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HUMAN RESOURCES FOR HEALTH IN THAILAND TECHNICAL REPORT

May 1999

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SITUATION ANALYSIS

Human Resources for Health (HRH) in Thailand have improved gradually in terms of quantity, quality and distribution. The major provider of health services for the rural population is the MOPH which has more than 70 percent of health facilities under its responsibility. Very few private hospitals exist in rural areas, especially at the district level. Despite the improvement in terms of health facilities expansion and increased number of HRH of various categories, the situation of HRH in the rural area, especially at the district level, still needs to be further improved in terms of the number of personnel, their motivation and their performance. Comparing the HRH to population ratios between central provincial towns with the rest of the corresponding districts shows a large gap. Although the situation of HRH distribution to central provincial towns are still far from ideal, the situation in the rural districts are much worse with around 1 doctor for every 25,000 population. Other major problems include a high turnover rate of HRH working at the district level and low morale. The emphasis of the present analysis defines the district level as the "rural" area that will require priority attention for better HRH deployment, rather than defining all provinces outside of Bangkok as the focus for analysis and attention. Although the final recommendations aim at improving the situation with regards to all categories of HRH working in the rural area, detailed data analysis in this chapter focused on doctors, dentists, and pharmacists as they represent the major categories of concern in terms of their shortage in rural areas. Improving the deployment of these three major categories will certainly affect the service provision to the rural population.

A. DOCTORS

1. Distribution and Trend by Region

The shortage of physicians is highest in the northeastern region of Thailand (see Table 1.1). Half of the doctors in Thailand work in Bangkok, serving 6 million population, while the other half work outside Bangkok, serving 57 million population (see Table 1.3). The total number of doctors in the country, and the absolute number of doctors in each region, has increased for the last 16 years by at least 50 percent in each region. However, the distribution of doctors between Bangkok and the rural areas only improved during the period from 1979 to 1985, and thereafter it stabilized and then worsened (see Table 1.2). The population to doctor ratio in the northeastern region was 11 times larger than Bangkok in 1995. This shows that basic health services are maldistributed as the allocation of doctors is according to the basic health infrastructure (see Figure 1.1). Therefore the distribution of health infrastructure is one reason for the maldistribution of human resources for health.

Table 1.1: *Trend in the Distribution of Doctors in Each Region of Thailand, 1979 - 1995*

Region	Number of Doctors (population per one doctor)								
	1979	**1981**	**1983**	**1985**	**1987**	**1989**	**1991**	**1993**	**1995**
BKK	4,069	3,927	4,084	3,917	4,211	5,888	5,832	6,191	5,582
	(1,210)	(1,360)	(1,404)	(1,512)	(1,418)	(1,063)	(958)	(905)	(999)
Central	1,814	1,019	1,387	1,444	1,730	2,008	2,227	2,499	3,309
	(11,652)	(9,654)	(7,179)	(7,010)	(6,663)	(5,920)	(5,805)	(5,224)	(4,042)
North	741	815	934	777	1,264	2,021	1,747	1,822	2,037
	(13,112)	(12,364)	(10,879)	(13,269)	(8,297)	(5,331)	(6,317)	(6,243)	(5,824)
South	362	447	608	786	908	1,165	1,179	1,274	1,369
	(15,641)	(13,148)	(10,061)	(7,922)	(7,705)	(6,306)	(6,079)	(5,737)	(5,510)
NEast	633	723	889	1,134	1,467	1,631	1,818	1,848	1,884
	(25,761)	(23,492)	(19,675)	(15,709)	(12,694)	(11,762)	(10,970)	(10,848)	(10,805)
Total	6,619	6,931	7,902	8,058	9,580	12,713	12,803	13,634	14,181
	(6,956)	(6,942)	(6,259)	(6,254)	(5,595)	(4,361)	(4,426)	(4,207)	(4,180)

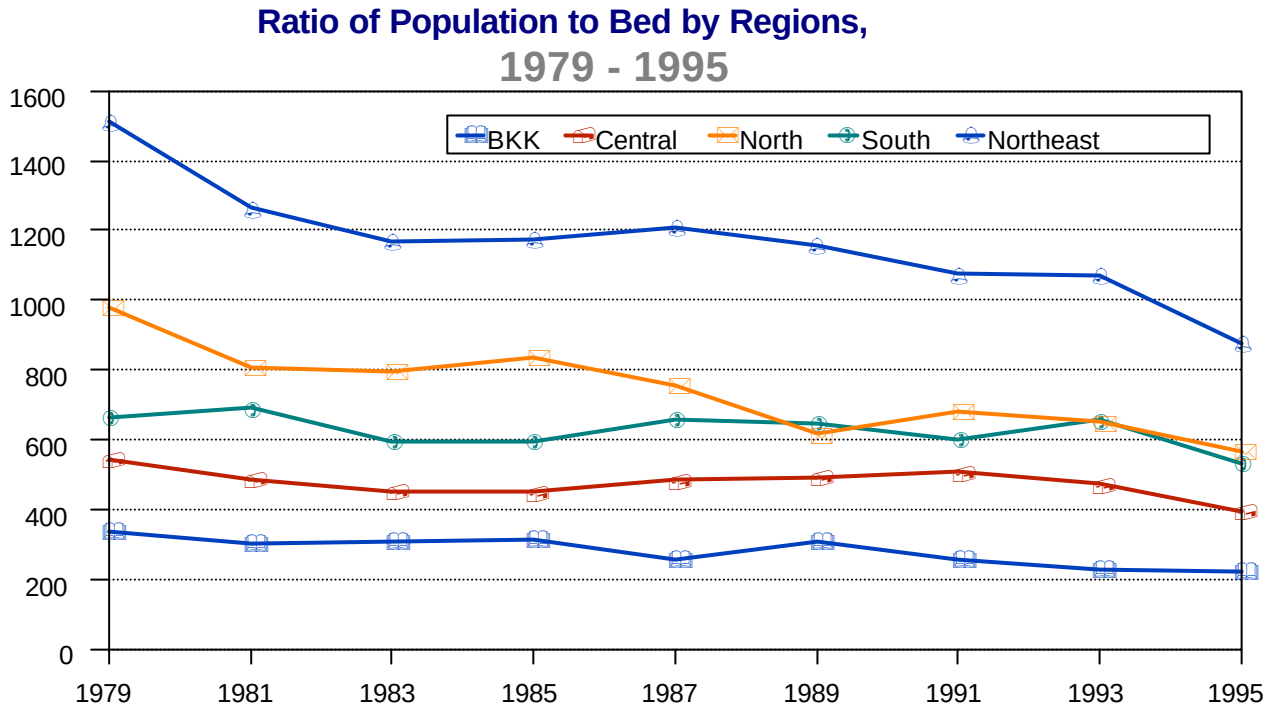
Source : Health in Thailand, 1995 –1996.

Table 1.2: *Ratio of Population per Doctor by Region Compared to Bangkok, Thailand, 1979 - 1995*

Region	Ratio of population per one doctor of each region comparing to Bangkok								
	1979	**1981**	**1983**	**1985**	**1987**	**1989**	**1991**	**1993**	**1995**
BKK	1	1	1	1	1	1	1	1	1
Central	10	7	5	5	5	6	6	6	4
North	11	9	8	9	6	5	7	7	6
South	13	10	7	5	5	6	6	6	6
NEast	21	17	14	10	9	11	11	12	11
Total	6	5	4	4	4	4	5	5	4

Note : Calculated from the data of Table 1.1.

Figure 1.1: *Ratio of Population to Bed by Regions, Thailand, 1979-1995*



Source : Health in Thailand, 1995-1996, Bureau of Health Policy and Plan, MoPH, Thailand

2. Distribution by Institution (Public/Private and Level) and Over Time

Doctors in the Ministry of Public Health (MOPH) are the main group serving the population in rural areas. Doctors employed by other Ministries also provide services to the poor. Doctors in universities and in the private sectors mostly work in Bangkok (see Table 1.3).

Table 1.3: *Distribution of Doctors Working in Various Authorities, Comparing Bangkok and Regions Outside Bangkok, Thailand, 1993*

Authorities	Bangkok		Outside BKK		Total	
	Number	%	Number	%	Number	%
Total	6,191	45.4	7,443	54.6	13,634	100.0
M.of Public Health	839	6.2	5,004	36.7	5,843	42.9
Other Ministries	2,789	20.5	1,363	10.0	4,152	30.5
Private	1,575	11.6	967	7.1	2,542	18.6
Non-for profit organization	413	3.0	71	0.5	484	3.5
Municipalities	470	3.4	14	0.1	484	3.5

Authorities	Bangkok		Outside BKK		Total	
	Number	%	Number	%	Number	%
Gov.enterprises	105	0.8	24	0.2	129	0.9
Doctor population ratio	1: 899		1: 7,053		1: 4,259	

Source : Srivanichakorn S. Situation of Shortage Doctors in Thailand, 1997.

Most physicians work in regional or provincial hospitals, followed by the private sector, district hospitals, and otherwise in the MOPH in that order (see Figure 1.2). In 1994 , the Thai Medical Council pushed a change in the first year of compulsory services to be a skill training program for new graduates whereby they would rotate through big hospitals instead of district hospitals. This has resulted in an abrupt drop in the number of doctors in district and even in provincial hospitals.

Figure 1.2

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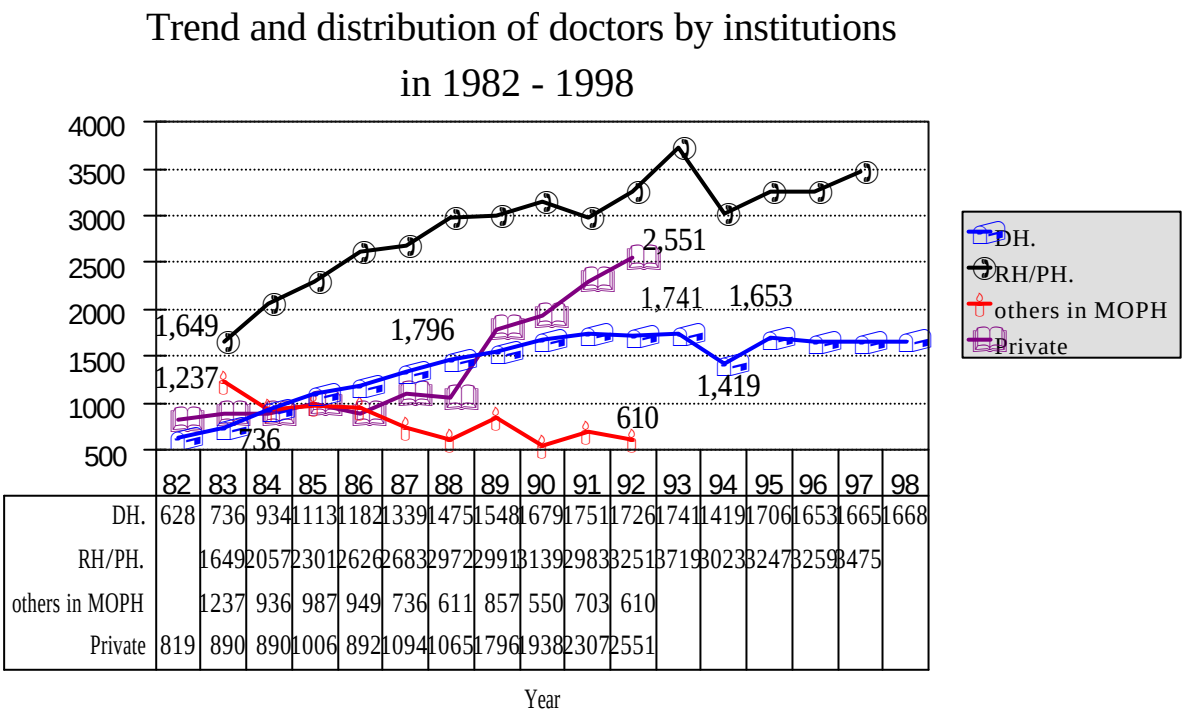


Source: Rural Heath Division, Provincial Hospital Division and Medical Council

If the distribution of doctors in rural areas inside Muang districts (the capital district of each province) is compared to other rural districts, **the highest shortage is found in the non-Muang districts, and even the population per doctor ratio in Muang is almost 50 percent higher than in Bangkok (see Table 1.4).**

Table 1.4: *Health Facilities and Doctors in Various Areas, Thailand*

	BKK.	Outside BKK	Municipalities	Non-Muang districts (no provincial hospitals)
Population (1992)	5,591,366	57,374, 998	4,313,357	39,725,523 (1996)
Health centers(1997)	325	135	135	9099 (no doctors)
Private clinics (1993)	3,532	3,759	2631 (estimate 70 % of clinics outside BKK)	829 (estimate 30 % of clinics outside BKK)
Private Hospitals (1993)	145	223	223	2
Other government hospitals (1993)	40	54	na	Na
No. of District Hospitals (1996)	--	699	46	699
No. of Provincial Hospitals (1998)	--	92	92	--
No. of Doctors (1993)	6,191	7,443	3,247 (only PH)	1,653
Population per doctor	903	7,708	1,324 (only PH)	24,032

Source : Srivanichakorn S. Situation of Shortage Doctors in Thailand, 1997.

3. Doctors Distribution in Each Province

Outside BKK, number of doctors under MOPH in each provinces varies, the range of population to doctors ratio is 1:4,293-1:25,817 (Table 1.5). There are 4 provinces where the ratio is more than 20,000, 2 of them are newly settled provinces where the provincial hospitals have only few doctors.

Table 1.5 : *Name of Provinces, Categorized by Ratio of Population per Total Doctors under MOPH, Thailand, 1997*

Population/ 1 Doctor (Total districts)	No. of provinces	%	Name of provinces
< 5,000	2	2.7	Pukhet, Angthong
5,001-8,000	13	17.3	Chantaburee, Samut-songkram, Saraburee, Ratchaburee, Pung-nga, Trad, Cholburee, Singhburee, Samut-sakorn, Lumpang, Ranong, Uthaitanee, Songkhla,
8,001-	12	16.0	Petchaburee, Yala, Nakornpathom, Nakornnayok,

Population/ 1 Doctor (Total districts)	No. of provinces	%	Name of provinces
10,000			Rayong, Suratthanee, Pisanuloke, Chacheng-sao, Ayuthaya, Uttaradit, Maehongsorn, Trung
	13	17.3	Chumporn, Prajinburee, Nakornsawan, Supanburee,
10,001-			Sukhothai, Prae, Lopburee, Prajeub-keerekhan,
12,000			Lumpoon, Pattanee, Tak, Satool, Mukdaharn
12,001-	12	16.0	Chainart, Udornthanee, Payao, Kanjanaburee,
14,000			Chiengrai, Nakorn-ratchasema, Nan, Nonthaburee, Pattalung, Khonkaen, Yasotorn, Umnajjaroen,
14,001-	9	12.0	Krabee, Loei, Ubol-ratchatanee, Pathumtanee, Pijit,
16,000			Nakornsri-thammarat, Samutprakarn, Bureeram, Sakolnakorn
16,001-	5	6.7	Naratiwas, Chiengmai, Chaiyapume, Surin,
18,000			Nongkhai,
18,001-	5	6.7	Roi-ed, Kumpangpetch, Mahasarakarm,
20,000			Nakronpanom, Kalalsin
20,001-	3	4.0	Nongbua-lumpu, Srakaew, Srisakes
25,000			
25,0001-	1	1.3	Petcha-boon
26,000			

Note: Population used at December 1996, from Governance Department,, M. Of Interior
The number of doctors included in this table are only those under MOPH in 1997, and does not include doctors in private practice or universities. Source of data: Rural Health Division, Provincial Hospital Division , MOPH.

4. Doctors at the District Level

While the number of doctors is increasing in every health unit in Thailand, the number in district hospitals is still low and has decreased in some years (see Figure 1.1), while the workload in District Hospitals (DHs) has increased (see Table 1.6). The number of doctors in DHs fluctuates up and down (see Annex 9). Some districts in big cities have a stable number of doctors (having senior doctors), some have a stable number of hospital directors but changing numbers of other doctors, some have no stability at all: having only junior doctors, or even no doctors) (Table 1.7). Thus, there is a different degree and pattern of shortage of doctors in different district hospitals, so measures to solve the problem of maldistribution have to differentiate according to the situation.

Table 1.6: *Trend of Workload of Doctors in District Hospitals, Thailand, 1991 - 1997*

Year.	Total Doctors in DHs	Beds per Doctor Ratio*	Population per Doctor
1991	1,592	8.1	21,870
1992	1,681	8.2	23,456
1993	1,766	8.5	21,617

Year.	Total Doctors in DHs	Beds per Doctor Ratio*	Population per Doctor
1994	1,411	11.9	27,689
1995	1,574	11.5	25,227
1996	1,653	na.	24,273
1997	1,665	12.3	24,118

Note : Data base from Rural Health Division, MOPH.
* Beds adjusted by occupancy rate

Table 1.7: *Distribution of District Hospitals with Various Number of Doctors, 1997*

.Number of Doctors in DHs	Number of DHs	% of Total DHs
1. no doctor at all	25	3.7
1. only 1 junior doctor (C4-5):	108	16.1
1. 2 or > 2 junior drs or having 1 senior drs (C6-8)	162	24.1
1. having senior drs and total drs = 2-3	270	40.1
1. having senior drs and total drs > 3	108	16.1
Total	**673**	**100**

Note : Data base from Rural Health Division, MOPH., 1997.

The population to doctor ratio, for rural districts only, is 1:10,681 minimum and 40,786 maximum (Table 1.8) which is 2 times higher than the ratio when urban districts are included. There are 2 provinces, Pathumtanee and Nonthabure, where the ratio is higher than 1:40,000. They are located at the periphery of Bangkok and there are many private doctors who are not included in this table. But the other 2 provinces, Surin and Srisakes, are poor provinces, the ratio is higher than 1:35,000. These provinces need additional doctors and budget support.

Table 1.8 : *Provinces by Population per Doctor, Calulated only Rural Districts, Thailand, 1997*

Population/ 1 Doctor (Rural Districts)	No. of provinces	%	Name of provinces
10,001-15,000	7	9.3	Pung-nga, Ranong, Trad, Samut-songkram, Maehongsorn, Samut-sakorn, Chumporn,
15,001-20,000	19	25.3	Singhburee, Satool, Tak, Uthaitanee, Pukhet, Prajeub-keerekhan, Rayong, Petchaburee, Chantaburee, Cholburee, Ratchaburee, Prae, Prajinburee, Lopburee, Kanjanaburee, Nan, Pattalung, Angthong , Mukdaharn
20,001-25,000	20	26.7	Krabee, Chacheng-sao, Surat-thanee, Nakornnayok, Lumpoon, Pattanee, Ayuthaya, Uttaradit, Loei, Lumpang, Pijit, Songkhla, Payao, Trung, Sukhothai, Bureeram, Nakornpathom, Yala, Udornthanee, Sakolnakorn
25,001-30,000	16	21.3	Khonkaen, Nongkhai, Srakaew, Yasotorn,

Population/ 1 Doctor (Rural Districts)	No. of provinces	%	Name of provinces
30,001-35,000	9	12.0	Supanburee, Nakornsawan, Chainart, Chiengmai, Nakronpanom, Kalalsin, Chiengrai, Umnajjaroen, Pisanuloke, Nakornsri-thammarat, Nongbua-lumpu, Chaiyapume, , Tak, Satool, Nakorn-ratchasema, Mahasarakarm, Naratiwas, Ubol-ratchatanee, Petcha-boon, Roi-ed, Samutprakarn, Kumpangpetch, Saraburee
35,001-40,000	2	2.7	Surin, Srisakes
40,001-45,000	2	2.7	Nonthaburee , Pathumtanee

Note: Population used at December 1996, from Governance Department,, Ministry of Interior. The number of doctors calculated in this table are only those under MOPH in 1997, doctors in private practice and universities are not included.
Source: Rural Health Division, MOPH.

5. High Turnover Rate of Doctors in District Hospitals

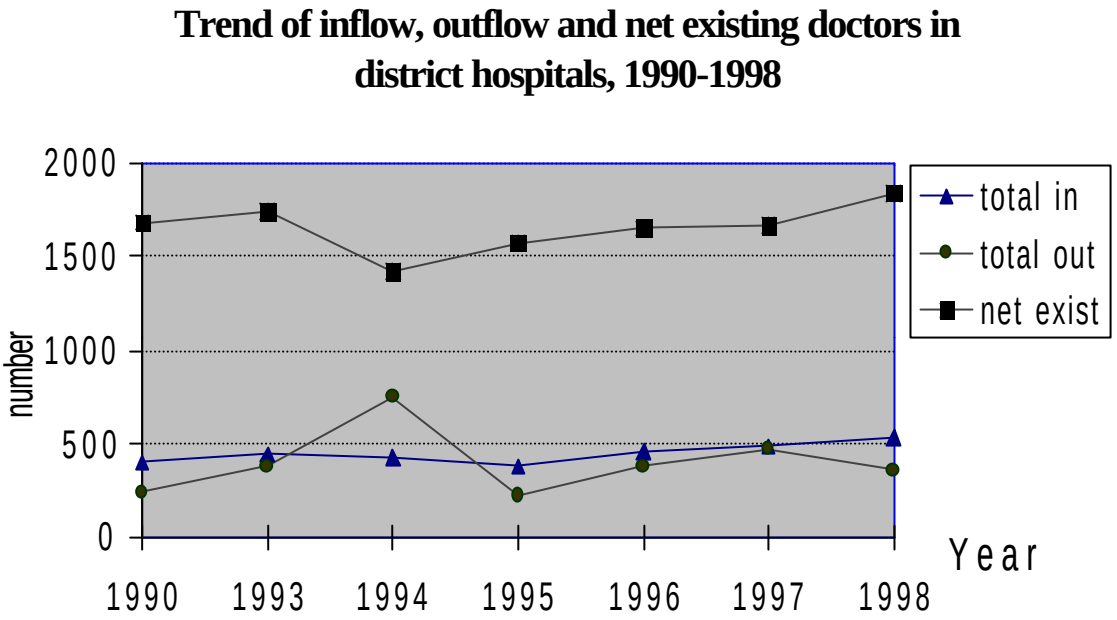
New graduate doctors come to work in district hospitals for 1 to 3 years and then go back to medical school in urban areas for specialist training. When they return to work as specialists, they prefer to work in bigger hospitals in towns rather than district hospitals. The number of doctors in DHs fluctuates in each year. When doctors, the leaders of health teams change, it jeopardizes the functioning of the small hospitals. Therefore, the main problem is high turnover rate of doctors in district hospitals and the short duration of working there. This causes discontinuity of health service development in rural areas (see Table 1.9 and Figure 1.3).

