

CASE 6

CHRISTIAN MEDICAL COLLEGE AND HOSPITAL, VELLORE

Dr. John K.G. Webb, Director of the Christian Medical College and Hospital (CMCH), Vellore, Tamil Nadu, wrote to the representatives of the IIMA Alumni Association early in August, 1971:

I hope you will forgive me for my rather abrupt approach on the phone regarding a possible time for meeting The SQCU* has been doing some preliminary work on the preparation of a long-term forecast of income and expenditure for this institution. We were discussing the data yesterday and realized that we had reached a point in this task where we needed help. Both Mr. Prasad* and we will very much look forward to discussing this problem with you.

At the meeting, Dr. Webb was accompanied by Mr. K.G. Koshi who was to succeed Dr. Webb as Director in October, and Mr. Jacob, Treasurer of CMCH,

Dr. Webb and his top management team were concerned with the financial results for the year 1970-71, which showed a deficit of Rs. 1.26 million (8.6% of the total expenditure for the year). They were keen on forecasting the income and expenditure levels for the next five years, 1971-72 to 1975-76, in an attempt to anticipate financial problems and initiate corrective action.

BACKGROUND

CMCH had its beginning in 1900 when Dr. Ida Seudder started her work in one room in her father's bungalow on the outskirts of Vellore in response to "The challenge which God set before her".

In 1893, when she was on a visit to her father, a missionary doctor. "In one night three girls, Hindu, Brahmin, and a Muslim, lay dying in childbirth for lack of a lady doctor." "With a very troubled heart she heard next morning from her father's servant that all three girls had died because she had not been qualified to help them. She resolved to study medicine and return to help the women of India."

Realizing that many patients in the villages could not come even as far as Vellore for treatment, she initiated "roadside clinics" in 1906. Since then taking care of the sick and needy in small villages around Vellore has been a regular feature of the hospital.

The hospital has had steady growth. By 1971, it was one of the largest health complexes in India, operating a 11 23-bed hospital, an advanced research centre, and nursing and medical colleges. It employed 385 doctors and 659 paramedical staff. Exhibit-I gives data regarding the activities of the hospital as of 1971.

ORGANISATION

The CMCH was run by the CMCH Association. The management of the affairs of the association was the responsibility of the College Council and the Executive Committee.

College Council: Any church in India not smaller than a diocese which contributed Rs: 2,500 per year towards CMCH Association was entitled to become a corporate member. Each corporate member can nominate

* In-charge, Statistical Quality Control Unit (SQCU), Madras. SQCU undertakes consulting work on a retainer basis. They have been associated with CMCH from 1965-66.

Written by C.K. Prahalad. The case is based on the work done by the Indian Institute of Management Ahmedabad, Alumni Association, Madras Chapter. Besides the case writer, Mr. Tilak Shankar and Chandrasekhar, both alumni of IIMA, were involved in the project.

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Christian Medical College and Hospital, Vellore, Tamil Nadu, India - Facts and Figures 1970-71, p.3.

a representative to the Council. Any church or similar body outside India which contributed Rs. 15,000 or more was also a member of the Council. All administrative officers (as defined in the Constitution) and seven members of the staff of the College and Hospital -two selected and five nominated - were also represented on the Council. Further, several positions in the Council were reserved for organisations like the Christian Medical Association of India, Catholic Hospital Association, Director of the Union Mission Tuberculosis Sanatorium, Arogyavaram, etc. There were 15 co-opted members. In all, there were over 100 members of the Council in 1971. The Council's main functions were (a) to-adopt an Annual Budget and (b) to control The general policy, development, and expenditure of the College and Hospital.

Executive Committee: The Executive Committee consisted of the officers of the Council-Chairman, Vice-Chairman, and Secretary-and the Director, Principal, and nine to eleven elected members of the Council (of whom three may be members of the staff). The Executive Committee managed the affairs of the Council in the intervals between regular meetings.

Internal Organisation: CMCH, like a typical hospital, was organised into clinical and service units. Clinical units in a hospital system (like surgery and general medicine) are the equivalents of line departments in a manufacturing organisation. A ward was assigned to each clinical unit, and the number of beds in the ward were dependent on the popularity of the clinical unit and the demand for that speciality. Service units (like diagnostic pathology, biochemistry, and blood bank) formed the staff function. Service units provide the diagnostic services to the clinical units. In addition, the hospital has an administrative service consisting of personnel, finance, public relations, etc.

The Director was responsible for the administration of the college and hospital in accordance with policies approved by the Council and the medium of communication between all committees ... "and individual members of the staff on the one hand and the Council on the other."

The Director was assisted by two Associate Directors - one medical and one lay. In addition, the Constitution had provision for several Deputy Directors; CMCH's principal administrative officers were the following:

1. Director
2. Two Associate Directors
3. Deputy Director(s)
4. Treasurer
5. General Superintendent
6. Principal
7. Dean of the College of Nursing
8. Medical Superintendent
9. Nursing Superintendent

The Director was responsible for the entire CMCH complex: teaching, research, and the hospital. The Associate Director (Medical) helped the Director with all the medical aspects of the three major activities. The Associate Director (lay) was responsible for all the non-medical aspects of the complex- finance, personnel, administration, etc. There was a provision for several Deputy Directors (both medical and lay). The Treasurer was in charge of accounting, credit collection, stores and inventory control, payroll, and costing. The General Superintendent was responsible for transport, diet, public relations, purchase, engineering services, laundry, and personnel (all non-medical employees). The Medical Superintendent was in charge of all the medical services of all clinical and service units in the hospital. The Nursing Superintendent was responsible for the deployment of all nurses and nursing auxiliaries. An organisation chart as of February, 1972 is given in Exhibit 2.

