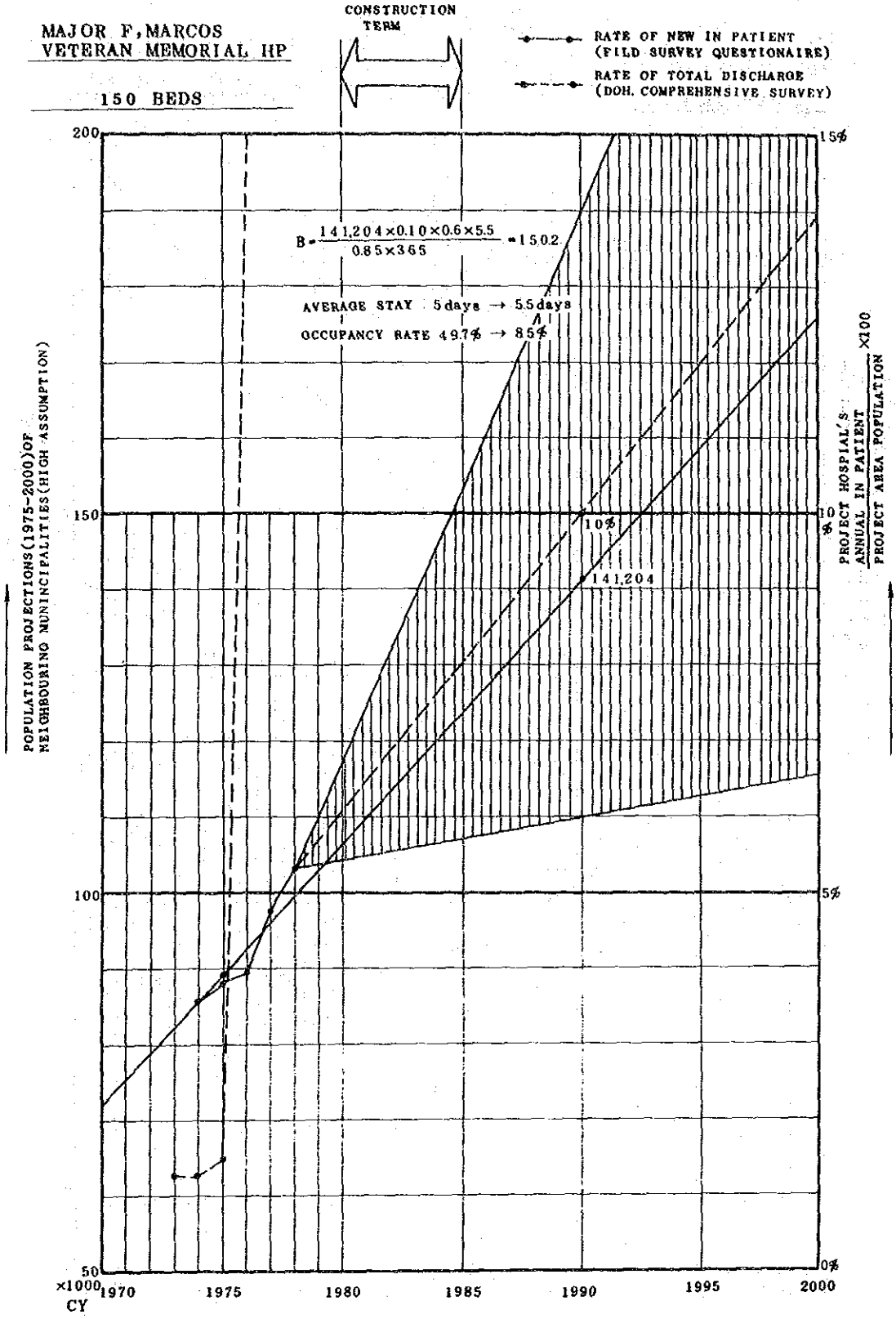

KALINGA-APAYAO PH
100 BEDS
CONSTRUCTION TERM
RATE OF NEW IN PATIENT (FILD SURVEY QUESTIONAIRE)
RATE OF TOTAL DISCHARGE (DOH. COMPREHENSIVE SURVEY)
B=74,070×0.11×0.6×6.5 / 0.85×365 =102.4
AVERAGE STAY 6days → 6.5days
OCCUPANCY RATE 65.8% → 85%
11%
74,070
150
100
50
0
15%
10%
5%
0%
1000
CY
1970
1975
1980
1985
1990
1995
2000
POPULATION PROJECTIONS(1975-2000)OF NEIGHBOURING MUNICIPALITIES(HIGH ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL IN PATIENT / PROJECT AREA POPULATION ×100

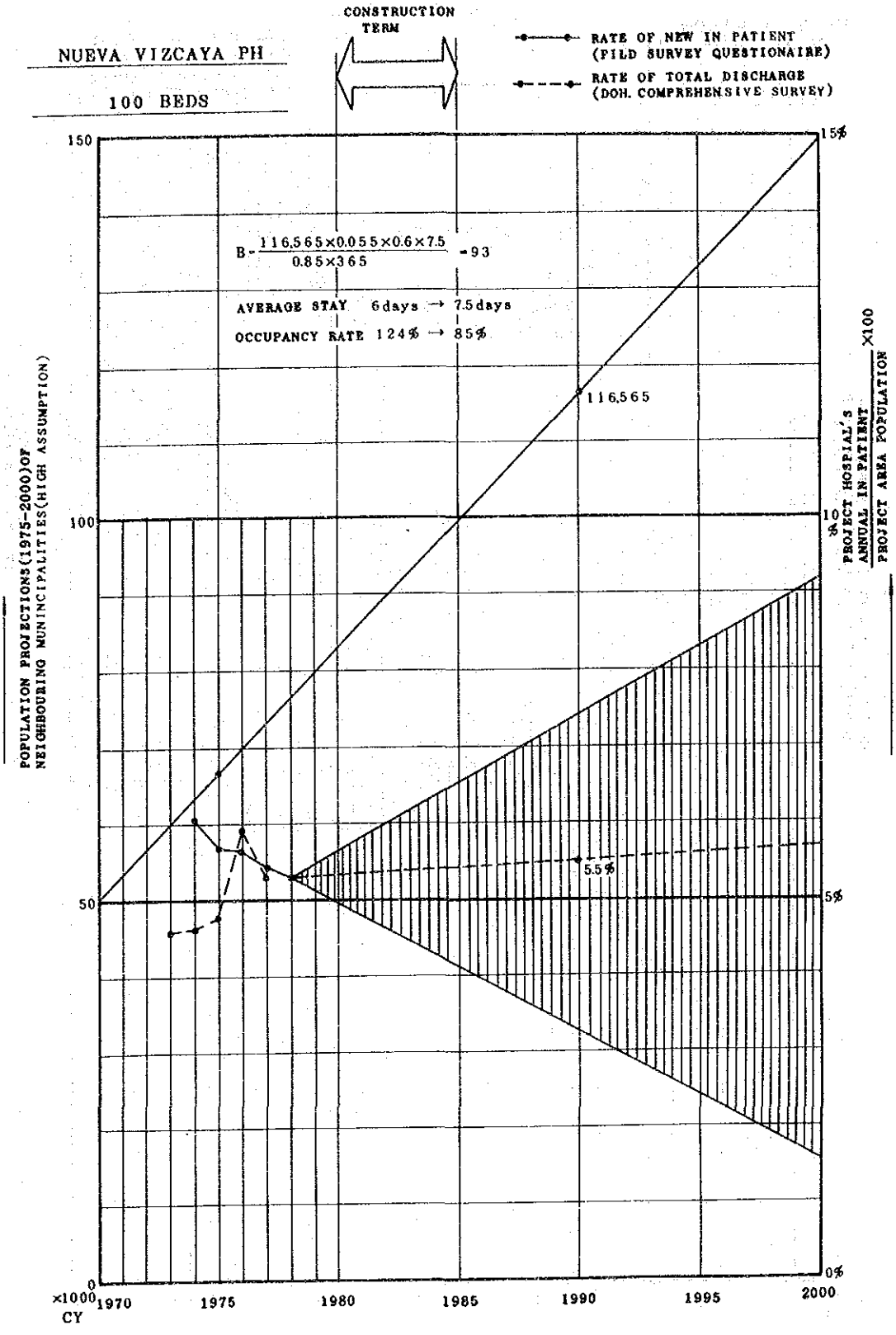

CAGAYAN PH
100 BEDS
CONSTRUCTION TERM
RATE OF NEW IN PATIENT (FILD SURVEY QUESTIONAIRE)
RATE OF TOTAL DISCHARGE (DOH. COMPREHENSIVE SURVEY)
250
200
150
100
×1000
CY
1970
1975
1980
1985
1990
1995
2000
B = 169,539×0.04×0.6×7 / 0.85×365 = 91.8
AVERAGE STAY 6days → 7days
OCCUPANCY RATE 70.3% → 85%
POPULATION PROJECTIONS(1975-2000)OF NEIGHBOURING MUNICIPALITIES(LOW ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL IN PATIENT / PROJECT AREA POPULATION ×100
169,539
5%
4%
0%

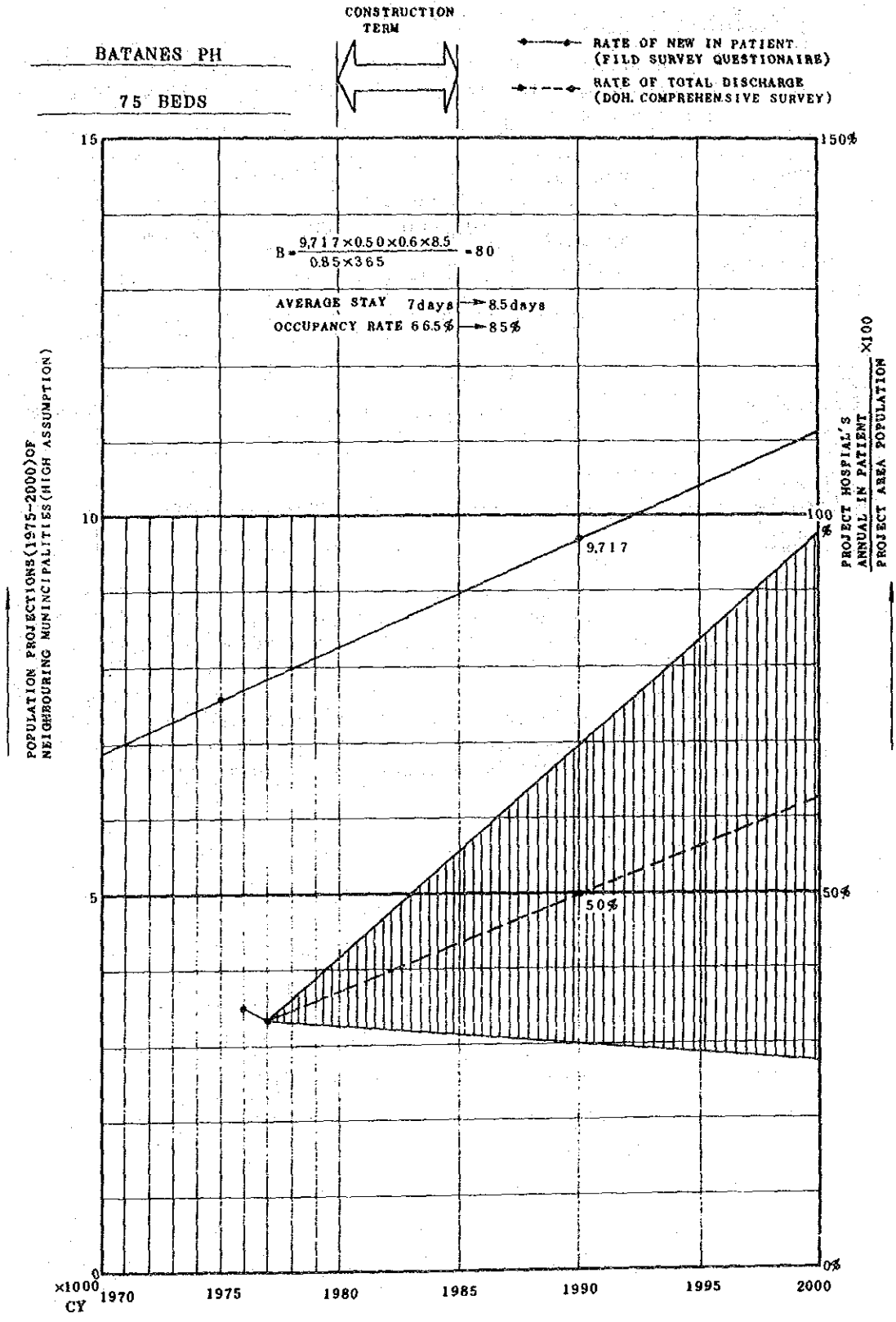

ISABELA PH
150 BEDS
CONSTRUCTION TERM
RATE OF NEW IN PATIENT (FILD SURVEY QUESTIONAIRE)
RATE OF TOTAL DISCHARGE (DOH. COMPREHENSIVE SURVEY)
B=231,289×0.06×0.6×5.5 / 0.85×365 = 147.6
AVERAGE STAY 4.2days → 5.5days
OCCUPANCY RATE 782% → 85%
231289
6%
POPULATION PROJECTIONS(1975-2000)OF NEIGHBOURING MUNINCIPALITIES(LOW ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL IN PATIENT / PROJECT AREA POPULATION ×100
300
250
200
150
×1000
15%
10%
5%
0%
1970
1975
1980
1985
1990
1995
2000
CY


QUIRINO PH
100 BEDS
CONSTRUCTION TERM
RATE OF NEW IN PATIENT (FILD SURVEY QUESTIONAIRE)
RATE OF TOTAL DISCHARGE (DOH. COMPREHENSIVE SURVEY)
B = 97,749×0.095×0.6×6 / 0.85×365 = 107.8
AVERAGE STAY 5.5days → 6days
OCCUPANCY RATE 85.9% → 85%
97,749
9.5%
POPULATION PROJECTIONS(1975-2000)OF NEIGHBOURING MUNINCIPALITIES(HIGH ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL IN PATIENT / PROJECT AREA POPULATION ×100
150
100
50
0
15%
10%
5%
0%
×1000
CY
1970
1975
1980
1985
1990
1995
2000


IFUGAO PH
100 BEDS
CONSTRUCTION TERM
RATE OF NEW IN PATIENT (FILD SURVEY QUESTIONAIRE)
RATE OF TOTAL DISCHARGE (DOH. COMPREHENSIVE SURVEY)
B = 50,147×0.12×0.6×7 / 0.85×365 = 81.5
AVERAGE STAY 5days → 7days
OCCUPANCY RATE 49.3% → 85%
12%
50,147
POPULATION PROJECTIONS(1975-2000)OF NEIGHBOURING MUNINCIPALITIES(LOW ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL IN PATIENT / PROJECT AREA POPULATION ×100
150
100
50
0
15%
10%
5%
0%
×1000
CY
1970
1975
1980
1985
1990
1995
2000


MAJOR F, MARCOS
VETERAN MEMORIAL HP
150 BEDS
CONSTRUCTION TERM
RATE OF NEW IN PATIENT (FILD SURVEY QUESTIONAIRE)
RATE OF TOTAL DISCHARGE (DOH. COMPREHENSIVE SURVEY)
B = 141,204×0.10×0.6×5.5 / 0.85×365 = 150.2
AVERAGE STAY 5 days → 5.5 days
OCCUPANCY RATE 49.7% → 85%
10%
141,204
POPULATION PROJECTIONS (1975-2000) OF NEIGHBOURING MUNINCIPALITIES (HIGH ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL IN PATIENT / PROJECT AREA POPULATION ×100
200
150
100
50
15%
10%
5%
0%
×1000
CY
1970
1975
1980
1985
1990
1995
2000


