

administration and the set up of rural health service network in the state. 'Administration and Delivery of Primary Health Care in Assam' and 'The Existing Physical Infrastructure and the Human Resource Involved in the Delivery of Health Care in Assam' are respectively the themes of the next two Chapters.

REFERENCES

- Government of Assam (1991), *Review of 7th Five-Year Plan, Planning and Development*, Government of Assam.
- World Bank (1993), *World Development Report - Investing in Health*, Oxford University Press, Oxford.

NOTE

1. For analyzing the trend in real government expenditure on health care it was necessary to convert expenditure series in current prices to a series in constant prices. However obtaining an appropriate deflator series for this purpose was difficult. Two alternative deflators have been tried. One is the NSDP deflator with which Net-State Domestic Product (NSDP) OF Assam at current prices are expressed as NSDP at 1980-81 prices. The NSDP deflator is strictly not appropriate for the purpose. In search of more appropriateness the deflator used by the Directorate of Economics and Statistics, Govt. Of Assam for converting contributions of 'public administration' sector to NSDP from current prices to constant prices has also been tried. However since the results obtained from the use of the two alternative deflator series did not differ much, the NSDP deflator was persisted with.
2. To find whether there has been acceleration or deceleration in the growth rate in the post reform period, a semi-log trend equation with an additional dummy variable that takes the value '0' for the years up to 1991-92 and '1' for years from 1992-93 onwards was fitted to the series of both total and per capita government expenditure on rural primary health care at 1980-81 prices. The estimated regression model is,

$$\ln Y = a + b.T + c.D + U$$

Y Variables	Estimated a	Estimated b	Estimated c	R ²
Government Expenditure on Rural Primary Health Care	4.8080 (72.600)***	0.0466 (4.075)***	-0.2083 (-2.068)*	0.6636
Per Capita Govt. Expenditure on Rural Primary Health Care	1.9746 (27.129)***	0.0284 (2.263)**	-0.2322 (-2.097)**	0.3034

Figures within parentheses are t values

*, ** and *** indicate significance at 0.10, 0.05 and 0.01 levels respectively.

Where T takes the values 1 to 15 for years from 1983-83 to 1997-98 and D takes the value '0' for years from 1983-84 to 1991-92 and '1' for

the years from 1992-93 to 1997-98. In the model 'b' measures the exponential growth rate in Y for the period 1983-84 to 1991-92 and 'c' is the increase in the growth rate in the period 1992-93 to 1997-98 over that of 1983-84 to 1991-92. The results are presented above.

The negative and significant estimated values of 'c' indicate that there has been a slow down in the growth of real government expenditure on rural primary health care in Assam in the post reform period.

be literate. In Sonapur and Chaygaon the percentage of households (of which, all adult members are literate) were 40.0 and 16.6 respectively. The illiteracy was found to be highest among the sample households from Chaygaon. [Refer Table 9.5].

Table 9.5 : Distribution of Sample Households according to Level of Adult Literacy				
Categories	Number of Families			
	Sonapur	Kamalpur	Chaygaon	Total
(1)	(2)	(3)	(4)	(5)
All Adults are Illiterate	12 (14.1)	3 (4.0)	16 (17.7)	31 (12.4)
Only some Adult Males are Literate	18 (18.1)	7 (9.3)	19 (21.1)	44 (17.6)
Some Adults including Some Females are Literate	21 (24.7)	17 (22.6)	40 (44.4)	78 (31.2)
All Adults are Literate	34 (40.0)	48 (64.0)	15 (16.6)	97 (38.8)
Total	85 (100)	75 (100)	90 (100)	250 (100)

Figures in brackets indicate the percentages.

(d) House Type

Combining the three sample areas about 63 percent of households (157 out of 250) dwell in thatched houses. In Chaygaon, as many as, 80 percent of the sample households live in thatched houses. In contrast, about 50 percent of

Table 9.6 : Number of Households with Different Types of Houses in the Sample Areas				
Categories	Number of Families			Total
	Sonapur	Kamalpur	Chaygaon	
(1)	(2)	(3)	(4)	(5)
Thatched House	46 (54.1)	39 (52.0)	72 (80.0)	157 (62.8)
Tin Roofed with Earthen Floor	30 (35.3)	24 (32.0)	18 (20.0)	72 (28.8)
Tin Roofed with Concrete Floor	9 (10.6)	12 (16.0)	0 (0.0)	21 (8.4)
Total	85 (100)	75 (100)	90 (100)	250 (100)

Figures in brackets indicate the percentages.

sample households in both Sonapur and Kamalpur live in tin roofed houses. The further division of tin roofed houses into tin roofed with earthen floor and tin roofed with concrete floor, shows that Kamalpur has higher percentage of tin roofed with concrete floor houses (16 percent) than Sonapur (10.6 percent).

(e) Occupational Category

Out of 85 sample households from Sonapur, 52 households earn their living primarily from farming and related activities either as self-employed peasant farmers or as daily wage earner. In the sample from Chaygaon the dependence on similar activities was found to be even higher. Out of the 90 households 45 were self-employed farmers and another 25 were daily wage earning families. The sample of Kamalpur area is markedly different from the other two samples with regard to occupational distribution as nearly half of the households earn their livelihood from non-farming services and related activities. [Refer Table 9.7].

Table 9.7 : Distribution of Sample Households Across Occupational Categories				
Occupational Categories	Number of Families in			Total
	Sonapur	Kamalpur	Chaygaon	
(1)	(2)	(3)	(4)	(5)
Self Employed Farming	35 (41.1)	16 (21.3)	45 (50.0)	96 (38.4)
Farming and Petty Business	6 (7.1)	2 (2.6)	11 (12.2)	19 (7.6)
Farming and Service	5 (5.8)	4 (5.3)	0 (0.0)	9 (3.6)
Daily Wage Earning	17 (20.0)	16 (21.3)	25 (27.7)	58 (23.2)
Non Farming Self Employed like Petty Business	5 (5.8)	5 (6.6)	8 (8.8)	18 (7.2)
Non Farming services	16 (18.8)	28 (37.3)	1 (1.1)	45 (18.0)
Service and Petty Business	1 (1.1)	4 (5.3)	0 (0.0)	5 (2.0)
Total	85 (100)	75 (100)	90 (100)	250 (100)

Figures in brackets indicate the percentages.

(f) Land Ownership

The distribution of sample families according to size of land ownership is shown in Table 9.8. The Table reveals that in Chaygaon area there is high concentration of households in the lowest size class of land ownership i.e., below 0.5 hectare. In Kamalpur area also there is a concentration of households in the same size class but with a somewhat lesser degree. On the other hand, in Sonapur area the highest concentration of households is in the next higher size class namely 0.5 - 1 hectare. The average size of land owned per family is highest in Sonapur and lowest in Chaygaon. Taking altogether the three locations, it is found that about three fourths of all households owned less than one hectare.

Table 9.8 : Classification of Sample Households with Land Ownership				
Land Owned (in hectare)	Number of Families in			Total
	Sonapur	Kamalpur	Chaygaon	
(1)	(2)	(3)	(4)	(5)
0-0.5	23 (27.1)	35 (46.7)	54 (60.0)	112 (44.8)
0.5-1	31 (36.5)	21 (28.0)	25 (27.8)	77 (30.8)
1-2	19 (22.3)	15 (20.0)	9 (10.0)	43 (17.2)
2-3	6 (7.0)	2 (2.7)	1 (1.1)	9 (3.6)
Above 3	6 (7.0)	2 (2.7)	1 (1.1)	9 (3.6)
Total	85 (100)	75 (100)	90 (100)	250 (100)
Average Land Per Family	8.3	5.8	3.8	5.9

Figures in brackets indicate the percentages.

(g) Household Income

The classification of sample households according to family income in the reference year 1997-98 is presented in Table 9.9. In Sonapur and Kamalpur the average annual per capita family income were more or less same i.e., Rs. 3546 and Rs. 3307 respectively. But in Chaygaon the same was Rs. 1745, which is nearly half of that in the other two areas. In this location nearly 75 percent of the families were in the lowest per capita income class i.e., earning below Rs. 2000 per

annum. This dismal situation in Chaygaon corresponds to concentration of sample households in low income earning occupation category of daily wage earning and also in the lowest land owned category of below 0.5 hectare. In both Sonapur and Kamalpur there was a concentration of households in both lowest income category and the highest income category, but relatively fewer households in the intermediate category.