An interesting feature of the hospital organisation was the multiple role requirement of the medical and nursing staff. Clinical and service unit heads, for example, were also professors at the Christian Medical College (C MC). They reported to the Principal as professor and to the Medical Superintendent as clinical or

service unit heads.. The senior nursing staff were on the faculty of the nursing school. Students from both the nursing and the medical colleges worked in the hospital for experience under the supervision of the hospital staff.

Several clinical and service unit staff were also involved in the on-going research programmes. Many senior members of the hospital were at the same times teacher practitioners and researchers, and it was difficult at times to identify a decision with any specific activity.

GROWTH OF CMCH

In the early years the hospital was financed largely by donations from abroad, notably the USA and from the churches in India. The sources and uses of funds for the years 1967-68 to 1970-71 and other related data are given in Exhibit 3. The details of expenditure for 1970-71 is given in Exhibit 4.

CMCH had become an undisputed leader in the area of teaching, research, and innovation in health care in India. Exhibits 5 and 6 show some research projects in progress in 1972 and the "first" in medical advances in India achieved by the CMCH over the years. The major reasons for its sustained excellence, according to an insider, were the following:

1. The hospital was founded on a missionary spirit to train men and women in India in the art and science of medicine "and to equip them, in the spirit of Christ, for service in the relief of suffering and promotion of health." This objective demanded a high degree of dedication to excellence and commitment to service.
2. A large number of doctors were sent abroad for specialized training. Several highly qualified doctors and researchers came to Vellore from the USA for long periods in a spirit of service.
3. The management activity promoted the quest for excellence. Around 1962, it initiated a scheme called "special fund" to promote the growth of clinical units. The fund made available a discretionary amount to the clinical units for growth.
4. Almost all the expansion of facilities were financed by donations from charitable organisations abroad or through gifts from grateful patients. Clinical units enjoyed growth commensurate with their ability to attract funds from these sources. This had a salutary effect. The clinical units were, in fact, unfettered and operated independently adhering to the broad policies of the hospital. It encouraged individual initiative and the drive towards excellence.

CMCH IN 1971

The workload of the hospital measured in In-patient (IP) days and Out-patient (OP) visits are given for the period 1964-65 to 1970-71 in Exhibit 7. The average increase in workload of the various clinical units for OP and IP is given in Exhibit 8. CMCH's personnel as of 1971 is indicated in Exhibit 9.

PRICING

For pricing, the patients were divided into four groups - private patients, patients who pay as standard, partly paying, and free patients, the hospital recovered from the private patients the total costs (called standard plus a margin profit) from patients who pay only at standard the total actual cost, from those who pay partly a percentage of actual cost which varied with the patients, and from the poor and needy patients nothing at all. The distribution of in-patients and out-patients by these groups for a representative period (September-November 1970) for various clinical units is given in Exhibit 10.

The Out-patients were charged as follows. The hospital charged Rs. 35 for private patients. The other patients were not charged consulting fees though all three groups were charged Rs. 2 towards "medical record" charges. An OP could visit the hospital as many times as he needed to and no additional consulting charges were levied. The charges for diagnostic tests were levied on the basis of the tests conducted and the patient group (paying, non-paying, etc.) to which the patient belonged.

CHARITY

The doctors at CMCH had the discretion to give concessions to the patients based on their evaluation of the patient's needs and his ability to pay. Typically, bills were prepared at standard for all patients (other than those in private wards who paid on a standard plus basis), and the senior doctors in the clinical unit could reduce the total bill based on their judgement. The extent of reduction could be from 5% to 50%. These concessions were called "charity". Exhibit 11 gives details of the contribution of the major clinical units for both OP and IP, including the extent of "charity".

Doctors who were motivated by the missionary concept of service zealously guarded their right to write off the bill, if they were convinced that the patient needed help. A senior doctor said:

There should be a clear understanding and implementation of the policy of missionary hospital regarding charity. Medical facilities in the country have been improving fast and no Christian medical institution can now try to provide facilities technically superior to anything available anywhere outside. But if they conform to their missionary objectives, they can provide service which is superior in its human quality and conformity to high standards of medical ethics which patients and the relatives value highly and which is hard for money to buy. It is specially this human quality which attracts to missionary hospitals patients who are in a position to buy service of the same technical quality. From the point of view of the missionary hospital, the principal reason for maintaining paying wards and treating patients who could very well afford to go to hospitals which sell equally good even more comfortable facilities, is to earn money with which to give free treatment of high technical, human and ethical quality to poorer patients who cannot afford to buy them outside. In other words, the pay wards exist only to make charity wards possible.

Another senior doctor observed

As far as charity is concerned we need to separate the entirely free patient from the patient who pays varying degrees of the cost of treatment. We talk about the human quality of medical care. I do not believe that this has anything to do with religion. It is something which qualifies us to be called human; opposite types of behaviour are in human qualities. Part of this basic human quality of medical care is to ensure that the sick patient is given the best possible care regardless of the ability to pay. There are many who feel that the human quality of our medical care has gradually deteriorated during the past few years, and I would be inclined to agree with them.

The percentage of charity for the years 1961-62 to 1968-69 is given for both OP and IP in Exhibit 12.

