BRIDGING IN HEALTH

Reports of studies on health services for children

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INTRODUCTION

Among the many challenges confronting a reorganized National Health Service is the need to continue to improve the services for children. Success or failure will in the early stages depend locally upon the ways in which the child health care planning teams do their work: how well they succeed in identifying local needs and how well they succeed in providing the essential leadership to achieve solutions. It will be their responsibility to bring together disparate professional skills and interests, to weld these into a unified team, supplied by an effective information service and secretariat, to make decisions based upon full knowledge of local resources, and to develop efficient channels of communication and consultation with all those concerned with the implementation of new policies.

Above all, a child health care planning team has to face the challenge of what many currently regard as the greatest problem for children in our present society, the Law of Inverse Care, namely that better-off families whose need is generally least, make the optimal use of the services provided, whilst the poorer families whose need is commonly greatest make the least use of available resources. To have an effective part in this area of urgent need, the work of a unified child health service becomes inextricably involved with the work of the social and educational services. It is therefore crucial to forge a good relationship between a child *health* care planning team for a district and its potential counterpart *educational* and *social* planning teams (involving social service areas which may overlap but which regrettably will in many cases not be geographically coterminous with health service districts). The pertinent question arises as to whether there will need to be in each area and district a comprehensive *children's services team* (of which child health is only a part)?

Within the reorganized NHS there are many unanswered questions regarding child health. Whilst the organization of the curative roles of hospital and GP services are well defined as are ways and means to provide improved coordination of their activities, the organization of the preventive medical services for children is undecided. The Sheldon Committee (1967) recommended that the ideal solution would be for GPs to undertake many of the services at that time provided by the local authority medical officers.'Paedi-

atrics in hospital and community in Newcastle upon Tyne' reveals the defects in the old system and produces overwhelming evidence that for many years to come a child health service consisting of GPs and hospital consultants cannot and could not provide a comprehensive preventive medical service.

This report explores the gaps and illustrates with clear examples the areas which need to be filled in. It provides evidence of the extent to which GPs are likely to provide additional preventive health care for children in the future and arrives at the practical conclusion that welcome though this contribution will be, it can never be sufficient. The present training of hospital paediatricians equips them to undertake hospital paediatrics. Between the GP and hospital paediatric services lies a vast medical territory which needs to be populated by well-trained child health doctors. It is suggested that a start should be made from both sides. Doctors already experienced in preventive child health in the local health authority service should become members of group practices and health centres thereby enhancing and extending the range of services which are provided from that source. Hospital paediatricians should widen their horizons and should increasingly undertake responsibility for specialist child health services outside hospitals. In practice this means that in each district the team of consultant paediatricians should contain at least one member who has received special training in community paediatrics (which has yet to be specified) in addition to training in hospital work. It will be the administrative responsibility of the area specialist in child health to ensure that these developments from both sides are integrated to provide a comprehensive service. All this will take time and meanwhile there is need to acknowledge the major contribution to child health that is being made now (and will be required for some years to come) by medical officers previously employed by local authorities who have continued despite many uncertainties to provide this service for the area health authorities. These doctors deserve to be given a clearer statement by the DHSS about their future career structure as soon as possible.

'The school health service and the school doctor' by Lowdon and Walker of Newcastle, sets out very clearly the issues regarding the school health service which will confront the new community physician, the area specialist in child health, and the child health care planning team. This report supports the view of the WHO Symposium on Child Health that routine school medical examinations are relatively unproductive. A combination of techniques is suggested including developmental examination, the involvement of family doctors, and increased use of the skills of school nurses and teachers. More complete pre-school care would free the school doctor to devote more time to the special needs outlined in this report. Three specific medical roles are identified: first, a member of the general practice team who has special responsibility for the preventive and developmental care of children, second a doctor responsible for the health supervision of a defined population of children in school, and third a doctor with more specialized skills in the assessment and community care of the handicapped child. This report has

much to say about the logistics and administration of a future school health service which is immediately relevant at this particular time.

'Child health' the report of an experimental group set up by the Joint Liaison Committee of the Humberside Area Health Authority in conjunction with the Nuffield Provincial Hospitals Trust, describes their experiences in establishing the constitution, role, and scope of a child health care planning team. The group was aware from the outset that unless they succeeded in gaining the enthusiasm of their individual members that, as with all such teams now to be recruited within the reorganized NHS, they might suffer all the disadvantages of change without benefit to health care. One does not need to read between the lines to appreciate that the earlier meetings contained elements of frustration and disillusion. This report should be necessary reading for all those about to engage in this work, for it provides valuable forewarnings of many of the early difficulties and asks many of the difficult questions which will confront similar groups all over the country. All the members of such teams are bound to be busy people. How then to ensure that the time taken up by their meetings is effectively spent? What preparatory work can effectively be carried out to provide the necessary information for team meetings and who should provide it? What type of information and continuous monitoring services will the team require? How to deal with the effective representation of the views of, and communication with key people in the district who are not members of the team? These are but a few of the questions asked in this interim report. There is little doubt that the further conclusions will be equally valuable to a national audience.

'Design and implementation of a developmental paediatric programme' is a detailed report of the work already undertaken in Derbyshire with support from both the Nuffield Provincial Hospitals Trust and jointly from the DHSS and the former Derbyshire County Council. The proposed scheme involves four examinations of every Derbyshire child during the first five years of life. These examinations are only to be carried out by doctors specifically trained for the task. The service involves both a general appraisal of the child including educational and social, as well as medical factors, and a counselling service for the parents. The scheme is computerized both for the schedule of appointments and for records and analysis.

The content of the clinical examinations and the arguments for undertaking them at particular ages are described in detail and in the process provide a most valuable bibliography. The description of the resources and the logistics of the scheme provide an insight into how far an existing medical staff establishment can undertake such a commitment given appropriate training and facilities. The interest of local GPs in the scheme has been considerable and those who wish to participate are given every encouragement to do so.

The evaluation of the work of this project will be of national and international interest. This report provides a clear description of the formidable

amount of planning and thought that has taken place in Derbyshire to achieve this advanced stage in their comprehensive screening programme for preschool-age children.

'Congenital malformations in Devon: their incidence, age, and primary source of detection' is the first report of a DHSS-supported study which will not be completed until 1977. It describes the incidence of congenital malformations in a defined birth population of 25,000 births. When complete the survey will identify the age up to and including the first school medical examination at which congenital malformations are detected and the source of detection. It appears that only half the malformations known to exist in 5-year-old children are detected in the neonatal period. There are a number of malformations in which earlier detection would have been valuable to the patient. After the neonatal period hospitals play only a minor part in the detection of malformations being responsible for the detection of only 12 per cent of malformations not identified after the first month. Very few malformations which were previously unrecognized are discovered at the first school examination. This report provides a part of the justification for the introduction of the scheme described in the report that follows it.

These five papers provide a most valuable contribution for all those who are embarking upon the task of making sure that the reorganized child health service provides not just a new administrative structure but a genuine advance in the well being of all the children that it will serve.

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PAEDIATRICS IN HOSPITAL AND COMMUNITY IN NEWCASTLE UPON TYNE

Hans Steiner

Chapter 1

Preface

This study was carried out by Dr Hans Steiner holding a three-part appointment as Consultant Paediatrician to the Newcastle upon Tyne University Hospitals, Senior Medical Officer in the City Health Department, and Principal Research Associate in the University Department of Child Health during 1972-4.

The inquiry was designed and carried through in association with S. D. M. Court, Professor Emeritus; J. K. G. Webb, James Spence Professor of Child Health (from November 1972); G. A. Neligan, Reader in Paediatrics; D. Wilson, lately Medical Officer of Health, Newcastle; D. Story, lately Senior Medical Officer, Newcastle; and J. H. Walker, Senior Lecturer and Head of the Department of Family and Community Medicine.

Acknowledgements

The study was supported by the Nuffield Provincial Hospitals Trust who provided the financial assistance necessary to carry it out.

A great number of colleagues in the hospital and community services in Newcastle upon Tyne, as well as general practitioners, health visitors, social workers, educational psychologists and teachers, have generously given their advice and help during the course of this work. They are too numerous to mention by name, but we would like, in particular, to thank: Miss F. E. Hunt, lately Chief Nursing Officer, and Miss A. Y. Sanderson, lately Superintendent Health Visitor and Deputy Chief Nursing Officer, for advice and help with the health visitor survey; Mr B. Roycroft, Director of Social Services, for arranging an attachment to the Social Services Department; and Mrs F. Southern, Medical Social Worker, for advice and help with the hospital social work survey. Finally, we are especially grateful to Mrs Jenny Steiner for secretarial assistance during the course of the study and the preparation of this report.

Chapter 2

Introduction

The improvements in the care of children which should occur as a result of the reorganization of the National Health Service will depend not only on the success of the reorganization of the administration of the Service that came into effect on 1 April 1974 (1), but also on the development of a new or more effective professional partnership between all those concerned in the care of children. These include general practitioners, medical officers in the community child health services, consultant paediatricians, child psychiatrists, social workers, and teachers.

At present, in spite of good intentions, there appear to be wide gaps in the services for children in our community.

An increasing awareness of the limitations of these services and of those who work in them, for providing a comprehensive child health service, has stimulated the setting up of the study, which forms the basis of this report.

The purpose of this study was to identify gaps in the hospital and community services for children, to make recommendations for filling these gaps and to give specific consideration to a possible new role for consultant paediatricians, which might help to link hospital and community services.

The work was carried out in Newcastle upon Tyne during a two-year period from 1 February 1972 to 1 February 1974 by a paediatrician who had a conventional training in clinical paediatrics in the hospital service, and special training and experience in the assessment of growth and development in young children.

Observations were made during the course of clinical work both in the hospital and the community services.

The hospital work was linked to that of the professorial unit of the Child Health Department and included a regular weekly general paediatric out-patient clinic, a special out-patient clinic for children with handicapping conditions and social and community problems, a regular follow-up clinic of babies in a maternity hospital, and clinical responsibility for the care of in-patients with acute as well as chronic illnesses.

The clinical work in the community consisted of a regular weekly child health clinic in the city, and consultations with GPs, health visitors, medical officers, social workers, educational psychologists, and teachers. Many of these took the form of a visit to surgeries, clinics, social services headquarters and schools, and of case conferences.

In addition, special arrangements were made to obtain some first hand knowledge and experience of the functions of the community social services and in particular their relationships with the health services. These consisted of a full-time attachment for a month to an area social services team, and a programme of visits to residential nurseries, family group homes and other facilities provided by the Social Services.

During the course of the study a number of surveys were carried out in Newcastle in order to obtain further objective information about services for children. These included the following:

1. *Surveys of the work of medical officers and health visitors in the community child health clinics.* During a two-week period in March and again in June 1973, information was sought for all children seen in the city's child health clinics by the medical officers and the health visitors respectively. The intention was to find out the reasons for visiting the clinics, the frequency of previous visits, the abnormalities and problems that were identified and their management, the nature of the communications between clinics, GPs, and hospitals, and whether the children were seen by their own health visitor. (All the health visitors in Newcastle being attached to GPs.)

2. *Survey of the medical officer's work in one child health clinic in Newcastle during a period of approximately one year (1972-3).* This survey consisted of the personal observations made during the regular weekly clinic which formed part of the clinical work of this study.

The clinic was situated in a poor area of the city and it was anticipated that some families whose children were seen in the child health clinic would also avail themselves of the services of the nearby area social services headquarters. On completion of the clinic survey, information was sought from the area social services team about the families who had also sought their advice. In particular, an attempt was made to find out the reasons for seeking this advice and the communications which took place between health and social services.

3. *Survey of the child health clinics of GPs in Newcastle.* For this purpose, it was decided to include all sessions specially set aside by GPs for the children of the practice. It was arranged to attend these sessions in order to record the same type of information that was sought in the other clinic surveys.

4. *Survey of children on the Newcastle handicap-observation register.* A senior medical officer from the community child health service had been responsible for keeping a register of handicapped children of preschool age whose families might need help from the community services.

Information was sought about the nature of the handicaps, the methods of notification, the communications between community and hospital services, and the services provided by the senior medical officer for these children.

5. *Survey of children attending a special follow-up clinic at a maternity hospital* (The Princess Mary Maternity Hospital). This survey included children who had survived a variety of severe perinatel complications and whose progress was being followed by the hospital in order to make an assessment of the results of special care.

It was anticipated that some of these children would also attend their GPs' clinics or community child health clinics, leading to a duplication of supervision and care. Information was sought about attendance at other clinics in order to find out the kinds of communications that need to take place between hospital and community services.

6. *Survey of a consecutive sample of 210 children selected because they had been readmitted on at least one occasion to the wards of the Royal*

Victoria Infirmary or Babies' Hospital during 1965-71. It was anticipated that these children would include some in whom the reason for readmission might have been associated with either a failure of communication between the hospital and community services, or a failure on the part of the hospital services to make an accurate diagnosis of problems other than the clinical conditions which led to the admission. These included emotional, educational, family and social problems, or, a failure to take effective action when these additional problems were identified. Information was sought about the clinical diagnoses, the identification and management of emotional, educational, family, and social problems, and the nature of the communications between hospital and community services.

Only children with medical conditions under the care of a paediatrician have been included in this survey.

7. Survey of a consecutive series of 211 children seen in an out-patient clinic during 1972-4 in the course of this study. This survey of children with a variety of medical problems was intended to identify those with additional emotional, educational, family and social problems, which were thought to play an important part in the lives of these children, and which might require further investigation and management by the community services.

8. *Survey of the work of the hospital social worker.* Information was sought about the problems that were identified by the social worker, and her contribution to the management of a random sample of 100 children with a variety of medical problems seen in the out-patient clinic, or the wards, of the Royal Victoria Infirmary and Babies' Hospital, Newcastle upon Tyne.

It was decided at the outset to concentrate on the community services for children of preschool age because it was felt that there would be insufficient time during the two years of the study to consider the school health services and because the training and experience of the paediatrician responsible for the study was concentrated on this age-group.

The study

The conclusions based on the surveys and personal observations, followed by the proposals for improving the services for children, will be presented under the following headings:

1. **Services for children of preschool age.**

(*a*) The child health clinics of the community health service and of general practitioners.

(*b*) The care of handicapped children.

2. **The relation between hospital and community services.**

3. **Consultant community paediatricians.**

A series of tables which are intended to provide supporting evidence for the conclusions are set out separately in the Appendix.

A number of case-histories have been included in each section in order to illustrate the findings and support the proposals.

It must be emphasized that the conclusions and the proposals in this

report are based entirely on the findings in Newcastle upon Tyne which has a medical school and regional reference facilities. It remains to be seen whether they apply to other comparable communities.

Chapter 3

Conclusions and proposals

1. Community child health services for children of preschool age

(*a*) *Child health clinics of the community health service and of general practitioners*

Conclusions

1. The community child health clinics still provide an important service for mothers and young children. This consists of support, health and birthday checks, explanation and reassurance, advice about relatively minor non-urgent illnesses, and immunizations (Tables 1, 2, 3).

2. Medical officers in the community child health clinics are, for the most part, working in isolation from the other health services for children.

The attachment of health visitors to GPs in group practices has led to a further separation of primary health care services because mothers who attend community child health clinics are no longer likely to see their own health visitor (Table 4).

In relation to children who are also under hospital care, communications between hospital paediatric services and community child health clinics have generally been inadequate (Table 5).

Medical officers are also inhibited by the fact that they are unable to prescribe treatment, even though they may have been consulted in addition to or in preference to the GP (Tables 6, 7).

3. The majority of medical officers have not had adequate training in preventive child care work.

4. Only a minority of GPs have so far undertaken to conduct a special clinic for the children of the practice. In some of these clinics, the sessions are intended only for children with non-urgent medical complaints and for immunizations, and do not include health or birthday checks (Tables 8, 9, 10).

5. Although some of these GPs had worked in community child health clinics in the past, none of those visited had any special training in preventive child care work. All relied on their health visitors for advice and all indicated that they would welcome further advice and training, particularly in the objective assessment of growth and development.

6. A number of factors make it unlikely that many GPs will undertake this part of child health work in the near future, namely:

(*a*) The contract of the GP to provide 'general medical services', does not specifically include the provision of preventive child care services. The lack

of financial inducement for this type of work has probably contributed to the failure to develop this service in group practices.

(*b*) Some group practices have patients scattered over a wide geographical area, making it difficult for mothers with young children to attend.

(*c*) Some GPs are still single-handed (Table 8).

(*d*) Some GPs stated that they did not have the time to provide a special session for children.

(*e*) There is, as yet, no satisfactory training programme in preventive child care work for GPs.

7. In a socially deprived area in the city of Newcastle, there is a clear overlap between problems encountered in a community child health clinic and those encountered in a nearby area social services headquarters (Table 11).

The child health clinic doctor is often unaware of the contribution of the social services in providing help for families who are also attending the clinic. The health and social services in this particular area of Newcastle are in separate buildings and there is no effective system of joint consultation and management.

8. Although many mothers from a socially deprived area of Newcastle attend child health clinics, the number of children with defective growth and development and unrecognized illnesses from families with major social problems, who do not avail themselves of the services of the child health clinics, is not known.

Case-histories

N.S., the first baby of a 19-year-old mother was brought to the child health clinic for the first time at the age of 8 weeks. She had not been feeding well for six days, and had been crying excessively and not sleeping at night. The mother was clearly depressed and worn out, and she indicated that her husband was also getting tired; he was also worried because he felt unable to cope in his new job as a television engineer, due to lack of sleep. Mother was also in need of family planning advice, but had felt unable to ask her own doctor about this 'because he is so busy', and she had not recently seen her own health visitor, who had visited the home on only one occasion. Her GP did not have a child health clinic in the practice and her own health visitor did not work in the community child health clinic.

Comment. This family was in urgent need of regular support and advice. The GP was contacted and arrangements were made for her own health visitor to continue supervision in the home. Mother was later given drug treatment for her depression and arrangements were made by the GP for her to be fitted with an intra-uterine contraceptive device. In view of the fact that the GP did not have his own child health clinic and the fact that the community child health clinic was more readily accessible to the mother (within 'pram-pushing distance'), it was decided with his approval, and that of the health visitor, to continue to see the baby regularly in the community child health clinic for weighing, health checks and immunization.

M.A. was brought to the child health clinic for the first time at the age of 3 months by his mother for weighing and a health check. His GP did not have a child health clinic in the practice and the baby was not seen by his own health visitor during the visit to the clinic. It was noted that he was a big fat baby (weight on the 90th centile), and that his mother was already giving him cereals, that the milk feeds were too concentrated, and that his fluid intake was inadequate. Specific advice about reducing the strengh of feeds, limiting cereals, and ensuring adequate fluid intake was given. The mother seemed to be a sensible intelligent woman and the baby was well cared for. No further action was therefore taken.

Two weeks later, the baby was brought to the child health clinic again. He had been snuffly, vomiting, and not feeding well for about twenty-four hours, and had the characteristic clinical features of hypernatraemic dehydration, which was confirmed on admission to hospital (serum sodium 174 mEq/l, blood urea 195 mg%). Fortunately he made a complete recovery and subsequent development has been normal.

Comment. Later it was learnt from their own health visitor, who knew the family well, that mother 'had her own ideas about feeding babies', and was 'unwilling to accept advice from doctors'. This information was not available at the first visit to the clinic when more specific arrangements could have been made for closer supervision by the health visitor who knew the family.

T.H. Mother brought him to the child health clinic at the age of 20 months, in preference to the GP's surgery because the clinic was much nearer at hand and no appointment was necessary. He had been unwell for three days with fever, irritability, and anorexia, and was found to have an otitis media. He was given a letter to the GP and an appointment was made for him to attend the surgery that same evening.

Comment. A throat swab taken in the clinic later grew a haemolytic streptococcus Group A. Treatment could not be prescribed at the clinic, and mother had to see her own doctor for a prescription at considerable inconvenience as it necessitated a long bus journey to the other side of Newcastle. The family had moved about three months before, but had decided not to change their GP.

S.B. One-month-old baby of an 18-year-old unmarried mother, living with her parents, who came to the child health clinic to have the baby weighed and for a health check. Four weeks later, she was referred to the nearby area social services team by a voluntary social worker because she was in urgent need of a cot and other materials for the baby. She was also in serious financial difficulties and had been asked to leave her parents' house because of lack of space. A social worker was assigned to help her.

Comment. The GP did not have a child health clinic in the practice and her own health visitor, who knew the family well, was not present during the visit to the child health clinic. Practical help and advice could have been

arranged at the time of this visit, had the poor social circumstances been identified. These would have readily come to light if the family's health visitor had been present.

M.N. was brought to the child health clinic at the age of 11 months because of an upper respiratory tract infection. She had been a very frequent attender in the past (22 visits) and was also being regularly followed-up by a paediatrician because of developmental retardation. It was later found that this family was well known to the nearby area social services team because of multiple problems including marital, housing, and financial difficulties; a social worker had been allocated to the family on a long-term basis.

Comment. There was no record of a communication from the hospital to the child health clinic. The standard practice had been for paediatricians to send copies of letters to GPs to the Medical Officer of Health, who then forwarded the letters to the child's own health visitor, who in this case did not work in the child health clinic visited by the family. Mother expressed a strong preference for seeking medical advice and support from the child health clinic, rather than the GP and the hospital, because it was much more convenient for her to attend the clinic, where she said she felt more at ease. The social worker concerned with this family stated that mother needed a great deal of support and advice about her developmentally retarded baby, and this was then the main reason for her frequent visits to the area social services headquarters. There had not been any communication between the clinic medical officer, the GP and the social services, about the family, and the paediatrician was not aware that the community social services were involved.

Proposals

1. We understand the reasons why the Sheldon Committee recommended that the ideal solution would be for GPs to provide the service given by the community child health clinics (2). Primary care for young children, both curative and preventive, would then be carried out within one arm of the service rather than two. We would accept this as a desirable aim, but for it to succeed, the following conditions, not easily or quickly fulfilled, would in our view be necessary:

(*a*) A member of a group practice, with suitable paediatric training, should take a special interest in the preventive and curative child care work of the practice, in order to improve the standard of paediatric care provided by the practice.

(*b*) The contract of a GP who undertakes this work should include the provision of preventive as well as curative services. Extra payment should be made to GPs who have taken part in a recognized training programme, and who maintain their interest and skills in this work.

(*c*) More GPs should join in group practices in suitable health centres.

(*d*) Practices should be limited to defined geographical areas in order to make them more accessible to mothers with young children, and enable the

health visitors attached to group practices to provide a more effective service.

(*e*) Suitable training programmes in preventive child care work should be provided.

2. In the substantial interval before GPs are able to fulfil these conditions and undertake this work, there is a need for a continuing service, in between, but effectively linked with GPs and hospital services.

Community child health services and the medical officers who work in them will need to be maintained, especially in the poorer parts of cities. It should be the responsibility of the health care planning team (child health) and the specialist in community medicine (child health) to ascertain the needs and plan services accordingly.

3. In the short-term future, the attachment of medical officers to group practices should be encouraged as a means of promoting the development of preventive child care services in these practices. The precise form of attachment could vary according to the needs of the practice and the wishes of the doctors concerned. Some medical officers might become integral partners of the practice, others might limit their work to child health clinic sessions in the practice.

4. Medical officers who continue to work in community child health clinics should be allowed to assume full clinical responsibility as qualified and registered doctors and prescribe treatment for children with medical complaints, provided that they have had appropriate paediatric training and on the understanding that appropriate communication takes place with GPs.

5. Hospital paediatricians should communicate directly with child health clinic medical officers, as well as with GPs, about children who are under their care and who, in addition, are regularly brought to the child health clinic in addition to or in preference to the GP's surgery.

Provided that adequate communication is established with the GPs and provided that an effective recall system is in operation, the follow-up of certain children with medical and/or social problems could be most effectively and appropriately undertaken by the community child health clinics.

6. In socially deprived areas, it is necessary to develop an effective partnership leading to joint consultation and management between child health and social services.

This would be facilitated by siting some child health clinics within area social services buildings or vice versa. This would enable medical officers to work more closely with the local area social services teams.

7. It is necessary to develop a separate system of seeking out children in families with social and environmental problems who do not at present make use of the available preventive health services.

This could be done by: an evaluation by health visitors attached to group practices of the general quality of family care in all families with children in the practice; and a closer collaboration between child health clinics and the area social services teams, which would be facilitated by the closer association of community medical officers with these teams.

(b) The care of handicapped children

Conclusions

1. A considerable amount of community care was already being provided for some children with chronic mental and physical handicaps, in addition to the statutory provisions for their future education.

In Newcastle, during the last two years, a senior medical officer of the community child health services had maintained a register of handicapped children and had provided a great deal of help from them and their families (Tables 12, 13).

2. There is, however, a need to develop a more comprehensive and effective register and system of care in order to help all handicapped children who need special help from the community health, social, and education services.

The deficiencies in the care of handicapped children in the community are due to the following factors:

(*a*) The criteria for inclusion of children on the register were not clearly understood by those responsible for their primary health or hospital specialist care. In particular, relatively few physically handicapped children were on the register (Table 12).

(*b*) With the exception of children with severe mental subnormality, the total number of handicapped children likely to benefit from comprehensive community care was not accurately known.

(*c*) At present, the effective provision of comprehensive medical care for handicapped children depends mainly on two separate sections of the Health Service, which have entirely different responsibilities. In addition, the doctors concerned do not have the appropriate training or the right kind of clinical responsibility, both of which are necessary for the provision of comprehensive care.

On the one hand, hospital paediatricians who, in conjunction with general practitioners, are usually responsible for clinical care are not in a position to provide community care. On the other hand, the Senior Medical Officer, who was trying to provide the essential continuing community care, did not have clinical responsibility for these children. Furthermore, communications between these two services have often been inadequate; the majority of direct notifications to the handicap register have been made by health visitors.

Case-histories

T.E. Mental subnormality. Referred to a paediatrician by the GP at the age of 1 year 10 months with mental subnormality and failure to thrive. She was seen in the out-patient clinic on three occasions during the next four months. No specific cause for the mental subnormality was found. She was then discharged from hospital care.

The senior medical officer responsible for the handicap/observation register first heard about the child during a visit to a nursery school. She was then aged 3 years 10 months and had been at the nursery for about 3

months, where she was found to be retarded and withdrawn. A health visitor report was requested and this suggested that the parents were finding it increasingly difficult to cope, that mother was depressed, and that they were not clear about the child's future. The mother was then interviewed at the nursery school by the senior medical officer. Health visitor support was organized and it was arranged for the child to stay an extra year at the nursery before a decision be made about her future education.

Comment. The paediatrician confined his activities to the confirmation of the diagnosis of mental subnormality, and the exclusion of a treatable medical condition. No contact was made with the community services, other than with the GP. Two years later, it was clear that the parents had been in considerable difficulties and had had a very unhappy time. These might have been avoided by earlier health visitor or social worker intervention. An earlier admission to a nursery could also have been considered.

D.V. Blindness. At the age of four months, referred by a community medical officer to a paediatrician with a provisional diagnosis of 'autism'. Further investigations revealed a familial tapeto-retinal degeneration and blindness. A copy of the discharge letter to the GP was sent to the Medical Officer of Health, following a hospital admission. This gave an account of the clinical findings. He continued to be seen regularly by an ophthalmologist and by the paediatrician. No detailed social history was recorded during the admission to hospital or out-patient visits, and no other communication took place with the community services.

When D.V. was aged 2 years 9 months, his twin was admitted to hospital under the care of another paediatrician with fractured ribs, and arm, and bruises. A diagnosis of 'non-accidental injury' was made. At this point, a detailed family and social history was taken, and a health visitor report was requested. It was noted that the family was Indian, that mother was having a very hard time coping with five children under 6 years, and that the father had left home. A social worker was already in touch with the family. Following discharge home, the twins were seen a number of times in the out-patient clinic and regular communication took place between the paediatrician and the social worker about the whole family.

The community services first heard about him as a result of the initial letter to the Medical Officer of Health when he was 4 months of age, but no further action was taken as he was under continuing paediatric supervision. Following the twin's admission to hospital, a copy of the discharge letter to the GP was sent by the paediatrician to the Senior Medical Officer who visited the family at home and found that, even at the age of 3½ years, D.V. could not speak English. Attempts were made to place him in the nursery class of a school for the blind. These failed at this age because he did not settle. It was also found impossible to provide him with home tuition.

Comment. The paediatrician who first saw the child at the age of 4 months confined himself to the clinical diagnosis, and although there was a communication to the community health services, this did not mention any of the family's personal and social problems, and no specific community help was provided by the community health services. The child continued to be seen regularly as an out-patient, but there is no record of any family stresses or problems. The full extent of the family's problems were not appreciated by the hospital and community health services until the admission of the twin with a 'non-accidental injury'. It might have been possible to help the family earlier, and avoid some of the problems associated with D.V.'s education, had efforts been made earlier to teach him English and place him in a day nursery or nursery school.

M.C. Down's Syndrome. At the age of 3 years, the paediatrician notified the child to the Senior Medical Officer responsible for the handicap register. However, the Senior Medical Officer had already known the child for two years as a result of a notification by the health visitor, had visited the family at home, had given much advice about general management (including family planning advice) and had arranged a free placement at a day nursery.

Comment. The community health services provided an essential part of the care from an early age which could not be provided by the hospital services. The comprehensive care of the family might have been further facilitated by earlier communication between the paediatrician and the community child health services.

Proposals

1. In order to plan and make provisions for a comprehensive service for all handicapped children, the specialist in community medicine (child health) should be responsible for keeping a register of children with mental and physical handicaps who are likely to require special help from the community health, social, and education services.

2. It is anticipated that the main responsibility of the specialist in community medicine (child health) will be the administration of services rather than the management of individual children and their families. Improvements in the services for handicapped children and their families will also require a more effective partnership between GPs, community medical officers, hospital doctors, and social and education services, and the responsibility for developing this clinical service should be entrusted to one or more consultant paediatricians who have the appropriate clinical and social training and knowledge of the community services. We have called them 'consultant community paediatricians' and their contribution and training are more fully examined in section 3 of the study. A close working partnership will need to be established between the specialist in community medicine (child health) and these consultant community paediatricians in order to ensure the most effective management of handicapped children and their families.

3. The notification to the specialist in community medicine (child health) of children for inclusion on the handicap register should be a medical responsibility, and not primarily the responsibility of the health visitor, who will, however, provide necessary information and help to ensure that all handicapped children are notified.

4. *A comment on the role of the assessment centre in the care of handicapped children.* In Newcastle, the assessment centre serves as a regional reference centre as well as a local centre for handicapped children.

In the past, a senior medical officer from Newcastle has held a regular session at the centre with full access to all its facilities.

In future, the paediatricians referred to in 2 above should be similarly associated with the centre and could assume a measure of responsibility for Newcastle children who require continuing help.

2. The relation between hospital and community services

Conclusions.

1. Consultant paediatricians already recognize the fact that many children who are referred to hospital for an out-patient consultation, or are admitted for further investigation and treatment of medical conditions, often have additional emotional, educational, family, and social problems (Tables 15, 16).

2. The identification of these additional 'community' problems by paediatricians is not done in a sufficiently systematic way (Table 17).

3. The actions taken by consultant paediatricians following the identification of 'community' problems are often inappropriate and delayed. At times no specific action is taken, or communications made with the community services, even though problems likely to require management in the community have been identified (Tables 18, 20).

The communications from paediatricians to the community health services have often been impersonal. They have usually consisted of copies of letters to the GP rather than a direct personal communication (Table 19). This has played a part in maintaining the separation of hospital and community health services, and inhibited the development of an effective professional partnership in the care of children.

4. The present services do not effectively meet the needs of families with complex medico-social problems and children with certain chronic physical and mental handicaps. Consultant paediatricians tend to focus primarily on the clinical diagnosis. They do not always attempt to defind emotional, educational, family, and social problems, or to record systematically information about these; which in turn lead to a failure to take appropriate action.

5. *Services for the newborn.* An important part of the services for the newborn consists of the follow-up of babies who have survived certain perinatal problems, in order to assess the results of special care, and hopefully improve their management.

The majority of the children who attend a hospital follow-up clinic also

attend community child health clinics (Table 21). In the past, communications between hospitals and community clinics have not taken place in a direct or systematic way.

6. *Paediatric social work and the hospital medical social worker* (MSW). The future integration of hospital with community social services may alter the relationship between MSWs and the paediatric units with which they are associated.

Much of the work of the MSW consists of gathering further information and of providing short-term help. In a small proportion of cases, long-term help in the form of 'casework' is also provided in conjunction with paediatric management (Tables 22, 23).

It can be shown that the needs of some families with social and family problems, who are under the care of consultant paediatricians, are being effectively met as a result of the consultation and joint action that arises out of a close partnership between the paediatricians and an experienced MSW.

There is a danger that the effectiveness of this partnership will be lost as a result of the involvement of less experienced social workers from the community services, who are not only likely to be able to devote less time to these families, but are also less likely to be closely associated with clinical units on a long-term basis.

Case-histories

K.C. Coeliac disease. A diagnosis of coeliac disease was made during an admission to hospital at the age of 16 months for investigation of failure to thrive. It was also recorded on admission that mother was only 19 years old and unmarried, and that she had financial and housing problems. There was no mention of these problems in the GP's letter of referral, and the hospital social worker was not consulted during the admission. The discharge letter to the GP did not mention these social problems, and there was no communication with the community health or social services. As well as regular outpatient visits, there were two further admissions to hospital at 4 and 8 years because of poor progress as a result of a faulty gluten-free diet. There is no record of an inquiry about the social circumstances at the time of these visits or admissions.

Comment. The paediatrician confined himself to the clinical diagnosis. Further investigation of the social circumstances was not undertaken to ensure that all possible help was being given to this family by the community services.

L.B. Asthma. There were six admissions to hospital and seventeen outpatient visits between the ages of 4½ and 12½ years. Treatment with systemic corticosteroids (ACTH) was started at the age of 11½ years. It was noted during every admission to hospital that he had missed a great deal of school. At 11 years, the paediatrician wrote to his headmaster for a school report;

this showed that he was in a remedial class for slow readers. The only communication by the paediatrician with the school medical officer took place at the age of 12½ years. His educational progress was still unsatisfactory, he was still not attending school regularly and his behaviour was disturbed. Arrangements were then made for him to be admitted to a long-stay children's hospital.

Comment. There was a considerable delay in contacting the school health service and indeed the school medical officer had earlier been 'by-passed' when the paediatrician wrote directly to the headmaster for a report. This boy's education suffered as a result of his chronic handicap. The school medical officer could have been actively involved in the supervision of this child at an earlier stage. This could have led to a modification of the management as a result of a better understanding of the disabilities on the part of the paediatrician. Systemic corticosteroid treatment might well have been considered at an earlier stage as well as long-term residential hospital or special school care.

R.S. Diabetes mellitus. During the first admission to hospital in diabetic coma at the age of 9½ years, it was recorded that he disliked school intensely and that he was nearly bottom of his class. On discharge home, a special letter was sent to the school medical officer which gave the clinical details and suggested that arrangements be made for him to have his diet at lunchtime at school. There was no mention of any school difficulties. He continued to be followed-up as an out-patient at two- to three-monthly intervals; at times the control of his diabetes was unsatisfactory in that he had hypoglycaemic attacks. It was noted on several occasions that he had learning difficulties at school and that his behaviour was disturbed. No communication took place with the school health or education services. At 12 years, he was referred by the paediatrician to a child psychiatrist because he was now refusing to go to school. The school medical officer had not been consulted about him at any time by the teachers and he had only been medically examined there on one occasion on school entry. The psychiatrist found that there were serious family difficulties and long-standing social problems in addition to educational problems.

Comment. Although significant educational problems were identified and some communication took place with the school health service, this was clearly inadequate. It is likely in retrospect, that there may have been an association between poor control of his diabetes, resulting in hypoglycaemic episodes, and problems at school.

I.B. Asthma. First admission at the age of 8 years 1 month for investigation and assessment of asthma. It was noted that he had missed about two months of school every year. It was thought that emotional and adverse social factors were important in relation to the asthma. No communication took place with the school health or education services.

Two months later, the headmaster wrote to the paediatrician as follows:

> I have been meaning to write to you for some time about a child in this school whom I think is under your care. Both his class teacher and I are anxious to know whether there is anything we can do in school to help him as we realise he is going through a difficult period. Mrs B. has been very good about coming to school to explain as far as she can what is the matter, but I thought that maybe you would be able to give us a fuller picture of the case, and point out where we may help him most . . .

About two weeks later, he was referred by the paediatrician to a child psychiatrist, who commented that there was no evidence of disturbance in the family background, but that there was evidence of difficulty at school, particularly with reading, more because of absence rather than any degree of mental subnormality. No further arrangements were made by the psychiatrist to see him again.

A second admission for reassessment took place at the age of 9 years 1 month, and he had been seen as an out-patient on eight occasions up to that age. There is no record of any communication from the paediatrician to the school health or education services at any time following these visits or admission to hospital.

Comment. There was a clear failure of communication with the school health service on the part of the paediatrician. In addition, the headmaster did not consult the school medical officer, who was not involved in the supervision of this child at any stage.

L.L. Epilepsy. Referred by the GP to a paediatrician at the age of 7 years with attacks suggestive of petit mal. She continued to be seen regularly at the out-patient clinic, and it became clear that she had a severe form of epilepsy with Jacksonian and major convulsions. She was also thought to be mentally retarded. She had been in foster care in a family group home since the age of 4 years and was likely to remain there until the age of 16 years. There were two admissions to hospital at 7½ and 8 years for control of frequent convulsions. A copy of a discharge letter to the GP giving the clinical details, was sent to the Medical Officer of Health following one of the hospital admissions, but not other communication took place between the hospital and community health and education services at any time. At 8½ years, her epilepsy was still not well controlled despite treatment with three anticonvulsants, and according to her foster mother, her behaviour had deteriorated. She thought, however, that her school work had not recently been affected. A visit to the GP was arranged (as part of this study), and it was learnt that the GP had not seen the child for two years and was not aware of any recent changes in her behaviour and epilepsy. On further inquiry, the school medical officer had only seen her on one occasion at school entry, and was not aware of any difficulties at school. Her teacher, however, reported that her behaviour was deterioriating and she had stopped learning. Whilst these inquiries were being made the head teacher arranged,

independently, for a psychological examination to be done by the educational psychologist, who then wrote to the paediatrician asking for further information about the epilepsy, and suggesting that she ought to go to a special school. This was deferred following a discussion between the paediatrician and the psychologist, and with the approval of the teachers, in order to see whether an improvement in the control of the convulsions could be achieved with more intensive medical treatment. If was also felt that she was happily settled at her present normal school, and that a move at this stage might be very disturbing to her. It was arranged by the paediatrician to hold a case conference with all concerned in order to plan more effective supervision of the child in the future.

Comment. Before the inclusion of this child in this study at the age of 8½ years, neither the general practitioner, nor the school medical officer had been actively involved in the supervision and management of this child, and communication between the paediatrician and the school health service had been inadequate. It will be necessary for the paediatrician to continue long-term supervision in view of the severity and deteriorating nature of the epilepsy, and to work in closer collaboration with the GP, school health and educational services, to ensure the most effective care of this child.

J.B. 'Choking attacks': Previous infant death. Admitted to hospital with his mother at the age of 3 months following a consultation between the GP and the paediatrician. There was considerable concern about the baby, who was said to be having 'choking attacks', because of the loss of a previous baby about 1 year ago as a result of an unexplained 'cot death'. It was clear that the baby was entirely normal, but that both parents were naturally very worried. The hospital medical social worker interviewed the mother on the ward during the admission and commented that the events following the death of their first baby were playing an important part in the parents' lives. They lived on a modern housing estate, and following the baby's death, the attitude of their friends and neighbours changed, in that they were clearly frightened and ill at ease with these parents and began to avoid them to such an extent that the mother felt an outcast in the community. She now had no friends and there was no support from the immediate family, who did not live in the area. Following a discussion with the GP and health visitor, it was decided to try and introduce them to a young mother with a baby, living on the estate, with whom she could make friends, and the health visitor undertook to do this.

Comment. The hospital social worker provided invaluable information essential to the management of this family.

Proposals

1. All consultant paediatricians should have a basic training in the assessment of growth and development, and a fuller training in child and family psychiatry and the work of the community health, education and social

services, in order to meet more effectively the needs of children who have 'community' problems, in addition to the clinical conditions which brought them to hospital.