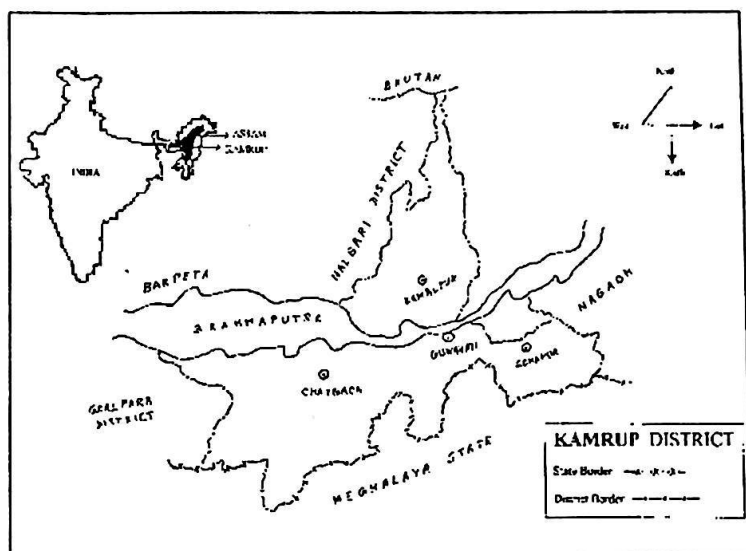
Table 9.9 : Classification of Sample Households According to Per Capita Family Income

Annual Per Capita Income (in Rs.)	Number of Families in			Total
	Sonapur	Kamalpur	Chaygaon	
(1)	(2)	(3)	(4)	(5)
0-2000	41 (48.2)	24 (32.0)	67 (74.4)	132 (52.8)
2001-3000	7 (8.2)	8 (10.6)	15 (16.6)	30 (12.0)
3001-4000	11 (12.9)	5 (6.6)	1 (1.1)	17 (6.8)
4001-5000	5 (5.8)	8 (10.6)	6 (6.6)	19 (7.6)
5000 +	21 (24.7)	30 (40.0)	1 (1.1)	52 (20.8)
Total	85 (100)	75 (100)	90 (100)	250 (100)

Figures in brackets indicate the percentages.

Conclusion

The various indicators emerging from the sample data show that the Kamalpur primary health centre area is relatively better off than Sonapur, which in turn is better off compared to Chaygaon. The Chaygaon appears to be most backward of the three areas in terms of basic infrastructure and human development indicated by lower levels of per capita income and adult literacy.



Appendix Table 9.1 : Classification of Sample Households According to Family Size

Family Size	Number of Families in			Total
	Sonapur	Kamalur	Chaygaon	
(1)	(2)	(3)	(4)	(5)
2	2	0	8	10
3	11	3	10	24
4	14	10	11	35
5	15	11	21	47
6	18	14	20	52
7	10	11	12	33
8	7	8	3	18
9	4	5	2	11
10	2	3	2	7
12	2	5	1	8
13	0	1	0	1
14	0	3	0	3
20	0	1	0	1
Total Households	85	75	90	250
Average Family Size	5.67	7.18	5.25	6.03

Appendix Table 9.2 : Name of the Selected Sample Villages Under the Block Primary Health Centre Areas		
<i>Under Sonapur</i>	<i>Under Kamalpur</i>	<i>Under Chaygaon</i>
Sonaigaon	Paikana	Belguri
Jogubari	Sarikot-2	Ganakpara
Ural	Baihata	Alukhonda
Maloybari East	Kokeria	Batakuchi
Maloybari West	Bordoipakhia	Nowamati
Samata		Bamunigaon

EFFECTIVENESS OF PUBLIC SECTOR RURAL PRIMARY HEALTH CARE SERVICE

Sources of Primary Medical Advice to Sample Households *Dependence on Government Versus non-Government Sources*

The effectiveness of primary health care service can be understood in two senses. First of all, it may be understood as the effectiveness of health advice or a medicine in curing / preventing a particular health problem. Looked at from this angle the question of effectiveness is essentially a subject of medical science or competence of the medical practitioner. Notwithstanding the importance of effectiveness in the above sense our study is more concerned with effectiveness in another sense. Since the present study is concerned with the proper utilization of government expenditure on various programmes of health care our primary interest is to investigate whether health services supposed to be provided by the government agency actually reached the target population. Thus, the effectiveness of rural primary health service in the context of present study is concerned with questions such as - to what extent public sector activities in the rural health service meet the primary health care needs of the rural population, especially of the socio-economically weaker section. Looking for answer to this question a number of analyses of data collected in the field survey have been carried out. First, the relative importance of government sources and non-government sources as providers of health advice to the sample households has been

examined. Then relative importance of public and private sources as the supplier of medicine to the same households was examined. It should be noted that the part of health budget of the government is allocated to spread awareness about various ongoing government schemes related to disease control and immunization. The extension workers involved in the awareness spreading activities form a part of the rural health network. Analysis has been carried out to examine the effectiveness of their health care extension work. Additionally, a multiple regression analysis has been carried out to identify economic and non-economic factors that determine per capita expenditure of rural household in procuring health care.

It may be instructive to examine whether there is a difference between households having different economic status tend to approach different sources of health advice. For instance, we may expect that households having poor economic base and also lagging behind in literacy may fall back to a greater extent on traditional and informal practitioners; whereas, an economically better-off household would perhaps rely more on formal practitioners of either public or private sector.

However, classification of households according to the economic status is not an easy task. Ideally per capita family income would be best possible criteria. However, obtaining accurate data of this variable is problematic particularly for rural households. It is obvious that a part of rural household income may not be monetised and on this part the informant (the head of the household) may not be able to provide an accurate estimate even when he is not inclined to understate the household income. Thus in spite of our best effort in the field work to include income from all possible sources of the household, the per capita household income estimates might have been left with some amount of error. Hence, instead of relying only on 'per capita income', we are also using the variables 'house type' and 'land owned by the household' as indicators of its economic status. It may be mentioned that the cross classification of sample households according to house type (such as (1) thatched with earthen floor, (2) tin roofed with earthen floor, (3) tin roofed with concrete floor

/ RCC) and income category (such as : Rs. 0 – 1300, Rs. 1301 – 2000, Rs. 2001 – 3000, Rs. 3001 – 4000, Rs. 4001 – 5000 and above Rs. 5000, annual per capita income) shows that there is a strong and significant association between the two variables indicating that a larger percentage of higher income household residing better type of houses ($\chi^2 = 42.22$ for 6 d.f., Table 10.1). However, the association is less than perfect and a handful of high-income earning households are found to be living in the lowest category of house type.

To investigate whether households of different economic status tend to approach different sources for health advice, we have run three types of cross-classification table:

- (1) Annual per capita income with sources of health advice;
- (2) House type with sources of health advice;
- (3) Household land ownership with sources of health advice.

Table-10.1 reveals that 48.4% of sample households depended exclusively on free government health service for health advice, whereas only 18% of households depended exclusively on private practitioners for the same. Another 30% depended on both government health service and private practitioners. Thus about 80% of households in the locations of our field study relied on public sector health care service for health advice. Dependence on public sector sources for health advice has been found to be greater among households with lower economic status. About 67% of households in the lowest income category depended exclusively on public sector for health advice, whereas the proportion of similar households in the highest income group is only 13.4%.

The second type of cross-classification table (Table 10.2) also reveals that the exclusive dependency upon government medical / paramedical staff for health advice shows a decreasing trend with the betterment in the house type. For instance, about 62% households residing in thatched houses depend upon public sector exclusively for health advice. This rate decreased to 31.9% in case of tin roofed with earthen floor house dwellers and it again decreased to 4.7 % among households living in tin roofed with concrete floor / RCC

Table 10.1 : Cross-Classification of Sample Households According to Per Capita Family Income and Sources of Health Advice

Annual Per Capita Family Income (in Rs.)	Sources of Health Advice						Total
	(a) Government Medical/ Para-medical Staff	(b) Private Medical Practitioners	(c) Traditional and Other Informal Practitioners*	(d) Combination of Sources (a) and (b)	(e) Combination of Sources (a), (b) and (c)	(f) Combination of Sources (b) and (c)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
0-1300	47 (67.1)	5 (7.1)	0	12 (17.1)	1 (1.4)	5 (7.1)	70 (100)
1301-2000	40 (64.5)	7 (11.3)	1 (1.6)	9 (14.5)	4 (6.5)	1 (1.6)	62 (100)
2001-3000	19 (63.3)	4 (13.3)	0	7 (23.3)	0	0	30 (100)
3001-4000	1 (5.8)	6 (35.2)	1 (5.8)	8 (47.0)	1 (5.8)	0	17 (100)
4001-5000	7 (36.8)	4 (21.0)	0	5 (29.4)	2 (10.5)	1 (5.2)	19 (100)
Above 5000	7 (13.4)	17 (32.6)	0	23 (44.2)	4 (7.6)	1 (1.9)	52 (100)
Total	121 (48.4)	43 (17.2)	2 (0.8)	64 (25.6)	12 (4.8)	8 (3.2)	250 (100)

Figures in brackets show the percentages of row totals.

* includes Ayurvedic, Homeopathic and other traditional practitioners excluding the formally trained Homeopathic and Ayurvedic practitioners.