HEALTH PROFILE OF THE REGION

The region around Vellore saw a phenomenal growth in health care facilities during the years following Indian Independence. Madras city (100 miles from Vellore), the capital of the State in which CMCH is situated, for example, expanded the facilities available at the government hospital -the General Hospital, Stanley Medical College and Hospital, Royapetah Hospital, and Kilpauk Medical College and Hospital. The total bed strength of these government-owned hospitals was about 3,000. The facilities available were equal to that of Vellore in several areas. CMCH, it was felt, had to improve its sophistication to be competitive. One doctor commented:

A hospital of this kind (CMCH) is dependent on external patients referral. We have to use a "one-upmanship" game to very large extent and have to stay ahead of and provide more than what any other teaching hospital can provide to continue to attract the patients. The minute we lose our leadership in any of these fields, we would automatically begin to lose private patients referral. So much so, many improvements and newer equipment, although by themselves may not be very necessary nor monetarily rewarding, would be essential simply to keep up this leadership over and above other hospitals. This would especially be so in the speciality departments. It may even be necessary to add on a few gimmicks and trimmings to attract these patients. Some of these like phonocardiography are quite simple and

inexpensive while others can be quite expensive, but the general principle of staying ahead of others has to be maintained.

The clinical units in the hospital were generally divided into General, Specialities, and Higher Specialities.

The clinical units in the hospital were generally divided into General, Specialities and Higher Specialities, based on the sophistication of the medical technology used by them. An analysis of the patient profile by clinical units, classified on the basis of the region of the patients, is given in Exhibit 13.

Commenting on the patient profile at CMCH senior professor of Cardiology observed. "We used to get, even as late as 1960, simple cases in the clinic. Now, 9 out of 10 are cases which have several complications and who have been to not one but at times several physicians/hospitals before they think of CMCH. Increasingly, the work is getting very sophisticated." In fact the situation was such that they had difficulty in attracting enough patients with common ailments, so necessary for a teaching hospital with undergraduate students.

CMCH'S RESPONSE

The need for excellence and the competitive pressure on CMCH called for an organisation response. The response in many ways was clinical unit-based. Each unit react uniquely. Most of them improved the technological sophistication. New specialities were created. For example, nephrology was higher speciality carved out of Medicine; Open-heart surgery was another. The "drive" of the clinical unit heads was the focus of-growth. For example, Neurosurgery, under the leadership of Dr. Chandy, came to occupy the largest number of beds. The special funds provided an added impetus for technological sophistication.

SPECIAL FUND

The essential characteristics of the special fund started in; 1962 were the following:

- i) Each clinical unit will be entitled to a percentage of the physician's fees over and above Rs. 100 charged to and recovered from the patients in that unit. This will be credited to-a department "special fund".
- ii) The department retained the right to use the funds for furthering the technological developments in the clinic as it deemed fit. The special fund was really a fund for discretionary spending at the disposal of the unit. Exhibit 14 gives the magnitude of special funds available with the major clinics.
- iii) The designated aid from charitable organisations outside India and from within the country and those from grateful patients provided an added resource base for growth for the clinical units. The ability to attract funds from these sources depended largely on the "contacts" the doctors had developed.
- iv) Diagnostic units (like X-ray, pathology, blood bank, and biochemistry) as they did not come in contact with the patients or collect "fees", were not entitled to a share in the special fund. As such the only source of funds for growth in the laboratories were gifts from abroad. Observed a senior professor. "The labs grow whenever it has a foreigner as the unit head. He has contacts and gets gifts. Otherwise it does not grow. This is a very sad situation." The service support was not growing in tandem with the growth of clinical units and their sophistication.

The opportunity for growth to clinical units was a mixed blessing. A veteran at CMCH said, "Individual departments have been encouraged to develop to the fullest extent without any regard for development of other departments or the institution as a whole. The encouragement has undoubtedly contributed a great deal to the development of many departments. Nevertheless, it is also partly responsible for the problems with which we are faced today."

Exhibit 14 shows the amounts outstanding against the major clinical units and three major service units - clinical biochemistry, microbiology and pathology.

FINANCIAL FORECAST

The Treasurer prepared a "maintenance budget" every year for approval by the Council of Management. The hospital did not operate a capital budget as almost all capital equipment were gifts from organisations or patients or bought with the aid of the special fund.

The finances of the hospital has been causing concern to the management of CMCH. In 1971, the deficit was 8.6% - nearly Rs. 1.26 million. The donations had stabilized and there were reasons to believe that they may go down marginally. The hospital had to:

- a) Project their needs for the next five years. and
- b) develop a plan for meeting the deficit, if any.

The SQCU had collected a large amount of data regarding the various aspects of the working of CMCH. Some of the salient features of the studies conducted by SQCU are given below:

Wages and Salaries: Traditionally CMCH paid salaries which were lower than the "going rate" as the governing principle was the "spirit of service". During 1969, the ward boys and peons formed a union and went on a strike to demand wages comparable to those paid by the government hospitals around. The management had to yield. Commented a doctor, "This was an unprecedented step. None of us were emotionally prepared at that time to accept the idea of a strike. But it did take place. Every time the government revises its scales, which it does before every election, we may have no option but to increase our wages." The study by SQCU showed (based on data for the period 1966-67 to 1970-71) that the "natural trend" due to increments to staff called for a provision of 3.3% increase in wages and salaries (consolidated for all categories) per year.

Drugs: Due to an increase in the use of sophisticated drugs, mostly due to the sophisticated technologies used, a 10% increase was considered adequate coverage.

Depreciation: An estimated 5% increase was expected basically due to the installation of a power laundry and the Central Sterile Supply Depot (CSSD).