2. There is a need to develop a more comprehensive system of defining the family and community as well as the clinical aspects of a case. 'Problem-oriented' records should be developed in order to facilitate the recording of information which is necessary to ensure appropriate and comprehensive care for children in hospital and the community.

3. When community problems requiring further management are identified, direct and personal communications should take place with the community services and clinical responsibility be transferred when appropriate.

4. There is a need for some consultant paediatricians to work in the community as well as the hospital services, in order to acquire the knowledge and experience to advise about the care of children who require continuing community as well as hospital care. These include children with complex medico-social problems as well as those with chronic mental or physical handicaps. Such consultants would have more intensive experience of the disciplines mentioned in 1 above.

5. The follow-up of babies from special care baby units should be the responsibility of a doctor closely associated with the clinical work of the unit, because the nature of the neonatal illness and the management need to be well understood. In addition, parents are most likely to be helped to adjust to and recover from the stress of the baby's illness by those who have been associated with the neonatal care.

When appropriate, there should be direct communications with the community child health clinics as well as with GPs.

6. Hospital medical social workers should remain as integral members of paediatric clinical units in order to develop the special expertise required for this work. They should be associated with these units on a long-term basis in order to develop an effective professional partnership primarily with consultant paediatricians, but also with other members of the hospital team.

3. Consultant community paediatricians

Conclusions

1. The proposal of the British Paediatric Association that 'effective integration of paediatric services in hospital and in the community require the development of a new type of consultant paediatrician with experience and skills in both areas of work' (3), can be supported by the experience and information obtained during this experimental consultant paediatrician/ senior medical office project.

2. There is also a need to develop an effective professional partnership between health and community social services at a clinical level.

3. With the appointment of specialists in community medicine (child health) who will have mainly administrative duties, it will be necessary to have appropriately trained and experienced consultant paediatricians to

advise and participate in the clinical care of individual children and their families who are in need of continuing community as well as hospital care.

4. At present, the majority of consultant paediatricians do not have the training or the time to provide effective community as well as hospital care for children with chronic handicaps and others with complex medico-social problems.

5. There is a need for continuing research into the social and community aspects of child care.

Proposals

1. The child health services of the area health authority should include an establishment of one or more consultant paediatricians with clinical responsibilities in the community as well as the hospital services.

They should be called consultant community paediatricians and they should have an extensive knowledge of child development and clinical childhood illnesses, sufficient understanding of and contact with child psychiatry, social work and education, and a thorough knowledge of community services and how they may be applied. It would enable them to apply an informed clinical approach to human problems and therefore make an important contribution to the welfare and care of children.

3. Their work should include educational and advisory as well as clinical functions.

(*a*) *In the community.* To work in consultation with GPs in group practices, community child health services and area social services teams, in order to promote a better professional partnership between these services and provide advice about preventive and curative child care in the community.

To develop a close working relationship with the specialist in community medicine (child health)

To have consultant clinical responsibility for certain children with chronic physical and mental handicaps and some with complex medico-social problems.

To take part in the training of GPs, community medical officers, health visitors and social workers in child care.

(*b*) *In the hospital.* To advise on the diagnosis and management of children who have family and community problems, and to advise on the most effective use of community health, social, and education services. The association of consultant community paediatricians with hospital services should not diminish the role of social workers; on the contrary, they should be able to strengthen their role and promote a better understanding and use of the available social services by all concerned with the care of children.

There is a particular need to develop 'problem-oriented' records which indicate family and community problems as well as the illness that brought the child to hospital. Consultant community paediatricians would be in a strong position to promote such a development.

Consultant community paediatricians should have clinical responsibilities

in the out-patient clinic, and on the wards, for children with acute illnesses as well as others with chronic mental and physical handicaps and complex medico-social problems. This is necessary not only to maintain a high standard of clinical competence but also to promote the education of all those concerned with the care of children in hospital, including junior doctors, medical students, and nursing staff, in the social and community aspects of paediatrics, and in order to develop an effective partnership with them. The proportion of time allocated to hospital work will depend on the needs of individual clinical units, and could be of the order of five sessions in the hospital (including out-patient clinics and a session in the assessment centre) and six sessions in the community services.

4. *Training.* Consultant community paediatricians should have a comprehensive training in clinical paediatrics in the hospital service in addition to the social and community aspects of child care. An appropriate training programme will need to be set up and this should be the responsibility of medical schools with established departments of child health and social medicine.

There should be opportunities for all to take an active part in the care of children in the community at an early stage of hospital paediatric training. Provision should therefore be made during the senior house officer/registrar period of training for experience in the community health, social and education services.

Later, during the senior registrar stage, there should be opportunities to develop a special interest in community care, with provision of research facilities, and a comprehensive training in child development, child psychiatry, social work and community child care, for those who intend to pursue this work.

5. *Research.* Consultant community paediatricians should take an active part in research into the social and community aspects of child care.

6. *Consultant community paediatricians and the school health service.* Although this study has been mainly concerned with community services for children of preschool age, there have been opportunities to observe the work of the school health service in relation to children of school age, who presented at the hospital with a variety of medical complaints.

It is our strong impression that the amount of work in relation to the school health service is so great and the type of knowledge and experience so relatively specialized, that it would be difficult, if not impossible, for a consultant community paediatrician to assume these responsibilities in addition to those outlined above.

Obviously, it is desirable to maintain continuity of care for children whose problems are detected before school entry. On the other hand, it is clear that additional expertise is needed in relation to many problems that arise for the first time at school, such as learning difficulties, truancy, adolescent problems, and occupational guidance, many of which have a medical component. A further period of training in this field will be required if doctors are to play a useful part, and it may be that some consultant paediatricians will need to specialize in educational health.

Case-histories

These are intended to illustrate the management of a representative sample of children who were under hospital as well as continuing community care during the two years of this research project.

They demonstrate the additional contribution that can be made to the care of children as a result of being in a position to assume clinical responsibility, as a consultant paediatrician, in the community as well as in the hospital services.

M.C. Hiatus hernia syndrome. Family problems. This baby, with a birth weight of 2,500 g, was born at a gestation of thirty-six weeks by emergency caesarian section following an antepartum haemorrhage. Regular respiration was not established until two hours after birth and he had apnoeic attacks with cyanosis, convulsions, and evidence of renal tubular necrosis from which he made a complete recovery. Mother required massive blood transfusions and developed serum hepatitis.

The hospital medical social worker had come to know the mother during the antenatal period and visited the home after the birth. She reported that the preparations for the baby were adequate; also, that there was much marital disharmony, and that the father was a schizophrenic and 'irresponsible'. She suggested to the mother that she should visit her GP 'if she felt depression getting the better of her'.

The baby was discharged home from the special care nursery at the age of 5 weeks, having apparently recovered from the perinatal complications. The mother looked after him satisfactorily in the mothers' room in the nursery for a couple of days before taking him home, and the health visitor was alerted on discharge. Arrangements were made to follow his progress in the follow-up clinic at the maternity hospital.

The following problems then arose: there were feeding difficulties, vomiting, and excessive crying, suggestive of a hiatus hernia syndrome. The mother had to be admitted to hospital for a short period of investigation during which it was found that she had recovered from the serum hepatitis. The father looked after the baby during this time. He then became increasingly depressed, lost his job, and began to spend most of the family's money on betting. Mother also became increasingly anxious and depressed and unable to cope with the baby and the housework.

The health visitor had visited the home frequently and, with the approval of the general practitioner, arranged for an early consultation at the maternity hospital follow-up clinic.

The baby was then 7 weeks old and the following actions were taken by the consultant paediatrician. The baby was admitted to hospital without mother. A consultation with the health visitor and GP took place at the surgery, where it was decided to seek further psychiatric advice for the father, to treat mother's depression, and to enlist the help of the community social services. It also became clear that mother had been quite unable to cope with the baby and, according to the health visitor, had not made adequate

preparations at home, and had very little knowledge of how to feed and care for him.

In hospital, the diagnosis of hiatus hernia syndrome was confirmed. No other abnormalities were found on full investigation, and the baby, apart from his restlessness and failure to thrive, appeared to be developing normally.

A case conference was then arranged by the consultant paediatrician, with the area social services team, the health visitor, and the GP. It was decided to provide a home adviser and a social worker to undertake long-term supervision of the family. It was also arranged to follow the baby's progress at monthly intervals at the local community child health clinic rather than the maternity hospital follow-up clinic, because this was much more convenient for mother, and because the GP did not have a regular child health clinic for children of the practice. It was also felt by the GP that the clinic medical officer was better equipped to assess the child's growth and development. It was decided to review the position again in six weeks time.

Arrangements were then made by the paediatrician to see the baby with the medical officer at the first visit to the clinic, in order to hand over responsibility for supervision and ensure that the clinic staff, which included other health visitors, were fully aware of this family's difficulties. Regular reports were to be sent to the maternity hospital follow-up clinic.

The father's psychiatrist was also contacted to ensure that he was aware of all the problems.

Since then, the baby has started to thrive and is developing normally, and mother has learnt to cope much better at home. Her health has improved, she has become more independent, and has taken a part-time job in the evenings. The father has seen the psychiatrist and attempts are being made to persuade him to attend a day-centre and to find him a job. Mother has clearly responded to the help and support that is being provided jointly by the health and social services. The clinic medical officer has reported regularly on the baby's progress, which was satisfactory.

Later, when the baby was 9 months old, mother decided to apply for a full-time job because she felt that her marriage was breaking up and she wanted to become more independent. A discussion took place between the paediatrician, the health visitor, the social worker, and the home adviser about the arrangements that would need to be made for looking after the baby. The father was not responding to psychiatric treatment; he was still not working and clearly could not look after the baby. It was provisionally arranged to admit the baby to a day nursery when the mother begins work. It would then be necessary to transfer responsibility for medical supervision to another medical officer responsible for this nursery.

At the age of 1 year, the baby was seen at the maternity hospital follow-up clinic for a formal review of growth and development. He was then thriving and developing normally.

Comment. In order to try and help this family, it was clear that there was an overriding need for someone to take responsibility for ensuring that all aspects of comprehensive care had been considered and to co-ordinate the activities of the health and social services in the hospital and in the community.

It seemed appropriate for the consultant paediatrician already responsible for following the baby's progress after a complicated perinatal period to undertake this task, because of his commitment to and close link with the community health and social services.

J.I. Asthma. Between the age of 2½ and 4½ years, there were thirty-four visits to the out-patient clinic and four admissions to hospital with severe wheezing. In view of the severity of his handicap, he started treatment with intramuscular ACTH at 2 years 10 months. His attacks were often precipitated by respiratory tract infections and sometimes by emotional upsets, and it was found necessary to continue with ACTH on a long-term basis despite the introduction of 'Intal' (sodium cromoglycolate), which he was able to take successfully from the age of 3 years.

He comes from a very good home and his parents are intelligent, professional, people.

It became apparent that his parents had become increasingly dependent on the hospital for support and advice, and although their GP was a highly respected member of a well-organized group practice, within easy access of their home, they no longer sought his advice on numerous occasions when the child was unwell.

It was therefore arranged to see the parents and the child in consultation at the GP's surgery with a view to helping them to accept their GP as the person to consult in the first instance during an acute illness, or for advice about general management. By this time, the child had remained well for several weeks and it was intended to transfer some responsibility for long-term follow-up from the hospital to the GP.

A full discussion took place at the surgery, including a consideration of the problems of long-term corticosteroid treatment and the management of acute attacks, and it was agreed that the GP should see the child regularly at two-monthly intervals and that a further review should be undertaken jointly with the paediatrician at the surgery six months later.

During that time, there were few serious attacks. He settled well at school, and it was possible six months later to decide to wean him off ACTH. A discussion took place with the GP about the possible use of a 'Becotide' (beclomethasone dipropionate) inhaler as a substitute for intramuscular ACTH, should there be any serious relapse.

By this time, the parents had fully accepted their GP as the doctor concerned with the primary care of the child. It was arranged for the GP to review his progress regularly at three-monthly intervals and for the paediatrician to see him at the hospital follow-up clinic in one year's time.

Comment. It was possible by means of a direct approach to the GP to come

to a satisfactory arrangement for the long-term care of this child, and help the parents to do away with their exclusive dependence on the hospital services.

The consultation at the surgery had the effect of stimulating a lively discussion on the management of children with asthma in general, and was much appreciated by the GP who, despite a succession of letters following out-patient visits, did not have a clear appreciation of some aspects of the management of this condition.

D.W. Mental subnormality. She was referred to the hospital out-patient clinic at the age of 9 years by her GP for a second opinion, because her parents had been unable to accept the fact that she was mentally handicapped and in need of special education.

They had been informed by means of a standard letter that she had been examined by the school educational psychologist who had recommended a move to a special school. Although discussions had taken place between the class teacher and the parents about the lack of progress at school, the parents did not fully understand the implications and did not have an opportunity to discuss these with the educational psychologist or the school medical officer. They had also consulted their GP who had been unable to give them a reason for their child's handicap.

At the hospital, no specific cause for the mental subnormality was found on further investigation.

A visit to the school for a discussion involving the school medical officer revealed that, although her behaviour was somewhat disturbed, she had settled in well and was making some progress. The school medical officer had only seen the child on one occasion at school entry for a routine medical examination, and the parents had visited the school on only one occasion during the previous twelve months.

It was arranged to see the parents at the special school with the school medical officer. A full discussion took place with an explanation of the nature of her problem. The parents had been wondering whether she might benefit from speech therapy, but this was thought not to be indicated. They were also encouraged to visit the school as often as they wished and they were told of the special help that was available later, when she would be ready to leave school and seek employment.

Three months later, it was learnt that the parents had been back to the school to see the teachers; they had come to accept the situation and were able to take an active interest in her progress at school.

Comment. It was possible to help these parents most effectively, after the visit to the hospital, by means of the direct contact and joint consultation at the school with those responsible for the child's education and welfare.

A.S. Ventricular septal defect. Baby for adoption. This baby had been in the care of a foster mother from the age of 1 week. Her mother was unmarried aged 16 years, and did not want to keep the baby.

At about 3 weeks of age, she developed heart failure and came under the care of a paediatric cardiologist who suspected that she had a ventricular septal defect. She responded well to medical treatment.

The foster parents decided that they would like to adopt the baby.

At the age of 5 months, further paediatric advice was sought by the community social services. They had obtained a report from the paediatric cardiologist about the baby's condition, but they did not understand the full implications of the findings, in particular the long-term prognosis, and felt unable to proceed further with the adoption without more specific information.

It was arranged with the paediatric cardiologist to send a further report which gave a more specific opinion as to the prognosis and the likelihood of the need for further special investigations, such as cardiac catheterization, and the possibility of a future operation.

Despite a more specific and detailed report, it was still found necessary to explain to the social workers the implications of the findings.

In addition, a comprehensive assessment of growth and development was made. The baby was progressing normally and it was decided to proceed with the adoption.

Comment. This case arose out of the contact that had been established with a particular area social services team during the course of the study. It illustrates the need for close collaboration between child health and social services, and the special paediatric advice that is sometimes required by the social services.

G.D. Henoch-Schönlein purpura. Social, family and educational problems. There were two admissions to hospital in the space of three months, at the age of 10½ years, with Henoch-Schönlein purpura and transient signs of nephritis during the second admission.

During the first admission, it was noted that the home conditions were poor, and the hospital social worker commented that the family were in financial difficulties, that mother was on probation for illegally re-connecting the electricity meter and that the probation officer was co-ordinating help and supervision of the family.

During the second admission, three months later, it was clear that there had not been any improvement in the family's circumstances and it was suspected that there were also educational problems. The family was then referred by the paediatrician who had been responsible for G.D.'s hospital care for further investigation and management during the course of this study.

The following actions were taken:

A home visit was arranged with the health visitor who knew the family well. The facilities for bringing up a family of four children aged 12, 10½, 7, and 3 years were quite inadequate. The basic amenities for cooking, washing, and sleeping were almost nonexistent; the house and lavatory were in a poor state of repair, lighting and heating were defective, and there

was little room for the whole family to relax. The house and backyard were very dirty and no effort had been made to keep them tidy. It was learnt that mother was under treatment for depression and spent very little time at the house; she preferred to stay at her mother's house. The father had been chronically unemployed and was under treatment for a suspected stomach ulcer. As far as the other children were concerned, the 12-year-old sister had a chronic suppurating otitis media which was associated with some deafness, and marked psoriasis affecting the trunk and legs; both of these conditions required treatment. The 7-year-old brother had intermittent nocturnal enuresis. It was also disturbing to find that the three children of school age had not been attending school regularly for some time; the parents were not able to give a reason for this, other than that they had not been well.

The GP was consulted and he commented that 'they were never out of the surgery', and had complained of a whole variety of relatively minor medical and psychosomatic symptoms.

The children went to two different schools, and a visit to these schools was arranged. It was found that the school medical officer had not seen the children other than at school entry, and had not at any time been consulted by the teachers.

The eldest child's headmaster commented that she had hardly been to school at all during the previous six months. A variety of reasons were given. He had visited the home and been told by the father that she was unhappy at her present school, where in fact she had been making good progress. It turned out later that she was embarrassed about her appearance due to the psoriasis, but it was also apparent that her mother wanted her at home to help her with the housework.

G.D.'s headmistress commented that she had been worried about him for some time because he had seemed to be unwell, and listless, and had been complaining of abdominal pain. He had missed a great deal of school during the previous eighteen months, but had usually caught up with the work because he was 'quite bright'. She felt that the main reason for his poor attendance was his association with a boy who was often absent from school and who came from a well-known 'problem family' who lived in a self-contained flat in the same house as G.D. As far as his 7-year-old brother was concerned, he was making good progress at school although he had also been absent on many occasions. The headmistress stated that she had recently drawn attention to the family at a meeting of the area social services co-ordinating committee which was attended by the family's health visitor and the school medical officer. It was decided at this meeting, that the health visitor should find out more about the family, but no decision was made about further social help, because the family was already under the care of the Probation Service which was responsible for the supervision of his mother.

A case conference was then arranged with the probation officer, the area social services director and the health visitor, during which it was decided to make a further urgent attempt to rehouse the family as a top priority. The

area social services director also agreed to help with debts and to guarantee the rent for a year. An attempt would also be made to get all the children to the same school, and, if necessary, make special arrangements for someone to take them there in the mornings.

With the approval of the GP it was decided that the medical supervision of the children should, for the time being, be undertaken by the consultant paediatrician who was also working in the community, in order to ensure that the children were effectively treated and followed up in close collaboration with the other health and social services who were trying to help the family. The eldest child's psoriasis and ear infection were treated. G.D. had a further relapse with a purpuric rash and abdominal pain and it was arranged to see him at home rather than in hospital because the parents had failed to keep hospital appointments in the past.

The school medical officer was also put in the picture and it was arranged that any new problems that might arise at school would be promptly reported to the paediatrician.

Comment. It was apparent that the existing GP, school medical officer and hospital-based paediatrician had been unable to ensure the provision of comprehensive medical care for the children of this family.

The admission of G.D. to hospital with an acute illness provided us with a further opportunity of trying to help this family. As a result of a continuing commitment in the community as well as in the hospital services, it has been possible for a consultant paediatrician to provide more comprehensive medical treatment and ensure that the community health and social services were fully aware of all the problems, and were working together for the benefit of the family.

P.H. Failure to thrive. Social problem. This baby was admitted to hospital with her mother at the age of 4 months, following a visit to the home by the health visitor, who had found that she was underweight, that the home conditions were poor and that mother was not looking after her properly.

The mother, aged 18 years, came from a well-known 'problem family'. She was unmarried and had a life-long history of deprivation and ill-health. At the age of 6 years, she sustained severe burns when her nightdress caught fire and she spent the next few years in and out of hospital. She had numerous plastic operations and was left with severe deformities and contractures, involving the whole of her trunk, neck, upper arms, and legs. During these years, her education suffered considerably and she is now almost illiterate. In addition, she became severely emotionally disturbed. At the age of 7½ years, she was placed into the care of the local authority because her parents had refused to allow her to have proper medical treatment and were unable to care for her. She spent the next eight years in and out of various foster homes and a long-stay children's hospital. She did not settle anywhere, and later became so embarrassed about her appearance that she began to avoid all company. There is no prospect of marriage with the

father of the child, who is an epileptic and has been described by a psychiatrist as a psychopath. In fact, when he learnt of the pregnancy he refused to see her any more and this resulted in a severe reaction on the part of the mother who threatened to take her life, and had to be admitted to hospital for several weeks with severe depression.

She was, at the time of the baby's admission to hospital, living in a single room at her father's house under very poor and quite inadequate conditions. Her parents had separated and her father was chronically unemployed.

In hospital, a full investigation did not reveal any illness to account for the baby's failure to thrive and although she was in a dirty, neglected condition on admission, there was no evidence of deliberate injury.

During the next four weeks, it became increasingly clear that mother was quite unable to look after the baby on her own. Despite the constant motherly support and advice of the nursing staff, the baby failed to gain weight adequately when mother was solely responsible for her care.

A case conference was arranged at the hospital with all those who had been concerned with the care of the family. As a result, the following factors came to light.

The social workers agreed that, although the family had been under the care of the community social services for many years, it had not been possible to materially improve their way of life and alter their poor environmental conditions.

The GP and health visitor had found it impossible to ensure that mother was providing adequate care for the baby, and the health visitor felt that it would not be possible to provide adequate supervision in the future, because mother seemed to be incapable of responding consistently to any advice that was given.

The psychiatrist who had looked after the mother during her depression commented that she was mentally subnormal, illiterate, and severely emotionally disturbed, and would be unlikely to be able to lead an independent life with her baby without a great deal of help and support.

The hospital medical and nursing staff felt that mother was not able to provide the basic needs of the baby without constant reminder and supervision. She also had to be reminded about her own personal care. It was noted that she had continued to meet the father of the baby and it was feared that she might become pregnant again. It was suggested that she should be fitted with an intra-uterine contraceptive device. She refused to accept this advice but did agree to take the contraceptive pill. As far as the baby was concerned, she was thriving and developing normally, whilst mother was being closely supervised by the nursing staff.

As a result of these discussions, it was decided to apply for a court order in order to place the baby in the care of the local authority. In the meantime, an effort would be made to find a suitable foster home for *both* mother and child. This was unfortunately unsuccessful and during that time, mother had made a provisional arrangement to stay with friends who were willing to give her and her baby a home. This was a young married couple with a 2-year-old boy whose father was the brother of P.H.'s father.

It was thought, as a result of a further social investigation, that these arrangements would not be satisfactory, particularly on a long-term basis, and the application for a care order went ahead.

This was not successful, although the court accepted that the child was in need of care and protection. Instead, an order was made that mother could continue to look after her baby, provided that she continued to live with her friends for the next three years.

On leaving hospital, arrangements had to be made to continue the medical supervision of mother and baby. A new GP and health visitor were found for them and arrangements were made for her to attend a nearby community child health clinic where the GP's health visitor could also see them. Arrangements were made for mother to continue with oral contraception and for the baby to be seen regularly at monthly intervals in the out-patient clinic, in order to make an objective assessment of the baby's growth and development.

During the next four months, the situation deteriorated because mother found it increasingly difficult to live with her friends; there was friction between them in relation to the housework and mother's lack of initiative in looking after herself. She was spending an increasing amount of time at her father's house, was again depressed, and found it more difficult to look after herself, and the baby.

As far as the baby was concerned, she continued to thrive, but we were considering a further application for a care order. In the meantime, it had been arranged for mother and baby to be readmitted to hospital, as an emergency, in the event of a breakdown in the arrangements for their care.

It had not been possible up to then to make provisions for the future welfare of the mother. It will be necessary to provide her with sheltered employment and if possible some further education.

Comment. This case-history illustrates the many difficulties associated with the care of children of families with complex medico-social problems. The existing health and social services are ill-equipped to deal with these problems and it is clear that there is a need for an additional contribution by someone who is able to ensure the continuing medical supervision of the baby, and co-ordinate the care provided by the health and social services.

It has been shown in this case, that this can readily be undertaken by a consultant paediatrician with responsibilities in the community as well as in the hospital services, and it is suggested that this is a most appropriate way of meeting the needs of these families.

Chapter 4

Summary and suggestions

The reorganization of the administration of the National Health Service has provided a unique opportunity for the development of a co-ordinated com-

prehensive health service for children. A prerequisite for such a development is a reappraisal of existing services to determine where changes might effect an improvement in the quality of care provided. This report has described such an appraisal of hospital and community services for children in Newcastle upon Tyne.

Our findings have demonstrated significant defects and gaps in these services. Although the study has been confined to Newcastle, the fact that these defects have been demonstrated in a centre with a long-standing interest and record of achievement in the social and community aspects of paediatrics suggests that the lessons we have learned may well be of wider application.

There is a clear need for the primary health care team of GP and health visitor to assume greater responsibility for the preventive aspects of child care. We are convinced that this important aspect of paediatrics should, if the necessary conditions can be met, become an integral part of the services provided by GPs.

Since GPs have not so far been ready to take on this work to any great extent, it will be necessary to maintain this service without reliance on GPs for an appreciable further period of time. During this time much can be done to promote the development of preventive paediatrics within general practice.

The attachment of health visitors to group practices has already stimulated greater interest in this work. Vocational training programmes and short courses in child care are being developed.

There is already a wealth of experience available in the community child health services. We believe that many medical officers at present working in these services would welcome an attachment to group practices to continue this work, and that many GPs would also welcome this arrangement. The precise form of attachment could vary. Some medical officers could become integral members of the practice on a full-time basis; others might have more limited responsibilities on a sessional basis. This could be an important step in the development and integration of preventive paediatrics in general practice.

The preventive child health services which must for the present remain the responsibility of the community health services should be strengthened. The medical officers concerned should have a comprehensive training in child health and care. Their role should be modified to include responsibility for the treatment of children whose parents have sought their advice.

There is a particular need, especially in the poorer parts of cities, to develop an effective partnership between the community health and social services. Already some child health clinics are sited in the same building as the area social services headquarters, and these arrangements should be extended. In addition, some medical officers could be appointed in close association with local social services teams in selected areas, in order to make the maximum contribution to the care of socially deprived children and to avoid the overlap occurring at present.

The importance of the contribution of the medical officers in the community child health services should receive fuller recognition. In our view, provided they have the necessary training and experience in child health, they could be appropriately called 'community paediatricians'.

Among children admitted to hospital, a proportion of those with acute illnesses have significant community problems that affect their total management; many with chronic mental and physical handicapping conditions require continuing expert community care. There is a clear need for the hospital paediatric services to improve communications with the community health services, to improve their understanding of the long-term needs of children and their families and of the community services that are available to help them, and to develop a more effective partnership with community social services in the care of families with complex medico-social problems.

In the course of this study we have become increasingly aware of the limitations of existing services for children, particularly for those with community as well as hospital problems. We are convinced of the need for a new approach. We therefore endorse the view expressed on behalf of most paediatricians by the British Paediatric Association that 'a new kind of paediatrician with experience and skills in both areas of work' is required (3). We have suggested that they be called 'consultant community paediatricians' and that each area health authority with a medical school should include an establishment of one or more such consultants.

It is apparent that future consultant community paediatricians will need a firm foundation in clinical paediatrics and, in addition, will require comprehensive training in child development and social and community paediatrics, and appropriate training in child psychiatry. We have suggested that medical schools with established departments of child health and social and community medicine should take a lead in setting up the appropriate training programmes. The future consultant community paediatricians will clearly have an important role in the teaching of students, of paediatric trainees, and of members of the allied health professions, and also in research in the wide field of social paediatrics.

So far we have based our proposals on the special needs and responsibilities of a university centre such as Newcastle. The needs of regional paediatric services will also have to be considered. It has been suggested by the British Paediatric Association that 'the provision of at least one partner for each consultant district hospital paediatrician will make possible the beginning or extension of consultant involvement in the community child health services' (3). We would endorse this view on the understanding that a second consultant paediatrician in a district would bring to the service a greater measure of special skill in relation to social and community paediatrics. However, in the district, where full clinical responsibility will ordinarily be shared between two paediatricians we would visualize, initially at least, a lesser degree of specialization in community and social paediatrics than in university centres where the demands of teaching and research will be substantial.

In the course of this project, it has been possible on a limited scale to try out the role of a consultant community paediatrician. It seems right to emphasize that it has proved interesting and exciting work with substantial rewards offered by the opportunity to play an active and perhaps more effective part in helping families with some of their most difficult problems.

Appendix

Table 1. Survey of the work of health visitors in the community child health clinics of Newcastle during a two-week period in June 1973. Reasons given by 1,093 mothers for visiting the clinic.

Reasons given for visiting the clinic	*Number of children Age-group (months)* 0-6	7-12	13-24	24+	*Total*	*Percentage of all 1,093 children*
For weighing*	447	219	107	64	837	77
Feeding advice	162	54	13	7	236	22
For a birthday check	–	17	41	39	97	17†
For advice about a medical problem	83	44	28	21	176	16
For immunization††	28	36	39	51	154	14
For advice about growth and/or development	38	16	20	22	96	9
To buy food or vitamins	9	3	–	3	15	1·4
For advice about a social problem	3	4	2	4	13	1
For advice about a maternal problem (eg anxiety, depression)	6	5	2	–	13	1
To play in playgroup	–	–	–	4	4	0·4
For advice about family planning	3	4	3	–	10	0·9
Miscellaneous	13	12	7	4	36	3

*This provides an opportunity for discussion about the child's growth and development, during which reassurance and advice is often given by the health visitor.

†Out of a total of 579 children aged over 6 months.

††These children had for various reasons not been immunized at the regular monthly immunization sessions held in the clinics.

Note. More than one reason was often given.

Table 2. Survey of the work of medical officers in the community child health clinics of Newcastle during a two-week period in March 1973. Reasons given by 343 mothers for consulting the clinic doctor.

Reasons given for consulting the clinic doctor	*No. of children Age-groups (months)* 0-3	4-12	13-24	24+	Total	*Percentage of all 343 children*
Birthday check	–	23	31	28	82	41*
For a health check	70	11	–	–	81	24
Skin problem	21	18	7	6	52	15
Immunization†	1	13	19	12	45	13
Respiratory infection	11	16	5	5	37	11
Feeding problem	16	12	3	1	32	9
Vomiting and/or diarrhoea	9	5	6	6	26	8
Eye problem	3	4	4	1	12	4
Orthopaedic problem	1	1	5	4	11	3
Behaviour problem	–	2	2	7	11	3
Developmental problem	–	3	2	1	6	2
Social problem	–	4	–	3	7	2
Maternal problem (eg anxiety, depression)	5	1	–	–	6	2
Speech problem	–	–	–	–	4	1
Miscellaneous	19	17	8	3	47	14

*Percentage of 200 children aged over 6 months.
†These children had not been immunized at the regular monthly sessions.
Note. More than one reason was often given.

*Table 3. Survey of the work of health visitors in the community child health clinics of Newcastle during a two-week period in June 1973. Number of previous visits to the clinic by 1,084 children.**

Age-group (months)	*Total no. of children*	*No. of previous visits* 0	1-5	6-10	11-20	21-30	31-50	Over 50
0-3	330	79	212	35	4	–	–	–
Over 3-6	184	8	72	64	36	4	–	–
Over 6-12	250	14	42	49	95	41	9	–
Over 12-24	162	4	15	33	59	28	17	6
Over 24	158	18	20	17	43	21	27	12

*In addition, nine children had attended clinics in other areas and their past records were not available.
Note. 165 (15 per cent) had attended a clinic on more than twenty occasions.

Table 4. Survey of the work of health visitors in the community child health clinics of Newcastle during a two-week period in June 1973. Proportion of children seen by their own health visitor. *

Age-group (months)	*Total no. of children*	*No. of children seen by their own health visitor*	%
0-6	514	116	23
Over 6-12	252	51	20
Over 12-24	162	31	19
Over 24	165	25	15
Total	1,093	223	20

*Attached to the children's GPs.

Table 5. Survey of the work of medical officers in the community child health clinics of Newcastle during a two-week period in March 1973. Communications from hospitals to child health clinics.

Total number of children who visited the clinic and were also attending hospital	26
Number with a record of a communication from the hospital	8* (31%)

*This consisted of a copy of a letter to the GP in four and a special letter to the clinic medical officer in the remaining four.

Table 6. Survey of 242 visits to one child health clinic in Newcastle by 159 children during 1972-3. Number of times that the GP had already been consulted about problems that brought the children to the clinic.

Problems	*Total no. among 242 visits*	*Known to have consulted GP*	%
Vomiting and/or diarrhoea	28	8	29
Respiratory infection	40	11	28
Rash	36	5	14
Feeding difficulties	25	3	12
Behaviour problem	25	1	
Worms	1	1	
Total	155	29	19

Table 7. Survey of 242 visits to one child health clinic in Newcastle by 159 children during 1972-3. Reasons given by 38 mothers for preferring to come to the child health clinic rather than the GP's surgery.

The child health clinic is nearer	8
No appointment is required at the child health clinic	10
The child is 'not ill enough' to see the GP	8
Strong preference for child health clinic*	18

* A variety of reasons were given:

The clinic doctor seems to have more time	(4)
The clinic doctor is a 'proper baby doctor'	(5)
The clinic doctor examines the child more thoroughly	(3)
The GP does not have a 'baby clinic'	(2)
Previous difficulties in communication and disagreements with the GP	(4)

Note. More than one reason was sometimes given. Although a specific question was put to all mothers attending the clinic, namely: 'Why have you come to the clinic rather than your doctor's surgery?', a definite reply was given by only 38 (24 per cent) out of 159 parents.

Table 8. Survey of GPs' child health clinics in Newcastle, May-September 1973.

Type of group practice no. of doctors	*Total*	*No. with a regular child health clinic session*
1	17	1
2	11	1
3	10	2
4	6	4
5	2	1
6	1	–
Total	47	9 (19%)

Note. 12 (11·5 per cent) out of a total of 104 GPs undertake to do a regular child health clinic session in their practice. 17 (16 per cent) are single-handed.

Table 9. Survey of GPs' child health clinics in Newcastle, May-September 1973.

	Nature of the work of the clinic			
Practice	*Health checks only*	*Medical complaints only*	*Both*	*Developmental screening examinations*
A	–	+	–	–
B	+	–	–	+
C	–	+	–	–
D	–	–	+	+
E	–	–	+	–
F	–	–	+	–
G	–	+	–	–
H	–	–	+	–
I	–	+	–	–

Table 10. Survey of GPs' child health clinics in Newcastle, May-September 1973. Reasons given by 53 mothers for visiting the clinic (7 clinic sessions surveyed).

Reasons given for visiting the clinic	*No. of children Age-group (months)* 0-6	7-12	13-24	24+	*Total*	*Percentage of all 53 children*
Respiratory tract infection	1	1	5	5	12	23
Immunization	4	4	2	1	11	21
Skin problem	6	1	–	3	10	19
Birthday check	–	–	4	1	5	15*
Health check	4	–	–	–	4	7·5
Vomiting and/or diarrhoea	3	1	–	–	4	7·5
Feeding problem	2	–	1	–	3	6
Behaviour problem	1	1	–	–	2	4
Miscellaneous medical problems	3	–	–	8	11	21

* Percentage out of 34 aged over 6 months.
Note. More than one reason may have been given.

Table 11. Survey of children who visited one community child health clinic in a poor area of Newcastle during February 1972 to January 1973. Visits to nearby area social services headquarters.

Total number of children who visited the child health clinic	159
Number who have also visited the nearby area social services headquarters:	44 (28%)
For the following reasons:	
Multiple problems requiring social casework intervention	17
For help with clothing, furnishings, financial help	21
For help with housing	3
For help with a marital problem	1
With a view to admission to a day-nursery	1
For help with a medical problem	1

Note. These 159 children paid 242 visits to the community child health clinic during the period of the survey. A social problem was identified in the clinic in only 10 (6 per cent) cases and a contact with the nearby area social services team was made in only two instances.

Table 12. Survey of children of preschool age born in 1968-70 who were on the Newcastle handicap/observation register. Clinical diagnoses of 67 children who were already under hospital paediatric care.

Mild mental subnormality	21
Severe mental subnormality:	
Down's syndrome	8
Others	11
Spina bifida	5
Hydrocephalus	3
Epilepsy	3
Cerebral palsy	3
Deafness	3
Blindness	2
Social deprivation*	2
Non-accidental injury	1
Partially sighted	1
Autism	1
Severe scoliosis	1
Language delay	1
Asthma	1

* An additional 11 children with chronic handicaps were considered to be socially and emotionally deprived.

Table 13. Survey of children of preschool age, born in 1968-70, who were on the Newcastle handicap/observation register. Actions taken by the Senior Medical Officer responsible for keeping the register in relation to 67 children who were also under hospital paediatric care.

Visited the child at home	15
Saw the child at a community child health clinic by special arrangement	15
Saw the child at the Newcastle Assessment Centre*	14
Arranged admission to a playgroup, day-nursery, or nursery school	31
Put on waiting-list for special school or special care unit	17
Contacted social services	5
Arranged family planning	3
Arranged physiotherapy at home	1
Contacted paediatrician	11
Contacted other hospital consultants	10
Contacted the GP†	3

* The Senior Medical Officer had a regular session at the Assessment Centre for children on the register, and had full access to its facilities.

† Although a direct contact with the GP was made in only 3 (4·5 per cent) out of 67 cases, the health visitors of all the children on the register were always contacted, and regularly reported on their progress.

Note. All the children attending a day-nursery or nursery school were visited regularly by the Senior Medical Officer.

Table 14. Survey of children of preschool age who were on the Newcastle handicap/observation register. Source of notification to the register of 67 children who were also under hospital paediatric care.

Health visitor	25
Copy of letter from paediatrician to family doctor	13
Paediatricians	9
By matron of day-nursery or teacher of nursery school during a visit by the Senior Medical Officer	7
Another community medical officer	2
As a result of a visit to the Senior Medical Officer's routine weekly child health clinic	2
The Senior Medical Officer already knew the family	3
Psychiatrist (in mental subnormality)	1
Uncertain	5

Table 15. Survey of a consecutive series of 211 children seen in the out-patient clinic during 1972-4. Additional social, family, emotional, and educational problems identified in children with a variety of medical complaints.*

Clinical diagnosis	*Total no. of cases*	*Additional problems*					
		Social	*Family*	*Emotional*	*Educational*	*More than one problem*	*Total*
Asthma	41	–	4	–	10	11	25(61%)
Epilepsy	37	2	3	3	3	15	26(70%)
Mental subnormality	27	4	9	–		4	17(63%)†
Respiratory infections	19	–	3	1	3	1	8
Diabetes mellitus	15	–	3	1	1	3	8
Limb pains/headache	10	–	1	–	–	4	5
Chronic constipation/ soiling	8	–	1	1	–	3	5
Feeding problems	8	1	3	–	–	–	4
Recurrent abdominal pain	6	–	1	1	–	2	4
Failure to thrive	6	–	1	–	–	4	5
Enuresis	5	–	1	1	–	1	3
Miscellaneous	29††	–	5	2	–	7	14 (48%)
Total	211	7 (3%)	35 (17%)	10 (5%)	17 (8%)	55 (26%)	124 (59%)

* Definition of additional problems

Social: Housing, financial, or other environmental problems.

Family: Marital, psychiatric, or problems in relation to other relatives (eg the elderly).

Emotional: Any indication of disturbed behaviour.

Educational: Poor progress and/or missing a significant amount of school.

† Excludes educational problems.

†† Includes: speech or language defect (4), urinary tract infections (2), ulcerative colitis (2), social deprivation (2), and one each with Henoch-Schönlein purpura, heart murmur, obesity, eczema, gastro-enteritis, naevus, traumatic haematoma, fibroma of hand, osteogenesis imperfecta, hydrocephalus, recurrent diarrhoea, coeliac disease, conjunctivitis, old rheumatic fever, anorexia nervosa, iron deficiency anaemia, ? non-accidental injury, anhydrotic ectodermal dysplasia, rickets.

Note. The relatively large number of cases of asthma in this series reflects a special interest in this condition by the professorial unit of the Child Health Department. Eleven of them had more than one problem, including an emotional problem.

Table 16. Survey of readmissions to hospital (Royal Victoria Infirmary and Babies' Hospital, Newcastle upon Tyne), 1965-71. Social, family, emotional, and educational problems recorded in addition to certain medical conditions that led to the admissions to hospital.

