

GOVERNMENT OF PUNJAB (INDIA)
ECONOMIC AND STATISTICAL ORGANISATION



**DEVELOPMENT OF MEDICAL
EDUCATION
AND
FORECAST OF DEMAND FOR
AND
SUPPLY OF HEALTH MANPOWER
IN
PUNJAB**

ISSUED BY

THE ECONOMIC ADVISER TO GOVERNMENT, PUNJAB

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Publication No. III

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PREFACE

Health manpower is one of those strategic categories of manpower which require detailed planning in advance because it takes a period of 4½ years and sizable investment to turn out a medical graduate. For proper manpower planning of this category, it is essential to collect data regarding its development in the State, present position of employment and probable demand and supply of such personnel in the next five to ten years period. The present report has been prepared keeping into view the above objectives.

The report briefly traces out the history of the development of medical and para-medical education in the State and makes an assessment of the supply of doctors at the end of the Fourth and the Fifth Plans and of para-medical personnel at the end of the Fourth Plan. The report also contains a forecast regarding demand for doctors and other para-medical staff in the corresponding periods. The demand estimates in this report are, however, limited to the public sector alone. Since there is yet unsatisfied demand for medical services in the private sector, it is expected that after meeting the requirement of the public sector, the remaining personnel will get absorbed in the private sector. It is, however, necessary to be constantly aware of the situation so that measures could be taken sufficiently in advance before any symptoms of imbalance in the medical manpower tend to appear on the scene.

The assessment made in this Report indicates that the supply of doctors at the end of the Fourth Plan would be more than sufficient to meet the demand for doctors in the public sector due to the expanding medical health facilities. In fact, it is tentatively estimated, that after meeting the requirements of the public sector, there would be a surplus of 938 doctors, 147 dental doctors, 228 auxiliary nurse mid-wives and 105 lady health visitors by 1973-74. There is yet ample scope of their absorption in the private sector. The categories of sanitary inspectors,

laboratory technicians and radiographers would, however, remain shortage categories in the State. In case of nurses it is expected that their supply would be barely sufficient to meet the demand in the public sector alone. The total number of doctors in the State at the end of the Fourth Plan (1973-74) and Fifth Plan (1978-79) has been estimated at 6,947 and 8,313 respectively. Though the estimates given in this report are tentative, it is hoped that these will prove useful for studying the health manpower situation in the State in its proper perspective.

My thanks are due to Dr. Ajit Singh, Deputy Economic and Statistical Adviser for his guidance and supervision and to Shri Balbir Datt, Research Officer for drafting the report. Acknowledgement is also made of the useful work done by Shri Narinder Nath, Technical Assistant and Shri Harnam Singh, Computer in the collection and compilation of data.

CHANDIGARH :
July, 1970.

J. S. SANDHU,
Economic Adviser to Government,
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CHAPTER I

INTRODUCTION

1.1. Health Manpower.—According to Kaprio, health manpower includes all those who are participating directly in health and medical services and activities of the community. The definition has been further elaborated by Dr. S. K. Rao, Professor of Public Health Administration, N.I.H.A.E., New Delhi. Health manpower to quote him includes : '(i) Professional health personnel, (ii) Auxiliary health personnel who have less than full professional qualifications and require supervision by fully trained high level health personnel and (iii) Para-medical workers covering all professions allied to medicine'.¹

1.2. Manpower Planning.—The programmes for professional education and training must be aimed at ensuring availability of trained personnel of different categories, required in relation to development proposed (during the Fourth Five Year Plan), in view of inevitable time-lags involved in the education process. An attitude of complacency towards manpower planning in the medical field is likely to create imbalances in the supply and demand of different categories of health personnel. Keeping this into view, a review of the existing training programmes in the State along with an analysis of the supply and demand of different categories of medical and para-medical personnel during the Fourth Five Year Plan has been made in the following chapters of this report.

1.3. Sources of Information.—This report is based on the information collected from the State Directorate of Health Services, medical colleges and para-medical institutions located in the State. The study is restricted only to those categories of medical manpower which are connected with the allopathic system of medicine. The main emphasis in the development of our medical education is on allopathic system.

1.4. Main Findings.—The Western system of medical education commenced in Punjab with the establishment of a medical school at Amritsar in 1920. At present there are four medical colleges in the State with an intake capacity of 400 students per annum. With the exception of Dayanand Medical College, Ludhiana, the remaining three medical colleges in the State have arrangements for post-graduate medical education.

¹Rao S. K. In his paper entitled '*Planning to meet Community Health Service Administration Manpower Needs*', circulated to the trainees of Training Programme on Manpower Planning held in New Delhi in November, 1968.

There are two dental colleges with an annual admission of 42 students. One of the dental colleges offers study in M.D.S. (Master of Dental Science) course.

For the training of para-medical personnel facilities exist in different hospitals and institutes in the State. Para-medical personnel who get training in the State include general nurses, auxiliary nurse-midwives, lady health visitors, laboratory technicians, pharmacists and radiographers. For the training of sanitary inspectors there is one institute located at Chandigarh.

The main findings of the study are as under :—

Population served per medical college in Punjab is 3.5 million which compares favourably with the norm (one medical college for an area with 5 million population) recommended by the Health Survey and Planning Committee, 1961.

In 1967 Punjab had a higher out-turn of medical graduates per lakh of population than all other States except Mysore.

It has been estimated that during the Fourth and the Fifth Plan periods a total of 1964 and 1856 doctors would pass out of the medical colleges of the State provided the existing seating capacity in the medical colleges is not altered.

Assuming that 10 per cent of the doctors graduating from the medical colleges in the State would take up higher studies, the total supply of M.B.B.S. doctors available during the Fourth Plan is estimated at 1768.