Maintenance and Power: Initial projections showed that the increase in costs due to additional spares, maintenance crews and power will be around 10%.

Income: Income from patient sources had increased by 31% for the period 1968-69 to 1970-1. Several doctors were against tapping this source for additional income. It was felt that CMCH was already considered "very expensive". But pressed with the need for additional funds, the doctor group at CMCH made several suggestions. Some of them were:

- i) creating more private beds to generate income,
- ii) charging OPs for repeat visits,
- iii) increasing the charges to patients by a blanket 5-10%,
- iv) expanding the "paying clinics", and
- v) reducing the discretionary privileges of doctors in slashing bills-charity.

All these suggestions provoked strong emotional reactions amongst the senior staff- resentment as well as commitment. Most often, suggestions were turned down as they did not correspond to the concept of service at CMCH. Concerns like the following were common. "We should deal with the matter of getting more income from the out-patients and improving out-patient facilities; both must go together. We also need to be very careful in levying out-patients' fees. It should be done in such a manner that we do not get rid of our teaching material." (Out-patient provided undergraduate medical educational, substantial portion of the teaching material).

There were several voices raised against higher specialities. The doctors felt that "for post-graduate training higher specialities are very useful. However, for undergraduate training it may not be beneficial. It may also

give a false concept of ideal medical practice in their minds. This may be partly because of poor demonstration of practical rural medical practice, the practical common peoples' medical practice. With greater press on these points we may be able to continue without significant change in the hospital speciality-non-speciality structure. Therefore, the most important change needed is in developing meaningful common-man's medical practice, to which the undergraduate student may be exposed more effectively, especially from the viewpoint of training medical men for peripheral mission centres."

At the same time, the doctors demanded the development of higher specialities like Haematology, microneurosurgery, radiation therapy using a 45 m.e.v. betatron, renal transplants, etc. There was a general consensus that higher specialities are more paying and that there exists substantial scope for increasing income.

COST REDUCTION

Cost reduction was actively promoted as a step the hospital should undertake on war-footing. The urgency of this measure is reflected in the comment of a doctor: "The matter of cutting costs has also almost entirely been relegated to the distant future. Unless we seriously tackle this right now we are definitely going to get into trouble." Some of the areas which were being explored were:

- a) **The total length of stay of the patient at the hospital:** Exhibit 15 shows the average stay of a patient in the various clinical units and the length of pre-operative stay. It does not cover the waiting time of the patients due to non-availability of beds. The pre-operative waiting time, according to a senior surgeon "really consists of two elements, a necessary period for emotional adjustment of the patient and an avoidable element due to delays in getting diagnostic test results. Our biggest problem is 'the X-ray department. Would you believe that for a barium meal the waiting time is 15 days?"

"In addition, patients wait to get admitted. Obviously, a patient who has come from Delhi will wait in a hotel here and spend all his money waiting for admission. He has nothing left to pay the hospital later on and we are forced to give 'charity' at the time of his discharge."

- b) CMCH has an excellent "automatic kitchen", under the direction of highly qualified dieticians. Observed the chief dietician, "We have the best facilities in the country. We serve three kinds of food - English (or Western), Indian and Modified/Optional food in special cases. Mostly private ward patients take English style food." Only about 100 private patients, 100 general ward patients and 65 free patients took food from the kitchen. Most of them used the hotel facilities in Vellore town. Several hotels in Vellore were allowed entry into the hospital to serve food.

It was common practice amongst hospitals, even government hospitals, to insist that all patients take food from the hospital kitchen. The prices charged per day by CMCH for food and the variable costs are given below:

Prices and Variable Costs of Food -Table 1

Food style	Price charged in Rs		
	Private Patients	General Ward Patients	Variable Cost (Rs.)
English	10.50		6.00
Indian	7.50	4.00	3.50
Modified/Optional	-	5.50	4:00

Fixed costs of running the kitchen were estimated to be Rs. 20,000. It was also found that among the private patients (30% of the total), 20% prefer English style and 80% Indian style. Among general ward patients (70% of the total), which included 14% free patients, the preference was for Indian food (70%) and modified (30%).

- c) A third area for cost reduction which was being considered was rationalization of staffing pattern. It was suggested that staffing, especially the medical and nursing help, should be based on the "Extent of

Care" that the patient needs rather than on a clinical unit basis, or on the basis of blanket formula. The Nursing Council of India had laid down a standard for nurse-patient ratio in teaching hospitals as 1 : 4. This ratio was not adhered to by most hospitals; 1 : 6 was common. The Nursing Council did not envisage differential nurse-patient ratio based on patient needs and the care called for.

PLANS FOR GROWTH

Clinical units were planning improvements in the level of technology applied. Radiation therapy had received a gift of a 45 m.e.v. betatron for deep therapy, the only one of its kind in Asia as gift from the Danish International Development Authority, Rs. 6, 00,000 was needed to construct a building to house it and shield the environment from radiation hazards. The gift did not include the cost of building or the recurring costs of maintenance. Typically, gifts of equipment were accepted by the clinical units. They did not make an exhaustive evaluation of the recurring costs to the hospital or the income generating potential of the new facility. This is but one example.