Table 10.2 : Cross-Classification of Sample Households According to House Type and Sources of Health Advice

House Type	Sources of Health Advice						Total
	(a) Government Medical/ Para-medical Staff	(b) Private Medical Practitioners	(c) Traditional and Other Informal Practitioners*	(d) Combination of Sources (a) and (b)	(e) Combination of Sources (a), (b) and (c)	(f) Combination of Sources (b) and (c)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Thatched	97 (61.7)	18 (11.4)	2 (1.3)	29 (18.4)	6 (3.8)	5 (3.1)	157 (100)
Tin Roofed with Earthen Floor	23 (31.9)	21 (29.1)	0 (0.0)	19 (26.3)	6 (8.3)	3 (4.2)	72 (100)
Tin Roofed with Concrete Floor	1 (4.7)	4 (19.0)	0 (0.0)	16 (76.2)	0 (0.0)	0 (0.0)	21 (100)
Total	121 (48.4)	43 (17.2)	2 (0.8)	64 (25.6)	12 (4.8)	8 (3.2)	250 (100)

Figures in brackets show the percentages of row totals.

* includes Ayurvedic, Homeopathic and other traditional practitioners excluding the formally trained Homeopathic and Ayurvedic practitioners.

houses. The percentage of households dependent exclusively on private medical practitioner or a combination of both public sector and private practitioner tend to be higher among households dwelling in better house type category.

The third type of cross-classification table (Table 10.3) relating 'household land ownership' with 'health care facility' also indicates the similar trend. With the rise in the family land ownership, the dependence on public sector facility falls from 69.1% by bottom most class to 16% in case of top most class. Conversely the dependency rate on private sector rises.

Table 10.3 : Cross-Classification of Sample Households According to Family Land Ownership and Sources of Health Advice							
Family Land Ownership (in Bighas)	Sources of Health Advice						Total
	(a) Government Medical/Para-medical Staff	(b) Private Medical Practitioners	(c) Traditional and Other Informal Practitioners*	(d) Combination of Sources (a) and (b)	(e) Combination of Sources (a), (b) and (c)	(f) Combination of Sources (b) and (c)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
0-3	74 (69.1)	11 (10.3)	1 (0.9)	17 (15.9)	2 (1.8)	2 (1.8)	107 (100)
3.1-7	29 (39.7)	15 (20.5)	1 (1.4)	19 (26.0)	5 (6.8)	4 (5.5)	73 (100)
7.1-14	14 (31.1)	11 (24.4)	0	18 (40.0)	1 (2.2)	1 (2.2)	45 (100)
Above 14	4 (16.0)	6 (24.0)	0 (0.0)	10 (40.0)	4 (16.0)	1 (4.0)	25 (100)
Total	121 (48.8)	43 (17.2)	2 (0.8)	64 (25.6)	12 (4.8)	8 (3.2)	250 (100)

Figures in brackets show the percentages of row totals.

* includes Ayurvedic, Homeopathic and other traditional practitioners excluding the formally trained Homeopathic and Ayurvedic practitioners

As a whole the dependence on informal sources of health advice is not significant (only 0.8% of households depend exclusively on this sector). However, it should be noted that the households depending on such sources were residing mostly in thatched houses, a few in tin-roofed with earthen floor houses and none in the better type houses.

The analysis of source of health advice and the economic status of households at the individual block level also reveals some interesting facts. For instance, it is the Sonapur primary

health centre area, where although a negligible percentage (about 2 percent only) of households were found exclusively dependent upon the traditional advice, however a significant section of households (about 22%) takes the advice of traditional and unregistered practitioners over and above the public and private sector medical staff. From the observation it was found that the hill tribes (like Karbi etc.), tea tribes and other backward class communities generally prefer to go to traditional healers for the treatment of diseases. This suggest that beside the confidence that these communities have in traditional treatment, their low income status may also be an important factor since, often they need not pay traditional practitioners at the time of treatment.

It seems that the sample households in Chaygaon PHC area, which is relatively more backward are comparatively more dependent on public sector for health care service. This may be because of two factors - (1) the population being comparatively poorer is unable to afford private medical care; and (2) because of general backwardness in terms of infrastructure, basic facilities and low level of income of the people, private sector health care providers are less available in the area.

About 100% households having infants in the family in Kamalpur area has a first choice of Homeopathic practitioners (those without having any formal education) in case of child morbidity. This is mainly because - (1) people have the general belief that Homeopathic medicines are free from side effect and effective for babies; and (2) compared to Allopathic care it is cheaper.

From the field study in both Sonapur and Kamalpur area, it was observed that in the rural area the remote villages have difficult access to both private and public health services, but their utilization of private facilities is higher than the villages nearest to the health centre. Table 10.4 shows that 50% households belonging to remote villages seeks private sector health care against 20% households belonging to villages nearest to the health centre. Similarly, only 10% households of former class use public sector facility whereas the percentage in the case of latter class is 27. The reason

generally cited for this type of response is that after spending resources like time and money in commuting they want a sure service, which is possibly available in private sector only.

Table 10.4 : Distribution of Sample Households According to Distance from Nearest Health Centre and Choice of Medical Advice					
<i>Health Advice Categories (in Percentages)</i>					
	<i>Public Sector Medical/ Paramedical Staff</i>	<i>Combinaition of Public and Private Sector</i>	<i>Private Sector Medical staff</i>	<i>Others</i>	<i>Total (row percent-age)</i>
(1)	(2)	(3)	(4)	(5)	(6)
Households beyond 4 km from the health centre	10	38.3	50	1.7	100
Households within 4 km from the health centre	27	52	20	1	100

The forgoing analysis reveals the importance of public sector health care in the rural areas. Nearly 80 percent of sample households were found to be taking health advice from the public sector medical personnel (at least a single member of the family using public health facility), although many of the households are also dependent on the advice of private practitioners. However, exclusive dependence on public sector medical advice is higher among households of poorer economic status. This implies that public sector health facilities in rural areas has been taking an important role from the welfare point of view, as availability of such facilities spares the poor households the expenses of procuring health advice from the private market. However, the findings also indicate that there is much room for improving the coverage and quality of rural primary health care. It may be recalled that households living in distant areas from the health centre choose to procure private advice than approached public sector personnel. Moreover in the absence of easy access to public sector health care facility some poor households are forced to depend on informal practitioners.

Thus, if the quality of life in rural areas especially in the poor section is to be improved the network of rural primary health care has to be extended to cater to the remote villages

also. This can be achieved either by increasing the number of health centre/sub-centres or by improving the communication from interior villages to health centres or by a combination of both.

Access to and Adequacy of Public Sector Distribution of Medicine to Sample Households

In contrast to source of health advice, the significance of public sector as a provider of medicine is much less significant. In our sample only two households were found to be depending exclusively on public sector for medicine required. Whereas 54% of the total households have to depend exclusively on medicine purchased from private market, 44% get their medicine supply partly from free public sector source and partly from private market. To examine the extent to which households of different economic groups tend to depend on different sources of medicine, we have run three cross-classifications of sample households-

- (1) Annual per capita income with sources of medicine.
- (2) House type with sources of medicine.
- (3) Household land holding with sources of medicine.

From the three cross-classification tables (Table 10.5, 10.6 and 10.7), as for supply of medicines, sample households have been found to be far less dependent on the public sector primary health care system. Clearly market agencies play a bigger role than the government agencies in making medicines available to the rural households. The Tables further reveal that exclusive dependence on private source for medicine is higher in the middle-income categories. In the highest and the lowest income categories dependence on mixer of both public and private sector sources is greater than middle-income categories. The poorer sections' less exclusive dependence on private source of medicine may be due to their inability to afford enough purchased medicine. The less exclusive dependence of the richest section, on the other hand, can be rationalized in terms of their better access to public sector sources owing to their locational advantage and influence.

It may be recalled from the discussion in Chapter Five that in total spending on health sector by the Government

Table 10.5 : Cross-Classification of Sample Households According to Per Capita Family Income and Sources of Medicine

Annual for Capita Family Income (in Rs.)	Sources of Medicine						Total
	(a) Govern- ment Medical/ Para- medical Staff	(b) Private Medical Practi- tioners	(c) Tradi- tional and Other Informal Practi- tioners*	(d) Combi- nation of Sources (a) and (b)	(e) Combi- nation of Sources (a), (b) and (c)	(f) Combi- nation of Sources (b) and (c)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
0-1300	0	25 (35.7)	0	41 (58.5)	2 (2.8)	2 (2.8)	70 (100)
1301-2000	0	31 (50.0)	0	27 (43.5)	4 (6.5)	0 (0.0)	62 (100)
2001-3000	0	21 (70.0)	0	7 (23.3)	2 (6.7)	0	30 (100)
3001-4000	0	13 (76.5)	0	4 (23.5)	0	0	17 (100)
4001-5000	0	12 (63.2)	1 (5.2)	3 (15.8)	1 (5.2)	2 (10.5)	19 (100)
Above 5000	2 (3.8)	29 (55.8)	0	18 (34.6)	2 (3.8)	1 (1.9)	52 (100)
Total	2 (0.8)	131 (52.4)	1 (0.4)	100 (40.0)	11 (4.4)	5 (2.0)	250 (100)

Figures in brackets show the percentages of row totals.