The out-turn of dental doctors in the State during the Fourth Plan is expected to be 195.

During the Fourth Plan an out lay of Rs 179.15 lakh is proposed to be spent on medical education. It forms 23.9 per cent of the total proposed Fourth Plan Outlay on Health Programmes in the State.

An amount of Rs 25.50 lakh is proposed to be spent on Training Programmes for para-medical personnel during the Fourth Plan.

It is estimated that 446 general nurses, 417 auxiliary nurse-midwives, 208 lady health visitors, 640 compounders/pharmacists, 123 laboratory technicians and 265 sanitary inspectors would be passing out of the training institutes in the State during the Fourth Plan.

On the eve of the Fourth Plan 27.42 per cent of the posts of M.B.B.S. doctors and 20.45 per cent of dental doctors were lying vacant in the public sector. Shortages among para-medical personnel varied between 1.36 per cent (in the case of auxiliary nurse-midwives) and 21.92 per cent (in the case of sanitary inspectors). This clearly shows that health manpower is a shortage category in this State.

It has been assessed that 830 M.B.B.S. doctors, 48 dental doctors, 443 nurses, 189 auxiliary nurse-midwives, 103 lady health visitors, 153 dispensers, 373 sanitary inspectors, 236 laboratory technicians and 29 radiographers would be required to man different posts (including the shortages and replacements) in the public sector during the Fourth Plan.

After meeting the requirements of the public sector, there will be a surplus of 938 M.B.B.S. doctors, 147 dental doctors, 3 nurses, 228 auxiliary nurse-midwives, 487 dispensers and 105 lady health visitors and a shortage of 108 sanitary inspectors, 113 laboratory technicians and 1 radiographer at the end of the Fourth Plan. Estimates for the private sector have not been attempted.

The total number of doctors in the State at the end of the Fourth and Fifth Plans is estimated at 6,947 and 8,313 respectively. Doctor population ratio in the State is likely to improve from 1 : 2490 on the eve of the Fourth Plan to 1 : 2347 by the end of the Fourth Plan and 1 : 2245 by the end of the Fifth Plan.

CHAPTER II

MEDICAL EDUCATION AND TRAINING

2.1. *Growth of Medical Colleges.*—The modern system of medical education commenced in Punjab with the establishment of a medical school at Lahore (now in West Pakistan) which was later on transferred to Amritsar in 1920. Upto 1918 the M.P.L. Diploma was awarded. In that year the Punjab State Medical Faculty was constituted and the diploma was named L.S.M.F. In 1938 a new diploma called L.M.S. was instituted. In July, 1943, the State Government decided to raise the medical school to the status of a degree college. Thus the first medical college started functioning in the State with effect from 1st October, 1943.

The State Government also gave recognition to another diploma level institute named "The Women's Christian Medical College", established at Ludhiana in 1915. The Institute offered study in L.S.M.F. and L.M.S. diploma courses until its upgrading for the M.B.B.S. course in 1953. The College also began to admit both men and women students for the M.B.B.S. course during this year.

The third medical college in the State also came into existence during the year 1953 at Patiala.

Another institute named 'The Arya Medical School' at Ludhiana was recognised by the Punjab Medical Council in 1935 for first professional L.S.M.F. The Institution was recommended for upgrading to the M.B.B.S. standard by the Bhoré Committee. The L.S.M.F. course was discontinued and the School was upgraded to the M.B.B.S. standard in 1964.

At present there are four medical colleges in the State. Whereas the medical colleges at Amritsar and Patiala are under the Government management, both the colleges located at Ludhiana are in the private sector. The teaching departments have been progressively strengthened by addition of laboratories, staff and equipment.

The State enjoys good facilities for medical education compared with many other States in the country. This can be seen from the number of medical colleges and population served per medical college in different States of India as shown in table 2.1.

TABLE 2.1

Number of Medical Colleges and Population served per Medical College in different States of India—1968

State	*Number of Medical Colleges	Population served per Medical College (Million)
1	2	3
1. Himachal Pradesh	1	3.46
2. Jammu and Kashmir	1	3.95
3. Rajasthan	5	5.01
4. Madhya Pradesh	6	6.51
5. Uttar Pradesh	8	10.92
6. Assam	3	4.95
7. Bihar	4	13.86
8. Orissa	3	6.93
9. West Bengal	5	8.56
10. Maharashtra	11	4.36
11. Gujarat	5	5.07
12. Andhra Pradesh	8	5.22
13. Kerala	4	5.11
14. Madras (Tamil Nadu)	9	4.26
15. Mysore	9	3.13
16. Haryana	1	9.57
17. Punjab	4	3.51

Source : *Fact Book on Manpower Part II—IAMR Report No. 4/1969.

It will be seen from table 2.1 that the population served per medical college in Punjab is less than in all other States except Mysore and Himachal Pradesh (Union Territory). This shows that medical education facilities in this State are far better than in most of the States in India. Such facilities are quite inadequate in States like Bihar and Uttar Pradesh.

2.2. *Admission for M.B.B.S. Course.*—The intake capacity of the Government Medical Colleges, Amritsar and Patiala, was raised from 100 each to 150 each in 1963 in the wake of emergency created by the Chinese aggression. The number of annual admissions in Government Medical College, Patiala, was further raised to 160 in 1966. However, the number of seats was again brought down to 150 in 1969. There has been no change in the intake capacity (i.e. 50 each) of the Christian Medical College, Ludhiana and Dayanand Medical College, Ludhiana ever since their existence. Besides the M.B.B.S. regular course, there are also arrangements for M.B.B.S. condensed course in both the Government colleges. Actual admissions for both M.B.B.S. regular course and condensed course during the years 1961—69 are shown in table 2.2.