Research groups, the pride of CMCI-1 were also concerned with their future as USAID and other external funds, it was rumoured, were likely to be restricted. Reflecting on these aspects and more specifically on the financial needs of the hospital, Dr. Koshi the Director said, We have come to a stage in our growth where we need some soul-searching. Our traditional approach to growth may not be effective in the future. We need to raise more funds, become self-sufficient. Sometimes I wonder whether unfettered growth is the best strategy - is there an optimum size for a hospital? Whether we should deliberately slow down some clinical units and pace up some plan for our technology? We have abundant faith, a dedicated staff, a certain organisational vitality. We should be able to find our answers. The first item on my agenda is the financial forecast. I also need to develop a strategy for CMCH which will ensure its unique position of excellence in the health map of our country."

Questions

1. Identify and analyse the problems/issues involved in the CMCH case.
2. Analyse and comment upon the Financial and Management Control System (including the special fund instituted in 1962) prevalent in CMCI-1.
3. What recommendations would you like to offer for solving various problems/issues identified by you?
4. What strategy of growth would you like to recommend for CMCH, giving reasons/justifications for your recommendations?

EXHIBIT I
Size of Operations - CMCH, Vellore

Patient Care

Total Beds	:	1123
Major Operations/year	:	9227
Minor Operations/year	:	19616
Total Out-patient Visits/year	:	4,41,000
Procedures in Diagnostic and Service		
Departments/year	:	80,800
Prescriptions for Drug Items	:	11,42,155
Major Heart Operations and		
Cardiac Cathetrizations	:	863

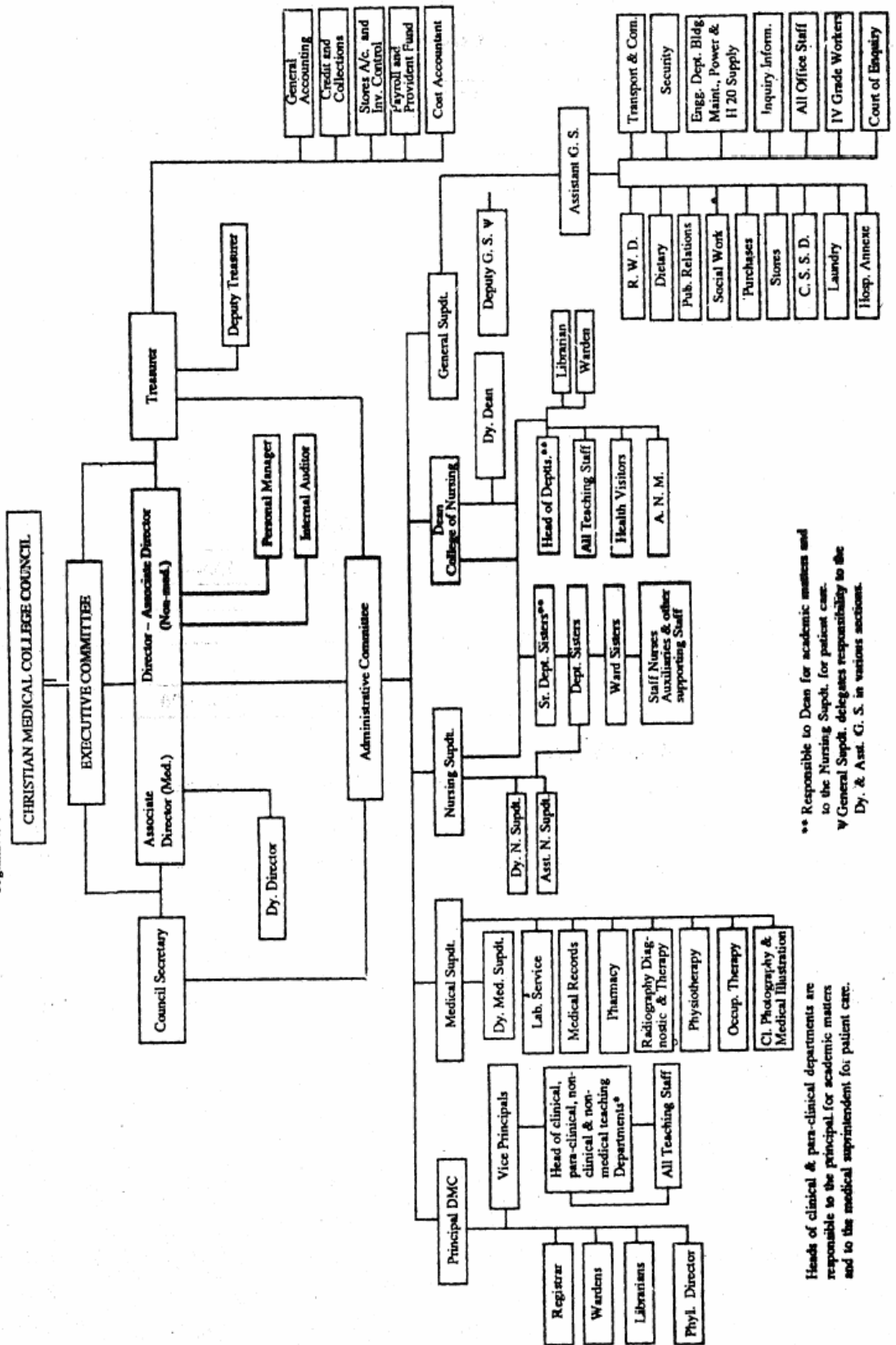
Research

Current Programmes	:	37
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Education

Post-Graduate Degree Courses	:	18 specialities
Post-Graduate Diploma Courses	:	8 specialities
Ph.D. Programme	:	8 specialities
Non-Medical Post-Graduate Degree	:	5 courses
Nursing (including Post-Graduate)	:	9 courses
Paramedical Courses	:	11 courses

EXHIBIT 2.
Organization Chart of Christian Medical College and Hospital, Vellore



** Responsible to Dean for academic matters and to the Nursing Supdt. for patient care.
 * General Supdt. delegates responsibility to the Dy. & Asst. G. S. in various sections.