Clinical diagnosis	*Total no. of cases*	*Additional problems*					
		Social	*Family*	*Emotional*	*Educational*	*More than one problem*	*Total*
Asthma	27	–	1	4	11	5	21
Mental subnormality	16	2	3	–	7*	2	14
Congenital heart disease	15	1	1	1	–	–	3
Recurrent abdominal pain	8	–	2	3	–	2	7
Lower respiratory infections	8	1	1	–	2	1	5
Malabsorption syndromes	8	1	1	–	–	–	2
Epilepsy	7	–	–	–	1	1	2
Diabetes mellitus	7	–	–	3	–	–	3
Endocrine disorders	7	–	–	1	1	–	2
Liver disease	4	–	1	–	1	–	2
Failure to thrive	4	1	2	–	–	–	3
Osteitis	3	–	–	–	–	1	1
Ulcerative colitis	3	–	–	1	–	2	3
Total	117	6 (5%)	12 (10%)	13 (11%)	23 (20%)	14 (12%)	68 (58%)

* Only seven had reached school age.

Table 17. Survey of readmissions to hospital 1965-71. Detailed background information recorded during later admissions in children with additional problems recorded during the first admission.

Problems recorded during the first admission	*No. of children*	*Detailed background information recorded during later admissions*
Educational	10	7
Emotional	9	7
Social	3	2
Parental	9	3
Social and parental	8	4
Other mixed	11	10
Total	50	33 (66%)

Table 18. Survey of readmissions to hospital 1965-71. Communications from paediatricians to community services in relation to children with and without problems in addition to those that led directly to their admissions to hospital.

	Total no. of children	*Communication from paediatricians to:*			
		MOH or school MOs	*Health visitors*	*Teachers*	*Social services*
Children *with* other problems					
Educational	13	4	—	2	—
Emotional	15	3	—	2	—
Social	5	2	—	—	—
Family	16	5	3	1	2
Mixed	30	13	3	3	1
Total	79	27 (34%)	6 (8%)	8 (10%)	3 (4%)
Children *without* other problems	131	31 (24%)	4 (3%)	2 (1·5%)	1 (0·8%)

Note. There are no significant differences between the number of communications to the MOH, school MOs, health visitors, and social services in children with or without additional problems ($p > 0{\cdot}05$). A significantly greater number of communications took place with teachers in relation to children with additional problems ($p < 0{\cdot}05$).

Table 19. Survey of readmissions to hospital, 1965-71. Communications from paediatricians to the school health service in relation to children with educational problems.

Total number of children with educational problems*	28
Communications from paediatricians to the school health service following an admission to hospital or out-patient visit	11 (39%)
Nature of communications from paediatricians:	
A special letter to the Medical Officer of Health or school medical officer	7
A copy of a letter to the family doctor to the Medical Officer of Health	4

* Includes children with social and other problems.

Table 20. Survey of readmissions to hospital, 1965-71. Communications from paediatricians to the school health service in relation to eight children who were found to have a low Intelligence Quotient (≤ 80) or a marked discrepancy between verbal and performance quotients during a hospital admission.

	Age (years)		*Full-scale IQ*	*Communications from paediatricians to school health service*
D.M.	5¾	Mental retardation Spastic	<60	+
G.O.	5	Mental retardation	70	+
D.W.	14	Epilepsy	71	—
D.L.	13½	TB chest and kidney	79	—
C.S.	13½	Diabetes mellitus	80	+
J.D.	8½	Migraine	80	—
J.W.	5½	TB Meningitis	Verbal 138* Performance 95	—
A.R.	8¾	Asthma	Verbal 89† Performance 115	—

* The clinical psychologist commented on the 'extremely poor performance', and recommended further investigation and special schooling.

† The clinical psychologist commented that 'the low verbal IQ suggests that he is not keeping up in school and it might be as well to give him some extra tuitition'. No specific action was taken by the paediatrician in relation to these two children's education.

Note. All except D.M. (IQ <60) were at a normal school.

Table 21. Survey of children with perinatal problems who have attended a hospital follow-up clinic. Among Princess Mary Maternity Hospital births during May 1970 to September 1973.

Total number of children with perinatal problems who attended the follow-up clinic	130
Number of children who are also attending community child health clinics	95 (73%)

Note. Only 13 (10 per cent) are attending their GP's child health clinic in preference to a community child health clinic.

Table 22. Survey of 100 cases referred to the hospital social worker at the Royal Victoria Infirmary, Newcastle upon Tyne. January to December 1973. Problems identified by the social worker.

		Problems identified by the social worker				
Clinical diagnosis	*Total no. of cases*	*Housing*	*Financial*	*Marital*	*Severe parental anxiety*	*More than one problem*
Respiratory infection	18	5	1	—	2	7
Other infections	14	2	2	1	—	2
Failure to thrive	9	2	—	2	—	4
Mental subnormality	8	1	—	3	—	2
Abdominal pains	7	1	—	3	—	1
Congenital heart disease	6	—	1	—	—	—
Non-accidental injury*	6	2	—	—	—	3
Head injury	5	—	—	1	—	1
Miscellaneous†	27	2	1	6	2	6
Total	100	15	5	16	4	26

* Includes suspected cases.

† Includes: behaviour problems (3), social deprivation (3), haemophilia (2), enuresis (3), rheumatic fever (2), epilepsy (2), obesity (2), and one each of the following: hypsarrythmia, acute nephritis, feeding problem, accidental poisoning (turpentine), acute leukaemia, Henoch-Schönlein purpura, asthma, headaches, alopecia, febrile convulsions.

Table 23. Survey of 100 cases referred to the hospital social worker. Actions taken in relation to families in whom a problem had been identified.

	Problems identified by hospital social worker				
Actions taken by hospital social worker	*Housing (15)*	*Financial (5)*	*Marital (16)*	*Severe parental anxiety (4)*	*More than one* (26)*
Home visit	4	—	5	1	4
Health visitor contacted	4	1	4	1	10
Other social worker contacted	2	—	9	2	13
Inquiry to housing department	7	—	1	—	3
Payment of fares	—	2	—	—	3
Arranged to see again	—	—	4	3	3
Referred to community social services	1	1	3	—	5
Long-term support	—	—	5	2	5

* Twelve of these families were already well known to the community social services.

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THE SCHOOL HEALTH SERVICE AND THE SCHOOL DOCTOR

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Chapter 1

Introduction

The decision to transfer responsibility for the school health service from local education authorities to the revised National Health Service in 1974 will provide the first real opportunity to create an integrated system of medical care for children and young people in Britain for over fifty years.

Provided at present by a rather haphazard partnership of local authority, GP, and hospital services, the quality of care and its completeness depends more upon individuals, their attitudes, and their professional relationships than upon a clear definition of roles and responsibilities. While basically the local authority are responsible for prevention, GPs and paediatricians for cure and care, the margins are blurred.

The school medical service, established at the turn of the century primarily as a case-finding organization, rapidly became involved in the treatment (by the provision of a free specialist service) of the children whose medical needs it uncovered.

In a similar way, the maternal and child health service, although again primarily preventive, played a large part in the treatment of minor ailments in preschool children in the years before the establishment of the NHS.

Despite the provision at that time of a free GP service for each child, the work of the local authority clinics continued to expand. Parents appeared to make a choice between GP and child welfare clinic, and accepted the fact that if the child taken to the clinic required active treatment, it would have to be referred by the clinic doctor to either the practitioner or, with the practitioner's consent, to the paediatrician.

Accepting the undesirability and illogicality of continuing to provide two parallel systems of care, the Sheldon Committee report on *The Future of the Child Health Services* recommended that eventually all community care of preschool children should be concentrated in family practice, but that this should only be achieved when changes in the organization and training of GPs made it feasible.

Although the development of group and health centre practice, the attachment of health visitors and, above all, the acceptance of vocational training for general practice, are now creating the necessary climate, the universal adoption of Sheldon's recommendations are still far from practical. Although they are not yet capable of implementation, the principles of preschool child care have at least been established.

This is not the case for the care of the schoolchild for, while the decision to integrate the school health service in the reorganized NHS has been taken, the details of the method of integration have not yet been agreed.

The initial proposal of the Management Document was that the service should remain under the administrative control of the community physician. Although this may be expedient, it would maintain the separation which now exists and would leave the school health physician in a subordinate position in an administrative hierarchy. Although many of the current generation of community physicians began their careers in maternity and child welfare or school health service work, and are sympathetic to its aims, their promotion was effected by their transferring to an administrative role. Their successors, whose sole function will be administration, will not necessarily have this type of clinical orientation, and will be no more likely to be orientated towards child health than to any of the other clinical services.

If the care of children is to be integrated, it is essential for those who contribute to share a common administrative base, establish common clinical standards, and agree their respective roles and responsibilities. So that it may play an effective role in an integrated system, the functions of the school health service and its staff require re-definition.

The aim of child care has been defined by the WHO as to give each child the opportunity to achieve his full potential – in physical, emotional, intellectual and social terms. If this is to be achieved, each child must be assessed both as an individual and as a member of a group, so that appropriate care or treatment for any deviation from normal can be provided. It was essentially for this purpose that the school health service was created in 1907.

Although there have been many changes in the pattern of child health since then, the service has continued to conduct routine examinations of all children with the emphasis still upon the detection of physical abnormality.

While the most important of these examinations is that at school entry, many local education authorities also routinely examine children on two other occasions during their school career, despite the evidence that the second and third examinations are of relatively little value and are no longer statutorily required. As routine examinations are still regarded as one of the major purposes of the school health service and absorb a high proportion of the available time of its medical and nursing staff, they have a profound effect on the wider role the Service can play in any integrated system of child care.

In considering the future of school medicine therefore, it is necessary to

assess how valuable any of the routine examination procedures really are, and how many children who require special care they identify.

A major problem of this assessment, however, is the quality of the data on which it can be based. In 1968, for example, over 700,000 entrant, 600,000 intermediate, and 400,000 leaver examinations were carried out in England and Wales. The 'yield' in terms of 'defects per 1,000 pupils examined' ranged from 166 for entrant examinations, to 203 for intermediate examinations. The extent to which these defects affected the child's wellbeing, how many were already known to the GP, or how many were actively treated rather than referred for treatment, is not recorded. Perhaps of equal importance were those defects which remained undetected. Routine physical examination has been shown to be unreliable (Tizard *et al.*, 1970), and many known defects go either unrecognized or unrecorded (Asher). How profitable the examinations were in terms of improvement in child health is difficult to estimate.

The role of the school health service has been recently fully outlined (*The Health of the School Child* [HMSO, 1972]). Although at present it includes the medical review of children when they enter school, the report suggests that in the future the objective should be the reassessment in a learning situation of those children who have already had their major problems identified. Under these circumstances the role of the school doctor would be to assist the family doctor, the paediatrician, and others in the care of the individual child, a role for which the school doctor would need special knowledge, skills, and abilities. Although Warren and Cooper showed that about 20 per cent of local authority doctors possessed the Diploma in Child Health, and although the courses provided by the universities and by the Society of Medical Officers of Health are well supported, many school doctors have had no special training.

The future of the service must therefore depend on a definition of the needs of children and of the skills, knowledge, and working relationships of those capable of meeting them.

Plans for an integrated child health service must include proposals for an administrative framework, a series of job definitions for those who work within it, and an outline of their training requirements. As the Service must develop from its existing components, however, it seems sensible to examine these in as much detail as possible.

This report describes a study of three areas of the work of school doctors, and attempts to draw some relevant conclusions. The areas covered are:

1. The entrant medical examination and its follow-up.
2. The management of children referred for special investigation.
3. The work of the school doctor in a special school for the physically handicapped.

Chapter 2

The Entrant School medical examination

Aims of the study

1. To assess the current value of the conventional school entry medical examination:

(*a*) In terms of the defects identified by the examination itself.

(*b*) In terms of the evaluation of defects detected before school entry.

2. To assess the use made of existing and acquired information in total assessment.

3. To evaluate the management pattern of those children thought to require medical, social, or educational supervision.

4. To identify the strengths and weaknesses of routine examination of children and to suggest methods for improvement.

Methods

The population studied consisted of a 50 per cent sample of those children born in Newcastle upon Tyne during 1960 who, on 1 January 1970, were still resident in the city. The school health records of each of these 1,255 children were scrutinized and analysed. The study depended entirely upon recorded data (by the school doctor or school nurse) and upon other documentary evidence in the form of child welfare, health visitor, and immunization records and copy letters to and from hospital, GPs, or others.

The standard school health record consists of form M10, which is established as each child enters school and on which all medical information is recorded. The design of the form largely predetermines the function of those who complete it. Sections covering family history, previous medical history, immunization, social conditions, parental occupation, and vision and hearing, can be completed by the clerk or school nurse.

The doctor's responsibility is to complete a systematic checklist describing the full examination of the child, and to provide fuller clinical notes about any abnormality detected. The protocol used in completing the checklist consists of the following:

√ = no defect.
O = defect requiring observation.
T = defect requiring treatment.
RS = defect requiring reference to specialist.
RGP = reference to the GP.
PD = permanent defect not requiring action.

Without expanded clinical notes the interpretation of this summary column may confuse. Particular difficulty can be experienced in interpreting 'O' entries. Many minor defects require to be noted, although they do not require continuing surveillance by the school doctor. Often 'O' is used to record abnormalities of this type when the doctor is simply recording for future reference and has no intention of examining the child before the next routine inspection.

Other entries are also capable of misinterpretation: 'RS' for example is occasionally used to indicate that a particular problem is already under the care of a hospital specialist. 'T' may imply that treatment must be initiated; or that it has already been arranged. Throughout the study, therefore, all entries in the summary columns were qualified by referring to the expanded clinical case-notes. Interpretation of these case-notes and other available records, health visitors' cards, and hospital letters in particular, allowed us to make a subjective, but we hope impartial, assessment of the quality of the problems detected and their management. Evaluation was essentially functional, and was based upon an estimate of the severity of the defect recorded and its significance for medical, developmental, educational, and social well-being.

Results

A total of 1,255 entry medical records were examined, amongst which a total of 1,280 defects were recorded in the 'Summary findings' on form M10.

Table 1. Defects recorded by protocol.

O	Requiring observation	1,050
T	Requiring treatment	122
RS	Referral to specialist	83
RGP	Referral to GP	15
PD	Permanent defect	10
Total		1,280

Table 2 lists the type of defect recorded, and Table 3 their distribution among 1,255 children.

Table 2. Medical defects recorded.

Dental caries	343
Head infestation	36
Cleanliness	27
Nose, throat, otitis media	199
Vision and squint	129
Orthopaedic	102
Speech	58
Hearing	38
Undescended testis	35
Skin disease	70
Chest disease	42
Enuresis	46
Heart murmurs	24
Disorders of behaviour and stability	26
Fits and epilepsy	13
Others	92
Total	1,280

Table 3.

No. of defects	0	1	2	3	4	5	NS	Total
No. of children	458	417	236	88	23	7	26	1,255

Many of the problems recorded are within the remit of the school dentist or the school nurse. When these are excluded, the number of abnormalities is reduced to 874 and their distribution shown in Table 4.

Table 4.

No. of defects	0	1	2	3	4	5	NS	Total
No. of children	621	407	142	54	4	1	26	1,255

Thus, although on initial examination 70 per cent of children were found to be suffering from a detectable disorder, this fell to 50 per cent when problems of personal and dental hygiene were excluded.

Ultimately the number of defects reported is dependent upon the assessment each school doctor makes of individual deviations from normal, no matter how minor, and in particular upon the way he or she interprets these in the O-RS classification of the M10.

Each clinical record was therefore scrutinized carefully to assess whether each abnormality should be regarded as clinically significant, or whether it had been recorded for completeness or for further reference only. A substantial number of those recorded were regarded as not being of clinical importance.

In many categories a high proportion of the recorded abnormalities were not considered to be currently clinically significant. Fifty-three per cent of the defects of the upper respiratory tract, for example, appeared to have been recorded for the sake of completeness rather than action.

A high proportion of visual defects, however, and the great majority of abnormalities of speech and hearing were obviously of significance, as were the smaller but important number of physical abnormalities detected.

The total 'yield' of the entry medical in terms of 'hard' abnormality is represented, therefore, by the 'Clinically significant' column of Table 5.

The prevalence of abnormality at school entry which this represents, however, does not necessarily provide a complete picture of the pathology of early childhood. Many problems will have been identified by the preschool child health services, local authority clinics or GP, and only a proportion by the school doctor. In general, it is difficult to be certain how many of the abnormalities detected at school entry were previously known. Unless special arrangements for transfer of information from general practice or hospital exist, the school doctor must rely upon records accompanying the form M10: in particular the health visitor card, the child health clinic notes, any hospital letters, and the parental history at the time of examination.

On the basis of the information available to the school doctor at the time of the examination, it was possible to divide the defects into those detected before school entry and those detected at the entry examination.

Table 5.

Type of disorder	*Total recorded*	*Clinically significant*	*Clinically significant %*
Nose, throat, otitis media	199	93	46·73
Vision and squint	129	75	58·13
Orthopaedic	102	50	49·0
Speech	58	48	82·75
Hearing	38	30	78·94
Undescended testis	35	25	71·42
Skin disease	70	21	30·0
Chest disease	42	15	35·7
Enuresis	46	14	30·43
Heart murmurs	24	12	50·0
Disorders of behaviour and stability	26	6	23·0
Fits and epilepsy	13	5	38·46
Others	92	35	38·0
Total	874	429	49·0

Of those previously detected, a high proportion had been treated successfully, many in hospital. Despite early detection and treatment, however, almost half of these children still had clinically significant abnormalities on school entry.

Table 6. 'Already known' defects at 5-year examination.

Type of disorder	*Total 'known'*	*Referred to hospital preschool*	*Total still clinically significant at 5 years*	*Clinically significant %*
Nose, throat, and otitis media	25	13	16	64·0
Vision and squint	73	73	23	30·67
Orthopaedic	23	22	9	39·13
Skin	14	4	4	28·57
Speech	10	10	9	90·0
Enuresis	2	0	2	100·0
Chests	5	1	2	40·0
Hearing	7	5	5	71·43
Undescended testis	2	1	2	50·0
Behaviour	3	1	1	33·33
Heart murmur	8	8	4	50·0
Fits and epilepsy	6	6	4	66·67
Others	22	17	10	45·45
Total	200	161	91	45·0

Because of the shortcomings of the method of recording, it is probable that note was made only of the more serious problems detected during the preschool years. This is borne out by comparison of Tables 6 and 7. Although over 600 fresh defects were discovered at the entry medical, half of which we regarded as 'significant', only 58 (8 per cent), compared with 161

(80 per cent) in the 'known' group, required referral to hospital. Comparison of these findings is not therefore likely to be valid until an improved method of recording is devised.

Table 7. 'Fresh' defects at 5-year examination.

Type of disorder	*Total*	*Referred to hospital at 5 years*	*Total clinically significant*	*Clinically significant %*
Nose, throat, and otitis media	174	29	77	44·30
Vision and squint	56	3	52	92·86
Orthopaedic	79	11	41	51·90
Skin	56	1	17	30·36
Speech	48	0	39	81·25
Enuresis	44	2	12	27·27
Chests	37	2	13	35·14
Hearing	31	1	25	80·65
Undescended testis	33	1	24	72·73
Behaviour	23	0	5	21·74
Heart murmur	16	5	8	50·0
Fits and epilepsy	7	1	1	14·29
Others	70	2	25	35·71
Total	674	58	339	50·29

Referrals

Although following the entry medical a total of 429 children were regarded as suffering from a clinically significant defect, only a small proportion appeared to require further investigation or treatment. In the initial medical summary 83 were categorized as RS (referred to specialist) and 15 RGP (referred to GP). Further scrutiny showed that some of these entries related to earlier referral and a total of 80 children were actually referred as a result of the school entry medical, 58 to specialists and 22 to their GPs. In addition 54 children were referred by the school doctor to specialist colleagues within the school health service itself ('internal referrals').

The distribution of problems dealt with in these ways is shown in Table 8.

External referrals

In the absence of copy letters to or from the GP it was impossible to make any judgement about the quality of GP referrals or their management, but although letters were not sent to the school doctor after every hospital consultation, correspondence was sufficient to enable us to assess the specialist's opinion of each of the referred children and of the action taken. This is summarized in Table 9.

Only 8 of the 54 (14 per cent) children seen in hospital therefore were not regarded by the specialist as having an abnormality, and 39 (72 per cent) had disorders which required surgical or medical treatment.

Table 8. External referrals.

	To specialist	*To GP*
Nose, throat and otitis media	29	7
Cervical adenitis	1	1
Hearing defects	1	0
Knock knees	5	1
Flat feet	4	3
Other orthopaedic problems	2	0
Cardiac murmurs	5	0
Respiratory infection	2	2
Squint	3	0
Miscellaneous (enuresis, undescended testis, fits)	6	8
Total	58	22

Internal referrals

Historically the school health service has been responsible for ensuring the provision of specialist care through the employment of its own consultants. With the inception of the NHS this diminished, but continues in some specialties, particularly ophthalmology. In our study 32 internal referrals to the ophthalmologist were made following the entry medical. At the age of 6, routine vision testing identified 142 children who required further investigation, and a further 5 were referred by the school doctor. Of the total 147, visual defects were confirmed in 73; 45 were regarded as normal; and 29 (20 per cent) failed to attend. The other internal referrals consisted of 14 children with hearing loss, 5 referred for speech therapy, and 3 for physiotherapy.

Table 9. Hospital activity.

	Number of defects seen in hospital	*Investigation of treatment*	*Operation*	*Parents advised*	*Nothing abnormal detected*	*Did not attend*
Skin	1		1			
Squint	3	3				
Nose, throat and adenitis	30	9	13	1	5	2
Hearing	1	1				
Congenital heart	5	4				1
Bronchitis	2	1		1		
Developmental	1	1				
Undescended testis	1				1	
Orthopaedic	11	2	1	5	2	1
Enuresis	2	2				
Fits	1	1				
Total	58	24	15	7	8	4

Continuing care by the school doctor

One of the major problems of the school doctor has been to decide the extent of his responsibility for supervision of children with defects. In our

study, of the 1,280 defects recorded, 406 were regarded as being within the remit of the school dentist or were referred to the school nurse.

Although 455 were categorized as 'For observation', they were clearly not regarded as being clinically significant and were thus not seen again by the school doctor. The remaining 429 however included the 134 referred for further advice, and those whose abnormalities appeared to us to require continuing supervision.

In common with many other local authorities, most 9-year-old medical examinations are now conducted on a selective basis. Children identified as having potential difficulties by teachers, school nurses, parents, and doctors are examined at that time. It must be assumed, therefore, that children not referred for specialist or GP opinion remained the responsibility of the school doctor, and would be seen again before then.

Although no common pattern is laid down for follow-up examination between 5 and 9 unless a specific note 'To be seen again at nine years' is made, Observation or 'To be seen again' implies review before the 9-year-old examination. We scrutinized each record, therefore, to determine whether follow-up of significant abnormalities had occurred, and by interpreting the expanded clinical notes and by reference to letters to and from the hospital, made some assessment of the quality of management by the school doctor of the problem identified at school entry.

Table 10. Defects requiring action.

		Opinion of action			*Reason for unsatisfactory opinion*	
Notes by school doctor	*Total*	*Satis-factory*	*Unsatis-factory*	*Follow-up*	*Letters from MO*	*Letters to MO*
'Defect noted', 'Parent advised', or 'Referred to nurse'	123	84	39	38	1	1
Recorded as 'To be seen again'	92	59	33	33	0	0
Internal referral	53	44	9	0	2	9
Referred to GP	14	9	5	0	1	5
Referred to hospital specialist	57	49	8	2	2	6
Already known	90	67	23	18	3	5
Total	429	312	117	91	9	26

Management was considered completely satisfactory in 312 (72 per cent) of the 429 children with 'significant' abnormalities. When it was not satisfactory, 'failure to follow-up' by the school doctor was the principal reason. For example, 33 of 92 children, specifically stated 'To be seen again' were not.

Correspondence with GPs, hospital specialists or colleagues within the school health service itself was often inadequate. In nine cases letters written

by the school doctor were unsatisfactory or absent, and in twenty-six instances reports from the specialist or GP to whom the child had been referred were missing: if indeed they had ever been sent. From the records therefore it would appear that the management of approximately one-quarter of the clinically significant abnormalities was less than satisfactory, largely because of a failure to follow up on the part of the school doctor, but also because of poor communication with specialist or GP. Whether these inadequacies affect the total well-being of the child or his educational pattern requires to be established. Some of the more important clinical abnormalities were studied in an attempt to clarify the point.

Cardiac murmurs

Twenty-four children were recognized at the age of 5 as having cardiac murmurs. Eight of these had been identified before school entry: two by child welfare clinics, four by the GP, and two by unrecorded doctors.

At school entry it was decided that twelve of the murmurs were not clinically significant and did not require further observation. Two of the remaining twelve were seen once more by the school doctor, when it was decided that they were 'not significant'. Six of the remaining ten were referred for specialised opinion (although there was no record that an appointment was actually made for one). Although the other four were noted 'For observation' they were not seen again until the age of 9 despite the fact that one was known to have proven congenital heart disease, and another, already under hospital care, was later to have cardiac surgery.

Of the six initially detected at school entry and referred to hospital, a first letter acknowledging the referral was received by the school doctor for five, but further letters for only two, despite the fact that one was subjected to surgical treatment. Of the five who visited hospital, only two were reviewed by the school doctor before the age of 9. At the 9-year-old examination all but two of the twenty-four were reviewed.

It seems therefore that although initial detection of murmurs is regarded as the proper function of the school doctor, referral to a specialist implies transferring total responsibility. This appears to be accepted by both school doctor and specialist, for after the initial letter little follow-up information was forthcoming. Although by clinical criteria, management may have been satisfactory, in the absence of up-to-date medical information the school doctor was not in a strong position to advise the teacher or those responsible for the child's care in school.

Speech defects

While cardiac murmurs are a traditional focus of medical concern, speech disorder is less readily detected by a short conventional physical examination. Of the 58 speech defects recorded, interpretation of the expanded summary suggests that 13 were in the 'To note only' category. Another 23 were followed up by the school doctor and at that time regarded as functionally important, but 14 who were to have been reviewed were not. Eight were

referred for speech therapy, of whom 2 were treated. A third, who was to have been treated, failed to attend, and there was no record of communication between the speech therapist and the school doctor for the remaining 5. At the 9-year-old examination, 33 of the initial 58 were reviewed, and 5 were considered still to require therapy, although it was impossible to assess any educational impact their defect may have had.

Undescended testis

Of the 35 boys with undescended testis at the age of 5, one was referred to a paediatrician immediately. Seventeen were followed up during the next two years by the school doctor; 10 of these were regarded as normal. During this time an additional boy was referred for surgery by his GP.

At the 9-year-old examination, 34 of the original 35 were examined. Six were referred for specialist advice, and a further 5 kept under review.

Follow-up and management of undescended testis appeared to be excellent.

Social handicap

Less tangible than organic defect, but perhaps of potentially greater significance, are the social difficulties which many children experience. An attempt was made to evaluate the quantity and quality of social data recorded on form M10. For this purpose social difficulties were defined as one or more of the following: father unemployed; chronic illness of father or mother; parents separated for any reason; illegitimacy. It was found that in 8 per cent of cases, one or more of the records on which social data might be recorded (clinic and health visitor records) were missing.

Table 11. Social data.

No social problem	940
Social problems recorded on M10	92
Social problems recorded elsewhere	123
Records missing	100
Total	1,255

Thus, although even by these simple criteria 18·6 per cent of children were socially handicapped, the fact was recorded in the M10 for less than half.

The average number of physical defects in the socially handicapped group (1·06) was only slightly higher than that for the remainder (1·03), but some defects of infestation, personal hygiene, skin disease, and bronchitis were significantly more frequent. These children are thus at increased medical, as well as social, risk.

Summary

Conventional school entry medical examination of 1,255 children identified

1,280 'defects'. One-third of these were of personal hygiene or dental caries, and a further third regarded as not being of clinical significance.

The remaining 429 defects were categorised as actually or potentially significant, and 112 children were referred for further investigation: 58 to a hospital specialist, 22 to their general practitioners, and 32 to another member of the school health service.

Two hundred children were known at school entry to have had abnormalities detected during the preschool period. Most had been investigated or treated before school entry, but 91 were still regarded as 'clinically significant'.

The yield of the entry examination, therefore, could be regarded as a group of 112 children referred for specialist advice, including some with significant abnormality (cardiac murmurs for example), and a larger group of 317 whose health required supervision.

Management of these groups was regarded as satisfactory in 72 per cent of cases. Inadequate correspondence and failure to follow up were the most important reasons for an unsatisfactory verdict. Although social handicap is assuming increasing importance, it was not consistently recorded even when known to exist.

In our opinion, the structure and form of the M10 defines both the quantity and quality of the information it records and the activity of the school doctor. Although much detail had been painstakingly recorded, a considerable amount of important information was either missing or obscured.

If school entry examination is only designed to detect physical abnormality, it is reasonably successful. If its function, however, is to produce a profile of each child in total developmental terms, it and the system into which it fits must be dramatically revised.

Discussion

Whatever criticism can be made of the conventional school entry medical, it appears still to be achieving its primary objective of detecting previously unknown clinical abnormalities. On the evidence of our study, although the majority of children with significant defects had been discovered and treated during the preschool period, a substantial number were detected at school entry and referred for further investigation.

The first major criticism of the conventional entry medical examination is the lack of accurate existing clinical and social data available to the doctor or, if available, not provided in a readily assimilable form.

The second criticism is of failure by the school doctor to follow up children recognized as abnormal. This may be due to a variety of reasons, not least of which is the pressure to examine each school entrant within a reasonable period of time after arrival in school. The more significant cause, however, must be the traditional restriction of the role of the school doctor to that of primary detection, with no responsibility for treatment.

A third criticism of the entry procedure is that the emphasis is still upon clinical examination, at the expense of the assessment of emotional, social and intellectual development. It seems illogical that the school entry medical should duplicate examinations carried out by the preschool child health services, whilst neglecting observations of greater relevance to the child's future education.

Our observations suggest that all the abnormalities found at school entry could have been previously detected by GP or child health clinic. If the majority of abnormalities could be excluded in this way, school entry would be regarded as a time for total developmental review rather than for clinical examination.

A review of this type would require a reorientation of the existing system, with a change in emphasis towards team work and increased reliance upon the co-ordination of existing information about each child before school entry. The review could consist of three phases:

1. *Co-ordination of background information provided by:*

(*a*) Parental questionnaire.

(*b*) Health visitor report.

(*c*) Child health clinic notes.

(*d*) General practitioner report.

(*e*) Hospital reports.

Although potentially unwieldy, the collection of this information will be assisted by the increasing attachment of health visitors to general practice, and by the assumption by many general practitioners of preschool child health supervision. Co-ordination would be the responsibility of the health visitor and, if necessary, the practitioner could be paid a fee for the completion of a brief report on each child.

Accurate information about illness provided by GP and hospital would supplement developmental detail provided by health visitor and child health clinic, and a complete, or partial, profile of each child would be created, supplemented where possible by additional social or psychological reports.

This method would divide the entry into two groups:

(*a*) Those children whose profile was complete, and whose development and care could on existing information be regarded as satisfactory.

(*b*) Those whose profile was incomplete, or who, because of items in the history or because of parental concern, require further examination.

2. *The second phase of the entry procedure* would be a series of screening tests conducted in school by a formal partnership of school nurse and teacher. As all infant and nursery class teachers inevitably make informal assessments of each of their entrants, there seems little reason why the entry routine should not formalize this contribution by including tests of co-ordination, comprehension, speech and social function, of the type suggested by Whitmore (1973).

The nurse would carry out parallel screening tests of height, weight, dental health, cleanliness, vision and hearing, and it would only be after the information from health visitor, child health clinic, GP, hospital, school nurse,

parents, and teacher had been collated that the school doctor would become involved.

3. *Clinical examination of school entrants* would be conducted purely on a selective basis. Those who were not in any of the risk categories, whose preschool assessment was regarded as adequate, and who completed the screening process satisfactorily, would not be formally examined by the school doctor, although the doctor would be available to parents and teachers who wished to discuss the development of an individual child.

Only those children whose preschool assessment was regarded as inadequate, whose history suggested potential problems, or who failed any of the screening tests conducted by the teacher or nurse would be examined.

The success of a system of this type could create more medical time, which would be devoted to the further examination of those children whose development was in doubt, or whose preschool assessment had been incomplete. By delaying the medical contribution until the stage at which all available existing information had been collected and screening tests completed, the doctor's role would become much more specialized and specific.

Implications

Very precise demands would be made on all involved in a routine of this type. Success would depend fundamentally upon the acceptance by teachers, school nurses, and screening technicians of a formal role in appropriate aspects of developmental assessment. A definition of the techniques to be used would have to be made, and appropriate training provided. A close partnership between all of those involved would be essential.

The quality and co-ordination of records would be critical and preschool data, provided by GP and health visitor, particularly important. A consolidated record for each child could be created, although the confidentiality of some information might create theoretical difficulties.

The implications for the school doctor would be considerable. An effective partnership with the nurse, teacher, and educational psychologist, and fruitful collaboration with family practitioners, paediatricians, and others, could only be based upon expertise in clinical and developmental paediatrics. If these aims are to be achieved, the school doctor too would require specific training for his or her role.

Chapter 3

Children with specific problems at school

While routine examination of children, and referral of those with clinical problems to GP or specialist, is an independent activity of the school doctor (and is recorded entirely on the form M10), it is usual for the smaller number of children who have problems with substantial educational implications to

be referred to the Senior School Medical Officer. In our study these children were identified through the special files maintained in the central school health service office and we found, during scrutiny of these records in 1970, 178 children (of approximately 3,000 children born in Newcastle upon Tyne during 1960) who represented the significant problems within the total initial population. Table 12 specifies the problems involved.

Table 12.

Educationally subnormal or ineducable	84
Maladjusted	16
Physical handicap	32
Multiple handicap	15
School absence	31
Total	178

Referral procedure

As the Senior School Medical Officer has a statutory responsibility for handicapped children from the age of 2, and as some abnormalities are more readily detected than others, referral may occur at almost any stage of development and by a variety of agencies.

Table 13, in which these categories have been subdivided, illustrates the fact that particular abnormalities are recognized by particular agencies.

Educationally subnormality is recognized primarily by school-teachers. A remarkably small proportion of these children were detected during the preschool years by either the child welfare service or following referral to a hospital specialist. In contrast, the smaller number of severely subnormal children were more likely to be recognized by the preschool child health services and referred to the school health service before school entry. Exceptions were two children, subsequently found to be severely subnormal, recognized only on entry to infant school; and five others: one referred to the school health service by the parents, three by an assessment unit or hospital specialists, and one by the special services division of the education department.

The majority of maladjusted children were referred by paediatricians, psychiatrists, or by the special services division, and only a small number by teachers or school doctors.

Most of the children with mixed intellectual, emotional, or physical handicaps were referred by hospital specialists or head teachers, and only when physical handicap predominated did the school doctor or child welfare service play the major role.

School absence, for which the special services division is responsible, accounted for 17 per cent of all referrals.

Table 14 illustrates the age at which children were referred. The educational and medical problems of thirty-five, including the more heavily handicapped, were considered before the age of 5. The number of maladjusted and absentees increased with age. Delay in referring children with educational subnormality is obvious. Thirty-two of the seventy children

Table 13.

		Referral to school health service by							
Group	*No.*	*Parent*	*Head teacher*	*M & CW*	*Hospital specialist*	*Cerebral palsy assessment centre*	*Special services division*	*School Medical Officer*	*Outside source*
Educationally subnormal	70	—	63	5	2	—	—	—	—
Severely subnormal	14	1	2	7	2	1	1	—	—
Maladjusted or 'mentally disturbed'	16	—	2	—	7	—	5	1	1
Multiple: educationally subnormal and maladjusted	6	—	4	—	2	—	—	—	—
Educationally subnormal and physically handicapped	9	—	—	—	5	1	1	1	1
Physically handicapped	32	1	2	5	6	2	3	9	4
School absentees	31	1	1	—	—	—	29	—	—
Total	178	3	74	17	24	4	39	11	6

ultimately assessed as ESN were not referred until they were over the age of 8, when they had been in school for at least three years.

The majority of referrals to the Senior School Medical Officer were therefore of educationally subnormal children referred by head teachers. With one exception, only those children with a physical handicap were referred by school doctors themselves, and it appears, as we have seen, that the school entry examination is not particularly effective in identifying any other than this group.

Table 14.

		Age at initial referral (years)							
Group	*No.*	*0-3*	*3-4*	*4-5*	*5-6*	*6-7*	*7-8*	*8-9*	*9 and over*
Educationally subnormal	70	–	–	5	1	7	25	18	14
Severely subnormal	14	2	3	6	3	–	–	–	–
Maladjusted or 'mentally disturbed'	16	–	–	–	1	4	1	3	7
Multiple: educationally subnormal and maladjusted	6	–	–	–	–	1	–	1	4
Educationally subnormal and physically handicapped	9	1	–	4	–	2	–	–	2
Physically handicapped	32	–	5	9	6	3	5	3	1
School absentees	31	–	–	–	4	7	8	11	1 NR
Total	178	3	8	24	15	24	39	36	28

Educational subnormality

Although the 'ascertainment' of handicapped children is the responsibility of the Senior School Medical Officer, assessment is increasingly conducted on an interdisciplinary basis. The records of these seventy children contained letters of referral, teachers' reports, educational psychologists' reports, the form 2HP completed in part by the school doctor, reports from specialists and, in many cases, a report by the social services department of home conditions. After admission to a day or residential school, copies of psychologists' reports and school reports were also included. Copies of the statutory letters to the parents, and of the formal recommendation for special schooling presented to the education committee, were included and in fifty-four cases a copy of this letter was sent to the GP. It was uncertain from the records whether this had been done in seven cases, and in the remaining nine it appeared that the GP had definitely not been informed.

Decisions were not always made at the first medical assessment. A measure of the efficiency of the service or the difficulty of assessment may be the time required for ascertainment and placement (see Table 15).

Two of the four children whose assessment took over six months to complete were too young for complete examination when first referred; one failed to attend appointments; and in only one case was any delay preventable, due to a misunderstanding in correspondence.

Table 15. Educational subnormality.

No. of children	*Interval between referral and medical assessment (months)*			
	Under 1	*Under 3*	*Under 6*	*Under 12*
70	24	32	10	4

The majority of recommendations following medical assessment were for ESN day-school placement (Table 16), but because of the high level of demand for places, admission was rarely immediate (Table 17).

Table 16. ESN placement by Senior School Medical Officer.

Total no. children	*Day-school*	*Residential school*	*Deferred*
70	58	3	9

Table 17. Interval between referral to Senior School Medical Officer and admission (months).

School	*No.*	*Under 1*	*Under 3*	*Under 6*	*Under 12*	*Under 18*	*Not placed*
ESN day-school	58	–	3	17	29	7	2
Residential school	3	–	–	–	1	–	–

For two-thirds of ESN children there was a delay of six months or more from first referral to the SSMO and admission to special school, although older children tended to be admitted more quickly.

Assessment increasingly involves several individuals, in particular the teacher, the educational psychologist and a school medical officer. Table 18 lists those mainly involved in the recommendations and the number of occasions each child was seen.

Table 18.

Authority	*Number of consultations*				
	1	*2*	*3*	*4*	*5*
Head teacher	59	2	2	–	–
M and CW	5	–	–	–	–
Hospital specialist	2	–	–	–	–
Educational psychologist	43	18	7	–	–
MO	43	3	–	–	–
SSMO	25	3	–	–	1
Special services	32	–	–	–	–

In the majority of cases the intellectual assessment was made by an educational psychologist, and the school doctor completed only the actual medical examination. In almost one-third of the cases, however, the assessment was made by the SSMO alone. It appears that whether completing the full examination or only the medical component, the school doctor is less

likely to be involved in repeated consultation than the educational psychologist.

Follow-up information was obtained approximately one year after assessment from educational psychologists' progress reports.

Not all the children had been admitted to ESN schools, or had been long enough in a school to be reviewed. Of the forty-four who had however, all were considered to be correctly placed.