TABLE 2.2

Intake in Degree Course in Medical Colleges in Punjab

Year	M.B.B.S. (Regular Course)	M.B.B.S. (Condensed Course)	Total	Intake per lakh of population
1	2	3	4	5
1961	255	40	295	2.60
1962	257	38	295	2.53
1963	352	50	402	3.34
1964	407	48	455	3.67
1965	399	48	447	3.49
1966	415	48	463	3.51
1967	411	48	459	3.37
1968	415	48	463	3.30
1969	399	14	413	2.86

Source : Medical Colleges in the State.

It can be seen from the table that intake per lakh of population in the degree course in medical colleges in Punjab improved from 2.60 in 1961 to 3.67 in 1964 and thereafter it witnessed a steady decline and reached 2.86 in 1969. It clearly points to the fact that the increase in intake is lagging behind the increase in population. The initial spurt

in 1964 has been on account of increase in the admission capacities of the colleges in that year.

At this stage it would be useful to examine the development of medical education in Punjab in the light of the three important recommendations of the Health Survey and Planning Committee, 1961 (known as Mudaliar Committee).

The three recommendations* of the Committee are as under :—

- (i) The Committee did not favour the revival of licentiate qualification in medicine. The Committee did not agree with the view that such persons are likely to settle in rural areas. It was also of the view that rural and urban areas cannot be differentiated in the matter of providing medical relief.
- (ii) A norm of one medical college for an area with 5 million population was considered adequate.
- (iii) In the interest of personal attention, annual admission to a medical college should not ordinarily exceed 100.

The position in Punjab vis-a-vis these three recommendations is as follows :—

- (i) There has been no fresh admission to the L.S.M. F. (Licentiate) course in the Dayanand Medical College, Ludhiana after 1962. No other medical college in the State has a licentiate course.
- (ii) In Punjab there is on the average one medical college for 3.5 million population, which indicates that this State is comparatively more developed in the field of medical education.
- (iii) In Punjab two colleges have an admission capacity of less than 100 students each while the remaining two have got seating capacity of more than 100 students each.

2.3 Out-turn of Medical Graduates. There has been no out-turn of medical graduates from the Dayanand Medical College, Ludhiana, before the commencement of the Fourth Plan since the first admission to the M.B.B.S. Course was made in

*IAMR Report No. 4/1967—Development of Modern Medical Education in India and Student Wastage in Medical Colleges—Pages 7 and 8.

December, 1964 in that college. However, there has been regular out-turn of medical graduates from the remaining three medical colleges in the State. Information regarding the out-turn from the medical colleges in the State has been incorporated in table 2.3.

TABLE 2.3
Out-turn of Medical Graduates in Punjab

Year	M.B.B.S. (Regular Course)	M.B.B.S. (Condensed Course)	Total	Out-turn per lakh of population
1	2	3	4	5
1961	180	18	198	1.75
1962	195	31	226	1.94
1963	230	41	271	2.25
1964	220	39	259	2.09
1965	223	33	256	2.00
1966	236	41	277	2.10
1967	276	36	312	2.29
1968	353	33	386	2.75

Source : Medical Colleges in the State.

Annual out-turn of medical graduates has shown an increase of 96 per cent in 1968 over 1961 in the State. There has not only been an absolute increase in the out-turn, it has also increased in terms of per lakh of population from 1.75 in 1961 to 2.75 in 1968. It may, however, be mentioned that the doctors passing the condensed course do not add to the supply, they only improve the quality of the existing stock in which they have already been included as licentiates.

A comparison with the out-turn figures available in respect of other States for the year 1967 depicts that Punjab had a higher out-turn of doctors per lakh of population than all other States except

Mysore. Though this indicates a better flow of doctors for medical services in this State, the comparison with other States is beset with certain limitations like the high mobility of doctors from one State to the other and even out-side the country. The out-turn of doctors in different States during the year 1967 is shown in table 2.4.

TABLE 2.4
Out-turn of M.B.B.S. Doctors in different States, 1967

State	Out-turn*	Out-turn of Doctors per lakh of population
1	2	3
Jammu and Kashmir	46	1.18
Rajasthan	320	1.31
Madhya Pradesh	592	1.55
Uttar Pradesh	631	0.74
Assam	255	1.77
Bihar	507	0.94
Orissa	308	1.52
West Bengal	436	1.04
Gujarat	346	1.40
Maharashtra	989	2.11
Andhra Pradesh	792	1.94
Kerala	294	1.48
Madras (Tamil Nadu)	624	1.66
Mysore	634	2.31
Haryana**	51	0.55
Punjab***	312	2.29

Sources : *Fact Book on Manpower Part II—IAMR Report No. 4/1969.

**Economic Adviser to Government, Haryana.

***Fact Book on Manpower Part III—Punjab State.

2.4 Post-Graduate Medical Education.—The quality of a good doctor depend upon the quality of under-graduate training received by him. Unless the teaching staff is well-qualified with post-graduate medical education, the institutional out-turn is likely to be of poor standard. A Committee constituted by the University Grants Commission in 1964 and headed by Dr. A.L.Mudaliar observed, "We regret to note that in their anxiety to open more colleges (medical) and with a view to satisfying the demands of the public, State Governments have unfortunately not always considered all aspects of the question and have precipitately opened medical colleges with insufficieint staff and inadequate accomodation and in many cases without proper equipment also. This had led to difficulties in regard to proper recognition by the Universities." Though the detailed programme of the State Government to fill in the existing gaps during the Fourth Five Year Plan will be discussed in the next chapter, a brief review of the development of post graduate medical education in the State in the recent past is made in the following paragraphs.