Heads of clinical & para-clinical departments are responsible to the principal for academic matters and to the medical superintendent for patient care.

EXHIBIT-3
Christian Medical College & Hospital, Vellore
Sources and Uses of Funds in Rs. '000

SOURCES				
ITEM	YEAR			
	1967-68	1968-69	1969-70	1970-71
Income from main hospital	7,163	8,215	9,422	10,830
Income from other hospitals	557	574	633	710
From students:				
— MBBS	232	234	243	251
—Other	107	106	118	120
General	50	56	69	102
Council members contribution	1,781	1,654	1,658	1,423
Donations	79	75	95	53
Grants	311	500	298	393
Deficit(adjusted against plant and capital)	—	1,028	1,128	1,294
Total	10,280	12,442	13,664	15,176
USES				
ITEM	YEAR			
	1967-68	1968-69	1969-70	1970-71
Medical College (Clinical) and Hospital				
Administration & Maintenance	13.41	15.88	16.74	20.63
Nursing	11.17	12.76	-15.21	16.80
Clinical units	18.57	20.73	23.02	25.27
Service units	34.25	40.61	44.97	50.43
Medical College (Non-clinical)				
Administration & Maintenance	2.22	2.81	3.05	3.07
Pre-clinical	3.95	4.49	4.91	4.83
Division of communities health	.88	.84	.76	.93
Laboratory	.98	1.18	1.34	1.39
College of Nursing	4.02	4.48	5.18	5.62
General Administration				
Salaries & Maintenance	6.05	6.85	7.31	7.77
Others	2.57	2.59	1.81	1.74
Maintenance & Repairs	3.20	.90	.90	.90
Depreciation	3.00	8.80	9.11	9.87
Miscellaneous	1.55	1.54	1.44	1.30
Total	105.82	124.46	135.75	150.55

EXHIBIT 4
Christian Medical College & Hospital, Vellore
Expenditure in Rs. '000 – 1970-71

Item	Expenditure (Rs.)	Per cent of total
Salaries	7424	48.98
Supplies	3256	21.49
Depreciation	987	6.49
Maintenance and Repairs	528	3.50
Light and Power	534	3.50
Expenses	1401	9.24
Misc. (others)	425	
Maintenance-Property	199	
Telephone	63	
Taxes	29	
Linen	82	
Gas	153	
Medical Records	42	
Hospital Annexe	31	
Chatrem	2	6.80
Total	15,156	100.00

Exhibit 5
Statement of Current Research Projects — 1971-72

Sl. No.	Title of the Project	Sponsoring Authority	Amount authorised	Duration of the project	Remarks
1	Longitudinal Studies in Human Reproduction	U.S. Dept. of Health, Education and Welfare, Public Health Service - National Center for Health Statistics, Washington	11,43,375	1969-74	
2	Collaborative Neurologic Studies Denver-Vellore	U.S. Dept. of Health, Education and Welfare, N.I.H., U.S.A.	3,90,000	1969-72	
3	Nutrition Research	U.S. Dept. of Health, Education and Welfare - National Institute of Health, Bethesda, Maryland, U.S.A.	12,54,545	1970-73	
4	Paraplegic Rehabilitation	U.S. Dept. of Health, Education and Welfare - Social & Rehabilitation Service, Washington	9,44,150	1968-73	
5	Investigation of Stroke Patients and Application of improved methods of Rehabilitation	U.S. Dept. of Health, Education and Welfare - Social & Rehabilitation Service, Washington	11,87,000	1967-72	
6	Vocational Rehabilitation Project	U.S. Dept. of Health, Education and Welfare - Social & Rehabilitation Service, Washington	15,77,000	1968-73	
7	Welcome Research	The Welcome Trust, London	2,67,000	1970-72	
8	Welcome Research	U.S. Dept. of Health, Education and Welfare - National Institute of Health	Amount yet not sanctioned		
9	Studies in Trauma-Effects of adrenocortical hormones and carrageenin on the biosynthesis of mycopolyccharides (glycosaminoglycans)	Indian Council of Medical Research	13,920	1971-72	
10	Peripheral Centre of the Indian Registry of Pathology	Indian Council of Medical Research	10,000	1971-72	
11	Studies on Beta Haemolytic Streptococci and Streptococcal Diseases in South India	Indian Council of Medical Research	18,750	1971-72	Actual bills reimbursed
12	V.D.R.L. Screening	Indian Council of Medical Research	7,440	1971-72	
13	Role of gangliosides and other glycolipids in abnormal neuronal discharge	Indian Council of Medical Research	7,600	1971-72	
14	A Clinical and Laboratory study of genitourinary Tuberculosis	Indian Council of Medical Research	22,300	1971-72	
15	Red Cell Haemolysis in patients following Hetergraft and ball valve replacement	Indian Council of Medical Research	8,500	1971-72	
16	A Social and Psychiatric study of a representative group of families in and around Vellore, North Arcot District	Indian Council of Medical Research	10,418	1971-72	
17	Mechanism in Hypoxic Pulmonary Oedema	Indian Council of Medical Research	7,485	1971-72	
18	Mechanism of Growth of Nail	Indian Council of Medical Research	5,440	1971-72	
19	Transmission of Leprosy to experimental animals	Indian Council of Medical Research	9,195	1971-72	
20	Studies on Pseudo Cholinesterases in Leprosy	Indian Council of Medical Research	6,970	1971-72	
21	Ultrastructure of choroid plexus of children with hydrocephalus and of monkeys with experimentally induced hydrocephalus	Indian Council of Medical Research	9,600	1971-72	
22	Glycoproteins and neutral and acidic glycolipids in CDF in various neurological disorders	Indian Council of Medical Research	6,785	1971-72	
23	Pattern of health expenditure among urban and rural communities	Indian Council of Medical Research	19,697	1971-72	
24	The Role of Thyroid in Developing Rat Brain - Biochemical and Electrophysiological Studies	Government of India	9,042.00	1971-72	Actual bills reimbursed
25	Studies on the Metabolism of amino acids and carbohydrates with special reference to intestinal functions	Council of Scientific & Industrial Research	23,800.00	1971-72	
26	Schemes on Biosynthesis and Physiological Function of acidic lipolipids and Nucleopoly-saccharides	Council of Scientific & Industrial Research	22,859.06	1971-72	
27	Training in Leprosy and Physiotherapy	Hindu Kushl Nivaram Sangh, New Delhi	15,324.66	1971-72	Actual bills reimbursed