Management

Critical assessment of the 70 records suggested that in 65 cases management was highly satisfactory. In five cases improvements were possible: in four there appeared to be unnecessary delay in assessment due to poor communication between medical and educational agencies; and in one there was a failure of follow-up by the medical service.

Once admitted to special school the medical aspects of educationally subnormal children are recorded in normal school medical records (M10), and are kept separately as they deal with day-to-day problems. They contain additional information about the role of the school doctor in management.

Fifty-three of the 70 records were immediately available. It was found that in 51 cases a full entry medical examination had been recorded, and that in several others additional examinations by the school doctor had also been undertaken. The fact that a statutory assessment had been carried out was noted in 26 cases, but in the other 27 only a routine medical examination had been recorded.

Table 19 indicates the total number of full medical examinations recorded for the 53 children during the period 1965-70. These include the entry medical, the statutory assessment examination (when recorded), and the 9-year-old medical examination.

Table 19.

Total cases	*Number of full medical examinations recorded in form M10, 1965-70*					
	1	*2*	*3*	*4*	*5*	*Over 5*
53	12	22	17	0	1	1

Defects were identified at the entry examination in 42 children. Particular attention was paid to those which might have a bearing on future social and educational development, in particular speech disorder and psychological difficulty. In 16 of the 53, abnormalities in these categories had been identified, but only 7 had been followed up by the school doctor.

In 35 instances the school doctor had referred children for further treatment: 12 to the ophthalmologist, 9 for hearing assessment, 4 for speech therapy, and 10 for miscellaneous problems: largely ear, nose, and throat disorders. Frequency of referral (66 per cent) was therefore substantially higher than in the 'normal' group of school entrants (8 per cent).

The health visitor's card was present in 44 of the 53 notes studied, and in 19 very definite social or developmental difficulties had been recorded. In 7 of the 19, no reference was made to these difficulties in the M10 completed at the time of the 5-year-old medical, and it is difficult to know whether their significance had been appreciated.

For both medical and social reasons the group of children ultimately assessed as ESN appear to come from a 'high risk' category. This is confirmed by the educational psychologists' reports, which show that 22 of this group of 53 children assessed as ESN had siblings who were already attending ESN schools. There was no recorded evidence that this fact had been appreciated by the school doctor at the time of the entry medical examination. At school entry a clustering of speech, psychological, and family difficulties should alert both the doctor and the teacher.

Severe subnormality

Of the 14 children in this group, half had been identified by the maternity and child welfare service, and all referred to the Senior School Medical Officer by the age of 6. Seven were mongols, one a gargoyle, one a hemiplegic, and five were unclassified. In the majority, referred while very young, complete assessment was usually delayed until educational placement became necessary. Two children, however, reached school at the normal age and were referred for examination by head teachers.

Table 20. Time from recommendation to medical assessment (months).

No. of children	*Under 1*	*Under 2*	*Under 6*	*Under 12*	*Over 12*
14	6	2	1	3	2

Seven were admitted to what was then the junior training centre within nine months of assessment, and at that time no further school health service records were maintained. Although some records were kept for these children in the junior training centre and, for those unsuitable for admission, in the mental health department, it was difficult to assess any further contribution the school medical officer made to their care.

Multiple handicaps

Children in this group were all 'educationally subnormal', but were divided into sub-groups associated with physical handicap and maladjustment.

Educational subnormality and physical handicap (9)

Only one of these children had been referred before the age of 4. The majority had not been medically assessed until the approach of school entry (see Table 14).

The physical handicaps from which they suffered were as follows:

Cerebral palsy	2
Congenital heart disease	1

Partial sight	1
Epilepsy	1
'Failure to thrive'	2
Burns	1

The initial assessment was undertaken either by a school medical officer or the Senior School Medical Officer himself, and the difficulty of the problems is illustrated by the multiplicity of the educational placements suggested. Two children were initially admitted to a school for the physically handicapped and later transferred: one to the blind school, and the other to a school for the ESN. Two others were seen on three occasions, when initial placements in an ordinary school and in the junior training centre were reviewed and transfer arranged to the school for the physically handicapped. A 'trial and error' technique appeared to be necessary for some. Although two were placed immediately in the school for children with cerebral palsy and another in the junior training centre, a subnormal child with epilepsy had not entered school, and one with burns was assessed by a total of six agencies, including school doctor, educational psychologist, and plastic surgeon, before a final decision to recommend residential special school was made.

This group of educationally subnormal children with physical handicap included four in whom there were substantial social problems, and illustrates the importance and difficulties of comprehensive assessment.

Educational subnormality and maladjustment (6)

All the records studied contained a full psychologist's and/or psychiatrist's report, and school placement was straightforward. One child had been admitted to an ESN day-school and five to residential schools. In five cases the social background was known to be relevant, and in two the file contained a review report which showed placement to be satisfactory.

Maladjustment (16)

The main records for children in this group were kept at the child guidance clinic, and only in the school health service when a request for a special investigation had been made directly to the Senior School Medical Officer. It appeared that twelve of the children who reached the child guidance clinic had been initially referred by the head teacher to the educational psychologist and thence to the psychiatrist. Twelve of the sixteen records studied contained the report of a psychiatric investigation carried out before the Senior School Medical Officer became involved in the problem.

It was only when placement in special school was considered desirable that medical assessment became necessary. This was carried out in a straightforward manner, except in one instance when a failure of communication between the school health service and a hospital specialist caused delay.

The remaining four of the sixteen maladjusted children were all referred by the special service division, three because of delinquency. One was

referred by the Senior School Medical Officer to a psychiatrist, who undertook assessment and treatment. In the other three, there were no psychiatrists' reports, although it appeared that there had been an intention to refer.

Management varied: one child was taken into care; placement decisions were deferred in three cases; and the parents refused further investigation in one case. Of those placed in residential schools, only four had a review report in their notes when the placement was considered satisfactory.

In eleven of the sixteen, there was a history of a disturbed social background. Three records had no social reports, and in only two were there no apparent social antecedents. The importance of the social history in routine examination is illustrated.

Physical handicap (32)

The physical handicaps encountered included:

Congenital heart disease	6
Bronchitis and asthma	5
Spina bifida	3
Cerebral palsy	3
Orthopaedic disorders	3
Hydrocephalus	2
Deafness	2
'Delicate'	2

together with six single cases of fibrocystic disease, arthritis, epilepsy, haemophilia, partial vision, and 'glandular fever'.

Of the 32 children in this category, no decision was taken about 6 at the first medical examination. One was never seen again, 4 were admitted to the school for the physically handicapped after further examination, and 1 was later recommended to continue in ordinary school. Twenty-five were admitted to the day-school for the physically handicapped, 13 after additional assessment by the medical staff of the school, and 12 without further examination. Of the 32 records, only 6 were not considered to be satisfactory, 4 because of lack of correspondence with relevant specialists.

Absentees (31)

A qualitatively different, but significant, group of 31 children formed the remainder of those from our original sample referred to the Senior School Medical Officer. This group were brought to the attention of the special service division because of repeated school absence. As would be expected, medical reasons were offered in explanation, and diagnoses included 'colds', skin infections and rashes in 13; asthma and bronchitis in 6; and tonsillitis and otitis media in 3. The school health service file contained the request for a medical opinion and an account of the examination. There was no note of previous illnesses or of the social background in the file, although the M10 would have been available at the time of examination.

Of the 31 children, 12 were regarded as having no significant medical problem and were recommended to continue at ordinary school. Five of these were referred on a second occasion, although 3 did not attend. One was found to be suffering from a chronic chest infection under treatment by his GP, and the fifth, with a chronic urinary tract infection, was recommended for home tuition. One child was recommended for admission to the physically handicapped school, but the parent refused.

Eight other children were examined; no decision was made at the initial appointment, and seven did not attend for further review. One was referred twice by the head teacher, and was subsequently assessed psychologically and admitted to an ESN school.

Ten of the initial group of 31 did not attend at all, and 7 were not referred again. One of the three who were referred again never attended; one, after two further failed appointments, was seen, referred to an educational psychologist, and ultimately admitted to a remedial class; and a third was eventually admitted to an ESN school.

This group is characterized by non-attendance: not only at school, but at medical examinations. Although non-attenders are difficult to reach, non-attendance is a complex social, medical, emotional, and educational problem. An accurate assessment of all the factors is required if the underlying problems are to be recognized and resolved.

Discussion

Approximately 6 per cent of the children born in Newcastle upon Tyne in 1960 were referred before the age of 10 for special assessment by a member of the school health service because of intellectual, emotional, physical, or social handicap.

The commonest of these handicaps was educational subnormality, recognized primarily by the teacher. Children with multiple handicaps were likely to have been investigated by a paediatrician before the problems of school placement were considered, and some children with emotional disorders had been referred directly by the head teacher to the child guidance service. Absentees were initially the responsibility of the special service division.

The school doctor was involved in the initial detection only of children with physical handicap, although a greater awareness of the associated 'risk factors' (and better family records) might have identified more of the ESN at school entry.

Despite the excellence of most of the records, it was often difficult to determine which section of the school health service held itself primarily responsible for continuity of care. It was also difficult to assess the degree and quality of communication between the professions. It appeared that for all categories other than physical handicap, the educational psychologist was more likely to provide continuous care than the doctor.

While it seems necessary for each member of the team to maintain individual records, a single dossier should contain a complete clinical,

educational, and administrative summary for each child, and should indicate who is primarily responsible for providing continuity of care.

While the multidisciplinary nature of assessment was illustrated, the relatively late involvement of the school doctor or Senior School Medical Officer was striking, and often appeared to have been motivated only by the need for formal medical ascertainment. The high prevalence of physical and sensory abnormality among the intellectually handicapped, and the frequency of social and emotional problems among the absentees, emphasized the complexity of these problems and the need for closer teamwork and earlier medical consultation.

The respective roles of school doctors and psychologists therefore, and their relationships with teachers, psychiatrists, social workers, and GPs still need much clearer definition, for functional stratification of the professions perpetuates the possibility that complex problems will continue to be dealt with in an unintegrated way.

The further development of multidisciplinary teams is indicated, with the development of a much closer working relationship between the school doctor, the educational psychologist, and the social worker; and with much more effective communication between workers in hospital and in the community.

The implications for the school doctor are again those of developing increased expertise in clinical paediatrics, child psychiatry, medical sociology, and in the areas of knowledge of colleagues with whom he must work more closely.

Chapter 4

The physically handicapped child

Although the school doctor has an increasingly important role to play in the care of all handicapped children, it is in the area of physical handicap that the most dramatic changes have occurred within the past decade, and where the most pressing medical need exists.

Pendower Hall School in Newcastle upon Tyne is typical of an open-air school which has had to adapt rapidly to the changing pattern of physical handicap in childhood. Opened almost fifty years ago to care for the 'delicate' child, it remained virtually unchanged in population until ten years ago. Within the past five years, however, the influx of children with congenital abnormalities (spina bifida in particular) has had a dramatic effect upon the school, its buildings, and its staff.

Without diminishing its primary role as an educational institution, the school has had to provide an increasing amount of medical and nursing care for children with a wide range of problems. The population of the school during three representative years is shown in Table 21.

Many of the children suffer from multiple handicap, and 25 per cent are regarded as socially deprived. Twenty-six per cent of the pupils travel

significant distances to school each day from other local authority areas, and a small group of twenty are resident, either as weekly or termly boarders.

The school is served by a nursing staff of one SRN, two SENs, three nursing helpers, three full-time and two part-time physiotherapists, three part-time speech therapists, and a visiting educational psychologist. Regular monthly visits are paid by an orthopaedic surgeon, and occasional visits by a paediatric surgeon, a developmental paediatrician, a child psychiatrist, and others whose patients or clients are pupils at the school. Boarders are on the list of a local general practice.

The role of the school doctor has become increasingly complex and varied over the years.

Table 21.

	1964	*1968*	*1972*
Spina bifida	7	21	33
Muscular dystrophy	6	13	14
Congenital heart disease	14	12	16
Cerebral palsy	7	12	12
Asthma	16	19	24
Bronchitis	21	4	0
Bronchiectasis	16	2	0
Epilepsy	4	5	6
Partially sighted	20	22	20
Speech	4	4	3
Cystic fibrosis	2	3	4
Perthes hip	3	7	4
Polio	3	1	2
Cerebral tumour	0	3	4
Rheumatoid arthritis	0	1	3
Emotionally disturbed	15	17	12
'Delicate'	20	11	12
Accident	3	3	3
Other physical handicaps	26	31	18
Total	187	191	190

Admissions

Requests for admission may be made by the Senior School Medical Officer, individual school doctors, paediatric consultants, neighbouring local authorities, or parents themselves. As the complexity of children being referred increases, it is essential that all available information from a variety of sources is collected before the child is seen. Ideally, correspondence with the consultant(s), educational psychologists, GP, social worker and health visitor involved should be collected before the child and his parents are interviewed in the school setting.

Selection for admission involves all members of the staff, and before the ultimate decision is taken a child and his parents should meet those who are going to be concerned with his care: school nurse, physiotherapist,

speech therapist, teacher and, if residential, the housemother. An assessment of the emotional and social needs of the family must be made, time for for supportive discussion allowed, and occasionally reference to social work or psychiatric agency considered. Each referral for admission, therefore, involves the school doctor in clinical, social, educational, and therapeutic assessments, and expenditure of a minimum of one to one-and-a-half hours. Frequently a complete assessment is only possible after a home visit has been paid, or after the child's problems have been discussed with one or more of the specialists involved.

Because of an increasing shortage of special school places, and because education in a normal setting is desirable wherever possible, the admission procedure must be regarded as of vital importance, particularly as it may be the first time during the child's life at which all the factors concerned with his past health and future development are considered together. The work of the school doctor involved in this routine is a product of the number of children considered for admission each year. In recent years admissions have fallen from an average of sixty to forty, but the number of children seen has remained constant.

As the complexity of the handicaps of children entering special schools for the physically handicapped increases, it is not always possible, even with a careful admission routine, to make a correct decision within a short assessment period. While the creation of district and regional assessment centres will add precision to initial assessment, the needs of many children will only be identified after a period of observation in the school itself. The nursery and infant classes of special schools must work increasingly in partnership with the staff of the local assessment centre, and in this setting the school doctor should play an increasingly important co-ordinating role.

Management

Table 22 illustrates the fact that the heavily handicapped children in Pendower Hall School are being actively treated by the partnership of school doctor, school nurse, and physiotherapist. The efficiency of the nursing staff in managing incontinence appliances, dealing with trophic lesions, dispensing medicine, administering injections, and dealing with the numerous minor and major crises of everyday school life, determines to a large extent the amount of time each child can spend in the classroom.

Table 22.

	Nursing items per day		*Physiotherapy*
Condition	*Toilet*	*Therapy*	*items per week*
Spina bifida (35)	90	3	120
Muscular dystrophy (14)	42	2	24
Cerebral palsy (12)	4	0	26
Asthma (24)	0	15	36

Although each child in the school has his own GP and usually a consultant, the school nurse, and the school doctor must provide immediate

medical care throughout the day. The management of urinary tract infections, faecal incontinence, trophic lesions, Spitz-Holter valves, epilepsy, asthma, skin diseases, cystic fibrosis, and many other problems involves day-to-day supervision and a close link with the parents.

Physiotherapy is vital in the treatment of children with spina bifida, cerebral palsy, and other locomotor disorders. Until school entry many children attended hospital physiotherapy departments, often after prolonged journeys and usually for fairly short periods of treatment. One of the major advantages of a school for the physically handicapped is its ability to concentrate treatment resources. Pendower Hall School has a well-equipped physiotherapy department and hydrotherapy pool. The majority of the heavily handicapped children are the responsibility of one orthopaedic consultant who visits on a regular monthly basis and reviews, in collaboration with the physiotherapist, the school doctor, the appliance maker, and others, the progress of each child.

The amount of school time which this type of review and management saves is considerable, and once again provides the opportunity for the school doctor to continue the role of co-ordinator of clinical, social, and educational care. Because of the regular contact with orthopaedic and paediatric surgeons, the school doctor is able to deal with the inter-current problems of orthopaedic and surgical management in consultation with the physiotherapist and the nurse.

Other specialist colleagues involved in the care of children in schools of this type include child psychiatrists, educational psychologists, ophthalmic surgeons and speech therapists. Fourteen (7 per cent) children in Pendower Hall School were referred by the Department of Child Psychiatry. Many others whose major handicap is physical or sensory also have some degree of emotional disturbance. It is essential that care at home, in hospital, and at school is co-ordinated. This can only be achieved by close contact between school and the others involved. Joint consultation is desirable, and the most effective venue for case conference is the school itself, where the teacher who is in contact with the child more frequently than any of the other professions can be included in discussion.

Children admitted as boarders have particular needs. Admission may be for a variety of medical, social, or educational reasons, but is commonly because of the impracticability of daily travel. While admission as a day pupil is regarded as an important step, assessment for admission to the residential unit requires even more careful consideration. In particular, the emotional and social needs of the child and his parents must be considered. Frequent relaxed contact with the family is essential. It is vital that the parents have confidence in the house mothers, who in turn must be well-informed about the problems and needs of the child. Because so many of these needs are medical, the school doctor must be involved.

In addition to these more sophisticated functions, the school doctor and school nurse have the normal responsibilities for the control of infectious disease, general hygiene, infestation, and immunisation.

Review

Ideally, each child in a special school should be physically examined and completely reviewed each term. In Pendower Hall School there are fourteen classes, each with approximately fifteen children. A case conference involving the headmaster, the teacher, the school nurse, the physiotherapist, the house mother if the child is resident, the speech therapist if she is involved, and a social worker if relevant, should be held for each class. If the child is to be examined, and the medical aspects of management considered alone, this must be done beforehand. In many instances the case conference gives rise to further referral to specialist, psychologist, or social worker and, when appropriate, the conference should result in a consultation between at least one member of the team and the parent.

Discharge

There is general agreement that no child who is capable of being educated in a normal school should remain in a special school any longer than necessary. Because of the quality of the problems involved however, an increasing proportion of children in special schools must remain until school-leaving age. When it is possible to discharge a child to normal school, it is essential that the school to which he goes is aware of his handicap and his needs. Usually liaison will be effected by the head teacher, but frequently the school doctor must provide advice for the staff of the new school. Occasionally he may persuade the staff that they are capable of coping with a handicapped child of that type.

More commonly the problems of discharge are those of further training, employment, mobility, housing, and the whole field of social functioning. Here the school doctor must work closely with the existing members of the case conference team, but also with the careers advisory service, the industrial rehabilitation service, and frequently the social services department. Often at this stage the child will have ceased to be a patient of his paediatrician, and will have to be transferred to an adult physician, psychiatrist, or neurologist. It is vital that the GP remains deeply involved.

Workload

One of the major problems of assessing workload that this type of care creates is the Parkinsonian principle: it either expands to fill the available time or is compressed within it. The evolution of the problems of the heavily handicapped child, and the child with spina bifida in particular, has been so rapid that with notable exceptions there has been a consistent shortage of medical time and medical skill in the school setting. It is only therefore possible to estimate the amount of medical time which ideally would be provided in a school of this type, and in staffing the special school system as a whole.

In 1970 and 1971, 74 children were admitted to the school, 53 were discharged (including three deaths), 32 left at the age of 16, and 18 were transferred to other schools. On the basis of a one-and-a-half hour assessment

examination therefore, approximately thirty working sessions were devoted to admissions, and ten to children leaving or being discharged. If a clinical review of each child in the school on a termly basis were possible, this would involve a minimum of forty-five sessions and an equivalent number of sessions would be devoted to case conference.

On the assumption that parent counselling would be shared with other members of the case conference team, it would be reasonable to allocate fifteen sessions throughout the year to this function.

The management of routine admissions and discharges, and regular review, therefore requires the allocation of four sessions per week during the school term. The regular visits of the orthopaedic and paediatric surgeons, and the less regular visits of developmental paediatrician, paediatric neurologist, educational psychologist, ophthalmologist, child psychiatrist, and others, account for a minimum of a further session per week, so that the total allocation during school term should amount to five sessions per week. No allowance has been made for informal consultation with teachers and other members of the staff, for home or hospital visits, for consultation with medical colleagues, or for dealing with the frequent acute problems inevitable in the care of two hundred heavily handicapped children.

Teaching

The changes in the pattern of handicap in childhood have been so dramatic over the past ten years that it is essential for all involved in child care to be aware of the problems which handicap produces, and of the facilities available to meet them. An important function of schools of this type, therefore, is to inform and educate teachers, health visitors, school nurses, physiotherapists, medical students, GPs, paediatricians, and others. The practical difficulties produced by groups of visiting students are considerable, but must be accepted if the future care of the handicapped child is to be improved.

Relationships

The role of the school doctor in a special school is considerably different from that of the school doctor involved only in the routine examination of children. As we saw in our study of the school entry medical, the identification of abnormality by screening leads where appropriate to referral to GP or specialist, with little therapeutic action or clinical responsibility undertaken by the school health service itself.

The admission of a child to a special school, particularly for the physically handicapped, increasingly implies the creation of an active therapeutic partnership between the school and the school health service, the education department, the GP, several hospital specialists, the social services department, ultimately the Department of Employment, and frequently a voluntary society.

The system could not function if the traditional separation between preventive and curative services was maintained, and in schools such as

Pendower Hall the school doctor must accept clinical and therapeutic responsibility on behalf of a variety of colleagues if the care of the child is to be complete. At the present moment this is based upon personal relationship and goodwill, for the school doctor is still inhibited by the school health service regulations from accepting full clinical responsibility and responsibility for prescribing. This inability is particularly highlighted in his relationship with general practitioners, for although the GP continues to be involved, the problems of children in special schools are so rare in family practice that the school doctor develops his most effective link with the consultant paediatrician.

Effective care increasingly depends upon interdisciplinary collaboration. Medical management, education, social, and emotional care must all be co-ordinated. Although the role of co-ordinator can be assumed by any of the professions involved, when the primary problem is medical or psychiatric it seems appropriate that this should be the doctor working in the school setting. The fulfilment of this role and acceptance by colleagues, however, depends upon a demonstration of special expertise and abilities, as well as upon personality and status.

It appears to us that the role can only be fulfilled by appropriately trained doctors who accept real clinical responsibility for the care of children. Whatever title is ultimately chosen, these doctors must either be paediatric practitioners or consultant community paediatricians in their own right and, by implication, full members of the local division of child health.

Chapter 5

Discussion

The present role and possible future of the School Health Service have been repeatedly discussed, most recently and authoritatively in the 1972 edition of *The Health of the School Child.*

As part of a system of comprehensive child care, its tasks have been categorized under twelve headings, the first four of which can be summarized as:

1. Supervision of the development and growth of all children.
2. The identification of children with specific disorders affecting learning and behaviour.
3. The identification of physical defects.
4. The carrying out of general population screening tests.

These four initial tasks are largely fulfilled through routine entry medical examinations which, as we have seen, identify a small number of children with important physical defects and a larger number with significant, but less serious, abnormalities. In our study very few disorders affecting learning or behaviour were detected at entry, and several children subsequently identified as educationally subnormal passed undetected through the examination procedure.

Our findings support the view of the WHO Symposium on Child Health: that routine examinations are relatively unproductive, and that efficient case-finding now requires a combination of techniques which includes examination, but does not rely upon it exclusively. Examination at some stage of development must continue, and Grant has demonstrated the value of involving the GP. We have suggested a routine which would both exploit the GP's knowledge of the child, and make better use of the skills of the school nurse and the teacher.

The role of the school doctor in screening will be determined ultimately by the efficiency of the preschool child health services and, in the immediate future, by the speed with which the Sheldon Committee proposals for integrating preschool child health care into general practice can be implemented.

Although there have been few developments in this direction, the establishment of vocational training schemes is beginning to attract into general practice young doctors who see total family care as their prime responsibility. The expansion of group practices and health centres is providing an improved framework for their work, and is increasing the possibility of including full-time or part-time women doctors with a special interest in child health, within group practice. Encouragement of this trend is necessary.

The time seems ripe to establish a 'Paediatric List', analogous to the 'Obstetric List', so that doctors accepting responsibility for preventive child health care in general practice or in community child health clinics will be encouraged to seek special training, and be rewarded for their efforts.

More complete preschool care, with an increase in the proportion of children physically screened before school entry, would leave the school doctor free to fulfil other functions, particularly the assessment of children with developmental disorders, and the management (in collaboration with psychologists, teachers, GPs, and other specialists) of the much smaller number with specific problems.

At present, children with special problems are identified in a variety of ways and usually only those with physical handicap are identified by the school doctor. As those suffering from educational subnormality and emotional disorders, however, have a high prevalence of associated medical abnormality, it is desirable for the doctor to be involved in their care as early as possible. If continuity of care is to be maintained, it seems essential that the doctor should play a part in initial assessment, in partnership with the psychologist, teacher, and social worker; and if more specialized medical investigation becomes necessary he should refer the child to the paediatrician or psychiatrist, in collaboration with the GP.

When assessment can involve a multitude of specialists (paediatrician, psychologist, audiologist, speech therapist, physiotherapist, social worker and others) one member of the team must provide consistent parental counselling and support. Often the school doctor will be the most appropriate..

Although our example of special care within the school health service was a school for physically handicapped children with high medical dependency, other special schools, those for the educationally subnormal, the blind, the deaf and the maladjusted, have similar or greater needs. We suspect that at present many of these needs may be neither adequately recognized nor adequately met.

The needs of parents for genetic counselling, emotional support, and help with the practical and clinical problems of handicap is now becoming more apparent (Walker *et al.*, 1971; Hare *et al.*, 1966; Boon *et al.*, 1972), and there is little evidence that this support is being provided by either GP, hospital specialist, or social worker.

As the problems of children in special schools become more complex, their teachers, nurses, therapists, and parents will require more medical education and support, and the clinical responsibilities of the school doctor will increase. Care will be effective only if the doctor in the school is capable of meeting these needs.

In considering the future of child health, the WHO Symposium saw the need for a doctor who could

> 'integrate the various medical aspects of child health work. He should have a general medical training, a special training in normal and abnormal development or paediatrics, and familiarity with the social aspects of the subject. His particular concern should be with special examinations and investigations of vulnerable and "at risk" children, and with continuing general surveillance of handicapped children. He should be in close touch with hospital doctors and general practitioners, and probably have a part-time hospital appointment.'

We agree, and would expand the concepts even further, for it seems to us that we have identified three specific medical roles within an integrated child health service.

The first is that of the member of the general practice team who accepts special responsibility for the preventive and developmental care of children.

The second is that of a doctor responsible for the health supervision of a defined population of children in school. Working closely with parents, teachers, nurses, educational psychologists, and GPs, this doctor would screen all school entrants and, spending a minimum amount of time in routine physical examination, would provide within the school setting consulting services for children and for those concerned in their education, health, and development. This doctor would have to develop a partnership with GPs, particularly those with child health functions, and would accept clinical responsibility for the assessment of individual children and their management in school.

Thirdly, there is a need for a doctor with more specialized skills in the assessment and community care of the handicapped child. This doctor would provide a consultant service to other doctors in the child health

service, GPs, fellow consultants, educational psychologists, social workers, and others, and would accept complete clinical responsibility for children in his care. Having a hospital as well as a community role would allow him to provide continuity of specialist care for many children with complex handicaps. The concept of this 'community paediatrician' has been described independently and with slight variations in emphasis by Walker (1969), McGregor (1969), McKeith (1970), and Mitchell (1970), and supported in principle, although with some modifications, by the British Paediatric Association.

Logistics

The optimum staffing of the school health service within an integrated system is difficult to predict. We have shown that a special school for the physically handicapped requires approximately five medical sessions per week, although how many of these must be consultant sessions has not been determined.

The assessment of the 180 children with special problems whom we studied would have required a minimum of fifty sessions per year, the equivalent of at least one session per week. The provision of an improved service to other groups of children, for instance the educationally subnormal, and the emotionally and socially disturbed; and an extension of the contacts between the child health service, general practice, and the hospital, would mean that any doctor fulfilling this role at specialist level would be more than fully extended, in an area with a population of approximately 250,000.

It is more difficult to predict the manpower needs for the more effective care of children in normal schools. The present staffing ratio appears at first sight to be grossly inadequate. In 1970, 3,280 doctors were employed full-time or part-time by the local education authorities in England and Wales. This was equivalent to 880 full-time staff, giving a doctor/pupil ratio of approximately 1:8,000. During 1970, approximately 1,800,000 periodic inspections (an average of 2,000 per doctor), and 1,200,000 special inspections or reinspections (1,400 per doctor) were carried out.

As the average doctor would be responsible for the examination of approximately 800 entrants each year, at the present rate of examining ten or twelve children per session this must have occupied 80 sessions during the forty-week school year. A further 240 sessions must therefore have been spent in other examinations and re-examinations, leaving approximately 140 sessions for the many other duties of the school health service which have recently been defined (*Health of the School Child*, 1972).

In any revised scheme it is unlikely that the evaluation of the records of each child, the examination of those particularly at risk, and consultations with teachers, nurses, and parents, would diminish the time required for entrants; and although routine periodic examination of older children will decline, it would be surprising if available medical man-hours were not usefully occupied in consultation. It would be hoped that the amount of

time spent on administrative and non-clinical duties could be reduced and maintained at a minimum.

A school population of the size we have studied (40,000) would therefore continue to be served as at present, by five full-time doctors or their part-time equivalents. One of the doctors should be a consultant community paediatrician, who would also be responsible for preschool care and would link the service effectively with both general practice and the hospital.

Administration

One of the most pressing problems of creating an integrated child health service is that of establishing the appropriate administrative framework. The management proposals for the reorganized National Health Service suggest that the existing clinical staff of the local authorities will transfer to an administrative hierarchy in the National Health Service, and become responsible to the community physician. This transfer would effectively maintain the *status quo*. At present, the historically separate components of general practice, local authority, and hospital are staffed by doctors with widely differing educational backgrounds and role definitions. It may be that true integration will not be possible until new staff, specially trained for new posts, fit into a new administrative framework. However, while the establishment of training programmes will take some time, it is clear that the administrative structure will be defined within the near future.

Although efficient administration is essential, it seems to us that the most urgent need for child health is to bring the medical staff of the school health service and the preschool child health services into a meaningful relationship with the other clinicians involved in child care. This is unlikely to be achieved unless all doctors working with children are properly trained for their role; are capable of assuming full clinical responsibility; and, whether in general practice, child health clinic, school health service, assessment centre or hospital, subscribe to a common philosophy. One of the major disadvantages of the existing system has been that collaboration has depended largely upon personalities and personal relationships. The expansion of the Cogwheel division of child health to include the community services would provide for the first time a vehicle which could lead to unification of the medical child health services.

The transfer of doctors and nurses from local authority to area health authority employment, however, does produce particular problems of administration for the local education authority. These have been fully discussed in the first report of the Sub-Committee on the School Health Service (1972), and it seems probable that if the recommendation of the Working Party on Collaboration is accepted, the joint consultative committee of each area will establish a sub-committee responsible for school health. This sub-committee will in turn be served by a management team, which could consist of the senior doctor appointed by the area health authority in agreement with the local education authority, the community

paediatrician, the director of education, a community physician, the senior school nurse, the director of social services, and the senior educational psychologist.

Although the creation of an appropriate administrative framework is important, functional integration in the medical field will depend upon the clinicians themselves, and in particular upon the abilities of the consultant community paediatrician.

A clinical hierarchy

Although it is essential that within the new service each children's doctor is an independent clinician, a hierarchy of skills, rather than of administrative status, appears inevitable, at least for the immediate future. Three categories of skill could be envisaged–

1. All children's doctors with appropriate experience or training should be accorded 'paediatric practitioner' status and appointed to a 'paediatric list'. Those working at present in the local authority clinics, and particularly their vocationally trained successors, will be increasingly attached to group practices, act as full members of the general practice team, and assume responsibility for the preventive care of children in the practice population. They will also be involved in the supervision of the smaller number of those suffering from handicap. Without diminishing the role of their colleagues as 'family doctors' they could bring special expertise to the team, and in particular link closely with the other health, social, and educational services for children. They would have a special relationship with school doctors, and particularly with the community paediatrician.

2. Children's doctors working in schools would also be on the paediatric list, but would have had special training appropriate to their more specialized role. They would collaborate closely with paediatric colleagues in general practice clinics and hospital, and would develop a special relationship with teachers, psychologists, and others in the education service, and with the consultant community paediatrician. Some of them would work in close association with the Department of Social Services, in the case of the socially deprived; some would develop special skills in assessment in the district assessment centre; and others would join the team in child guidance clinics.

3. The consultant community paediatrician is central to the concept of an integrated child health service. Although wary of the terminology, the British Paediatric Association have endorsed the need for consultant paediatricians who possess special skills in preventive, social, and behavioural paediatrics. The Association have accepted that this paediatrician would work in association with a number of general practices, in the school and preschool health services, and in the assessment and care of handicapped children. The community paediatrician will only be effective if he is a full member of both the community and hospital teams; and he will, while available to advise the local education and social services department, continue to function primarily as a clinician.

The administration of a division of child health will require the services of a community physician, one of whose tasks will be to maintain an effective information system. This will only be achieved if co-ordinated clinical records of high quality are available, another area in which effective links between paediatricians in practice, hospital and the community are essential.

Recruitment and training for an integrated service

One result of delaying decisions about the future of the child health service has been a dramatic fall in recruitment. Elliott has highlighted the fact that many of the local authority medical staff currently in post are middle-aged, or even elderly, and there is a danger that their skill and knowledge will be lost completely.

Although the problem of integrating existing staff into the new service does exist therefore, it is perhaps less acute than that of attracting and training new recruits. As in general practice (Walker, 1973), the establishment of a training programme may create its own demand.

The three levels of training appear to require definition:

1. That necessary for inclusion on a 'paediatric list'.
2. The additional requirements for school medicine.
3. That for the consultant community physician.

To avoid continuation of the separation which exists within the present service, it is essential for as much of any proposed training programme as possible to be common to all types of chidlren's doctor.

1. *The paediatric list*

The knowledge required of doctors working in child health clinics was outlined in the report of the Sheldon Committee in 1966. It includes:

(*a*) Anatomy, physiology, and psychology of children.
(*b*) Infant nutrition and hygiene.
(*c*) Normal growth and development.
(*d*) The 'at risk' hazards.
(*e*) Tests for specific defects.
(*f*) Recognition of acquired illnesses.
(*g*) Family psychology and sociology.
(*h*) Elementary child psychiatry.
(*i*) Immunisation and vaccination.
(*j*) Ability to teach parents.
(*k*) Knowledge of the relevant legislation.

Some of this knowledge is acquired during undergraduate education; more will be added during a period of six or twelve months in hospital paediatrics; but some will require special training on appropriate courses.

Within the past four years, the development of planned vocational training for general practice has attracted an increasing number of recent graduates. Their two-year hospital rotation invariably includes a six-month paediatric post, and some of the trainees have already acquired the DCH.

Were regional courses in developmental paediatrics to be provided, the majority would become potential members of the paediatric list.

Women graduates, not prepared at present to undertake a full three-year vocational training programme, could, after a minimum of twelve months in hospital paediatrics, attend the same course and become eligible for inclusion on the list.

Recognition by inclusion on the paediatric list would ultimately become an essential requirement for preventive and developmental work with children.

2. *School medicine*

Doctors working with school children require the same basic knowledge and skills as their colleagues in practice or clinic, and must therefore be on the Paediatric List. In addition, they must also be knowledgeable in many other fields. These will include:

(*a*) The physical, psychological, and social development of the school-child and adolescent, and methods used in their assessment.

(*b*) The common physical and emotional disorders of children, their recognition and management.

(*c*) Management of the medical, social, and educational problems of the handicapped child, with particular reference to the work of specialized medical colleagues.

(*d*) Familiarity with the fundamentals of the work of associated professions, their aims, techniques and ethics.

(i) Educational psychology.
(ii) Teaching.
(iii) Nursing.
(iv) Speech therapy.
(v) Physiotherapy.
(vi) Social work and social services.

(*e*) A knowledge of the fundamentals of health education.

The training of the school doctor must therefore be much more extensive than that of his colleague on the paediatric list. Much of it will be common with that of the consultant community paediatrician, and must be based on a mixture of in-service experience and attendance at special courses.

Some experience of seconding paediatric registrars to the community already exists (McGregor, 1969; Mellor, 1973). The programme we have in mind would be more specific and would initially occupy one year of rotating posts in child psychiatry, educational psychology, physical handicap, subnormality, and social work, with attendance at short and extended courses of seminars, lectures, and tutorials.

3. *The consultant community paediatrician*

The difference between the training of the school doctor and the community paediatrician may be small and essentially that of hospital experience and qualifications. The community paediatrician will require as a

minimum the training we have already outlined. Experience in hospital must be more extensive; periods in child psychiatry, subnormality, and general practice should be included; and a higher qualification in paediatrics obtained. The training of the community paediatrician will therefore be as long, or longer than that of his hospital colleagues.

This brief outline requires detailed definition. We believe that one of its advantages would be the creation of a training programme common to all doctors working with children. It would also provide a career structure in which the possibility of transfer, particularly from 'school doctor' to 'community paediatrician' would exist.

Its creation would depend upon collaboration between a large number of agencies involved in the care of children, and it would require special funding. Its success appears to us to be fundamental to the establishment of an effective integrated system for child health.

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PLANNING THE CHILD HEALTH SERVICES

The activities of the Humberside Health Care Planning Team in Child Health

B. Edwards W. Ferguson D. Jackson

Introduction and background to the project

This report is the product of the work of doctors, nurses, social workers, administrators, and many others who came together with the common objective of testing in practice one of the most exciting innovations of the reorganized National Health Service. In reporting our and their activities, we have consciously tried to be self-critical in order that our experiences, our mistakes and our successes might be of practical use to other health care planning teams.

In adopting this approach, we may not have fully reflected the goodwill, interest and enthusiasm that was present throughout the experiment. As things developed so did the excitement as the members began to realize that health care planning teams did, indeed, offer the prospect of a new and powerful approach to the development of health and other services in a much more flexible and sensitive way than had previously been possible.

The 'Challenges for Change' group set up by the Nuffield Provincial Hospitals Trust at a meeting in December 1972 noted that whereas the architects of reorganization were deeply involved in formulating the theoretical concepts for the reorganized National Health Service, very little was being done to test these new approaches in the field. It was thought that the new authorities would establish themselves much more quickly and solidly if a pool of practical experience about some of the completely untried concepts could be established prior to 1 April 1974. Unless this experience was available there was a danger that up and down the country a considerable amount of time and effort would be expended trying to find solutions to problems that were common to everybody.

Health care planning teams are one of the important new features of the reorganized Service and one that promises to pay early dividends if successful because of the opportunities they create for the professionals in the service to view health care together, from the new comprehensive prospective.

At about the same time the Humberside Area Joint Liaison Committee

had also been considering how a pool of useful experience might be created for the new area authority and agreed to seek support for the establishment of an experimental health care planning team. The Trust readily responded to an approach on these lines and the Team was established.

Child health was chosen because there already existed in Humberside some planning impetus arising from an impending capital development in the hospital service and strategies such as developmental assessment clinics were under discussion. Moreover, this particular field of health care has the additional interest of involving local authority social service and education departments as well as other agencies such as the probation service and the courts.

This report relates the practical experience gained as a result of the Team's deliberations over a six-month period, examines some of the problems they encountered and explores some of the underlying concepts. Two of the authors were members of the Team.

Chapter 1

The concept of health care planning teams

Among the new concepts introduced into the management structure of the integrated health service the formation of health care planning teams within districts could be a keystone in the planning process. This title incorporates three of the basic principles within which the integrated health service will operate.

First, health care in its new comprehensive form is applicable to patients whether they are cared for in their own home, in acute, community, or long-stay hospitals, or other institutions.

Secondly, planning which will have a formal and important role to play in the new service, as it is expected to be an effective method of identifying need, influencing trends and fashions within the service, and ensuring that available resources are used wisely. The planning system is now only in the embryonic stage and considerable development, accompanied by full labour pains, will be suffered before the suckling infant is born. After this several more years of trial, error, and tribulation will pass before even the adolescent stage is reached.

Thirdly, the word 'Team' permeates the new management structure. The appraisal of the effectiveness of the multidisciplinary concensus teams will be an interesting exercise, and we hope that this report will throw a little light on some of the problems which can be anticipated when health care planning teams are formed.