Table 1.9 : *Percentage of Doctors in District Hospitals Leaving for Specialist Training in Each Cohort in the Past 10 Years by Institution of Working Before Leave, Thailand, 1981 - 1991*

Year before training	DHs %	PHs %	M. Defense %	Total %	Cumula-tive %
0	0	0	0	8.7	8.7
1	5.9	19.6	8.7	3.8	12.5
2	6.9	14.7	23.9	5.9	18.4
3	44.5	70.4	54.5	52.0	70.4
4	15.4	17.8	13.7	15.2	85.6
5	6.8	11.1	9.9	4.9	90.5

Source: Srivanichakorn S. et.al., Specialist Training Rate of New Graduated Doctors, 1992.

Figure 1.3: *Trend in Inflow, Outflow, and Net Existing Doctors in District Hospitals, Thailand, 1990 – 1998*



6. Compulsory Services and Doctors at District Hospitals

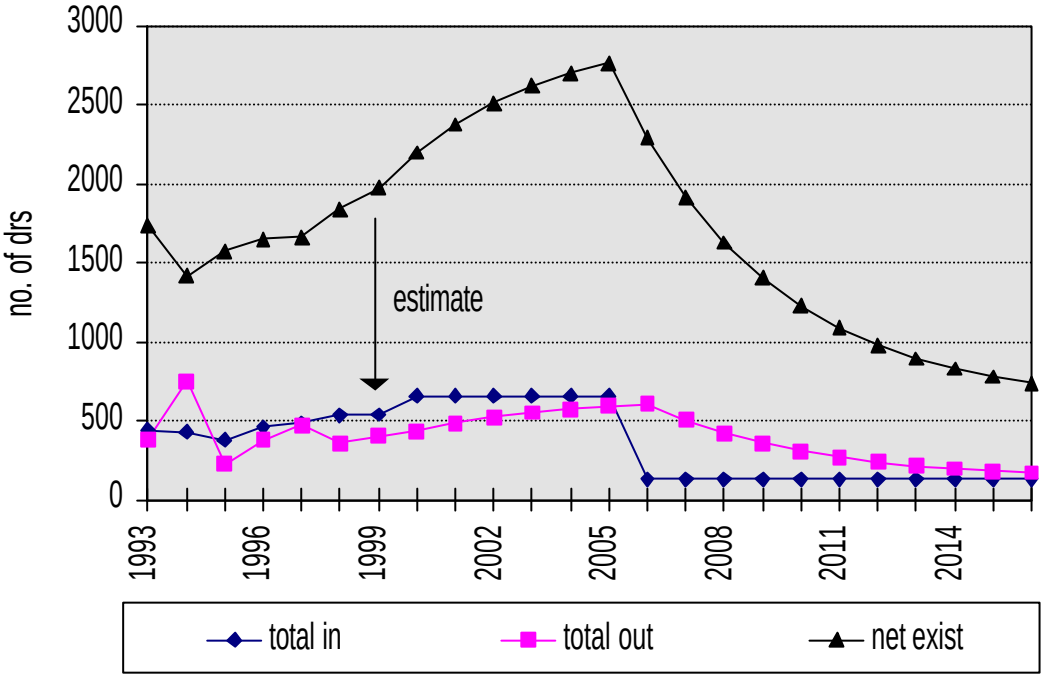
Half of the doctors running district hospitals are working during their compulsory period, so compulsory service is the main viable mechanism for staffing district hospitals (see Table 1.10). If the compulsory measure was discontinued and the actual outflow remained the same, the number of district hospital doctors would increase slightly and then abrupt decrease after 6 years (see Figure 1.4) .

Table 1.10: *Proportion of Physicians Working District Hospitals During Compulsory Period, Thailand, 1982-1997*

	Total doctors in DHs	After compulsory period		During compulsory period		others	
Year	**#**	**#**	**%**	**#**	**%**	**#**	**%**
1982	628	175	27.87	453	72.13	-	-
1983	736	331	44.97	403	54.76	2	0.27
1984	934	377	40.36	552	59.10	5	0.53
1985	1,113	446	40.07	654	58.76	13	1.17
1986	1,182	527	44.58	652	55.61	3	0.25
1987	1,339	602	44.96	731	54.59	6	0.45
1996	1,653	661	39.99	992	60.01	-	-
1997	1,665	841	50.5	824	49.5	-	-

Note: Others = do not know the exact batch and some graduated abroad.
Source: Rural Health Division, MOPH.

Figure 1.4 : ***Estimation Number of District Hospital Doctors, If the Compulsory Services was Discontinued*** **in 1999**



Note: The estimated rate of voluntary inflow of doctors is 20 % and the outflow rate is 22 % after the compulsory measure is discontinued.

Although the government allocates new graduate doctors to MOPH and then to DHs every year, the number has not matched to the number needed in DHs, the doctors leave in 2 to 3 years, and so the net gain is small. The allocation mechanism has not taken into account the outflow rate of each unit, but only the estimated number required by each institution (see Table 1.11).

Table 1.11 : *Allocation of New Graduate Doctors, Thailand, 1990 - 1999*

Year of Graduation	Total graduates	MOPH (%)	Universities in regions (%)	Universities in BKK (%)	M. of Defense (%)	Other (%)
1990	763	489 (64.1)	na	Na	Na	Na
1991	822	507 (61.7)	na	Na	Na	Na
1992	820	520 (63.4)	na	Na	Na	Na
1993	838	586 (69.9)	na	Na	Na	Na
1994	819	536 (65.4)	123 (15.0)	41 (5.0)	84 (10.3)	35 (4.2)
1995	820	587 (71.6)	109 (13.2)	22 (2.7)	78 (9.5)	24 (4.1)

Year of Graduation	Total graduates	MOPH (%)	Universities in regions (%)	Universities in BKK (%)	M. of Defense (%)	Other (%)
1996	825	572 (69.3)	131 (16.0)	19 (2.3)	82 (9.9)	21 (2.5)
1997	838	593 (70.7)	123 (14.7)	20 (2.4)	80 (9.5)	22 (2.6)
1998	868	613 (70.6)	124 (14.3)	29 (3.3)	80 (9.2)	22 (2.5)
1999	1,171	784 (67.0)	227 *(19.4)	52 (4.4)	82 (7.0)	26 (2.2)
	1,171	864* (73.8)	147 (12.6)	52 (4.4)	82 (7.0)	26 (2.2)

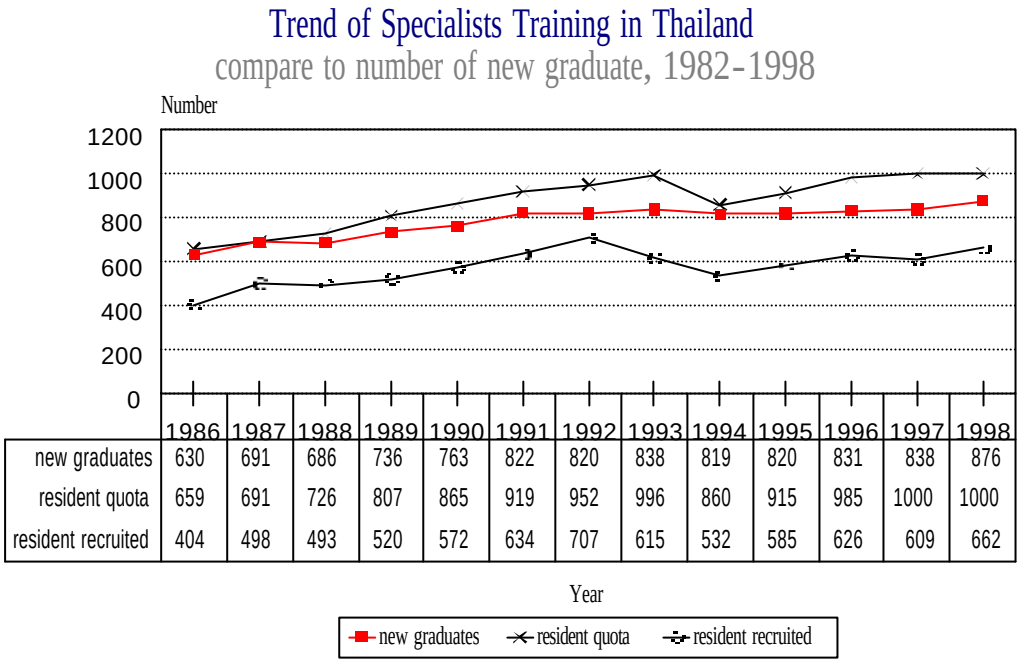
Note: * this includes 80 doctors for regional hospitals in MOPH, as new medical education centers.
Source: Civil Servant Commission and Health Manpower Development Insititute, MOPH.

7. Doctors and Specialist Training

One of the major concerns about the deployment of doctors that is they are quite different from other categories of HRH as they prefer to specialize. This preference results from multiple factors. The overall proportion of doctors becoming specialists has increased continuously over the last two decades. The Thai Medical Council started the residency training programs in Thailand in 1968 and the quota for residency training has increased steadily at a rate higher than the increase of the number of new graduates since 1986. (see Figure 1.5).

Although the number of actual trainees recruited is below the quota and still below the number of new graduates each year, it raises the question of how many specialists are needed for Thailand when doctors are still badly needed in rural areas and specialists cannot work fruitfully at the district level. Moreover the generous quota of residency training opportunities had “sent the message” among the medical professions and the general public that the most needed doctors are specialists. Many medical graduates seek further specialty training and move away from the district hospitals. After completing specialty training, very few of them go back to the district hospitals (see Figure 1.6).

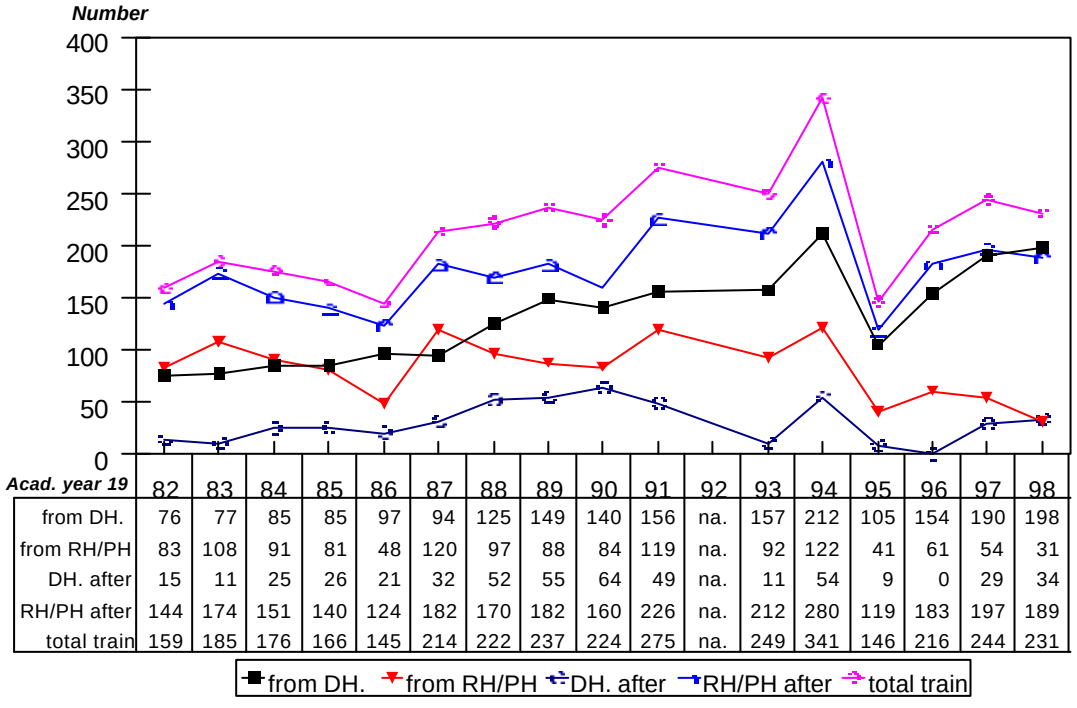
Figure 1.5: *Trend of Specialist Training in Thailand, 1986 - 1998*



	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
new graduates	630	691	686	736	763	822	820	838	819	820	831	838	876
resident quota	659	691	726	807	865	919	952	996	860	915	985	1000	1000
resident recruited	404	498	493	520	572	634	707	615	532	585	626	609	662

Source: Thai Medical Council

Figure 1.6: *Trend of Outflow and Inflow of Residents and Specials in Provincial and District Hospitals, Thailand, 1982 - 1998*



Acad. year 19	82	83	84	85	86	87	88	89	90	91	92	93	94	95	96	97	98
from DH.	76	77	85	85	97	94	125	149	140	156	na.	157	212	105	154	190	198
from RH/PH	83	108	91	81	48	120	97	88	84	119	na.	92	122	41	61	54	31
DH. after	15	11	25	26	21	32	52	55	64	49	na.	11	54	9	0	29	34
RH/PH after	144	174	151	140	124	182	170	182	160	226	na.	212	280	119	183	197	189
total train	159	185	176	166	145	214	222	237	224	275	na.	249	341	146	216	244	231

Source: Rural Health Div.,Provincial Hospital Div., Health Manpower Dev. Institute, MOPH

B. DENTISTS

1. Distribution and Trend by Regions

The number of dentists in the country has tripled over the last two decades. Further, their distribution between Bangkok and other parts of the country has improved with more of the dentists being distributed to provinces other than Bangkok. Looking at the population to dentist ratio it is clear that the situation in Bangkok has changed only minimally compared to those ratios in the four regions of the country. The ratio of population per dentist was highest for the northeastern region in 1979. This ratio was reduced by a factor of 6 while the actual number of dentists increased by 7 fold (see Table 1.12).

Table 1.12: *Distribution and Trend in Dentists by Region, Thailand, 1979 - 1995*

Region	Number of dentists (population per one dentist)								
	1979	**1981**	**1983**	**1985**	**1987**	**1989**	**1991**	**1993**	**1995**
Bangkok	705	676	752	797	878	1,085	1,215	1,331	1,077
	6,982	7,901	7,624	7,578	6,802	5,766	4,599	4,208	5,180
Central	113	152	193	206	257	369	443	526	735
	83,938	(64,717)	(51,591)	(50,218)	(44,852)	(32,213)	(29,181)	(24,817)	(18,195)
North	108	110	160	168	141	220	268	295	348
	(89,963)	(91,609)	(63,506)	(62,887)	(74,381)	(48,696	(41,176)	(38,561)	(34,090)
South	38	57	61	69	78	179	255	246	298
	(114,900)	(103,105)	(100,278)	(89,275)	(89,696)	(41,044)	(28,108)	(29,710)	(25,314)
Northeast	58	83	81	86	114	254	227	388	462
	(280,655)	(204,639)	(215,938)	(208,767)	(163,35 1)	(75,526)	(87,858)	(51,670)	(44,062)
Total	**1,022**	**1,078**	**1,247**	**1,326**	**1,468**	**2,107**	**2,408**	**2,786**	**2,920**
	(45,071)	**(44,636)**	**(39,662)**	**(38,510)**	**(36,515)**	**(26,316)**	**(23,531)**	**(20,589)**	**(20,300)**

Comparing the difference and changes between Bangkok and the regions it can be seen from Table 1.13 that the difference in terms of the number of population per dentist between the northeastern region and Bangkok was highest in 1979 (40 times difference). This has been reduced to only 9 times higher in 1995. The same could be seen for other regions where the differences between those regions and Bangkok has also improved dramatically.

Table 1.13: *Ratio of Population per Dentist Compared to the Ratio in Bangkok, Thailand, 1979-1995*

	Year								
Region	**1979**	**1981**	**1983**	**1985**	**1987**	**1989**	**1991**	**1993**	**1995**
Bangkok	1	1	1	1	1	1	1	1	1
Central	12	8	7	7	7	6	6	6	4
North	13	12	8	8	11	8	9	9	7
South	16	13	13	12	13	7	6	7	5
Northeast	40	26	28	28	24	13	19	12	9
Total	6	6	5	5	5	5	5	5	4

2. Dentists in Different Provinces

As expected from the regional figures, the general situation of dentists improved for the country and thus the ratio of population to dentist ratio of the country has decreased from 40,071 to 20,300 during the 15 year period. However, when the actual number of dentists is broken down by province and compared to the size of the provincial population, .it can be seen that there are 9 provinces where the population to dentist ratio is more than 40,000, and all except 2 of the provinces are in the northeastern region.

Table 1.14: *Name of Provinces, Categorized by Ratio of Population per Dentist, Thailand, 1997*

Dentist/ Pop.	No. of Provinces	%	Name of Provinces
< 1:5,000	1	1.3	Bangkok.
5000-8000	4	5.3	Nonthaburee, Chantaburee, Chiengmai, Sonkhla
8000-10,000	4	5.3	Khonkaen, Samut-songkram, Phuket, Pung-nga
10000-20000	26	34.2	Pathumthanee, Ayuthaya, Angthong, Singhburi, Nakornnayok, Cholburi, Rayong, Trad, Prajinburi, Ratchburi, Cahchengsao, Nakornpathom, Nakornsawan, Uthaithanee, Pissanuloke, Pichit, Uttaradit, Lumpoon, Lumpang, Maehongsorn, Ranong, Chumporn, Satool, Trung, Yala

Dentist/ Pop.	No. of Provinces	%	Name of Provinces
20000-30000	19	25.0	Lopburi, Chainart, Supanburi, Pethaburi, Supanburi, Prajueb, Kanchanaburi, Samut-sakornm nakorn-ratchasima, Umnajjaroen, Kumpangpetch, Tak, Sukhothai, Prae, Nan, Payao, Chienrai, Suratthanee, Krabee, Pattalung
30000-40000	13	17.1	Samutprakarn, Srakaew, Lei, Nhongkai, Sakolnakorn, Udornthnanee, Nhongbualimpu, Ubolratchatanee, Nakorn-srithammarat, Yasotorn, Nakornpanome, Mukdaharn, Pattanee
40000-50000	5	6.6	Bureerum, Chaiyapume, Mahasarakham, Petchaboon, Narathiwas
50000-60000	3	3.9	Surin, Kalasin, Roi-et
60000-80000	1	1.3	Srisakes

Source: Information Center, Dental Health Division, Health Department, MOPH, 1998

3. Dentists at the District Level

a. Rural Districts have a High Population to Dentist Ratio

Taking a closer look at the district level, the ratio of population per dentist shows much greater differences. While the range for all provinces is between 5,000 - 80,000, if only the number of dentists working in the rural districts are taken into account and compared to the rural population being served, those dentists working in rural districts serve a much higher range of population numbering between 20,000-100,000. While the majority of the dentists in the central districts could be serving less than 20,000 population per dentist, their colleagues in the rural districts have to take care of a much higher number of 30,000 - 60,000 population. The highest is in Narathiwas where a dentist in the rural district has to cover an average rural population of 182,872 population compared to around 5,000 in Bangkok (see Table 1.15).

Table 1.15: *Provinces by Population per Dentist, Calculated only for Rural Districts, Thailand, 1997*

Population/1 Dentist	No. of provinces	Name of provinces
< 20,000	2	Samut-songkram, Lumpoon
20,000	7	Nakornnayok, Chantaburi, Trad, Umnajjareon, Maehongsorn, Ranong, Pung-nga
30,000	16	
40,000	16	
50,000	9	

Population/1 Dentist	No. of provinces	Name of provinces
60,000	14	
70,000	2	Trung, Cahiyapoom
80,000	3	Kalasin, Ubolratchathanee, Yasotorn
90,000	3	Surin, Roi-et, Pattanee
100,000	3	Srisakes (117,126) Yala (135,327) Naratiwas (182,872)

Source: Information Center, Dental Health Division, Health Department, MOPH, 1998.

b. Trends in the Number of Dentists at the District Level

The number of dentists working in rural districts, although still quite low in 1997, has actually undergone quite a dramatic increase in terms of their number since 1988. Almost all of the dentists working in the rural districts work in district hospitals in the MOPH. While dentists worked in only around 19 percent of district hospitals in 1988, this increased to around 80 percent in 1997. The number of dentists also increased by 7 fold. This was made possible primarily due to the introduction of compulsory service for dental graduates starting in 1988 (see Table 1.16).