* includes Ayurvedic, Homeopathic and other traditional practitioners excluding the formally trained Homeopathic and Ayurvedic practitioners.

Table 10.6 : Cross-Classification of Sample Households According to House Type and Sources of Medicine

House Type	Sources of Medicine						Total
	(a) Govern- ment Medical/ Para- medical Staff	(b) Private Medical Practi- tioners	(c) Tradi- tional and Other Informal Practi- tioners*	(d) Combi- nation of Sources (a) and (b)	(e) Combi- nation of Sources (a), (b) and (c)	(f) Combi- nation of Sources (b) and (c)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Thatched	2 (1.2)	82 (52.2)	1 (0.6)	63 (40.1)	5 (3.2)	4 (2.5)	157 (100)
Tin Roofed with Earthen Floor	0	41 (56.9)	0	25 (34.7)	5 (6.9)	1	72 (100)
Tin Roofed with Concrete Floor	0	8 (38.1)	0	12 (57.1)	1 (4.7)	0	21 (100)
Total	2 (0.8)	131 (52.4)	1 (0.4)	100 (40.0)	11 (4.4)	5 (2.0)	250 (100)

Figures in brackets show the percentages of row totals.

* includes Ayurvedic, Homeopathic and other traditional practitioners excluding the formally trained Homeopathic and Ayurvedic practitioners.

Table 10.7 : Cross-Classification of Sample Households According to Family Land Ownership and Sources of Medicine

Family Land Ownership (in Bighas)	Sources of Medicine						Total
	(a) Government Medical/Para-medical Staff	(b) Private Medical Practitioners	(c) Traditional and Other Informal Practitioners*	(d) Combination of Sources (a) and (b)	(e) Combination of Sources (a), (b) and (c)	(f) Combination of Sources (b) and (c)	
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
0-3	2 (1.8)	47 (43.9)	0	53 (49.5)	2 (1.8)	3 (2.8)	107 (100)
3.1-7	0	47 (64.3)	1 (1.4)	20 (27.3)	5 (6.8)	0	73 (100)
7.1-14	0	27 (60.0)	0	16 (35.5)	1 (2.2)	1 (2.2)	25 (100)
Above 14	0	10 (40.0)	0	11 (44.0)	3 (12.0)	1 (4.0)	25 (100)
Total	2 (0.8)	131 (52.4)	1 (0.4)	100 (40.0)	11 (4.4)	5 (2.0)	250 (100)

Figures in brackets show the percentages of row totals.

* includes Ayurvedic, Homeopathic and other traditional practitioners excluding the formally trained Homeopathic and Ayurvedic practitioners

of Assam the allocations to medicine and related consumables has been becoming gradually smaller. Further our field investigations show that even what is allocated to various rural health centres only a part of it actually reached the ultimate users or the supposed target ultimate users. For instance, against the 1800 bottles of saline, reported to be given to Sonapur PHC (last year) from the office of the Directorate of Health Services of Assam, Kamrup, the Sub Divisional Medical & Health Officer-I of Sonapur primary health centre reported to have received only 80 bottles. There seems to be a huge leakage of resource allocated for these items and the actual amount distributed to the supposed beneficiaries.

However, the adverse welfare implication of reduced allocation of funds for medicine and related consumables and non-availability of such items in rural health centres is apparent from the figures presented in the Table 10.8. The households covered in our sample, were found to be spending on the average Rs. 360 (annually) which amounted to 10.14%

Table 10.8 : Percentage of Income Spent on Medicine by Sample Households of Different Income Groups	
<i>Income Categories</i>	<i>Percentage of Income Spent on Medicine</i>
0-1300	18.58
1301-2000	17.68
2001-3000	13.32
3001-4000	16.19
4001-5000	5.17
Above 5000	7.28
Average	10.14

of their income on purchasing medicines. Moreover, the burden of purchasing medicines falls much more heavily on poorer households than the richer ones. The households of poorest income category spend nearly one fifth of their income in procuring medicine. While the richer section spend only 5 to 7 percent.

Thus, from welfare point of view there should be increased allocation of public sector fund for provision of basic and essential medicine for rural population. However, mere provision of allocation will not ensure availability of medicines in the rural households. Our investigation at Directorate of Health Services, which distribute the medicine etc., and primary health centres through which the medicines are to be distributed show that there is huge leakage of resources allocated for these medicines and related consumables. Thus, devising a mechanism for effective distribution is as much important as stepping up the allocation.

In case the government is unable to devise such a mechanism and drastically reduce the leakages it would perhaps be better to reallocate the total health budget in favour of rural health infrastructure by reducing the non-effective allocation to medicine and consumables. Strengthening the health infrastructure in rural areas can at least make primary medical advice more accessible to the rural population. Although in the process they may be left to fend for them-selves so far as procuring the prescribed medicine are concerned.

Factors Determining Per Capita Expenditure on Health Care of Sample Households

To explain the variation in overall per capita family expenditure on health care (PCE) among the sample households multiple regression analyses have been carried out. It may be noted that 'family expenditure on health care' not only includes the direct expenditure on procuring medical advice and buying medicines, but also other related expenditures such as the cost of commuting to health centre and medicine shops. In light of the insights gathered in the field study and on the basis of preliminary analysis of the sample data the following explanatory factors have been selected for the regression analysis.

- (a) Per capita family income denoted by the variable PCI.
- (b) The presence of chronically ill members in the family. This factor has been taken care of by using a dummy variable C which takes the value '1' for families having chronically ill member and the value '0' for other households.
- (c) Per capita number of sick days (excluding the chronically ill members) denoted by the variable PSD.
- (d) The source of health advice i.e., whether the family depends on the free government medical staff or on private practitioner for seeking health advice in the event of sickness. Two dummy variables HA_1 and HA_2 have been used to take care of this factor. Both these variables take the value '0' for households that depend exclusively on free service of government medical personnel. For households that depend on both free service of government medical personnel and paid service of private practitioners, the variable HA_1 takes the value '1' but variable HA_2 still takes the value '0'. For those households that depend exclusively on private practitioners, HA_1 takes the value '0' and HA_2 takes the value '1'.
- (e) The source of medicine indicated by the dummy variable SM. SM takes the value '0' for households getting medicines partially or fully from free public sector source, and takes the value '1' for households

having to depend exclusively on purchased medicine from market.

- (f) The distance in kilometer from the nearest public sector health centre denoted by the variable DIST.

For estimating the relationship of the dependent variable PCE with these explanatory factors, two alternative functional forms were considered. One was the simple linear form and the other was the following non-linear form.

$$PCE = \alpha (PCI)^\beta \cdot (PSD)^\gamma \cdot (DIST)^\delta \cdot \exp(\theta_1 L_1 + \theta_2 L_2 + \phi C + \mu_1 HA_1 + \mu_2 HA_2 + \lambda SM + U) \quad \dots (1)$$

Where U is a random variable capturing the efforts of the disturbance factors, L_1 and L_2 are dummy variables to take care of any general locational differences among the three primary health centre areas. (For households from Kamalpur area both L_1 and L_2 take the value '0', for those from Sonapur $L_1=1$, $L_2=0$ and for those from Chaygaon $L_1=0$, $L_2=1$) and α , β , δ , θ , ϕ , γ , μ and λ are the parameters of the model.

The logarithmic transformation of the above formation is,

$$\ln(PCE) = \ln\alpha + \beta\ln(PCI) + \gamma\ln(PSD) + \delta\ln(DIST) + \theta_1 L_1 + \theta_2 L_2 + \phi C + \mu_1 HA_1 + \mu_2 HA_2 + \lambda SM + U \quad \dots (2)$$

Which is linear in parameters and hence estimable by linear regression technique. The log linear form was finally selected for two reasons. First, the per capita expenditure on health care function with per capita income as one of the explanatory variable is of the nature of an extended Engel¹ function. The log-linear form of the Engel function has the convenience of directly giving the estimate of the income elasticity. Secondly, log-linear form gave a better fit than the simple linear specification of the function.

The estimated coefficients along with their standard error of coefficient and other details are presented in Table 10.9 below.