NUEVA VIZCAYA PH
100 BEDS
CONSTRUCTION TERM
RATE OF NEW IN PATIENT (FILD SURVEY QUESTIONAIRE)
RATE OF TOTAL DISCHARGE (DOH. COMPREHENSIVE SURVEY)
B=116,565×0.055×0.6×7.5 / 0.85×365 =93
AVERAGE STAY 6days → 7.5days
OCCUPANCY RATE 124% → 85%
116,565
5.5%
150
100
50
0
15%
10
5%
0%
×1000
CY
1970
1975
1980
1985
1990
1995
2000
POPULATION PROJECTIONS(1975-2000)OF NEIGHBOURING MUNINCIPALITIES(HIGH ASSUMPTION)
% PROJECT HOSPIAL'S ANNUAL IN-PATIENT / PROJECT AREA POPULATION ×100

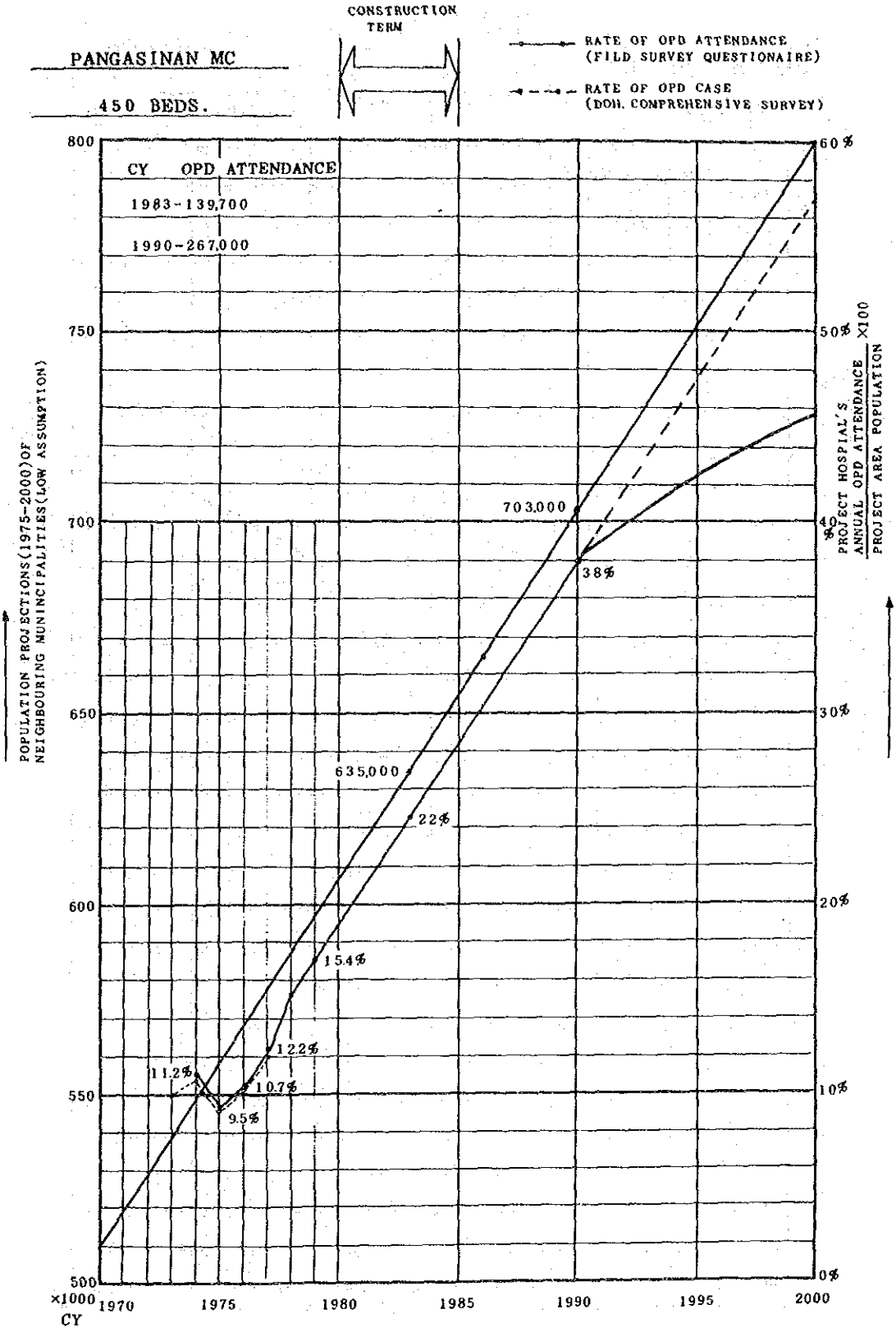

BATANES PH
75 BEDS
CONSTRUCTION TERM
RATE OF NEW IN PATIENT (FILD SURVEY QUESTIONAIRE)
RATE OF TOTAL DISCHARGE (DOH. COMPREHENSIVE SURVEY)
B = 9,717×0.50×0.6×8.5 / 0.85×365 = 80
AVERAGE STAY 7days → 8.5days
OCCUPANCY RATE 66.5% → 85%
9,717
50%
POPULATION PROJECTIONS(1975-2000)OF NEIGHBOURING MUNINCIPALITIES(HIGH ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL IN PATIENT / PROJECT AREA POPULATION ×100
×1000
CY
1970
1975
1980
1985
1990
1995
2000
15
10
5
0
150%
100%
50%
0%

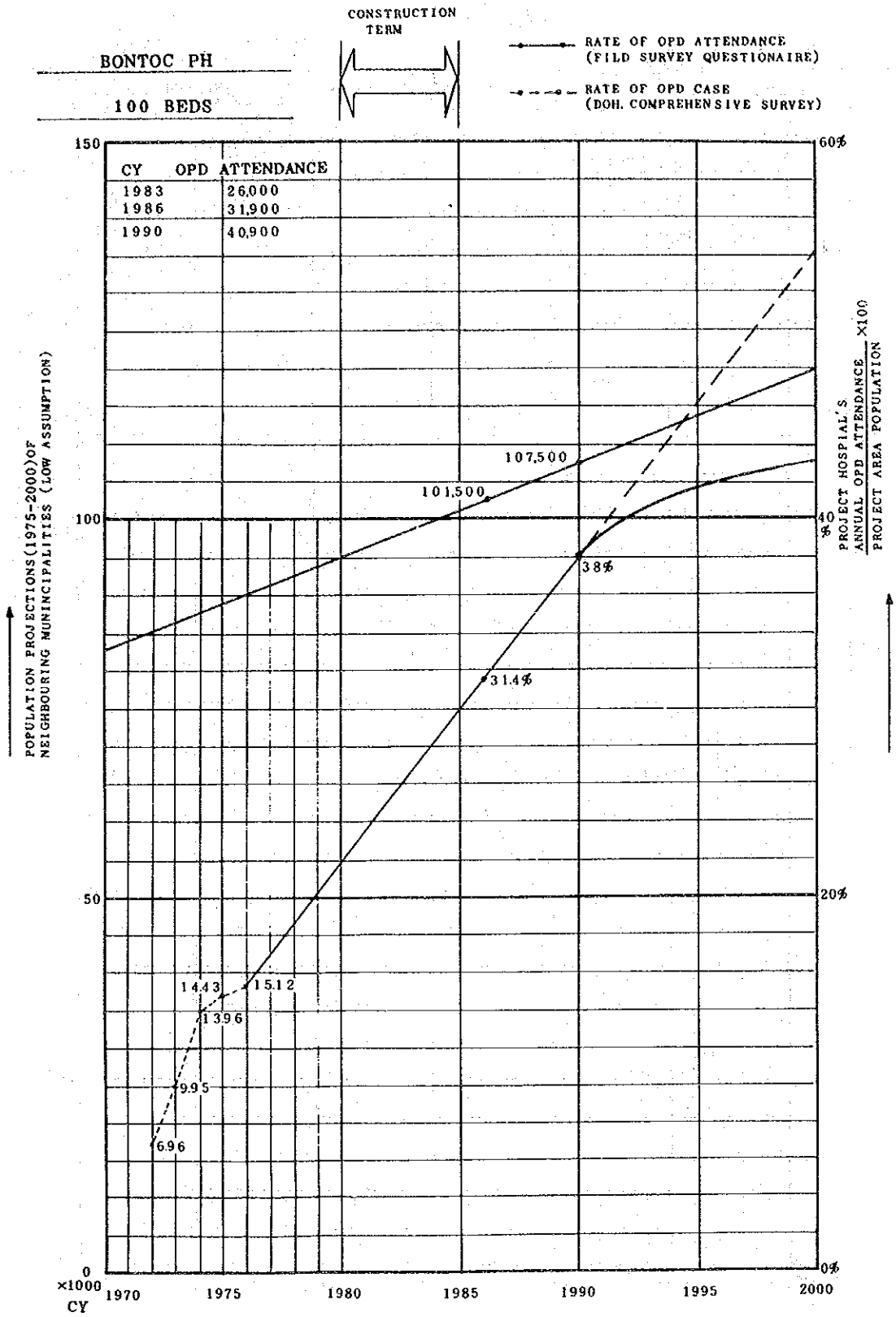
2) Estimate on Number of Outpatients

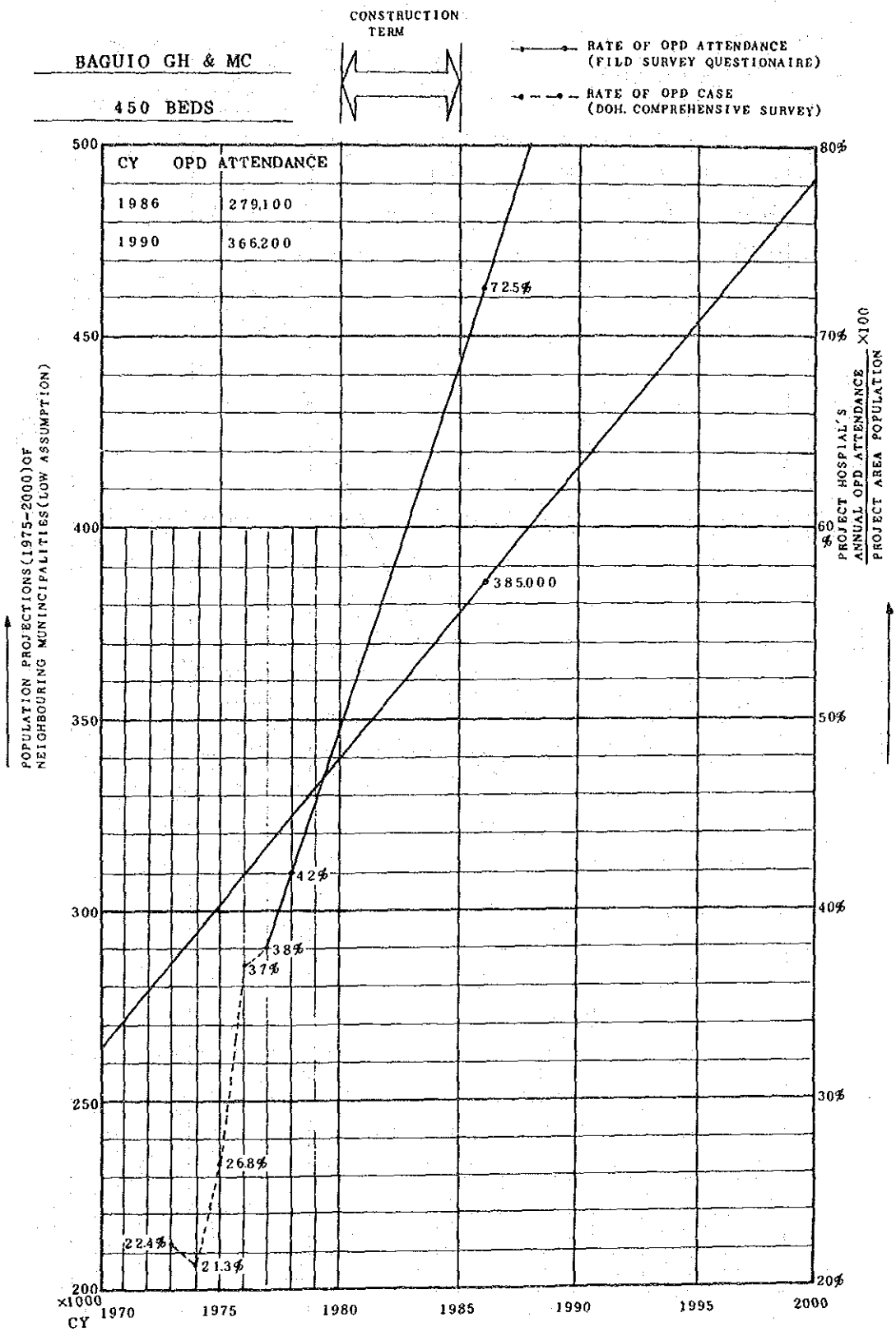
In broad terms, an estimate on the number of outpatients will be accompanied by the following raises in capacity under the present plan.

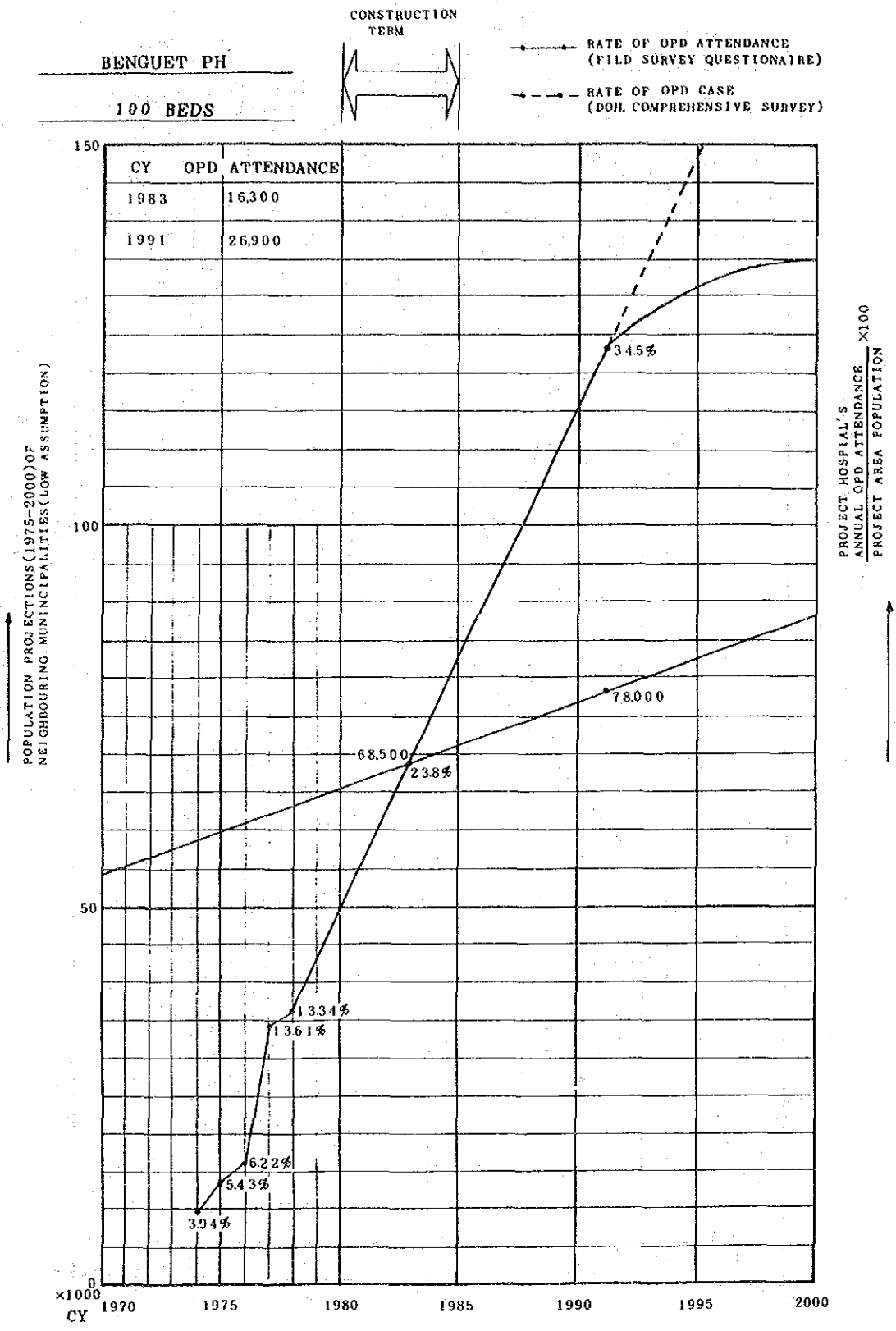
	Present	Planned			
Floor space of outpatient service sector	Region I 110 M^2	100 BED	200	300	450
		380 M^2	740 M^2	1110 M^2	1110 M^2
	Region II 15.5 M^2	380 M^2	740 M^2	1110 M^2	1110 M^2
Number of rooms	4 rooms	9 rooms	9 rooms	15 rooms	15 rooms
Manpower (physician + residents)	Increase of about 1.2 times				