Table 1.16: *Number and Coverage of Dentists in District Hospitals, Thailand, 1988 – 1997*

Fiscal Year	no. of operating DHs.	DHs having dentists	% coverage	Total dentists in DHs	% of actual to CSC frame
1988	543	102	18.8	102	9.4
1989	561	197	35.1	197	17.6
1990	566	328	58.0	328	29.0
1991	574	340	59.2	340	29.6
1992	592	422	71.3	422	35.6
1993	644	443	68.8	515	40.0
1994	649			571	43.3
1995	674	526	78.0	626	46.4
1996	698	556	79.7	638	45.7
1997	707	551	77.9	708	50.1

Source: Jaruwat Busarakumha, 1998.

The MOPH also suffered quite a large number of loss of dentists, who were assigned to work in the MOPH, but then resigned before being posted to a rural area. Further, a large number also left the rural services during the period of compulsory services, leaving only around 75 percent of graduates to complete the compulsory services. After compulsory services of three years, the percentage of those remaining in the rural areas to work stabilized at around 35-40 percent at the fourth year after graduation (see Table 1.17).

Table 17: *Number of Dentists that Resigned from the MOPH, Thailand, 1996*

The batch Year	allocate no. to MOPH?	No. of resigned dentists.			
		Immediate after graduate	later	Total	% of resign to allocated no.
1 1989	184	9	108	117	63.6
2 1990	205	25	114	139	67.8
3 1991	190	28	87	115	60.5
4 1992	260	31	132	163	62.7
5 1993	241	41	97	128	57.3
6 1994	264	24	99	123	46.6
7 1995	220	20	43	63	28.6
8 1996	263	13	23	36	13.7
Total	**1827**	**191**	**703**	**894**	**48.9**

c. High Turnover of Dentists at the District Level

Despite the increase in the number of dentists working at the district level, there is quite a high turnover of dentists working at this level. The number of annual inflow to district hospitals was around 180 to provide compulsory services. There was a negligible inflow from other sources to rural areas compared to the number from compulsory services. However the outflow each year was also quite high at around 122 dentists per year on average. The net increase of dentists for district level hospitals thus remains at only around 50 per year despite a high number allocated to the MOPH of around 200-250 dentists each year (see Table 1.18).

Table 1.18 *Number and Inflow and Outflow of District Hospital Dentists, Thailand, 1991 – 1997*

Fiscal Year	Inflow		Outflow	Number Of Dentists
	from new graduate allocation	transfer from other places		
1990	-	-	-	328
1991	117	5	110	340
1992	177	data not available		422
1993	147	data not available		515
1994	199	3	146	571

Fiscal Year	Inflow		Outflow	Number Of Dentists
	from new graduate allocation	transfer from other places		
1995	163	8	116	626
1996	200	9	197	638
1997	169	7	106	708

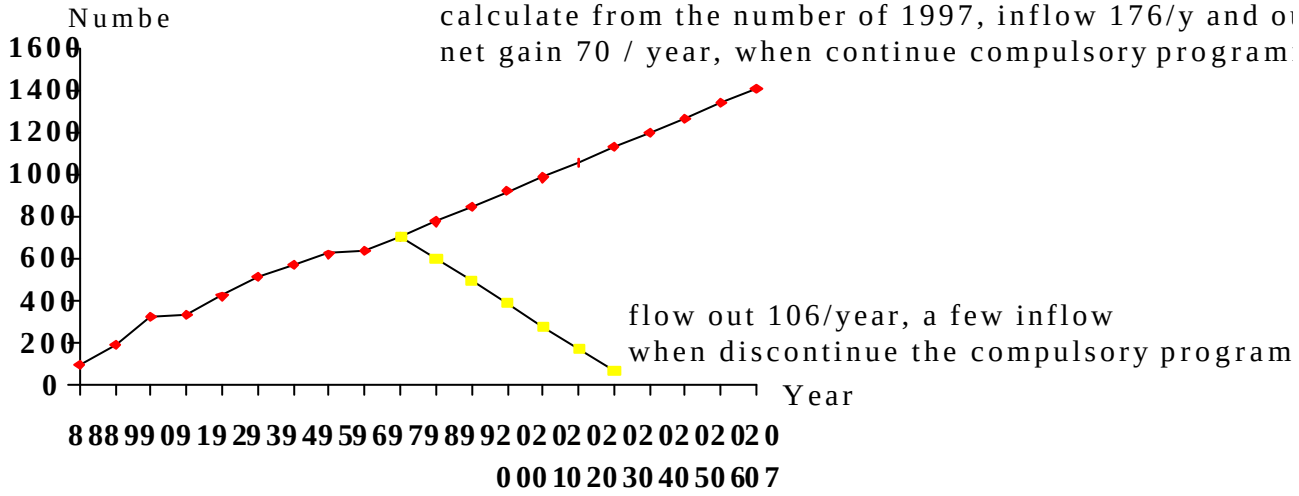
Source: Janthana Unkchusak, 1998.

d. Dentists at the District Level and Compulsory Services

One of the issues facing the distribution of dentists to the district level is the enforcement of compulsory services. Due to the attempt to downsize and limit the growth of the civil service, the number of posts available to various ministries are tightly controlled. With the economic crisis the situation became worse. It is projected that the number of posts for dentists working in the districts will be filled by the year 2002 at the present rate of inflow and outflow as described above (see Figure 1.7). If compulsory service was discontinued, and the number of annual out-flow remained the same, the number of dentists working at the district level would drop dramatically and, in 7 years, would fall back to the same number as before the introduction of compulsory services in 1988.

Figure 1.7

Estimation number of dentists when continues and discontinue the compulsory programme



C. PHARMACISTS

1. Trend in Regional Distribution of Pharmacists

The number of pharmacists in Thailand, like other major categories of HRH, has undergone a significant shift to various regions in the country during the last two decades. In 1979, the majority of pharmacists lived and worked in Bangkok and the population to pharmacist ratios were 100 times higher in the northeastern and northern regions compared to Bangkok. This difference was reduced to only 15 and 9 times that of Bangkok in 1995 (see Table 1.19).

Table 1.19: *Ratio of Population per Pharmacist by Region Comparing to the Ratio for Bangkok, Thailand, 1979 - 1995*

Region	Year								
	1979	**1981**	**1983**	**1985**	**1987**	**1989**	**1991**	**1993**	**1995**
Bangkok	1	1	1	1	1	1	1	1	1
Central	29	29	27	27	22	11	12	10	3
North	88	67	25	26	21	11	12	11	9
South	36	37	37	40	26	11	10	9	7
Northeast	98	94	71	75	59	22	21	20	14
Total	**8**	**8**	**7**	**7**	**7**	**6**	**6**	**6**	**4**

The population to pharmacist ratio in Bangkok remained more or less stabilized at 2,300 per pharmacist during the period which meant that most of the additional pharmacists were distributed to the other provinces outside of Bangkok. The most dramatic improvement in this respect was the northern region where the ratio has narrowed down to 10 times higher than Bangkok. The actual number of pharmacists increased by 20 fold (see Table 1.20).

Table 1.20: *Distribution of Pharmacists by Region, Thailand, 1979 - 1995*

Region	Number of Pharmacists (population per one pharmacist)								
	1979	**1981**	**1983**	**1985**	**1987**	**1989**	**1991**	**1993**	**1995**
Bangkok	2,136	2,295	2,479	2,762	2,850	2,445	2,608	2,717	2,446
	(2,304)	(2,313)	(2,331)	(2,076)	(2,095)	(2,559)	(2,143)	(2,061)	(2,280)
Central	142	143	161	175	253	408	500	615	1,728
	(66,796)	(67,245)	(61,845)	(56,897)	(45,561)	(29,134)	(25,855)	(21,226)	(7,835)
North	28	51	175	188	241	375	443	490	606
	(202,214)	(155,294)	(58,063)	(54,048)	(43,517)	(28,729)	(24,910)	(23,216)	(19,644)

Region	Number of Pharmacists (population per one pharmacist)								
	1979	**1981**	**1983**	**1985**	**1987**	**1989**	**1991**	**1993**	**1995**
South	118	114	70	74	128	256	339	416	474
	(82,399)	(86,325)	(87,386)	(82,662)	(54,659)	(28,699)	(21,143)	(17,569)	(16,149)
Northeast	72	77	105	113	150	341	443	483	613
	226,083	(218,195)	(166,581)	(154,788)	(124,147)	(56,257)	(45,020)	(41,507)	(33,010)
Total*	**2,496**	**2,603**	**2,990**	**3,312**	**3,622**	**3,825**	**4,333**	**4,721**	**5,867**
	18,455	**(18,485)**	**(16,541)**	**(15,418)**	**(14,799)**	**(14,496)**	**(13,077)**	**(12,150)**	**(10,104)**

2. Pharmacists and the MOPH

The better distribution of pharmacists to other provinces outside of Bangkok could result from many factors. The most dramatic increase in all regions of the number of pharmacists was between 1985-1989. This coincides with the period of the introduction of compulsory services of pharmacists to rural areas. The number of pharmacists working in the MOPH has increased steadily and accounts for around half of the total number of pharmacists in the country. However, the number of pharmacists required by the MOPH was nearly filled by 1997 (83% of the number specified by the staffing standard determined by the CSC) (see Table 1.21).

Table 1.21: *Number of Pharmacist CSC Posts for Health Units under the Permanent Secretary's Office, MOPH, Compared to the Number Actually Working, Thailand, 1989 - 1998*

Year	CSC Frame (number)				Actual working	% of actual
	PH	PHO/DHS	Health college	Total	Number	to CSC frame
1989	645	857	20	1522	962	63.21
1990	645	857	20	1522	1205	79.17
1991	706	934	20	1660	1438	86063
1992	718	964	20	1718	1558	90.69
1993	718	964	20	1718	1608	93.6
1994	712	1012	20	1744	1723	98.8
1995	712	1012	20	1744	1974	113.19
1996	1151	1709	38	2898	2256	77.85
1997	1239	1709	38	2986	2473	82.82
1998	1239	1709	38	2986		

Note: PH = provincial hospitals, PHO = Provincial Health Office, DHs = District Hospitals, CSC frame = the post for government officers, identified by Civil Servant Commission

D. NURSES

1. General situation

The distribution of nurses has also improved gradually over the last two decades. The number of nurses has increased by about 3 times, while the population to nurse ratio has improved by about 2.5 times. The regional distribution has also improved. The northeastern region which used to suffer the greatest population to nurse ratio has improved by 5 times both for the total number and the population to nurse ratio. The difference between Bangkok and the northeastern region which used to be as great as 1: 18 has decreased to only 1:6 over the last two decades. (see Table 1.22).

Table 1.22: *Trend in the Distribution of Nurses in Each Region, Thailand, 1979 - 1995*

Region	**Distribution of nurses (Population per one nurse)**								
	1979	**1981**	**1983**	**1985**	**1987**	**1989**	**1991**	**1993**	**1995**
Bangkok	9,428 (522)	10,826 (494)	11096 (517)	11,831 (501)	12,982 (460)	14,338 (436)	13,514 (413)	14,979 (374)	16,089 (347)

Region	Distribution of nurses (Population per one nurse)								
Central	2,588	2,954	4,580	5,032	6,488	7,368	8,795	10,526	13,240
	(3,665)	(3,555)	(2,174)	(2,012)	(1,777)	(1,613)	(1,469)	(1,240)	(1,010)
North	2,089	2,548	3,082	3,313	4,234	4,620	6,747	7,823	9,370
	(4651)	(3,862)	(3,297)	(3,112)	(2,477)	(2,332)	(1,636)	(1,454)	(1,266)
South	1,392	1,415	2,216	2,423	2,962	4,138	4,900	5,694	6,498
	(4068)	(4,153)	(2,760)	(2,570)	(2,362)	(1,775)	(1,463)	(1,284)	(1,161)
Northeast	1,715	1,981	2,591	3,420	4,086	5,251	6,729	7,649	9,065
	(9492)	(8,701	(6,751)	(5,209)	(4,558)	(3,653)	(2,964)	(2,621)	(2,246)
Bangkok : Northeast	1:18	1:17	1:13	1:10	1:10	1:8	1:7	1:7	1:6
Total*	**17,212**	**19,674**	**23,565**	**26,019**	**30,752**	**37,515**	**40,685**	**46,671**	**54,262**
	(2676)	**(2,449)**	**(2,099)**	**(1,987)**	**(1,743)**	**(1,478)**	**(1,393)**	**(1,229)**	**(1,092)**

Source: Report on Heath Resources, Bureau of Health Policy and Plan, MOPH.

2. Nurses at the District Level

The number of nurses at the district level has also improved gradually. This is due to the production level of nurses by the MOPH. Although the production of nurses by the MOPH was not well accepted by the professional organization as well as the Bureau of University Affairs, it has continued and most of the nurses produced are technical nurses which are posted at both the provincial and district levels. The requirement of nurses at both the district and provincial levels, set by the CSC staffing standard, indicates a significant difference between registered and technical nurses. The same is true for the provincial hospitals. The number of technical nurses present for both levels has already exceeded the number required, while the number of registered nurses is about 60 to 70 percent the number required. It is interesting to note that the number required by the provincial hospitals and district hospitals are quite similar and showed a difference of only around 8,000 or about 27 percent more at the provincial hospital. The difference of doctor requirement between the district and provincial level showed a difference of about 5,000 or about 150 percent more than at the provincial hospital (see Table 1.23 and 1.24).

Table 1.23: *Ratio of Population per Registered and Technical Nurse, Thailand, 1988 - 1995*

Region	Ratio of population per one registered nurse and technical nurse, Thailand									
	1988		1990		1992		1994		1995	
	RN	TN	RN	TN	RN	TN	RN	TN	RN	TN
Bangkok	1:527	1:2778	1:434	1:3043	1:387	1:2355	1:356	1:2196	1:347	1:2445
Central	1:1863	1:2371	1:1516	1:1914	1:1363	1:1698	1:1064	1:1395	1:1010	1:1349
North	1:1894	1:2711	1:1818	1:2595	1:1561	1:2220	1:1363	1:2074	1:1266	1:1866
South	1:1836	1:2397	1:1680	1:2081	1:1355	1:1777	1:1275	1:1586	1:1161	1:1526
Northeast	1:3940	1:2734	1:3321	1:3584	1:2804	1:3271	1:2479	1:2798	1:2246	1:2614
Total	1:1693	1:2889	1:1277	1:2602	1:1308	1:2257	1:1150	1:965	1:1092	1:1895

Source: Report on Health Resources, Bureau of Health Policy and Plan, MOPH.

Table 1.24: ***Comparison of Estimated Need for Nurses at Hospitals Against the Actual Numbers Present, Thailand***

Type	District Hospitals			Provincial/Regional Hospitals		
	CSC frame	actual	%	CSC frame	actual	%
Registered Nurse	30,533	22,163	72.59	38,534	23,338	60.56
Technical Nurse	8,215	15,083	183.60	10,808	16,317	150.97
Total	38,748	37,246	96.12	49,342	39,655	80.37

CHAPTER 1I
MECHANISMS INVOLVED IN HRH DEVELOPMENT (HRD)

Various mechanisms are involved with the three major components of human resources development: planning, production and utilization. Although this report focused on the issue of HRH deployment which is part of HRH management, it is useful to look at the other two major components as many of the policy issues or possible remedial actions are related to the other two components. The efficient management of these mechanisms plays a vital role in solving the problems of HRH deployment for rural areas.

A. HRH PLANNING

The major HRH planning mechanisms are within the Ministry of Public Health (MOPH). As a national health policy body, the ministry has to deal with the availability, distribution and use of various types of health resources. As a major health service provider, it has to plan for its own HRH requirement, i.e. who will be posted to serve the majority of the rural population through an extensive network of health facilities at provincial, district and tambol (sub-district) level? As a part of the HRH production units, especially for those categories that the MOPH will use for its own health facilities, it has a role to develop the production plan. The MOPH has not been very effective in national HRH planning viz. influencing other related national policies in HRD and health development. HRH planning in the MOPH has more to do with planning for its own staffing requirements, and negotiating for posts, as well as development of a production plan for the HRH categories that it produces. A national mechanism was established during the mid 80s to mid 90s to better coordinate the MOPH and related educational institutes so that the HRH policies of the country could be better directed and implemented. However, this mechanism has fallen short of addressing national HRH issues.

In this respect, there are many other mechanisms and organizations that have been engaged or have initiated HRH planning exercises. Most of them undertook the activities out of their institutional interest. Various health-sciences faculties developed production plans. Some of them were based on a more comprehensive look at the needs of such HRH for the country. Professional organizations such as the Thai Medical Council initiated a few working groups to look at the needs for doctors for the country. A team of dentists, consisting of those working in the MOPH and dentistry schools, carried out a major planning effort to quantify the needs for dental health manpower. The planning methodologies adopted by each group are quite different and thus are the results and their implications.

B. HRH PRODUCTION

There are two major ministries involved in HRH production. The Bureau of University Affairs (BUA) deals with the production of major professionals in health (i.e. doctors, dentists, pharmacists, nurses, health sciences technicians, physiotherapist, etc.) The MOPH has its own schools for production of nurses and other auxiliaries such as junior

sanitarians, dental nurses, technical nurses, etc. There are a few private institutions that train HRH. Most of them train nurses and pharmacists. There is one private medical school. The BUA takes care of the quality of production while professional councils dealt with the quality of practice and licensing for practice. The Thai Medical Council also deals with residency training programs by crediting training institutes and determinining various policies regarding residency training quantity and quality. Other professional councils do not yet have an extensive role in post-graduate or specialty training. The MOPH is expected to play the major role in national health policies and standardisation, however there was an attempt to limit its role in setting targets for HRH production. Nevertheless, the MOPH introduced a program for the MOPH hospitals to be the sites for clinical rotation affiliated with medical schools to produce medical graduates. It was unclear who should take the major responsibility in terms of doctor production in this case.

C. HRH UTILIZATION

There are many organizations that use HRH. The MOPH is the major public provider but other organizations such as the BUA (through their teaching hospitals), the Ministry of Defense (MOD), the Ministry of Interior (MOI), etc. are also the users of HRH as they have their own service facilities. The private sector has a share of around 20-25 percent in terms of number of beds and hospitals. Depending on the general economic condition of the country and the categories of HRH, the proportion of HRH working full time in the private sector varies.

1. Staffing Standard of Health Facilities in the Rural Areas

Most of the health service facilities in rural areas are with the MOPH. Thus the major users of HRH in rural areas, especially in the rural districts, is the MOPH through their network of general hospitals, district hospitals and health centers. The types and numbers of HRH working in each type of health facilities are determined jointly by the MOPH and the CSC which controls the number of civil servants in various ministries at both the central and provincial levels. The CSC determines the staffing needs through consultation with the MOPH. During the last decade the governments have tried to control the growth of the civil service and thus the number of HRH in the rural areas were also affected. The staffing standard of health facilities in the rural area, namely those of regional, general, community (district) hospitals and health centers, have been revised every three years according to agreements between the CSC and the MOPH. This was also applied between the CSC and other ministries. The results of these periodic revisions has led to the increase in the number of HRH required in each type of facility, although the degree of change varied. The methods used to determine the staffing standard for each type of facility differed, but mostly relied on an HRH to facilities ratio. There was an attempt also to work out the requirement for medical specialists for both general and regional hospitals without due attention paid to the need for general practitioners at this level. The result was that the estimated requirements for doctors at this level far exceeds the number needed if the service delivery were to have a proper mix between generalists and specialists. Having a large gap in the requirement for doctors to be filled according to the

revised staffing standard has allowed the general and regional hospitals to absorb more doctors, even new graduates, compared to the district hospitals. On the other hand, the number of other types of HRH at the district level, such as dentists and pharmacists, has not been systematically worked out, but rather depended on some minimalist estimation of assessing 1-2 persons per district hospital.