Discussion of the Results

Factors Affecting Per Capita Household Expenditure on Health Care: The results of the multiple regression model fitted to explain the variations in per capita household expenditure on health care are summarised in Table-10.9. R^2 ,

Table 10.9 : Ordinary Least Square Estimates of Parameters of Equation (2)

Explanatory Variables/Particulars	Estimated Coefficients/Parameters	Standard Error of Estimated Parameters
(1)	(2)	(3)
Constant ($\ln\alpha$).	0.6533	0.5419
$\ln$ (PCI)	0.4505***	0.0615
$\ln$ (PSD)	9.3122***	0.0772
C	0.3262***	0.0933
HA_1	0.1657	0.1638
HA_2	0.1129	0.1775
SM	-0.0897	0.1021
$\ln$ (DIST)	0.1613**	0.0763
L_1	0.8683***	0.1427
L_2	0.2694*	0.1465
R^2	0.4846	
F ($\gamma_1 = 9, \gamma_2 = 240$)	25.0731***	

Note: ***, ** and * imply significant at 1, 5 and 10 percent level respectively. (The degrees of freedom of t-statistic for testing the significance of individual coefficients, is the number of observations less the number of coefficients including the constant term, which in this case is $250 - 10 = 240$.)

the coefficient of determination, is 0.48 indicating that the model explains 48% of total variation in the dependent variable. Though the R^2 value is not particularly high, the same cannot be considered as unsatisfactory in the context of a cross-section study as the present one. Moreover, the F statistic for overall significance of the fitted model has come out highly significant (i.e., at 1 percent level).

Six out of the nine regression coefficients of the model have come out statistically significant. Among the coefficients that have been found to be highly significant is β , the income elasticity of expenditure on health care. The elasticity is positive but less than unity. The estimated income elasticity value is warranted, as health care service by nature is a necessary item of consumption. Estimates of γ the elasticity with respect to number of sick days per capita, and ϕ , the coefficient of the dummy variable C indicating the presence of chronically sick members in the family, is also highly significant and expectedly positive. δ , the elasticity with

respect to distance has come significant at 5% level. The elasticity is positive with the magnitude of 0.16. This implies that hundred percent increase in distance, say from two kilometers to four kilometers, from the nearest health centre lead on the average to an increase in per capita expenditure on health by 16%. The coefficients of the dummy variables L_1 and L_2 are both positive, but the coefficient of L_1 is much larger in magnitude and statistically far more significant. The implication of this result is that in general people in Sonapur area have to spend somewhat higher amount per capita on health care than in the other locations of the field study. Our experience in the field study suggests two possible explanations for this. Firstly, the Sonapur area happens to be a malaria endemic area. Hence people may have to spend a little more in prevention and cure of malaria attacks. Secondly, a good part of this area being hilly, the general expenditure on travel to health centre or medicine shop is likely to be somewhat higher here than in the other two areas.

The coefficients of the dummy variables HA_1 and HA_2 are positive indicating that households need to spend a little more if they have to get their health advice partially or fully from private practitioners. However, coefficients of neither of these variables are statistically significant. The coefficient of the other dummy variable SM is negative as expected indicating that per capita household expenditure on health care tends to be less if the household receives at least a part of the medicines used from free distribution in government health centres. However, this coefficient is also statistically not significant.

Factors Determining Economic Burden of procuring Health Care Service

Another multiple regression analysis is carried out as an attempt to explain the factors affecting the economic burden of procuring health care service on the sample households. The dependent variable 'B' standing for 'Burden of Health Care Expenditure' has been defined as the percentage of family income spent on procuring health care service. Thus,

$$B = \frac{\text{Family expenditure on health care}}{\text{Family Income}} \times 100$$

It may be noted that B, not only includes the direct expenditure on procuring medical advice and buying prescribed medicine but also other related expenditure such as the cost of commuting to health centre and medicine shops. B has been regressed to the same set of variables as in the earlier exercise, but this time only a linear specification has been chosen, as there is no prior justification for a non-linear specification. Thus the model this time is

$$B = b_0 + b_1 L_1 + b_2 L_2 + b_3 (PCI) + b_4 (PSD) + b_5 C + b_6 (HA_1) + b_7 (HA_2) + b_8 (SM) + b_9 (DIST) + V \quad \dots (3)$$

Where, V is the random disturbance term, which is assumed to satisfy the classical least square properties. The estimated coefficients along with standard error of coefficients and other details are presented in Table 10.10 below.

Table 10.10 : Ordinary Least Square Estimates of Parameters of Equation (3)		
Explanatory Variables/Particulars	Estimated Coefficients/Parameters	Standard Error of Estimated Parameters
(1)	(2)	(3)
Constant	9.3628***	2.5069
PCI	-0.0012***	0.0002
PSD	0.1785*	0.1026
C	1.9438	1.4800
HA ₁	2.4340	2.5679
HA ₂	5.5079**	2.8047
SM	1.4100	1.6096
DIST	0.0390	0.2722
L ₁	12.5147***	2.3978
L ₂	1.7923	2.2536
R ²	0.3740	
F (γ ₁ =9, γ ₂ =240)	15.9318***	

Note: ***, ** and * imply significant at 1, 5 and 10 percent level respectively. (The degrees of freedom of t-statistic for testing the significance of individual coefficients, is the number of observations less the number of coefficients including the constant term, which in this case is 250-10=240.)

Discussion of the Results: The results of the regression analysis for explaining the variation in economic burden of procuring health care service among sample households are presented in Table 10.10. The R² value of 0.374 is not

particularly high, but the F-statistic for overall significance of the fitted regression line is highly significant. Individually five parameters of the model have been found to be statistically significant. While, the constant term and two other coefficients are significant at one-percent level, another coefficient is significant at five percent level and yet another at ten-percent level.

The coefficient of per capita income is negative and statistically highly significant indicating that the burden of health care expenditure tends to decrease with the increase in per capita family income. Other coefficient that has been found to be highly significant is that of dummy variable L_1 . The coefficient is large and positive confirming in general a higher burden on families living in Sonapur area.

The coefficient of dummy variable HA_2 is positive and significant at five percent level. This implies that the families having to rely entirely on private practitioner for health advice have to bear a significantly higher burden than those who have access to free government health service staff for advice.

It is interesting to note that the coefficient of dummy variable SM (source of medicine) is not significant. This implies that there is no significant difference in the burden on the basis of whether the household buys its entire medicine requirement from the market or gets at least a part free from government health centre. This finding gives credence to the general impression that these days few items are available free in health centres of Assam.

Role of Extension Work in Implementation of Various Health Care schemes

Apart from primary curative care, primary health service also includes steps for prevention of common, infectious and endemic diseases. The various schemes under operation for such preventive and pro-motive health care have been mentioned in Chapter Six. In implementation of these schemes apart from imparting of actual service, the extension work for information, dissemination and motivating the common people to avail the services place an important role. In the field study information were collected to observe the

effectiveness of such extension work in the sample locations. The findings in this context are reported in the following sub-sections.

Progress of Immunization: The progress of immunization against infectious and communicable diseases like measles, polio, tetanus etc., among infants and child bearing/ pregnant mothers of the sample households is presented in Table - 10.11. Out of 250 households under survey 113 households have their children in the age group less than 5 years. All total 157 numbers of children comprised the sample. The children were classified into two categories – (1) children born recently (infants up to 2 years old); (2) children born earlier ($2 < \text{age} < 5$). The classification was done with the view to examine the progress of immunization over time, whether the infants born recently are better immunized or not. The Table shows that about 81 percent of infants under survey were fully immunized, about 10 percent of infants were partially immunized and the remaining percentage were out off getting the facility. The rate of progress of immunization in case of recently born infants (which is 85%) compared to earlier born infants (which is 78%) is not very significant, nevertheless, it is a considerable increase. Thus, the progress of the programme is to some extent satisfactory, although the fulfillment of target lags still behind to achieve the national norm of 95% immunization of the infants. On the other hand, out of total 157 childbearing mothers, only 64% were fully immunized, which is much less than the national target of 100 % immunization of pregnant and lactating mothers. Of course, the data depicts a positive increase in case of recent childbearing mothers.

The further examination of the progress of the programme across the block primary health centre areas reveals that the rate of immunization of infants was maximum in Sonapur (about 91%) and minimum in Chaygaon (57.5%). In both Kamalpur and Sonapur the rate of immunization in case of recently born infants increased considerably than the infants born earlier. The sample data of Chaygaon shows a rather exceptional picture. In this area non-immunization rate in recent times increased highlighting a serious cause of concern for the policy makers. Another

Table 10.11 : Progress of Immunization Among Infants and Child Bearing Mothers of the Sample Households

	Immunization of Infants			Immunization of Child Bearing Mothers		
	Age<2	2<age<5	Total	Recently Child Bearing Mother	Earlier Child Bearing Mother	Total
Fully Immunized	67 (84.62)	61 (78.20)	128 (81.5)	54 (68.35)	47 (60.25)	101 (64.3)
Partially Immunized	7 (8.86)	9 (11.53)	16 (10.2)	16 (20.25)	16 (20.51)	32 (20.38)
Non-Immunized	5 (6.32)	8 (10.25)	13 (8.3)	9 (11.39)	15 (19.23)	24 (15.28)
Total	79 (100)	78 (100)	157 (100)	79 (100)	78 (100)	157 (100)

significant cause of concern is that in Chaygaon only 27% of the mothers were fully immunized, and about 45% of the mothers were partially covered by the programme.

