Exeter Community Health Services

Summary of Project

EXETER COMMUNITY HEALTH SERVICES COMPUTER PROJECT

SUMMARY OF PROJECT

DECEMBER 1974.

C O N T E N T S

1. Introduction.

The initial proposals for the Exeter Community Health Services Computer Project were made as the result of a feasibility study carried out in 1967. Financial support for a more detailed evaluation of these proposals was then provided by the Nuffield Provincial Hospitals Trust and a preliminary study was authorised by the D.H.S.S. This second stage of the Project culminated in a preliminary report, which was submitted to the D.H.S.S. in 1969. Authority was then given by the Department to undertake a systems study, which was carried out during 1970. This section summarises the results of the systems study

The broad objectives of the Exeter Project are to provide (i) better patient care, (ii) increased clinical and administrative efficiency and (iii) better facilities for management and research. These are very broad aims and the particular characteristics of the Project stem from the observation that the patient should be the focus of any well directed system of medical care. The individual patient may be concerned with several different health service agencies and there is a need for the whole of the medical care system serving a community to be regarded as a coherent entity - a principle which is seldom challenged in the light of the unification of the health services generally. Thus in addition to the direct improvement of particular services, the main objective of the Project is to set up a community-based information system. The relevance to the generality of hospital services provided by experimental development in non-teaching hospitals is additionally important.

At the primary level of medical care the Project is concerned with Health Centres. This form of practice is considered likely to set the pattern during the next decade. Progress in this direction has been particularly rapid in the Exeter area and in the surrounding County of Devon, where to date 40 Health Centres have been established. Two health centres were involved in the initial stages of the Project, the first at Ottery St. Mary serving a rural population of some 10,000 patients and the second at Exeter, St. Thomas, serving an urban population of some 25,000 patients. If the services provided prove to be successful, expansion to other health centres in the Exeter district on a modular basis will be possible and all systems design is being carried out with this end in view.

In the hospitals the Project will be concerned initially with both in-patient and out-patient activities at a small (110-bed) orthopaedic hospital. Although only one specialty is involved, almost all the activities taking place at larger general hospitals are represented. Systems developed and proved in the orthopaedic hospital will be introduced into a new district general hospital which finally opened in mid-1974 with 432 beds initially. Both medical and administrative activities will be covered in the health centres. The hospital-based applications however will involve mainly administrative and nursing activities. For the patients registered at the two health centres, consultation information will be recorded by the general practitioner and, where appropriate, attached Local Authority Health Department staff, and will be collated with information from the two hospitals to provide an integrated patient record. This record will enable information collected at one source to be made available (subject to safeguards) at other places where the patient requires medical care.

2. Systems Design (Proposals and Benefits)

The approach followed during the Systems Study was conditioned by the decision, confirmed in the preliminary study, that the full hospital clinical record should not be considered as an application to be implemented in the initial stages of the Project. The reasons for exclusion are based firmly in the belief that such implementation would be extremely difficult to achieve in our timescale and probably contentious thus prejudicing progress in other applications. Subject to this proviso, the objective of the systems team has been to obtain an overall view of the activities of the local health services in all their aspects. To this end full and comprehensive investigations have taken place in the two health centres, at the orthopaedic hospital and at the existing district general hospital whose staff and activities are due to be transferred to, and reinforced at, the new district general hospital. This forthcoming move to new premises has presented an opportunity for the Project team to participate in and to influence the planning of systems to be implemented in the new environment. As a result of this approach on a broad front, it has been possible to compare alternative strategies for the development of the Project and hence to select a programme which is likely to lead to an optimal return on the investment of resources. At the same time, due account has been taken of the interaction of activities in different parts of the system. The initial purpose of the investigation was to categorise systems as follows:-

(a) essential for the success of the Project as a whole;
(b) suitable for computer application at an early stage in the Project;
(c) suitable for later inclusion in the computer system;
(d) unlikely to be suitable for inclusion in the forseeable future.