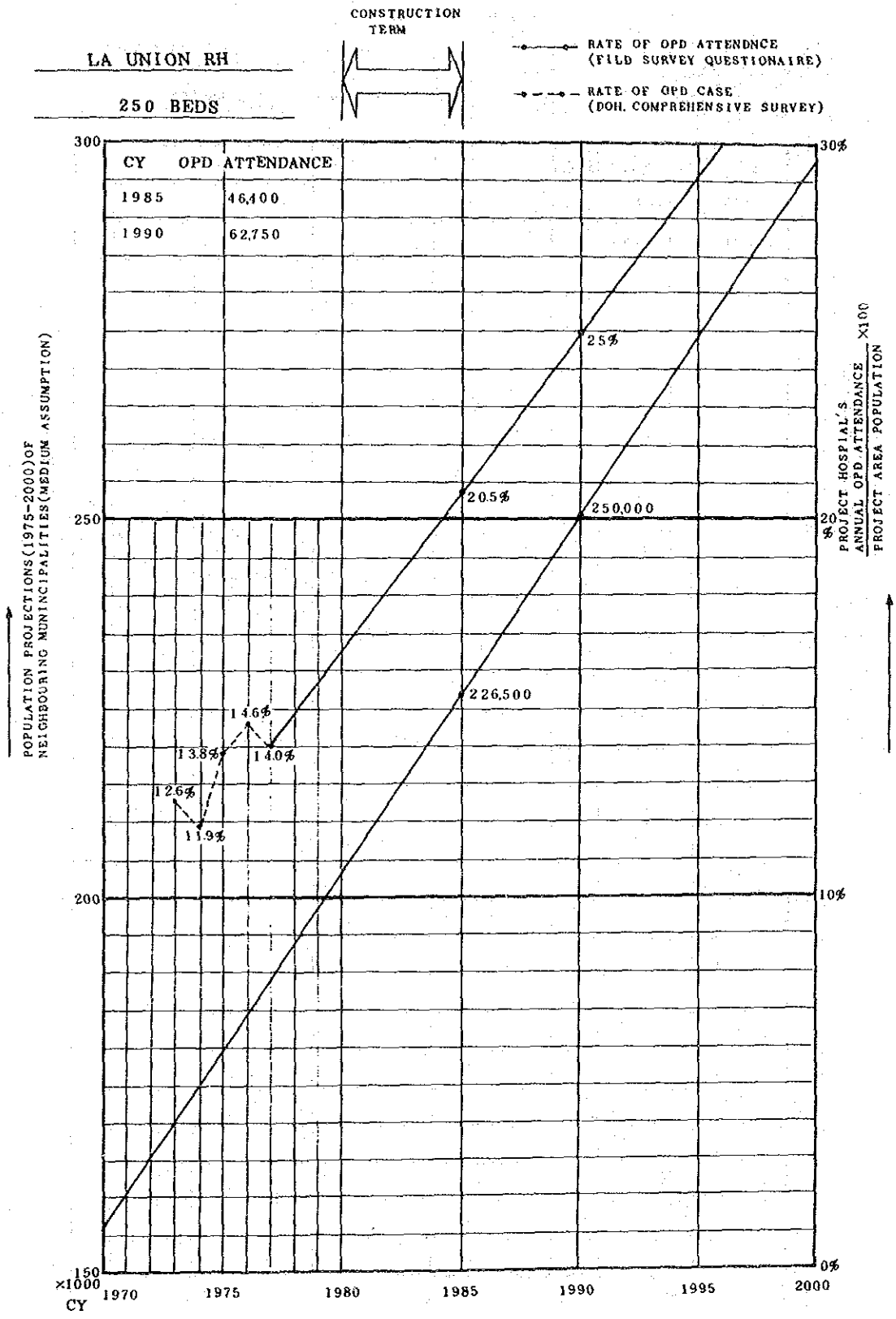
As a whole, it would be feasible to take care of three times the present number of outpatients. As any increase beyond this number will reach a saturation point, there will be a need for improvement. The number of outpatients at each subject hospital, as in the case of an estimate on the number of inpatients, will be estimated on the basis of annual changes in the rate of the number of outpatients at a given subject hospital to the population of the surrounding area.

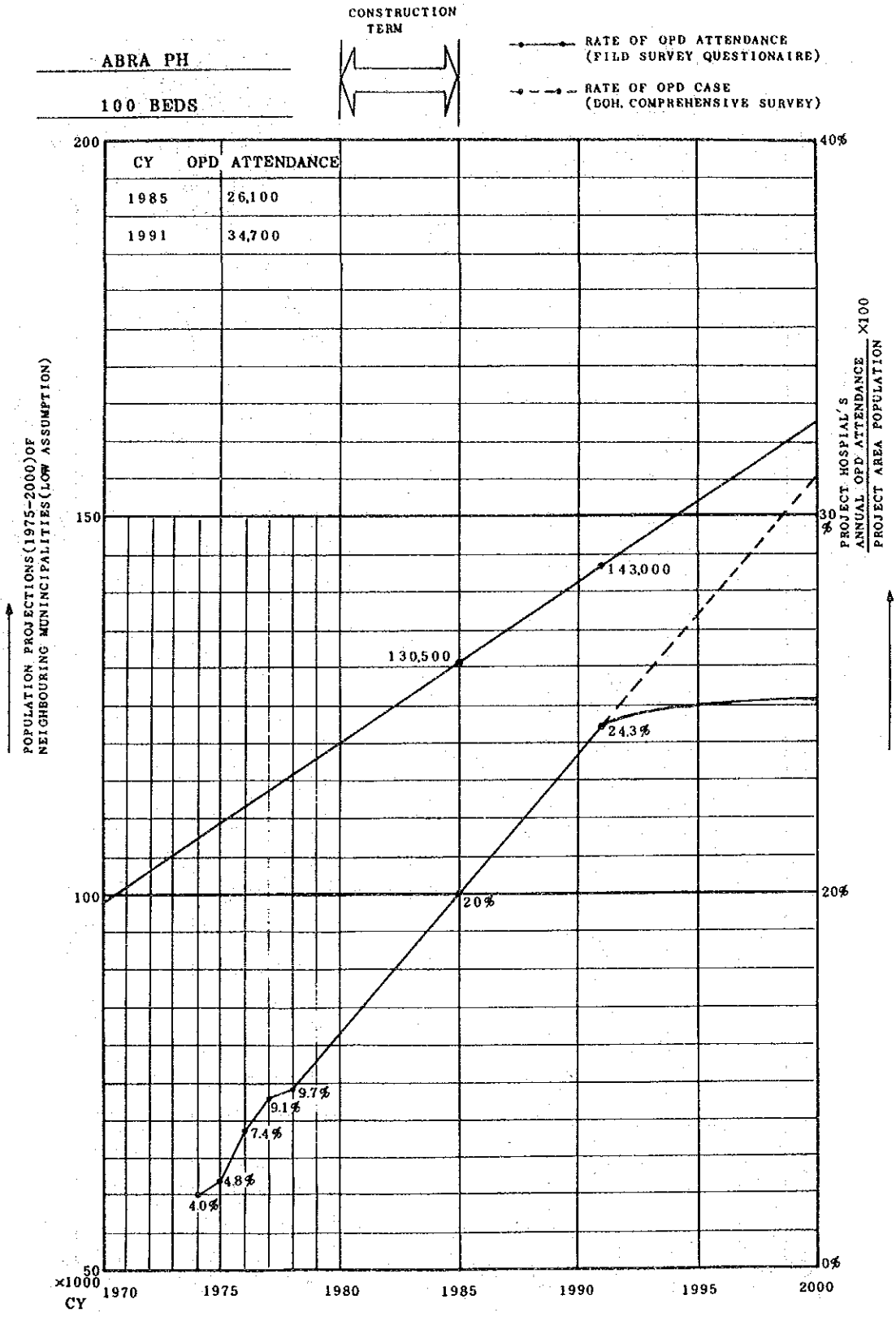

CONSTRUCTION TERM
RATE OF OPD ATTENDANCE (FILD SURVEY QUESTIONAIRE)
RATE OF OPD CASE (DOH. COMPREHENSIVE SURVEY)
PANGASINAN MC
450 BEDS.
CY OPD ATTENDANCE
1983-139,700
1990-267,000
703,000
635,000
38%
22%
15.4%
12.2%
11.2%
10.7%
9.5%
POPULATION PROJECTIONS(1975-2000)OF NEIGHBOURING MUNINCIPALITIES(LOW ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL OPD ATTENDANCE / PROJECT AREA POPULATION ×100
×1000
CY
1970
1975
1980
1985
1990
1995
2000

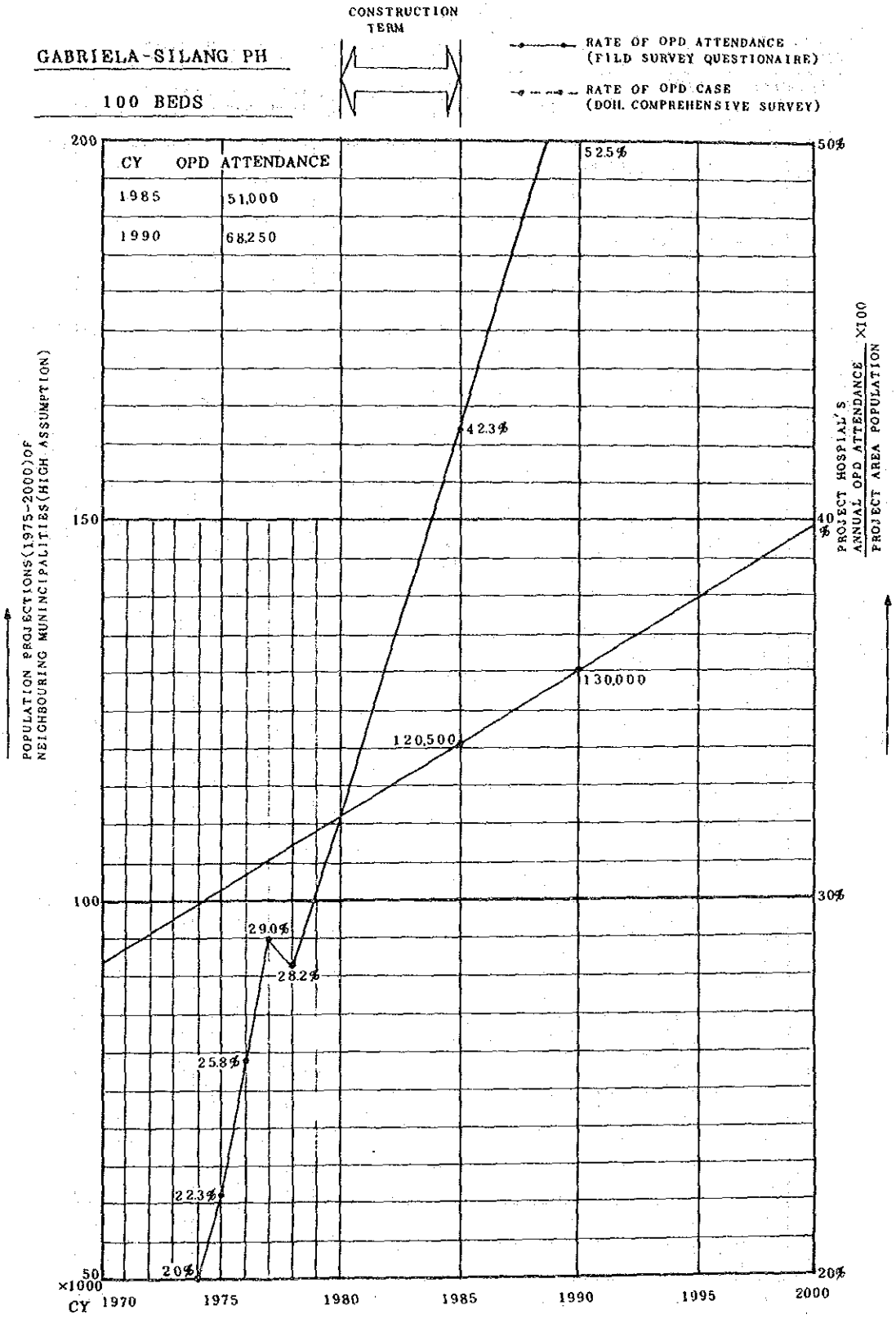

BONTOC PH
100 BEDS
CONSTRUCTION TERM
RATE OF OPD ATTENDANCE (FILD SURVEY QUESTIONAIRE)
RATE OF OPD CASE (DOH. COMPREHENSIVE SURVEY)
CY OPD ATTENDANCE
1983 26,000
1986 31,900
1990 40,900
107,500
101,500
38%
31.4%
14.43
15.12
13.96
9.95
6.96
POPULATION PROJECTIONS(1975-2000)OF NEIGHBOURING MUNINCIPALITIES (LOW ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL OPD ATTENDANCE / PROJECT AREA POPULATION ×100
150
100
50
0
60%
40%
20%
0%
×1000
CY
1970
1975
1980
1985
1990
1995
2000