The individual block wise enquiry gives the idea that the rate of immunization among infants and their mothers in Sonapur can be related to the good extension work (imparting the people to avail the free immunization facility supplied by public sector) of health workers like multipurpose workers, auxiliary nurse midwives, anganwadi workers and doctors etc. About 80% of households were motivated by the health workers in Sonapur. It is the Chaygaon primary health centre area where both rate of immunization and the extension work by the health workers are poor. From investigation in the sample area it is found that health workers rarely visit the field area. They rather record their presence in the primary health centre. The extension work by the health workers is also poor in Kamalpur, but it is almost redundant among population in this socio economically developed area where about 56% of sample households were equipped with self information about the need of immunization [Table- 10.12].

From field study it is found that about 36% children were born in their own home without any outside help. The utilization of doctor's service slightly increased in case of

Table 10.12 : Sources of Information About Immunization Used By Households Having Infants

Sources	Households											
	Kamalpur			Sonapur			Chaygaon			Total		
	A	B	T	A	B	T	A	B	T	A	B	T
1	15 (55.5)	9 (56.2)	24 (55.8)	1 (3.7)	5 (14.2)	6 (9.6)	3 (27.2)	0 (13.6)	3 (29.2)	19 (22.5)	14 (25.9)	33 (25.9)
2	11 (40.7)	7 (43.7)	18 (41.8)	3 (11.1)	3 (8.5)	6 (9.6)	4 (36.4)	5 (45.4)	9 (40.9)	18 (27.6)	15 (24.1)	33 (25.9)
3	1 (3.7)	0 (2.3)	1 (2.3)	22 (81.4)	27 (77.1)	49 (79.0)	4 (36.4)	5 (45.5)	9 (40.9)	27 (41.5)	32 (51.6)	59 (46.4)
4	0 (3.7)	0 (2.3)	0 (2.3)	1 (3.7)	0 (0.0)	1 (1.6)	0 (0.0)	1 (9.1)	1 (4.5)	1 (1.53)	1 (1.6)	2 (1.5)
Total	27 (100)	16 (100)	43 (100)	27 (100)	35 (100)	62 (100)	11 (100)	11 (100)	22 (100)	65 (100)	62 (100)	127 (100)

Note: A ← Recently Born Infants.

B ← Earlier Born Infants.

T ← Total.

Sources: 1 ← Self Informed.

2 ← Told by Neighbours, Relatives etc.

3 ← Health Workers (ANM/MPW/Doctor etc.).

4 ← Others.

Figures in Brackets () indicate the percentages of column total.

infants born recently than the infants born earlier. Taking together all the infants it is found that the percentage of uses of trained dais/ auxiliary nurse midwife and doctor's services are 11.46 and 23.56 percents respectively. The rate of non-utilization of any outside help is highest in Chaygaon and rate of utilization of doctor's service is maximum in Kamalpur. Exceptionally in Sonapur, both trained and untrained dais take a significant role (14.4 and 53.6 percents respectively) helping the mothers to care the newly born babies (Table 10.13).

Table 10.13 : Classification of Babies Availing Different Types of Care at the Time of Birth

Infants	Baby Born Under the Care of				
	No Outside Help	Untrained Dai	Trained Dai/ANM etc.	Doctor	Total
(1)	(2)	(3)	(4)	(5)	(6)
Born Recently	27 (34.12)	23 (29.11)	9 (11.39)	20 (25.32)	79 (100)
Born Earlier	29 (37.18)	23 (29.48)	9 (11.53)	17 (21.79)	78 (100)
Total	56 (35.66)	46 (29.29)	18 (11.46)	37 (23.56)	157 (100)

Figures in brackets show the percentages.

Extension Work and Various Disease Control Programmes in the Field Study Areas

Apart from immunization programme the health workers are supposed to play an active role in other ongoing health programmes like Control of Diarrhea, National Malaria Eradication Programme, Control of Tuberculosis, Control of Goitre etc. With respect to these programme the coverage of extension work shows similar pattern across blocks as in case of immunization. In other words, extension workers are much more active in Sonapur area whereas their presence is less felt by the sample households in Kamalpur and Chaygaon areas. In Sonapur area nearly four fifths of the sample households reported that during last one year from the date of survey health workers visited their house/ area and discussed about health needs and problems. In contrast only 10 percent of sample households in Kamalpur and none of the sample households in Chaygaon could remember a visit by health workers during last year to enquire and talk about health problems or health needs.

From the field study it was also clear that the percentage of literacy of mothers is the highest in the fully immunized group and much lower in the partially immunized group and very low in non-immunized group. Individual block wise the literacy among mothers has been found highest in Kamalpur and lowest in Chaygaon. The high literacy rate among mothers apparently had a strong positive affect on the progress of immunization at Kamalpur in spite of deficiency of extension work in that block (Table 10.14).

Table 10.14 : Literacy of Mothers Having Different Degrees of Immunization by Their Infants

Immunization of Infants	Literacy of Mothers		Total
	Literate	Illiterate	
(1)	(2)	(3)	(4)
Fully Immunized	72 (56.2)	56 (43.8)	128 (100)
Partially Immunized	5 (31.3)	11 (68.7)	16 (100)
Not Immunized	1 (7.7)	12 (92.3)	13 (100)
Total	78 (49.7)	79 (50.3)	157 (100)

Figures in Brackets indicate the percentages.

Conclusion

The conclusion emerging from the above discussion can be summarized in the following points.

- (1) Nearly 80 percent of sample households were found to be taking health advice from the public sector medical personnel (at least a single member of the family using public health facility), although many of the households are also dependent on the advice of private practitioners. However, exclusive dependence on public sector medical advice is higher among households of poorer economic status. Our field study suggest that better the economic condition of the households less is the exclusive dependence on public sector and more is the dependence on private or the combination of public and private sector medical practitioners.
- (2) The hill tribes (like Karbi etc.), tea tribes and other backward class communities of the sample survey areas generally prefer to go to traditional healers for the treatment of disease. For instance, about 22% of the sample households of Sonapur take the advice of traditional and unregistered practitioners over and above the public and private sector medical staff.
- (3) It is observed that in the rural Assam the remote villages have difficult access to both private and public sector health services, but their utilization of private facilities is higher than the villages nearest to the health centre.
- (4) The households in the sample were found to be spending on the average Rs. 360 (annually) which amounted to 10.14 percent of their income on purchasing medicine. Moreover, the burden of purchasing medicines falls much more heavily on poorer households than richer ones. The households of poorest income category spend nearly one fifth of their income in procuring medicine. While the richer sections spend only 5 to 7 percent of their income. However, the study reveals that in rural areas exclusive dependence on private source for medicine seems to be higher in the middle-income categories.

- (5) From secondary data it was found that in total spending on health sector by the Government of Assam the allocations to medicine and related consumables have been becoming gradually smaller. Further our field investigations show that even what is allocated to various rural health centres only a part of it actually reached the supposed target ultimate users.
- (6) The multiple regression analysis of per capita family expenditure on health care reveals that besides per capita income, per capita number of sick days, presence of a chronically ill member in the family, what significantly effects the expenditure is the distance of the household from public sector primary health centre. The elasticity of per capita family expenditure on health with respect to distance from the nearest health centre has been found to be 0.16. This implies that hundred percent increase in distance, say from 2 kilometers to 4 kilometers, leads to on the average an increase in per capita expenditure on health by 16 percent.

The multiple regression analysis of burden of health care expenditure reveals that the burden tends to decrease significantly with per capita income and increase significantly with per capita number of sick days. But more important findings of this analysis is that the families having to rely entirely on private practitioner for health advice have to bear a significantly higher burden than those who have access also to free government medical staff for advice.

- (7) The progress of immunization rate among infants in the sample areas is more or less satisfactory, but the immunization rate in case of pregnant mothers is much less than the national target of the programme. The positive relationship between spread of women's literacy and progress of family welfare programme is confirmed by our findings on progress of immunization programme in the field study areas. Similarly it is also established that the extension work of health workers, health guides and doctors etc., obviously have a positive impact on the spread / implementation of immunization and other health care programmes

particularly in backward areas. At the same time it is almost redundant in rural areas for families / areas economically well-off/ literate.

- (8) The field study findings suggest that the number of health centres should be increased so that the average distance of a rural household from the health centre is reduced. This will help rural households in particular to rely more on government medical staff for health advice and reduce their economic burden of health care service. Moreover, devising a mechanism for effective distribution of medicine etc., and to reduce the leakages of resources is as much important as stepping up the allocation.
- (9) The health information service should be focused in only those areas, which are backward not only in terms of income, but also in terms of literacy particularly female literacy.