The results of this exercise are summarised in Appendix 1 of the report.

Having applied this classification to all systems studied it was then possible to determine priorities and hence to evolve a phased programme of implementation. The design of the various systems has been conditioned by experience available as a result of the experimental studies carried out at Exeter, from the other Health Services computer projects and elsewhere. As a result there are some minor differences from the pattern recommended in the preliminary report, although the broad outlines of the proposed systems are unchanged.

Similar systems are proposed for the two health centres. Each general practitioner will be supplied with a V.D.U. for use during consultations and receptionists will use both V.D.U.'s and teletype equipment. The systems classified as category (a) are (i) patient registration, (ii) checking patient records, (iii) updating patient records, (iv) Pathology Laboratory requests, (v) entering reports from the Pathology Laboratory or the two hospitals, (vi) repeat prescriptions, (vii) referrals to Local Authority services. Only one health centre system is assigned to category (b) - patient screening. The benefits of the proposed systems have been assessed.

Patients are likely to gain the most, both from the ready availability of information from multiple sources and in the sense that the predicted reductions in time spent on administration, and record maintenance will enable the general practitioner to devote more time to patient care. At the same time the structured form and greater accessibility of the patient record will assist the general practitioner to work efficiently, both in terms of improved clinical assessment and more effective and well-monitored therapy. The hospitals will also have immediate access to what are termed the "priority details" of the general practice record and hence all the available information about factors such as important medical conditions, therapy and drug sensitivity which are important for the care of the patient. Patient care will also be improved by the rapid transfer of information between the hospitals, the Pathology Laboratory and the health centres. The proposed systems will lead to a marked increased effectiveness on the part of the health centre receptionists, since retrieval and maintenance of records will be greatly speeded up and the standards of legibility and accuracy will be improved. When implemented, the screening systems will provide the general practitioner with what is potentially a very powerful new instrument for patient care.

In the out-patient departments of the two hospitals the proposed systems in category (a) cover (i) patient registration, (ii) new appointments, (iii) preparation for clinics, (iv) patient reception, (v) clinic attendance, (vi) return appointments and queries and changes. During the consultation with the hospital doctor, access will be provided to a clinical summary printed on paper, showing patient identification, general practitioner dates of past out-patient attendances, dates and duration of past in-patient episodes (including primary diagnoses and operations), together with fuller details of medical history for patients from the Project health centres. As the Project develops it is proposed that the doctors should have the facility to add brief notes, possibly in structured form, for inclusion in the next clinical summary for that patient. The benefits of the proposed system for appointments include improved efficiency in producing notification letters to patients, provision of access to appointment files from several locations, application of agreed rules as to the priority of different categories of patient and as to strategy for booking clinics, the "smoothing" of the load between clinics, and the improvement of the clinic listing process. The patient registration systems will prevent duplication between the various existing patient indices and will provide a facility for amending and checking information with the patient. The clinic preparation systems will produce listings for the "pulling" of case notes by the medical records staff and will greatly facilitate searches for missing notes as the result of an improved records "tracer" system. Identification labels for documents will be produced by the computer with a consequent saving of clerical effort. The systems proposed involve a pre-registration process which will smooth and speed the reception of patients and assist with the location of any case notes or other records. The doctors will benefit from the information provided by the clinical summaries and also from the improved presentation of information about pathological reports, x-ray reports and therapy. The computer system will reduce the waiting time of patients and will offer the possibility of implementing more efficient appointment procedures. The monitoring of what are essentially all the administrative activities of the out-patient departments will offer the possibility of further improvements in the

management of this activity. Patients from the two health centre practices will enjoy further benefits associated with the availability of an integrated patient record and the improved communication facility. In order to support the proposed systems, V.D.U. and teletype terminals are required in the main out-patient reception areas and in the main records departments. These terminals will normally be used by clerical staff. No terminal facilities are proposed for use within consulting rooms and clinical notes will, as at present, be produced manually.