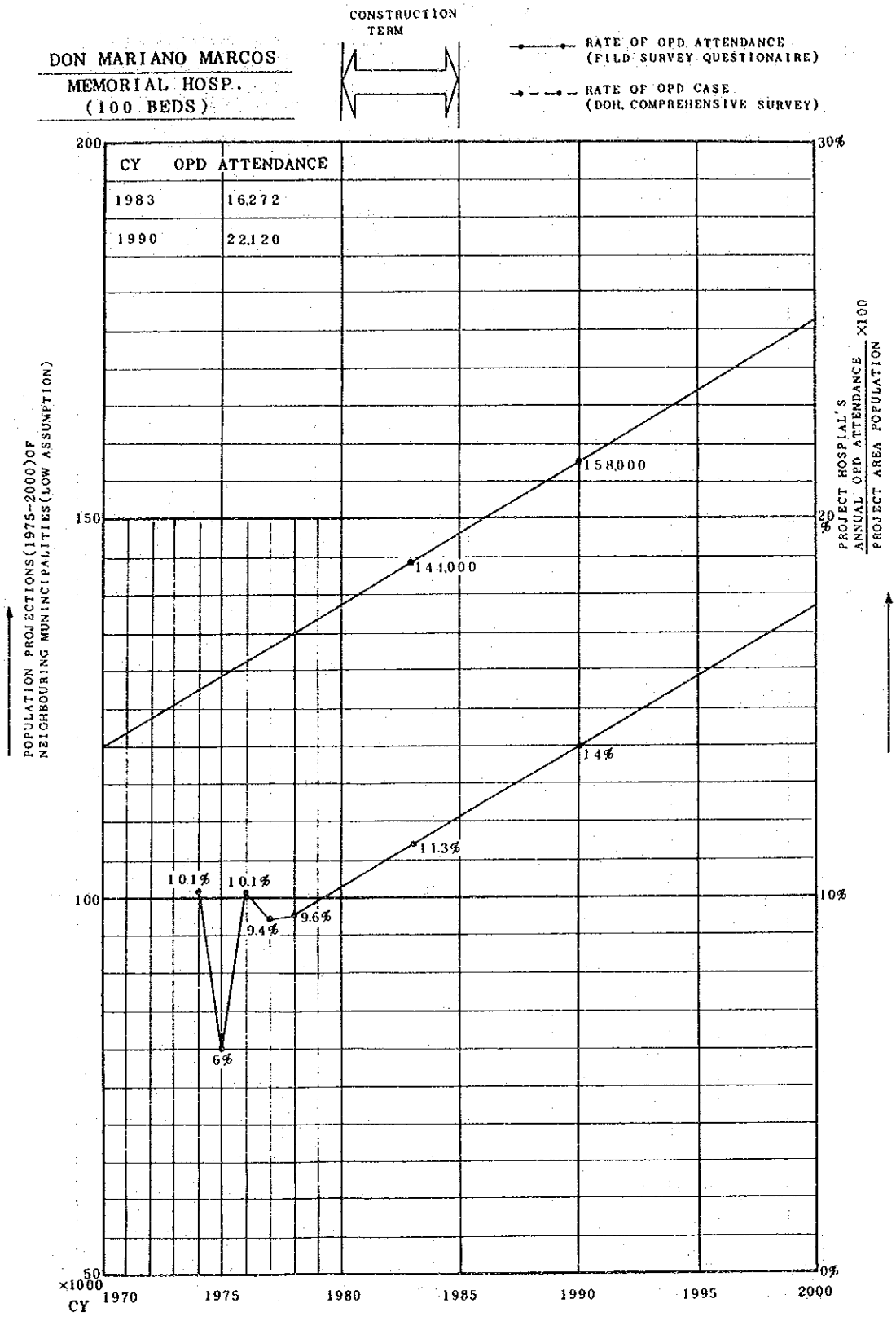

BAGUIO GH & MC
450 BEDS
CONSTRUCTION TERM
RATE OF OPD ATTENDANCE (FILD SURVEY QUESTIONAIRE)
RATE OF OPD CASE (DOH. COMPREHENSIVE SURVEY)
CY OPD ATTENDANCE
1986 279,100
1990 366,200
72.5%
385,000
42%
38%
37%
26.8%
22.4%
21.3%
POPULATION PROJECTIONS(1975-2000)OF NEIGHBOURING MUNINCIPALITIES(LOW ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL OPD ATTENDANCE / PROJECT AREA POPULATION ×100
%
×1000
CY
500
450
400
350
300
250
200
80%
70%
60%
50%
40%
30%
20%
1970
1975
1980
1985
1990
1995
2000

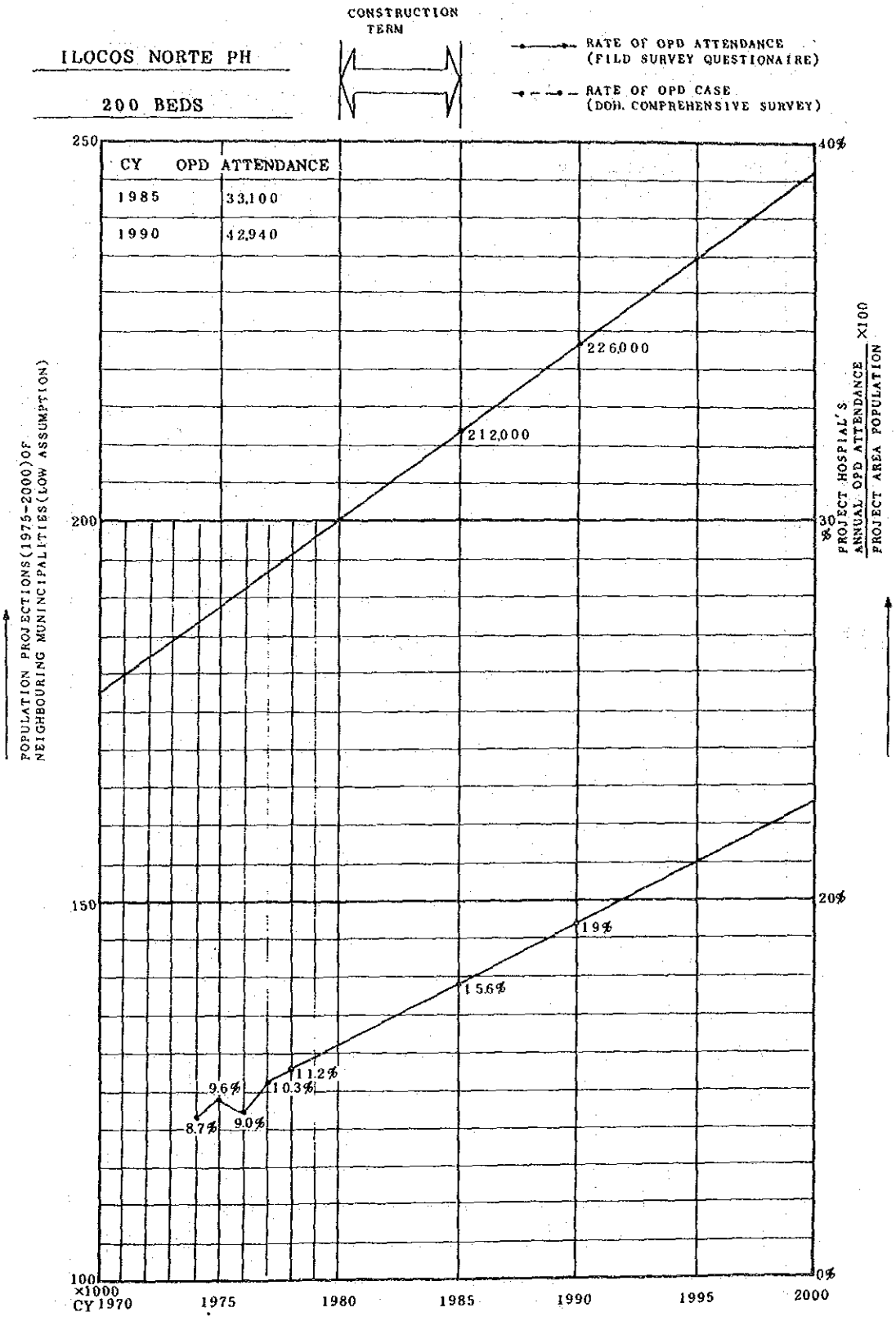

BENGUET PH
100 BEDS
CONSTRUCTION TERM
RATE OF OPD ATTENDANCE (FILD SURVEY QUESTIONAIRE)
RATE OF OPD CASE (DOH. COMPREHENSIVE SURVEY)
CY OPD ATTENDANCE
1983 16,300
1991 26,900
150
100
50
0
×1000
CY
1970
1975
1980
1985
1990
1995
2000
POPULATION PROJECTIONS(1975-2000)OF NEIGHBOURING MUNINCIPALITIES(LOW ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL OPD ATTENDANCE / PROJECT AREA POPULATION ×100
34.5%
78,000
68,500
23.8%
13.34%
13.61%
6.22%
5.43%
3.94%

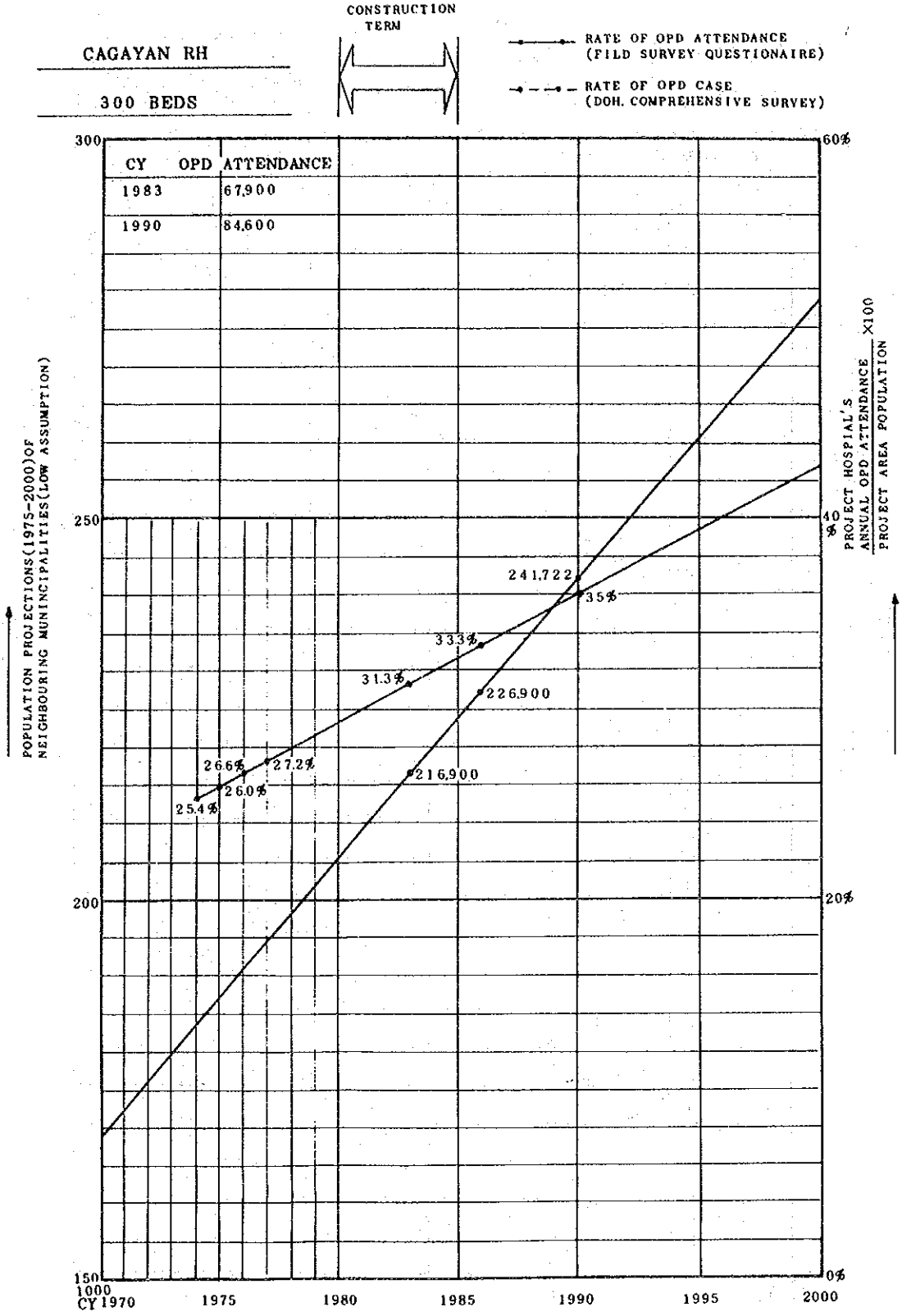

LA UNION RH
250 BEDS
CONSTRUCTION TERM
RATE OF OPD ATTENDNCE (FILD SURVEY QUESTIONAIRE)
RATE OF OPD CASE (DOH. COMPREHENSIVE SURVEY)
CY OPD ATTENDANCE
1985 46,400
1990 62,750
25%
20.5%
250,000
226,500
14.6%
13.8%
14.0%
12.6%
11.9%
POPULATION PROJECTIONS(1975-2000)OF NEIGHBOURING MUNINCIPALITIES(MEDIUM ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL OPD ATTENDANCE / PROJECT AREA POPULATION ×100
300
250
200
150
30%
20%
10%
0%
×1000
CY
1970
1975
1980
1985
1990
1995
2000

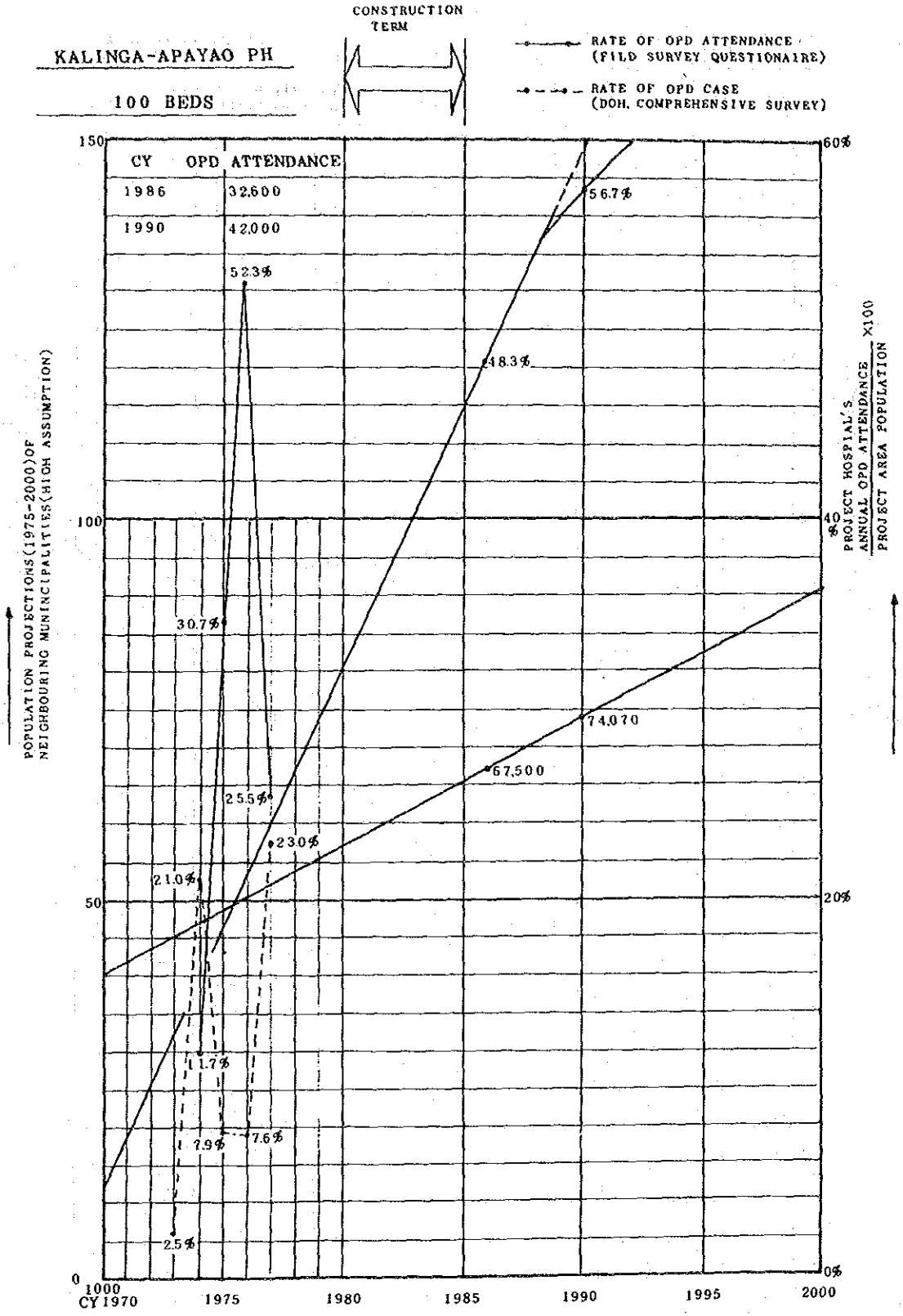

ABRA PH
100 BEDS
CONSTRUCTION TERM
RATE OF OPD ATTENDANCE (FILD SURVEY QUESTIONAIRE)
RATE OF OPD CASE (DOH. COMPREHENSIVE SURVEY)
CY OPD ATTENDANCE
1985 26,100
1991 34,700
POPULATION PROJECTIONS(1975-2000)OF NEIGHBOURING MUNINCIPALITIES(LOW ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL OPD ATTENDANCE / PROJECT AREA POPULATION ×100
143,000
130,500
24.3%
20%
9.7%
9.1%
7.4%
4.8%
4.0%
200
150
100
50
40%
30%
20%
0%
×1000
CY
1970
1975
1980
1985
1990
1995
2000