There are arrangements for post-graduate medical education in all the medical colleges except the Dayanand Medical College, Ludhiana. Post-graduate diploma courses are offered in Ophthalmic Medicine and Surgery, Anaesthesia, Dermatology, Gynaecology and Obstetrics, Child Health, Chest Diseases, Radiology and Laryngology and Otology. Master of Surgery (M.S.) and Doctor of Medicine (M.D.) are the two post-graduate degree courses conducted by all the three medical colleges (i.e. excluding Dayanand Medical College) in the State. Institutional out-turn of these courses is shown in table 2.5.

TABLE 2.5

Out-turn of Post-graduate Diploma and Degree Courses from the Medical Colleges in the State

Year	Post-graduate Degree			Post-graduate Diploma									
	M.S.	M.D.	Total	D.O. M.S.	D.A.	D.D.	D.G.O.	D.C.H.	D.C. D.	D.R.	D.L.O.	Total	
1	2	3	4	5	6	7	8	9	10	11	12	13	
1961	..	5	10	15	4	6	..	..	..	6	..	..	16
1962	..	4	6	10	6	4	..	..	..	4	..	..	14
1963	..	6	10	16	6	6	..	..	..	6	..	..	18
1964	..	16	19	35	6	..	..	..	..	..	1	4	11
1965	..	15	13	28	4	6	2	6	6	..	3	6	33
1966	..	15	19	34	5	8	6	8	3	7	4	6	47
1967	..	17	11	28	8	14	2	7	13	5	3	8	60
1968	..	27	25	52	8	4	..	5	11	..	3	..	31

Source : Medical Colleges in the State.

- M.S.—Master of Surgery.
M.D.—Doctor of Medicine.
D.O.M.S.—Diploma in Ophthalmic Medicine and Surgery.
D.A.—Diploma in Anaesthesia.
D.D.—Diploma in Dermatology.
D.G.O.—Diploma in Gynaecology and Obstetrics.
D.C.H.—Diploma in Child Health.
D.C.D.—Diploma in Chest Diseases.
D.R.—Diploma in Radiology.
D.L.O.—Diploma in Laryngology and Otology.

It will be seen from table 2.5 that between 1961—68 there has not only been expansion in the post-graduate diploma education in new courses but also a big increase in the out-turn of M.S. and M.D. doctors.

The importance of post-graduate medical education lies in producing specialist doctors and well qualified teachers for under-graduate medical education.

2.5. Dental Education.—The dental college at Amritsar was started in 1952 with an admission capacity of 14 which was later on raised to 30. The dental wing of Medical College, Patiala was established in 1956 with 12 annual admissions. Intake and out-turn of B.D.S. (Bachelor of Dental Surgery) course in the two colleges during the years 1961 to 1968 are given in the following table.

TABLE 2.6
Intake and Out-turn of B.D.S. Course in the State

Year	Intake*	Out-turn*	Index of Out-turn (1961=100)	Out-turn of B.D.S. doctors per million of population
1	2	3	4	5
1961	.. 42	19	100	1.68
1962	.. 42	20	105	1.71
1963	.. 42	26	137	2.16
1964	.. 42	29	153	2.34
1965	.. 42	30	158	2.34
1966	.. 44	28	147	2.12
1967	.. 42	34	179	2.50
1968	.. 42	33	174	2.35

*Source : Dental Colleges in the State.

Increase in the out-turn of dental doctors from 19 and 20 in 1961 and 1962, respectively to above 30 in 1967 and 1968 is due to the raising of annual admissions from 26 in the Second Plan period to 42 in the Third Plan period.

There are also arrangements for M.D.S. (Master of Dental Science) course at the Dental College, Amritsar. In 1965 five doctors obtained the M.D.S. degree in the State. This degree was again awarded to three doctors in 1968.

2.6. Para-Medical Training.—'Nursing' is recognised as an essential component of the total health programme and therefore a study of the demand and supply of nursing personnel as also programmes for the development of the nursing profession must be made an integral part of the health plan*. Position as regards the training facilities for nurses and other para-medical personnel existing in the State is discussed in the following paragraphs.

At present there are four nursing schools established by the State at V.J. Hospital, Amritsar, Rajindra Hospital, Patiala, Lady Dufferin Hospital, Patiala and Civil Hospital, Jullundur. There are 513 seats in these institutes. Training centres for auxiliary nurse; midwives have been established at Nangal, Lady Dufferin Hospital, Patiala, Civil Hospital, Hoshiarpur and Civil Hospital, Faridkot with a seating capacity of 198 in total. Punjab Health School, Amritsar was started during the Second Plan period for the training of lady health visitors with 70 seats. The seating capacity of the school is 86 at present. Courses for laboratory technicians and pharmacists have been offered at Government Medical Colleges, Amritsar and Patiala with 30 and 140 annual admission capacities respectively. Radiographer's training is imparted at Rajendra Hospital, Patiala and V.J. Hospital, Amritsar. Annual intake for the course is 32. For the training of sanitary inspectors there is one Centre at Chandigarh with annual admission capacity of 50. Actual intake in these institutes for different types of courses during the years 1961 to 1968 is depicted in table 2.7.

*I.A.M.R. Working Paper No. 5/1965, "Stock of Nursing Personnel in India".

TABLE 2.7

Intake in Para-Medical Institutes in Punjab, 1961 to 1968

Name of the Training Course	Year							
	1961	1962	1963	1964	1965	1966	1967	1968
1	2	3	4	5	6	7	8	9
1. General Nursing ..	81	139	172	84	96	179	143	108
2. Auxiliary Nurse Mid-wifery	88	104	142	74	126	76	127	53
3. Lady Health Visitors ..	56	34	47	52	41	44	58	44
4. Compounders/Pharmacists	80	90	150	150	150	149	150	149
5. Laboratory Technicians ..	8	8	48	51	51	46	34	29
6. Radiographers ..	..	..	..	7	9	7	7	4
7. Sanitary Inspectors ..	N.A.	N.A.	N.A.	47	38	35	85	81

Source : Para-Medical Institutes in the State.