The Accident and Emergency Department in the new district general hospital will be provided with terminals to enable registration, treatment, appointments and administrative details to be noted. Information about the patient stored within the computer system will provide the Accident/Emergency officer with "priority details" and a summary of the patients' out-patient attendances and in-patient admissions. This will produce direct benefits in terms of patient care and will reduce the clerical functions required in this department.

The in-patient systems proposed for the two hospitals are similar and include in category (a) (i) waiting list management, (ii) admissions procedures, (iii) ward administration, (iv) nursing orders and (v) preparation of discharge letters, and in category (b) nursing reports. The waiting list management procedures will permit the regular review of priorities according to predetermined criteria and the planning of admissions in the light of these priorities and of the hospital resources available. At the same time the waiting lists procedures will produce much of the information required for the admission of the patients, for H.A.A. and for waiting list statistics. The admission procedures will speed the collection of information from patients on admission and will improve the efficiency of many aspects of the admission routine. The ward administration systems will assist the ward staff in the recording of admissions, registration details, transfers, predicted discharge dates and discharge details. The nursing order systems will assist with the allocation of tasks to nurses by the ward sister and with other aspects of the management of nursing activities. Summaries of clinical information will provide the doctors with a cumulative statement of pathology test results, x-ray reports, details of nursing orders and any discharge details so far specified. These latter will provide notification to relevant departments of discharges much earlier than at present. The main benefit to be derived from maintaining the nursing reports will arise from standardisation, although the production of bed state information and condition reports will be facilitated. In order to implement these systems both V.D.U. and teletype terminals will be required for the admissions and ward staff.

A teletype terminal will be installed in the Pathology Laboratory which will enable requests to be obtained directly from wards and health centres and will also be used for entering results of these tests. The X-ray Department will be treated in many respects like an out-patient department, although wherever possible pre-registration will be carried out elsewhere. A terminal will also be installed in the Pharmacy to enable issues of drugs to be recorded and for ordering and accounting purposes.

The computer system as a whole will capture information about most of the more quantitative aspects of hospital activities. All the statistics required for H.A.A. at present will be covered and facilities will be available for more detailed and frequent analyses of the same type. The systems to be introduced will provide all the necessary data for resource optimisation which will be implemented at a later date. In terms of both of the hospitals and of the health centre patients, much useful research data about morbidity and other factors will be generated.

3. Confidentiality

In a community-based system the problems associated with confidentiality of medical records and the storage of data on a computer will possibly be greater than in other medical computing applications. The problem exists at two levels.

(1) In providing effective safeguards against the misuse of the data about individual patients and groups of patients which will be accumulated by the system, and

(2) In restricting access to the computer to authorised health services staff.

The first problem is a very general one which is causing public concern in the context of computer based information systems of every kind. In anticipation of a solution at the national level, a local Ethical Committee will be set up. This will be a lay committee with a strong medical representation and will keep the relevant activities of the Project under continuous surveillance.

The second problem will be overcome by only allowing authorised users access to the system via individual user codes and further internal computer checks concerned with the user and the type of action he wishes to perform.

4. Mode of Operation

The data on which the Project will rely will be produced at many widely dispersed points. These data need checking by the originator at the time of recording and this can best be achieved by the use of remote terminals. For data on which immediate action need not be taken, only checking and temporary storage of it will be necessary and for this remote data capture only is required. Updating of these records can be done later in conventional batch mode. For the remaining data some immediate updating of computer records will be necessary, and this will involve full "real-time" capabilities. The systems configuration proposed will be a mixture of the two terminal modes and the more conventional batch mode of operation. For these reasons it will be necessary for the computer to support all modes simultaneously.

5. Computer Installation.

The computer was installed in March 1973 and accepted in May 1973. The configuration is shown in Appendix 2. Location of terminals is shown in Appendix 3.