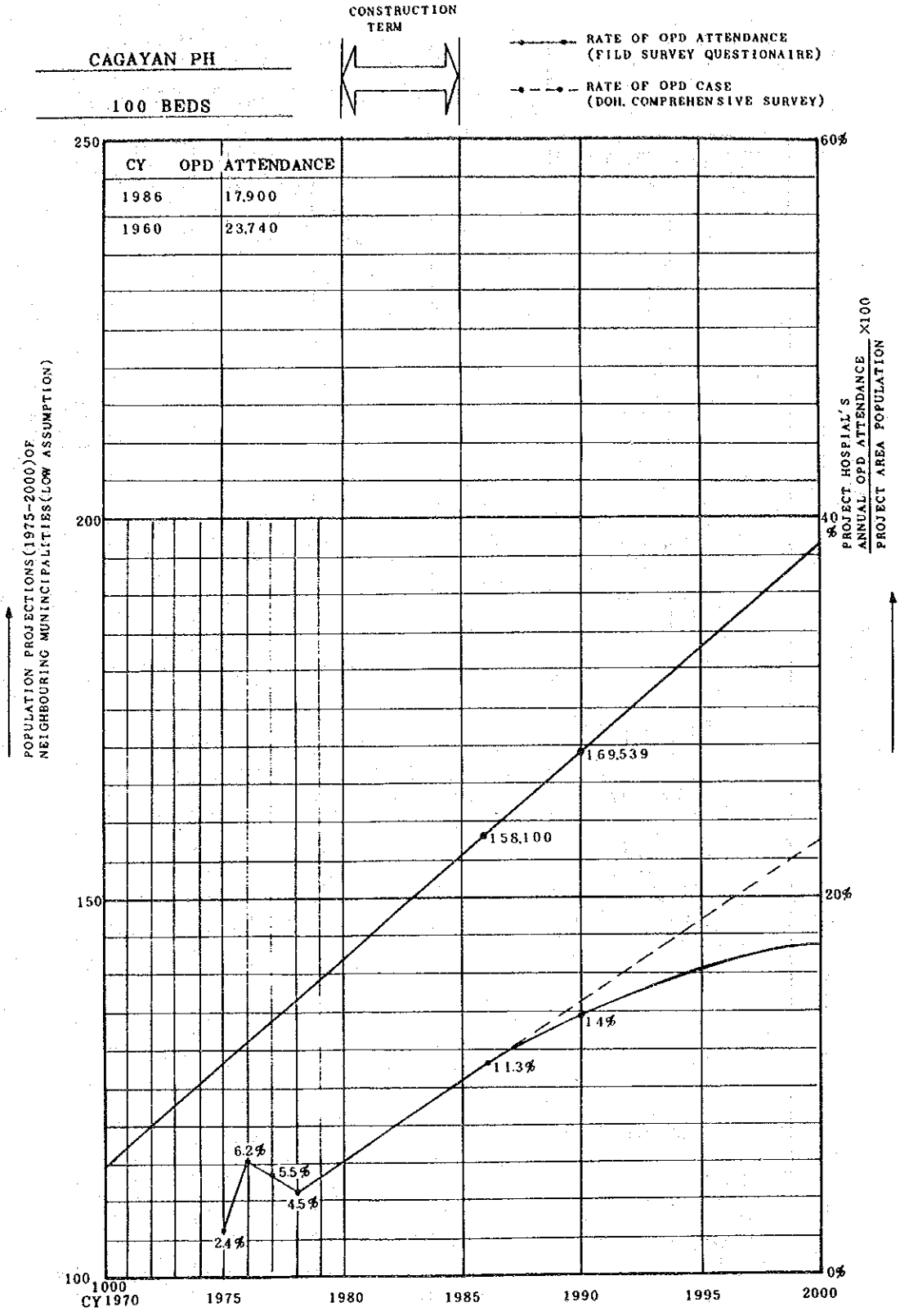

GABRIELA-SILANG PH
100 BEDS
CONSTRUCTION TERM
RATE OF OPD ATTENDANCE (FILD SURVEY QUESTIONAIRE)
RATE OF OPD CASE (DOH. COMPREHENSIVE SURVEY)
CY OPD ATTENDANCE
1985 51,000
1990 68,250
POPULATION PROJECTIONS(1975-2000)OF NEIGHBOURING MUNINCIPALITIES(HIGH ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL OPD ATTENDANCE / PROJECT AREA POPULATION ×100
200
150
100
50
×1000
50%
40%
30%
20%
CY 1970
1975
1980
1985
1990
1995
2000
52.5%
42.3%
29.0%
28.2%
25.8%
22.3%
20%
130,000
120,500

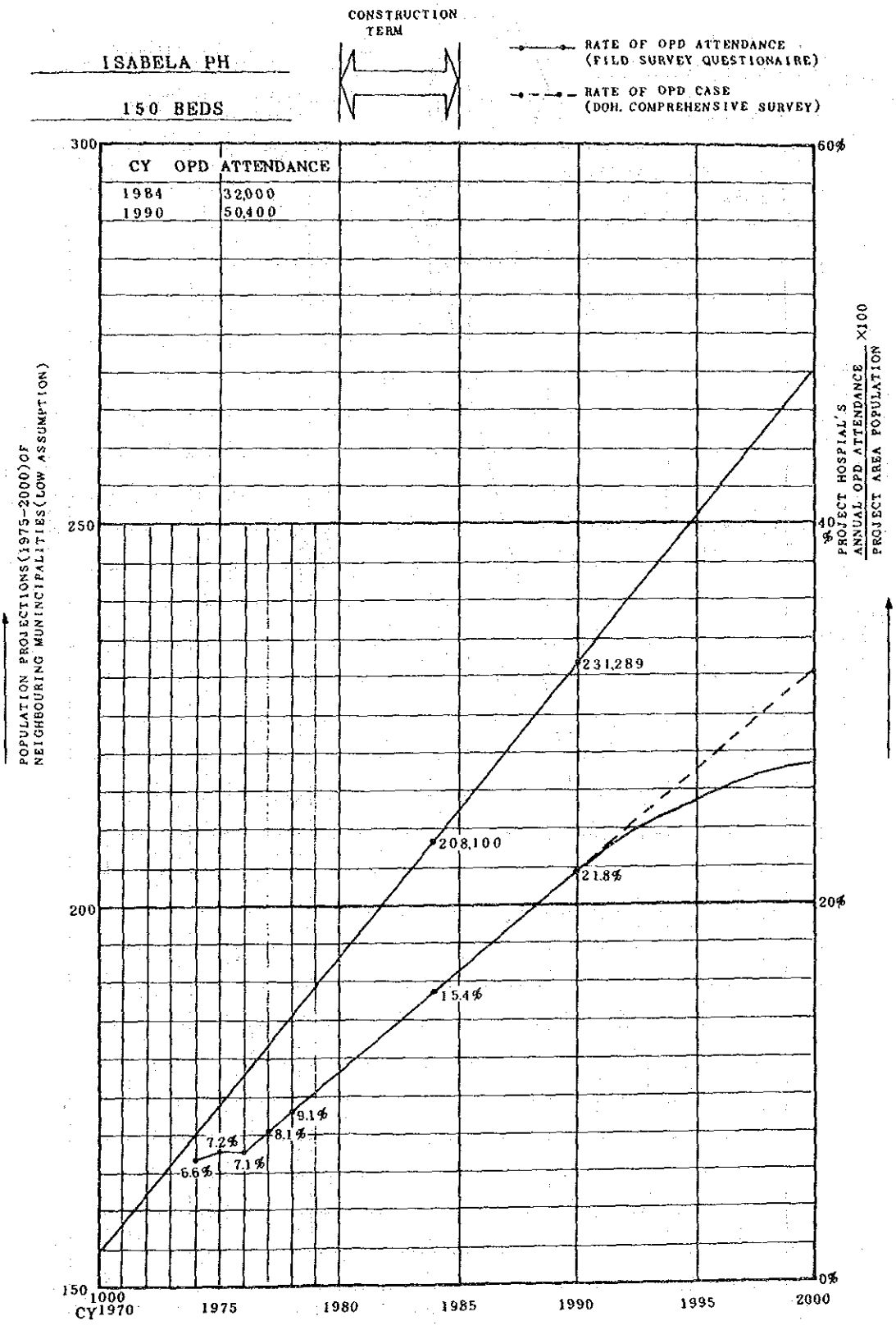

DON MARIANO MARCOS
MEMORIAL HOSP.
(100 BEDS)
CONSTRUCTION TERM
RATE OF OPD ATTENDANCE (FILD SURVEY QUESTIONAIRE)
RATE OF OPD CASE (DOH, COMPREHENSIVE SURVEY)
CY OPD ATTENDANCE
1983 16,272
1990 22,120
158,000
144,000
14%
11.3%
10.1%
10.1%
9.4%
9.6%
6%
POPULATION PROJECTIONS(1975-2000)OF NEIGHBOURING MUNINCIPALITIES(LOW ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL OPD ATTENDANCE / PROJECT AREA POPULATION ×100
200
150
100
50
×1000
30%
20%
10%
0%
CY
1970
1975
1980
1985
1990
1995
2000

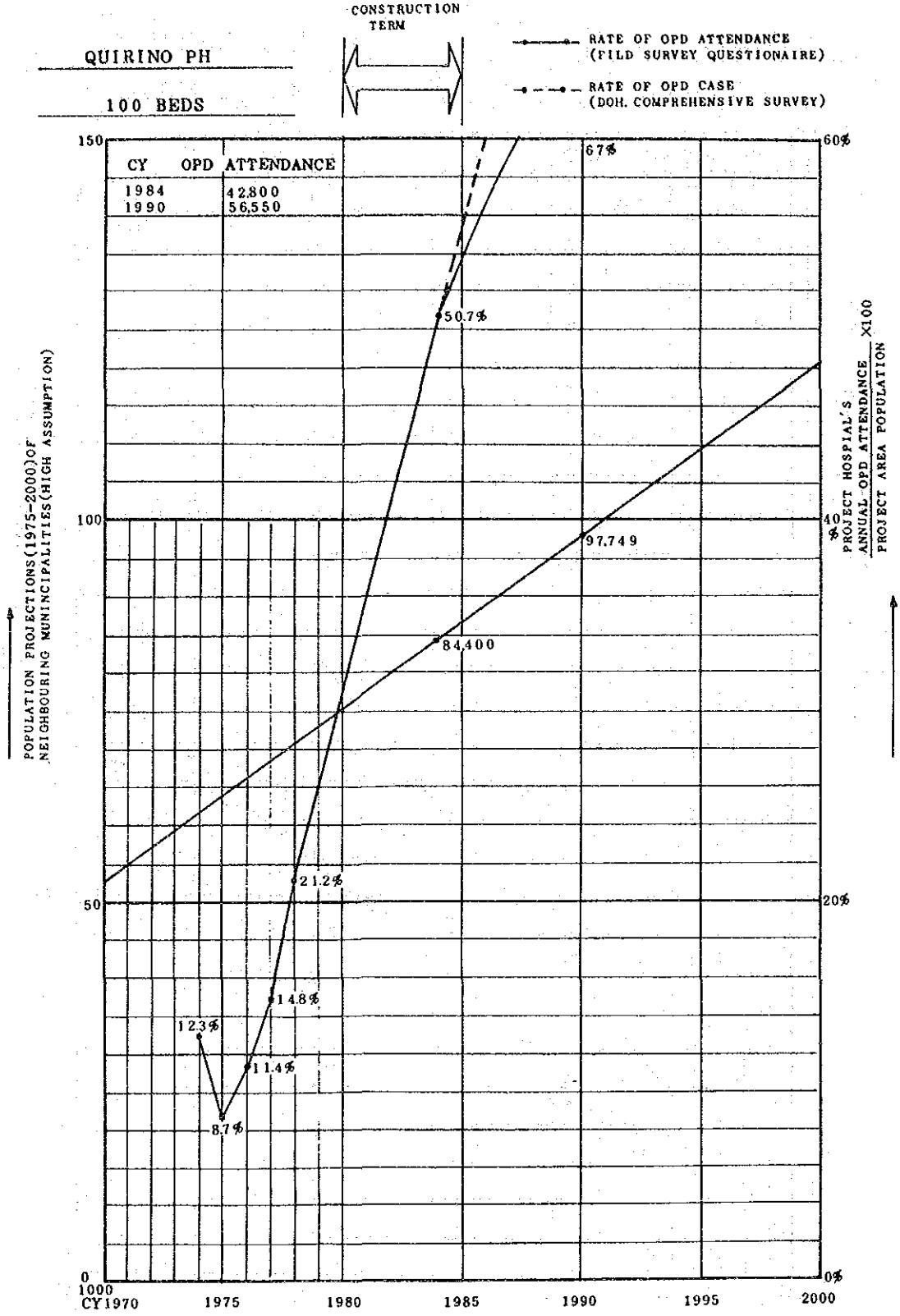

ILOCOS NORTE PH
200 BEDS
CONSTRUCTION TERM
RATE OF OPD ATTENDANCE (FILD SURVEY QUESTIONAIRE)
RATE OF OPD CASE (DOH. COMPREHENSIVE SURVEY)
CY OPD ATTENDANCE
1985 33,100
1990 42,940
226,000
212,000
15.6%
19%
8.7%
9.6%
9.0%
10.3%
11.2%
POPULATION PROJECTIONS (1975-2000) OF NEIGHBOURING MUNINCIPALITIES (LOW ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL OPD ATTENDANCE / PROJECT AREA POPULATION ×100
250
200
150
100
×1000
40%
30%
20%
0%
CY 1970
1975
1980
1985
1990
1995
2000