EXHIBIT 6
Medical Breakthrough in India - Contribution of CMCH, Vellore*

1. Heart Diseases

First in India to carry out, open-heart surgery. Rheumatic heart diseases occur all over the world resulting in narrowing of the mitral valve. It is possible to overcome the ill effects by operative procedures to enlarge the valve opening. It was found that high proportion of Indians develop a marked narrowing of this valve at an early age and that contrary to general teaching, such operations are successful. In some parts of the world this is done with artificial valves but at Vellore, transplanted valve have produced good results as well as proved to be cheaper to the patients.

2. Neurological Diseases

Outstanding has been the work of neurobiochemistry which has concentrated on studying some of the biochemical reactions occurring in the brain, particularly in relation to substances known as mucopolysaccharides, gangliosides and cerebrosulphatides. One of these enzymes has been shown to be absent in hereditary mental diseases called "metachromatic leucodystrophy". This is a breakthrough. The leader of the team received the Bhotnagar Award in 1962 for biochemical sciences.

A localized form of the tuberculous infection of the brain, called tuberculoma is common in India and it closely resembles cancer of the brain. For the first time an investigational tool, using radio isotopes, which distinguishes the two, has been developed.

3. Oology

Has performed several successful renal transplants working in close liaison with the nephrology unit. Nephrology unit has been carrying out renal dialyses (using artificial kidney) for well over ten years.

4. Microsurgery

Vellore was the first to develop microsurgery of the ear for deafness. 341 stapedectomies were performed in 1970. This curial surgery is supported by the resources of a well -equipped Audiology section.

5. Leprosy

This is one of the biggest health problems in India. Pioneering work was done in the development of the tendon transplant to correct the claw-hand deformity. Fundamental studies in this area like animal transmission experiments, immunological and metabolic changes in leprosy patients and electron microscopic studies of the bacilli and the ultra structural changes they produce in affected host tissues and especially the way the bacilli produce nerve damage, are, in progress.

6. Infectious Diseases

Tropical eosinophilia is a common disease and it used to be treated with injections of arsenic, which proved to be fatal at times. The aetiology of the disease was unknown. Studies at Vellore have established, for the first time, an understanding of the aetiology of the disease as well as a standard form of therapy. The enterovirus laboratory has made significant contributions to the understanding of the pattern of viral infection in a normal urban population and has defined the types of viruses that may occur. It has also shown that enteroviruses isolated were not the significant causes of gastroenteritis.

* Taken from a note prepared by CMCH, Vellore. The above mentioned areas are but a small sample of the significant research/clinical breakthroughs and is intended to provide "a feel" for the nature of work done at CMCH.

EXHIBIT-9
Staff at CMCH as of 1971

Doctors	385
Nurses	436
Paramedical	223
Non-medical	211
Gen. Adm.	436
Eng. & Mtce.	143
Chaplains & Evangelists	11
Peons, Cleaners & Grade-IV	882
Vital	2727

EXHIBIT-10
Data on I-Patients and Out-Patients
Sept.-Nov., 1970 (3 Months)

Unit	Private %	Gen. Full Pay	Part Free %	Free %
A) In-Patients				
1. Med.I	38	33	25	4
2. Med.II	35	40	20	5
3. Med.III	45	26	26	3
4. Cardiology	50	27	20	3
5. Dermatology	20	64	10	6
6. Paediatrics-I	5	79	12	4
7. Paediatrics-II	—	89	9	2
8. R.T.	37	37	20	6
9. Urology	39	34	23	4
10. Surgery-I	18	48	30	4
11. Surgery-II	30	40	23	7
12. Surgery-III	34	23	40	3
13. Plast. Surgery	30	37	20	13
14. Orthopaedics-I	29	22	43	6
15. Orthopaedics-II	15	50	30	5
16. Neurology	28	43	25	4
17. Thoracic	—	43	48	9
18. ENT	7	73	13	7
19. Dental	—	50	12	38
20. Obst. & Gynaecology-i	4	47	47	2
21. Obst. & Gynaecology-II	7	53	37	3
22. Obst. & Gynaecology-III	5	47	43	5
23. Hand Research	—	—	20	80
24. SSHR	17	—	—	83
B) Out-Patients	15	65	—	20