The out-turn of different categories of para-medical personnel in the State is shown in table 2.8,

TABLE 2.8
Out-turn of Para-Medical Personnel from Institutes in Punjab, 1961—1968

Name of the Training Course	Year							
	1961	1962	1963	1964	1965	1966	1967	1968
1	2	3	4	5	6	7	8	9
1. General Nursing [..	49	54	67	63	85	78	92	102
2. Auxiliary Nurse Midwifery	54	37	71	79	115	69	108	82
3. Lady Health Visitors ..	36	47	31	43	43	35	33	49
4. Compounders/Pharmacists	32	35	58	54	94	119	102	115
5. Laboratory Technicians ..	..	8	8	42	48	45	25	19
6. Radiographers ..	..	..	..	..	..	7	9	15
7. Sanitary Inspectors ..	N.A.	N.A.	N.A.	N.A.	47	38	35	83

Source : Para-Medical Institutes in the State.

CHAPTER III

ASSESSMENT OF SUPPLY

Before an analysis is made of the demand for medical and para-medical personnel in the State, it is proposed in this section to work out the likely supply of these personnel to be available during the Fourth and Fifth Plan periods. Since the health manpower is a 'shortage category' in this State, the supply will be determined only by the out-turn available from the institutions in the State plus the in-migration of the out-turn from the institutions located outside this State. At present no information is available regarding the in-migration of doctors and other medical personnel from outside the State. Recently the Institute of Applied Manpower Research has initiated a "Study regarding the Utilisation pattern of Medical Graduates in India." This study, when completed, would also throw light on the migration aspect of doctors. However, the State Health Directorate has recently conducted a study regarding the utilisation of medical manpower in the Punjab State. Only 21.15 per cent of the doctors (who graduated from medical colleges in Punjab during the years 1965-66 to 1967-68) addressed on the subject responded back, apart from 7.8 per cent in whose case the letters were returned undelivered. Since the non-response was very high, the results might not reveal the actual state of affairs. On the basis of the response, however, the results have been compiled by the State Health Directorate which reveal that only 23.46 per cent of the doctors joined the State Government Service and another 45.81 per cent joined service in Centre or other States. The proportion of doctors doing private practice was very small (4.91 %). As is obvious from the results, there is an element of bias in favour of the doctors who are in Government service. On the other hand response from most of the doctors engaged in private practice appears to be very poor. The percentage of doctors engaged in private practice cannot be so low as indicated by the survey results. As such the results compiled on the basis of 21.15 per cent response cannot hold good for all the doctors. In other words it is difficult to determine the out-migration rate from this study. Since the study was conducted by following the institutional out-turn, it could not throw light on the in-migration of doctors to this State. Under such circumstances we can only assume that the out-migration is duly compensated by the in-migration and as such the whole of institutional out-turn from this State would determine the supply of medical manpower in this State.

3.1. *Supply of Medical Graduates.*—To work out the perspective out-turn from medical colleges in the State, a study *regarding

*Manpower Report No. 1/1970—"Student Wastage and Stagnation in Medical Colleges in Punjab"—brought out by Economic and Statistical Organisation, Punjab.

student wastage and stagnation in medical colleges in Punjab was conducted by this Organisation some-time back. The results of this study are based on the students admitted in the medical colleges in Punjab during the batch years 1951 to 1963. According to this study 70.45 per cent of the students complete their studies within the prescribed period, 16.75 per cent take one year more, 4.00 per cent two years more, 0.99 per cent three years more and 0.55 per cent take even more than three years in excess of the prescribed period to complete their studies. The wastage rate works out to 4.77 per cent of the total admissions in a year. These proportions have been used to work out the out-turn from the medical colleges during the Fourth and Fifth Plan periods. In table 3.1 anticipated out-turn of medical graduates during the Fourth and Fifth Plan periods has been given.

TABLE 3.1
Anticipated Out-turn of M.B.B.S. Doctors during the Fourth and Fifth Plan periods

Year	Anticipated out-turn		
	M.B.B.S. Regular Course	M.B.B.S. Condensed Course	Total
Fourth Plan			
1969-70	.. 333*	40*	373*
1970-71	.. 379	46	425
1971-72	.. 382	22	404
1972-73	.. 384	4	388
1973-74	.. 374	..	374
Total 1969—74	.. 1,852	112	1,964
Fifth Plan			
1974-75	.. 372	..	372
1975-76	.. 371	..	371
1976-77	.. 371	..	371
1977-78	.. 371	..	371
1978-79	.. 371	..	371
Total 1974—79	.. 1,856	..	1,856

*Actual

It will be observed from table 3.1 that 1964 doctors are likely to pass out of the medical colleges in Punjab during the Fourth Plan. During the Fifth Plan the institutional out-turn has been anticipated to be 1856. Since there will not be any admission to M.B.B.S. condensed course from the year 1970 onwards, there will not be any out-turn from this course during the Fifth Plan. While working out the supply from the regular course, it has been assumed that annual intake in the medical colleges during the Fourth Plan will remain the same as at present, i.e., 400.

We may however, account for the factor that with the greater emphasis being laid on the development of post-graduate medical education in the State, some of the medical graduates may pursue higher studies for which arrangements exist in the medical colleges in the State. It may be safely assumed that 10 per cent of the doctors graduating from the medical colleges in the State would take up higher studies. After making adjustment for this factor the total available supply of M.B.B.S. doctors is estimated at 1,768 during the Fourth Plan.