NOTE

1. An Engel function is a relationship between the household expenditure on a particular item of consumption and the household income. The function is named after Ernst Engel who was the first to make a systematic study of family budgets.

APPENDIX TABLE 10.1

Cross-Classification of Sample Households According: To House Type and Income Category				
Family With Peer Capita Income Category (in Rs.)	House Type			Total
	Thatched House	Tin Roofed With Earlier Floor	Tin Roofed With Concrete Floor/RCC	
0-1300	59 (37.5)	9 (12.5)	2 (9.5)	70
1301-2000	40 (25.4)	21 (29.2)	1 (4.8)	62
2001-3000	21 (13.8)	8 (11.1)	1 (4.8)	30
3001-4000	11 (7.0)	5 (6.9)	1 (4.8)	17
4001-5000	10 (6.4)	8 (11.1)	1 (4.8)	19
Above 5000	16 (10.2)	21 (29.2)	1.5 (71.4)	52
Total	157 (100)	72 (100)	21 (100)	250

Figures in brackets indicate the percentages.

SUMMARY OF FINDINGS, CONCLUSION AND SUGGESTIONS

Summary of Findings

It may be recalled that the study has a macro level aspect, which is primarily based on secondary data and a micro level aspect based on field study in three primary health centre areas viz., Sonapur, Kamalpur and Chaygaon in Kamrup district of Assam.

The findings of the macro level analyses are summarized in the following three sections, which is followed by the summary of findings in the field study.

Trends and Composition of Government Expenditure on Health in Assam

Trends in Total and Per Capita Expenditure on Health: In Assam the total government expenditure on health sector at current prices increased steadily from Rs. 6.29 million in 1951-52 up to Rs. 2343.97 million in 1998-99 with some year-to-year fluctuations over the period. In real terms i.e., in 1980-81 prices though, the increase appears more modest. Over this period the trend in per capita government expenditure on health in real terms shows three distinct phases. From 1951-52 to 1981-82 the per capita expenditure shows rising trend but with some year-to-year fluctuation in the expenditure during the period. Between 1981-82 and 1987-88 the per capita expenditure shows steady increase. Since 1987-88 there has been a declining trend in real per capita government

expenditure on health. Also since late 1980s the share of the health sector in the allocation of expenditure of the Government of Assam has been showing a declining trend. It seems that in face of fiscal hardship that the Government of Assam has been facing since 1986-87, the expenditure on health sector has been squeezed more than that on the other sectors.

The comparison with all India position however shows that the ratio of government expenditure on health in Assam to the state income has been more or less same as the ratio of government expenditure on health to national income at the all India level. However, this ratio falls short of the 5 percent mark recommended by the World Bank for significant impact on health of the masses.

Trends in the Composition of Government's Expenditure on Health Care and Their implications: As far trends in the composition of state government's expenditure on health, there was a spurt on capital expenditure between mid 1970s and late 1980s, which contributed significantly to the expansion of health care infrastructure specially in rural areas during the period. In the 1990s however, about 90 percent of the total expenditure on health has been under revenue account. This shows that in the face of declining allocation of public expenditure on health since the late 1980s the axe has fallen more heavily on capital expenditure and the expansion of health infrastructure under public sector must have received a setback in the 1990s as capital expenditure in real terms has declined.

- The revenue expenditure of the government on health has three broad components viz., expenditures on curative care, promotive & preventive care, and medical education. Of the three components medical education in general has been getting the smallest share. The share shows declining trend in the post reform period. However, for a brief period in the 1980s the share became more than 20 percent with expansion of medical education infrastructure during the period.

The share of expenditure on curative care and promotive & preventive care fluctuated from year-to-year. In absolute terms the trend in revenue expenditure on curative care has

not kept pace with the expansion of the network of health care centres. Consequently, although there are today many more health centres for the delivery of public sector health care, on the average the content of the service flowing to the service seekers has been less substantive particularly in terms of medicine and other consumables. The decrease in government involvement in the distribution of such consumables might have helped the private commercial sector to expand by catering to the demand for medicine and other consumables. But our field study shows that the private market forces are yet to penetrate into the more backward at farflung area, such as most of the sample villages of the Chaygaon primary health centre area.

Increased government spending on 'disease control programme' and 'maternal and child health' services since the mid 1970s seems to have a positive impact reflected in a sharp decline in death rate in general and infant mortality rate in particular during the 1980s. The increased allocation of government expenditure to rural family planning programme since the same point of time might also have some impact, as the birth rate in the state declined relatively slowly from 34.8 per thousand of population in 1981-82 to 31.2 in 1991-92.

Trends in Government Expenditure on Primary Health Care: It may be recalled that from discussions in Chapter Five the 'primary health care' in the context of the present study has been defined to include the following three components- viz., (1) basic medical care including access to primary advice from qualified medical/paramedical personnel, common medicines etc., (2) immunization against infectious and communicable diseases like measles, polio, tetanus, tuberculosis etc., (3) measures to prevent common, endemic and infectious diseases like malaria, diarrhea etc. The analysis of trend in government expenditure on primary health care in the state for the period from 1983-84 to 1998-99 reveals that the share of total government expenditure going to primary health care had a long term declining trend over the last two decades of the 20th century. In absolute terms at constant prices the government expenditure on rural primary health care registered a modest trend growth rate of 2.65 percent per

year. In per capita terms the growth rate was merely 0.6 percent. Moreover there are evidences of growth of the expenditure in both total and per capita term slowing down in the post reform period. Similarly, there are traces of some amount of urban bias in allocation of government expenditure on primary health care between rural and urban areas. These trends thus indicate no major step up in the governmental effort to make the critical service of primary health care available to rural population in the state. Indeed, the sharp decline in capital expenditure on the rural health service in the post reform years implies drastic slashing of public investment on physical facilities for delivering rural health care. Clearly rural primary health care is one of the sectors that have been made to bear brunt of the state's growing fiscal hardship.

Comparative Position of Assam and India with Respect to Health Infrastructure

In Assam one can see the same all India picture with regard to the rural -urban imbalance in the distribution of hospital facilities. The disparity between rural and urban areas of the facility is glaring both for Assam and at the all India level, as the number of hospitals, hospital beds, dispensaries as well as dispensary beds available per lac of urban population far exceeds the number available per lac of rural population. However hospital facilities, particularly for the rural population in Assam is somewhat less available than the same at the all India level. Moreover in Assam the public sector has a more dominant role in providing hospitals, hospital beds and dispensary facilities than in India as a whole. For instance, as per statistics available for 1993, in Assam, out of total 268 numbers of hospitals and 325 numbers of dispensaries the public sector accounted for 70 percent of hospitals and 85 percent of dispensaries. In contrast at the all India level only 33 percent of hospitals and 37 percent of dispensaries were in the public sector.

There has been an impressive expansion in the network of public sector rural health centres in Assam from the mid 1980s to mid 1990s, thanks to the spurt in government's capital expenditure on health sector from the mid 1970s to late 1980s. In spite of this expansion of the network, Assam

is yet to meet the national norms of population coverage by different categories of health centres as per National Health Policy of India, 1982. Moreover despite the expansion of public sector health care facilities in Assam particularly in rural areas over the last 20 years or so, the availability of doctors per lac of population has remained lower in Assam, compared to the all India position.

Role of Non-Government Agencies in Delivery of Health Care

The non-government agencies engaged in delivery of health care service include both profit oriented private commercial units and non-profit motivated voluntary organizations popularly known as non-government organization (NGO). It is clear from the foregoing section that compared to the all India picture the public sector or the government agencies still play a dominant role in Assam in the delivery of health care in general and primary health care in rural areas in particular. In other words, the non-government sector has not come up adequately in the state to cover the gap in the delivery of health service left by the public sector.

The Role of Non-Government Organizations: Quiet a few non-government and voluntary organizations are actively engaged in the delivery of health care specially primary health care. However, the priorities and activities and the location of operations seem to be different. While organizations like the Red Cross Society and Christian Missionary hospitals are directly involved in providing medical services specially maternal and child care, many other organizations are engaged in raising the awareness of the public for better utilization of the health services provided by the government agencies. In both these senses their role is complementary rather than competitive to the public sector. Despite their potential role in better utilization of government resources through their involvement in implementation of various community health programmes, their activities so far have remained localized in isolated pockets.