2. Additional Payment for HRH in the Rural Area

All civil servants receive the same level of salary based on a position classification system (PC system) managed by the CSC. The MOPH can determine additional payment to HRH but these payments have to be approved by the MOF even though they might be paid out of a hospital's own revenue. If certain items are to be paid from government budget, the Bureau of Budget will also be involved in the decision making. The MOPH can hire its own staffs using hospital's revenue, but the number has to be approved by the CSC. Other ministries have their own respective personnel rules and regulations as well as committees for personnel management such as the BUA and the MOD. The MOPH system for additional payment to HRH in rural areas consists of various types of payment for services and entitlements, including post adjustments. The details are summarised as follow:

Types of Additional Remuneration	Rates (baht / month)	Total Budget required per year	Sources of Budget	Rationale
1. Administrative post adjustment	5,600 - 21,000	500- 600 mil. (for both 1 and 2 combined)	Government budget	To attract competent people to work with the public sector
2. Post adjustment for certain types of posts such as doctor, dentists including those providing certain types of services such as psychiatrict services, drug addict rehabilitation, social medicine	3,500 - 15,600		Government budget	Same as 1 with different rate according to the PC level starting from C7

Types of Additional Remuneration	Rates (baht / month)	Total Budget required per year	Sources of Budget	Rationale
3. Supplementary payment for 8 priority medical specialties and those providing services in the psychiatric department, drug addict rehabilitation and social medicine	4,000	NA	Hospital revenue	Set by MOPH with concurrence from MOF. This is for those categories and service providers who are below C7 and not entitled to the post adjustment payment in 2.
4. Non-private practice compensation for doctors, dentists and pharmacists	10,000	Total 255 mil. From government budget for those working in the rural health facilities as well as those working in BKK	Government budget with possible additional budget from hospital revenue	To encourage public servants to dedicate full time to the work in the public services. Enforced through cabinet resolution of 4 May 1993
5. Monthly supplement for district health system HRH (doctors, pharmacist and dentists, nurses in district hospitals and nurses in health centers	2,000-2,200 for regular district for all except nurses, Level 1 and 2 districts: 10,000-20,000 for doctors and dentists. 5,000-10,000 for pharmacists. 1,000-2,000 for nurses. 2,000 for	271 mil. for district level and 7.5 mil. for health center	Government budget	Toencourage HRH to work at the district level. First introduced in the mid ’70 wit revision of rate and criteria for payment periodically, last revision 1997 with big jump for Level 1 and 2 districts and

Types of Additional Remuneration	Rates (baht / month)	Total Budget required per year	Sources of Budget	Rationale
	nurses in health centers			newly introduced payment for nurses in health centers
6. Flat rate for overtime services	Doctor and dentists 800/8 hr shift Pharmacists 500 nurses 400	NA	Hospital revenue	latest revision of rate payable as of 12 September 1992.
7. Night shifts overtime for nurses	RN 200 TN 150 PN 100 per 8 hr. shift	192 mil. for regional and general hospitals. 200 mil. for district hospitals.	Government budget with possibility of hospital revenue supplement	To encourage nurses for the night shift duty in the public hospitals as they tended to go for beter paid jobs in the private sector when the previous rate of payment was lower
8. Payment for OPD during extra working hours	Doctors 30/case Dentists fee schedules but both with a minimal guarantee of 100/ hour Pharm. 90/hr RN 80/hr TN 60/hr others 50/hr	NA	Hospital revenues	To allow those working in the public services to have better earning from their extra hour work so that they will remain working in the public sector.
9. Fee schedules for surgery during extra working hour	Payment for doctors and surgical team according to surgical procedures	NA	Hospital revenue	To encourage timely surgical services during emergency and extra hour work

3. Present System of Additional Payment for HRH in the MOPH

The additional payment system was introduced mainly to attract HRH to remain working within the public sector. From existing evaluation and studies it was found that these payments were able to slow down the shift of HRH from the public to the private sector. Some of the crucial findings and other related issues about additional payment introduced to attract HRH to work in the public sector are summarised as follows:

3.1 Most (80%) of those paid under non-private practice compensation were new graduates under the compulsory services period. The total amount paid each year was around 1.425 billion baht with 1,188 physicians, dentists and pharmacists being paid. This is less than 25% of the total three categories of HRH who worked in the MOPH. At the district level 71% of doctors, 73% of dentists and 64% of pharmacists received this type of compensation.

3.2 For provincial hospitals the total amount spent for additional staff remuneration was around 1.71 billion baht (1997). This is around 25% of the salary of all types of health staff. Only less than 10% of such payment was from the government budget. The rest was from hospital revenue. The amount spent for those at the district level was not available for comparison.

3.3 Most of the health staff interviewed during the assessment mentioned that their morale had been better with the additional payment. Though total wages and benefits might not be as high as what the private sector pays, the additional remuneration had increased their income from the government significantly. On average, doctors at the district level were estimated to have tripled the amount they would have earned from salary alone. The payment system has also led to more service hours in public facilities and shortened patients' waiting time, especially patients coming outside of regular working hours.

3.4 The most recently revised monthly supplement for HRH in district hospitals with Level 1 and 2 districts getting far more than the rest of the country has raised complaints and requests for revision from those working in rural areas. The MOPH has decided to reconsider issues in this respect. No conclusion was reached at the time of this report.

D. ALLOCATION OF NEW GRADUATES FOR THE RURAL AREAS

Most of the staff in rural areas served by the MOPH were recruited to work in the rural areas through a compulsory service contract signed between the student and the education institutes after passing the entrance examination since 1971. For staff produced by the MOPH a contract was signed between the student and the MOPH. For those produced by the MUA, the compulsory service policies had to be approved by the Cabinet and the graduates are expected to work for all government agencies. Although the policies were to have more HRH working in rural areas, many other organizations without health facilities in rural areas did receive part of the allocation. Regarding medical graduates only about 60 percent of the annual graduates are allocated to work with the MOPH. The proportion was higher for dentist and pharmacists. There are three separate national committees to decide on how to allocate the new graduates every year. The MOPH functions as the secretariat for all three committees. As for nurses produced by the MOPH, they are recruited from various provinces and be assigned at enrollment where they are expected to work after graduation. All those who refused to work as mandated will have to pay a fine depending on the categories of HRH. The fine was criticised of being too low and having little effect to deter new graduates from refusing to work in rural areas. The proportion of HRH at the district level who are not under compulsory services may have improved during the last two decades but they have been quite slow and easily affected by the change in the economic difference between the rural and urban areas.

The allocation of new medical graduates and their utilization within the compulsory service period has certain areas for potential improvement. At present, the new graduates serving compulsory services are being assigned to work as follows:

D.1 New graduates were assigned to Provincial Hospitals (PHs) for the first year in order to be rotated in various departments. This assignment is meant to increase their skills and knowledge, e.g. by working under supervision. However the new graduates were mostly used as additional workforce and hardly received any supervision. They also served as additional workforce to be allocated to help with DH work when required, either by the Provincial Chief Medical Officer (PCMO), the DH or by the PH. The MOPH and the Medical Council allowed each province to set up a period when the medical graduates might be rotated to work at the district level in the first year, but the tendency is to try to minimize or even not allow them to do so, in order for them to be properly supervised by staff in big hospitals in the first year.

D.2 A certain number of new graduates assigned to the MOPH are posted to work in PHs that have been asked to

function as teaching hospitals. This is meant to add to the existing workforce so that experienced staff will have more time to teach the medical students. These staff are assigned to the teaching hospital for three consecutive years during their compulsory service period hoping to attract them to work there after the compulsory service period, if they were found by the hospitals to be acceptable for their permanent staff. This practice reduces the effective number of medical graduates available to be assigned to the district level for the subsequent years during the compulsory service period.

D.3 For the next two years during the compulsory service period doctors were expected to serve at the district level. However, they can ask to be transferred to other locations, including provincial hospitals. This further reduces the number available to work in rural areas during the compulsory service period.

D.4 There were no data as to how much of the effective working time at the district level of those doctors under compulsory service period has been reduced compared to the period before all these changes (especially after the introduction of the first year training requirement at the provincial level). The only set of data that may help to suggest that this may have negatively affected the district level was the fact that the increase in the number of doctors at the district level has started to slow down or even decreased after the initiation of the requirement. However there were no complete data about the outflow of doctors from the district level to explain whether the decrease or the slow down has been the results of the reduction in effective time spent at the district level during that three year period or has it been due to the increase in the outflow of doctors during that same period (see Figure 1.3 in Chapter 1: Situation Analysis).

E. RESIDENCY AND OTHER TRAINING OPPORTUNITIES FOR HRH IN RURAL AREAS

Those HRH working in the public sector in the rural areas or any other part of the country can ask for a leave for graduate or post-graduate training. The number to be approved for each year is entrusted to the PCMO. However residency training for doctors has a different track of management. The two major divisions in the MOPH, the Rural Health Division and the Rural Hospital Division, which provide support to the health facilities in rural areas will determine the specialties and number to be sent for residency training every year. There is a matching process whereby the candidates will be selected by respective hospitals whose quotas have been approved. The medical graduates have to apply and be selected by respective training institution they applied for. After finishing training the doctors will go back to the hospitals that have selected them. This process has posed a few important problems in relation to the motivation of doctors to work in rural areas.

First, it is well known that a large number of doctors apply for residency training after completing the compulsory services in rural areas. Those working in the remote districts are concerned that they might not be selected by the respective hospitals having quota to send doctors for specialty training. They believe their chances increase if they work close to big hospitals in provincial towns where quotas for specialists are often provided. This leads to doctors wanting to remain working in provincial hospitals rather than be posted into remote districts. Moreover the Rural Health Division allocated quotas for specialty training for certain district hospitals hoping to attract more to work at the district level as well as upgrading services at certain district hospitals. However, the quotas were too low compared to those for provincial hospitals. Moreover those completing training rarely went back to work in the district hospitals. Those who went back tended to be discouraged from working at the district level for fear of losing their skills and expertise because of lack of continuing education. Thus the issue of specialty training and the retention of HRH at the district level is a highly complicated issue that no single measure can be expected to solve.

F. HRH MECHANISM AT THE PROVINCIAL AND MINISTERIAL LEVEL

Due to the complex nature of HRH management and the centralized nature of the public administration system, various issues related to the management of HRH in the MOPH are being tackled by different units. Moreover, the command over the work of the MOPH at the top level tends to separate between the three major components that affect the use of HRH in rural areas, namely personnel management, health services development and manpower development. They fall under three Deputy Permanent Secretaries. Moreover the component on health service development will normally be further divided between the Provincial and Rural Health Services under two different Deputy Permanent Secretaries. This has resulted in the fragmented attention being given to the issue of HRH deployment in rural areas. In many cases it is the division level which determines policies and is approved by top executives who might not be concerned about the potential conflict with the major policy of emphasis on rural development. Although there have

been attempts to better coordinate the various lines of command the efforts have not been effective.

At the provincial level, it is less complex as there are not that many divisions involved. However the very nature of separation between the provincial and district hospitals must be considered. Although the PCMO is supposed to be in charge of provincial health system functions and development covering both provincial and district hospitals and health centers, in practice in most provinces the coordination has been poor. There might be certain degree of cooperation, or provincial hospitals supporting the district level, but they are quite limited (see Chapter IV: Approaches and Findings). However the advantage that the provincial level has over the central level in terms of HRH management is the ability to link HRH management with the related needs for the improvement of health services facilities, and providing educational or other technical supports needed for capacity strengthening. The allocation and rotation of HRH is also much easier at the provincial level, except for the rotation between the provincial and district hospitals. The other issue of HRH management at the provincial level is the inadequate concern being given to the productivity or performance appraisal of the HRH. This has made the system of additional payment introduced by the MOPH inefficient and criticised of being wasteful and unfair rather than bringing about better services for the people and better morale to those working in rural areas.

CHAPTER III
MAJOR PROBLEMS WITH HRH UTILIZATION AND MANAGEMENT IN RURAL AREAS

From review of existing data, field visits and discussion with various groups of people both in the MOPH and outside, the following problems and issues have been identified:

1. Compulsory service is crucial for distributing HRH to the rural health services. However there are many issues facing the continuation of policies on compulsory services. The trend of downsizing the civil service, and the present economic crisis, have raised criticisms about the appropriateness of compulsory service. This is in addition to the prevailing criticism that compulsory services are not an effective way to distribute HRH to the rural area. At the same time dentists and pharmacists requirements for rural areas as determined by the MOPH staffing standard are nearly filled while the new batch of students are still require to sign contracts for compulsory services. On the other hand, there is a need to improve on the deployment of medical graduates during the compulsory services in rural areas so that it can help to alleviate the shortage of doctors at the district level. Some of the questions that have been identified regarding the issues of compulsory services are as follow:

    1.1 Are the compulsory services economically rational or should the policy be modified?

    1.2 Should the government introduce self-financing instead of providing subsidies for education of health-sciences students and at the same time discontinuing compulsory service requirement?

    1.3 What are the perceptions and possible reactions of medical students and their parents towards compulsory services and self-financing?

    1.4 How much should the government pay doctors during the compulsory services?

    1.5 Now that the needs for dentists and pharmacists for rural health services are approaching saturation according to the present staffing standard, how should these two categories be treated regarding compulsory services?

2. The HRH shortage in the district health system is chronic and highly sensitive to changes of in the environment. There was a phase of rapid increase due to the emphasis being given to district hospitals during the 5th five-year plan (1982-1986). When the economy was good during the past decade and with the introduction of the new method of using doctors under the compulsory services, the growth in the number of doctors at the district level was low or even stagnated. There were quite a number of studies on why doctors decided to leave rural services, most them leaving after completing their compulsory service. However there are also increasing proportions of doctors in district hospitals who are beyond the compulsory service requirement but still working at the district level. There are not yet any studies to find out the reasons why they stayed on

after completing the compulsory services. Knowing the perceptions and expectations of both those remaining working at the district level for an extended period, as well as those who left the district hospitals after completing compulsory services, may be useful to guide us towards more effective measures for deployment of HRH in rural areas.

3. The staffing standard for rural health service facilities, though systematically determined, could benefit from better refinement to arrive at a better balanced staffing pattern between the provincial and district levels. This is particularly true for the three categories under compulsory services namely doctors, dentists and pharmacists. The periodic revision of the staffing pattern resulted in greater needs for HRH at the provincial level. The number required for doctors was never met and thus resulting in a seemingly large gap of HRH requirement at the provincial level while district hospitals also had a large gap of HRH needs that was only partially filled. A refined staffing standard may help to better focus HRH allocation to the areas with more severe shortages, rather than making the HRH shortage in the rural area seemed wide-spread and difficult to focus resources on. The revised staffing pattern can thus be used to better focus on priority provinces and districts for future allocation of limited HRH and other relevant policies.

4. The additional payment for HRH in the rural area has resulted in attracting more HRH to work with the MOPH both at the provincial and district level. However the payment system was assessed and found that there was room for improvement. Certain types of remuneration, especially the non-private practice compensation was popular among new graduates while those who has already established their channel of private practices remained with their private practices. There were also debates about the rationale for such compensation, coupled with the fact that it may have been paid to reduce the overall productivity of health personnel if hospitals managers could not make use of those being paid to generate more work in the public settings. Some doctors argued that such payment reflected the fact that the government accepted that doctors have been unreasonably paid and thus found ways of adding to their salary and thus increase the morale and the quality of their work even without requiring more working hours with such payment. However, the additional non-private practice remuneration remains a type of compensation that needs to be revisited to make it more efficient.

Another issue that has been quite obvious was the generalized nature of the compensation system. The rate paid to those working at the district level was the same as that at the provincial level, thus creating no incentive to work at the district level where the shortage of HRH is greater. People of the same professional background got some type of the compensation especially those related to professional qualification, no matter where they worked and what types of jobs they were doing.

For the workload-related remuneration the system took into account mostly curative services workload. Most of such work took place at big hospitals in urban areas at the provincial level. This has made the overall income of those working in provincial hospitals more sizable compared to those at the district level where less curative workload and less sophisticated procedures or practices may be more common.

Preventive and promotive services provided at district facilities were not included in the list of workload-related compensation.

Another area that needs to be revised deals with the categorization of two different types of district with different rates of additional monthly compensation. The classification was done by the central MOPH with some feedback from the provinces. There were some disputes about the final results of the classification. Moreover the situation for certain districts may not be alleviated by paying more for those wanting to work there as there might not be anybody willing to work there for an extended period of time but it may be easier to find someone for a non-permanent posting using the additional monthly payment in a slightly different way.

5. While the number of HRH at the district level might not have increased, the situation of HRH shortage at the provincial level has improved quite significantly. It is therefore important to explore how to build better relationship between the provincial and district levels so that the HRH available in the province could be used to better provide services at both provincial and district levels. The practical separation between the two lines of provincial and district hospitals have affected the cross-mobilization of HRH between the two levels. This happened despite the administrative system of having both of them under the same PCMO. It will therefore be useful to explore how the two levels have been working with each other and helping with regards to HRH sharing and service system development. It may help to provide some practical model and ways of better use the existing HRH in each province or group of provinces rather than having them staying separated with great difficulties in cross-mobilization.

6. Existing HRH problems in the rural areas are not due as much to the lack of good policies as to the lack of effective implementation from the responsible units. The highly centralized nature of HRD in the country including within the MOPH as the major user of HRH in rural areas has made the actual implementation of sound policies highly inefficient. Creating better management, as well as a certain degree of restructuring of existing units carrying out different roles and functions, will be necessary if the HRH shortage in rural areas is to be alleviated. This includes issues such as:

6.1 Use of graduates under compulsory services for a better balance between the provincial and district level.

6.2 Planning for HRH requirement for the rural health facilities and the actual allocation of posts and budget for HRH recruitment for the two levels.

6.3 Better synchronization of plans in the education institutes with the needs for HRH in rural areas such as the case of residency training and medical specialists production.

6.4 Possibility of using auxiliaries for certain types of service delivery in different types of health facilities.

6.5 Continuous educational supports (e.g. CME) for those HRH working in rural areas.

CHAPTER IV
APPROACH AND FINDINGS

A. OVERALL METHODOLOGY

Based on the review and preliminary discussion with the identification of the various problems outlined earlier, the TA team carried out additional activities for data collection and data analysis as follows:

- Six surveys. Four of them aimed at finding out the reasons why doctors decided to leave or stay on in district hospitals. Two of the surveys aimed at assessing the attitudes and possible reactions of medical students and their parents towards compulsory services and self-financing for medical education. The last survey was of dental students' reactions to compulsory services and self-financing of education.

- Group discussions to find out how provincial and district hospitals are related or working with each other in different provinces and how they might further foster their working relationship and help alleviate the HRH shortage at the district level.

- Organize meetings with different groups of people responsible for various activities in HRH deployment in the MOPH and in provinces to find out their suggestions or reactions to possible recommendations.

- Develop working models for estimating doctor requirements for provincial as well as district levels and use this as an example of how to modify the current staffing norms to better distribute doctors to the district level in the future.

- Mapping priority areas that will deserve higher attention in terms of HRH requirements. This was carried out both for the identification of priority provinces and priority districts. The idea of priority province was to guide the implementation of the policy on improving sharing of HRH between the two levels as well as focus for priority allocation of HRH , especially new graduates. The identification of priority districts will help to further focus on the priority district within the province. This will be useful both for HRH allocation as well as targeting additional payment for HRH working in those districts.

B. FINDINGS

1. Factors Affecting the Working Duration at District Hospitals

As mentioned in the summary of key HRH problems in rural areas, HRH at the district level has a high turnover rate. This is particularly true for doctors and dentists and to a lesser extent with pharmacists and nurses. However the trend also showed that there has been a higher proportion of doctors at the district level who have completed their

compulsory service requirement. The team therefore decided to launch surveys for both those leaving the district hospitals and those remaining for an extended period of time to find out their views and reasons towards working at the district hospitals.

Approach:

A set of structured questionnaire was sent to 4 groups of doctors:

- Doctors who has been working in the DH for more than 5 years (the senior group), their position ranked from C6 to C8. They were asked the reasons why they remained working at the district level, how they perceived the DH work, and what they thought was important to improve their satisfaction with the work at the district level.

- New doctors working in DH for less than 5 years (the junior group), the position ranked from C4 to C5. They were asked about their perception toward DH's, whether they will continue working there and the related reasons for such decisions. They were also asked what it would take for them to be more interested to work longer in the DH's.

- Doctors (mostly specialists) working in provincial/regional hospitals (the provincial group.) were asked whether they ever worked in DHs, and if yes, how they felt towards the work there, what reasons made them leave the DH and would they want to work in the DH again, what are the important motivating factors, how much the income they want to enduce them to work at the district hospitals.

- Doctors during the residency training program (the resident group), were asked the same issues as provincial hospital doctors, to see the opinions of a different cohort.

All groups were also asked their opinions on certain new working environment at the district level and asked to choose which one they preferred.

Interviews and group discussions were held with the doctors in DHs and PHs who used to work in DH about their perception towards working there, what they liked and disliked, the major problems and obstacles for them to work and stay at the district level. This was carried out in 3 provinces: Nan in the north, Khon Kaen in the northeast, and Pattanee in the south.

Findings:

The senior group (N = 184) have been working for 11 years on the average (5-30 years), most are men (94%), married (86.4%), not specialists (76.1) and the directors of hospitals (76.6%).

The sample of junior group (N = 193) have been working for 2 years on the average, male (60%) female (40 %) and most are single (87.4%) and non-directors (75.4 %).

The sample of provincial group (N = 149) have been working in provincial hospitals for 7.5 years (1-24 years). Most are male (77.3 %), with experiences in DH of 66.4 %.

The sample of resident group (N = 53) have been working for 3.5 years and 88.7 % had experiences working at the district level.

The directors of the senior group.had positive attitudes toward their work more than the junior group and the other groups, even though they all shared the feeling of working harder in the rural areas. The component they ranked lowest was the opportunity for capacity development. This is the same in all groups (see Table 4.1 and 4.2).

Table 4.1: *Perception of District Hospital Doctors towards their Work, Comparing between Gender, ranking from high to low (the weight is 5 maximum and 0 minimum)*

The Senior Group.				The Junior Group			
male (N=170)	average wt.	Female (N =9)	ave. wt.	male (N=114)	ave. wt.	Female (N =77)	ave. wt.
Being valued	4.25	Being valued	4.44	Being valued	3.97	Being valued	3.79
wide variety of work	4.15	wide variety of work	4.33	hard work	3.71	hard work	3.35
hard work	4.10	continuous self development	4.13	wide variety of work	3.33	wide variety of work	3.22
interesting, enjoyable work	3.65	hard work	4.00	interesting, enjoyable work	3.21	interesting, enjoyable work	3.06
continuous self development	3.49	interesting, enjoyable work	3.89	continuous self development	3.02	continuous self development	2.7

Table 4.2: *Perception of District Hospital Doctors towards their Work, Comparing Directors and Non-Directors, ranking from high to low (the weight is 5 maximum and 0 minimum)*

The Senior Group				The Junior Group			
Directors (N=138)	ave. wt.	Non-directors (N =41)	ave. wt.	Directors (N=48)	ave. wt.	Non-directors (N =144)	ave. wt.
Being valued	4.38	Hard work	3.85	Being valued	4.00	Being valued	3.87
Wide variety of work	4.33	Being valued	3.83	wide variety of work	3.87	hard work	3.53
Hard work	4.17	Wide variety of work	3.59	hard work	3.73	wide variety of work	3.08
Interesting,	3.86	Interesting,	2.98	interesting,	3.46	interesting,	3.03

enjoyable work		enjoyable work		enjoyable work		enjoyable work	
Continuous self development	3.72	Continuous self development	2.83	continuous self development	3.42	continuous self development	2.72

The senior group was also satisfied with the administrative work as well as the preventive and promotive service roles. They also felt more comfortable with the roles in manpower development compared to the junior group and the non-directors (see Tables 4.3 and 4.4). Satisfaction with curative service is on a comparable scale.