3.2. *Supply of Specialist Doctors.*—Supply of specialist doctors during the Fourth Plan will depend upon the number of doctors taking up post-graduate studies and the time taken by them in completing their studies. No study has so far been conducted in this regard. During the Fourth Plan it is envisaged to strengthen various teaching departments in accordance with the recommendations of Indian Medical Council so as to make good the deficiencies resulting from increase in annual intake in the medical colleges (following Chinese Aggression) without corresponding increase in staff and physical facilities. To make good this deficiency it is also proposed to give financial assistance to deserving students to encourage post-graduate studies.

3.3. *Supply of Dental Doctors.*—Assuming that the student wastage and stagnation in dental colleges will be at the same rate as in the case of medical colleges, the out-turn of dental doctors during the Fourth Plan is expected to be 195. Though the in-take capacity for the M.D.S. course is 6, only 2 doctors joined the course during the first year of the Fourth Plan. The out-turn of M.D.S. doctors in 1969-70 was 3. Another 5 to 6 doctors are expected to get the M.D.S. degree during the remaining four years of the Fourth Plan.

During the Fourth Plan an amount of Rs 16.50 lakh is proposed to be spent on the development of dental education in Punjab.

3.4. *Fourth Plan Outlay for Medical Education.*—Net State Plan outlay on Medical Education (including Dental Education) proposed for the Fourth Plan is as under :—

TABLE 3.2
Net State Fourth Plan Outlay on Medical Education

Item of Expenditure	Out-lay on Medical Education (Rs. in lakh)	Total Outlay on Health Programmes (Rs. in lakh)	Col. 2 as per cent of Col. 3
1	2	3	4
(i) Revenue ..	82.40	288.05	28.61
(ii) Capital ..	96.75	461.95	20.94
Total (i)+(ii) ..	179.15	750.00	23.89

The above amount is proposed to be spent on nine schemes which include improvement and expansion of Government medical colleges (including dental colleges) and hospitals at Amritsar and Patiala, grants-in-aid to private medical colleges in the State, provision of interns hostels at district hospitals and financial assistance to the post-graduate students. Some details about these schemes are given in the following paragraphs.

(i) Improvement and Expansion of Rajindera Hospital, Patiala

The annual admission capacity of Government Medical College, Patiala is 150 whereas the total number of beds available is only 674 which is less than the prescribed norm of 5 beds per annual admission. This deficiency is to be made good by providing additional beds and making good some other important deficiencies under this scheme.

(ii) Improvement and Expansion of Medical College, Patiala

The proposals included in this scheme aim at strengthening of staff in accordance with the recommendations of Indian Medical Council. Whereas the number of seats has been raised from 100 to 150, there has not been corresponding increase in staff and equipment.

(iii) Improvement and Expansion of V.J. Hospital and Construction of new hospital in the Medical Enclave

The existing hospital is an old converted district hospital which does not fulfil the needs of a modern teaching hospital. It is proposed,

therefore, to take in hand construction of a new 500 bedded hospital in the medical enclave near the Medical College, Amritsar. New casualty Department is to be commissioned. Central sterilization facilities are to be developed.

**(iv) Improvement and Expansion of Medical College,
Amritsar**

This scheme is similar to scheme No. (ii). It is proposed to make good the deficiency in the staff due to increase in the admission capacity of Medical College, Amritsar from 100 to 150.

(v) Grant-in-aid to the Private Medical Colleges in the State

Under this scheme the State Government undertook to provide in annual instalments an amount of Rs 25 lakh to the Dayanand Medical College, Ludhiana to help in its conversion into a degree college in 1964. The last instalment was proposed to be paid during the year 1969-70 (The instalment could not be paid during the year 1969-70).

(vi) Provision of Interns Hostels at District Hospitals

One year internship has been made compulsory before registration for all medical graduates. Since the teaching hospitals have not got sufficient accommodation for the whole of the annual out-turn from the medical colleges, 5 selected district hospitals will be used for internship training also. Under this scheme proper hostel accommodation for the internees is proposed to be provided.

(vii) Financial Assistance to the Post-graduate Students

This scheme aims at encouraging brilliant medical graduates to take up post-graduate studies. This will help in augmenting the supply of specialist doctors.

**(viii) Improvement and Expansion of Dental College/Hospital,
Amritsar**

It is proposed to strengthen the staff of the Dental College, Amritsar in accordance with the norms recommended by the Indian Dental Council and also to make improvement in the physical facilities.

(ix) Improvement and Expansion of Dental Wing of Medical College, Patiala

This scheme is similar to scheme No. (viii). It is proposed to strengthen the staff and make improvement in the physical facilities in the Dental Wing of Medical College, Patiala.

3.5. *Supply of Para-Medical Personnel.*—The institutes for para-medical education in the State were requested to supply the information regarding the number of para-medical personnel likely to pass out of them during the Fourth Plan. Whereas the actual figures of institutional out-turn for the first year of the Fourth Plan are available, the same for the remaining four years of the Fourth Plan were estimated keeping into view the number of students likely to appear in the final examination during these years and the experience regarding pass percentage in the previous years. Anticipated out-turn of different categories of para-medical personnel during the Fourth Plan is given in the following table.

TABLE 3.3

Anticipated Out-turn of Para-Medical Personnel during the Fourth Five-Year Plan

Year	Category of Personnel							
	General Nurses	Auxiliary Nurse-Midwives	Lady Health Visitors	Compounders/Pharmacists	Laboratory Technicians	Radio-graphers	Sanitary Inspectors	
1	2	3	4	5	6	7	8	
1969-70*	..	95	88†	42	130	17	..	81
1970-71	..	110	79	54	120	26	..	46
1971-72	..	77	91	42	125	28	8	46
1972-73	..	51	75	35	130	27	10	46
1973-74	..	113	84	35	135	25	10	46
Total	..	446	417	208	640	123	28	265

Source : Para-Medical Institutes in the State.