At the time of writing the only official thoughts on the concept of health care planning teams are contained in the report *Management Arrangements for the Re-organized National Health Service.* A précis of the outline of the concept as envisaged by the 'Grey Book' is given below.

The district management team is to be responsible for identifying areas where the health services provided fail to meet the needs of the consumer

and for developing ways of using existing resources more effectively. In order to assist them in the execution of this function district management teams will establish multidisciplinary health care planning teams which will concentrate on planning services to meet particular groups of need.

Two types of health care planning teams are indicated. *Ad hoc* teams established to examine specific issues such as the introduction of day surgery or the reorganization of the out-patients' department, and on-going teams for special problem areas (eg child health, psychiatry, the elderly) where a high degree of interaction between hospitals, community health, and other social agencies is necessary. Not only do these services have the most to gain from the unification of the National Health Service but are also likely to undergo significant changes in the years following 1 April 1974 and consequently require more concentrated and permanent machinery to undertake continuous monitoring and planning.

The 'Grey Book' does not consider the composition of health care planning teams in any great detail and apart from indicating a need for flexibility simply lists some of the professions from which representation is required. (GPs, consultants, hospital and community nurses, health visitors, local authority social workers, etc.) The teams are to be supported by a community physician and an administrator.

1. Continually reviewing the needs of particular groups and the services provided to meet those needs: monitoring.

2. Contributing to the formation of policy and to the development of the annual district plan.

3. Carry out investigations to establish ways of introducing improvements.

4. Assist in the co-ordination and monitoring of the implementation of projects and their results.

Team members are envisaged as the link between the professions and the planning machinery and are not only to bring their own particular skills and knowledge to the planning process but also the opinion of their professional colleagues on what is practical and acceptable.

Finally, the 'Grey Book' points out that 'data must be gathered and analysed if Teams are to work effectively'. This is to be done in two ways. Specialist planning staff will be available to advise and support the team and the community physician and the administrator will conduct special studies and analyses. In practice this means that teams will create their own information systems although some specialist assistance will be available from the area HQ.

In practice the functioning of a health care planning team might be represented by Fig. 1. National priorities and guidelines emanating from the central department will be joined en route by regional priorities and guidelines and will ultimately be presented to the team by the AHA and the DMT who will, no doubt, wish to add policies and guidelines of their own.

Members of the health care planning team must relate the policies, priorities, and guidelines presented to them, to their own knowledge and experience and forge them into positive planning proposals for inclusion in the

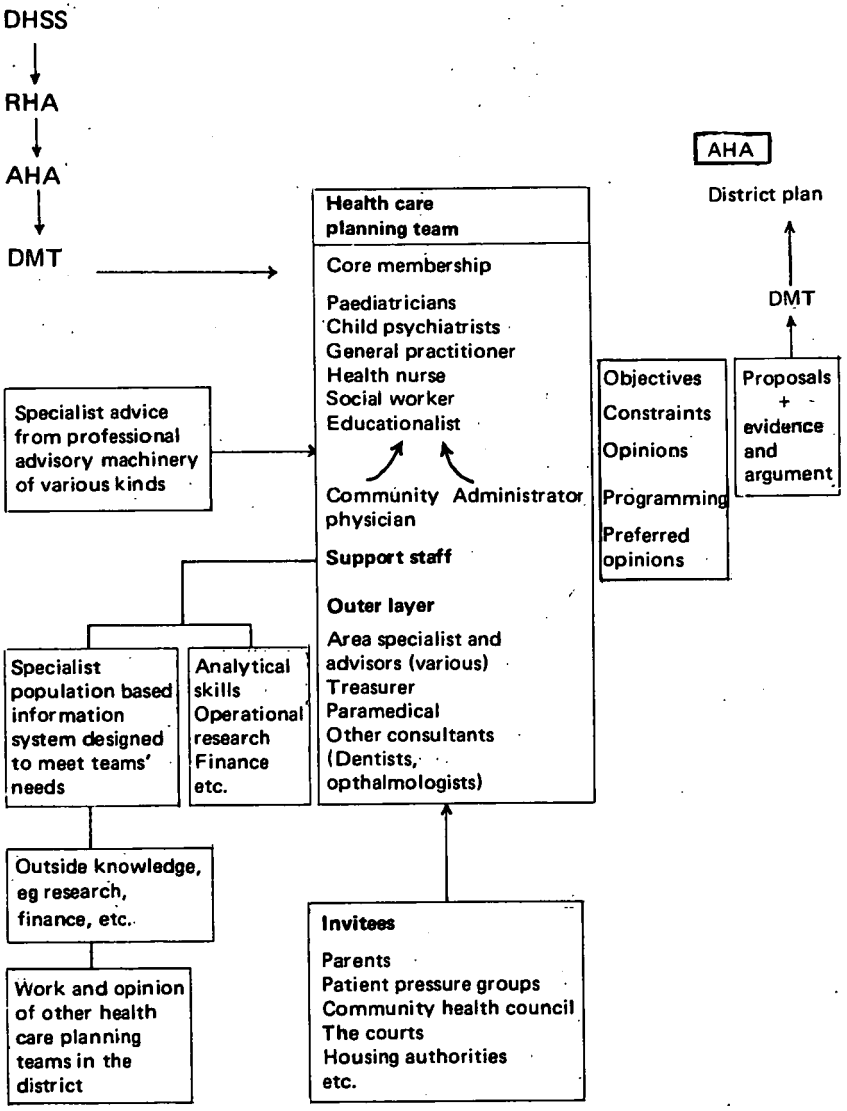


Figure 1

district plan. The process whereby raw data and other information is fed into the melting pot of the health care planning team, and then reacts with the knowledge, experience, and ideas of its membership is to say the least, complex.

Chapter 2

Setting up the Team

The brief

The brief that was agreed with the Nuffield Trust was couched in the most general terms. An experimental health care planning team was to be established for a period of six months and an evaluation of its operations prepared at the end of that period.

Composition

It was inevitable that the composition of the Team should be determined somewhat arbitrarily and rather than seek nominations from each discipline and from each authority (which would have made the Team unwieldy) it was thought more appropriate to extend invitations to particular individuals. It was appreciated from the beginning that this would not create a Team that was truly representative of the existing authorities in the North Humberside Area but this was never the intention. The intention was to simulate a health care planning team operating in the reorganized National Health Service. Whatever detailed failings there might have been in the Team's composition we are confident that the group was sufficiently comprehensive for the purposes of this project. The Team was comprised as follows:

1 Medical Officer of Health.
2 Consultant paediatricians (in effect the only two consultant paediatricians working in the district).
1 Child psychiatrist (at the time the only child psychiatrist working in the district).
1 General practitioner.
1 Social worker (local authority).
1 Hospital nurse (paediatrics).
1 Area nursing officer (health visiting).
1 Deputy group secretary.

At the fourth meeting of the Team, an additional area nursing officer (health visiting) joined the Team in order to bring experience and more detailed knowledge of the problems peculiar to urban areas and to facilitate the collection of information.

Support staff

It had originally been intended to appoint a research assistant with experience in operational research but it did not, however, prove possible to recruit such an individual and it was decided that until a suitable appointment could be made, a senior administrative officer from the Hull (A) Group HMC would act in this capacity and provide the necessary support. As time progressed and it became clear that a suitably qualified research assistant was simply not available, a wholetime secretary was appointed instead and the administrative support referred to above retained.

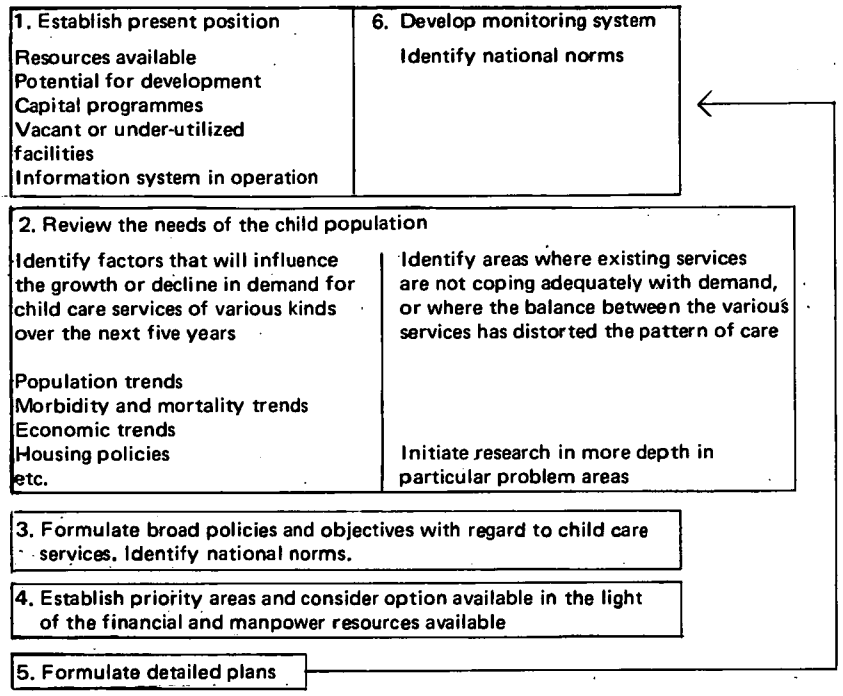


Figure 2

Terms of reference and objectives

Although the Team deliberately decided to keep their terms of reference very wide and to define and re-define them as more practical experience was gained, certain decisions had to be taken at the very beginning of the exercise with regard to the geographical area to be covered, constitution and method of working.

For its geographical canvas the Team took the whole of the north bank of the Humber, which at that time seemed likely to constitute a health service district. A plan is enclosed in Appendix 1. The district comprises the major city and port of Kingston upon Hull and the surrounding East Riding of Yorkshire. As far as constitution was concerned the Team noted that their brief gave them power to vary their membership as they wished and as will be reported later this power was used.

To begin with, two specific and overriding objectives were identified:

1. To describe in detail the existing health services for children in North Humberside, to identify deficiencies and problem areas and to produce proposals for development.

2. To experience a health care planning team in action: its frustrations, its needs, its methodology, etc., and if possible to produce a blueprint that might be of value nationally to other health care planning teams.

The next stage of refining these broad objectives and reducing them to working tasks took place over the period of a month or so.

With regard to the first objective the model shown in Fig. 2 was evolved.

The Team has resisted the temptation to call upon national figures in this field for practical help on the ground that this would place them in a privileged position that all Teams could not aspire to in 1974. However we made one exception and gratefully acknowledge the assistance we received in preparing this report from Keith Barnard, Nuffield Centre for Health Services Studies, University of Leeds.

Chapter 3

The meetings

The child health care planning team met on ten occasions. With few exceptions meetings were held in the board-room at the Hull Royal Infirmary and to begin with took the form of a working lunch. Lunchtime meetings were chosen because of the difficulties of arranging a definite time during the working day without disrupting clinic sessions or other essential work. The Hull Royal Infirmary was chosen as a suitable venue because of its central position in terms of where the members work and, of course, because of the ease with which catering could be arranged. Towards the end of the research period it became quite obvious that one-hour lunchtime meetings simply did not allow enough time to complete the business and less frequent but longer evening sessions were found to be more useful.

Meeting, 16 May 1973

This was a highly informal meeting. There was no agenda, no minutes were taken and no one took the chair.

Consideration was given to two documents (prepared by the Medical Officer of Health and Administrator) which form the basis of the overriding objectives mentioned earlier. There was a general but inconclusive discussion.

Meeting, 23 May 1973

In many ways this meeting set the pattern of future meetings. An agenda had been prepared and the administrative officer was in attendance to provide support. The Chairman (Medical Officer of Health) and Vice-Chairman (consultant paediatrician) were appointed and notes of the meeting taken. The appointment of the Medical Officer of Health as Chairman was seen as quite natural and reflected his concern with the child health services over a wider spectrum than any other member.

Of the four fairly lengthy items on the agenda, only one was discussed (and this only in part) and this again set the pattern for the future. The time available at a lunchtime meeting is obviously limited and the Team did not approach the agenda with any sense of urgency. No doubt this was inevitable and necessary at the initial meetings as members adjusted to their role and to each other.

The item discussed was a review of some available statistical information relating to children in North Humberside, that had been extracted from the Joint Liaison Committee's Area Profile.

This information was not designed specifically for the Team's particular use, and certain problems were quickly identified. For example, it emerged that some statistics that had been collated from Form LEA 21M relating to children with handicaps assessed as being in need of special education, in no way gave an indication of the incidence of handicap in North Humberside. The consultant child psychiatrist on the Team (who was frequently responsible for assessing children for this purpose) pointed out that a child was only assessed in need of special education if there was a possibility of this being provided. This assessment usually took place immediately prior to admission to a special school and if, therefore, there was a shortage of places, this step would not be taken and the statistics collected would therefore bear no relation to the actual incidence of handicap or for that matter the adequacy of special educational provision. From this point on the Team developed a healthy scepticism towards the information it was presented with.

However, in addition to this information members had their own practical experience to draw on of the way in which services operated, of their shortcomings and of their strengths, and the Team was very quickly able to identify a wide range of problems and start discussing them.

The difference in the infant mortality rates between Hull (25 per 1,000 live births) ane the East Riding of Yorkshire (10 per 1,000 live births) was very quickly noted as an area worthy of further investigation.

This led on to a discussion of the role of child welfare centres and the sort of people who attend them. It was suggested that the 'problem family' often did not attend these centres, and that the reasons for this included the middle-class orientation and standards of these clinics and the general social incompetence of the problem family. The possibility of reaching such families by an extended home visiting programme was discussed.

The discussion was very generalized and highly subjective, and the desirability of testing some of the assumptions implicit in the argument was considered, but the discussion moved on before any firm agreement was reached.

Other issues touched upon during the meeting included the value of special care baby nurses; linking with social workers in dealing with problem families; child minding and its potential implications for the health of the children and the value of GP well baby clinics.

At the end of the meeting it has become quite apparent that the Team lacked practical insights into the problems of the city of Hull, and it was therefore agreed to invite a health visitor from the city to join the Team.

Meeting, 30 May 1973

Following the initial flood of problems that had been identified at the second meeting there was considerable pressure from the Team to embark immediately upon research into some depth into one or two of the more

interesting and serious problems (eg post neonatal deaths, battered babies, etc). However, following a series of discussions outside the main meetings between the community physician and the Administrator it was suggested to the Team that it would be wiser to use the limited supporting resources to continue building up a more comprehensive picture. When that picture was completed the time would have arrived for detailed research.

The Team accepted this recommendation although it should be recorded that the temptation to embark upon detailed research at this early stage was a real one.

Meeting, 13 June 1973

This was the first meeting at which the newly appointed whole-time secretary was present.

The Team continued their review of the statistics made available to them, and focused very quickly on the child guidance service. The future of this service seemed highly speculative, and the Team became concerned that it would suffer from its position in the middle ground between health, education, and social services. As the discussion proceeded it became clear that the majority of the members of the Team were inadequately briefed on the role of the service and its day to day workings, and accordingly the child psychiatrist agreed to prepare a paper which would form the basis of a discussion at a later meeting.

The school health service and its future was then discussed in a speculative manner.

Towards the end of the meeting the Team were invited to review progress to date. It was quickly agreed that the Team still did not possess a thorough enough understanding of the present scene to indicate priority areas for attention, and the discussion thus concentrated upon devising some means of building up further a comprehensive picture of the district.

The problems of measuring quality were discussed and serious but inconclusive consideration given to the possibility of mounting a postal patient attitude survey. Random patient attitude surveys administered by health visitors; a comparison between medical and patient perspectives on the course of a particular treatment and in-patient attitude surveys were also discussed.

In the event no firm conclusions were reached about the measure of quality, but a decision was taken to build up a comprehensive child profile of the district which would paint a picture of the social and economic environment in which the child health services operated and the major health problems that they were dealing with.

This meeting (13 June 1973) was particularly important in a number of respects. First the decision to prepare a detailed child profile was reached, a decision which was to occupy the time and energies of the limited supporting staff that was available for the next two or three months.

Secondly, it was the first occasion that the Team members themselves were invited to prepare background papers. Following the invitation to the child psychiatrist to prepare a paper on the child guidance service, each

member of the Team was asked in turn if they would prepare a short paper describing the service with which they were concerned: its problems, its boundaries and its relationship with other health and social services. In practice this approach met with a mixed response.

It was evident that a considerable amount of learning was going on within the Team at this stage as members tried to get a grasp of the total scene and the advantages of its multidisciplinary composition became increasingly obvious. Experience and information was passing freely between the hospital and community-based members without any feelings of competitiveness.

The contribution made by the individual members of the Team were very variable at this stage, and the early discussions were dominated by three or four members.

One feature of the process that escaped our notice at this stage (it only emerged some weeks later during an informal discussion) was the feelings of disillusionment and despair experienced by some members of the Team when the service with which they were associated came under critical review and was found to be lacking.

Unconsciously the Humberside Team adopted a supportive role in this situation and avoided in discussions direct criticisms of particular services by putting an emphasis on potential developments. As a result the feelings did not persist for very long.

Meeting, 20 June 1973

The Team spent this meeting discussing the content of the profile, which they had agreed at the previous meeting should be prepared, and the possibility of establishing an on-going information system. The idea of a comprehensive child population information system was discussed, but eventually discounted as impracticable.

The next step was to see if key indices could be isolated, which, if monitored, would provide the data essential for matching services to changing patient needs. The model the Team had in mind was that which would identify, for example, every handicapped child in the district (at whatever age the handicap occurred) and ensure that provision was made for the child's treatment, education, and care as it grew older. In other words planning positively for the future rather than waiting for a significant demand to emerge before taking any steps to meet it.

One important fact that emerged during this discussion was that despite the existence of observation registers, there was a very serious gap in the information available about children in the period between the discontinuance of the health visitors' support after birth and school age. Handicaps developing in children between these ages might not be diagnosed at all until the child entered school; or, if they were diagnosed the case was not necessarily built into the only statistics available, ie those prepared by medical officers of health.

The sort of indices that could be measured were partially identified.

It was also agreed to define a child for statistical purposes as from birth

to the seventeenth birthday on the grounds that this definition appeared to coincide most easily with the multiplicity of definitions added by the various bodies involved.

Meeting, 27 June 1973

This meeting was devoted primarily to a wide ranging discussion of the child guidance service, the basis of which was the paper prepared by the child psychiatrist.

There was a considerable amount of interplay during this discussion between the social workers, community nurses, and medical staffs, and the importance of a common approach on the part of both the health and local authorities became quickly evident. The need for social work support for child psychiatrists was noted, and the special problem of the psychotic child discussed.

Towards the end of the meeting the Team returned again to the child guidance services following a suggestion that they were 'an out-dated concept'. No conclusions were reached, but it is worth recording that at this point the Team felt confident enough and relaxed enough to start seriously challenging the value of well-established services.

This was another occasion when a significant amount of information and experience was exchanged amongst Team members.

The last item for discussion was, as usual, the arrangements for the next meeting, and it became clear that members were finding it extremely difficult to keep up regular weekly meetings. The GPs and hospital consultants were those in the most difficulty. Moreover, from an administrative point of view it was becoming obvious that the resources available to the Team were inadequate to service weekly meetings.

It was therefore agreed that the Team should not meet again until the profile had been completed.

Meeting, 11 July 1973

Despite the fact that the child health profile had not been completed, a meeting had been called. An outline draft of the profile was made available, and the Team were able to indicate that the progress that had been made was on the right lines.

The opportunity was taken to view again progress to date and to give further thought to the way in which a health care planning team ought to conduct itself.

It was agreed that one of the early tasks of the Team would be to become familiar with the hospitals and other institutions from which health services for children were provided. A list of these places had been circulated prior to the meeting indicating the sort of services that were provided at each institution, and highlighting any areas that were thought to be potentially relevant.

It was decided that the Team would visit a selection of these places, and it was agreed that visits should be undertaken by two or three people together and that members should visit those places with which they did not normally come into contact. (The response to this agreement proved dis-

appointing in the event, and few visits were made. The reasons, which were understandable, were shortage of time, lack of suitable opportunity, etc.)

The problem of utilizing effectively the talent and experience within the Team was still at this point exercising the minds of the Chairman and Administrator who voiced their feelings to the Team.

The preparation of a profile had clearly not been a matter that the Team had tackled with any relish, and in practice they had been reasonably happy to accept whatever was presented to them.

The interests and backgrounds of the members were primarily clinical, and in an attempt to create an environment in which the clinically orientated members of the Team could contribute in a more comfortable, and direct and practicable way, it was decided to review a series of cases in the Westerland Infants Hospital at Elloughton, on the outskirts of Hull. Westerland Infants Hospital has 27 beds which are allocated between the two paediatricians on the Team. It is used in conjunction with the Paediatric Unit at the Hull Royal Infirmary, primarily for longer-stay children, many of whom have social problems. The objective of the visit was to assess the ways in which the health and social services had operated in the treatment and care of particular children. (The visit was in fact to prove quite successful and provided an opportunity for one of the consultant paediatricians to make a particularly strong contribution, and the studies that were reviewed did indeed demonstrate some of the short-comings of existing services.)

The discussion proceeded further along this tack, and it was the GP who suggested that the case-study approach might be taken a stage further and that each member of the Team should prepare one or more case-studies of children who were known to them. Wherever possible it was agreed that the opinions of the parents should be sought.

This was an important stage in the Team's development as it offered an opportunity for the first time of monitoring the services (and thus gaining some measure of the degree to which they were successfully co-ordinated) in a way that was interesting and challenging to the members of the Team.

Meeting, 13 August 1973

This meeting was called at a time when it was thought that the child health profile would be complete. In the event this was not so but sufficient progress had been made for the Team to consider its next step.

The main agenda item for the meeting was a further assessment of the progress of the Team to date and a consideration of the possible future options open to the Team in the final three months of the experiment. Some considerable thought had been given to this prior to the meeting and a diagrammatic representation of the ground covered and the ground yet to be covered had been prepared. In essence the paper concluded that the Team had now concluded its initial review of the services and should now get down to identifying the major problem areas and looking at them in more detail.

A list of topics for more detailed research (see Appendix) was compiled at the meeting, and it was agreed to form two working parties, each to investigate one topic. The activities of these working parties are reported later.

Two of the case-studies that had been commissioned at the previous meeting were also discussed and proved to be particularly descriptive of the ways in which the existing health and social services operated, and high-lighted starkly some quite serious problems arising from their mal-co-ordination.

Meeting, 18 September 1973

Prior to this meeting the Chairman and Administrator on the Team had visited the DHSS and had discussed the role of health care planning teams with the representatives of the DHSS who were particularly involved in formulating policy in this field. Consequently the Chairman opened the meeting with a report of this discussion and some time was spent in discussing the questions raised by the DHSS.

Much of the remainder of the meeting was concerned with the reports of the working parties which had been established previously. Both working parties reported that whilst they were making progress they had experienced far greater difficulties than had originally been anticipated, particularly in gathering the sort of information they felt necessary.

It was also agreed that the case-study approach be developed further and each member was again asked to prepare a short report on a particular child in North Humberside. The objective of these reports was to describe the progress of the child's condition, the treatment offered, the alternative available, any identifiable shortfall in the existing services as they affected the child in obtaining the required treatment and care.

Chapter 4

The working parties

The first three months of the HCP Teams activity did not involve members of the Team actively in the actual investigation of any current problem in Humberside. Indeed, as mentioned earlier, the temptation to investigate a particular area had been resisted in the early days when most of the resources available to the Team had been channelled into collecting information for the profile. Once this had been completed, it was considered both possible and desirable to investigate one or two individual subjects, and for this purpose the Team divided itself into two working parties, each to undertake an in-depth study of one topic.

The purpose of investigating two individual subject, was threefold. First, it was hoped that such an investigation would involve members of the Team far more in the actual work of an HCP team than they had been involved in the first three months. Secondly, it was hoped that they would be involved in such a way that their own particular professional knowledge, expertise, and experience would be used to the full. Thirdly, it was intended to observe

the working party in action with a view to assessing whether or not it was possible for the HCP Team to undertake their own investigations.

A list of all the topics that had been suggested for research at previous meetings was drawn up and the full HCP Team invited to make additions. From this list two subjects were chosen for 'in-depth' examination: post neonatal deaths in Hull and the East Riding of Yorkshire and the facilities available for the multiple-handicapped child.

The choice of these two topics reflected to some extent the special interest of members of the Team but were particularly attractive in that the methodology for each differed significantly. The former is a piece of statistical research, whilst the latter required more of a low-gear approach with a heavy emphasis on collaboration with social services departments, education authorities, and the school health service.

Both working parties were given powers to co-opt additional skills and experience and, in fact, both groups made use of this opportunity.

Administrative support was made available, but it was clearly understood that the intention was for the members themselves to undertake most of the work involved, and that the administrative support should not go beyond general co-ordination, secretarial assistance, and report writing.

Post neonatal deaths

The group consisted of four members of the HCP Team (a consulting paediatrician, a health visitor, a hospital social worker, and a hospital nurse). The group was fortunate in being able to co-opt a clinical assistant in paediatrics to assist in the investigation who not only had a special interest in post neonatal deaths, but also had some experience of conducting local research. The clinical assistant designed the skeleton framework for the investigation and collated and analysed the information collected by the other members.

The overwhelming majority of the work involved in investigating one year's post neonatal deaths was conducted outside the formal meetings of the group, which, in fact, met on only five occasions. The purposes of these actual meetings was to establish the methodology for the study and then, subsequently, to report progress and problems.

Most of the actual 'donkey work' of collecting the information fell to the hospital nurse, the health visitor and the social worker, who met on numerous occasions and spent many hours extracting the information required from the hospital case-notes, the health visitor's notes, and other records. This combination of background (hospital and community) worked well and facilitated access to records which, otherwise, might have been more difficult.

At the first meeting the clinical assistant had already prepared the broad framework for the investigation and had produced a list of approximately 100 variables which it was thought should be examined. The group added to this outline and suggested some additional factors such as poor housing conditions, the spacing of children within the family and the attendance of the mother at antenatal clinics which they felt should be included in the study.

(A full list of variables collected is included in the report which is included as Appendix 3.)

The first meeting concluded with an agreement as to how the information should be collected and how the tasks should be allocated amongst the participants. The question of interviewing the parents of children whose deaths were under investigation was considered and rejected. The working party felt very strongly that distress caused by such approaches could not be justified.

The working party met for a second time some six weeks later, mainly to report progress and deal with the inevitable problems that had arisen. On balance the investigation had been progressing satisfactorily although it had not proved possible to obtain all the information from the records available. For example, acute illness in the child's family six weeks before death was thought to be a variable worth examining. However, this information was simply not recorded in the documents and since there was no way acceptable to the working party of obtaining it, it was excluded from the investigation.

By the next meeting of the working party, a draft report had been prepared and indeed the final three meetings were concerned primarily in producing a final report.

The examination of post neonatal deaths proved to be a valuable experience in many ways. At the end of the day the working party produced a good example of local research. The entire project was conducted by members of the working party and very little administrative assistance or guidance was given. The group itself became very interested in the project and have expressed an intention to continue the investigation after the experimental HCP Team has been disbanded. Perhaps the most beneficial side effect of all is the close working relationship that has formed between the hospital-based and the community-based members of the group. No doubt other methods could have been found to foster this working relationship, but the point is worth making that collaboration on a particular investigation has led to greatly improved liaison between the hospital and the community services.

One final point must be stressed. Throughout the investigation the working party constantly found difficulty in obtaining even the most basic information. The reasons for this are numerous. For example, in some cases it simply had not been recorded by error. On others the mother had given different information on separate occasions and on further occasions the answer to a seemingly obvious question was simply not recorded at all as a matter of routine.

The facilities available for the multiple-handicapped child

Originally the members of this Working Party consisted of the child psychiatrist, a consultant paediatrician, a health visitor, a GP and a social worker. However, it was clear from the outset that the task facing the group was immense, and it was felt desirable to substantially increase the pool of exper-

ience available. Consequently, the following individuals were co-opted to the group: a local authority social worker who had special interest in the handicapped, a local authority medical officer with particular responsibility for children, an inspector of special schools and an educational psychologist. An administrator attended all the meetings to provide general co-ordination and support.

The subject matter of this working party's deliberations was vast and rather vague, and unlike the group investigating post neonatal deaths there were no obvious and clear boundaries to the study available for guidance. For example, one of the first tasks the group tackled was to attempt to define multiple-handicapped and this in itself proved extremely difficult. In the first instance, many children who suffer from two handicaps (eg a hearing and speech impediment) are, in fact, classified in the official statistical returns by the primary handicap only. Moreover, the group had to consider whether 'social' handicap should be included in the definition, or alternatively whether the list of handicaps should be confined to physical and mental disabilities alone. Ultimately, these problems were resolved and a working definition adopted, but the process of arriving at an acceptable definition was understandably lengthy.

Having adopted a definition, the working party considered that the next step in its activity should be to attempt to calculate the instances of multiple-handicapped in North Humberside. On the face of it, this appeared relatively simple, but in practice the task proved exceptionally difficult. In the first instance lists of children falling within the definition adopted by the working party and known to the health, education and social services department of the same local authority were prepared by the members of the group who were employed by these authorities. Unfortunately the lists were not comparable. Not only were the total figures inconsistent, but also a large number of children appeared on only one of the three individual lists. Consequently, the group concluded that the true incidence of multiple-handicap was considerably higher than the present authorities appreciated.

The causes of these inconsistences were varied and for the purposes of this discussion need not be recorded here. However, the point is worth making that the wide spectrum of experience available to the group proved invaluable in understanding the problem. Knowledge and experience were freely exchanged and members were able to acquire an insight into the different perspectives of the other departments that are concerned and involved in child health.

The severe difficulty experienced in attempting to assess the size of the multiple-handicapped child population led the working party to consider the type of information system that in the real situation it would require. This led naturally to a lengthy discussion of screening, and on methods of identifying and recording the handicaps and defects found. Although no firm conclusions were reached, the discussion had a considerable educational spin-off and for this reason alone was valuable.

The basic working methodology of the group was to consider papers

prepared and presented by individual members. Consequently, each member was heavily involved in the group's activities and a considerable quantity of additional work was placed upon them. The concept of involving the group members in actual research proved viable and effective.

At the end of the research period the working party had not progressed beyond the point of defining its terms of reference and establishing to its own satisfaction, a reasonable estimate of the numbers of multiple-handicapped children in North Humberside. These limited achievements do not, however, detract from the tremendous energy, enthusiasm and hard work of the participants. The task upon which the working party embarked is vast and in the very limited time available, the group made considerable progress.

Discussion. Chapters 5-12

Chapters 5-12 of this report discuss some of the problems and difficulties that the authors believe will be found in practice to exist in operating health care planning teams. The conclusions reached are based partly on the experience gained from observing the experimental team in action and partly from a theoretical examination of the concepts involved.

Chapter 5

Membership

The Humberside Team

As has already been noted, the composition of the Humberside Team was decided somewhat arbitrarily and at the end of the pilot study comprised:

1 Medical Officer of Health (Chairman).
2 Consultant paediatricians (the only two in the district).
1 Child psychiatrist (the only one in the district).
1 General practitioner.
1 Social worker.
1 Medical social worker.
1 Senior nursing officer (hospital).
1 Area nursing officer (health visiting, rural).
1 Area nursing officer (health visiting, urban).
1 Administrator.

Size

The size of health care planning teams is likely to influence both the way they operate and the results they produce. If the team is too large it is unlikely to function as a working group but more as a talk shop. If the team is too small its conclusions may be based on too narrow a perspective.

In simple numerical terms, we doubt if there is a magic number which achieves the necessary balance. The balance will almost certainly vary according to the nature of each district and perhaps even more significantly the abilities of each chairman. The 11 members of the pilot team were able

to operate successfully as a working group and we would think that if one wants to establish these teams on a working basis, the correct balance in most districts lies between 10 and 15 members.

Composition

The Humberside Team was by no means self-sufficient and certain skills and perceptives were clearly missing:

Education service

Some educational input is essential not only because of the education service's obvious links with the school health service but also because of its central role in the general development of the child. This central role is, of course, particularly significant with handicapped children where the boundaries between health and education become blurred. In the interests of the child it is vital that this blurring is one of overlap and collaboration rather than irregular and unco-ordinated contract. It is not clear what sort of educationalist input would be most appropriate, for example, education service administrator, special school headmaster or teacher, educational psychologist, primary or secondary level teacher of an all-ability school. All these individuals have a contribution to make and there would appear to be a choice as to whether each perspective within the education service should be represented by one individual or whether a number of people can be involved depending upon the nature of the discussion.

In our view whichever option is taken the education service should be represented substantively on the Team.

Finance

On the pilot Team the Administrator and the Medical Officer of Health had some experience of economic analysis but had the work progressed to the stage of pricing out policy options, there is no doubt that the assistance of an accountant would have been required.

The point at which financial considerations should enter the policy-forming process is a matter of careful judgement. If they enter too early they may act as an unnecessary restraint on the mind-stretching part of the exercise. Equally, it is important that they do not enter too late as they are a vital ingredient in the planning and scheduling part of the planning process.

Paramedical professions

The paramedical and scientific professions clearly make a significant contribution to the treatment of children. However, with odd exceptions they rarely specialize in the treatment of children but provide a specialist support service to a wide range of clinicians. Some means should be found of permitting these professions to contribute to the work of health care planning teams when their particular contribution is being discussed.

Dental care
There was no dentist on the pilot Team and because of this the dental health of children was only touched upon very lightly. Dental health is obviously important but not in our view central to child health. The options available are either to create a health care planning team in dental care (adults and children), or to arrange for the child health team to undertake a regular review of the dental health of children with the assistance of professionals from the dental field.

Other clinicians
Surgeons, radiologists, dermatologists, opthalmologists, and indeed almost every clinician has some contribution to make to the treatment of children. How can their views be expressed within the Team? We would suggest that there are a number of options, several or all of which could be adopted:

1. The community physicians could act as the link.
2. The paediatricians could reflect their colleagues' opinions.
3. If a particular consultant felt strongly enough about a particular problem he could attend Team meetings to discuss the matter.
4. Provision could be made for formal links between health care planning teams (this is discussed further in Chapter 10).

Geographic considerations
In a complex district containing significant urban and rural variations one representative from, say, general practice may not be enough to reflect different urban and rural problems. This was experienced by the pilot Team and as a result a second community nurse was invited to join the Team in order to reflect more accurately the particular inner city problems of Kingston upon Hull.

The contribution of paediatricians and child psychiatrists
On the pilot Team we decided to invite both paediatricians on to the Team. In the event, this was a happy decision because each had developed a special interest within the paediatric field thus adding materially to the Team's expertise. In Humberside this policy did not produce an embarrassing number of clinicians but we recognize that in some districts there may be more paediatricians and more than one child psychiatrist. In our view, wherever it is reasonably possible, all clinicians in the disciplines concerned should be members of the Team. If not, unnecessary and totally unproductive antagonisms may be created and equally likely the clinical practice of the excluded clinicians will continue both in ignorance and disregard of the Team's plans and objectives.

It might be argued that this would unduly weight the Team in favour of the hospital services but this was certainly not evidenced at all during the deliberations of the pilot Team. A reasonable objective view of the child health scene was sustained from the very beginning although in fairness it should be noted that at no time did the Team really get down to making

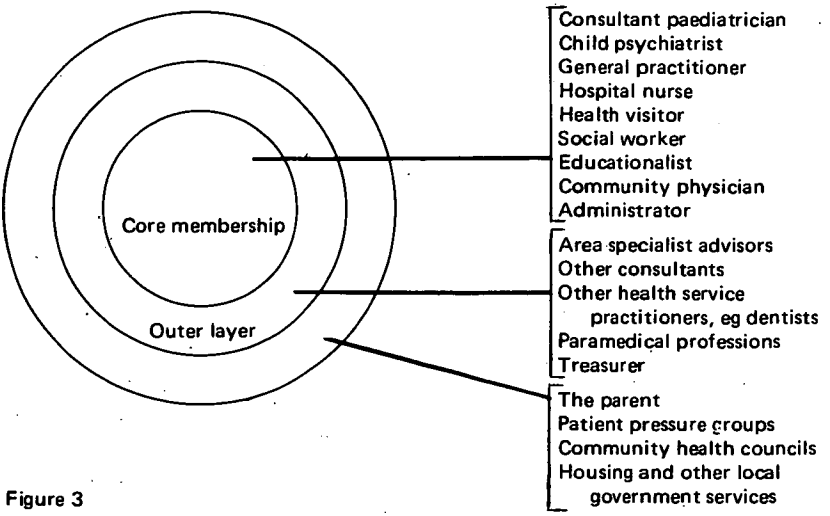


Figure 3

conclusive decisions about issues involving the allocation of resources or the programming of capital developments: areas where a degree of objectivity might have been lost. If this does prove a problem, we would suggest that a second general practitioner be added to the Team. The above considerations are one of the major reasons why the size of each team may vary from district to district.

Categories of membership

We think it may be possible to view membership of the Team within two broad categories:

1. Core membership. Those professions and/or skills that the team requires in order to take a comprehensive view of their field of study. The absence of any one could seriously unbalance the Team.

2. An outer layer: professions and/or skills whose contribution will on occasion be essential but whose attendance at every meeting is unnecessary.

However there is a third category of groups and individuals who have an important contribution to make on occasions, for example the parent, patient pressure groups, etc. The way in which this might apply to a health care planning team in child health is shown in Fig. 3.

Appointment of teams

It has not been announced how teams will be appointed although in practice it seems reasonably clear that the principle mover on the scene will be the DMT itself. One assumes that the clinical members will be nominated by the DMC and that they will therefore participate in a representative role. This in turn appears to imply regular contract between the DMC and their representative but further reference is made to this point later.

All other members will no doubt be appointed by the appropriate chief officer although it has been suggested that rather like the clinician the nursing representatives could be nominated by the local nursing professional advisory committees. This proposition ignores the fact of the nursing managerial hierarchy. Planning is the essence of management and the only reason one approaches the professional advisory machinery to obtain medical representation is the absence of a medical hierarchy.

Status of team members

Although there existed within the Humberside Team a mix of senior and middle managers and senior professionals, this did not appear to inhibit the contribution of the more junior members once the Team had settled down. Thus the community nursing officer was able to advance her own perspectives and ideas without prior reference to her Medical Office of Health. By and large we are satisfied that in a reasonably sized task-orientated group varying levels of seniority can work together satisfactorily.

If problems are to arise they are more likely to stem from officers outside the team because of a potential disparity between the composition of the teams and their objectives.

Health care planning teams have two broad objectives:

1. To monitor the existing service.
2. To guide policy development and planning.

The first function seems to us to require both a first-class information system and the positive contribution of staff working at grass roots level.

The second function requires experienced and senior officers.

Consider the problems associated with the appointment of essentially grass roots teams:

1. If the individual fieldworkers are attending in their own right, this clearly would effect their relationships with their seniors in the field. Whatever is laid down, in practice we suspect that the 'my representative' syndrome will appear which will reduce considerably the contribution that the individual concerned can make to the team's deliberations. It will also create tensions within the team because of their awareness that a powerful non-attending 'member' is operating in the background.

2. Such a team might have the effect of cutting middle management out of policy development altogether.

3. The accurate interpretation of data may require a broader perspective of the total scene than fieldworkers possess. It may also demand a higher level of analytical skill than is usually found at this level.

4. Senior managers who are not members of the team are likely to adopt an aggressive attitude to team conclusions or pour scorn on recommendations made 'without a true understanding of the total picture'.

5. Grass roots practitioners may be overwhelmed by the very size of the problem and unduly conditioned by the existing situation to break new ground.

In contrast consider the problems associated with a senior management/senior professional team.

1. No matter how good their information system is a senior management team is likely to be too far removed from the field to really grasp the minutiae of very small but nevertheless real and human problems or indeed to fully appreciate what is actually happening at the grass roots level. Anybody who doubts these propositions need only to refer to the reports of the committees of inquiry into the Health Service published during the past five years.

2. Senior managers are unlikely to identify clearly and regularly deficiencies that may reflect in some way upon their own performance.

3. A senior team does not permit grass roots people to contribute positively or effectively enough.

There are at least two ways out of this dilemma. The first option is to create a mixed team containing the skills and experiences necessary to perform both the monitoring and the planning functions. Frankly, in our view, such a solution is likely to prove to be the worst of both worlds.