Table 4.3: *Satisfaction of District Hospital Doctors towards Different types of Work in the District Hospitals, Comparing between Gender, ranking from high to low (the weight is 5 maximum and 0 minimum)*

The Senior Group (C6-C8)				The Junior Group (C4-C5)			
male (N=170)	ave. wt.	female (N =9)	Ave. wt	male (N=114)	ave. wt.	Female (N =77)	ave. wt
Administration	3.68	Administration	3.89	In-patient care	3.5	In-patient care	3.44
Out patient services	3.65	HRH development	3.67	Out patient services	3.19	Surgery and delivery	3.21
In-patient care	3.62	Prevention promotion, community services and development	3.56	Surgery and delivery	3.14	Prevention promotion, community services and development	2.48
Prevention promotion, community services and development	3.48	Out patient services	3.44	Administration	2.81	HRH development	2.31
HRH development	3.48	In-patient care	3.33	HRH development	2.71	Administration	2.27
Surgery and delivery	3.42	Surgery and delivery	3.11	Prevention promotion, community services and development	2.64	Out patients	2.25
Supervision and strengthen health centers	2.86	Supervision and strengthen health centers	3.11	Supervision and strengthen health centers	2.13	Supervision and strengthen health centers	2.01

Table 4.4: *Satisfaction of District Hospital Doctors towards the Types of Work in the District Hospitals, Comparing Directors and Non-Directors, ranking from high to low (the weight is 5 maximum and 0 minimum)*

The Senior Group (C6-C8)				The Junior Group (C4-C5)			
Directors	ave.	Non-directors	ave.	Directors	ave.	Non-directors	ave.

(N=138)	wt.	(N =41)	wt.	(N=48)	wt.	N =144)	wt.
Administration	3.99	In-patient care	3.32	In-patient care	3.52	In-patient care	3.46
Out patient service	3.74	Out patient service	3.29	Out patient services	3.45	Surgery and delivery	3.26
HRH development	3.71	Surgery and delivery	3.15	Administration	3.38	Out patient service	3.11
In-patient care	3.7	Prevention promotion, community services and development	2.76	HRH development	3.21	Prevention promotion, community services and development	2.38
Prevention promotion, community services and development	3.7	HRH development	2.73	Prevention promotion, community services and development	3.17	HRH development	2.34
Surgery and delivery	3.48	Administration	2.68	Surgery and delivery	2.92	Administration	2.33
Supervision and strengthen health centers	3.1	Supervision and strengthen health centers	2.1	Supervision and strengthen health centers	2.73	Supervision and strengthen health centers	1.88

Factors contributing to extending work in DHs after the completion of the compulsory period, expressed by the directors or the senior group consisted of the feeling of being valued and being able to make a meaningful contribution. They also felt that the work is suitable to their character, and enjoyable. Moreover they felt that they had good teams, stable families and income, and their working place is convenient with regards to their travel requirement (see Tables 4.5 and 4.6).

TABLE 4.5: *Reasons of Doctors Remaining Working in District Hospitals of the Senior Group, rank from the most important to the lower important (weight 5-0), BY SEX*

Male (N = 173)	ave. wt	Female (N = 11)	ave. wt
1. being of more value/contributory	3.98	1. good working team and environment	3.55
2. DHs match their characters	3.88	2. enjoyable, interesting work	3.45
3. stable family	3.78	3. being of more value/contributory	3.36
4. enjoyable, interesting work	3.75	4. easy for communication and transportation	3.09
5. good working team and environment	3.65	5.DHs match their charactors	3.00
6. adequate income	3.58	6.close to hometown	2.64
7. easy for communication and transportation	3.58	7.stable family	2.55
8. close to hometown	3.04	8. adequate income	2.18

TABLE 4.6: *Reasons of Doctors Remaining Working in District Hospitals of the Senior Group rank from the most important to the lower important (weight 5-0), COMPARING DIRECTORS AND NON DIRECTORS*

DIRECTORS (N = 139)	ave. wt	NON-DIRECTORS (N = 42)	ave. wt
1. being of more value/contibutory	4.12	1 adequate income	3.76
2. DHs match their characters	3.99	2. stable family	3.68
3. enjoyable, interesting work	3.88	3. easy for communication and transportation	3.49
4. good working team and environment	3.73	4. good working team and environment	3.38
5. stable family	3.71	5. being of more value/contibutory	3.33
6. easy for communication and transportation	3.56	6. close to hometown	3.31
7. adequate income	3.41	7. DHs match their characters	3.26
8. close to hometown	2.93	8. enjoyable, interesting work	3.21

As for the junior group who already had left district hospitals, they cited the five major factors that would be important to keep them working at the district level as consisting of a well- prepared team, more efficient work system, adequate number of doctors to cope with the high workload, adequate income and proximity to their hometown. These are slightly different when analysed by subgroup analysis of whether they are male or female and whether they were directors or non-directors (see Tables 4.7 and 4.8).

TABLE 4.7: *Factors that Motivate Doctors to Work Longer in District Hospitals (weight 5-0), opinions of the junior group., BY GENDER*

Male (N = 105)	Ave. wt.	Female (N = 76)	ave. wt.
1. well prepared team	4.09	1. well prepared team	4.05
2. more efficient system	4.04	2. more efficient system	3.93
3. adequate number of doctors	3.82	3. adequate number of doctors	3.74
4. adequate income	3.53	4. near the hometown of themselves/spouses	3.58
5. near the hometown of themselves/spouses	3.45	5. adequate income	3.44
6. more convenient living environment	3.38	6. more convenient living environment	3.21
7. less workload	3.02	7. not deal with administrative	2.78
8. not deal with administrative	2.51	8. less workload	2.69

TABLE 4.8: *Factors that Motivate Doctors to Work Longer in District Hospitals (weight 5-0), opinions of the junior group., COMPARING DIRECTORS and NON-DIRECTORS*

Directors (N = 48)	Ave. wt	Non-directors (N = 144)	ave. wt

Directors (N = 48)	Ave. wt	Non-directors (N = 144)	ave. wt
1. more efficient system	3.88	1. well prepared team	4.14
2. well prepared team	3.87	2. more efficient system	4.03
3. adequate doctors	3.74	3. adequate doctors	3.82
4. near the hometown of their own /spouses	3.33	4. near the hometown of their own /spouses	3.57
5. adequate income	3.33	5. adequate income	3.55
6. more convenient living environment	3.11	6. more convenient living environment	3.37
7. less workload	2.71	7. less workload	2.96
8. not deal with administrative	2.00	8. not deal with administrative	2.83
9. good schools for children	2.07	9. good schools for children	2.74

2. Factors Affecting the Decision to Leave District Hospitals

The study also gathered information regarding doctor's reasons for leaving district hospitals. Ninety-eight (98%) percent of the junior group plan to leave the DH as soon as their compulsory period is over. Eighty-seven (86.8%) percent of them will leave for specialist training, 5.5 percent for PH, and 2.2 percent to the private sector. Only 2.2 percent will remain working in the DHs. The reasons to leave the DHs were mainly the urge to study more and that the doctor found the work boring. The reasons are the same for both those who were directors and non- directors, men and women. Factors that would motivate them to work longer are a well prepared team, efficient working system, adequate number of doctors relative to workload, adequate remuneration, working places being close to their hometown, and adequate living facilities (see Tables 4.9, 4.10, and 4.11).

Table 4.9: *Reasons of Doctors Leaving District Hospitals Ranked from the Most Important to the Least Important (weight 5-0), for the junior group, BY DIRECTORS AND NON DIRECTORS*

DIRECTORS (N = 16)	ave wt.	NON-DIRECTORS (N = 73)	ave wt.
1. want to study more	4.75	1. want to study more	4.67
2. the work is boring	2.94	2. the work is boring	3.19
3. DH work give lower previlege than specialist work in towns	2.63	3. hard work	2.74
4. family factors	2.50	4. low income	2.60
5. hard work	2.44	5. family factors	2.45
6. low income	2.44	6. DH work give lower priveledge than specialist work in towns	2.11
7. difficult living environment	2.33	7.difficult living environment	1.91
8. feeling of no value nor benefit to others working at DHs .	1.88	8. feeling of no value nor benefit to others working at DHs.	1.75

Table 4.10: *Reasons of Doctors Leaving District Hospitals Ranked from the Most Important to the Least Important (weight 5-0), for the junior group, BY SEX*

Male (N = 50)	ave. wt	Famale N = 37)	ave. wt
1. want to study more	4.58	1 want to study more .	4.81
2. the work is boring	3.22	2. the work is boring	2.97
3. hard work	2.66	3. hard work	2.67
4. low income	2.51	4. low income	2.55
5..family factors	2.42	5.family factors	2.55
6. DH work give lower priveledge than specialist work in towns	2.36	6. DH work give lower priveledge than specialist work in towns	1.94
7. difficult living	2.08	7.. difficult living	1.84
8. feeling of no value nor benefit working at DHs .	1.84	8. feeling of no value nor benefit to others working at DHs .	1.67

Table 4.11: *Reasons of Doctors Leaving District Hospitals Ranked from the Most Important to the Least Important (weight 5-0), for the provincial and resident groups*

The Provincial Group (N=88).	ave. wt	The Resident Group (N =48)	ave wt
1. want to study more	4.3	1.want to study more .	4.42
2. family factors	3.14	2. family factors	3.05
3. had enogh of the DH work	2.73	3. had enough of the DH work	2.58
4. low income	2.44	4. Low income	2.51
5. hard work	2.25	5. hard work	2.4
6. the work is boring	2.19	6. DH work give lower priveledge than specialist work in towns	1.96

When asked what were the limitations of their work in the district hospitals, the provincial and the resident groups who had experiences working at district hospitals identified the lack of teams with good potential as the prime factor followed by the lack of chances for using the knowledge they gained. The resident group identified another two factors related to the need for access to information and to a good career path. However, the provincial group who have changed from district to provincial working environment added the factor of the abuse of power from the higher echelon as a limitation of their work at the district level. Interestingly the high workload was not identified as crucial limitation for their work at the district hospitals (see Table 4.12).

Table 4.12: *Limitations of Working in District Hospitals*

The Provincial Group (N=43)	ave wt.	The Resident Group (N=30)	ave wt
1. lack of team with good	3.76	1. lack of team with good	4.17

potential		potential	
2. little chance to use the knowledge	3.63	2. little chance to use their knowledge	4.13
3. be imposed by the higher echelon	3.67	3. difficult to access update technology and knowledge	3.97
4. difficult to access update technology and knowledge	3.33	4. limited career path	3.76
5. limited career path	3.17	5. be imposed by the higher echelon	3.41
6. also have to deal with administrative work	3.03	6. high workload	3.25

The five factors that have been identified as crucial to motivate doctors to work at the district level consisted of: good management system, presence of a well-prepared team and equipment, high income, good communication and transportation, good schools for children. They also preferred not to work in the high risk areas (see Table 4.13).

Table 4.13: *Factors that Motivate Doctors to Work in District Hospitals, Comparing the Provincial and Resident Groups*

The Provincial Group (N=45)	Ave. wt	The Resident Group (N = 29)	Ave. wt
1. Good management system	4.16	1. Good management system	4.36
2. well prepared team and equipment	4.02	2. good school for children	4.24
3. high income	3.73	3. ready team and adequate equipment	4.19
4. not working in high risk areas	3.63	4. high income	3.86
5. good communication and transportation	3.62	5. good communication and transportation	3.74

The provincial and the resident groups were also asked whether they would be interested in going back to work at the district level again. The response was a bit different between the two groups. The residency which is the group leaving mainly because of the need to pursue additional training seemed to be more ready to go back on condition that the system there be improved as mentioned earlier. The provincial group who might have left district hospitals or never had experiences working there at all gave a different response and yielded a lower positive reaction to going back to the district level again (see Table 4.14).

Table 4.14: *Willingness to go back and work at the District Hospitals Again, Comparing the Provincial and Resident Groups*

The Provincial Group (N= 112)		The Resident Group (N= 44)	
not interested at all	62.6 %	not interested at all	27.3 %

interested if the system is developed	26.3 %	interested if the system is developed	54.5 %
interested without conditions	11.1 %	interested without conditions	18.2 %

In conclusion the survey yielded a number of interesting and useful findings that might be used for further discussion with the various groups:

1. Those doctors remaining working at the district level beyond the compulsory period had different sets of attitudes and values about their professions. Those who valued the work of specialists dealing with modern technologies and working in big institutions will be less attracted to work for a long period at the district level. However there are more who have built up their affinity with the work at the district level. This could be due to many other factors beyond personal attitude. Many of them could have been working in the less difficult areas and have been quite successful in their work. However for those who are attracted to the role model of specialists it will also be difficult to convince them to remain at the district level even though they could have been as successful during their compulsory services.

2. Those who remained working at the district level for a longer period tended to be more comfortable with the types of services provided at that level, compared to those who left the district level who like the activities less. These included health promotion and preventive services, community work, and manpower development and supervision. They were also attracted to work at the district level mostly because of the administrative work. The senior group who are non-director identified the conventional roles and functions of curative service and surgery, delivery as being the types of work they enjoyed more than the roles in disease prevention and health promotion. This will be important as the majority of those with high turnover in the district hospitals will become more and more those who are not in administrative positions.

3. The major reason that doctors leave district hospitals is the perceived need for continuing education, primarily specialty training. One of the major factors that was ranked quite low by all groups about district hospital was also the fact that the opportunity for continuous learning was quite deficient at that level. Taking these two factors together one of the crucial components that may need to be introduced and implemented seriously is the creation of various types of educational opportunities other than specialist training. This could mean a good-quality distant learning system of continuing medical education (CME), an alternative training program that may earn higher qualification in various fields of medicine including preventive medicine, the opportunity for advanced training in health management, etc. Moreover the teaching and learning experiences including the attitude of the faculties in medical schools may have to be changed to better re-orient the medical students towards rural health services and encompass the opportunity to learn about a much broader role of doctors in the society.

4. The management system and manpower capacity at the district level is something that will need to be further strengthened. This is certainly not something in isolation from the need to develop the management system of the public administration. It was also

interesting to note that income was not identified as a crucial component. This could be interpreted in many ways but taking into account some of the earlier studies where income was always referred to as a crucial factor and the fact the respondents were informed about the potential use of the information they provided, it would not be incorrect to assume that this factor has been resolved to quite a large extent by the existing payment system, especially for doctors.

3. Provincial – District Relationships

Approach:

Field visits and discussion with those working in district hospitals, provincial hospitals and the PCMOs who are in charge of the service provision in each province as well as making the best use of HRH in the provinces regardless of what level they work in. The team went to four provinces: Nonthaburi, Nan, Pattani and Khon Kaen.

Findings:

1. All of those interviewed agreed that better linkage between the two levels would help to improve services provided to the population. However, not everyone agreed that better linkage would lead to better retention of HRH in the rural areas, especially at the district level.

2. There are already existing models of provincial hospitals trying to better support the work at the district level, although the intensity varied according to many factor such as the continuity of such relationships. Nan province seemed to stand out very clearly as the province where provincial hospital has been supporting the district hospitals in many aspects (see Table 4.15). These efforts have been quite effective judging from the fact that most doctors in district hospitals maintain regular contacts with the provincial hospital and feel very comfortable asking for help and support from the provincial hospital, e.g. asking for a temporary doctor when there are some urgent needs. At the same time, the usual patients referral problems were kept well under control because of the historical good relationship between the two levels. The second factor seemed to result partly from historical developments. Specifically, most doctors at the district hospitals had spent some extended period of time (at least a year) in provincial hospitals and thus formed the informal sense of acquaintance. The hospital also tried to do its best to boost such impression by providing facilities that made doctors feel that they had the second office in the provincial hospitals once they came into town. They also made it easy for district hospitals to borrow equipment or even ask for temporary supplies of drugs or allow drug exchange. They also tried to organize regular technical meetings with those at the district hospitals although this proved to be not as effective as they expected. Such relationships also depend on the leadership and teamwork of the provincial hospitals. It is also a matter of relative leadership between the provincial health office and the provincial hospitals. Administratively district hospitals have little to do with provincial hospitals and things have to be dealt with through the PCMO. However the

good relationship between the two offices at the provincial level determine also how effective and how much the provincial hospital work and supports the district hospitals.

Table 4.15: *Supports rendered to the District Level by the Provincial Hospitals*

	Nan	Nont.	KK	Pattani
1. Provide drug supplies or drug exchange	4	1	2	1
2. Doctors to help with services	2	NA	NA	NA
3. Regular technical conference	3	NA	1	2
4. Referral conference	2	1	2	2
5. Outreached services development team	1	NA	NA	2
6. Act as in-service training site on demand	1	NA	1	NA

3. There were quite a number of proposal that the provincial hospital should be administratively responsible for the district hospitals to provide better support. It was suggested that efficient management of hospital services could be improved if hospitals at both levels were more closely related rather then having to be mediated through the PCMO. This view was not shared by all of those at the district level. Some agreed with the principle but they were concerned about certain points such as the fact that provincial hospitals were too curative oriented and may look after district hospitals from purely curative goals and objectives. Moreover closer linkage would mean a larger organization and span of control. Presently provincial hospitals might not have yet achieved the efficiency they were expected to achieve. Adding district hospitals to the direct line of command may be counterproductive and not lead to the expected outcome of better support to the district level.

4. Some other alternative proposals were made to link provincial to district hospitals through alternative financing methods. Khon Kaen is experimenting the fund-holding approach. At present, the changes are confined only to patient flow and budgetary responsibility. There is no change in technical support provided to the district level by the provincial level. Attention is also not on improving working condition or better retention of HRH at the district level. The district fund-holding approach may prove to be useful for improving the quality and cost-effectiveness of patient care although this aspect is not yet systematically documented.

5. However it poses another possible alternative regarding HRH deployment and retention at the district level, if the model could lead to better job satisfaction of those HRH at the district level. It may mean that better HRH retention and function at the district level may not necessarily require building a too close relationship between the two levels (e.g. to put them under the vertical relationship to each other). Other possible models proposed had to do with creating mechanism or rules and regulations that may better facilitate the provincial hospitals supporting the district level. These measures include the requirement for HRH, especially doctors to have to serve at the provincial level for some period before being posted to the district level. Alternatively earmarked budget might be provided to each province for district service development and let the joint provincial-district team decided on how to best use this budget to mobilize supports

from the provincial level, including rotation of HRH between the two levels or paying for staffs at the provincial level to help provide services at the district level whenever needed. Such earmarked budget could also be used for other types of activities or expenditure that may facilitate the provincial hospitals to better improving the capability as well as morale of those at the district level such as sending of a mobile team to improve the work system at the district level, or even procuring equipment necessary to upgrade the quality of services rendered at the district level.

6. On the issue of rotating HRH between the two levels, there is no wide spread practice along this line. Neither was there any need expressed for such a system. On the one hand the provincial level saw this as impractical as it would be very difficult to rotate staff from the provincial level to work at the district level, except for a very limited period of less than one day. On the other hand, it would be unfair to the population at the district level to have to face an ever changing group of HRH serving them.

7. When asked what would be done if a network of autonomous providers in each province were to be formed, providers at the provincial level seemed to be very receptive and came up with ideas on treating each district hospitals as branches of the provincial hospital, in certain districts closing down the district hospital inpatient services and maintaining only outpatient services and emergency care with rapid referral. Staffs may rotate to work in some remote districts based on different incentives with or without a frequent rotation possibility. Certain district hospitals may be established as sub-regional referral centers. For example, some district hospitals may be equipped with more sophisticated surgical or diagnostic facilities, and specialists may be assigned to work there on a periodic basis. Under the present system of organization, management, and structure, the issue of rotation of HRH between the two levels seemed to be not enthusiastically received by both levels.

Table 4.16: *Possible Models for Provincial-District Relationship*

	Pros	Cons
1. Combining DH and PH into single unit of command under the present administrative structure.	++++	++++
2. Providing services development budget for DH but planned and used jointly by PH and DH	+++	++
3. Allocating first year doctors to PH with requirement to work at the district level in the subsequent years. (Nothing was mentioned about other types of HRH).	++++	+++
4. Possible rotation of HRH during the compulsory service period from the PH to DH if necessary.	++	NA
5. Creating district fundholding relationship between DH and PH with possibility of using part of such budget for DH services development based on demand by DH.	++	++
6. Creating autonomous provincial provider unit that will include both PH and DH as a single provider units.	+++	++
7. Creating separated autonomous provider units for PH	+++	+

and individual DH but creating links between the two levels through financial mechanism (service purchasing).

In conclusion the relationship between the provincial hospitals and district hospitals have been quite distant. Even with the best example available so far the relationship is far from adequate in terms of addressing the issue of HRH shortage. Most of the efforts were mostly aiming only at capacity building of the team at the district level. Although those at the provincial hospitals interviewed saw the benefit of creating a better integrated relationship the actual model will certainly be difficult to achieve due to the lack of historical good relationship and the lack of understanding of the other's roles and functions. The administrative integration of provincial and district hospital was criticised of possibly undermining the preventive and community roles of district hospitals as the provincial hospitals are seen as the dominating partner in such integration. Linking the two levels through financial relationship might create a sense of purchaser and providers thus making it even more difficult for district hospitals to cross mobile resources from provincial hospitals as they will become more disconnected two entities in the same province. However it remains important to develop possible useful model that might at least allow the better sharing of HRH in the provinces.