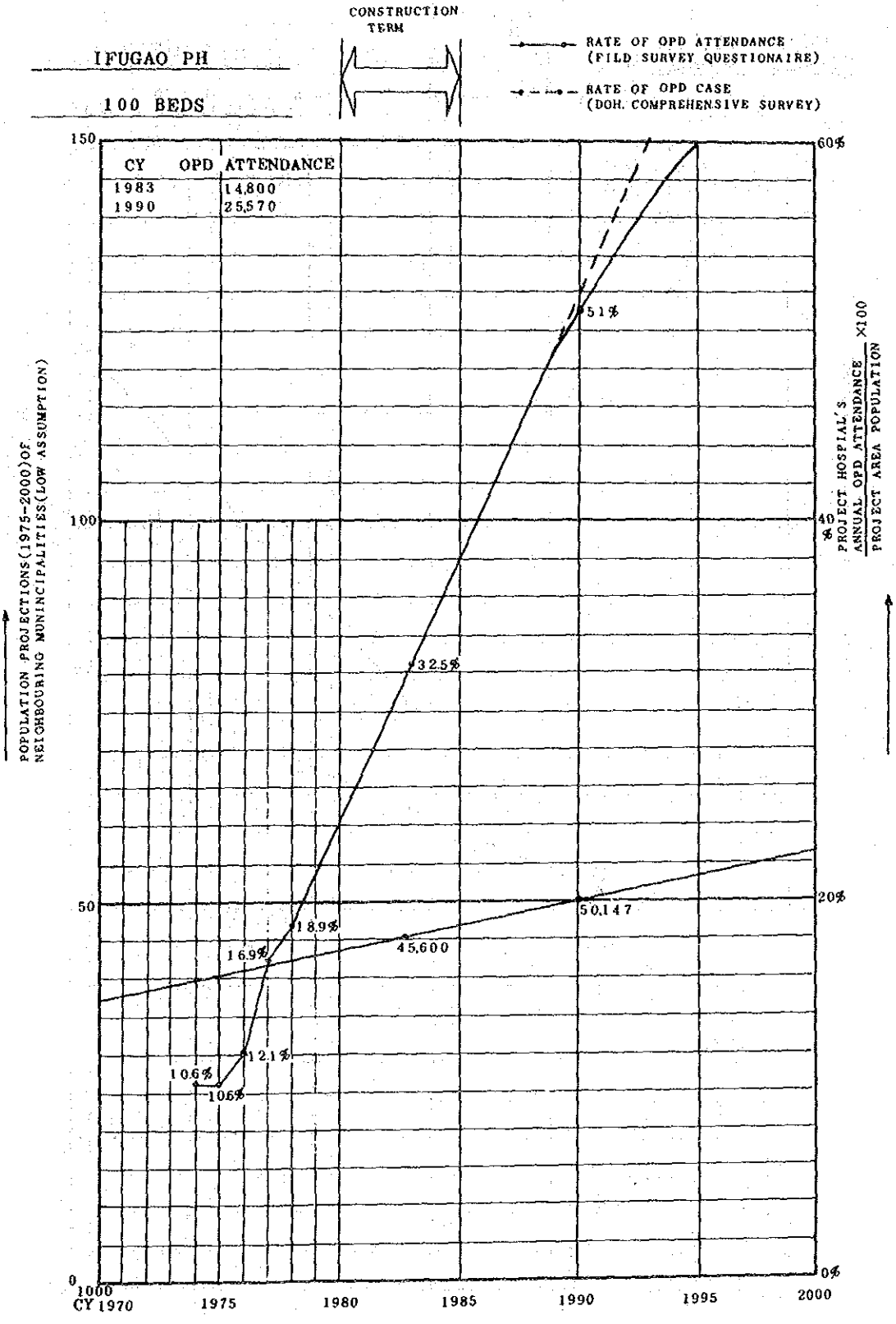

CAGAYAN RH
300 BEDS
CONSTRUCTION TERM
RATE OF OPD ATTENDANCE (FILD SURVEY QUESTIONAIRE)
RATE OF OPD CASE (DOH. COMPREHENSIVE SURVEY)
CY OPD ATTENDANCE
1983 67,900
1990 84,600
300
250
200
150
1000
60%
40%
20%
0%
241,722
35%
333%
31.3%
226,900
216,900
266%
27.2%
26.0%
25.4%
CY 1970
1975
1980
1985
1990
1995
2000
POPULATION PROJECTIONS(1975-2000)OF NEIGHBOURING MUNINCIPALITIES(LOW ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL OPD ATTENDANCE / PROJECT AREA POPULATION X100

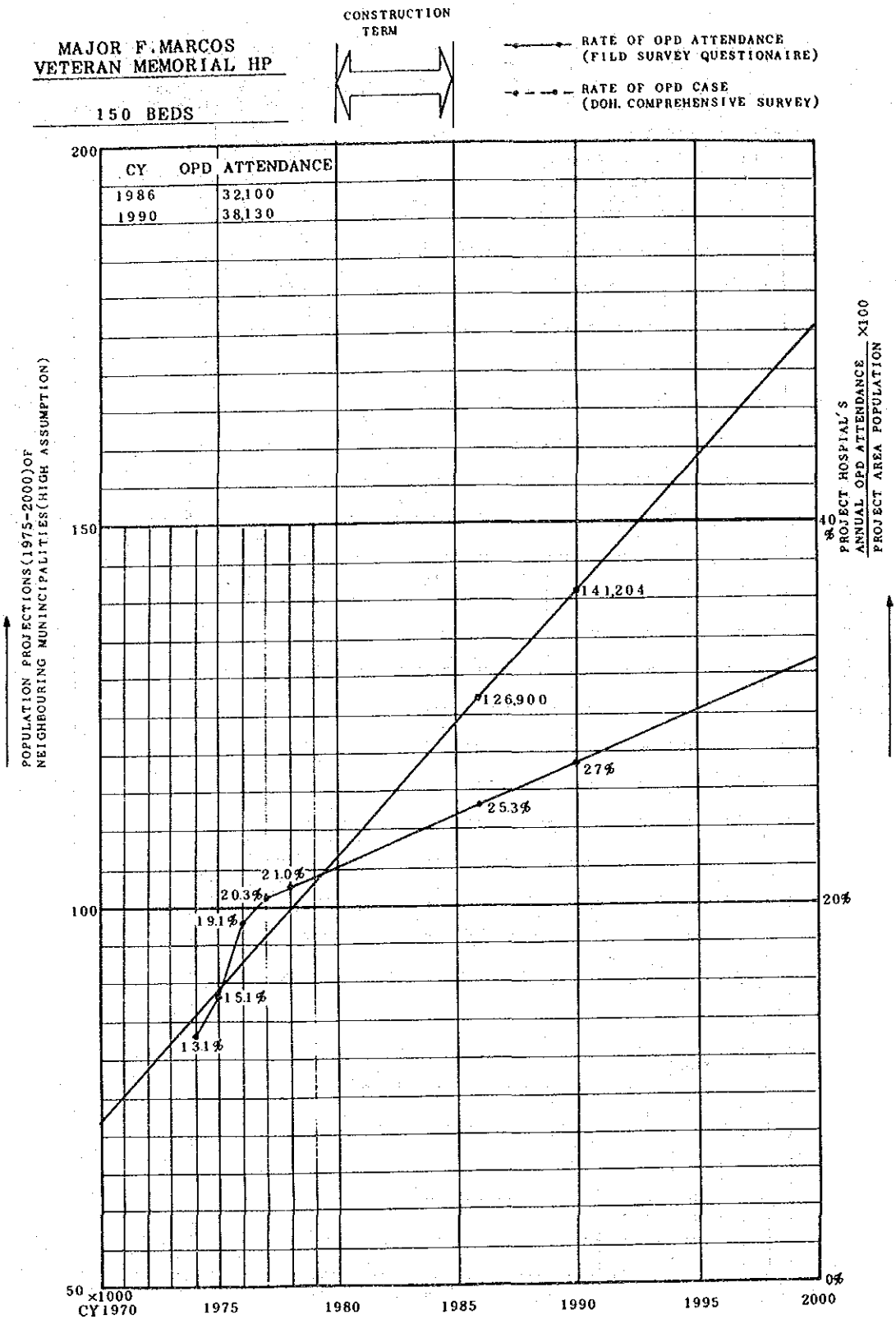

KALINGA-APAYAO PH
100 BEDS
CONSTRUCTION TERM
RATE OF OPD ATTENDANCE (FILD SURVEY QUESTIONAIRE)
RATE OF OPD CASE (DOH. COMPREHENSIVE SURVEY)
CY OPD ATTENDANCE
1986 32,600
1990 42,000
52.3%
56.7%
48.3%
30.7%
25.5%
23.0%
21.0%
11.7%
7.9%
7.6%
2.5%
74,070
67,500
POPULATION PROJECTIONS(1975-2000)OF NEIGHBOURING MUNINCIPALITIES(HIGH ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL OPD ATTENDANCE / PROJECT AREA POPULATION ×100
150
100
50
0
60%
40%
20%
0%
1000
CY 1970
1975
1980
1985
1990
1995
2000

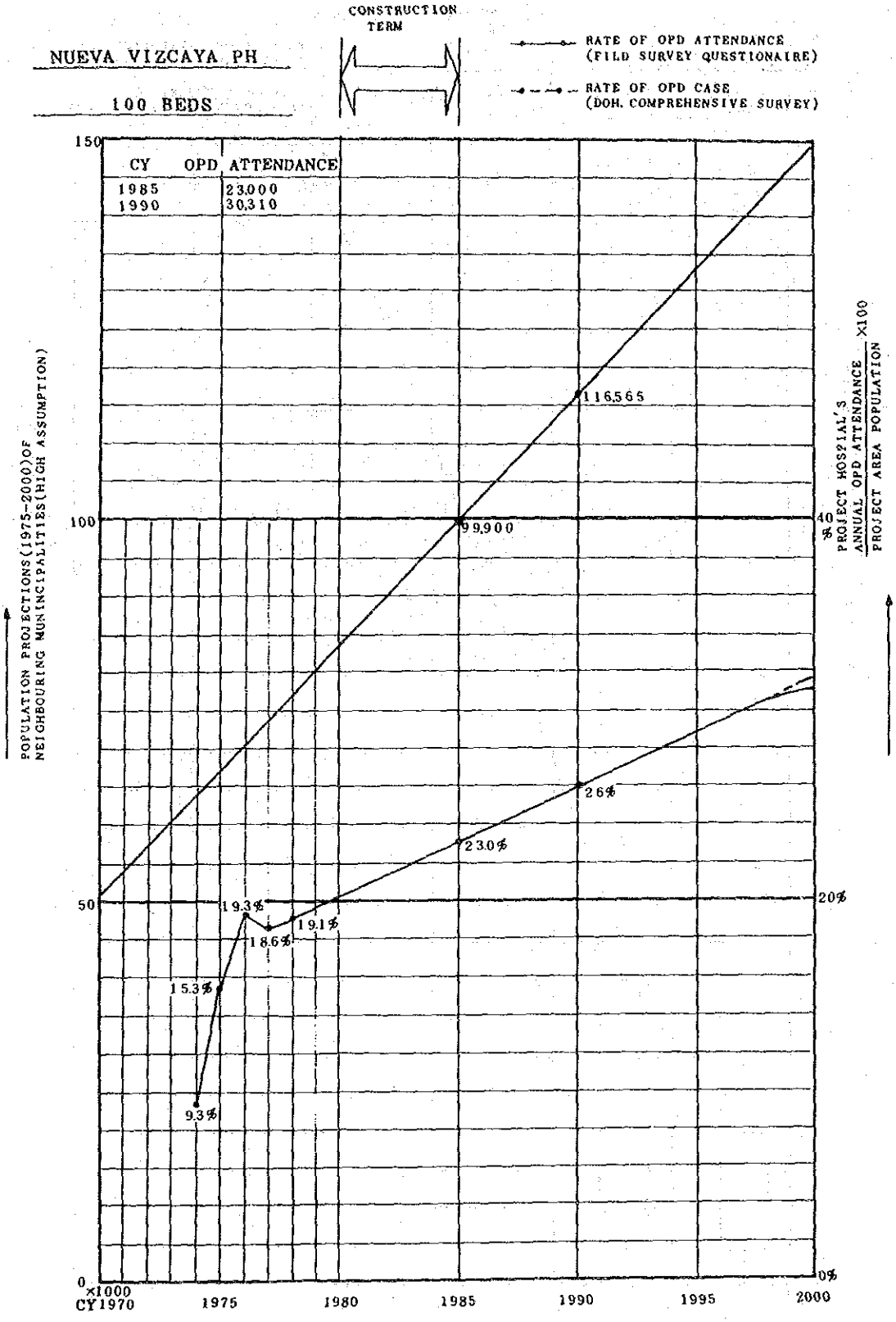

CONSTRUCTION TERM
CAGAYAN PH
100 BEDS
RATE OF OPD ATTENDANCE (FILD SURVEY QUESTIONAIRE)
RATE OF OPD CASE (DOH. COMPREHENSIVE SURVEY)
CY OPD ATTENDANCE
1986 17,900
1960 23,740
POPULATION PROJECTIONS(1975-2000)OF NEIGHBOURING MUNINCIPALITIES(LOW ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL OPD ATTENDANCE / PROJECT AREA POPULATION ×100
250
200
150
100
60%
40%
20%
0%
169,539
158,100
14%
11.3%
6.2%
5.5%
4.5%
2.4%
1000
CY1970
1975
1980
1985
1990
1995
2000

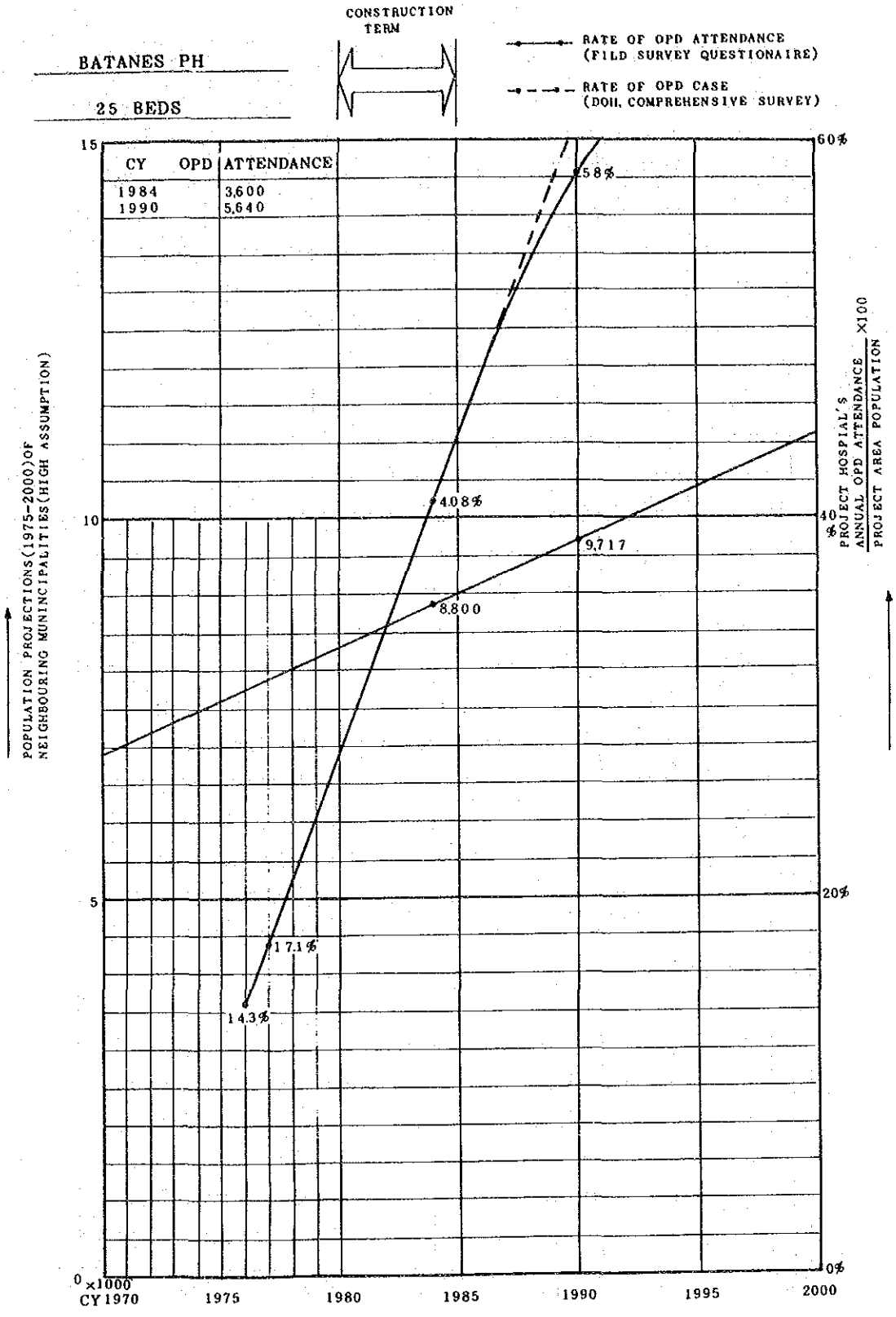

CONSTRUCTION TERM
ISABELA PH
150 BEDS
RATE OF OPD ATTENDANCE (FILD SURVEY QUESTIONAIRE)
RATE OF OPD CASE (DOH. COMPREHENSIVE SURVEY)
CY OPD ATTENDANCE
1984 32,000
1990 50,400
POPULATION PROJECTIONS(1975-2000)OF NEIGHBOURING MUNINCIPALITIES(LOW ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL OPD ATTENDANCE / PROJECT AREA POPULATION X100
300
250
200
150
60%
40%
20%
0%
1000
CY 1970
1975
1980
1985
1990
1995
2000
231,289
208,100
21.8%
15.4%
9.1%
8.1%
7.2%
7.1%
6.6%