*Actual

†Anticipated

3.6. *Fourth Plan Outlay for Training Programmes.*—Net State Plan outlay on Training Programmes for para-medical personnel proposed for the Fourth Plan is given in table 3.4

TABLE 3.4

Net State Fourth Plan Outlay on Training Programmes for Para-Medical Personnel

Item of Expenditure	Out lay on Training Programmes (Rs in lakh)	Total outlay on Health Programmes (Rs in lakh)	Col. 2 as per cent of Col. 3
1	2	3	4
(i) Revenue ..	10.00	288.05	3.47
(ii) Capital ..	15.50	461.95	3.36
Total (i)+(ii) ..	25.50	750.00	3.40

The above amount is proposed to be spent on three schemes. The first scheme envisages strengthening of teaching staff in the four nursing schools in accordance with the recommendations of the Indian Nursing Council. Besides, field training arrangements especially in public health nursing are to be developed in rural areas. The hostel facilities for trainees are to be developed. The second scheme aims at providing additional physical facilities in the Punjab Health School used for the training of lady health visitors and introduction of public health nurses training schools there. The third scheme relates to the training of basic health workers.

CHAPTER IV

ASSESSMENT OF DEMAND

In this chapter two types of estimates of demand for doctors and para-medical personnel in Punjab have been given. Firstly the estimates of demand for the public sector have been given. Information in this behalf was collected from the State Health Directorate. Secondly the global estimates on the basis of ratios of medical and para-medical personnel to total population of the State have been worked out.

4.1. *Demand for Medical and Para-Medical Personnel in the Public Sector.*—Perspective demand has got three components, (i) demand due to shortages, (ii) demand due to replacements and (iii) additional demand due to new investments. Table 4.1 depicts the number of posts sanctioned, the number of persons working against them and the shortages of medical personnel in the public sector as on 1st May, 1969.

TABLE 4.1

Shortages of Medical and Para-Medical Personnel in the Public Sector on 1st May, 1969

Category	Cadre strength	Number of persons working	Shortages	Col. 4 as per cent of Col. 2
1	2	3	4	5
1. M.B.,B.S. Doctors	.. 1,262	916	346	27.42
2. Dental Doctors	.. 44	35	9	20.45
3. Nurses	.. 695	665	30	4.32
4. Auxiliary Nurse Midwives	.. 1,102	1,087	15	1.36
5. Dispensers	.. 847	827	20	2.36
6. Sanitary Inspectors	.. 821	641	180	21.92
7. Laboratory Technicians	.. 219	208	11	5.02
8. Lady Health Visitors	.. 368	299	69	18.75
9. Radiographers	.. 63	63	..	..

Source : Director of Health Services, Punjab.

It would be seen from table 4.1 that the shortage in the case of doctors was far higher than in the case of many other categories of para-medical personnel. In the meeting of the State Working Group on Manpower and Employment held on 24th June, 1968 it was noted that a large number of doctors went out to other States or foreign countries. During the Third Plan period it was experienced that only about 22% of the doctors offered appointment in the public sector actually joined service. The Secretary to Government Punjab, Health Department explained in the aforementioned meeting that the Delhi Health Services were mostly manned by the doctors trained in Punjab as the pay scales and service conditions there were much better than those in Punjab State. However, the position has now improved due to the revision of pay scales and provision of better facilities for doctors in the State. In 1968-69 about 88 % of the doctors offered appointment joined the State Government Service. It is, thus, likely that all the vacant posts would be filled up during the Fourth Plan.

In table 4.2 total requirements of medical and para-medical personnel in the public sector during the Fourth Plan have been shown.

TABLE 4.2
Demand for Medical and Para-Medical Personnel in the Public Sector during the Fourth Plan

Category of personnel	Requirements due to					Total
	Plan Investments	Short-ages	Replacements	Defence		
1	2	3	4	5	6	
1. Doctors	301	346	63	120	830	
2. Dental Doctors	37	9	2	..	48	
3. Nurses	258	30	35	120	443	
4. Auxiliary Nurse-Midwives	119	15	55	..	189	
5. Lady Health Visitors	16	69	18	..	103	
6. Dispensers	90	20	43	..	153	
7. Sanitary Inspectors	152	180	41	..	373	
8. Laboratory Technicians	214	11	11	..	236	
9. Radiographers	26	..	3	..	29	

Source : Director of Health Services, Punjab.

At the time of Chinese aggression defence requirements from the composite State of Punjab were estimated at 200 doctors and 200 nurses. By applying the population ratio of 60 : 40, the calculations of 120 doctors and 120 nurses have been made by the State Health Directorate in respect of the new State of Punjab. Figures in column 4 have been worked out on the basis of estimated replacements due to death, retirements etc. at the rate of 5% in relation to sanctioned cadre strength.

4.2. *Likely Position at the end of the Fourth Plan.*—Likely position of shortages or surpluses of various categories of medical and para-medical personnel after meeting the requirements of the public sector at the end of the Fourth Plan would be as given in table 4.3.

TABLE 4.3

Likely Position of Surpluses or Shortages of Medical and Para-Medical Personnel at the end of the Fourth Plan after meeting the Requirements of Public Sector.