4. Compulsory Services: Economic Analysis and Surveys

4.1 *Economic Analysis of Compulsory Services and the Cost of Medical Education*

Approaches:

1. Assess whether the income foregone by students providing three years of service in rural areas is equivalent to the cost of their medical education borne by the government.

2. Estimate the opportunity cost to the government of training a medical student who pays off their educational debt rather than work in a rural area.

Analysis and Findings:

Cost of Medical Education: B 300,000/yr for 6 years = B 1.8 million
NPV = B 1.4 million

Net Income Forgone by Students Providing Rural Services:
B 240,000/yr for 10 years = B 2.4 million
NPV = B 1.6 million
(This was based on the assumption that those doctors undergoing compulsory services will have less income compared to their colleagues who could go into private practice right after graduation or finishing residency training and become specialists sooner. This

difference of income was estimated at about 20,000 baht per month and the gap will exist for only the first 10 years of their career).

The net difference is B 0.2 million, and dividing by three years and reinflating to nominal terms, to encourage medical graduates to take up compulsory service in rural areas, the government should minimally make additional payments of B 67,000, B 73,000, and B 80,000 in addition to their annual salary for the 1st, 2nd, and 3rd years of compulsory service, to make the graduates indifferent, with regards to salary, about providing services in the rural areas, as compared to working in more urban settings.

The opportunity cost of training a medical student who chooses to pay off their educational debt rather than work in the rural areas is at least the net opportunity cost of not having a doctor posted to the rural area. This assumes that the government would train this person as a physician whether they chose to work in a rural area or not, and therefore does not consider the costs of the medical education.

The opportunity costs of not having a doctor posted to a rural area can be estimated as the cost of transport for the rural population to go to a provincial hospital instead of a district hospital, minus the salary costs which would have been paid to the district level doctor. Assuming on average that a district has 50,000 population, each of whom makes one visit to a hospital in a year, at a net round trip transportation cost of B 50 (i.e. the cost of traveling to the provincial hospital as compared to a district hospital), then the annual opportunity cost of not having a doctor in a rural area is B 2,500,000 minus B 360,000 of salary, and for three years would be B 6,420,000. Thus, the medical student who elects not to provide services in the rural area should make a payment of B 6.42 million to "opt out" of such services. There were also alternative ways of estimating how much the students should pay if they chose to opt out of the services. One of them is to base this on the net present value of the production cost. This will be equal to 1.4 million baht. The other is to adjust according to the inflation rate adjusted from the present rate of payment imposed. Whatever the method may be it is far higher than the present level of 400,000 baht.

4.2 *Surveys of Medical Students and their Parents Towards Compulsory Services and Self-Financing for Medical Education*

Approach:

A survey was conducted to learn about the reactions and suggestions of medical students and their parents about the issues related to compulsory services. These include whether they agree or disagree with compulsory services, self-financing for education, adjustment of fine for not comforming to compulsory services, and whether they would need to ask for education loan if they have to pay for the full tuition fees. The surveys were carried out on 1st and 6th year medical students and their parents from all public medical schools. The first year students were selected to represent the general secondary students who

intended to study medicine. The 6th year was selected to assess the reaction of those about to start the services and might face a different working condition of services.

Findings:

More then 90 percent of both medical students and their parents agreed with the compulsory services requirement. Although it is worth noted that the 1st year medical students had a higher proportion of those in favour of the compulsory service.(see Table 4.17). Many reasons have been given such as it provides an opportunity to gain more experience and exposure to rural areas. Some said that it is necessary as there are still needs for doctors in the rural area. However around 50 percent of the respondents suggested that the compulsory services be improved while around the same portion thought that it is acceptable (see Table 4.18). Most of the improvements mentioned were the need to shorten the compulsory service period to 1to 2 years, being posted to bigger hospitals, and need for good accomodation in the hospitals while serving there. This indirectly reflected that about half of the respondents still held a slightly negative attitude about the compulsory services. The number of those disagreeing with the compulsory services also decreased which suggested that it might be possible to have more agreeing to serve the compulsory services if they could be properly informed about the actual situation of the compulsory services.

Table 4.17: Attitudes toward Compulsory Service

	No		Yes	
	N	%	N	%
student 1st Y	25	3.4	707	96.6
student 6th Y	39	9.2	386	90.8
Parent 1st Y	46	9.1	459	90.9
Parent 6th Y	23	9.8	211	90.2

Table 4.18: Suggestion for Compulsory Service

	Good		need improvement		should stop	
	N	%	N	%	N	%
student 1st Y	351	48.3	369	50.8	7	1.0
student 6th Y	149	35.1	262	61.8	13	3.1
Parent 1st Y	213	42.5	277	55.3	11	2.2
Parent 6th Y	90	39.1	132	57.4	8	3.5

Improvement suggestion include , shorter period of compulsory services, good accommodation , able to choose to work in big hospitals

When asked if they would like the government to opt for self-finance so that they could be free after graduation, about 75 to 80 percent chose the option.(see Table 4.19). However if they were to choose between the two options of self-financing and compulsory services, around 80 to 90 percent still chose to comply with the compulsory

services. This is slightly less so among the parents as compared to the students (see Table 4.20).

Table 4.19: Attitudes towards Paying Full Tuition Fees Rather than Compulsory Service

	not agree		agree	
	N	%	N	%
Student 1st Y	555	76.66	169	23.34
Student 6th Y	314	73.88	111	26.12
Parent 1st Y	400	80.16	99	19.84
Parent 6th Y	174	75.32	57	24.68

Table 4.20: Choices between Compulsory Service and Paying Full Tuition

	work for compulsory		pay tuition fee	
	N	%	N	%
Student 1st Y	649	90.13	71	9.86
Student 6th Y	354	86.98	53	13.02
Parent 1st Y	371	81.90	82	18.10
Parent 6th Y	153	75.37	50	24.63

If the government were to impose self-financing, around 60-85 percent said that they would need to ask for government education loans (see Table 4.21). However only about 50 percent of them would then agreed to work for the compulsory services. The others who asked for tuition fees loans would be ready to pay back after graduation rather than go for compulsory services. The percentage of respondents varied somewhat on this issue between sub-groups. While the students were more ready to choose to work for compulsory services, the parents were less ready to choose the option (85-90% for students compared to 75-80% for parents). On the issue of education loans a higher portion of the parents stated that they would require the loan (75-88%). This is less so for the students. It is natural to take the parents' attitude and ideas more seriously on this point as the parents are the decision makers in such matters. The number of expected doctors to work under compulsory services would drop to only 50 percent (regardless of the subgroups) if educational loans were introduced along with increase of tuition fees.

Table 4.21: Demand for Education Loans if Fall Tutition Fees Introduced

	1		2		3		not answer	
	N	%	N	%	N	%	N	%
student 1st Y	15	21.43	14	20.00	40	57.14	1	1.43
student 6th Y	21	36.84	3	5.26	31	54.39	2	3.51
Parent 1st Y	10	12.05	28	33.73	45	54.22	0	0
Parent 6th Y	12	24.00	12	24.00	25	50	1	2

1. pay tuition fee and not work for the rural

2. borrowing the loan and pay back when graduate, not to work for rural
3. borrowing the loan and work in the rural area in return

Asked what they would do if there were no compulsory services to the rural area, around 90 percent of them would have gone for many other options, the most common of which is to go for further training in country (around 50%). Only around 10 percent would go directly to work in the private sector. There is still quite a large portion of respondents (15-20%) who would choose to go for training abroad. This might reflect a higher socio-economic status among this fraction which is as high as 20 percent (see Table 4.22).

Table 4.22: What will be done if not work for the rural ?

	study aboard		more training in Thailand		work for private		public work in BKK		others	
	N	%	N	%	N	%	N	%	N	%
student 1st Y	146	22.71	302	46.97	81	12.60	63	9.80	51	7.93
student 6th Y	59	15.25	224	57.88	36	9.30	25	6.46	43	11.11
Parent 1st Y	65	16.70	164	42.16	34	8.74	73	18.77	53	13.62
Parent 6th Y	27	13.50	97	48.50	15	7.50	38	19.00	23	11.50

The last issue covered was the agreement on increasing the fine if not complying with the compulsory services requirement. It is interesting to note that there was as high as 55 percent who agreed with the increase in the fine. The present level of fine is rather low compared to the actual cost of education incurred as can be noted from the calculation shown above. It is also interesting to note that the proportion of parents who agreed with the increase in fine was higher than those among the student sub-group (Table 4.23).

Table 4.23: Increase the compensation if not work in the rural

	agree		not agree	
	N	%	N	%
student 1st Y	377	52.29	344	47.71
student 6th Y	230	54.25	194	45.75
Parent 1st Y	344	68.94	155	31.06
Parent 6th Y	137	59.57	93	40.43

5. Compulsory Services for Dentists and Pharmacists

Certain categories such as dentists and pharmacists are facing the problem of whether the compulsory service requirement should continue. This is due to the fact that the posts available for rural health facilities for these two categories are being filled after less than 10 years of compulsory service requirement. Based on the figures on turnover of these two categories at the district level it is quite clear that the number of dentists working at the district level, although approaching the limits of posts available in 2002, will start to decline if the compulsory services be stopped after than. There is no data on pharmacists but it was estimated that the posts will be filled by 1999. The number in rural areas will also start to decline although at a slower rate of around 10 percent per year if there is very small increase due to the discontinuation of compulsory services. However, the Rural Pharmacist Association did a study to revise requirement for pharmacist at the district level by redefining the task and roles of pharmacists at this level and came up with a conclusion that there was still a need for additional pharmacists if the roles of pharmacists at the district level were to become more proactive rather than just sticking to the conventional role of drug dispensing in the hospitals.

From the analysis and surveys as well as analysing existing data there are a number of conclusion that could be drawn regarding the compulsory services.

1. The presently imposed compulsory services are quite economically rationale from both the government and the students' point of view. It is not an infringment of individual freedom but rather a contract with sound social and economic basis. The minor adjustment needed about additional payment during the compulsory services might have been addressed already through the additional payment system adopted at present. If the economic analysis of foregone income was to be used strictly, it might even be possible or necessary to adjust the additional payment for doctors during the compulsory service period.

2. The discontinuation of the compulsory service requirement could affect the number of HRH available for the rural areas for many of the categories. For doctor itt will decrease the effective number of inflow to the district level at least by half projected from the response of the students and parents regarding the choices on education loans and decision after graduation.

3. On the issue of full payment for tuition fees, it is quite clear that the government will still have to pay for the education loans if it aims to maintain equity to higher education. The amount required for the loans may not be significantly less than the amount spent for subsidizing the education at present. The government may get the loan back after a while but the immediate impact will be the need to discontinue the compulsory service (as it will make the policy less rational at least from the economic point of view) and thus decreasing the major input for doctors to the district health system.

4. The needs for other categories of HRH through the imposition of compulsory service is also clear. The case of dentists showed that the number at the district level will

fall once the compulsory service be stopped. The same will be for pharmacists only at a different rate of decrease. Even for doctors, at the present rate of input from the compulsory services and the drop out rate of around 22 percent per year the rate of increase in the total number working at this level will start to slow down around the year 2000.

6. Redefining Staffing Standard and HRH Requirements for Provincial and Distict Hospitals

Approach:

In order to illustrate that the existing staffing standards would benefit from better refining the methods and such refining may be crucial to reflect better attention of HRH problems at the district level, an attempt was made to introduce alternative method based on major services to be provided by doctors.

At provincial hospital level , five major types of services provided by doctors in provincial hospitals were used to estimate the number of doctors required to carry of those functions (DR1).

At district hospital level, a package of primary medical care and curative services at first referral level was developed based on an average district population size of 50,000 and then used to estimate the number of doctors needed for district hospitals (DH1). Some variants could be developed by assuming certain additional roles such as supervision and capacity building of lower level facilities, or using different time spent as results of certain degree of specialty mix. There could be more variants and possible combination of services, roles and functions of each type of health facilities and thus derive the number of doctors needed. These are summarised in Table 4.24 as follows:

Table 4.24: Calculation of Required Doctors Using Various Methods

Calculation of Doctors with Requirements by various methods	
District Hospitals	
WORK DH1	= number of doctors required by calculation from existing workload in each district hospital, OPD 5 min. each, IPD 10 min per day-pt, minor OR 30 min, major OR 120 min.,abnormal labor 60 min. and abortion 30 min.
WORK DH2	= similar as WORKDR but change time for minor OR to be 15 min. each
DH1	= doctors required by calculation from expected workload of curative and health prevention, promotion, based on target population and roles of doctors
DH2	= CalDH1 + 1
DH3	= doctors required using the same method of calDH1, but plus more work for supervision and strengthen primary care units
FRAME1	= minimum doctors required, identify by Civil Services Commission
FRAME2	= full number of doctors required, identify by Civil Services Commission

Provincial Hospitals	
WORK-DR1	= calculate doctors required in PHs/ RHs by existing workload in each hospital, OPD 5 min.,IPD 15 min/day/pt, major OR 2 hrs., minor OR 0.5 hr., Abnormal labor 1.5 hrs.
WORK-DR2	= calculate, 1 DR/ 15 beds
WORK-DR3	= similar as cal-DR1 but differentiate OPD, 60 % for GP 5 min each, 40 % for specialist 10 min each
WORK-DR 4	= calculate doctors by population and expected services based, as 1 district hospital and 2nd referral hosp. for specialists
GP (1)	calculate workload of curative, prevention and health promotion for population in Muang district
GP (2)	calculate as (1) + supervision and strengthen primary care units in Muang district
CSC Frame	= no. fo staff identified by Civil Servant Comission
Optimum DR	= used different criterias according to types and stage of the hopitals • Regional Hospitals use the calculation based on actual workload, work-DR3 • Provincial Hospital in places where has potential to grow up used the calculation based on population and expected services; cal-DR4 (2) • PHs in the central region and nearby Bangkok used the calculation based on actual workload; cal-DR3

Based on the functional job analysis leading to estimation of doctors requirement as explained above the total number of doctors needed for each individual provincial and hospitals could then be calculated. The overall difference between this method and the CSC methods in temrs of doctors requirement at the district level could be shown in Table 4.24.

If the CSC staffing standard is used, the additional number of doctors required for all provincial hospitals in the 75 provinces will be 5,161. However based on the new staffing requirement calculation adopting different combination of roles and function, the highest additional number required will be at only 728. However the additional number of doctors required by district hospitals using CSC staffing standard will be at only 2,285 maximum. If the most comprehensive service package for district hospital is used to determine the number of doctor required at this level, the additional number of doctors required will be as high as 3,036. The conclusion was that the present staffing standard could be reviewed to yield a more balanced doctor requirement between the district and the provincial level. Without proper revision it might be improperly concluded that the provincial level still requires a lot more doctors in order for them to carry out the services of the hospitals, 5,161, while the district hospitals will have a lower requirement, 2,285.

7. Mapping of Priority Provinces and Districts

Approach:

There are two different approaches to identify priority areas for HRH situation improvement. The first one was to identify priority districts that should receive better attention with regards to HRH distribution and utilization. For this purpose three different approaches were carried out to rank rural districts all over the country. This excluded all districts in Bangkok and the central district of each province (the Muang districts of all provinces) which could be classified as urban districts.

The first criteria was to adopt the set of criteria developed by the Ministry of Interior which has made its latest revision of district classification system. This classification aims at providing information on the level of development of each district:

- *Special District* - one that has an exceedingly good infrastructure and many of those facilities used for classification.
- *Level 1 Districts* - those that are better developed with high density of population and well-developed infrastructure.
- *Level 2 Districts* - those with middle level of development with only some level of well-developed infrastructure.
- *Level 3 Districts* - is considered as the least developed with less infrastructure.
- *Level 4 Districts* - the least developed districts.

The MOI made use of four major attributes. The first one is economic infrastructure such as banks, hotels, industrial plants, etc. The second is general infrastructure such as electricity, pipe water system, telephone services, roads and transportation. The third is the district facilities such as hospitals, tourist office, libraries, parks, etc. The fourth is adminstrative criteria such as population size, areas, number of local administration present, etc. There were several steps in scoring and weighting of each criteria to come up with the final score for each district which could then be used for final classification into five different classes (see Annex 3).

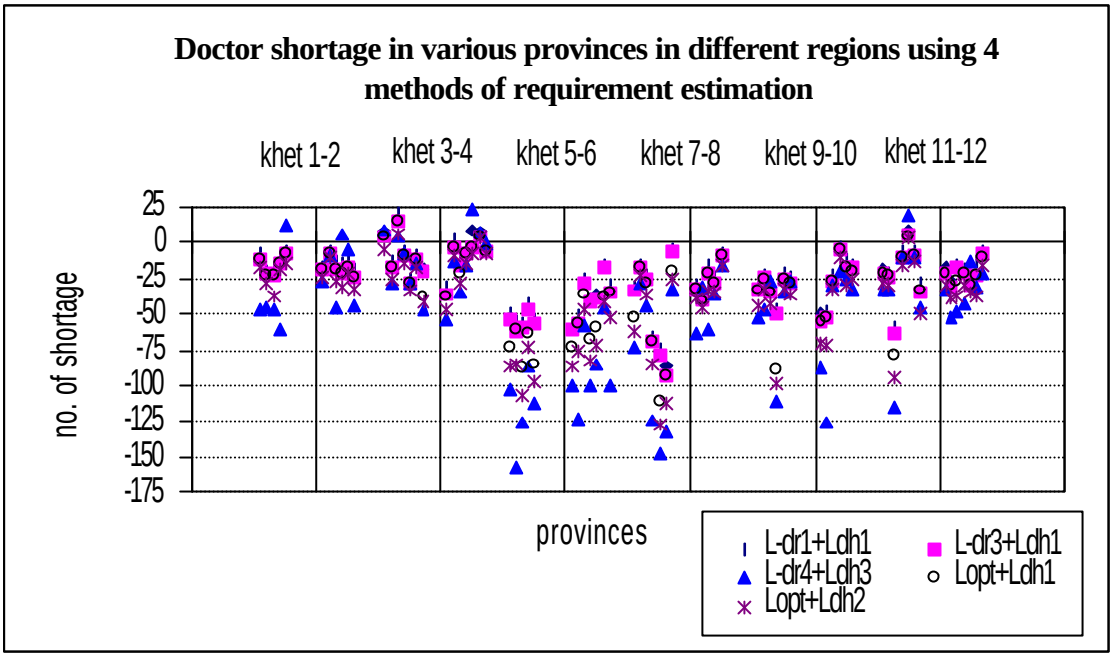
The second was to use the databases of the MOPH that could be used to reflect doctors preferred districts versus districts of high risk for doctors shortage. It was

based on the assumption that those districts with senior doctors are preferrable or better to work in while those with only 1-2 junior doctors or no doctors at all are priority districts that need attention in terms of HRH. Only the number and seniority of doctors were used and not for all categories of HRH because doctors are the category least available to work at the district level. There are all together five classes of districts being classified. Class 4 and 5 are those considered as priority districts (see Annex 4).

The third method carried out was the use of doctor to population ratio for the number of doctors and the population size in each district. There is no clear cut cut-off point being used here. The number of districts to be classified as priority districts could be selected in conjunction with the other two sets identified by the other two methods (Annex 5).

The other approach was to identify priority provinces rather than districts. This is meant for a different set of strategies to tackle the issue of HRH shortage by looking at the province rather than a district as the unit for intervention. The method used to identify priority provinces in this case was through the identification of HRH shortage based on comparing actual number of HRH present with the expected number estimated using certain methodology. As the staffing standard of rural health facilities determined by the CSC and MOPH should be further improved, the approach here was to develop a new staffing standard for different categories of HRH in order to identify the HRH requirement gap for each province. It is not necessary to do it for all categories of HRH. In this case doctors requirement for each province based on existing number and type of health facilities was calculated using five different types of workload, out-patient, in-patient, minor and major surgical cases and delivery. Also doctor requirement to carry out crucial roles in primary care other than the five services was also calculated based on the size of an average district of 50,000 population. The final results were then compared to the actual number of doctors present for each district and provincial hospitals. The number of additional HRH required for each province could then be used to rank and identify priority provinces for intervention (see Annex 6). The results of such an effort could be depicted by the scattergram as follows (see Figure 4.1):

Figure 4.1 Disribution of doctor shortage by province and khet



Note: refer to codes in Table 4.24 and Table 4.25

L-dr1+Ldh1 = the doctor shortage of whole provinces based on the requirement estimation using workload of 5 major ***curative services***, both provincial hospitals and district hospitals

L-dr3+Ldh1 = the shortage based on the curative services workload of DHs and PHs, but ***differentiate the OP services*** of provincial hospitals between specialists and GPs

L-dr4+Ldh3 = the shortage based on the requirement of provincial hospitals calculated from ***provincial population***, and curative, ***preventive and promotive worload***; district hospitals doctors requirement based on the comprehensive services and the function of strengthening primary care

L-opt+Ldh1 = the shortage base on the ***mixed method*** of requirement of provincial hospitals and curative services of district hospitals

Lopt+Ldh2 = the same as L-opt+Ldh1, but plus one more doctor for each district hospitals

The figure shows that there will be clusters of provinces with larger or smaller shortage of doctors (or any other types of HRH). In order to identify the priority provinces for further action the MOPH can choose from the scattergram a group of provinces with certain level of HRH shortage or it can classify the provinces into groups according to percentile. The TA team suggested that for the purpose of allocating additional HRH or other block grant budget to help solving the problem of HRH shortage at the district level, the provinces can be grouped into four quartiles.