APPENDIX 1 . SYSTEMS CATEGORISATION

CATEGORY	SECTION	SYSTEM
	TITLE	TITLE
A. Essential for the success of the Project as a whole i.e. producing essential information about patients both for themselves and for other systems.	PATIENT INDEX	initial take on of current patients New patients Manual index conversion
	HEALTH CENTRE SYSTEMS	Registration Finding Patient Number Checking Patient Numbers Updating Records Pathology Laboratory Requests Entering Reports Repeat Prescriptions Referrals to Local Authority
	OUT-PATIENT SYSTEMS R.D.&E. Wonford Proposals	Registration and new Appointments Clinic Preparation Reception Clinic Attendance Post Clinic Procedure Appointment Queries and Changes
	P.E.C.H. Proposals	Registration and all Appointments Clinic Preparation Reception Clinic Attendance Post Clinic Procedure Appointment Queries and Changes
	Fracture Clinic	Registration and New Appointments Clinic Preparation Reception Clinic Attendance PostClinic Procedure Appointment Queries and Changes

APPENDIX 1 SYSTEMS CATEGORISATION(Continued)

CATEGORY	SECTION	SYSTEM
	TITLE	TITLE
	IN-PATIENT SYSTEMS R. D. & E. Wonford	Waiting List Management Admissions Ward Administration Nursing Orders Discharge Procedure
	P.E.O.H.	Waiting List Management Admissions Ward Administration Nursing Orders Discharge Procedure
	SERVICE DEPARTMENTS Pathology Laboratory	Test Requests Test Results
	X-ray R.D.&E. Wonford	Requests Patient Arrival Reports Preparation for Out-patient Clinics
	MANAGEMENT SYSTEMS Hospital Activity Analysis	Hospital Activity Analysis

APPENDIX 1 SYSTEMS CATEGORISATION(Continued)

CATEGORY	SECTION TITLE	SYSTEM TITLE
B. Suitable for computer application at an early stage in the Project ie. i. good training ground ii. obvious assessable benefits iii. useful for illustrative purposes to other potential users in the hospital.	HEALTH CENTRE SYSTEMS	Screening
	ACCIDENT AND EMERGENCY DEPARTMENT	Registration Treatment Appointments Administrative Procedure
	IN-PATIENT SYSTEMS R. D. &. E. Wonford	Nursing Reports Clinical Summaries
	P. E. O. H.	Nursing Reports Clinical Summaries
	SERVICE DEPARTMENTS Pharmacy	Drug Ordering From the Pharmacy Drug Ordering and Accounting by the Pharmacy
	Catering	Costing
	MANAGEMENT SYSTEMS Nurse allocation and Records	Nurse Allocation and Records
C. Suitable for later inclusion in the computer system.	SERVICE DEPARTMENTS Transport Supplies Medical Social Worker	
D. Unlikely to be suitable in the foreseeable future(As we become more experienced our ability to reduce the number of systems in category D will increase).	SERVICE DEPARTMENTS Surgical Appliances	
	Physiotherapy	
SPECIAL REQUIREMENTS	SERVICE DEPARTMENTS Radiotherapy	

LOCATION OF TERMINALS

	VIDEOS	TERMIPRINTERS	
OTTERY ST. MARY HEALTH CENTRE			
Consulting Rooms	2		
Reception	2	1	
Local Authority Doctor & Staff	1		
P-E-O-H-			
Medical Records Dept.	2	1	
Outpatient Reception	1	1	
Inpatients Admissions	1	1	
Wards	1	1	
ROYAL DEVON & EXETER HOSPITAL, WONFORD			
Medical Records Department	2	1	
Outpatient Reception	4	1	
Inpatient Admission	1	1	
Wards	13	7	
Pathology Laboratory	1	1	(with p.t. input)
Xray	2	2	
Pharmacy		1	
Nursing School	1	1	
Accident & Emergency	2	1	
SECOND HEALTH CENTRE			
Consulting Rooms	6		
Reception	3	1	
COMPUTER CENTRE			
Console	1	1	
Data Preparation Room	2	2	(with one p.t. input)
	48	25	