The second option is to accept that two distinct functions exist and separate them. The team itself could be comprised of senior professionals and managers, possibly second tier officers and even on occasions members of the district management team. This would provide the necessary expertise for teams to make a positive contribution to policy development, programming and budgeting. Such a team is not entirely devoid of 'fieldworkers', of course, because of the presence of consultants and GPs. In order to mobilize the grass roots contribution we would suggest that each team should constitute a number of *ad hoc* task groups to examine a series of particular issues and prepare a report for the team. Each task group might comprise one or two members of the health care planning team proper plus a variable number of fieldworkers with particular experience in the field under review.

The report on the co-ordination of services for the mentally handicapped published by the King's Fund shows quite clearly the sort of positive contribution that fieldworkers can make to building up information systems and indeed undertaking research. The individuals concerned who are at the 'cutting edge' of the service by becoming involved in action research, as it is called, themselves go through a dynamic learning process involving changes in role, perception, and attitude.

In a small way this approach was tested by the Humberside Team. Two task groups were created to examine post neonatal deaths and problems of the multiple-handicapped child and the following additional skills were recruited to the groups.

1. Assistant Medical Officer of Health with particular interest in child health.
2. Educational psychologist.
3. Social worker with particular experience with handicapped children.
4. Inspector of special schools.
5. Clinical assistant in paediatrics.

One particular attraction to this approach is that it enables a greater number of people to be involved in the planning process.

Chapter 6

The consumer: community health councils

One of the most accurate and detailed views of the service provided to children was received from the parent of a mentally handicapped child. Her description of her family's experience is both moving and challenging. Despite its emotional bias, it clearly highlights deficiencies both in terms of facilities and staff attitudes and gave the Team its first real measure of those elusive elements, quality and co-ordination. (The original report, which was prepared by the parent at the suggestion of the GP on the Team, was subsequently used extensively as a case-study on integration courses.)

It is clearly essential that this consumer perception of the service is maintained, for, at the end of the day, it is perhaps the most important one of all.

There is some immediate attraction and logic in the notion that this consumer view should be projected by community health councils, who should therefore be represented on health care planning teams. It would certainly enable councils to become involved with real issues and problems in a positive and constructive way and, in doing so, gain a depth of understanding that it would be impossible to obtain from a detached and uninvolved position. If they are not involved they may become uninformed and destructive critics of the service, a situation which would be in nobody's interest, least of all the community. However, there are difficulties.

The very act of becoming involved in a practical way in the development of policy would tend to dull the critical edge of councils. They would find themselves defending area health authority policies rather than commenting objectively about them.

During the course of their deliberations health care planning teams will no doubt wish to review potentially emotive and political issues, for example, closure of hospitals. Whilst community health council reactions to such an option is clearly important, premature disclosures or public discussions might be positively disruptive at such an early stage in the evolvement of policy recommendations. Such a situation would certainly dull the edge of health care planning team discussion and radical options would probably be ignored.

One also has to consider the position of the area health authority and the district management teams who might find themselves presented with policy recommendations from planning teams with a tag attached to say that this recommendation had the blessing of the community health council. Further discussion with the council at the higher level would not be easy because, having participated in the perhaps painful process of evolving policy, the council will inevitably feel some commitment to it.

The relationship of the community health council, with its large proportion of local authority nominees and the joint consultative committees to be established between area health authorities and county councils to consider matters of common interest and collaboration, would also become confused if councils were seen to be part of the planning machine.

The strength of these objections depends to a large extent upon the

strength of the relationship between health care planning teams and councils and the answer is probably to find some means of collaboration that falls short of actual participation.

The problem might be tackled at two levels. One to invite the Council to nominate members to serve on 'task groups' that may be established by planning teams. As the objectives of these task groups are primarily information gathering, no problems of commitment will occur.

There may, however, be difficulties associated with the confidentiality of case-notes. Task groups must inevitably review cases and, in doing so, willno doubt gain possession of confidential material. This rather worrying and extremely sensitive point needs considering in the context of the objectives of the health care planning teams. Their prime concern is with broad issues; with communities rather than individuals and their brief positively excludes the review of the clinical management of individual cases. When individual case-histories are being reviewed, it will be with the objective of monitoring service deficiencies and identifying instances where shortages of resources forced a clinician to adopt a treatment process that is not necessarily the one he would have wished. The names of individual patients can always be consciously changed and one would hope that community representatives would understand the delicacy of their position and the fact that the stress on confidentiality is made as much by the community itself as by the medical profession.

The second level of involvement is concerned directly with policy and the Council's right to be consulted before major developments are agreed upon.

The simple act of the area health authority sending the community health council a copy of their policies and objectives or capital development programme whilst essential is, by itself, unlikely to stimulate a positive and constructive response.

We would suggest that each district management team should meet its corresponding council accompanied by each of its health care planning teams once a year prior to the formal submission of the district plan to the area health authority to discuss the present position and examine plans for development. If the planning cycle can be so arranged that this process is spread throughout the year there would be at least four conferences of this sort, one for each health care planning team. Following these discussions the area health authority itself would no doubt seek the formal reaction of each council to its area plans thus giving the council a second bite at the cherry. The value of the area health authority's holding an annual conference with all its councils to review the planning in the context of the whole area might also be considered.

We would hope that there would also be a continuing dialogue through the year between councils and district management teams (and thus with appropriate health care planning teams) to discuss particular problems or complaints.

Chapter 7

Information systems and requirements

'Data must be gathered and analysed if Teams are to work effectively' (Para. 2.51: *Management Arrangements for the Reorganised National Health Service).*

One of the first tasks likely to be considered by a newly established health care planning team is the creation of an information system. This was certainly the case with the Humberside Team and it is understandable in that there is a natural reluctance to reach any conclusions or make any recommendations without the opportunity of a thorough appraisal of the 'facts'. However, in a field as complex as health care planning very careful thought must be given to the actual requirements for information before a system to meet these requirements is established. Unless a thorough appraisal of real information needs is undertaken and careful consideration is given to the ways and means of meeting these needs, there is a danger of establishing a faulty system. This, in itself, may have wide repercussions on the concept and operation of health care planning teams generally.

The creation of an information system is not only expensive and time-consuming. It is a task upon which the initial enthusiasm of the teams may flounder. Moreoever, although the individual requirements of each team for the same group may vary slightly there will be considerable common ground. It is important that the systems designed to provide this core information are similar.

The desirability of having a broad similarity between systems implies national guidance which is in any event advantageous. In the absence of national guidance there is a danger that every newly established health care planning team will expend considerable time and effort in designing its own system. If the experience of the Humberside Team is repeated much of this effort may prove abortive.

The creation of an information system is also a task to which there would seem to be very few short cuts. The information already collected by education, social service, and other departments is of dubious value to health care planning teams because it is collected for the purposes of these departments and not for health service purposes.

For example, when the Humberside Team's Working Party on the facilities available for the multiple-handicapped child attempted to assess the incidence of multiple handicap in North Humberside it found that the health, education, and social services departments of the same county council produced three very different figures of the numbers of multiple-handicapped children known to each department. The reason for these differences is obvious in that each department assessed 'handicap' for its own purposes. Thus the education authority's definition, being concerned only with a handicap affecting the child's educational needs, differed significantly from the definition used by the local health authority. The point is worth noting therefore, that although existing information collecting systems may be of

some interest to health care planning teams they should be approached with great caution. In our experience they do not and cannot provide a substitute for the development of a health care planning team's own system.

When the Humberside Team considered its own requirements for statistical information it concluded that any system must ideally be capable of fulfilling four functions:

1. The system must describe the existing services and enable an on-going evaluation of their effectiveness to be undertaken.

2. The background against which the existing services operate must be described since without some knowledge of the environment of the people for whom the services are provided it is not possible to evaluate their effectiveness.

3. It must be sufficiently sensitive and flexible to identify changes in the pattern of need in time for the planning machinery to make the necessary alterations in the provision of health care.

4. Ideally the system should be of some assistance in measuring quality.

If an information system can fulfill all of the above functions, it should provide sufficient statistical information to enable a health care planning team to fulfill its two primary functions: contributing to policy formation and monitoring.

In addition to the above requirements for statistical information a health care planning team, when contributing to policy formation, must frame its recommendations against the background of national, regional, and area policy and in order to do so must possess considerable knowledge of whatever policies exist. No doubt it will be for the community physician and the administrator to advise the team on matters of national, regional, and area policy and priorities.

It is necessary to look more closely at the function ascribed to the information system and listed above. The first two functions, a description of the existing services, the background against which they operate and an evaluation of their effectiveness, can be dealt with together since the approach to these requirements is seen as broadly similar.

In an attempt to fulfill these two functions, the Humberside Team decided to produce a profile of child health similar to the area profiles produced by joint liaison committees. To this end considerable quantities of data were collected. (See Appendix 2.)

With the benefit of hindsight the Humberside Team would not have given the task of preparing a profile as much priority as they did. The exercise placed very heavy demands on the time available and relied almost exclusively on the assistance of numerous local authority and civil service departments. Obviously producing information takes time, particularly when the information requested differs somewhat from the normal presentation. The Humberside Team had the advantage of being the only health care planning team in the area asking for information at that time yet even so some authorities felt unable to spare sufficient time to answer our inquiries. When several health care planning teams in each district begin simultaneously to ask for information, it is highly unlikely that the authorities and organiza-

tions from whom the information is requested will be able to meet the demand. Moreover, many of these authorities will themselves be recovering from the trauma of a major reorganization and no doubt will be simply unable to supply information for health care planning teams immediately.

Another difficulty experienced by the Humberside Team in preparing the profile was the apparent suspicion with which certain authorities viewed requests for assistance. Some authorities seemed to interpret the legitimate expression of interest on the behalf of the experimental team as an attempt by the medical profession to exert influence beyond the confines of the NHS. There is no doubt that a health care planning team in any specialty that is so intimately connected with non-NHS community services should at least be aware of the possible suspicion with which their activities might be viewed.

The dangers of using information collected for non-NHS functions in the planning and monitoring of the health services were discussed earlier in this chapter. It cannot be overstressed that this is a dangerous practice which may produce misleading results. Teams should be fully aware of the potential pit falls before attempting to rely on this type of information.

Finally there are the obvious practical problems of presenting the information in a readily understandable form. The Humberside Team had access to facilities that other teams may well be denied. Even so presentations proved to be a major difficulty. Expertise in the presentation of statistical information is not readily available in the NHS and it is extremely doubtful that such expertise can be created in time to support health care planning teams if they are to be established in the early months following 1 April 1974.

The profile provides a fairly detailed picture of the health of the children of North Humberside and the social and economic environment within which they live. However, with any statistical approach there is a difficulty of interpretation as well as that of presentation reported above. If skills in presentation are scarce, skills in interpretation are even scarcer. No doubt the community physician and the administrator will guide the team to some extent on the interpretation of statistics but it is doubted that even they will always by themselves possess sufficient knowledge and skill.

For these reasons we recommend that the temptation to produce a profile as comprehensive as the profile that the Humberside Team attempted and in some part succeeded in producing should be firmly resisted in the early months. We suggest that initially teams should restrict themselves to producing only enough basic data to understand the scale and operation of existing services.

The third function the Humberside Team hoped that the information system might fulfill is that of identifying changes in the pattern of need in time for the planning process to make the necessary provision. Ideally the system should be sufficiently sensitive to pick up, say a mentally handicapped child at birth and ensure that all the services required by that child and his family are co-ordinated and provided at the correct time. The introduction of 'At Risk' registers and observation registers in the 1960s was an attempt to produce such a system but it is an illusion that these are main-

tained on anything like the scale required to perform this function effectively. Indeed some local authorities have abandoned the use of such registers because they have found that in practice far too many children are placed on the register and consequently they are of little value.

The Humberside Team have considered ways in which this function could be performed but any scheme is inevitably a long-term project involving considerable expense. It is to be hoped that national guidance will be issued on this subject and a national uniform system introduced.

If the existing information collecting systems are to be considered suspect from a health point of view; if it is accepted that there is insufficient expertise available to health authorities to present and interpret statistical information and if also it is accepted that initially at least it will be impossible for health care planning teams to obtain any real information from other social agencies: how then are teams to fulfill their information needs? 'Information needs' in this sense is confined to information for planning purposes and monitoring (it is anticipated that basic information on the existing services will be collected as suggested earlier).

Two broad categories of statistical information can be identified. There is that information that is required for major policy and planning decisions, for example the siting of a health centre, or the reallocation of funds between services, and there is that information required 'to complete the picture' when a health care planning team is investigating a particular area. It is suggested that as far as the latter sort of information is concerned health care planning teams perhaps with the help of their 'task forces' and guided by the community of physician and administrator should collect and analyse data themselves. This should only be undertaken on an *ad hoc* basis where the team is investigating a particular area. The first stage in the sequence must be to determine by other means the possible existence of a problem or gap and then move towards collecting the statistical information that will support or negate this theory and be of assistance if producing a strategy.

The former type of information need is considerably more complex and the decisions likely to be based on it are more likely to be irreversible and almost certainly very costly, for example, the siting of a health centre or day-hospital will include complex demographic and economic analyses as well as epidemiological studies.

The expertise and support facilities (access to computer time and programmes) required to provide this sort of information is not available to existing NHS authorities even at regional level, and it is inconceivable that it could be created except in the very long term. However such expertise and the support facilities are available in the planning departments of some existing local authorities and no doubt it will be transferred to the new county authorities. To a very large extent the information needs of the health care planning teams (and indeed district management teams and area health authorities) that fall into this former category can be met from this source and we strongly recommend that serious consideration

is given to the possibility of reaching an agreement with local authorities to collaborate in the supply of this type of data.

There remains the problem of information for monitoring, for identifying deficiencies and short falls or for identifying potential deficiencies and short falls that require further investigation (ie the first stage of the sequence mentioned above) and information that will assist in measuring that elusive factor quality.

We believe that the use of case-studies provides a reliable, cheap and relatively simple answer to problems of obtaining this type of information. Moreover, it is a method that will be available immediately to all health care planning teams in that it requires no elaborate administrative machinery and no money. All that is required is for the team to commission studies to be prepared by subordinates in the field, ' task forces,' or indeed parents and relatives.

Elsewhere, the case-study prepared by the parent of a mentally handicapped child is mentioned. Other case-studies were prepared by the health service practitioners (the community physician, health visitors, hospital nurses, social workers, etc.) and although these differ in their quality (no doubt because the aims and objectives of the exercise were not fully explained) they all describe more about the way in which the existing services actually operate in the treatment and care of individuals than any amount of statistical information could ever hope to do. Examples of these studies are included in Appendix 3. The dangers of using the case-study approach are obvious and we would not suggest that it provides an ideal and only solution to the problem of this type of information. However we see the use of case-studies as one of the ways open to health care planning teams of identifying the existence of potential problems and deficiencies. It is then for the teams to investigate fully and determine what action if any is required.

To summarize therefore, 'systems are like roads. Very expensive and no good building them until you know exactly where they will wind up' (Peter Townsend, *Up the Organisation*). Individual health care planning teams must avoid creating their own elaborate information superstructure; this is a matter for national guidance. The production of a profile of the type prepared by the Humberside Team will be impracticable at first and should in any event be avoided. Health care planning teams should make extensive use of case-studies to identify problem areas and to monitor the service and should only collect statistical data when it is necessary during the investigation of a particular subject. Finally we would strongly suggest that every effort is made to enable new health authorities to make full use of the information service available in local authority planning departments. This should prove to be a very fruitful area for collaboration.

Chapter 8

Overlap problems

Two types of overlap problems have been identified.

Other health care planning teams

Obviously health care planning teams will have common boundaries with each other. For example, there will no doubt be an overlap between child health and obstetrics, between paediatric and other forms of surgery, between facilities for adults and for older children to name but a few. Moreover, there will be an interest in certain therapeutic and diagnostic services common to all health care planning teams and no doubt teams will wish to comment on these services.

To avoid a duplication of effort and to ensure that health care planning teams operate in concert we suggest that it is for the community physician to co-ordinate the activities of health care planning teams and to arrange whatever joint consultation might be deemed desirable. We do not envisage any serious problems in this area, although there will inevitably be some divergence of view arising from the different perceptives with regard to development in the overlap areas: this divergence should be healthy.

Local government

One of the principal features of the reorganized NHS is its common boundary with local government. A deliberate overlap situation has, therefore, been created in order that collaboration and co-ordination of services between health and local government authorities is a practical proposition. Serving as they do the same community, both organizations have a vital interest in the others problems and policies. This has been recognized and formal consultative machinery is to be established at area level. However, a more practical and potentially more productive point of contact may be found at health care planning team level.

In order to fulfill their role, health care planning teams must pitch their horizons beyond the narrow confines of the NHS. Health is closely interrelated with the general, social, and economic environment in which the community live. They will, therefore, be interested in housing, pollution control, education, employment structures, wealth, traffic density, noise, to mention but a few. They are also concerned with any policies that result in population movement (slum clearance, new towns, new major industrial changes, etc.), in order that they may adjust the health care delivery systems to the changing population need. Finally, and perhaps most important, they have to collaborate in meeting the community's needs, for example, social services to reiterate a point made earlier. It seems to us that in view of this high degree of common interest positive steps ought to be taken to facilitate information exchange or even to consider the establishment of a common information/research unit to service the planning activities of both organizations at either area or district level. We were impressed by the quality of

the information available within the local government planning department in Hull and see little point in the health service attempting to duplicate their work.

There are to be representatives from local government on health care planning teams and it ought to be possible for them to act as a further bridge between the authorities. They could bring to teams details of local government policies and plans and in return take back to their own authorities the plans, policies, and views on priorities of the health authority. However, for this to work, the representatives must be relatively senior officers.

If nothing else, health care planning teams ought to be a rich source of material for the formal joint consultative committees.

Chapter 9

Workload and support staff

Members of the Humberside Team give their time and enthusiasm willingly in order to foster an experiment that offered the prospect of a new approach to child health. No adjustments were made by way of compensation to their existing workloads and case-loads; they simply carried the extra burden. This was no easy task particularly for the GPs and consultants and explains why their activities outside the team meetings were relatively limited.

One supposes that a similar situation will occur when teams are actually set up and on the basis of our experiment we offer the following advice:

1. The time available at meetings must be used positively, constructively, and with a proper regard for its value.
2. Teams must be adequately supported.
3. The amount of essential pre-meeting reading that members are required to do is potentially enormous but must be kept to an absolute minimum and where possible summaries should be provided.

The support staff available to the Humberside Team were as follows:

1. A senior administrative assistant who acted as secretary to the Team on a part-time basis (fifteen hours per week) and was thus involved in the preparations for and arrangements of meetings, the follow-up work after each meeting, the preparation of background papers, and the general co-ordination of this report and associated profile.
2. A research assistant who was employed whole-time on the project and who did by far the majority of the work on the preparation of the profile as well as writing the minutes of meetings, arranging visits, and generally controlling the masses of paper that the team generated.
3. A general administrative assistant with experience of hospital-based information systems and who was particularly adept at presenting information and was also available to the team on a part-time basis (perhaps four hours per week).
4. Secretarial support was provided as required and on average probably amounted to twenty hours per week.

The above was in addition to the considerable work undertaken outside

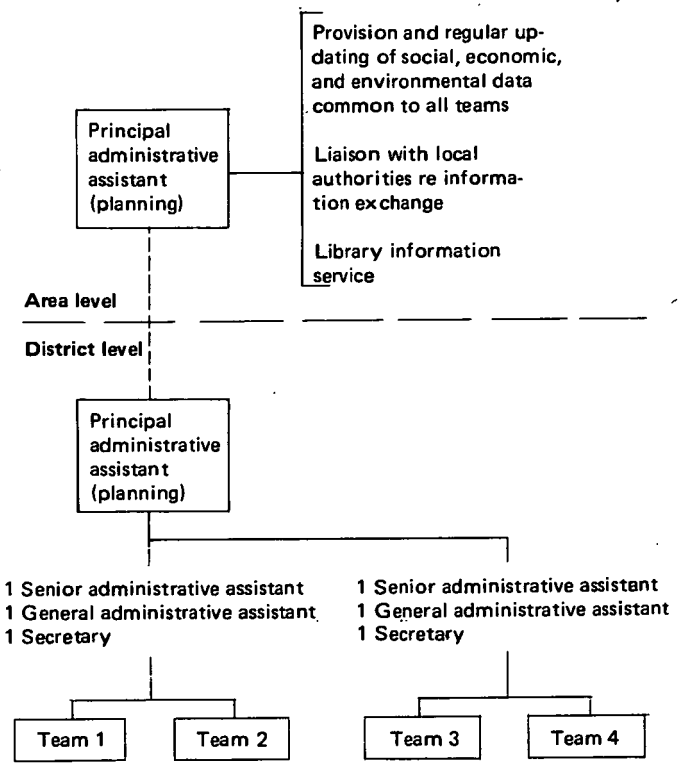


Figure 4

the meetings by the Medical Officer of Health, the administrator and one or two other members of the Team. It will be seen that the Humberside Team required almost the equivalent of two whole-time administrative staff and a part-time secretary to give general support and more particularly to meet the teams information needs.

In practice some of the work undertaken by the support staff would be applicable to other teams in the district and based on our admittedly limited experience the absolute minimum level of support we think would be required for a district with four teams in operation might be as shown in Fig. 4.

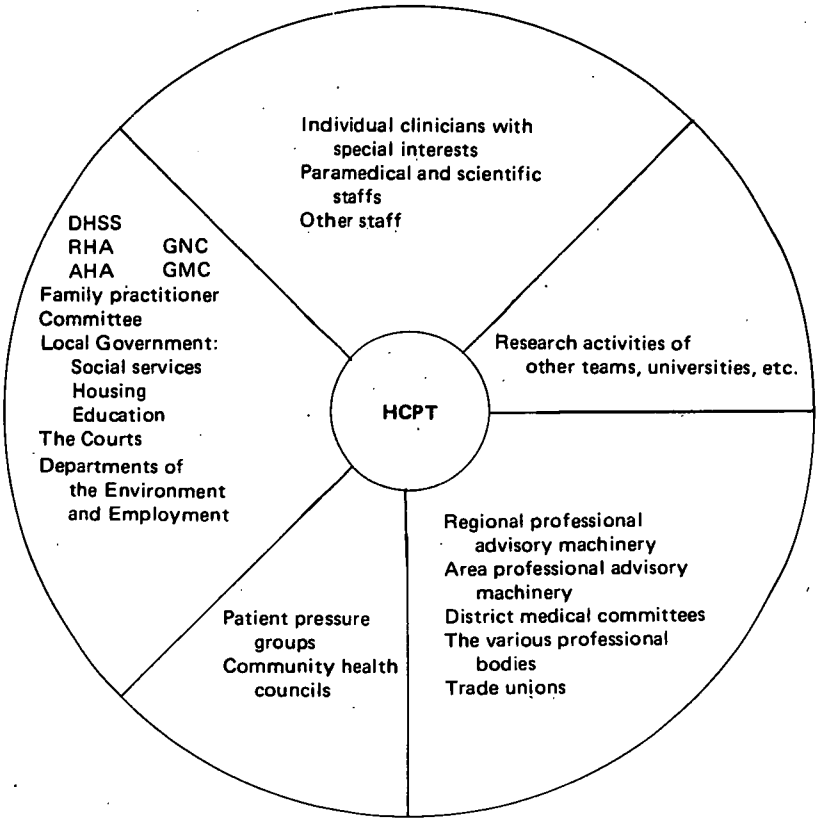


Figure 5

Chapter 10

Relationships with professional advisory bodies

As the organizational strategy by which the various professional groups come together to view the needs of particular patient groups, health care planning teams create many of the interfaces that are a feature of the new management arrangements. However, overlapping as they do the professional hierarchies and professional advisory machinery, they will inevitably be subject to considerable pressure both from within the organization and from outside sources. Some of the individuals and organizations whose attitudes, opinions, and policies teams will have to take note of are set out in Fig. 5.

Health care planning teams can be seen to operate in a highly sensitive situation and we are not satisfied that their role has yet been clearly enough defined particularly with regard to their relationships with the managerial structures and the professional advisory machinery.

Consider what might happen if a Team concluded that there was a serious imbalance of resources within their district and decided to recommend a reallocation of health visitor support from an affluent rural area to the city. Do the team stop at that point or do they go on to consider the practical realities by posing questions such as: 'How will the GPs in the rural area react to this proposal?'

We have already assumed that the GPs on the team are acting in a representative role but it remains to be seen how much discretion that actually confers on the individual concerned. Would it be for the team to make initial soundings on an issue of this sort and if so would it be done by the GP on the team informally or would he ask the DMC to discuss the matter? The latter approach might work reasonably well if the GP concerned was a member of the DMC but would become extremely cumbersome if he were not. One has visions of DMC agendas being filled with kites being sailed by each planning team (often kites that are incompatible with each other), and DMCs reacting in the classical way by either saying no or deferring any conclusion until further information is available.

'How will the nurses in the rural area react to this proposal?' The nurse on the team will be in a rather different position from the GP in that she will be advancing the nursing viewpoint from a position within the nursing hierarchy. However, there are still a number of different approaches. Does she sound out the nurses concerned? Does she arrange for the appropriate senior nurses to sound out the nurses concerned? Is it a matter that requires discussion either with the local nursing professional advisory committee or trade unions? If so, does she initiate these discussions?

There are many other questions that need to be asked including that relating to the community's reaction but even a relatively superficial view of the situation identifies a number of quite serious difficulties in the way of teams who want to move through to the point where their policies become practical propositions.

1. By discussing options with staff at this very early stage, the team may generate unnecessary heat and anxiety. If the discussions are not handled well such a resistance may be engendered as to make the options unworkable anyway.

2. If teams are required to undertake formal soundings as they proceed, their ideas are quite likely to be strangled in the bureaucracy: if they survive at all they will have certainly lost their freshness!

3. The team may create expectations in the minds of those consulted which may not in the event be met. If this happens with any regularity, the credibility of teams will undoubtably suffer.

One might conclude that because of the problems they may generate, teams should not indulge at all in the formal soundings or consultations

until the DMT have considered their recommendations. Even this has its problems however as, if teams keep things very much to themselves, they will inevitably be viewed with suspicion and even antagonism by the many interested groups with a legitimate interest in the field. It would surely be better if the professionals on the team tried to reflect their colleagues' views (based if necessary upon careful and informal sounding from those likely to be effected), without there being any requirement for teams to undertake formal consultation at every stage with the wide range of interested groups. The appropriate time for formal consultation is later when the DMT themselves have had time to consider all team proposals and start evolving their district plan.

Chapter 11

Health districts: are they the right level for planning teams?

In their ideal state health service districts are defined as the smallest viable unit within which comprehensive health care can be provided. To begin with few districts will be entirely self-supporting and in some areas the way in which existing services have been developed may make this ideal state forever unattainable. It is, therefore, necessary to consider the implications for planning teams of situations such as that occurring on the north bank of the Humber where all or most of the paediatric hospital resources are located within one district and provide a service to neighbouring districts. (Similar examples may be found particularly in the psychiatric and mental handicap fields.)

Is a health care planning team in child health really viable in a district without paediatric beds? How could they change the balance between hospital and community care if the hospital services are controlled by another district (whose judgement as to the right 'balance' might be different)? If in this situation each district has its own team, the paediatrician (and psychiatrists) will spend a great deal of their time attending a series of planning teams. This is a very real problem because one of the greatest constraints that operates against planning teams is the demands they make upon clinical manpower that is often a very scarce resource indeed.

There are at least four approaches to this problem:

1. Establish a team in each district on the grounds that teams are central to the district concept. Where the hospital component is provided elsewhere let the team act as a consumer of paediatric hospital resources. Arrange for a degree of overlap between members of neighbouring teams.

2. Establish multi-district planning teams with members drawn from the districts concerned. These are likely to be large teams and have an internal competitiveness built into them, which might not be in the interests of the weaker districts. This option would make less demands on the time of the clinicians.

3. Establish district teams but arrange for them to nominate members to serve on co-ordinating area teams. This is an attractive option but very time-consuming.

4. Establish area teams in situations of special difficulty.

The approach to be adopted is dependent to some extent on the relative weights attached to a team's responsibilities, ie on the one hand identifying a population's changing needs and on the other observing the health care delivery system in operation.

In our view the emphasis must be on monitoring the population and all districts should, therefore, have their own teams dispute the practical difficulties.

Chapter 12

Final comment

We are reluctant on the basis of our experience to offer firm advice to other health care planning teams and indeed hope that readers will draw their own conclusions from our work.

We, however, pass on the following concluding comments for other teams to consider together with a simple flow chart of early activity (Fig. 6).

First we urge other teams not to channel too much of their early energy and enthusiasm into the preparation of a detailed and comprehensive information system. We do not underestimate the value of such systems: indeed in the longer term they are the basis of a more sensitive and rational approach to health care planning. However, we doubt whether the expertise in information handling and analysis exists in sufficient depth in the NHS at present to sustain more than a few teams. A more modest approach therefore seems more appropriate until this expertise exists. (Incidentally a prime training need for the future.)

A basic appreciation of the community under review combined with specialist consumer views (eg mother of a handicapped child) and discussions with professionals dealing directly with patients will almost certainly identify the dominant problems quite rapidly and in sufficient detail for teams to get down to work. The 'technological' deficiency in the NHS can be corrected to some degree by developing a good working relationship with local government where a great deal of expertise exists, particularly in the demographic field.

Secondly it is vital that district management teams thoroughly appraise the role and function of the teams they establish and give them a clear brief to work to. The brief should include such basic matters as constitution, relationship with other advisory machinery and line managers, communication channels, as well as a clear statement of objectives. It would also be helpful if district management teams could themselves indicate early problems for review in order to give teams something to get their teeth into in the early months.

Finally a word of caution. Teams will only function effectively if the

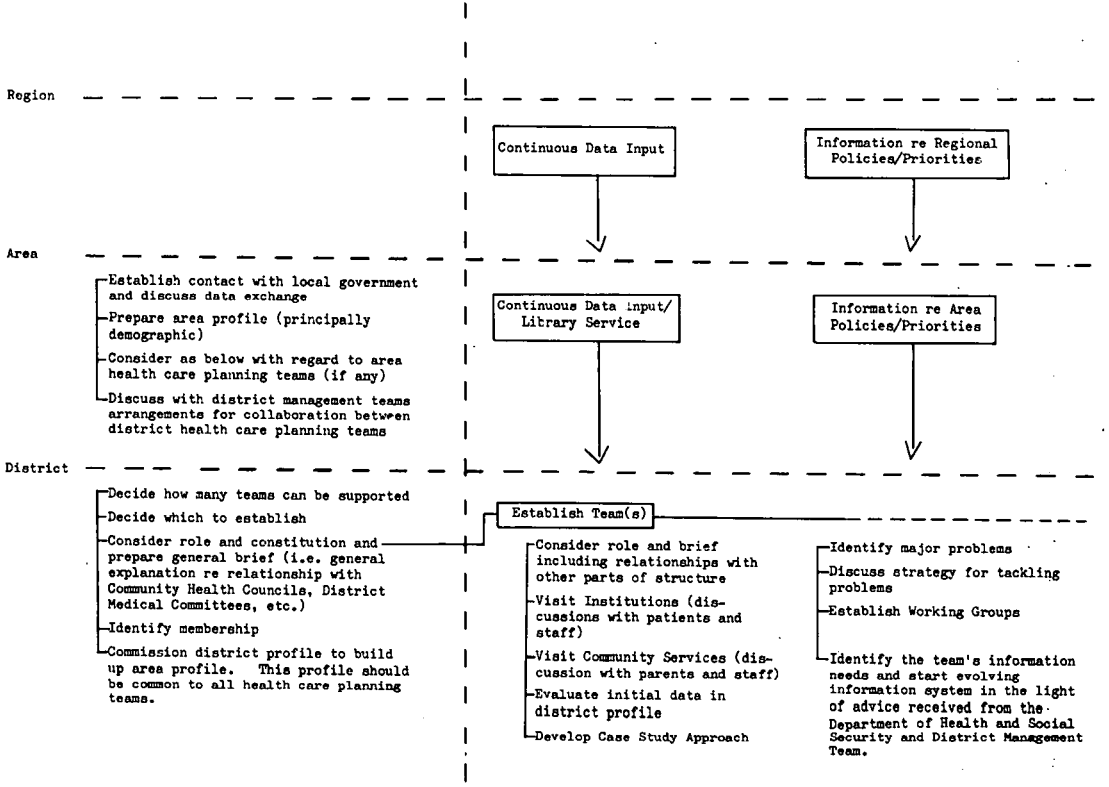

Region
Area
District
Continuous Data Input
Information re Regional Policies/Priorities
Continuous Data Input/ Litrary Service
Information re Area Policies/Priorities
Establish contact with local government and discuss data exchange
Prepare area profile (principally demographic)
Consider as below with regard to area health care planning teams (if any)
Discuss with district management teams arrangements for collaboration between district health care planning teams
Decide how many teams can be supported
Decide which to establish
Consider role and constitution and prepare general brief (i.e. general explanation re relationship with Community Health Councils, District Medical Committees, etc.)
Identify membership
Commission district profile to build up area profile. This profile should be common to all health care planning teams.
Establish Team(s)
Consider role and brief including relationships with other parts of structure
Visit Institutions (discussions with patients and staff)
Visit Community Services (discussion with parents and staff)
Evaluate initial data in district profile
Develop Case Study Approach
Identify major problems
Discuss strategy for tackling problems
Establish Working Groups
Identify the team's information needs and start evolving information system in the light of advice received from the Department of Health and Social Security and District Management Team.

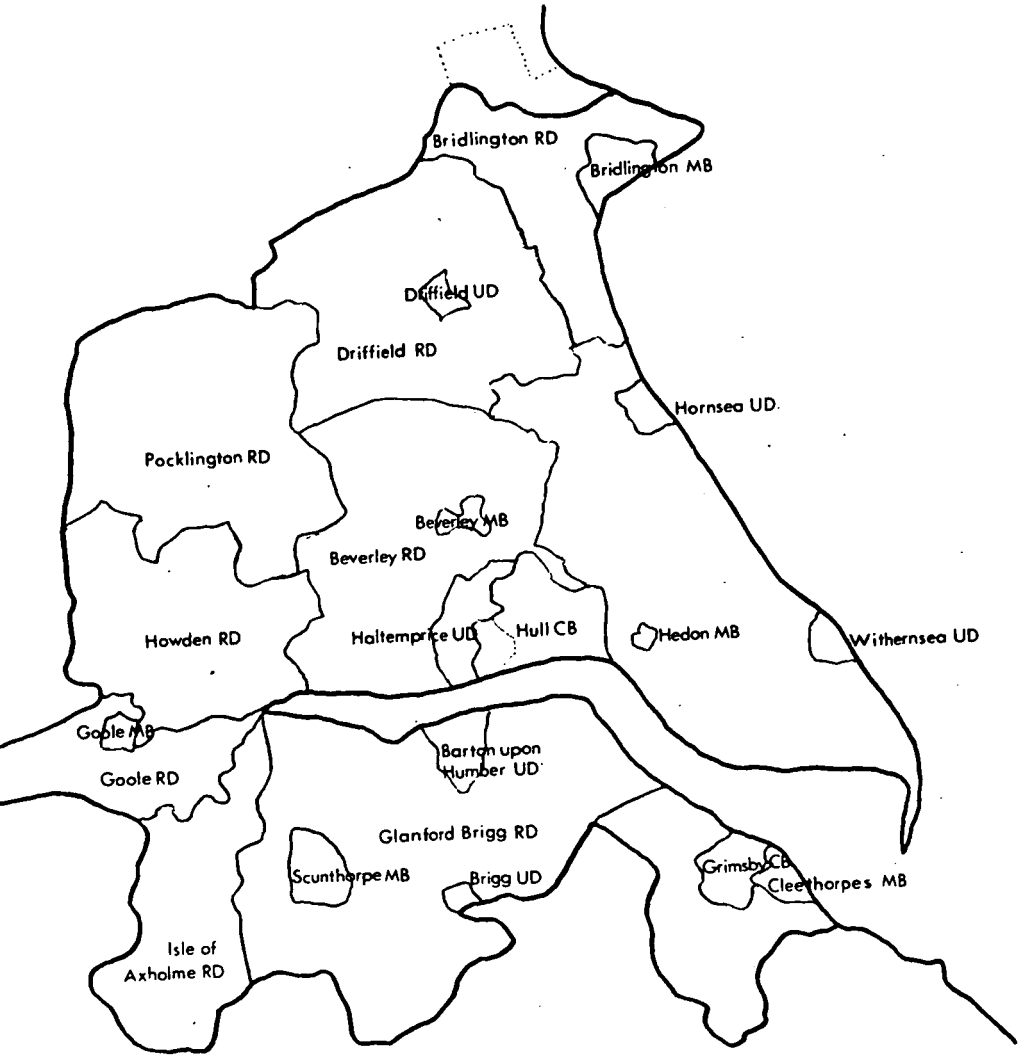
Figure 6

health care professions involved in the direct delivery of patient care identify with teams understand their role and feel some sense of commitment to the challenges they will generate. If the professionals regard teams as a threat to their professional aspirations or clinical freedom or perhaps even worse regard them as an irrelevance they will founder.

Teams must not emerge as privileged groups operating under a cloak of secrecy but as an open and dynamic medium for health professionals to collaborate in the development of better health care to their communities. In this context the relationship between health care planning teams and the medical advisory machinery is extremely sensitive and important.

Appendix 1

Map of Humberside



Appendix 2

List of headings in 'Profile of Humberside' prepared for the study

Part One. The demographic, socio-economic environment.

Section One. The general environment of the population of North Humberside.

A. Demographic data.

Map of Yorkshire, East Riding, showing the new local authority districts of County Humberside.

1. Population 1971, number, percentage, and density North Humberside and local authority areas.

2. Population 1961-71 and intercensal variation by cause: North Humberside and local authority areas.

Histogram of age percentage distribution by sex.

3. Population of North Humberside 1971, by age, sex.

4. Population of North Humberside 1971 by sex, age, and marital condition percentages.

Map: Yorkshire, East Riding in relation to County Humberside: showing pre-1974 local authority areas.

5. Population 1972: England and Wales, North Humberside and local authority areas; and total number of live birth in 1972.

Graphs: adjusted birth-rates; North Humberside 1963-72.

6. Infant mortality 1961-72: absolute numbers of deaths of infants under 1 year.

Map: sources of migration for Yorkshire, East Riding.

7. Migration within five years preceding the 1966 Sample Census.

8. Young migrants within five years preceding the 1966 Sample Census.

B. Housing

Local authority housing.

1. Stock of dwellings by tenure: England, North Humberside, Hull, and rural areas, 1971.

Pie charts.

2. Households by tenure with selected amenities, 1971 North Humberside, Hull, urban and rural areas.

(*a*) Percentage without exclusive use of hot water, fixed bath, and inside WC.

(*b*) Percentage with either no hot water or no fixed bath or shower: note on percentage with no flush toilet.

(*c*) Percentage with outside flush toilet.

3. Overcrowding: persons in permanent buildings by density of occupation: North Humberside and local authority areas 1971.

Pie charts.

C. Earnings and occupation.

1. Percentage of households with one or more cars, some local authority areas 1966.

2. Average weekly earnings, April 1972: Great Britain, North Humberside, and Mid-Yorkshire.

3. Socio-economic groups of economically active and retired males, 1966: England and Wales, some local authority areas.

Pie charts.

4. Distribution of total working population, 1971: Great Britain, North Humberside employment exchange areas.

Map of employment exchange areas.

5. Analysis of unemployment at 9 July 1973.

Section Two. The child population of North Humberside.

A. Demographic data.

1. Population (under 17), North Humberside by sex, age, 1961-71.

2. Population (under 17), North Humberside by sex and age, 1971. Percentage.

Histogram of age percentage by sex 1971.

B. Education.

1. School attendance: Hull and East Riding 1973.

2. Children staying on at school aged 16 and 17; England and Wales, Hull, East Riding 1971.

C. Employment.

Employment of boys and girls under 16 and school-leavers.

Pie charts.

1. Economic activity up to age of 17, by sex and marital condition and reason, 1971: Hull urban and rural areas.

D. Children in care.

1. Children under statutory or voluntary supervision.

Attendances at juvenile court.