The first group will consist of 25 percent of the provinces that have the largest gap of HRH requirement. This group of provinces will be the priority target for allocation of HRH. If no HRH required are willing to be posted there they will receive additional budget according to the number of HRH gap required in order to help mobilizing additional workforce at some other level of health services (see Chapter V: Recommendations).

The second and third group will be those 50 percent of provinces that have the middle level of HRH shortage according to the HRH requirement estimation for each province. They will be the second priority for HRH allocation. If there is still a gap for HRH requirement according to the revised staffing standard, they will not receive further block grant budget allocation.

The fourth group will be the remaining 25 percent of the provinces. This group of province will not be the target for HRH allocation. Neither will they receive block grant budget for additional HRH mobilization.

In terms of identifying the priority districts, using the MOI criteria, 380 districts are identified as priority districts (Level 3 and 4). However using the system developed by the TA team, only 133 districts are identified. Out of these two groups, 111 districts fall in both groups, and 247 or 65 percent differ. Adding this to the 25th percentile high of population to doctor ratio, there will be only 15 districts that could be identified as priority districts, because most of the Level 3-4 districts are small. If only the minimal set is used, there will be only 15 or 111 districts. The list of these districts can be found in Annex 7.

CHAPTER V
RECOMMENDATIONS

A. REVISED STAFFING STANDARD AND HRH REQUIREMENT FOR PROVINCIAL AND DISTRICT HOSPITALS & IDENTIFICATION OF PRIORITY AREAS

The presently implemented system of quantifying staff requirements and assigning staff jointly by the CSC and the MOPH has posed some problems. An alternative approach showed quite a large discrepancy based on the estimation of doctors needed for provincial and district levels (see Chapter IV: Approaches and Findings). The field visits and interviews showed that while the provincial level HRH shortage has not yet met the doctor requirement mentioned in the CSC staffing standard, the situation for doctors at provincial hospitals has improved, whereas the situation at the district level has not improved as much. This CSC staffing standard served as the basis for request for specialists and residency training quotas as well as HRH allocation by all the health facilities concerned. The estimation of HRH requirements based on a better defined and rationale approach should therefore be developed. For example, the doctor requirement could be based on the amount of workload expected such as five different types of major curative services plus curative and health promotion roles to be played by doctors. An example of such estimation was made by the TA team and presented in appendix VI..

The requirement of pharmacists and dentists at the district level should also be revised using the expected tasks and roles of each categories at the district level.

Moreover in estimating the requirement of each of the three major categories, doctors, dentists and pharmacists, based on expected workload the technical working group, one might consider the need to introduce certain categories of HRH to help with some services of less complexity which used to be conventionally carried out by these three professions. Examples are estimation of requirement for nurse practitioners to help with certain services that used to be provided by doctors and the needs for dental nurses for certain services provided by dentists.

The estimation of nurse requirements may not need much revision as the situation has improved steadily and what problems remain might be more qualitative rather than quantitative in nature. This means that the deployment of nurses could be better addressed through HRH management improvement than re-estimating the number of nurses required.

It is certainly premature for the TA team to suggest any particular method of re-estimating HRH requirements as the most important thing is to have a periodic review through **technical working groups** consisting of those with experiences in HRH requirement estimation at the institutional level and adopting the approach of job analysis rather than some norms such as ratio of personnel to the number of beds available. The working group should be created so that they can **revise the existing staffing standards** and **use them as the basis to**:

1) identify the priority provinces that will be the focus for the next round of allocating new graduates under compulsory services,
2) calculate additional budget for mobilizing HRH from other levels, and

3) adjusting compulsory services requirement for certain categories (e.g.dentists and pharmacists).

If the re-estimation cannot be carried out in detail soon, the results of estimating doctors requirement are provided in Appendix VI could be used for two out of the three objectives mentioned with the assumption that doctor shortage is the problem of HRH deployment that will require the most urgent attention and the adjustment of compulsory service is not yet an issue for doctors in the rural area at present.

The number of additional HRH required in each province will be ranked and grouped into percentile. The top 25 percent (highest shortage) will be provided with new graduates to meet both provincial and district shortages. The lowest 25 percent will not receive any additional HRH from new graduates, except for those priority districts identified by the working groups. The middle 50 percent of provinces will receive new graduates only to meet shortages at the district level.

B. IMPROVING MECHANISMS FOR HRH DEVELOPMENT AND DEPLOYMENT FOR RURAL AREAS

The MOPH is the major unit responsible for HRH utilization in the rural area. In this respect many of the policy directions have suffered ineffective implementation resulting in the imbalance of growth of HRH in the rural areas, especially at the district level. Moreover some of the programs or activities that might be necessary have not been developed. For example, the needs for continuing education for HRH in the rural areas have not been adequately attended to. The use of graduates under compulsory services, their opportunity for post-graduate training, including the balance of categories and specialties of HRH at various levels, are some other examples that could benefit from better organization and management for HRD at the ministerial level. There are many divisions and institutes involved and their roles and functions may need to be better coordinated or integrated. This includes the secretariat to various national committees on allocation of new graduates taken care of by the Barom Rachanok Institute (BRI). The Rural Health Division, the Rural Hospital Division and the BRI are responsible for allocating new graduates under compulsory services to rural areas. The two divisions take care of their own needs for specialists and manage the selection of proper candidates, while no definite mechanism coordinates with medical schools to ensure the implementation of policies that favour those HRH completing their services in rural areas. All these are just a few of the many key units that could be better coordinated to result in better HRH distribution and deployment in the rural area, especially at the district level.

Mechanism for better HRH Management and policy development are the following:

B.1 Coordinating center for HRH management for the rural area in the Ministry of Public Health.

The Center will have the following roles and functions:

B.1.1 Coordinate among various divisions and units involved with HRD in the MOPH to ensure that there will be consistent policies and plans in line with the national HRD policies and direction. This includes, among many of the priority concern, the allocation and use of graduates under compulsory services, the determination and periodic revision of staffing standard for the rural health facilities (including both the needs for auxiliary and specialists), the selection and posting for residency training and posting of those after the training, the needs for continuing education and other alternatives of in-service or distant training programs for those in the rural area which links with the Co-ordination Center for Medical Education and Continuing Education. (detail in B.5).

B.1.2 Monitor the situation of HRH in the rural area as well as implementing key projects and activities carried out by various units concerned.

B.1.3 Coordinate between the national mechanism and the MOPH on the analysis of the situation and possible remedial actions to improve the HRH situation in rural areas.

B.1.4 Develop policy options or alternatives as well as proper action plans for top level decision makers in the MOPH to ensure that there will be relevant policy directions and plans as well as effective implementation.

The structure and management of this Center should ensure continuity of management as well as top policy level linkage. The best is to create this unit within the Bureau of Health Policy and Planning. The manager for this Center should be assigned with a well-defined term of office to ensure continuity and should be senior enough to coordinate and enforce policy implementation when necessary. A joint secretariat should be formed to ensure proper coordination between the various units concerned. Part of the job of the manager is to coordinate and enforce policy implementation with the provincial health authorities. The technical work such as those of the technical working group for staffing standards can also be coordinated by this center. The Center should also be able to subcontract for services such as development and implementation of various educational programs for continuing education and alternative in-service as well as distant training programs.

B.2 Provincial mechanisms for better HRH deployment in the rural area are crucial mechanisms that are needed to ensure better deployment of HRH in rural areas as well as ensuring efficient use of financial resources for additional payment to the HRH. These mechanisms will deal with three related areas:

1) the use of HRH during the compulsory services,
2) the additional payment to HRH according to the rules and principles mentioned earlier, and
3) the use of block grant budget to recruit additional workforce for the district level (only in certain provinces that receive such funding).

Such a mechanism should carry out the following roles and functions:

B.2.1 Determine the policies as well as the criteria for the payment of HRH of various types by modifying from the general rules and rates provided by the central level.

B.2.2 Appoint appropriate groups and adopt mechanisms in each hospital to implement the policies and criteria in the actual payment.

B.2.3 Monitor the implementation of those policies.

B.2.4 Allocate the new graduates under compulsory services to various facilities in the provinces based on the general policy and principles determined by the central level as well as monitor to ensure that the HRH are allocated and work according to the requirements.

B.2.5 Plan as well as manage the funds used for additional HRH recruitment at the district level in those provinces of high priority.

Such a provincial mechanism should consist of administrators from various levels in the province. It should also be joined by the central level, either through the existing provincial supervision and inspection line or other additional appointees as required. Finally it should also include people from the local community who have experiences in management, especially manpower management.

B.3 There should be the **formation of a technical working group** to redefine staffing standard for the rural health facilities. This is a mechanism that will be required not only to determine the staffing requirements/standards but also to monitor its implementation as well as doing periodic revisions. Such functions used to be carried out by an ad-hoc committee set up every 3 years when the CSC staffing standards were developed. Moreover such a mechanism should rely heavily on technical groundwork rather than political negotiation. It will be best to have the Bureau of Policy and Planning working as the responsible unit for the creation and function of such a working group (consisting of experienced technical experts from various professionals and institutions). Such technical people should not be selected as representative of professional organizations or specialties, otherwise it will be very difficult to adopt a more neutral and objective view on staffing requirements.. The suggested qualification of its members is available at Appendix 1.

B.4 **National mechanism for HRD** in the country should be established. This mechanism should based on experience from many of the lessons with the work of the Coordinating Center for Medical and Health Affairs. One major shift will be the emphasis of the new mechanism to not only coordinate policy but also monitor policy implementation. The major roles and functions of this mechanism should consist of the following:

B.4.1 Determine the priority policy directions for national HRD that will help to ensure equitable distribution of HRH and efficient use of various related resources.

B.4.2 Coordinate the development of programs, projects and plans for effective implementation of the priority policies. This will include the role to determine the financial resources needed and support from government budget.

B.4.3 Monitor the situation of HRD in the country in various aspects including HRH quantity, quality, distribution, and utilization with special emphasis on rural areas.

B.4.4 Monitor and evaluate the implementation of the programs and plans and ensure they be implemented effectively.

Some of the policy issues that should be addressed by this national mechanism will include:

- Modification of compulsory services for certain categories of HRH.
- Balance and proper mix of various categories including auxiliary and specialists.
- Production or development of certain new categories that might be needed for better health services delivery to the population.

This mechanism should form an integral part of the more comprehensive national mechanism for health policy and system development. However while the establishment of a more comprehensive mechanism may not have yet been well thought out, it may be possible to establish the national mechanism for national HRD first as an autonomous public entity so that it can better ensure continuity of the secretariat of the national mechanism. The mechanism should be governed by a Board consisting of various stakeholders including the MOPH, those with experience of health-sciences production policies and management, professionals with a view for national health system development, national offices responsible for fiscal and social development policies, and other distinguished and highly respected individuals from the public in terms of social and health development. It should not be formed on a institutional representative basis as many of the issues will be viewed purely from institutional rather than national viewpoint. However, the mechanism should also be able to organize the next level for policy implementation through the joint planning and budgeting process. It should also be able to carry out or contracting for many of the technical work necessary for the effective function of the mechanism.

B.5 Co-ordinating Center for Medical Education and Continuing Education

It is proposed that a center should be established to co-ordinate three functions, including Production, Distribution, Continuing medical Education as well as various incentives to keep medical doctors and their colleagues to enjoy working in remoted areas where shortage of health professions ate existing, as shown in the Figure. Elaboration of the proposed functions focussing on medical graduates is as follows.

i) Co-ordinating with the BRI/MoPH for the under – graduate medical education to equip graduate to work especially during the compulsory service.
ii) To manage and contract suitable state University Medical Faculty to produce medical graduate suitable to work in the MoPH particularly in the Community hospital during the first three years.
iii) To be Secretariate of the "Committee to allocate quota of new medical graduates for different government hospital" as well as suggesting quota for the hospitals within MoPH.
iv) To set Quota for specialize training in MoPH according to the medical and health need of the poople.

v) To manage and make a contract with qualified Medical Education Units to operate CME program especially for medical doctors working in the Community hospitals.

This Co-ordinating Center should have autonomy working under direction of the Executive Board. The composition of the Board should include MoPH executive, relevant University staffs and respectable Resource persons in an appropiate number.

Funding should come mainly from the Government budget.

Structure and Qualification

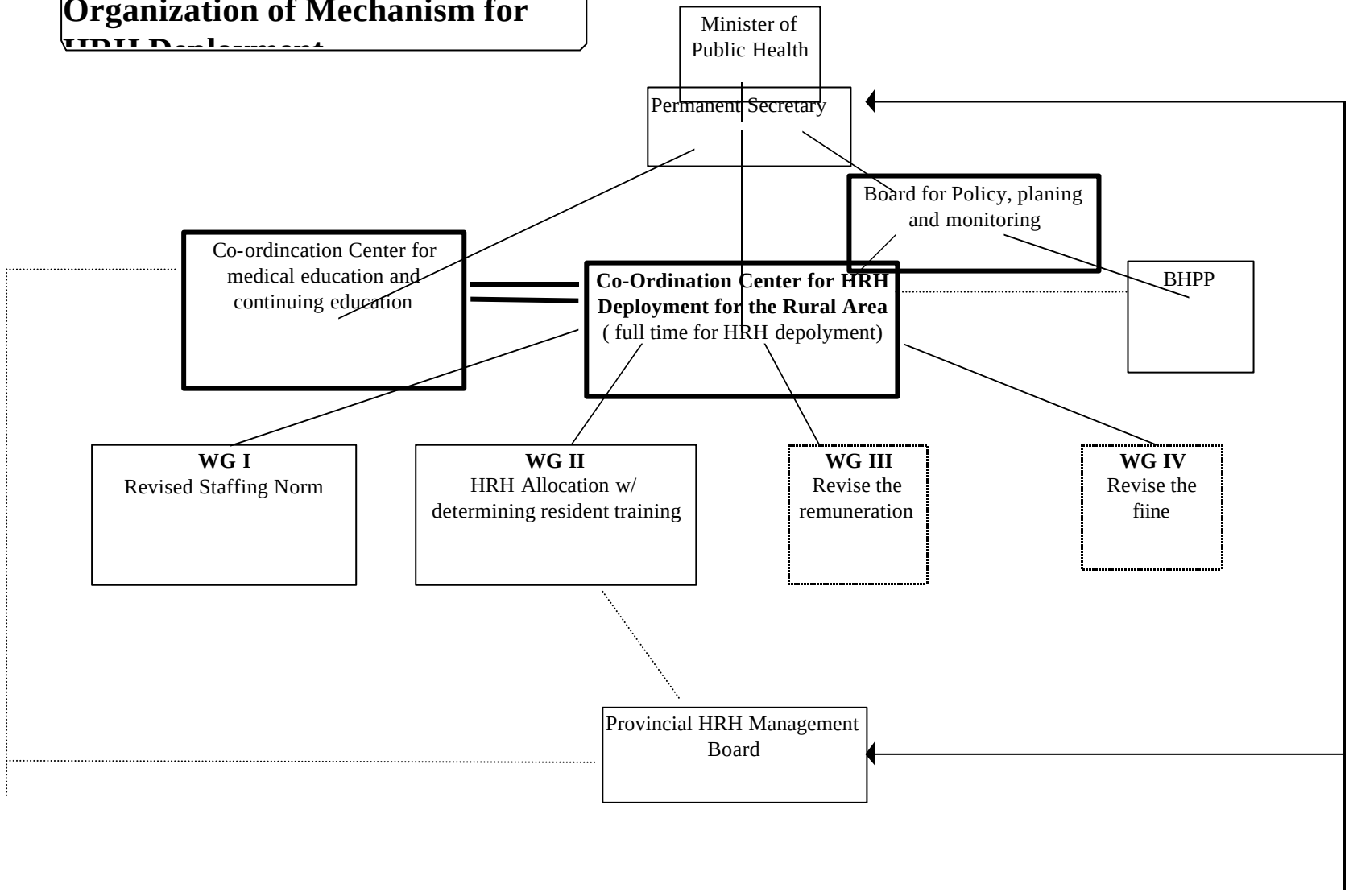
1. The manager for this unit should be assigned with a well-defined term of office to ensure continuity and should be senior enough to coordinate and enforce policy implementation when necessary. He/She should have strong leadership and good management skill with the technical background on education, continuing education and HRH development.
2. Most of the jobs here will be implemented through coordinating and contracting out. This center should work very closely to the center for HRH deployment of the rural area
3. The center would not be the big office. (all full time staff not more than 30)
4. This center should have autonomy working under direction of the Executive board. The composition of the Board should include MoPH executive, relevant university staffs and respectable resource persons in an appropriate number.
5. The Center should also be able to subcontract for services such as development and implementation of various educational programs for continuing education and alternative in-service as well as distant training programs

B.6 The Other Task group for Special Task

The other ad hoc working group for special task e.g revise HRH allocation with determing resident training, revise the remuneration, revise the fine will be set up to co-ordinate and finalise the propose measure on time.

Figure 5.1

Organization of Mechanism for HRH Deployment



C. COMPULSORY SERVICES

Compulsory services of four different categories have been the major factors contributing to the improvement of HRH distribution in the rural area, especially at the district level. With the attempt of the government to downsize the civil service, and function under the present economic crisis, as well as the trend of the general policies towards higher education emphasizing on self-financing rather than government subsidies, the policies towards compulsory services of health-sciences graduates were reviewed and debated. It was also obvious for medical graduates that the way they are being posted during the three year compulsory service period affects the distribution to rural areas, especially the district level. The following are recommendations regarding the compulsory services of the four categories of health-sciences graduates.

C.1. Continue the implementation of compulsory services of the four categories, namely doctors, dentists, pharmacists and nurses under the following principles.

C.1.1 The government will require the services of the graduates only as many as determined by the staffing standard of health facilities in the rural area, to be revised periodically based on technical criteria.

C.1.2 The actual number required as well as the length of the compulsory services will be worked out accordingly from the staffing standard.

C.1.3The majority of the graduates will be assigned to work at the district level. Other levels of health facilities should recruit or fill their staff requirement from sources other than the new graduates.

A working group should be appointed immediately to work out the staffing requirement of dentists and pharmacists at the district level as this will be crucial to determining the number of dentists and pharmacist needed for the public services. Given the present trend, the number required according to the latest estimate will be filled up by the year 2002 for dentists and 2000 for pharmacists, but those to be graduated by 2004 are still required to sign contracts for compulsory services. Moreover there are room for the increase in the number of these two categories required for the district level if the policies towards the roles and functions of these two categories will be revised and worked out in detail.

C.2 Consider the policies on self-financing of education for the four categories only in the light of overall change of the higher education system. However the needs for subsidies by the government for those categories with high production cost such as doctors and dentists are quite obvious. The government will need to either subsidize them directly through educational institutes based on the number of graduates enrolled or indirectly by providing education loans to students. Either way the students can pay back either by serving the compulsory service to be determined by the government or in monetary terms to be specified by the government. Failing to provide such subsidies will certainly create inequity of access to health-science education and limit the opportunities to the higher economic population. If any change can be introduced at this stage

it is to discontinue the subsidies to those categories that may require lower production cost and thus lower tuition fees. However, if those categories are still required for compulsory services, the continuation of subsidies may be necessary. Another modification that can be introduced is to better target the amount of budget required on a capitation basis and allocated to the institute according to the number of students present each year rather than on prospective estimation and annual allocation according to fiscal cycle which does not reconcile with the education annual cycle.

C.3 Target the posting and rotation of the graduates under compulsory service only at the district level. This means that the criteria used in allocating the number needed should give priority to the districts with very few being assigned to other types and levels of health facilities. The exception could be made only to replace those retiring each year in other levels of health facilities. However such retirement could also be filled from sources other than new graduates. Some other specific policies that need to be considered in this respect are:

C.3.1 **The first year assignment** of new medical graduates to general hospitals in the provinces should still continue but limited to only general rather than regional hospitals. Moreover all of them should be rotated to work at the district level for the remaining two years with no exceptions. The actual place of work (at the district level) could be worked out through some joint decision process between the second year graduates and the MOPH. However, the MOPH should try to make sure that the graduates will be assigned to the districts around the general hospitals where they were placed in the first year.

C.3.2 **Nurses should be expected to work at the sub-district level.** This policy should be seriously considered as a mean to boost the quality of services at the sub-district level.

C.4 Differentiate the additional payment for HRH working in the rural area between those working during the compulsory period and those working beyond the compulsory services. Those working at the provincial level should also receive different levels of remuneration compared to those at the district level. Some of the specific consideration consists of the following (refer also to the section on HRH remuneration in Chapter V: Recommendations).

C.4.1 The medical graduates working in general hospitals in the first year should not be entitled to the full-time payment supplement.

C.4.2 The rate for additional workload-related remuneration for the first year new graduates (of all categories) should be only half the rate approved.

C.4.3 If there is a need for the first year medical graduates to be assigned to the district level, they should receive the lowest rate of additional monthly supplement for the district hospital work.

C.4.4 Those under compulsory services should get only half of the additional payment rate to be determined in each province.

C.5 Other policies towards HRH under the compulsory services.

C.5.1 Priority should be given for higher education and residency training after completing compulsory services. The medical graduates completing the compulsory services should have priority over those who have not yet completed the services. The actual selection of the suitable candidates should be worked out jointly by the medical schools and the MOPH so that it could serve the purpose of being an incentive to work at the district level rather than the present practice of biasing towards those working closer to the provincial level. The same should be applied to other categories of HRH if they want to go for further higher education after completing compulsory services. There should be fellowships offered to those with outstanding performance during the compulsory services period.