QUIRINO PH
100 BEDS
CONSTRUCTION TERM
RATE OF OPD ATTENDANCE (FILD SURVEY QUESTIONAIRE)
RATE OF OPD CASE (DOH. COMPREHENSIVE SURVEY)
CY OPD ATTENDANCE
1984 42,800
1990 56,550
67%
50.7%
21.2%
14.8%
12.3%
11.4%
8.7%
97,749
84,400
POPULATION PROJECTIONS(1975-2000)OF NEIGHBOURING MUNINCIPALITIES(HIGH ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL OPD ATTENDANCE / PROJECT AREA POPULATION X100
150
100
50
0
1000
60%
40%
20%
0%
CY1970
1975
1980
1985
1990
1995
2000


IFUGAO PH
100 BEDS
CONSTRUCTION TERM
RATE OF OPD ATTENDANCE (FILD SURVEY QUESTIONAIRE)
RATE OF OPD CASE (DOH. COMPREHENSIVE SURVEY)
CY OPD ATTENDANCE
1983 14,800
1990 25,570
150
100
50
0
60%
40%
20%
0%
51%
32.5%
18.9%
16.9%
12.1%
10.6%
10.6%
50,147
45,600
1000
CY 1970
1975
1980
1985
1990
1995
2000
POPULATION PROJECTIONS(1975-2000)OF NEIGHBOURING MUNINCIPALITIES(LOW ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL OPD ATTENDANCE / PROJECT AREA POPULATION ×100


MAJOR F.MARCOS
VETERAN MEMORIAL HP
150 BEDS
CONSTRUCTION
TERM
RATE OF OPD ATTENDANCE
(FILD SURVEY QUESTIONAIRE)
RATE OF OPD CASE
(DOH. COMPREHENSIVE SURVEY)
CY OPD ATTENDANCE
1986 32,100
1990 38,130
POPULATION PROJECTIONS(1975-2000)OF
NEIGHBOURING MUNINCIPALITIES(HIGH ASSUMPTION)
PROJECT HOSPIAL'S
ANNUAL OPD ATTENDANCE / PROJECT AREA POPULATION ×100
200
150
100
50
×1000
40
%
20%
0%
141,204
126,900
27%
25.3%
21.0%
20.3%
19.1%
15.1%
13.1%
CY1970
1975
1980
1985
1990
1995
2000


NUEVA VIZCAYA PH
100 BEDS
CONSTRUCTION TERM
RATE OF OPD ATTENDANCE (FILD SURVEY QUESTIONAIRE)
RATE OF OPD CASE (DOH. COMPREHENSIVE SURVEY)
CY OPD ATTENDANCE
1985 23,000
1990 30,310
116,565
99,900
26%
23.0%
19.3%
19.1%
18.6%
15.3%
9.3%
150
100
50
0
40%
20%
0%
×1000
CY1970
1975
1980
1985
1990
1995
2000
POPULATION PROJECTIONS(1975-2000)OF NEIGHBOURING MUNINCIPALITIES(HIGH ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL OPD ATTENDANCE / PROJECT AREA POPULATION ×100


BATANES PH
25 BEDS
CONSTRUCTION TERM
RATE OF OPD ATTENDANCE (FILD SURVEY QUESTIONAIRE)
RATE OF OPD CASE (DOH, COMPREHENSIVE SURVEY)
CY OPD ATTENDANCE
1984 3,600
1990 5,640
58%
40.8%
17.1%
14.3%
9,717
8,800
POPULATION PROJECTIONS(1975-2000)OF NEIGHBOURING MUNINCIPALITIES(HIGH ASSUMPTION)
PROJECT HOSPIAL'S ANNUAL OPD ATTENDANCE / PROJECT AREA POPULATION ×100
15
10
5
0 ×1000
60%
40%
20%
0%
CY 1970
1975
1980
1985
1990
1995
2000

3) Estimate on Number of Deliveries

In broad terms, an estimate on the number of deliveries will be accompanied by the following raises in capacity under the present plan.

Total Bed	OB-Bed	Delivery Room	Labor Room	Case/day	Case/year
100	15	1	1	1 ∿ 2	365 ∿ 730
200	30	2	1	2 ∿ 4	730 ∿ 1460
300	45	2	2	3 ∿ 6	1095 ∿ 2190
450	68	2	2	4.5 ∿ 9	1643 ∿ 3285

Generally, arrangements will be made so that one or two deliveries may be taken care of per 100 beds a day. Next, an estimate on the number of deliveries at each hospital will be set at 1.5 ∿ 2.0 times the average deliveries in the five years from 1974 to 1978.

ESTIMATE OF THE NUMBER OF DELIVERY

SOURCES Field Survey Questionnaire

Abnormal Delivery / Normal Delivery

Hospital	1974	1975	1976	1977	1978	5 Years Average	Projection in 1985	Case/ bed per day
Pangasinan	410 / 1111	339 / 1233	482 / 1424	564 / 2023	584 / 2067	475.8 / 1571.6	713.7 / °2357.4	2.61 / 8.61
Bontoc	8 / 100	10 / 132	32 / 141	25 / 162	36 / 172	22.2 / 141.4	44.4 / 282.8	0.12 / 0.77
Baguio*1	2341	1969	2369	2372	2590	2328.2	°3492.3	12.76
Benguet	472	507	566	640	44 / 680	44 / 573	88 / 1146	0.24 / 3.14
La Union	374	470	588	680	27 / 649	27 / 552.2	54 / 1104.4	0.15 / 3.02
Abra	-	21 / 173	39 / 164	20 / 171	54 / 215	33.5 / 180.8	67 / 361.6	0.78 / 0.99
Gabriela Silang	103 / 289	117 / 279	129 / 298	114 / 308	112 / 313	115 / 297.4	230 / 594.8	0.63 / 1.63
Don M. Marcos	4 / 108	6 / 132	5 / 154	5 / 153	18 / 207	7.6 / 150.8	15.2 / 301.6	0.04 / 0.83
Ilocos Norte	35 / 282	41 / 286	46 / 350	49 / 386	49 / 443	44 / 349.4	88 / 698.8	0.24 / 1.91
Cagayan	200 / 838	169 / 959	215 / 865	235 / 995	248 / 1289	213.4 / 989.2	320.1 / °1483.8	1.17 / 5.42
Kalinga Apayao	6 / 34	4 / 40	3 / 20	2 / 71	1 / 79	3.2 / 48.8	6.4 / 97.6	0.02 / 0.27
Aparri *1	-	-	52	47	-	49.5	99	0.27
Isabela *1	240	275	242	249	-	251.5	503	1.38
Quirino	0 / 30	0 / 44	0 / 50	0 / 32	0 / 62	0 / 43.6	0 / 87.2	0 / 0.24
Ifugao	55 / 114	23 / 91	19 / 38	31 / 102	32 / 137	32 / 96.4	64 / 192.8	0.18 / 0.53
Maj. F. Marcos	6	46	730	1095	-	469.3	938.6	2.57
Nueva Vizcaya	21 / 68	24 / 70	31 / 82	36 / 90	41 / 98	30.6 / 81.6	61.2 / 163.2	0.17 / 0.45
Batanes *2	-	-	-	0 / 57	-	0 / 57	0 / 114	0 / 0.31

Normal delivery include Cesarian Cases.
*1 data from Comprehensive Report
*2 data from Field Survey hearing

4) Estimate on Number of Operations

In an estimate on the number of operations, there is a variation of two to five cases per bed in the case of Japanese public hospitals.

As classified by type of operation -- i.e., major operation, minor operation and emergency operation, the number of operations per year are:

Average 1.5 cases × 250 days = 375 cases/year (2.5 hours × 1.5 cases = 3.75 hours) per major operation room

Average 3 cases × 250 days = 750 cases/year (15 hours × 3 cases = 4.5 hours) per minor operation room

Average 5 cases × 250 days = 1.250 cases/year (1 hour × 5 cases = 5.0 hours) per emergency operation room

The figures represent the maximum capacity.

When these figures are applied to the planned operation rooms by type of planning as at present, the following table may be obtained.

Beds	Major operation room	Minor operation room	Emergency operation room	Case/year	Case/day
450	4	2	1	4250	17
300	4	2	1	4250	17
200	2	1	1	2750	11
100	1	1	0	1125	4.5

In respect to the number of operations at each subject hospital, we estimate the number at three times the average number of operations in the last five years (1974-78). For hospitals where data are available only on major operations, we estimate it at six times.

ESTIMATE OF THE NUMBER OF OPERATION (MAJOR & MEDIUM)

Hospital	1974	1975	1976	1977	1978	AVERAGE for 5 years	PROJECTION IN 1985∿	Case/ bed
Pangasinan	1323	576	862	1323	1228	1062.4	3200	7.1
Bontoc	27	32	42	63	137	60.2	200	2
Baguio*	479	434	483	468	532	479.2	2800	6.2
Benguet	47	59	58	58	70	58.4	200	2
La Union*	137	146	298	292	(517)	226.4	1400	5.6
Abra	-	125	114	229	108	144	400	4
Gabriela Silang*	109	155	249	311	-	206	600	6
Don M. Marcos	260	190	367	355	247	283.8	900	6
Ilocos Norte	465	530	663	633	507	559.6	1700	8.5
Cagayan	534	614	658	664	753	644.6	1900	6.3
Kalinga Apayao	198	205	308	194	322	245.4	700	7
Aparri	-	32	52	81	108	68.3	200	2
Isabela	211	210	170	207	-	199.5	600	4
Quirino	72	58	68	60	102	72	200	2
Ifugao	181	161	179	238	261	204	600	6
Maj. F. Marcos	-	-	-	-	210	210	600	4
Nueva Vizcaya	120	105	131	110	-	93.2	300	3
Batanes	-	-	-	-	-	-	200	2

*Data from Comprehensive Survey (number of operation is only major operation) Projection number is × 6

4. Present Condition of the Regional Health Care Infrastructure

1) Hospital Building

Hospitals investigated this time not only treat patients, but also functionally play the role of a nucleus for medical and health service in the respective regions covering the education and training of doctors, nurses and medical technicians, health guidance such as family planning, etc. Some hospitals have been providing regional medical service for half a century since their construction in 1920s, but most were constructed in the 1940s and 1950s with the aid of the United States of America. Even the latter are reaching the functional limit of hospital facilities as it is already 30 years since they were constructed, and their drastic renovation is required to provide modern medical service. There are already a few hospitals which are having new facilities built in different sites to provide modern medical service.

These hospitals have the following features, by construction age.

- o Hospitals built in 1920s

  One-storied or two-storied buildings of wooden or brick construction. Ward additions are mostly of reinforced concrete construction.
  Elevated floor and high ceiling suitable for natural ventilation.
  The addition to building facilities according to the increase of hospital functions aggravates communication among facilities, and disorders ward connections and traffic lines.

- o Hospitals built in the 1940s and 1950s

  Symmetric design of colonial style
  One-storied or two-storied buildings of reinforced concrete construction
  Direct sunlight is prevented by colonnades and the ceiling is made high for ventilation.
  Middle corridor plan
  Undesirable effects due to additions and renovation are observed.

- o Hospitals completed recently or being constructed

  Facilities are centralized and some hospital buildings are of multistoried reinforced concrete construction.
  Openings to the outside have become larger, but design consideration is made for shading.

Ventilation has changed from natural ventilation to mechanical ventilation using coolers, etc.
Due to multistoried construction and mechanical ventilation, story height has become small.

Middle corridor plan

Hospitals expand to involve complicated functions, in response to the expanding health care service and sophisticated and complicated medical techniques together with the progress of society. However, the added and renovated facilities investigated this time are not consistent with forward looking organic facilities planning to meet such situations. Apart from the historical features of construction techniques and construction materials, this trend of hospital facilities is a problem in facilities planning, and must be settled in the planning of new building, addition or renovation.

2) Electric Facilities

1) The ratios of power supply to the population of each province in Regions I and II are shown by province (Fig. 1).

2) The difference (power reserve) between the amount of power generated by outside power plants - sold power - and that generated by plants within hospital grounds - generated power - in Region I and II are shown by province (Fig. 2).

3) Transmission lines grouped by their respective voltage levels from power plants in Regions I and II are shown by province (Fig. 3).

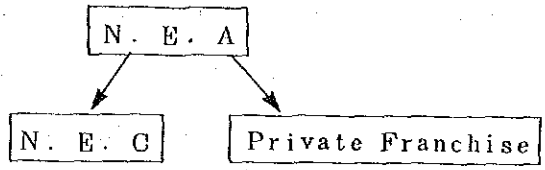
4) The telecommunication conditions, and the numbers of exchange installations, radio stations and telegraph offices in Regions I and II are shown by province (Fig. 4).

5) The transmission lines and planned lines of private power corporations in Region II are shown (Fig. 5).

(1) Power supply system

The power supply system in the Philippines consists of two major subsystems, the NPC (National Power Corporation) and private franchise subsystem. In Region I, all hospitals but Bontoc are supplied power from NPC substations. In Region II, all hospitals but Batanes are supplied from private franchise. Since Batanes is an island, a generator

of about 50KVA provides the power supply for the entire island.
Private franchises are not completely free from any relation with NPC.
Private franchises are supervised by a national organ, the National Electric Association (NEA). According to the national development of power supply, NEA supervises the private sector on the equipment and may replace some by national operation, considering the balance of power supply with other provinces.



(2) Lead-in charges

Lead-in charges are somewhat different from those of Japan. In the Philippines, plural lines can be led in to one site, and all the hospitals surveyed have plural lines of low voltage led in to their sites.

In this case, the expenses for the pole transformer, site pole and wiring are free of charge in the case of private franchise, but the expenses for site wires must be borne by the user in case of NPC. Furthermore, when high voltage (extra-high voltage) is received, using transforming equipment, the expenses for one set of transforming equipment must be borne by the user.

Unlike the case in Japan, transmission lines are not spread entirely over the country, and the spread of transmission lines must rely on national development projects.

(3) System of power rates

Power rates are different among the various districts, irrespective of NPC or private franchise. Here, there is no basement charge as in Japan, and users are charged only for actual consumption. An example is shown below.

If 600KWH is consumed;

$$\left[\begin{array}{l} \text{1st} \quad 15\text{KWH} \quad 0.5 \\ \text{Next} \quad 30\text{KWH} \quad 0.4 \\ \text{Excess} \quad \text{KWH} \quad 0.35 \\ \quad \left\{15\,\text{KWH} \times 0.5 + 30\,\text{KWH} \times 0.4 + (600 - 45)\,\text{KWH} \times 0.35\right\} \times (1 - 0.2) \\ \text{discount} \quad 20\% \end{array}\right]$$

The discount shown above is applied to public facilities such as national hospitals. This is not applied in all districts, but only in some districts in which power is supplied by NPC.