2. Known battered babies.

3. Children in care, boarded out, abandoned.

4. Children in care by Hull, East Riding 1972.

4. Children in homes, and numbers in residence; reasons for residence.

5. Child-minders.

7. Registered day nurseries and playgroups.

Part Two. Existing health services for children.

A. Hospitals.

1. Development potential of hospitals with facilities for children.

2. Number of children accommodated in wards not specifically set aside for children, 1972; by hospital, speciality, and age-group of child.

Summary by specialty.

3. Facilities provided by North Humberside for children outside the district.

B. Staff

1. Paediatrics and paediatric surgery.
2. Psychiatry.
3. Mental handicap.

Introduction to special analysis on HRI.

4. Number of beds in children's wards, HRI.
5. Staffing, number of beds, in Westerlands Infants Hospital.
6. Staffing, number of beds in the Maternity Hospital, Hull.

C. Antenatal facilities.

1. Clinics, number of sessions, attendances, 1972, Hull.
2. Clinics, number of sessions, attendances 1972, East Riding.
3. Hospital attendances.

D. Child health facilities.

At risk and observation registers.

1. Establishment, number in post of district nurses, midwives, health visitors, SRNs.
2. Child health clinic attendances, 1972, Hull.
3. Child health clinic attendances, 1972, East Riding.

E. School health services: staff

1. England and Wales wte.
2. Hull, establishment and in post, by specialty.
3. East Riding, establishment and in post, by specialty.
4. Provision of medical staff per 1,000 school population, Hull and East Riding.

F. School health services: facilities.

1. List of clinics. Hull and East Riding.
2. Special schools. Hull and East Riding.
3. Educational facilities in hospitals.

G. Vaccinations offered.

1. Facilities provided by NH for children outside the area, and by other areas for North Humberside resident children.

Part Three. Existing health of children.

Introduction.

1. Tables and graphs: still births, post-natal mortality, neonatal mortality, post neonatal mortality, illegitimacy rate; England and Wales, Hull and East Riding.
2. Abortions performed in 1972 on girls under 17 in North Humberside and in NHS hospitals.

B. Morbidity.

Introduction.

1. Babies with specific malformations, evidence of congenital malformations. England and Wales, Hull, and East Riding, 1970.
2. Vaccinations: percentage born in 1970 vaccinated by end of 1972.
3. Percentage of children aged 0-16 vaccinated against various diseases.
4. Rubella vaccination, Hull, East Riding.
5. Morbidity statistics: by illness, age-group, Hull.
6. Incidence of notifiable infections amongst schoolchildren, Hull and East Riding.

C. School medical examinations.

1. Number held annually; number of defects from Hull and East Riding.
2. Infestation with vermin, Hull and East Riding.
3. Dental examinations: numbers held annually, visits.

D. Handicapped children.

1. Numbers assessed.

E. Hospital admissions.

1. Children awaiting admission on 30 June 1973.
2. Out-patient waiting-times for first appointments as at 30 June 1973.

F. Hospital clinical activity.

1. Avenue Hospital.
2. Beverley Cottage Hospital.
3. Castle Hill Hospital (Chest Unit).
4. Castle Hill Hospital (Infectious Diseases Unit).
5. Castle Hill Hospital (Thoracic Unit).
6. De la Pole Hospital (Orthopaedic Unit).
7. East Riding General Hospital.
8. Hornsea Cottage Hospital.
9. Hull and East Riding Hospital.
10. Hull Hospital for Women.
11. Hull Royal Infirmary.
12. Hull Royal Infirmary (Sutton).
13. Kingston General Hospital.
14. Lloyd Hospital.
15. The Maternity Hospital.
16. Westerlands Infants Hospital.
17. Westwood Hospital.

Appendix 3

Findings of the post neonatal death survey

Introduction

1. Infancy remains the most hazardous period of childhood, in which death may occur as a result of infection, congenital abnormality, birth injury or respiratory difficulty, by accident or most alarmingly as a sudden and unexplained event. There has been extensive study of neonatal deaths,

which are of interest to both paediatricians and obstetricians; much thought is being given to the problem of cot deaths; but there has been less study of post neonatal deaths as a whole. Many of these deaths occur at home and unless the baby is attending paediatric out-patients the death escapes the notice of the paediatrician; the GP is only involved in an infant death at home three or four times in his practising life; and the full extent of the problem is only realized when inquiries are made from the local health authority.

2. It was decided to study post neonatal deaths as a group, looking into the social background of the family in which the death occurred, its general health, the health and care taken by mother during the relevant pregnancy, and the health and care of the infant in general and immediately prior to its death.

3. The study included 52 infants who died during 1972 aged between 1 and 12 months and who resided in the East Riding of Yorkshire. The majority of deaths occurred in the city of Kingston upon Hull and over half the deaths in the home.

Table 1. Place of death

	Place of death		
Place of residence	*Home*	*Hospital*	*Total*
Kingston upon Hull CB	26	14	40
Beverley MB	-	1	1
Bridlington MB	1	1	2
Driffield UD	1	-	1
Hornsea UD	-	1	1
Haltemprice UD	1	-	1
Country Districts	3	3	6
Total	32	20	52

4. Approximately 6 in every 10 post neonatal deaths occurred at home, the rate being 6·5 for Kingston upon Hull and exactly 1 in 2 for the rest of East Riding.

Mortality rates

1. Twenty one of the babies who died in 1972 were born in 1971, as this is approximately 2 in 5, the infant mortality rates have been calculated using the average number of births for the two years.

Table 2. Post neonatal death-rate

	Live births			*Post neo-natal deaths*	*Rate**
	1971	*1972*	*Average*		
Kingston upon Hull	5,051	4,841	4,946	40	8·09
Rest of East Riding	3,772	3,593	3,682	12	3·26
Total	8,823	8,434	8,628	52	6·03

*Deaths per 1,000 live births.

2. The post neonatal death-rate for the East Riding approximates to the national figure of 5·9 per 1,000 live births, but this is composed of the rate for Kingston upon Hull which is approximately 2 per 1,000 above the national rate and the rest of the East Riding where the rate is 2·3 per 1,000 lower than the national rate.

3. The average neonatal death rates for the years 1971 and 1972 were 10·9 per 1,000 live births for Kingston upon Hull and 8·5 per 1,000 live births for the rest of the East Riding, giving infant mortality rates of 19 and 11·8 respectively and a combined infant mortality rate of 15·9.

Causes of post neonatal deaths

1. The coroner certified the cause of death for thirty-seven babies, this included all the babies who died at home and five of those who died in hospital. The rest of the causes of death were certified by hospital staff.

Table 3. Causes of post neonatal death

	Kingston upon Hull		*Rest of East Riding*		
Cause of death	*Home*	*Hospital*	*Home*	*Hospital*	*Total*
Infection	24	7	3	3	37
Congenital abnormality	1	7	-	3	11
Accident	-	-	1	-	1
Battered baby	1	-	-	-	1
'Cot death'	-	-	2	-	2
Total	26	14	6	6	52

2. Five babies who died from infection and one from a congenital abnormality did so within 24 hours of admission to hospital. Five of the six were moribund on admission and could be considered to have been near cot deaths at home. Only eight of the thirty-two babies who died at home were seen by their GP or his deputy shortly before death. All but one of the babies who died at home were seen by their GP or his deputy shortly before death. All but one of the babies who died at home from infection were certified as dying from broncho-pneumonia. As yet the post-mortem reports have not been examined in order to check whether or not this was a diagnosis of convenience, because of this the two babies certified as cot deaths are classified with those dying from infection in the rest of this report. Two babies with Down's Syndrome died from infection and are included in that category although their chromosome abnormality played a part in their death. These are included in that category.

3. There was one death from an inherited condition, namely cystic fibrosis of the pancreas; the baby was the first child of healthy parents.

4. The baby who was battered to death aged 3 months was one of twins born prematurely to young parents, the father was found guilty of manslaughter. The accidental death was due to an 11-month-old baby catching her neck in the bars of her cot; the mother was seven months' pregnant and home conditions were poor.

Deaths from congenital malformations

1. There were eleven deaths attributed to congenital abnormalities, one baby died at home, four never left hospital and three others were home for less than two weeks in their life.

Table 4. Types of congenital abnormality

	Sex of infant		
Congenital abnormality	*Male*	*Female*	*Total*
Heart disease	3	1	4
Meningomyelococle	1	1	2
Imperforate anus	1	-	1
Multiple angiomata	-	1	1
Cystic fibrosis of pancreas	1	-	1
Hypothyroidism	-	1	1
Suspect chromosome	-	1	1
Total	6	5	11

2. The congenital heart lesions included a baby with partial situs inversus, auricular and ventricular septal defects, and an absent pulmonary artery, he died at home aged 3 months; another baby with a large ventricular septal defect and pulmonary vascular disease died post operatively aged 7 months. The third baby died aged 3 months from pulmonary atresia and bicuspid stenosis, he also had a cleft palate; the fourth baby had an auricular septal defect and patent ductus arteriosus, she died aged 2 months from pulmonary fibrosis.

3. The babies with meningomyelococle died aged 2 months and 6 months; they both required valves to control hydrocephalus. The first spent only three days at home being readmitted with an infected cerebrospinal fluid. The other baby was mentally as well as physically handicapped and failed to thrive.

4. The baby with an imperforate anus also had an absent coccyx, he was never home and died post operatively aged 5 months; an attempt was being made to restore gut continuity as the family conditions were too poor to cope with a colostomy.

5. Failure to thrive was the immediate cause of death for the baby with multiple angiomate, she presented neonatally with vomiting and weighed only 2 oz above her birth weight when she died aged 7 months. In addition to the observed haemangiomas on her face and head there were multiple angiomas in the gut mesentry and mediastinum.

6. The baby with cystic fibrosis of the pancreas had meconium ilius successfully treated neonatally, but chest infection was a persistent problem, he spent only 2 weeks at home in the 4 months he survived.

7. One baby showed many odd features suggestive of a chromosome abnormality, though chromosome studies showed her to be a normal female; she was severely mentally handicapped, never thrived, and died aged 3 months.

8. The only curable condition amongst the congenital abnormalities was hypothyroidism. The baby was admitted to hospital moribund aged 7 months and died within 24 hours. The health visitor had noted that the baby looked odd from 3 months, but the parents were of low intelligence and no help was sought.

Deaths from infection

1. There were 37 deaths certified as due to infection and two cot deaths; only ten of the deaths occurred in hospital and half of these occurred within 24 hours of admission.

Table 5. Types of infection (Figures in parentheses denote deaths at home)

	Sex of infant		
Infection	*Male*	*Female*	*Total*
Respiratory	18(14)	15(12)	33(26)
Gastro-enteritis	2(1)	1	3(1)
Meningitis	-	1	1
Cot death	1(1)	1(1)	2(2)
Total	21(16)	18(13)	39(29)

2. Seven of the babies who died at home were seen by their GP or his deputy shortly before death, the cause of death however, was certified by the coroner.

3. There were four babies in whom there was a predisposing factor contributing to infection and death; these included two babies with Down's Syndrome, one died in hospital aged 2 months, and the other at home aged 6 months, both had respiratory infections. The third baby had had neonatal meningitis and a valve inserted to control the resulting hydrocephalus; her developmental progress was not up to that expected for her age when she died of viral pneumonia aged 7 months; post-mortem examination showed adhesions around the base of the brain and internal hydrocephalus. The fourth baby also died of a respiratory infection, she was undernourished weighing only 7 oz above her birth-weight when she died aged 3 months; this was the only breast-fed infant in the survey.

4. Four other babies died in hospital from respiratory infections, three within twelve hours of admission; one of these babies aged 7 months had a recent history of gastro-enteritis requiring hospital admission; the other two babies were aged 6 weeks and 2 months. The fourth baby, aged 5 months was admitted acutely ill with a collapsed left lung, his condition improved following bronchoscopic aspiration, but he then developed laryngal obstruction requiring a tracheotomy, his condition further improved but then deteriorated again with general chest signs and he died five days after admission; the parents refused post-mortem examination.

5. There were two babies dying in hospital from gastro-enteritis, both did so within 24 hours of admission; one baby was aged 4 months and had a recent history of respiratory infections requiring hospital admission; the

other baby aged 9 months was overweight weighing 26 lb 12 oz. Their deaths occurred in March seven days apart.

6. A fostered baby aged 7 weeks was admitted with pneumo-coccal meningitis; she had been born 1 month prematurely weighing 5 lb; in spite of vigorous antibiotic treatment she died fifteen days after admission; post-mortem examination showed several intracranial abscesses.

Correlation between age and death from infection

7. As expected babies were at greatest risk of dying from infection during the first 6 months of life with the highest incidence between 2 and 4 months. There was also a peak incidence during the eighth month, no connecting factors were apparent for these deaths.

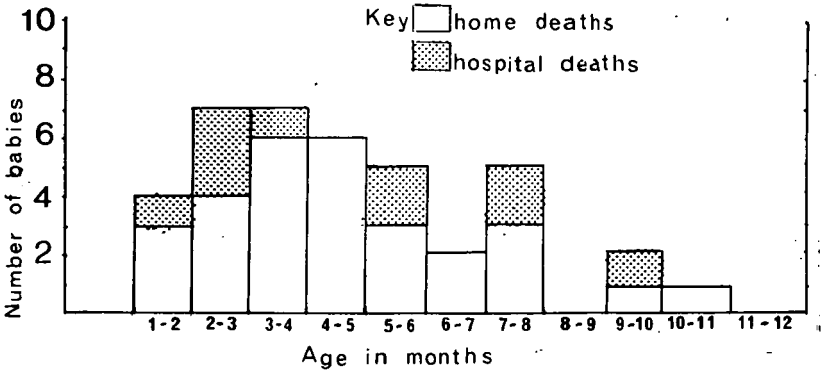


Fig. 1. Distribution of deaths from infection by age.

8. The age of death does not appear to bear any relation to whether the death occurs at home or in hospital.

Correlation between the month of year and death from infection

9. Approximately two or three of the deaths from infection occurred during the winter months January to March and October to December, eight of the twenty-five deaths occurred in hospital, whereas for the months April to September, only two of the fourteen deaths took place in hospital.

10. All three deaths from gastro-enteritis occurred during March. One in three deaths from infection occurred between 26 February and 7 May, that is a period of ten weeks and one day. The three deaths in January occurred within eight days and two of the three deaths in June on the same day; two of the four October deaths were within three days; the two August deaths were also within three days.

11. Four of the deaths from infection and the two cot deaths from the rest of the East Riding occurred during the last four months of the year, five of them within the last ten weeks. The two other East Riding deaths from infection occurred in February and March.

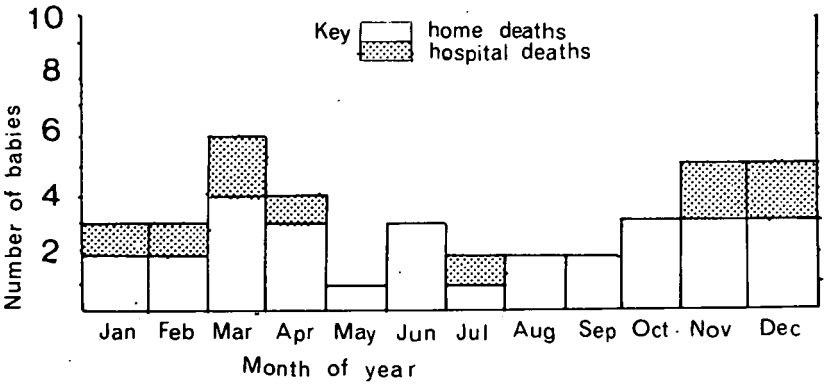


Fig. 2. Distribution of deaths from infection by month of year.

Kingston upon Hull deaths

1. Kingston upon Hull, for electoral purposes, is divided into twenty-one wards, which proved a useful division in which to study the post neonatal deaths; the city also falls conveniently into five main areas, namely North-west, South-west, Central, North to North-east and South-east.

2. Four in every ten of the city deaths occurred in the South-west area and nearly half the deaths from infection.

3. A quarter of the post neonatal deaths in the city came from one ward, namely St Andrews. This is a known poor housing area near the Fish Docks which has the second lowest population but the second highest birth rate: the density of population is the tenth highest in the City and the total area less than a square mile.

4. Considering the South-west area as a whole, there were fourteen deaths from infection, only two babies reached hospital, one dying fourteen hours after admission, the other four days later. Among the fourteen babies four were only children, seven had one sibling, two had two siblings, and one four siblings: the latter family had already lost a baby post neonatally. There were four young mothers, ie aged 20 years or less, two of these had another child, one being only 15 months older than the baby who died. One other family had a child less than 2 years older than the baby who died. (The ages of siblings for three families have not been obtained.)

5. Approximately three out of every four post neonatal deaths from infection in Kingston upon Hull occurred during the first six months of life, the ratio being similar for the South-west area. Only four of the younger age-group died in hospital, ie approximately 1 in 8, while the older age-group 3 out of 8 died in hospital. Five of the seven babies to die in hospital did so within twenty-four hours of admission, the sixth died during its second day in hospital and the seventh after four days.

Table 6. Kingston upon Hull post neonatal deaths by area (figures in parentheses denote home deaths).

Area	*Ward*	*Infection*	*Congenital abnormality*	*Other*	*Total*
South-west	Boothferry	-	-	-	-
	Coltman	1(1)	-	-	1(1)
	Newington	1(1)	-	1(1)	2(2)
	Pickering	4(3)	-	-	4(3)
	St Andrews	8(7)	2(1)	-	10(9)
Total (area)		14(12)	2(1)	1(1)	17(14)
North-west	Beverley	1(1)	-	-	1(1)
	Derringham	-	-	-	-
	Greenwood	1	-	-	1
	Newland	-	-	-	-
	University	2	1	-	2
Total (area)		4(1)	1	-	5(1)
North and North-east	Bransholme	2(2)	-	-	2(2)
	Stoneferry	2(2)	-	-	2(2)
	Sutton	1(1)	-	-	1(1)
Total (area)		5(5)	-	-	5(5)
South-east	Greatfield	1(1)	1	-	2(1)
	Holderness		1	-	1
	Longhill	1(1)	-	-	1(1)
	Marfleet	2(1)	1	-	3(1)
Total (area)		4(3)	3	-	7(3)
Central	Avenue	-	-	-	-
	Botanic	1(1)	-	-	1(1)
	Myton	1(1)	-	-	1(1)
	Drypool	2(1)	2	-	4(1)
Total (area)		4(3)	2	-	6(3)
City total		31(24)	8(1)	1(1)	40(26)

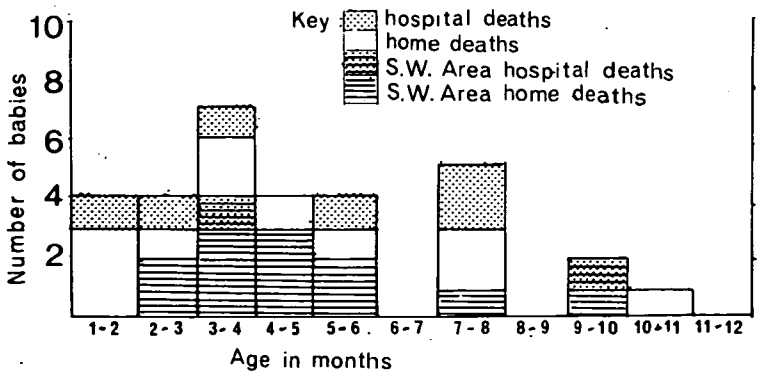


Fig. 3. Kingston upon Hull distribution of deaths from infection by age.

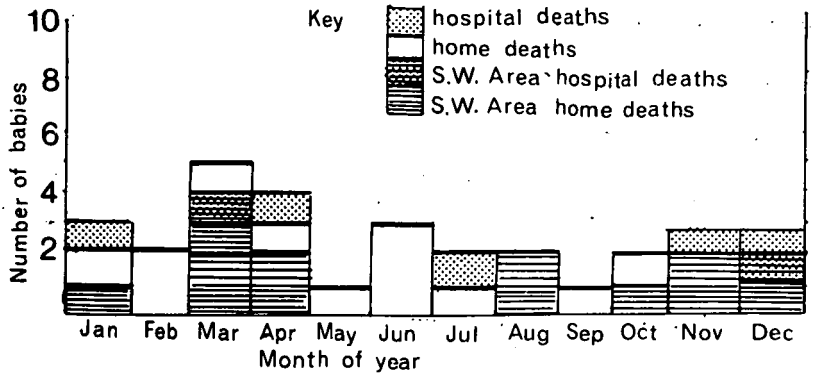


Fig. 4. Kingston upon Hull distribution of deaths from infection by month of year.

6. Six of the nine deaths occurring during March and April were from the South-west area; the only baby to reach hospital died from gastro-enteritis, the other five babies were certified as dying from broncho-pneumonia. There were four other post neonatal deaths in the city during March and April, two babies reached hospital, one of these was shown at post-mortem examination to have gastro-enteritis, the other was certified as dying from broncho-pneumonia but there was a history of loose stools and no post-mortem examination.

7. The deaths in August occurred in St Andrew's Ward on the 2nd and 4th; also four of the six deaths occurring in November and December, these deaths occurred at two- to three-week intervals; they were all certified due to broncho-pneumonia, the baby who died in hospital being the underfed breast-fed baby.

The family

Social grade

1. The classification used was Class I: professional; Class II: managerial; Class III: skilled; Class IV: semi-skilled; Class V: unskilled.

Table 7. Distribution of deaths amongst social classes and against cause of death (figures in parentheses denote home deaths).

Class	*Infection*	*Congenital abnormality*	*Other*	*Total*
I. Professional	-	-	-	-
II. Managerial	-	1	-	1
III. Skilled	14(10)	3	-	17(10)
IV. Semi-skilled	9(8)	3(1)	-	12(9)
V. Unskilled	16(11)	4	2(2)	22(13)
Total	39(29)	11(1)	2(2)	52(32)

2. Only one death occurred in classes I and II and this was due to a congenital abnormality. There did not appear to be any significant difference between the other three classes in the distribution of the deaths or in the place of death.

3. There were seven families known to have problems: four families of babies with congenital abnormalities, including that of a baby with Down's Syndrome were socially inadequate; two families where the baby died of infection had been suspected of ill-treating an elder sibling; and there was one family with nine children under 12 years old.

4. In eleven families, ie 1 in 4-5, the father was unemployed at the time of the child's death or at sometime during its life. These included nine families where the baby died of infection, two with congenital abnormalities, and the one accidental death.

5. Four fathers were fishermen and may have spent much time away from home.

Housing

6. It was hoped to be able to note both the general type of housing and the standard of its care, knowing that some families can convert a modern house into a pigsty, whilst others will make a palace from a crumbling sham-four. Unfortunately much of this information was not available from health. visitor cards and difficult to obtain in retrospect. Houses without bathroom and/or outside toilet were classified as poor: pre-war council houses as intermediate; post-war council houses as good. Terraced non-corporation houses were matched to council houses of similar age and style; semi-detached and detached property was classified as good.

Table 8. Type of housing against cause of death (figures in parentheses denote home deaths).

Housing	*Infection*	*Congenital abnormality*	*Other*	*Total*
Good	10(9)	6	-	16(9)
Intermediate	13(6)	3(1)	-	16(7)
Poor	16(14)	2	2(2)	20(16)
Total	39(29)	11(1)	2(2)	52(32)

7. Seven homes were noted to be dirty, three of the babies died from congenital abnormalities including the baby with hypothyroidism; the remaining four from infection, three of them at home. One home was overcrowded.

Parental age

8. The age of one mother and five fathers was not obtained. This included the parents of a baby being fostered prior to adoption and three fathers where the mother was aged 20 years or less and one where the mother was aged 21 to 30 years.

Table 9. Parent age against cause of death (figures in parentheses denote home deaths per parent).

Age	*Infection*	*Congenital abnormality*	*Other*	*Total*
20 years and under				
Mother	14(12)	1	2(2)	17(14)
Father	7(6)	-	1(1)	8(7)
21-30 years				
Mother	22(16)	5(1)	-	27(17)
Father	23(18)	6(1)	1(1)	30(20)
31-40 years				
Mother	1	4	-	5
Father	2	5	-	7
41 years and over				
Mother	1(1)	-	-	1(1)
Father	2(1)	1	-	3(1)
Age unknown				
Mother	1	-	-	1
Father	5(4)	-	-	5(4)
Total Parents	78(58)	22(2)	4(4)	104(64)

9. There were seventeen families, ie approximately 1 in 3 in which the mother was aged 20 years or less; in eight of these families, ie 1 in 6·5 the father was also of this age-group. Of the fourteen babies dying from infection to this age-group only two reached hospital, one was the underfed breast-fed baby and the other died from gastro-enteritis within thirty-six hours of admission. There was only one congenital abnormality causing death in this age-group but both the battered baby and the baby who died accidentally are included. In seven of the seventeen families there was already an older child and in five the family spacing was under two years, all the babies died from infection, one reached hospital. Three young mothers were pregnant when the baby died, two of the deaths were due to infection, the third was accidental.

10. There is a greater chance of a baby dying from infection doing so in hospital if the mother is over 21 years of age, ie 1 in 3-4 as opposed to 1 in 7 for the young mother.

11. The over 41-year-old group included the parents of the baby with Down's Syndrome who died from infection at home. The other baby who died of infection was the sixth child of a family which had already had a post neonatal death, the four younger children of this family were born within eight years. The congenital abnormality was the baby with congenital heart disease and a cleft palate.

Parental health

12. Information on the mother's general health was mainly obtained from the obstetric records: that on the father was more difficult to obtain but came from the mother's obstetric notes, health visitor records, and

hospital notes on the baby. Positive information of a health problem was obtained on twelve parents affecting ten families.

Table 10. Parental health problem against cause of death (figures in parentheses denote home death per parent).

Parental health problem		*Infection*	*Congenital abnormality*	*Other*	*Total*
Psychiatric illness					
Mother		4(2)	-	-	4(2)
Father		1(1)	-	-	1(1)
Low intelligence					
Mother		-	2	-	2
Father		-	1	-	1
Asthma					
Mother		1(1)	-	-	1(1)
Father		-	-	-	-
Recurrent bronchitis					
Father		1(1)	-	-	1(1)
Diabetes	Father	-	1	-	1
Disabled	Father	1(1)	-	-	1(1)
Total		8(6)	4	-	12(6)

13. The figure for low intelligence includes the parents of the baby who died from hypothyroidism; that for psychiatric illness includes the parents of a baby dying at home from infection. The disabled father had had an intracranial vascular accident.

14. Three mothers smoked 20 or more cigarettes a day, including one mother admitting to 50 a day; two of the babies died of infection, one at home and the other in hospital; the third baby died in hospital from congenital heart disease. Another mother smoked 10 cigarettes a day; her baby died at home of infection.

Mother care, mother craft

15. The standard of mother craft was noted on eighteen health visitor records.

Table 11. Standard of mother craft against cause of death (figures in parentheses denote home deaths).

Mother craft	*Infection*	*Congenital abnormality*	*Other*	*Total*
Good	12(7)	-	1(1)	13(8)
Fair	3(2)	-	-	3(2)
Poor	1(1)	1	-	2(1)
Total	16(10)	1	1(1)	18(11)

16. The congenital abnormality was the hypothyroid baby and the baby in the 'Other' group the battered baby. Numbers are too small to comment on the effect of mother care on the place of death.

Attendance at infant welfare clinics

17. At least monthly attendances at a welfare clinic were considered desirable, and classed as good. Nine babies with congenital abnormalities spent all or most of their life in hospital, the attendances for the remaining forty-three babies have been classified.

Table 12. Welfare clinic attendance against cause of death (figures in parentheses denote home deaths).

Clinic attendances	*Infection*	*Congenital abnormality*	*Other*	*Total*
Good	6(4)	-	-	6(4)
Infrequent	14(14)	-	-	14(14)
None	18(10)	2	2(2)	22(12)
Total	39(29)	2	2(2)	43(31)

18. Approximately six out of seven babies were infrequent or non-attenders at a welfare clinic; it is not known how this compares with the infant population as a whole.

19. Although so few babies attended a clinic regularly only one baby had not been seen by a health visitor at home but several attempts had been made to see this baby who died at home aged 30 days. Most babies had been seen on two or three occasions and three babies were seen five or six times at home. There was another baby on whom little information had been obtained. The parents had no fixed abode at the time of his death and health visitor notes have not been traced.

Mother's obstetric history

20. Analysis of the mothers' obstetric history has not been possible as the notes of seventeen mothers have so far not been made available for scrutiny. It is hoped that a supplementary report will be prepared and will include these results.

Siblings

21. There are seventeen families in which the baby was the parents' first child (this includes a set of twins) and therefore inexperienced in managing a child.

Table 13. Number of siblings against cause of death (figures in parentheses denote home deaths).

	Infection	*Congenital abnormality*	*Other*	*Total*
Only children	11(9)	4	1(1)	16(10)
Number of siblings				
1	14(12)	5(1)	1(1)	20(14)
2	6(3)	- -	-	6(3)
3	2(1)	1	-	3(1)
4	4(3)	- -	-	4(3)
5 and over	2(1)	1	-	3(1)
Total	39(29)	11(1)	2(2)	52(32)

22. Three families had six or more children, one baby died from a congenital abnormality (imperforate anus) and the other two babies from infection, one of them at home, the family sizes being eight, six and ten children.

23. A minimum of two years would constitute reasonable family spacing. There were twelve families in which the spacing was less than this and a further family of six where the spacing for the family as a whole was two to four years but was under two years for the four younger children. The ages of siblings are not yet available and therefore the family spacing is unknown for four families; in three the baby died from infection and one from a congenital abnormality. One in three families with more than one child had less than two years between each child.

Table 14. Family spacing against cause of death (figures in parentheses denote home deaths).

Number of siblings	*Infection*	*Congenital abnormality*	*Other*	*Total*
1	6(5)	2	-	8(5)
2	1(1)	-	-	1(1)
3	-	-	-	-
4	1(1)	-	-	1(1)
5 and over	1(1)	1	-	2(1)
Total	9(8)	3	-	12(8)

24. The only baby to reach hospital from this group died within 36 hours from gastro-enteritis. In four families with two children the age difference between the baby who died and its sibling was less than 16 months; three of the four mothers were aged 20 years or less. One family consisted of ten children, the eldest was born in 1960.

25. A history of infection in a sibling has only been obtained from one family where the baby died from infection in hospital.

Deaths amongst siblings

26. There was a history of a previous post neonatal death in three families. One family of four children lost two babies at home from broncho-pneumonia, one in 1969 aged 4 months, the other in 1972 aged 30 days. The second family had six children, one died in 1952 aged 5 weeks from gastro-enteritis, the baby dying in 1972 died at home aged 6 weeks from broncho-pneumonia. The third family had five children, one died in 1970 aged 5 weeks from bronchitis, the other in 1972 aged 3 months from broncho-pneumonia at home.

Other problems amongst siblings

27. The siblings of two babies who died at home from infection had been suspected of being ill-treated: one of the babies who died spent 24 hours in hospital aged 2 months having fallen off a settee.

The infant

28. Of the 52 babies who died there were 28 boys and 24 girls, there was no significant difference between the sexes for cause of death or place of death.

Table 15. Sex of baby against cause of death (figures in parentheses denote home deaths).

	Infection	*Congenital abnormality*	*Other*	*Total*
Male	21(16)	6(1)	1(1)	28(18)
Female	18(13)	5	1(1)	24(14)
Total	39(29)	11(1)	2(2)	52(32)

29. Two infants were one of twins, this includes the battered baby and the baby with Down's Syndrome who died at home.

Legitimacy

30. Seven babies were born to unmarried mothers, five mothers subsequently married, four of these mothers were aged 20 years or under; the five babies died from infection, three of them at home. The other two babies died in hospital, one from meningitis and the other from congenital heart disease.

Neonatal findings

31. Forty-five babies were born in hospital, six at home and one baby's place of birth is unknown.

32. In only three babies was there any attempt at breast-feeding, two mothers gave up before the end of the puerperium and in the third baby underfeeding was a contributary cause to its death from infection at 3 months.

33. Twelve babies were premature by weight, an incidence of 1 in 4·5 of babies dying post neonatally. Approximately 6 babies in 100 are premature by weight which suggests a low birth-weight baby is at greater risk of dying post neonatally than a mature baby; this may have been due to similar factors causing the baby's low birth-weight and its subsequent death.

34. The figure for infection includes the baby with Down's Syndrome who died at home. Both babies who were not legitimized were premature by weight.

35. Ten of the twelve premature babies were admitted to special baby units; one baby who weighed 4 lb 8 oz was cared for in the Maternity Unit at Bridlington, being discharged aged 4 weeks. This baby died accidentally. The other baby weighed 5 lb 8 oz. The mother discharged herself from the Maternity Hospital on the second day; the baby was admitted to Hull Royal Infirmary next day with feeding difficulty.

36. Neonatal problems amongst premature babies.

There were two babies with respiratory distress, one was severe. The

baby subsequently became deeply jaundiced requiring exchange transfusion. One other baby had hyperbilirubinaemia and another some feeding difficulty. Two of the babies with congenital heart disease cause no con-

Table 16. Cause of death in expremature babies against birth-weight (figures in parentheses denote deaths at home).

	Under 4 lb	*4-5 lb*	*5+-5½ lb*	*Total*
Infection	2(2)	1(1)	3(2)	6(5)
Congenital abnormality	-	3	1	4
Battering	-	1(1)	-	1(1)
Accident	-	1(1)	-	1(1)
Total	2(2)	6(3)	4(2)	12(7)

cern from this neonatally but one had a mild umbilical and conjunctional infection.

37. Other neonatal problems.

Eight mature babies required admission to a special baby Unit, three because of congenital abnormalities and five for observation because their condition was not completely satisfactory at birth; one of these developed hyperbilirubinaemia and all five subsequently died of infection between 2 and 5 months.

38. One mature baby had conjunctivitis neonatally.

Special baby clinic

39. The progress of three babies, two premature and one mature was being followed in the clinic. One of the expremature babies was found to have a low haemoglobin of 9·9 g, ten days before death. One other baby had a baby clinic appointment but died before it could be kept.

40. Hospital admissions of babies dying from infection other than that which ended in death.

Eight babies required hospital admission including two babies who were admitted twice.

Table 17. Reasons for admission (figures in parentheses denote home deaths).

Respiratory infection	2(2)
Gastro-enteritis	3(2)
Meningitis	1
Feeding problem	2(2)
Repair of inguinal hernia	1(1)
Observation following injury	1(1)
Total admissions	10(8)

41. The babies requiring two admissions were both for a feeding problem and then gastro-enteritis, the babies subsequently died at home from infection. The injury was a 2-month-old baby who fell from a settee. She died at home two weeks later from infection. The two babies who eventually died in hospital died from gastro-enteritis and viral pneumonia.

42. One other baby was seen in casualty aged 3 months with a grazed forehead from an ornament falling on him. He died two weeks later from infection but at post-mortem examination a bruise was noted on his shoulder.

43. Abnormal babies other than those dying from congenital abnormalities.

In addition to the two babies with Down's Syndrome who died from infection, the pathologist thought a third baby showed some features of Down's Syndrome. A baby died from pneumonia who had had neonatal meningitis and subsequently required a valve for hydrocephalus, her developmental progress was suspect when she died. An expremature baby who had had hyperbilirubinaemia showed neuromuscular irritability for which no biochemical cause was found.

Post-mortem examination

44. The cause of death was confirmed by post-mortem examination in forty-six of the babies who died. This included thirty-six of those dying from infection, eight who died from congenital abnormalities, the baby who died accidentally and the battered baby. The parents of one baby who died of infection refused post-mortem examination; post-mortem examination was not deemed necessary in the remaining five babies.

45. The post-mortem examination reports for babies who died at home have only recently been received from the coroner and have yet to be scrutinized. It is hoped to make some assessment of the infants' state of nutrition from the birth- and death-weights.

Conclusions

46. From the survey it would appear that certain types of family are particularly at risk to have a post neonatal death. This includes families living in poor districts, those in which one or both parents are aged 20 years or less, and families in which the child spacing is less than two years. Expremature babies are also particularly at risk.

Recommendations

47. (*a*) Health visitors and social workers are aware of the type of family and baby at risk and this should be stressed to those administrating the reorganization of the health services so that resources can be concentrated where necessary. The young mother is particularly at risk especially if her mother is unhelpful or if she refuses help offered in an attempt to prove independent. Advice to this age-group must be explicit. A young mother recently thought fruit juices for her baby included fruit cordials and that cereals meant corn-flakes for breakfast for her 2-month-old baby. It must not be taken for granted that the mother with more than one child is experienced. If she has two or three children under school age she is harassed and may not realize the baby is ill.

(*b*) Closer liaison between pathologist and paediatrician where babies have died at home. Several babies who died at home had been under the

care of a paediatrician and yet no approach was made by the pathologist for information about the baby which might have been useful when performing the post-mortem examination or at least have added interest to the case. It would also be of help if copies of the post-mortem reports were sent to the paediatrician for inclusion in the baby's notes. On many occasions because of this lack of communication out-patient appointments were sent to babies who had died.

(*c*) Possible genetic counselling. One set of parents who had experienced a second cot death from infection told the health visitor that they would not have another child as they thought there was something genetically wrong with them. Such families surely warrant considerable investigation including genetic counselling.

(*d*) Further study of infant deaths. This type of study has been useful but it is felt that more information would be available if details were coded within days instead of months of the death. General practitioners could then be approached for information about infection in the family or immediate neighbourhood and accurate information would be available on the state of the housing instead of just its type. Recently a family has come to light which has had two cot deaths where the baby was only 12 days old; it might be worth extending the survey to cover babies from 10 days to 1 year.

Appendix 4

Reading list

National and local authority services

Children's departments

Report on the Work of the Children's Department 1967-69. The Home Office (HMSO, 1970), 45p, 67 pages. Covers: 1. Child care and a family service; 2. Child care service; 3. Training; 4. Development group and the community development project, etc.

Welfare centres

Child Welfare Centres, Ministry of Health Standing Medical Advisory Committee (HMSO, 1967), 22½p, 43 pages. Discusses: 1. Present arrangements; 2. Need for a child welfare service; 3. Functions of the child health service; 4. Medical personnel; 5. The organization of the child health service; 6. Summary and recommendations.

Local authority services

'Families and their needs', Moss, P., *et al., New Society,* 23, no. 546 (22 March 1973), 638-40. 'How important are social and health services to mothers with pre-school children? A new survey reveals that too little use is being made of them. Local authority services appear to make

little impact on the majority of families; their purposes are not well understood. and those who do have knowledge of them tend to regard them as last-ditch agencies.'

Forward planning and NHS reorganization

'Child care: what future?', Briggs, P. W., and Oppe, T. E., *Lancet,* **1** (29 May 1971), 1119-22. Survey of child-care in relation to medical staff. It is concluded that consultant staffing should be based on the total child population served rather than on bed allocation.

'Children in the integrated national health service', Chamberlain, R. N., *Lancet* (4 November 1972), 963-5. Short paper discussing the merits of the child health service and the need for careful planning to achieve a service comparable to that of the maternity service in 1974. Stresses the importance of common postgraduate training for all those who are to care for children, irrespective of their specialist interests. (Includes eight important references.)

Paediatrics in the Seventies. Developing the Child Health Services, Court, D., and Jackson, A. Oxford University Press for the Nuffield Provincial Hospital Trust, £1, 1972). 107 pages. Presented in three parts. 1. Child health in Britain today. 2. The direction of change. 3. Proposals for the future. Section 2 details the following areas: 1. Paediatrics in hospital and in the community; 2. Special areas of care; 3. Paediatric system specialities; 4. Staffing; 5. Collaboration with independent specialties allied to paediatrics; 6. Training.

'Child health services today and tomorrow', Forfar, J. O., *Community Health,* **4**, no. 5 (March/April 1973), 261-7. A short discussion of the present situation and possibilities for the future. Covers integration of services, the increased specialization, the disengagement from institutions of adult medicine, general practice, the hospital paediatric service, neonatal paediatrics, community paediatrics, assessment orders, habilitation and rehabilitation, school health service, and records and statistics.

Hospital care

Hospital Management, Grant, C. (Churchill Livingstone, 1973), £2.50, 256 pages, includes chapter on management of paediatric units.