C.5.2 The Medical Council should issue licenses only to those completing their first year work after graduation. This will require that all medical graduates work in the rural area (provincial level) at least for a year after their graduation. Those wanting to opt out of the system by paying a fine will be allowed to do so only after the first year work requirement.

C.5.3 The CSC should allow the first year medical graduates under compulsory services to be accepted as civil servants without requiring licenses. However, if any of them fail to be licensed after the first year, they will be excluded from further public services and made to pay a fine for the remaining amount of time.

D. ADDITIONAL REMUNERATION

The existing system for additional remuneration of HRH in rural areas has been quite useful in attracting HRH to work in the rural areas. The most crucial improvement is better management along with some revision to better reflect the following principles:

- Remuneration should provide better compensation for those working in the rural area with priority given to the district level.
- The payment should be associated with better performance or productivity of the HRH, especially the delivery of comprehensive health services.
- Remuneration should be well-focused on those categories and services which are of high priority concern rather than a system-wide additional payment.

Some of the specific points requiring improvement include:

D.1 **The non-private practice remuneration of 10,000 baht per month should be re-conceptualized and implemented**. It should be made clear that the purpose of this payment is to provide additional salary for those willing to dedicate full-time to the work in the public sector in rural areas. This means that those being paid will have the obligation to provide various types of services required within the public sector both in the regular and extra working hours with good performance. This will clarify many of the criticisms about this type of payment making the HRH less productive, as they will not be able to work in the private sector, while the public sector is also not using them properly. The most important, however, for the improvement of this type of payment is to create better HRH utilization and performance appraisal system within the public facilities (see Chapter II: Mechanisms).

D.2 **The additional monthly payment for HRH working at the district level should be revised to minimize the gap between urban and rural incomes** without losing the possibility of making high priority areas attractive to the HRH. There are three issues that need to be addressed with this revision: the rate of payment, the types of HRH covered, and the differentiation of high priority areas.

D.2.1 The rate of payment at present provides clear differentiation between the high priority areas and the rest of the country. It also creates a big gap between different categories covered.

D.2.2 The number of categories covered includes four categories.

D.2.3 Some of the areas identified as priority areas are being challenged as undeserving.

The most crucial issue is the identification of priority areas. It is recommended that the classification system of hardship districts developed by the MOI be adopted along with some other criteria, including the districts with high population per doctor and also those districts with difficulties getting doctors. Such results should be reviewed by a group of representatives identified by those working at the district level and they could be revised every two year to make them as relevant as possible. The justification for each district identified as a priority district should be clearly documented. The amount of budget for each province, as determined by the three aspects, should be allocated to the provinces with the possibility of flexibility in payment according to performance of the HRH (see Chapter II: Mechanisms).

D.3 **The hospitals and the Provincial Health Office (PHO) should have the flexibility to adjust the actual payment** for each individual based on the rate determined by the MOPH but adjusted by the performance appraisal results. Certain criteria and appraisal tools, along with the technical working group, should be developed in each hospital and province to ensure better productivity from the HRH being paid under the additional payment system. (see Chapter II: Mechanisms).

D.4 **The suggested revised system for additional payment** along with some of the conditions required is summarized in the following table:

Types of Additional Remuneration	Rates (baht / month)	Total Budget required per year	Sources of Budget	Revision and Rationale
1. Administrative post adjustment	5,600 - 21,000		Government budget	status quo
2. Post adjustment for certain types of posts such as doctor, dentists including those providing certain types of services such as psychiatrict services, drug addict rehabilitation, social medicine	2,000 - 15,600		Government budget	Eligible from C3 level but only to those not under compulsory service period and deal with direct service delivery pertaining to those posts and services specified.
3. Additional payment for full time services in the public sector for doctors, dentists and pharmacists	10,000	Total 255 mil. From government budget	Government budget with possible additional budget from hospital revenue	modified from non-private practice payment, lumpsome allocation to provinces with possibility of flexible payment *
4. Monthly supplement for district health system HRH (doctors, pharmacist and dentists, nurses in district hospitals and nurses in health centers	2,000-2,200 for regular district for all except nurses, Level 1 and 2 districts: 10,000-20,000 for doctors and dentists. 5,000-10,000 for pharmacists. 1,000-2,000 for nurses. 2,000 for nurses in health centers		Government budget	Allocation be made to provinces as a bloc budget with possibility of flexible sliding rate based on performance and other locally developed criteria@
5. Flat rate for overtime services	Doctor and dentists 800/8 hr shift Pharmacists 500 Nurses 400	NA	Hospital revenue	Actual payment adjustable based on performance of regular work duty and overtime work#
7. Night shifts overtime for nurses	RN 200 TN 150 PN 100 per 8 hr.	400 mil. from government budget with	Government budget with possibility of	Government budget be allocated to cover

Types of Additional Remuneration	Rates (baht / month)	Total Budget required per year	Sources of Budget	Revision and Rationale
	shift	possible proportional allocation of 60/40 to district versus regional and general hospitals	hospital revenue supplement	100% of budget requirement of this item in hardship districts, the rest to be proportional to revenue generating potential of each facility&
7. Payment for OPD during extra working hours	Doctors 30/case Dentists fee schedules but both with a minimal guarantee of 100/ hour Pharm. 90/hr RN 80/hr TN 60/hr Others 50/hr	NA	Hospital revenues	payment rate should not be exceeded but final payment adjustable according to actual performance of regular duty as well as extra hour services#
8. Fee schedules for surgery during extra working hour	Payment for doctors and surgical team according to surgical procedures	NA	Hospital revenue	Final payment adjustable based on performance of regular duty and extra hour work quality#

Table Notes:
* The actual payment does not have to be 10,000/month for all alike but adjustable based on certain criteria and quality of performance during regular and extra working hours[2]/. The provincial mechanism also has to develop eligibility criteria and oversee that those eligible will be the ones to be assigned to the related services required over those who have not applied. A minimal set of eligibility criteria includes: direct service providers in health facilities with 24 hour services, work during the overtime not less than 20 percent of the regular working hours in a month (176 hours per month), carrying out services as specified/defined by each hospital during the overtime period.

@ Each province may develop its own sliding scale through consensus of all district hospitals in the province based on the total budget available. However the rate of 10,000 and 20,000 baht per month cannot be used if none of the doctors in the province work in Level 1 and 2 districts for more than 5 months consecutively. The actual payment can also be adjusted according to the performance during the regular and extra working hours by the provincial mechanism for HRH management.

The level of hardship of each district could be determined using the MOI classification system and adjusted by doctor preference (developed by the TA team). All districts

[2] / Actual methods and tools to be developed by the provincial mechanism for HRH management.

belonging to class 4 will be allocated 100 percent of the budget needed. All central districts in each province will be considered as non-hardship districts and thus not be appropriated government budget for this purpose. The provincial mechanism for HRH management will be the one to make the final allocation based on these principles. The new provincial HRH management mechanism will oversee the adjustment of these payments by developing criteria as well as tools and methods of measuring selected performance.

E. BLOCK GRANT BUDGET EARMARKED FOR BETTER HRH EMPLOYMENT AT THE DISTRICT LEVEL

It is recommended that block grant budgets be ear-marked for HRH deployment at the district level. This recommendation is based on the finding that the number of HRH present in each province may have improved to the extent that it could be used to alleviate the shortage at the district level if there was a proper financial mechanism for such purposes. Although certain provincial hospitals have tried to introduce different ways of supporting district hospitals, they were limited in scope, and hardly able to mobilize HRH at the provincial level to help with the service load at the district level. As the travel between various districts and the provincial towns has improved, it might be possible for the district level to hire some of the HRH from the provincial level to work for them on more flexible terms rather than having to depend solely on having additional HRH to work at the district level only on a continuous assignment basis (i.e. annual or monthly or even weekly). Moreover the provincial hospitals should be mobilized to provide technical support including improvement of work system at the district level wherever necessary. In this respect it might be necessary to have two separate block grant budgets.

E.1 Budget for hiring additional workforce for the districts in the high priority areas. Based on the calculation of HRH requirements it will be possible to compare the number of HRH actually present in each district and province with the number estimated to be required and thus identify the gap of HRH required. This will identify provinces with highest relative shortage of HRH of various categories. Using the existing income of each category received through their work in the public sector (including both salary and additional payment received through the public services) it will be able to estimate the budget required for each province to fill up the additional required HRH workforce. Taking into account the number of new HRH assigned, especially to the district level, the required block grant budget could then be estimated as follows:

Bloc budget = (E-A-N) * I where

E = Expected number of a particular category of HRH required for a province

A = Actual number of HRH of that category present in the province

I = (Mean) Income of that category derived from working in the public sector

N = New graduates or additional HRH assigned to the province

This budget will be made available only to the top 25 percent of provinces (those above 75 percentile) in terms of the additional HRH required. The

estimated budget required is approximately around 30 million baht for doctors. The actual use of the budget will be determined by the provincial mechanism to be created (see Chapter II: Mechanisms). However it will be used according to the following principle:

E.1.1 When HRH from the provincial hospitals are mobilized to work at the district level during the regular working hours, he/she will receive only half the amount payable, the other half will be given to the hospital as a general fund for staff welfare (it could be further allocated for specific departments, if appropriate). This will help to increase the supports of the remaining hospital staff who will have to face additional workload because of the reduced contribution.

E.1.2 If the additional HRH is from the private sector, they should be compensated with the full amount payable according to that category.

E.1.3 The provincial mechanism will determine the payable rate according to their own criteria but will be limited to the overall budget ceiling allocated. The mechanism will also determine the districts as well as the categories of HRH that need to be mobilized and compensated for including the sources of such HRH.

E.2 Block grant budgets for additional payment to the HRH in the province. In addition to the need for revised additional payment and establishment of provincial mechanism and HRH performance appraisal systems to achieve better service provision, and to increase staff morale and motivation, the budget required for such purposes, and the decision to pay for each individual should also be entrusted to the provincial level. This block grant budget could be calculated based on a centrally determined rate and the estimated number of HRH entitled for each type of payment. However, the proportion of government budget required for the estimated total amount of each province will be determined and allocated to each province in a block grant budget to allow the provincial mechanism to make adjustment in the actual payment. Such a proportion could be determined by using the following criteria:

E.2.1 All monthly supplement to the district level HRH and the payment for full time services will be allocated from government budget according to the number of HRH present in each province.

E.2.2 Additional budget for workload related payments will be allocated from government budget only as much as the present level of budget ceiling for this item. However the allocation to each province will be only for district hospitals that have relatively lower potential of revenue generation. The criteria to be used will be adopted from the MOI district classification system adjusted by the actual revenue generating potential of each hospital.

F. CREATING A NEW DISTRICT HEALTH SYSTEM

Those doctors working at the district level for more than 5 years referred to the fact that they enjoyed the roles they played at the district level including comprehensive health service provision. Through consultative process during the TA work, a proposal came up about providing more autonomy to the district level for more effective planning and management of the district health system. The major components include:

F.1 All health centers including the district hospitals should function as points of delivering primary health care (PHC) and primary medical care (PMC) to the population within their coverage, with efficient referral to the district level where more sophisticated primary medical care and secondary medical services will be provided with the opportunity of referring patients back and forth between the health centers and district hospitals.

F.2 The budget from the government for health services delivery in the district will be allocated to the district as block grant budget and allow district health management mechanisms (to be established in each district based on its own situation but consisting of both governmental as well as community partnership) to make proper allocation and utilization for various types of service outputs as required by the central government.

F.3 The district management mechanisms will have the autonomy over the use of human resources as well as determining proper additional payment for them using the centrally allocated budget earmarked for this purpose.

It is anticipated that such new arrangements will make the work at the district level more challenging to those with a certain degree of experience. The leadership in district hospitals has improved gradually over the last decade. Those with directors working at the district level for more than 5 years may be challenged to make proposals for such autonomy. The government may like to introduce this in demonstration districts to better boost the morale and image of work at the district level. Hopefully it will be another crucial contribution to better attract HRH to work at the district level.

G. REFORM THE MEDICAL EDUCATION TO FOSTER RURAL

From the questionaire survey being sent to a sample of medical doctors working in rural areas of Thailand as well as through interviewing medical doctors of community hospitals in four provinces including Nonthaburi (Central Region), Khonkaen (North-East), Nan (North) and Pattanee (South). These medical doctors (M.D.) can be classified into two groups according to the length of their stay : a) less than five year : and (b) between five to ten years or over.

One common complaint raised by these doctors is lacking the opportunity for continuing Medical Education. Since it is extremely difficult for them to leave the hospital to participate in medical conferences or other academic activities available in

the medical school or professional medical societies. Therefore CME via effective distance learning such as telc- conference, VDO tape teaching, as well as other techinques will be desirable to up-date their knowledges.

Other main reasons for the group of doctors who stayed shorter than five year are as follows : (a) hard and boring work ; (b) uncomfortable living environment in rural areas : (c) living far away from their families ; and (d) work in the rural area being less valuable and low pay.

It is interesting to note that the group who stayed longer than five years gave their reasons as follows : (a) hard but interesting work by visiting and inter-acting with community ; (b) rural community is more peaceful and friendly surrounding ; (c) being close to the family.

HYPOTHESIS

The views expressed via Questionair and interview by the Rural Medical Doctors who worked at the Community Hospitals, particularly for a period of less than five years can be hypothesized as follows:

a) The health problems and rural environment are different from the scenario they were familiar with in the teaching hospital and medical schools. Bio-psycho-social (holistic) approach and problem-solving skills are required more for working in rural environment in order to be appreciative and enjoyable.
b) Culture, value, life-style in a rural community are different between regions of the country as well as between rural and big urban community where the university and medical faculty being located. It is very difficult for the young medical graduates to adjust themselves and be happy in the new environment unless strong incentives can be obtained.
c) Continuing medical education is much less available to the rural medical doctors. Their chances to participate in the medical conferences and/or other academic activities were very limited. Teleconference and other types of Distance Learning are not available to them eventhough these activities are available in the Ministry of Public Health and many Faculties of Medicine in Bangkok and out side.

Most, if not all, of the problems elaborate here are not new. At the same time, the technologies as well as human resources to work on this problems are available. There are needs to reorganize some structures and functions in the MOPH to work in cooperation with the Universities in dealing with this important Deployment Issue.

APPROACH

Strategies for the approach should consist of (a) Immediate Action and (b) Long-term program

(a) Immediate Action Plan

At the present time, Continuing Medical Education (CME) for medical doctors particularly general practitioner especially in the rural areas has been carried out for

some time in some Faculties of Medicine. CME at the Siriraj Medical Faculty has been carrying out regularly for the past several years as follows:

- Short courses (1 to 3 days), such as Emergency Room Problems, Up-date in Internal Medicine, Up-date in drugs uses and etc.
- Refresher course (2 hours once a week) for topics requested by G.P.
- Questions and Answers for common medical problems via mail.

There are needs to make this kind of activities available to all doctors particularly in the rural areas. An appropiate medical education unit should be contracted to carry out CME to serve the rural doctors. A Co-ordinating Unit for this program should be established and funded.

(b) Long-term Program

As stated in the working Hypothesis that several factors contribute to the shortage of medical doctors as well as dentists or pharmacists in the rural areas

It is proposed that the Co-ordinating Ceenter for Medical Education and Continuing Education as proposed in the section of improving mechanism for HRH management (B.5).

Propose plan to produce a physician for rural areas.

To produce medical graduate suitable to work in rural community up to a level of Provincial hospital will be a key factor for a long-term solution for the Deployment issue. Functions I and II of the new Co-ordinating Center for Medical Education and Continuing Education should have influence in the method of selection medical students as well as re-orientation of the medical cursiculum.

Selection of medical students

Traditional method of the selection of medical students based heavily on competitive entrance examination. High school students living in urban are more advantage than small town and rural candidates.

The new proposal should be based on a requirement for basic knowledges in biological sciences, methamcties, Thai and English languages, psychological tests and social sciences. These tests should be carried out by the university to select a group of candidates who have a basic knowledge and capability to study medicine.

Then the Faculty of Medicine should appoint the Selection Committee composing of appropiate member of community representatives and university representatives to make a final decision on the candidates to be admitted to the Medical Faculty.

It is our belief that, by this method, we should be able to produce medical doctors who will be more comfortable to work in a community where they have grown up.

Medical Curriculum Reform

As we all realize that health and medical problems are the out-come of several contributing factors including life style, culture and belief, environment, personal hygiene, socio-economic status, food habits and intakes and so on. It is mandatory for students to understand the contributing factors to good or poor health as well as illness. Therefore, Bio-Psycho-Social should be a main core for Holistic approach. At the same time, Learning process and student center should be emphasized through small group discussion and inter active process.

With this principle, medical students should learn from a real problem (patient) from Pre-clinical years onward in a systematic way. Through this process, the students likely to be motivated to acquire the knowledges in order to understand pathological processes of the illness. Of course, they are able to acquire the knowledges from the Library or inter-act with the teachers or colleagues. To facilitate a desire to acquire new knowledges, a Learning Resource Center as well as Teachers (facilitator) will be very important.

In order to demonstrate a linkage between an individual patient with the family and community, the medical students will be assigned to visit the family and familiarize his/her self with the environment around the patient.

With this short discription , the medical students will be able to understand the linkages between Biological, Psychological and socio-economic processes that interact around the medical and health problems.

The out-come of the Problem-base and Community-base curriculum as deseribed should promote a physician – to be who:-

- See and solve health/medical problems in a Holistic manner
- Have an inquisitive mind and criticical thinking skill
- Is familiar with group process and work as a team.
- Will appreciate a Research and Development in carrying out his work

Appendix1

1. The Working Group I: Revise Staffing Norm

Roles and Functions

1. Determine and revise the staffing requirement/standards for the rural health facilities i.e. provincial hospitals, district hospitals and health centers
2. Match staffing norms with existing number of staff to identify HRH gaps and rank them according to the number needed by priority provinces and district hospitals.
3. Classify and revise the classification of rural districts as different degree of hardship work.
4. Monitor the allocation and distribution of HRH for the rural health facilities that link with the revised staffing norm.
5. Do periodic revision of the staffing norm and the district classification at least every 2 year

Qualification

1. This working group should made up of technical experts rather than political appointees.
2. The size of the group should not be more than 12 members.
3. The composition of this group should consist of experienced technical experts from various professionals and institutions. They should not be selected as representative of professional organizations or specialties, otherwise it will be very difficult to adopt a neutral and objective view on staffing requiremenst. This might have one form the CSC, district hospitals and provincial hospitals, the Rural Health Division and the Provincial Hospital Division.
4. The members of the group should have a wide perspective, concern to the whole health system not only of their own organization, be knowledgeable about HRH issues and neutral.

Appendix 2

2 The Working Group II.: HRH Allocation and Determining Resident Training

Roles and Functions

1. Allocate the new graduates to various provinces and hospitals according to the criteria proposed by TA (The HRH Deployment Report part A.3 page 61) and using the HRH gap and priority from the WG I.
2. Monitor the rotation and the assignment of HRH to ensure they work according to the criteria.
3. Identify the needs for the number and branch of specialists in each hospital using the revised staffing norm form the WG I.
4. Set up the criteria and process of selection that will ensure that those working and completing compulsory services at the district level will receive priority consideration.
5. Coordinate with the training institutions both through the Medical Council and directly with each training institution , to ensure the acceptance of the selected candidates for training.
6. Monitor the result of the implementation especially with regards to the distribution and retention of the trained specialists in the rural health facilities and the satisfaction of the eligible graduates working at the district level.

Qualification

1. The members of the group should have good leadership, management skill and be neutral with wide perspective.
2. Membership should include staff of the Rural Health Division, the Provincial Hospital Division and selected members from the Office of Inspector General and those from related professional organizations.
3. The structure and management of the group should ensure the continuity of management as well as top policy level linkage.
4. The size of the group should not exceed 15.

Appendix 4

The Coordinating Center for HRH Deployment for the rural area

Roles and Functions:

1. Coordinate among various divisions and units involved with HRH in the MOPH to ensure that there will be consistent policies and plans in line with the national HRD policies and direction and the proposed recommendations by TA.
2. Plan, develop, and monitor the implementation of the measures for the rural HRH deployment, which are in the policy matrix and action plan, proposed by TA
3. Develop detailed roles and functions and staff composition and organization of the following mechanism:
    - the Co-ordination Center for HRH Planning and monitoring .
    - the Co-ordination Center for Medical Education and Continuing Education.
    - the National Mechanism for HRH Policy and Planning.
    - the Provincial HRH Management Board.
4. Monitor the situation of HRH in the rural areas as well as the progress of implementation of key projects and activities carried out by the assigned working group or various units concerned.
5. Coordinate between the national mechanism and the MOPH on the situation and possible remedial actions to improve the HRH situation in rural areas.
6. Develop policy options or alternatives as well as proper action plans for top level decision makers in the MOPH to ensure that there will be relevant policy directions and plans as well as effective implementation of various units concerned in the MOPH.

Structure and Qualification

1. The structure and management of this unit should ensure continuity of management as well as top policy level linkage. The best is to create this unit within the Bureau of Health Policy and Planning.
2. The manager for this unit should be assigned with a well-defined term of office to ensure continuity and should be senior enough to coordinate and enforce policy implementation when necessary. Part of the job of the manager is to coordinate and enforce policy implementation with the provincial health authorities
3. A joint secretariat should be formed to ensure proper coordination between the various units concerned.. The technical work can be done through the working group and coordinated by this center. The staff should be composed of both technical and supporting staff. They should have experience in rural health service delivery, good coordinating and management skills with technical background.
4. The center should be smart and proactive. It should not big (all staff should not more than 20).