(4) Telecommunication conditions

a. Telephones

The operations and functions of hospital facilities greatly depend upon the means for communication with the outside, called telephones.

For example, telephones are important to respond to patients, and to procure and repair drugs and medical equipment, in light of emergency medical service.
(Local calls) With regard to Region I, exchanges for local calls are arranged as shown in Fig. 4, and the number of telephone sets per inhabitant is very small. However, the use of telephones for medical service can be expected to some extent.

As for Region II, the number of telephones per inhabitant is very low, with a small number of exchanges and delayed installation of lines and, therefore, the use of telephones for medical service cannot be expected.
(Toll calls) Little equipment is prepared for toll calls, except Baguio and Dagupan (pangasinan); and, at present, emergency telecommunications depend upon telegraph.

Operation organizations for public telecommunications in the Philippines are very complicated. The BOT (Bureau of Telecommunications) is the sole national enterprise, and all the other enterprises are operated by private organizations. For this reason, national development projects for telecommunications are also complicated, and because development

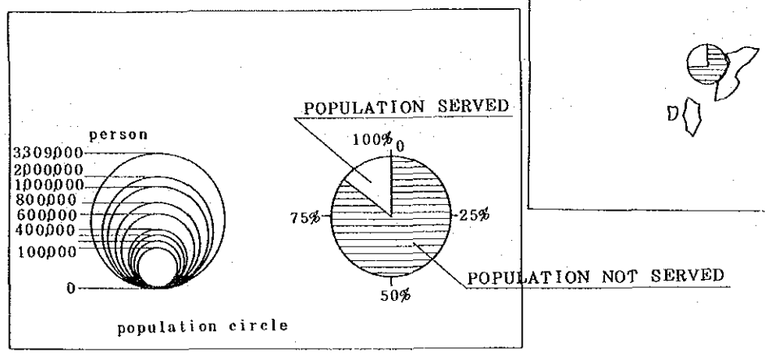
projects must be promoted, considering the system depending on private sector, considerable difficulties are involved.

b. Radio broadcast ... Radio stations are scattered as shown in the figure, and there are no stations which broadcast national programs. They each broadcast their own programs.

c. Television broadcast ... There are perfect service networks in cities (large cities like Manila), but there is no network of national scale. It is planned in the future to organize a network of national scale under the DOMSAT (domestic satellite) project.

Fig 1

POPULATION SERVED/NOT
SERVED BY ELECTRIC SYSTEM



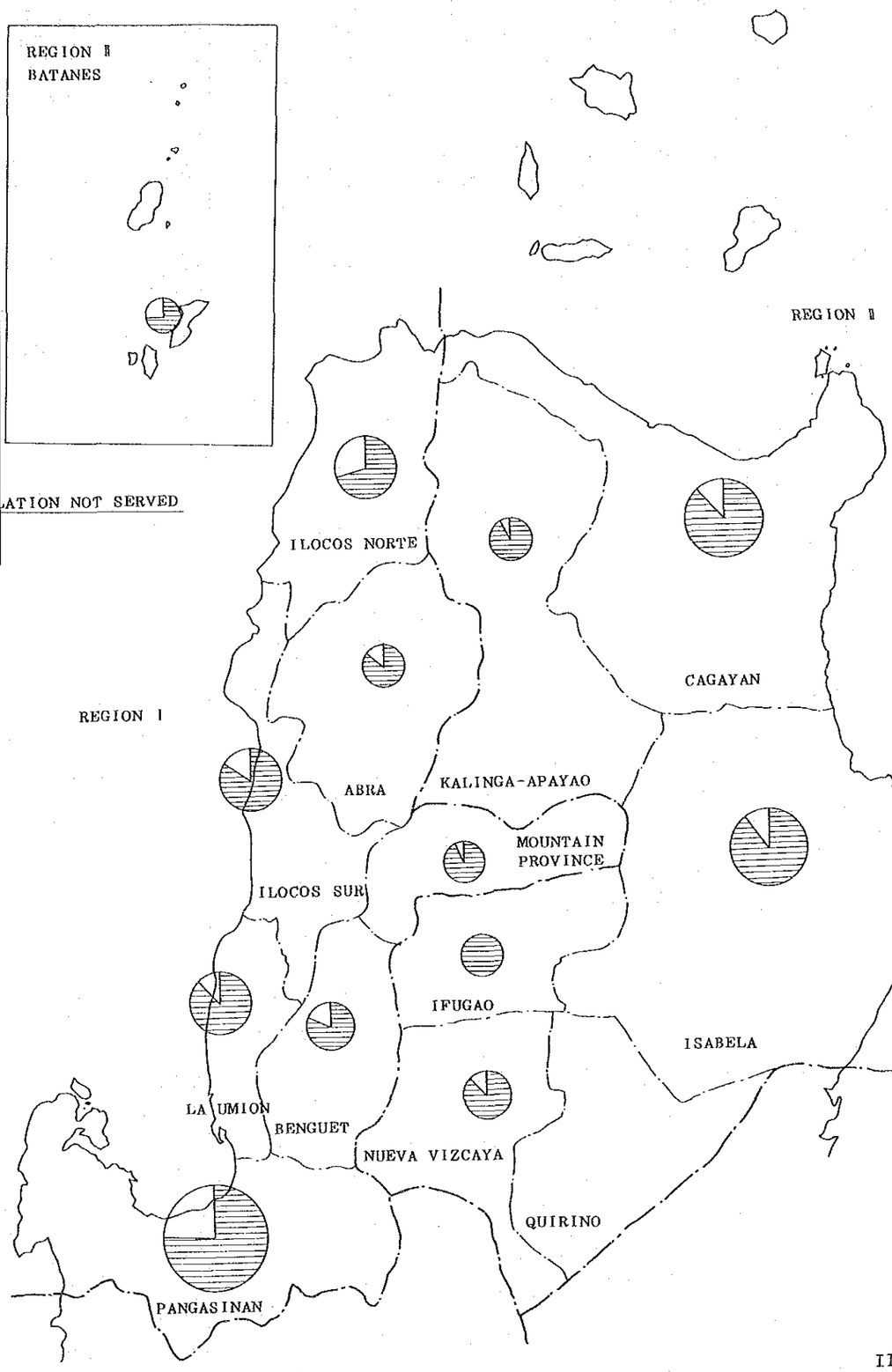


Fig 2

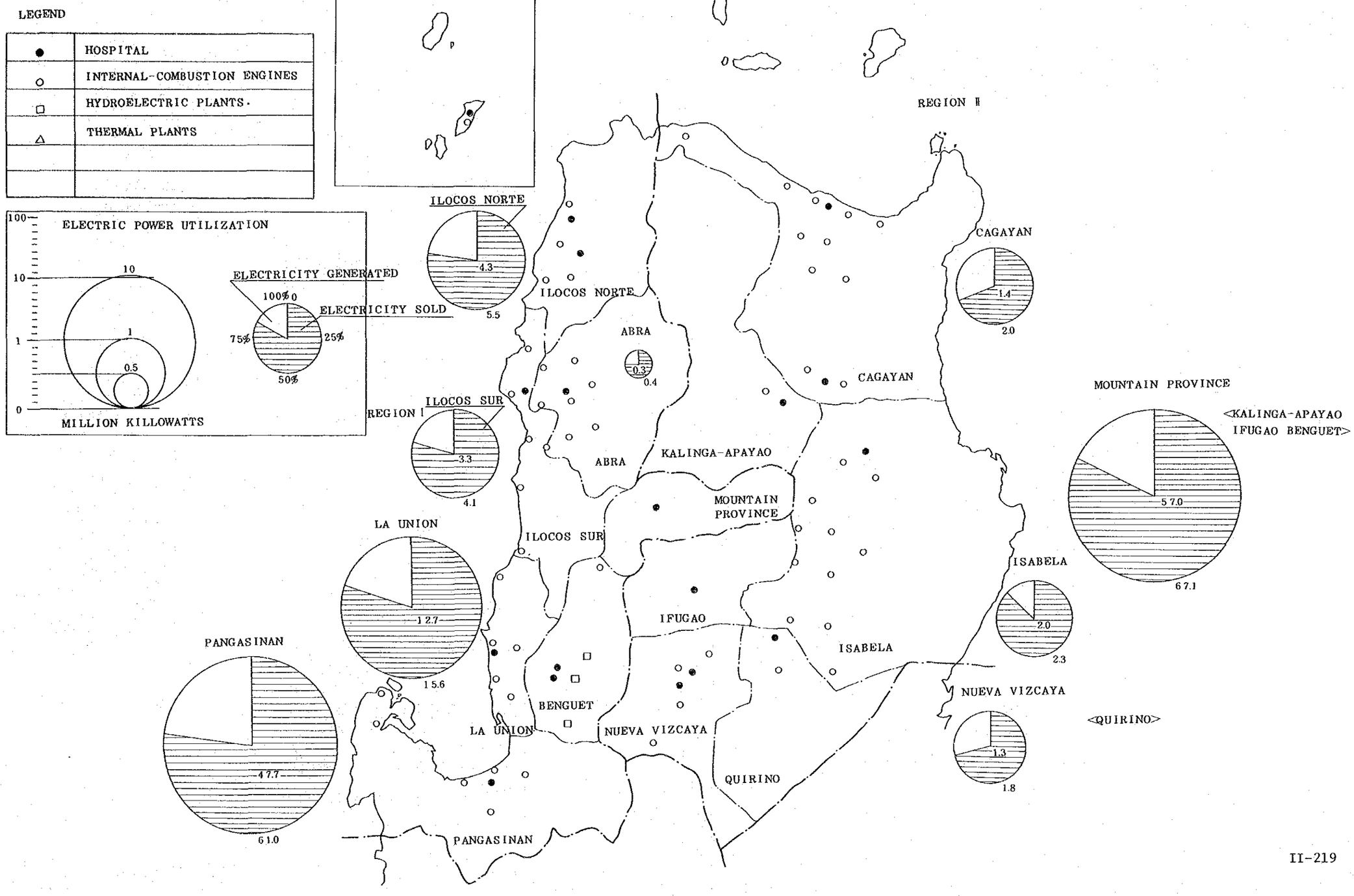
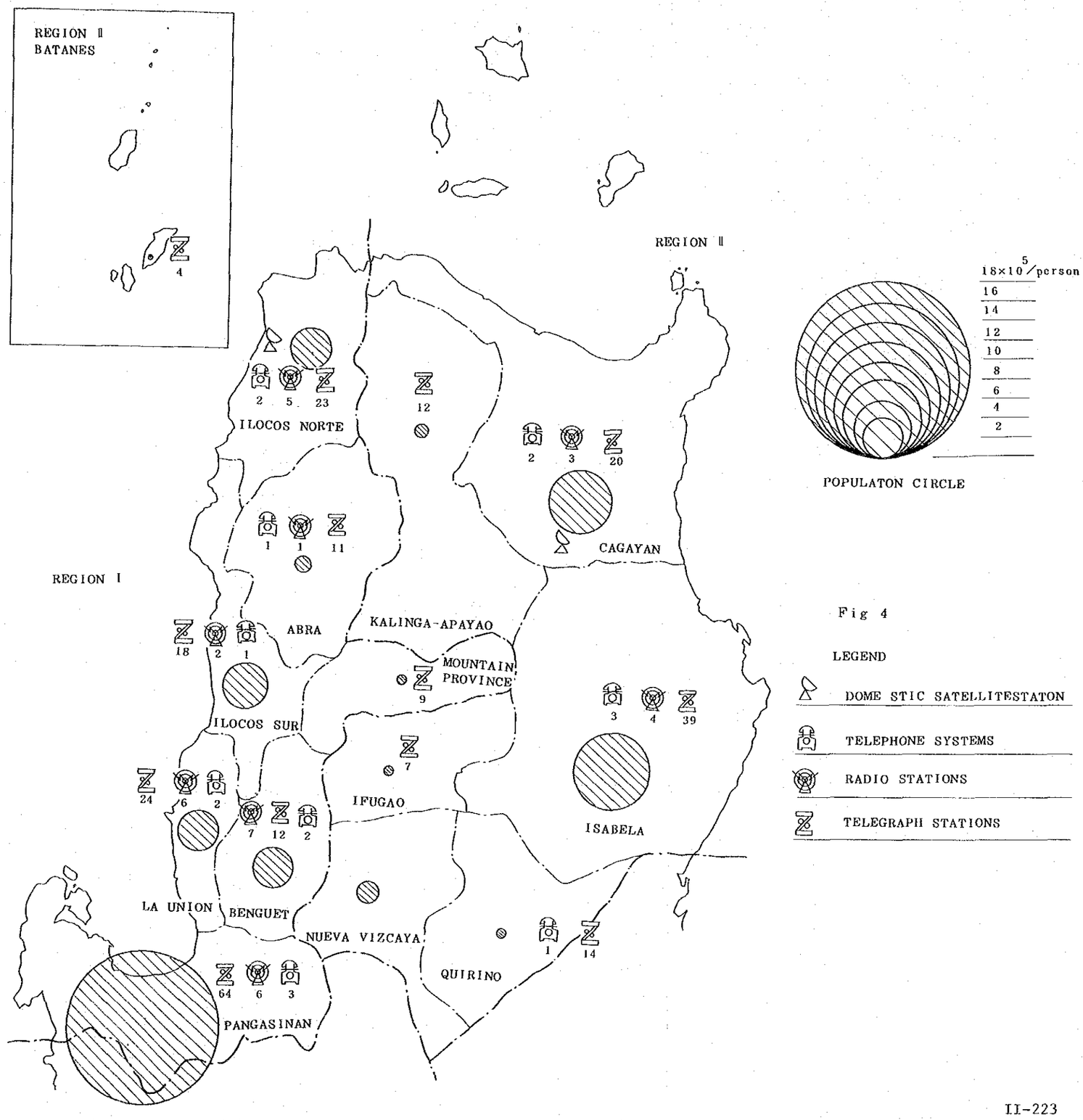

LEGEND
HOSPITAL
INTERNAL-COMBUSTION ENGINES
HYDROELECTRIC PLANTS.
THERMAL PLANTS
REGION II
BATANES
ELECTRIC POWER UTILIZATION
100
10
1
0
10
1
0.5
MILLION KILLOWATTS
ELECTRICITY GENERATED
ELECTRICITY SOLD
100%
75%
25%
50%
REGION II
ILOCOS NORTE
4.3
5.5
ILOCOS NORTE
ABRA
0.3
0.4
CAGAYAN
1.4
2.0
CAGAYAN
MOUNTAIN PROVINCE
<KALINGA-APAYAO
IFUGAO BENGUET>
57.0
67.1
REGION I
ILOCOS SUR
3.3
4.1
ABRA
KALINGA-APAYAO
MOUNTAIN
PROVINCE
LA UNION
12.7
15.6
ILOCOS SUR
ISABELA
2.0
2.3
IFUGAO
ISABELA
PANGASINAN
47.7
61.0
BENGUET
NUEVA VIZCAYA
<QUIRINO>
LA UNION
NUEVA VIZCAYA
1.3
1.8
QUIRINO
PANGASINAN

Fig. 3

Symbol	Legend
●	HOSPITAL
○	INTERNAL-COMBUSTION ENGINES
□	HYDROELECTRIC PLANTS
△	THERMAL PLANTS
Ⓗ	HYDRO PLANT
•	LOAD END SUBSTATION
∘	EXISTING/UNDER CONSTRUOTION

VCLTAGE	EXISTING/ UNDER CONST	FUTURE PROPOSED
69 KV	————	— — — —
34.5, 23, 13.8KV	————	- - - - -



POPULATON CIRCLE

Fig 4

LEGEND

DOME STIC SATELLITESTATON

TELEPHONE SYSTEMS

RADIO STATIONS

TELEGRAPH STATIONS

Fig 5

CAGELCO I, II DISTRIBUTION LINES