Category of Personnel	Total Supply during Fourth Plan	Total Demand during Fourth Plan	Surpluses or Shortages (+) or (—) at the end of the Fourth Plan
1	2	3	4
1. Doctors	1,768	830	+ 938
2. Dental Doctors	195	48	+ 147
3. Nurses	446	443	+ 3
4. Auxiliary Nurse Midwives	417	189	+ 228
5. Lady Health Visitors	208	103	+ 105
6. Dispensers	640*	153	+ 487
7. Sanitary Inspectors	265	373	—108
8. Laboratory Technicians	123	236	—113
9. Radiographers	28	29	—1

*Compounders/Pharmacists.

It would be seen from the above table that supply of sanitary inspectors, laboratory technicians and radiographers will fall short of their

requirements in the public sector. However, the supply of other categories of medical and para-medical personnel will be in excess of their requirements in the public sector.

If the trend of joining the State Government service as witnessed during the year 1968-69 is maintained, the shortage of doctors in the public sector will be wiped out by the end of the Fourth Plan. The surplus of doctors after meeting the public sector requirements is likely to be absorbed in the private sector. The private sector includes two components, viz., (i) self-employed doctors doing private practice, and (ii) doctor-employees of private employers. Doctor-employees of private employers, however, constitute only about 10 per cent of the total number of private doctors (an estimate derived by the I.A.M.R. at the All India level).

4.3. *Norms Recommended by the Government of India.*—The Government of India have recommended certain norms to work out the requirements of different categories of medical and para-medical personnel. In table 4.4 demand for doctors and para-medical personnel has been worked out on the basis of these norms.

TABLE 4.4
Demand for Medical and Para-Medical Personnel on the basis of Norms recommended by Government of India

Category	*Norm recommended by Government of India	Requirements worked out on the basis of projected population for 1973-74 (16,303 thousand persons)
1	2	3
1. Doctors	.. 1 : 3500	4,658
2. Nurses	.. 1 : 3500	4,658
3. Auxiliary Nurse Midwives	.. 1 : 5000	3,261
4. Health Assistants/Sanitary Inspectors	.. 1 : 5000	3,261
5. Laboratory Technicians	.. 1 : 10,000	1,630
6. Radiographers	.. 1 : 50,000	326

*Source—Director of Health Services, Punjab.

Shortages or surpluses of different categories of personnel in the State at the end of the Fourth Plan can be worked out only if the data regarding present stock of these personnel are available. The only available information in this context is the number of personnel registered with the Medical Council at Ludhiana. These data, however,

suffer from various draw-backs. Recently the Economic and Statistical Organisation, Punjab, brought out a working paper* on the stock of allopathic doctors in Punjab at the end of 1968. As such, under the present circumstances we can review the demand and supply position only of allopathic doctors in the State. This, no doubt, is the most important category of medical personnel.

4.4. *Stock of Allopathic Doctors.*—It has been estimated that the number of active doctors in the State at the end of the year, 1968 was 5,636. In table 3.1 it has been estimated that during the Fourth and Fifth Plans 1,852 and 1,856 doctors (excluding out-turn of condensed course) respectively will be added to the present stock. After applying an attrition rate of 2 per cent per annum to the present stock,** the total number of doctors at the end of the Fourth and Fifth Plans is estimated at 6,947 and 8,313 respectively.

4.5 *Demand for Allopathic Doctors.*—Punjab has already surpassed the norm of one doctor for 3,500 persons. It has been estimated that at the end of the year 1968 there was one doctor for every 2,490 persons in the State.

On the basis of the stock estimates given in the preceding paragraph, Punjab will achieve norms of 1 : 2,347 and 1 : 2,245 by the end of the Fourth and Fifth Plans respectively. Punjab thus compares very favourably with the norms fixed for the country. The Mudaliar Committee (1961) has fixed a target of 1 : 2000 to be achieved by the end of the year 1981. Punjab is likely to surpass this norm by that time. It may, however, be mentioned that doctor population ratio in the advanced countries is much lower than in our State as would be seen from the following table.

TABLE 4.5
Doctor—Population Ratios in certain Selected Countries

Country	Doctor— Population Ratios in 1960's
1. U.S.S.R.	.. 1 : 480
2. Germany	.. 1 : 650
3. U.S.A.	.. 1 : 670
4. Canada	.. 1 : 820
5. Japan	.. 1 : 900
6. France	.. 1 : 900
7. Sweden	.. 1 : 910
8. India	.. 1 : 5,130

*Minor Working Paper No. 1/1969—Stock of Allopathic Doctors in Punjab 1963—Issued by the Economic Adviser to Government of Punjab

**As the out-turn during the Fourth and Fifth Plan periods would be largely composed of fresh graduates, no attrition has been applied for the new entrants upto the end of the Fifth Plan.

4.6. *Demand for Specialist Doctors.*—Demand for specialist doctors in the public sector during the Fourth Plan has been worked out on the basis of the number of posts proposed to be created in various teaching and general hospitals.

TABLE 4.6

Demand for Specialist Doctors in the Public Sector during the Fourth Plan

Field of specialisation	Number of Doctors required
1	2
1. Surgery	25
2. Medicine	20
3. Obst. and Gyn.	4
4. Ophthalmology	3
5. E.N.T.	5
6. Radiology	4
7. Anaesthesia	7
8. Paediatrics	3
9. Orthopaedic	1
10. Fronsic Medicine	7
11. Psychiatry	2
12. Skin and V.D.	9
13. T.B.	1
14. Plastic Surgery	1
15. Preventive and Social Medicine	7
16. Blood Transfusion	1
17. Pathology	2
18. Pharmacology	1
19. Physiology	4
20. Anatomy	1
21. Urology	1
22. Neurology	1

Source : Director of Health Services, Punjab.

The State Health Directorate hopes to meet the requirements of specialist doctors from the out-turn of such doctors from the medical colleges in the State and the Post-Graduate Institute of Medical Education and Research, Chandigarh.