Findings of the Field Study

The main findings, which emerge from the analysis of data collected in the field study are summarized in the following points—

- (1) The field study reveals that the sample households are overwhelmingly dependent on the public sector network of health centres for basic health care. Nearly 80 percent of sample households were found to be dependent fully or partially on the public sector rural health service network for health advice.
- (2) However, among households located at relatively greater distance from the public sector health centre there is a preference for private source rather than public sector source for health care. The reason generally cited for this type of response is that after spending resources like time and money in commuting they want assured service, which is perceived to be available in private sector only.
- (3) Economic category wise also there appears to be some difference in the pattern of dependence of sample households on alternative sources of health advice. The cross-classification of households according to the source of health advice and economic status as indicated by per capita family income, house type and family land ownership shows that better the economic status less is the dependence exclusively on public sector for health guidance and more is the use of private or the combination of private and public sector medical practitioners. However, in case of medicines the dependence on free public sector source is much less across households of all economic strata. Of course, the burden of purchasing medicines falls more heavily on poorer households than on the richer ones. The households of poorest income category spend nearly one fifth of their income in procuring medicine, while the richer sections spend only 5 to 7 percents of their income.
- (4) Although the percentage of households depending exclusively on traditional and unregistered practitioners was negligible, about 8 percent of the households were found seeking the advice of such practitioners over and above using the service of public and private sector registered practitioner. Among these households there was a high percentage of households

belonging to hill tribes and tea tribes. Besides the confidence that these communities have in traditional treatment methods, their low income status may also be an important factor in making them seek health service from such informal sources, since often they need not pay traditional practitioners at the time of treatment.

- (5) The multiple regression analysis of per capita family expenditure on health care reveals that besides per capita income, per capita number of sick days, presence of a chronically ill member in the family, what significantly effects the expenditure is the distance of the household from public sector primary health centre. The elasticity of per capita family expenditure on health with respect to distance from nearest health centre has been found to be 0.16. This implies that other things remaining constant, hundred percent increase in distance, say from 2 kilometers to 4 kilometers from the nearest health centre, leads to on the average an increase in per capita expenditure on health by 16 percent.
- (6) The multiple regression analysis of burden of health care expenditure reveals that the burden tends to decrease significantly with per capita income and increase significantly with per capita number of sick days. But more important finding of this analysis is that the families having to rely entirely on private practitioner for health advice have to bear a significantly higher burden than those who have access also to free government medical personnel for advice. This reiterates the importance of public sector network of health service for making primary health care available for people living in rural areas.
- (7) It is interesting to note that the regression analysis found no significant difference in the burden of health care expenditure on the basis of whether households procure medicines fully from the market or get them at least partly free from the health centres. Non-significance of this coefficient gives credence to the general impression that these days few items are

available for free distribution in rural health centres in Assam. The analysis of government expenditure on health care also shows that in total spending on health sector by the Government of Assam, the allocations to medicine and related consumables have been becoming gradually smaller. Further cross checking at the level of the rural primary health centres in course of our field investigation it was found that even what was allocated to various rural health centres only a part of it actually reached the ultimate users. Obviously, there is considerable leakage of resources allocated for medicine and related consumables.

- (8) An important component of primary health care in rural areas has been the immunization programme. On the whole, there has been considerable progress of this programme in the field study locations. About 80 percent of the infants in our sample were fully immunized and another 10 percent were partially immunized. However, the progress of immunization of mothers has been less satisfactory. About 64 percent of the mothers in the sample only were immunized. The comparison of the locations of field study shows that the progress of immunization was highest in Sonapur area. This corresponds to intensive and effective extension work in this area by health workers such as, multi-purpose workers, anganwadi workers and doctors etc. The Kamalpur area though, socio-economically more advanced than Sonapur, lags behind the latter in the extent of immunization of both mothers and children. The extension work of health workers was found to be least effective in Kamalpur among the all three locations of field study. The progress of immunization in this location can be attributed to greater health awareness among households arising from their comparatively better-off socio-economic conditions specially in the area of female literacy. The coverage of immunization programme was found to be much less extensive in Chaygaon block compared to other two locations of field study. Incidentally the block was found to be

deficient than Sonapur in extension service of health workers and lagging behind both Sonapur and Kamalpur in female literacy.

- (9) Apart from immunization programme, in case of other on-going health care programmes like 'national malaria eradication programme', 'national tuberculosis control programme' etc., the extension workers were found to be much more active in Sonapur area whereas their presence was less felt by the sample households in Kamalpur and Chaygaon areas.

Conclusion and Suggestions

It is clear that in providing primary health care in rural areas of Assam the public sector plays a dominant role. The network of public sector primary health centres, sub-centres and community health centres has been playing an important role in rural areas not only in implementation of programmes of promotive and preventive health care such as immunization, but also in providing primary health care. The non-government agencies including the private commercial sectors and the voluntary non-government organizations have a much smaller presence in the health sector in Assam than at the all India level. Even this small presence is only complementary rather than competitive to what is delivered by the public sector. For better availability of primary health care for the masses it is therefore of great importance that the government expenditure on rural primary health care is stepped up. The increased investment is needed to extend the primary health care delivery network to interior villages where, private sector cannot be expected to make significant presence in near future. Moreover, increased allocation to rural health care is also necessary to correct the imbalance in per capita public expenditure on health between rural and urban areas.

However, increased allocation by itself is not going to serve the purpose unless the efficiency of government expenditure is also ensured. The efficiency can be improved by plugging the leakages of resources made for the health care sector and also through increased awareness about publicly financed health care programmes among the target

recipient groups. The field study shows that the areas in which the health workers have been active the programmes like 'immunization' had much greater impact, even though, the areas are otherwise comparatively socio-economically backward. Obviously, in such areas the increased public awareness created by good extension work of health workers have paid off in terms of better utilization of facilities made available under the different health care schemes of the government. On the other hand, areas with similar level of general socio-economic conditions where the extension service of the health workers were found to be rather slack have been lagging behind in taking advantage of such programmes of preventive and promotive health care.

While making fiscal allocations available to primary health sector is important for improving the living conditions of the masses especially in rural areas, the evidence from our field study clearly shows that it is equally important to improve the efficiency of implementation of the health care programmes for which the government expenditure is made. The fact that in some locations the health care programmes have had a significant impact while in others the same programmes have had much less success points to the conclusion that the ineffective implementation of health care programmes is a major factor responsible for the poor state of rural health care service in Assam. In other words, the findings in the field study lend support to the principal hypothesis of the study.

Having arrived at the above conclusions, a few suggestions inspired by the insights gathered in the field study are put forward for more effective utilization of resources spend by the government on rural primary health care in the state.

The network of public sector rural primary health care centres need to be further extended to give a better coverage to interior villages. Our field study shows that households located in relatively distant areas from the health centre have to depend to a greater extent on private sector not only for medicine but also for medical advice. Our analysis in chapter ten reveals that the burden of expenditure on health care

significantly increases with the increase in the distance of the households from the health centre. Hence, extension of the network of rural primary health care centres will serve the cause of development by providing health care and also by providing economic relief to the population located in remote villages. This may be achieved either by setting up more health centres or improving road communication of remote villages with existing health centre or by a combination of both. Obviously, such a programme would require increase in government's capital expenditure on rural health sector and rural road construction.

However, the health centres in the rural areas are handicapped in delivering primary health care because in recent years the supply of even the basic consumables such as cotton, gauze, linen etc., are being made available in extremely limited quantity. The medical officers of the health centres covered in our field survey cited this as a major problem in imparting their duties. The study has identified basically two factors which are at the root of this dismal situation – first of all, government allocation to such consumable items have got squeezed as a result of the growing fiscal hardship faced by the government (Refer Chapter Five); Secondly, even what is allocated does not seem to reach the target ultimate users indicating that there is a huge leakage of resources allocated to such heads. Since government's inefficiency and inability in making basic consumables available to rural health centres seems to have adversely affected the efficiency of public sector rural primary health care, we suggest a scheme for inducing private effort to supplement the public sector effort in this area. In this suggested scheme the government may canalize its effort towards providing the personnel and expanding and maintaining the fixed overheads required for the network of rural primary health service. For the supply of consumables to these health centres private initiatives can be induced. For instance, in every health centre/sub-centre some space may be given to private operators to run selling outlets providing common medicines and basic consumables. Although the users of rural primary health service may have to spend a little for the items to be procured from such shops, this cost

is likely to be out weighted by the benefit of greater efficiency of the service received and the convenience of availability of basic items of health care (Indeed our study shows that household's burden of expenditure on health care depends significantly not on whether medicine is received free from health centre but on whether the households have to depend on private practitioners for medical advice). Such a privately operated supply line of consumables supplementing the network of public sector primary health centres will be easier to monitor and manage more effectively. Once such a scheme becomes operational the government will be able to divert the fund currently allocated for providing consumables to support expenditure for expanding the network of rural health centres and maintenance of the equipment and other fixed assets of this network.

From the field study it becomes amply clear that spread of literacy, development of rural infrastructure specially roads, and extension of primary health care can have strong mutually reinforcing effects leading to a major impetus to upliftment of quality of life of the masses in the rural areas. Hence, the primary health care programme is likely to be far more effective when pursued as a component of a strategy for overall human development in rural areas rather than as an independent programme.

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