Exhibit II
Income generated by Clinical Units
Contribution Statement (Rs. '000)

	Income		Expenditure		Gross Cont.		Charity		Net Cont.	
	IP	OP	IP	OP	IP	OP	IP	OP	IP	OP
1 Cardiology	809	256	636	238	173	18	185	22	12	(4)
2 Casualty	-	4	-	53	-	(79)	-	18	-	(97)
3 Dental	24	34	37	56	(13)	(19)	7	8	(20)	(27)
4 Dermatology	44	112	62	137	(18)	(25)	6	11	(24)	(26)
5 E.N.T.	232	151	143	159	89	(8)	35	22	54	(30)
6 Medicine I	394	359	275	340	124	14	75	59	49	(45)
7 Medicine II	284	322	266	327	40	5	46	70	6	(75)
8 Medicine III	569	372	396	370	173	2	85	63	88	(61)
9 Neurology	784	209	644	160	140	49	165	13	(25)	(36)
10 Obst. & Gynae.I	253	62	209	69	44	(7)	72	9	(28)	(16)
11 Obst. & Gynae.II	273	64	214	65	59	(1)	68	12	9	(13)
12 Obst. & Gynae.III	181	32	162	40	19	(8)	50	7	(31)	(15)
13 Orthopaedics	295	137	255	203	40	(66)	107	62	(67)	(128)
14 Paediatrics	336	171	258	263	78	(92)	96	80	(18)	(172)
15 Radio Therapy	357	309	300	234	57	75	62	25	(5)	(50)
16 S.S.N.S	137	155	128	247	9	(92)	133	154	(124)	(246)
17 Surgery I	292	70	246	75	46	(5)	83	15	(37)	(20)
18 Surgery II	418	83	317	97	101	(14)	105	30	(4)	(44)
19 Surgery III	292	63	259	79	33	(11)	105	33	(72)	(44)
20 Plastic Surgery	94	12	76	16	18	(4)	17	1	1	(5)
21 Urology	338	116	257	131	81	(15)	63	22	13	(37)
22 Thoracic	505	106	266	113	237	(7)	165	9	72	(16)
23 Welcome	29	-	45	10	(16)	(10)	-	-	(16)	(10)
24 Physical Medicine	61	10	70	10	(11)	-	13	4	(3)	(15)
25 Others	91	51	83	50	8	1	-	-	50	1
	7092	3260	5604	3569	1511	(309)	1743	749	(150)	(1231)
	10,352		9173		1202		2492			(1381)

Figure () denote deficit.

Exhibit 12
Income Pattern at CMCH

	IP		OP		OP Income & Total Income
	(A) Charge	(B) Charity	(A) Change	(B) Charity	
	% B/A		% B/A		
1961-62	1705	502	1331	164	49
1962-63	3803	572	1497	218	28.4
1963-64	4199	685	1664	285	28.2
1964-65	4318	606	1740	275	28.4
1965-66	4554	666	2042	369	30
1966-67	5507	1106	2675	434	34
1967-68	6313	1318	3268	668	342
1968-69	6992	1746	3260	749	32.2

Exhibit 13

Patient Profile – Region of Origin (1971)

Clinical Group	Region of Origin in Percentage									
	Vellore Town & Taluka		N. Arcot District		Other districts in Tamil Nadu		Other States and from Abroad		Total	
	IP	OP	IP	OP	IP	OP	IP	OP	IP	OP
General	41.0	29.0	28.0	36.0	11.0	19.0	20.0	16.0	100	100
Obstetrics Gynaecology										
Paediatrics										
Specialities	14.0	18.0	22.3	28.3	31.5	26.8	32.2	26.9	100	100
General Medicine										
General Surgery										
Orthopaedics										
Dermatology										
Radiation Therapy										
ENT Ophthalmology										
Dental										
Higher Specialities	5.0	5.0	10.3	12.0	26.0	25.3	58.7	57.7	100	100
Neurology										
Cardiology										
Thoracic										
Nephrology										
Urology										
Plastic Surgery										

Note: 1) Analysis based on a random sample of 300 IPs and 300 OPs in each of the three clinical groups.
 2) N. Arcot District is the district in which Vellore is located and Tamil Nadu the home-state.

EXHIBIT 14
Income and return at CMCH
Special Fund Account as of 30-08-1971

Clinic	Special Funds (Rs.)
Kidney Lab	2,83,090
Nephrology	1,41,362
Mobile outreach service programme	1,15,932
Thoracic	1,15,789
Mobile Leprosy	1,13,113
Neurology	96,970
Biostatistics	94,251
Radiotherapy	84,502
Electrocardiography	71,609
Medicine-111	63,394
Eye camp	57,095
Medicine-11	51,176
Audio visual Unit	44,516
Medicine-1	44,140
Total	13,76,939

Note: Total number of special fund accounts as of 30-06-1971 were 86 Total amount in special funds as of 30-06-1971 was Rs. 19,74,434.10 The balance against some laboratories are given below:

Clinical biochemistry	Rs. 7966
Microbiology	Rs. 2229
Pathology	Rs. 6693

EXHIBIT	
Christian Medical College & Hospital, Vellore	
Average Length of Pre-operative Stay	
Department	Average Length of Stay
Plastic Surgery	2.5
Surgery-1	4.7
Surgery-11	6.4
Surgery-III	4.5
Urology	6.5.
Ortho-1	3.7
Ortho-1 I	3.7
Neurology	9.2
Cardiac	13.7
Thoracic	13.8
Overall	6.9