Planning

'How the design concept was applied in planning a 50-bed children's hospital', *Hospital Administration in Canada,* **13**, no. 2 (February 1971), 34-36 and 69. Stresses the need for broad terms of reference and authority. Emphasizes close and constant exchange of information between the users of the production team. Recommends the use of a flow chart as a basis for planning.

'Hospital planning for children', Smithells, R. W., *Hospital Building and Engineering,* **3**, no. 6 (November 1970), 5-6 and 8. Considers three factors for planning hospital care for children: 1. Full use of expensive

equipment; 2. Contact between paediatricians and other specialists; 3. Treatment of newborn babies. Proposes unit adjacent to the maternity unit and closely integrated with the general hospital. Also own out-patient accommodation.

Admissions

'Unnecessary and preventable hospitalizations: report on an internal audit', Lovejoy, F. H., *et al.*, *Paediatrics*, **79**, no. 5 (November 1971), 868-72. The data suggests a high rate of preventable hospital admissions among patients of high socio-economic status. The substantial number of admissions for diagnostic purposes argues for increased use of out-patient services.

Casualty departments

'A study of a children's casualty department in a general hospital', Mok, C. H., *Medical Journal of Australia*, **1**, no. 22 (27 May 1972), 1146-9. Findings show that: 1. There is an increasing tendency for patients to treat the casualty department as an ever-open doctor's surgery; 2. The children were treated for varied conditions not just injuries; 3. Because of interpreters on the staff more immigrants wanted to use the facilities; 4. People preferred to use it rather than hospitals with paediatric units.

Day surgery

'Day surgery for children', Davenport, H. T., *et al.*, *Canadian Medical Association Journal*, **105**, no. 5 (4 September 1971), 498-501. Describes the layout and facilities of a day surgery unit. Indicates that certain surgical procedures can be handled by day-care; this type of care is acceptable to the profession and parents; has advantages over the usual facilities of the hospital. The economic benefits are readily apparent.

Neonatal surgery

'Past, present and future of neonatal surgery and neonatal surgical units', Rickham, P. P., *Progress in Paediatric Surgery*, **2** (1971), 1-10. Discusses the position and role of neonatal surgical units on the basis of experience at the Liverpool Regional Neonatal Surgical Centre. Advocates this type of service because: 1. Medical and nursing staff do not acquire enough experience unless they see a number of cases; 2. This type of surgery requires an inordinately large staff, making small units uneconomic.

Children in hospital

'Children in hospital', Brown, L., *Health and Social Service Journal*, **83**, no. 4326 (17 March 1973), 610. 'The King's Fund Hospital Centre has been holding a series of one-day conferences on the general subject of "Continuity of care for children". Lee Brown attended one of these conferences where the subject under discussion was "The emotional needs of children in hospital".'

The Empty Hours: A Study of the Weekend Life of Handicapped Children in Institutions, Oswin, M. (Allen Lane, 1971), £2.50, 216 pages. Four-part study: 1. Handicaps, the functions of children's hospitals, development of child care services and special education; 2. Observations of the life of children in hospitals and residential schools at the weekend; 3. Roles of teachers, assistants, nurses, therapists, and voluntary workers; 4. Conclusions and discussion of problems.

Hospitals and Children: A Parent's-eye View, Robertson, J. (Gollanz, 1962), 90p, 159 pages. Standard text on managing children in hospital based on the Platt report. Includes chapters on: Mothers living in hospital, unrestricted visiting, extended visiting, children disturbed on return home, and staff attitudes in restrictive wards, etc.

Young Children in Hospital, Robertson, J. (Tavistock, 2nd edition, 1970), 75p, 155 pages. In three parts: 1. The emotional wellbeing of the young child in hospital; 2. Some implications of hospital practice; 3. Recent trends in Great Britain and obstacles to be overcome before achieving optimal care of the young.

Hospitals, Children and their Families. Report of a Pilot Study, Stacey, M., *et al.* (Routledge and Kegan Paul, 1970), £2.50, 179 pages. Discusses the problems involved in implementing the recommendations of the Platt Committee.

Welsh Hospital Board. Working Party on Children in Hospital in Wales. *Interim Report* (Cardiff: Welsh Hospital Board, 1971), 41 pages. Topics discussed include: policy, the present situation, rural area problems, visiting, 'mothers-in-units', and keeping children out of hospital.

Welsh Hospital Board. Working Party on Children in Hospital. *Children in Hospital in Wales: Final Report* (Chairman: M. Stacey), (Cardiff: Welsh Hospital Board, 1972), 106 pages. Four principle recommendations have already been accepted: 1. Any policy for children in hospital must rest upon a recognition of the special needs of children; and therefore 2. Staff expert in child health should be available to all children in hospital; 3. Close contact must be maintained between the child and his family during the hospital stay; 4. Children should be nursed out of hospital as much as possible.

Visiting

'Unrestricted visiting in children's wards — how it is working out', Dicker, K., *Midwife and Health Visitor,* **7**, no. 5 (May 1971), 185-7. Although it has immense advantages for the well-being of the children there are some complications. Some parents felt that they should stay all day and that they would be considered neglectful if they did not do so. If unrestricted visiting is to be a complete success it must be well managed. The ward sister should be a wise leader who does not hesitate to make some rules.

'Hospital visiting of children', Meadow, R., *Proceedings of the Royal Society of Medicine,* **65**, no. 4 (April 1972), 341-2. Discussion of the problems and benefits derived from unrestricted visiting.

Resident parents

'Where resident parents are welcome', McElnea, L., *Nursing Times,* **67,** no. 43 (28 October 1971), 1331-3. Survey of system used at Great Ormond Street. Details the support given to the child by the mother's presence, her duties in treating the child and the problem of cross infection. Several photographs illustrate the paper.

Care-by-parent

'Care-by-parent unit cuts costs, benefits hospitalized child', James, V. L., *Hospital Topics, Chicago,* **50,** no. 9 (September 1972), 72-74. Details layout and facilities. Experience on the unit has shown a reduction in costs, elimination of the harmful effects of separating the child from its mother; better after-care because of the mothers increased knowledge and ability; and a new area of training for medical students and housemen.

'Hospital care-by-parent: an evaluative look', Lerner, M. J., *et al., Medical Care,* **10,** no. 5 (September/October 1972), 430-6. This paper reports an evaluative study of the unit which focused on communication between parent and physician, effects of the hospital stay on parent and family and the impact of the unit on medical students.

Mother and Child Room (Scottish Health Centre, 1970), 15p. Information sheet presenting design and layout recommendations for a room for mothers admitted along with their young children. Plans, photographs of a mock-up, and an equipment list are included.

Nursing uniforms

'Children's ladies', Jackson, O. M., and Hope, G., *Nursing Times,* **67,** no. 3 (21 January 1971), 91. An experiment where children's nurses wear ordinary clothes rather than a uniform. The nurse-parent relationship improved and the atmosphere of the wards. It is believed that this experiment has broken down barriers which exist in a more formal approach.

Consultancy services

'Feasibility study of a paediatric telephone consultation service', Mapes, R. W., *et al., Paediatrics,* **5,** no. 2 (August 1972), 307-11. The study was designed to ascertain: 1. The extent to which such a service would be used; 2. The kind of doctors most likely to use it; 3. The kinds of problem which might arise; 4. The specialities having the greatest density of calls. Ninety-one per cent of the doctors using the service considered it of value.

Community paediatricians

'The community paediatrician', Mitchell, R. G., *British Medical Journal,* **3** (10 July 1971), 95-98. A new kind of doctor should be trained for the specific purpose of providing paediatric services in the hospital and personal medical services for children outside. He will also give advice on health matters concerning children in the community, particularly school health, liaise with GPs and have his own staff of assistants and trainees.

Paediatric units and pharmacy

'Clinical pharmacy practice in paediatric clinic', Levin, R. H., *Drug Intelligence and Clinical Pharmacy,* **6,** no. 5 (1972), 171-6. A pharmacist interviews the parent of each child to obtain a complete family history. Maintains a full medication history, notes adverse drug reactions of each family member, and monitors treatment to prevent iatrogenic misadventures.

Library services

'Children in hospital: do they need a library service?', Cumming, E. E., *Book Trolley,* **3,** no. 3 (September 1971), 3-9. Discusses the benefits to be derived from a professionally organized library service for children.

Voluntary services

'What volunteers have to offer a children's hospital', Robitaille, F. L., *Canadian Hospital,* **47,** no. 12 (December 1970), 36-39 and 16. Volunteers must be given challenging and satisfying tasks and job descriptions are essential. It is important that the hospital staff are familiar with these job descriptions and that they are willing to work with the volunteers.

Intensive care units

'Paediatric intensive care in the community hospital', Barbara, A. C., and Didonato, T. R., *Medical Clinics of North America,* **55,** no. 5 (September 1971), 1263-75. A special area of the intensive care unit should be designated for paediatric patients. Aspects discussed include equipment, organization, staffing, in-service training, laboratory and X-ray facilities, and safety precautions.

Occupational therapy

'Role of the occupational therapist in a children's treatment unit', Carson, J., *Occupational Therapy,* **1,** no. 3 (March 1972), 153-5. Mainly concerned with cerebral palsy: 1. Home management; 2. Parent training; 3. Follow-up at school, nursery, or any educational or rehabilitation agency; 4. Perceptual evaluation and training. Children needing treatment attend twice weekly for between three-quarters to one hour, and are given a home exercise programme to be carried out under the supervision of a therapist.

Mother and child health services

Mother and Child Health. Delivering the Services, Williams, C. D. (OUP, 1972), £2.20, 164 pages. Chapters include: The reasons for mother and child health services; the scope of mother and child health services; common problems in children; health education; health services for children; organization; personnel and training.

Antenatal care

'The Karatine mothercraft hospital: current and future activities', *Medical Journal of Australia,* **1**, no. 24 (10 June 1972), 1261-5. Unit set up to help mothers with their newborn babies. Premature babies are admitted and those emotionally disturbed, or those posing social problems by virtue of absent, disturbed, or physically ill parents. As the existing children's hospitals lack the relaxed and intimate atmosphere required to treat such problems, the mother craft hospital is a physical and perhaps economic necessity for their management.

Neonates

DHSS Report on Public Health and Medical Subjects no. 127: *Report of the Expert Group on Special-Care for Babies* (HMSO, 1971), 30p, 40 pages. Reviews the importance of special care, present facilities for special care babies, current research, staffing of special care nurseries, and planning of special care nurseries.

Autistic children

'The physical environment of the mentally handicapped IV. A playroom for autistic children, and its companion therapy project: a synthesis of ideas from ethology psychology, nursing and design', Richer, J. M., and Nicholl, S., *British Journal of Mental Subnormality,* **17**, no. 33 (December 1971), 132-43. Describes in great detail the layout, facilities, staffing, and methods used in the playroom at Smith Hospital, Henley-on-Thames. Concentrates on easy facilitation of social approach and a decrease of sources of arousal. A plan, asconometric drawing, and four photographs of the playroom are included.

Deaf and blind children

'Lea Hospital, Bromsgrove: the work of the deaf/blind unit', Southwell, F. J., *et al., Teacher of the Blind,* **59**, no. 2 (January 1971), 62-65. Caters for all young patients suffering from severe degrees of blindness and in a lot of cases deafness. The unit aims to assess each child's potential and to discover ways and means of enabling him to achieve this potential.

'Reorganisation of audiology services'. Chadwick, D. L., *Public Health,* **87**, (1973), 125-9. Outlines present situations and the proposals in the Government legislation for NHS reorganization. 'Discusses modifications of these proposals which may be necessary in order to achieve the most ideal and effective audiological organization possible.'

'Organisation of audiology services in Glasgow', Dunn, M., *Public Health,* **87** (1973), 131-3. Outline of scheme set up in accordance with the recommendations of the 'Ascertainment of children with hearing defects report', 1967. Discusses aspects of screening, management framework, and details of possible future developments.

'The reorganisation of educational services for children with impaired hearing', Fisher, B., *Public Health,* **87** (1973), 135-9. Covers in some detail

the following areas: 1. Reorganization of local education authorities to be brought about as part of local government reform; 2. Reorganization of the health services at present under consideration; 3. Reorganization of social services whose new administrative framework has already been laid down in the local authorities.

Institutional care

'Institutional care of children', Meierhofer, M., *Royal Society of Health Journal,* **93,** no. 1 (February 1973), 29-30. 'If these children, in their earliest years, are deprived of an adequate mother substitute they may well suffer irremediable damage. Their right to full bodily, spiritual and mental growth is withheld.'

Health centres

'Children's health centre considers "whole child" in planning care', Weeks, L. E., and Peterson, R. E., *Hospital Topics, Chicago,* **49,** no. 9 (September 1971), 65, 68, 70. Total care of the child from birth to 18 years of age. Advises that each child should be seen by the same doctor on all visits. Includes dentistry service, handicapped centre, psychiatric treatment, special education, speech and hearing departments.

Play in hospital

Play in Hospital (OMEP, May 1966), 40p, 31 pages. This report describes the work of play-leaders and convincingly shows the necessity of a play-leader as a member of a hospital team.

'Play programme reduces children's anxieties, speeds recoveries', Billington, G. F., *Modern Hospital, Chicago,* **118,** no. 4 (April 1972), 90-92. Discussed the facilities and staffing of the play programme. Total direct cost of the scheme in 1971 was less than £3,500 approximately.

Out-patient playroom

'Playroom in the out-patient clinic', Engelman, J. L., and E. G., and Fink, D. L., *Hospitals, Chicago,* **44,** no. 21 (1 November 1970), 47-50. Includes details of layout and use of a playroom designed to meet the needs of visiting children. From the administrative viewpoint the playroom meets a variety of important needs at relatively little expense.

'Play in hospital: the place, purpose and priority of hospital playgroups', Hales-Tooke, A., *Maternal and Child Care,* **6,** no. 64 (September 1970), 330-1, 334-6. Differing play services available. Recommends salaried play-leaders. Discusses the problems of establishing such a service, ie lack of funds, a misconception about the value of play and confusion about a play-leader's aims.

'Let's make a game of it!', Harding, V., and Walker, S., *Nursing Mirror,* **135,** no. 25 (22 December 1972), 14-17. Details the work of play specialists at Charing Cross Hospital. An important part of their work is preparing the child for treatment, especially surgery. Their aim is to reduce emotional stress by providing personal care and creative play activities.

Play in Hospital, Harvey, S., and Hales-Tooke, A. (ed.) (Faber, 1972), £3, 200 pages. The book covers: play in hospital from birth to 5 years; activities and hobbies for older children; children with special problems; the role of the play-leader; working with others on the ward; and some overseas schemes.

Play and Sick Child, Noble, E. (Faber and Faber, 1967), £1.12½, 157 pages. Covers the following headings: 1. The young child in hospital; 2. Play facilities in children's wards; 3. Doll-play projective test. Concludes that relatively few children are provided with every possible means or relieving their mental stress and that supervised play is a means of resolving the emotional problems which are inevitable.

Handicapped children

'Day assessment centre for handicapped pre-school children', Beaver, R., *Community Medicine,* **128,** no. 13 (14 July 1973), 303-8. 'It is agreed that assessment centres and observation units should be sited so that they are readily accessible to the parents and children of the area they serve.'

'Handicapped children in private nurseries and play groups in Enfield', Crawford, L. A., *Community Medicine,* **127,** no. 1 (7 January 1973), 6-7. 'Children with a wide variety of handicaps can become happily integrated into sessional nurseries and play groups with normal children; it is not necessary for the supervisor to have had nursing training, although this is of course an advantage.'

The Handicapped Child, IV, Dinnage, R. (Longman, 1970), £2.25, 366 pages. Comprehensive coverage of all aspects of neurological disorders. Includes the social needs of the children and discusses the services available and suggested lines of development. Includes an annotated bibliography of all major research done in this field since 1958.

'Opportunity classes and community care', Faulkner, R. E., *Health and Social Service Journal,* **83** (31 March 1973), 731-2. 'Community care all too often does nothing to involve the community. Yet the establishment of Opportunity classes for the handicapped child has deliberately involved the whole community and integrated handicapped and normal children.'

Handicapped and Impaired in Great Britain, Harris, A. I., Office of Population Censuses and Surveys. Social Surveys Division Part 1 (HMSO, 1971). £3·25. In-depth study of the handicapped covering medical services and treatment, health and welfare services, transport, leisure facilities, equipment, and local authority services.

The Family and the Handicapped Child. A Study of Cerebral Palsied Children in their Homes, Hewitt, S., and Newson, J., and E. (Allen and Unwin, 1970), £2.75. Describes an inquiry into the upbringing of young cerebral palsied children. Studies the adverse effects on the family from the parent's view and lists the various stresses and handicaps that result.

'Children's Wheelchair Clinic', Holt, K. S., *et al., British Medical Journal* (16 December 1972), 651-5. The clinic was initiated because many of the wheelchairs supplied to handicapped children are unsatisfactory. The re-

view emphasizes the importance of modifications to chairs the frequency with which they are required and the very long delay which causes additional problems because of growth.

Handicapped Children: Their Potential and Fulfilment (Joint Council for Education of Handicapped Children, 1971).

'The cost of handicap', Kew, S., *Health and Social Service Journal,* **83,** no. 4330 (1973), 860-1. 'What is the impact in emotional and financial terms of the birth of a handicapped child? To what extent do current provisions meet the increased cost of living for the family, and provide the necessary practical and emotional support?'

Patterns of Residential Care. Sociological Studies in Institutions for Handicapped Children, King, R. D., *et al.* (Routledge and Kegan Paul, 1971), £3.50, 255 pages. Examines the way that handicapped children are dealt with in the residential institutions that care for them. Includes a selected review of the literature on the care and up-bringing of children and on the theory of residential organizations. Factors studied include the size of institutions and living units, the ratio of staff to children and staff organization and training.

Handicapped Children – Their Potential and Fulfilment – A Selection of Papers from the Proceedings of the First National Conference of the Joint Council for the Education of Handicapped Children, Petrie, I. (ed.) (JCEHC, 1971), 113 pages. Topics covered include: 1. The neurologist's contribution to the assessment of the handicapped child; 2. The management of speech disorders in children; 3. Aspects of the social and emotional development of children in long-term residential care.

Handicapped Children in Care of Local Authorities and Voluntary Organizations, Scottish Education Department Social Work Group (HMSO, 1970), 22½p, 37 pages. Detailed survey and recommendations covering: 1. Assessment; 2. Residential care; 3. Foster care; 4. Hospital care; 5. After-care; 6. Employment; Statistical tables.

Living with Handicap, Younghusband, E. (ed.) *et al.* (National Bureau for Co-operation in Child Care, 1970), £2.50, 367 pages. 1. Analysis and consideration of the problems involved. 2. Evaluation of evidence from every relevant source. 3. Examines in detail the services provided by ten local authorities. Fifty recommendations. Particular consideration to: 1. Prevention; 2. Assessment; 3. Residential care; 4. School leaving; 5. Employment, and after-care; 6. Detection and screening; 7. Personal and social needs; 8. Co-ordination of services and staffing.

Youth Service Provision for Physically and Mentally Handicapped Young People Survey (Youth Service Information Centre, March 1972), £1, 110 pages. Detailed descriptions of most of the services available throughout the country. Concerned with the leisure of the handicapped.

Physically handicapped

Clothing for the Handicapped Child, Forbes, G. (Disabled Living Foundation, December 1971), £1.20, 79 pages. Detailed survey, for all handicaps, of

the types of clothing available. 1. Principles of selecting clothing. 2. Aids to independence. 3. Adaptions for differing handicaps. 4. Types of clothing available.

Handicap. A Study of Physically Handicapped Children and their Families, McMichael, J. (Staples Press, 1971), £2.75, 208 pages. Deals with every aspect of the problems of physically handicapped children: medical, educational, psychological, and social. Reveals many of the problems arising from the interaction of the various disciplines involved.

Mentally handicapped

Mentally Retarded Children: What Parents and Others Should Know, Blodgett, H. E. (University of Minnesota Press, 1971), $5.95, 159 pages. 'Among the subjects discussed are the purposes of education for retarded children, how they learn, speech and language development, the importance of feelings, how to make the best of professional help, problems of family living, planning for the future and how parents can learn to accept and adjust.'

Mental Retardation Occasional Papers, 2, 3, and 4, Holt, K. S., *et al.* (Butterworths, 1972), £2.50, 170 pages. Three papers: 'The quality of survival'. 'The need for long-term care', and 'Growing up in hospital'.

Mental Illness in Childhood: A Study of Residential Treatment, Kahan, V. L. (Tavistock, 1971), £3, 219 pages. An essential element in treatment consisted of child-centred intensive care and regressed nurtural care: both are described in detail and it is believed that a wide range of cases could respond well to this type of treatment.

The Mentally Handicapped Child, Kirman, B. H. (Nelson, 1972), £2.95, 233 pages. Presents the nature of the problem and brings together some of the information which has grown from this problem. Suggests lines of development and services already available.

The Challenge of Change. Annual report 1971 (National Society for Mentally Handicapped Children), 32 pages. Discussion of the implications and recommendations put forward in 1971. 1. Transfer of responsibility for education from DHSS to DES. 2. Establishment of local authority social service departments taking over functions affecting the mentally handicapped. 3. White Paper *Better Services for the Mentally Handicapped* which deplores the use of hospitals as homes.

The Quality of Care. Report of a Study Group in Denmark (National Society for Mentally Handicapped Children, May 1970), 50p, 55 pages. Detailed survey of the pattern of care and future development of services for mentally handicapped children.

'Report of the Working Party on the Mentally Handicapped', Social Services Department, East Riding of Yorkshire County Council, *Inlogov,* 5 (June 1972), 41-51. In-depth study of services available and existing co-operation. Recommends future development and covers in particular, sheltered accommodation, sitter-in services, holiday provision, youth services, special care units, and education.

The Mental Health Service after Unification, Tripartite Committee (BMA, 1972), 50p, 95 pages. Chapters include: 'A general pattern for the development of a mental health service'; 'Preventative and community psychiatry: the contribution of community medicine'; 'The child psychiatric services'; 'The psychogeriatric services'; 'The general practitioner and the mental health service'; 'The nurse in the mentral health service'; and 'Voluntary services in relation to mental health'.

Psychiatry

'Paediatric psychiatry in perspective', Pinkerton, P., *Practitioner,* **210** (January 1973), 15-20. Although dealing with the type of problems encountered also puts forward ideas for a multidisciplinary approach to child psychiatry based on a team approach including health visitors, social workers, education guidance officers, and the school health service.

Emotionally disturbed and maladjusted children

Child guidance

Child Guidance from Within: Reactions to New Pressures (National Association for Mental Health, 1967), 54 pages. Contains papers covering: 1. Diagnosis, consultation, and co-ordination of treatment; 2. Individual therapy in the clinic; 3. Helping the disturbed child in school; 4. Working with families who do not attend a clinic.

Maladjusted children

Emotionally Disturbed Children, Maxwell, S. M. (Pergamon Press, 1966), 50p, 56 pages. Includes the following four papers: 1. 'Approach to the treatment of the young delinquent'; 2. 'Coping with maladjustment in Scandinavia'; 3. 'Prevention in Denmark'; 4. 'The day-care approach to emotionally disturbed children'.

Emotionally disturbed children

'Total care for children', Gibson, R. W., and Scherr, M. L., *Hospitals, Chicago,* **45**, no. 20 (16 October 1971), 64-68. Describes the development of services for emotionally disturbed children and adolescents. Includes: 1. Child guidance clinic; 2. Community affiliation and consultation service for staff training; 3. A school; 4. Day treatment centre; 5. Inpatient unit for adolescents.

Severely disturbed children

Youth Treatment Centres. A New Form of Provision for Severely Disturbed Children, DHSS (HMSO, 1971), 27½p, 29 pages. Discusses the aims and future development of youth treatment centres for severely disturbed and antisocial adolescents.

Day units

'Oxford House day unit', Coleman, J., and Lindsay-German, J., *British Hospital Journal and Social Service Review,* **81**, no. 4226 (17 April 1971),

714-16. Day-unit for preschool children with emotional disturbances. Details layout, staffing, equipment, and methods used. Both mothers and children are observed and their interaction is used as a guide to better adjustment.

Adolescents

Autistic, Psychotic and Brain Injured Adolescents (PPWAPPA, 1971), £1.05, 155 pages. Covers the following papers: 1. The urgency of the problem; 2. Special units in subnormality hospitals; 3. Prescriptive education for children with minimal brain damage; 4. Programme of education in a day school; 5. Movement therapy; 6. The hope of the community; 7. Planning for the individual.

'The care and treatment of the adolescent psychiatric patient', McLachlan, G. (ed.), *Problems and Progress in Medical Care: Essays on Current Research,* Fifth Series (Oxford University Press for the Nuffield Provincial Hospitals Trust, 1971), £1.75, 107-18. The subjects dealt with concern the meaning of adolescence, the nature of the patients disturbances, objectives in treatment, planning and starting new units, out-patient services, staff, and administration and management.

'Is a separate adolescent ward worthwhile?', Rigg, C. A., and Fisher, R. C., *American Journal of Diseases of Children,* **22,** no. 6 (December 1971), 489-93. Details survey of twenty hospitals with adolescent facilities.

'The hospitalized adolescent', Schowalter, J. E., and Lord, R. D., *Children,* **18,** no. 4 (July/August 1971), 127-32. Most of the paper is devoted to the psychological aspects of experience gained in the unit. In general parents were more anxious about the outcome of the illness than the patients, who were concerned about more immediate medical procedures and daily discomforts. Some problems of the unit are mentioned.

Special studies

Diabetes

'A study of family attitudes to children with diabetes', Watson, A., *Community Medicine,* **128,** no. 5 (19 May 1972), 122-5. 'Parents distressed because their diabetic children received insufficient support and guidance from local authorities and hospital doctors; schools showing minimal understanding of diabetes; and poor communication between local authorities' are some of the points discussed.

Dialysis services

'Regional service for acute and chronic dialysis of children', Meadow, R., *et al., Lancet,* **2** (3 October 1970), 707-10. Details alternative services to be used for dialysis units for children and recommends a unit attached to the adult unit but separate from it and that both renal staff and paediatric staff should work on it.

Epilepsy

The Social Psychology of the Child with Epilepsy, Bagley, C. (Routledge and

Kegan Paul, 1971), £3.25, 276 pages. In depth study of how epileptic children behave and how they are regarded by parents, teachers, and peers. The dearth of medical centres which can diagnose and treat epilepsy is examined and hospital use according to parents' social class is analysed.

Haemophilia

'Answering the needs of haemophiliac children and their families', Jones, P., *Community Medicine,* **128,** no. 15 (28 July 1972), 351-4. 'Treatment of bleeding disorders is only a small part in the management of haemophiliac children. Provision of better housing and normal schooling are important environmental factors.'

Poisoning

'Poisoning in children – a community study', Heycock, J. B., *Community Medicine,* **127,** no. 2 (14 January 1972), 15-17. Study of poison cases over four years and some suggested methods of prevention. Shows that the predominant age group is 1-5 years, that patients reach hospital between 12 am and midnight; that boys are more frequently involved than girls and that cases occur predominately in large families of the lower social class.

Young chronic sick

'A survey of young chronic sick', Crompton, G., *Community Medicine,* **127,** no. 5 (4 February 1972), 65-68. Details the procedures used for an in-depth survey of the numbers and types of young chronic sick and the services they receive. Used for future planning and development of services.

'Social and psychological consequences of chronic illness in children', *Developmental Medicine and Child Neurology,* **15,** no. 1 (February 1973), 75-77. 'Chronic disease in childhood affects the psycho-social development of the child in ways which must be recognised by those concerned with him if he is to achieve optimal development.'

Transport

'Home transport for long-stay children', Sears, M., and Sylvester, P. E., *British Hospital Journal and Social Service Review,* **82,** no. 4280 (29 April 1972), 939-40. Scheme for transporting mentally sub-normal children home for weekends. Describes the system used and details benefits derived for parents, nurses and the children. Cost: £1.40 per child for the two days spent at home.

'Transport for sick newborn babies', Storrs, C. N., and Taylor, M. R. H., *British Medical Journal,* **3** (8 August 1970), 328-32. Describes the system used at Hammersmith Hospital: where a nurse and doctor travel with the newborn to another hospital or from home. Details the modification of the ambulances used and the precautions taken especially concerned with hypothermia.

School health

'An integrated school health service', Honywood, H., *Practice Team* (April 1973), pp. 2-4. 'Several years ago arrangements were made by the Health Department of Hampshire County Council for the school health service in the Hythe area to be carried out by local general practitioners and by the health visitors attached to their practices. Although they inevitably see many non-practice children, the fact that they all work from one centre and that local authority health service sessions and consultant out-patients clinics are held there, means that liaison is very good. Few children who need treatment slip through the net and far fewer school re-examinations are needed.'

'School health in "bits". A computerized school health service', Livesey, E. H., *Community Medicine,* **127**, no. 4 (28 January 1972), 46-50. 'A comprehensive record for children of both pre-school and school age is kept within a system flexible enough to permit additions or extensions. The technique of direct document reading is used.'

Report of the Chief Medical Officer of the Department of Education and Science, *The Health of the School Child 1969-1970* (HMSO, 1972),85p, 127 pages. Mainly statistical evidence of the most vital areas for planning. Discusses each section in depth and recommends areas to watch and future developments. Covers asthma, diabetes, diseases of the skin, infectious diseases, etc.

Screening

'Screening of the well child: a discussion of some of the problems involved', Bloor, M. J., and Gill, D. G., *Community Medicine,* **129**, no. 6 (24 November 1972), 135-8. 'A scheme is outlined for adjusting screening services to the preferences of those most reluctant to use them and for helping to solve some of the manpower difficulties that mass screening poses.'

'Developmental screening of pre-school children', Paterson, M. R., *Community Medicine,* **128**, no. 19 (26 August 1972), 423-4. 'The importance of fully diagnosing handicaps and providing appropriate treatment, parent counselling and education in child management is emphasized.'

'Screening tests for inborn errors of metabolism', Yu, J. S., *Modern Medicine* (December 1972), pp. 753-8.

Child development

Child Development, Hurlock, E. B. (McGraw-Hill, 5th edition, 1972), 494 pages. Headings are: 'Traditional beliefs about children'; 'Scientific studies of child development'; 'Principles of development'; 'Foundations of the developmental pattern'; 'Effects of birth on development'; 'Emotional, physical, motor, speech, and social development'; 'Social adjustments'; 'Play'; 'Creativity'; 'Development of understanding'; 'Moral development'; 'Some childhood interests'; 'Family relationships'; 'Personality'.

Today's Three-year-olds in London, Pollak, M. (Heinemann, 1972), £3, 152 pages. 'Practising in an area with a large immigrant population, Dr. Pollak could observe the health and development of different groups of London children. Significant differences in some areas of child development are already apparent by the age of three, and can be traced to the differing attitudes towards child rearing and home life.'

Health education

'Organisation of health education', MacQueen, I. A. G., *Community Health,* **4**, no. 5 (March/April 1973), 239-43. Headings are: 'The health education team'; 'Co-ordination and organizers'; 'National aspects'; 'Salaries and staffing'.

'Health education in the 1970s', Ward, A. J. D., *Community Health,* **4**, no. 5 (March/April 1973), 230-8. Headings are: 'Factors in development of health education'; 'New problems of preventive medicine'; 'The operational application of health education'; 'Research'; 'Professional development'; 'Health education in schools'; 'Voluntary bodies'; 'Technology and techniques, and the future'.

'The use of mass media in health education', Yarrow, A., *Community Health,* **4**, no. 5 (March/April 1973), 244-8. Headings are: 'The aims of health education'; 'The aims of the SHEU campaigns'; 'Some difficulties in carrying out campaigns'; 'Campaign execution'; 'Evaluation of campaigns, and the indirect approach'.

A select list of titles available from the national lending library

'A perspective on residential child care programmes', *Child Welfare,* **51** (January 1972), 30-37.

'Children in the integrated National Health Service', Chamberlain, R. N., *Lancet,* **2** (4 November 1972), 963-5.

'Providing primary paediatric care', Alpert, J. J., *Postgraduate Medical Journal,* **48** (October 1972), 571-6.

'Community medicine and the child', Ring, E. M., *Public Health,* **86** (January 1972), 65-71.

'Integrating maternal health services with child health services: a necessary advance in community planning', Wallace, H. M., *Clinical Paediatrics,* (Philadelphia), **11** (August 1972), 435-7.

'The Baltimore maternal and infant care project', Swallow, K. A., *Annals of the New York Academy of Science,* **196** (7 April 1972), 84-90.

'A concept for maternity and infant care in the future', Leonard, T. A., *Wisconsin Medical Journal,* **71** (April 1972), 121-7.

'An integrated child health service', Mitchell, M. E., *Health Bulletin (Edinburgh),* **27** (July 1969), 54-56.

'The basic problems in providing health services to school age children worldwide: an essay', Minear, R. E., *Clinical Paediatrics (Philadelphia),* **10** (November 1971), 626-31.

'Evaluation of the effectiveness of comprehensive and continuous paediatric

care', Gordis, L., *et al., Paediatrician,* **48** (November 1971), 766-76.
'Child health in a changing community', Court, S. D., *British Medical Journal,* **2** (17 April 1971), 125-31.
'Action for improved maternal and child health', Thompson, H. C., *Journal of Paediatrics,* **78** (June 1971), 1075-6.
'Some thoughts on planning health care for children and youth', Wallace, H. H., *Children,* **18** (May/June 1971), 95-100.
'Some continuing health problems of school children and young people and their implications for a child and youth health service', Henderson, P., *Public Health,* **85** (January 1971), 58-66.
'Child care – what future?', Briggs, P. W., *et al., Lancet,* **1** (29 May 1971), 1119-22.
'Emerging needs of children', Andrew, R. R., *Medical Journal of Australia,* **1** (13 February 1971), 398-400.
'A community approach to maternal-child health', Williams, P. S., *et al., Nursing Outlook,* **19** (January 1971), 44-46.
'Maternal and child health planning: a framework', Le Nobel, C. P., *Tropical and Geographical Medicine,* **22** (September 1970), 38-39.
'A noncategorical approach to treatment programmes for children and youth', Lourie, N. V., *et al., American Journal of Orthopsychia,* **40** (July 1970), 68-69.

DESIGN AND IMPLEMENTATION OF A DEVELOPMENTAL PAEDIATRIC PROGRAMME

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The scheme reported here was implemented by the Health Committee of the Derbyshire County Council, and had the backing of the Derbyshire Local Medical Committee as well as of the Education Committee of the County Council.

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Chapter 1

Introduction

Objectives
The original objectives of the scheme were these:

1. To assess the work of the Derbyshire Local Health Authority child services as organized in 1971. The total population served was 670,000, and the preschool child population 48,000.

2. To design programmes for the reorganization and management of the community preventive child health services and, in some measure, of the

community therapeutic services for preschool children, in anticipation of the introduction of an integrated health service in Derbyshire, in accordance with proposals made in connection with the reorganization of the National Health Service.

3. To implement such programmes, in full or in part, so that they could be evaluated in the light of operational experience.

In effect a model system was to be designed and operated with a view to its subsequent adoption by area health boards.

The management of health services and epidemiology

Two distinct operational principles coexist in the management of the health services.

1. Most services are simply made available and the level of demand is therefore determined by the public. This is the governing principle of the hospital and GP services and some parts of the public health service. The consequence is that demand is erratic.

2. On the other hand for much of public health a centrally managed system has operated. In each local authority there has been a complete population file for every child (or house, food supplier, and so on) and the initiative to examine or provide (for example, placement in a residential school) has rested with the authority.

More fundamental in the reform of the health service than either the abolition of the tripartite structure or the adoption of new management methods will be the application of epidemiological techniques to determine medical policy. This will involve a shift towards controlling demand and away from leaving it to be fixed by the public, because demand may not reflect need but may be conditioned by the availablity of facilities or by tradition. The same is true of the social services generally, with this difference, that in medicine the effects of treatment are more obviously demonstrable and more susceptible to measurement. It is, however, a remarkable fact that whereas the teachers of medicine or surgery practise their subjects inside the National Health Service, the university departments of social medicine have been divorced from it and in particular from its administrative organs: the regional hospital boards, the executive councils, and the local health authorities. This isolation has led inevitably to the assumption that epidemiological guidance about the community medical services may be obtained from academic departments only by their undertaking *ad hoc* studies and special surveys on behalf of management. Their participation in the *organization* of provision for whole populations is unusual. The consequence is that the evaluation of health care systems in epidemiological terms is difficult because they are not designed with this in mind. In designing a preventive service for a county-wide population of children it therefore seemed essential to aim to assess or categorize in some way every child, individually identified in accordance with a preselection programme, and to employ appropriate clinical and administrative techniques in such a way that evaluation of the system as a whole and of its component parts would be facilitated.

The computer

In community health service programmes the contribution of the computer is chiefly in connection with the organization problems and the data-processing requirements that arise when the handling of very large populations is involved. The computer will provide an appointment, notification, recall, and recording system; eliminate clerical labour for the clinicians; regulate the flow of material in accordance with clinical and staff capacity; and sequestrate the bulk of material to be dealt with by automated procedures without impeding personal communication about cases by the doctors concerned. In a pioneer application (Galloway, 1963) a computer-assisted service for immunization resulted in immunization indices for West Sussex approaching 100 per cent, and the cost to the NHS of the model system after seven years operation was shown to be 36 per cent less than the average cost in England and Wales (Saunders, 1970). A rather more complex computer-assisted system which involved all three branches of the tripartite service and both therapeutic and preventive services was introduced for cervical cytology (Saunders and Snaith, 1967, 1968, 1970). From the operation of these programmes it emerged that there are five significant characteristics of computer-assisted systems (Snaith, 1972). First, they are comprehensive: every member of the relevant population is included. Second, the initiative is not left with the individual to come forward for the service, but is taken by the organizing centre. Third, a co-operative of clinicians and facilities in the different parts of the health service is created for the programme. Fourth, there is a measure of standardization of the service offered. Fifth, a standard record is preserved. In effect, operational integration as distinct from mere administrative co-ordination is achieved.

A preventive clinical medical service

In view of the experience which had been obtained with computer systems for very elementary medical services such as immunization and cytology, it was now proposed that a system should be devised which involved the clinical examination of the whole patient and not just a single test: namely a developmental paediatric programme. The preventive clinical services for children pose the fewest problems of design and implementation in attempting to reorganize and automate their administration. Local authority infant welfare clinics have been established for half a century. They are well patronized by the public and are accepted by GPs, with the patients of whom they are concerned. Substantial finance and resources are allocated to the clinics, there is a corps of doctors to do the work, and a network of purpose-built or hired premises in which to do it. There is nothing new about developmental screening at infant welfare clinics and many local health authorities have adopted schemes of different kinds, some of which employ computers. There is, however, general recognition in the profession that the contribution of the clinics to the health service is not great, and that they need to be reorganized and evaluated. It seemed reasonable, therefore, to design and operate a new system in Derbyshire in advance of the integration of the

NHS. The computer could easily provide appointments and recall for every child to be examined at regular intervals and also records appropriate for management, evaluation, and research purposes. The initiating document for the completion of the population file would be the birth notification form. The provision of a narrative computer clinical record would not be an objective of the exercise; brief summary records would be compiled, and provision made for detailed clerical records to be kept. The training of the clinical staff of the county health department and (chiefly) of GPs would be an essential prerequisite for the implementation of the programme, which would take place over a period of time, the model system replacing the pre-existing arrangements area by area. The operation of the programme would need to be co-ordinated with the community therapeutic services provided by GPs and by the hospitals (which increasingly will have the paediatric assessment centres recommended by the Sheldon Report, 1967). A comparison of the value of the new system with the old would be essential and for this ascertainments of handicap would provide the most obvious criteria. If successful the project might provide a guide to similar community health programmes for other sections of the population.

To design community preventive health programmes of this character was beyond the resources which are available to a local health authority. On the other hand, the implementation of such programmes was well within the scope of local authorities, which are familiar with the logistical problems involved in handling very large populations. The support of the Nuffield Provincial Hospitals Trust was therefore sought to enable research staff to be employed to design computer-assisted community programmes and assess their merits. The authority contributed to the work chiefly in connection with the operation of the programmes, ie computer programming, computer time, administration of programmes in operation, and medical advice.

The R & D unit and health care planning

'In order to carry out the planning of the operational health care services . . .' permanent health care planning teams will need to be established for services for children, the elderly, the mentally ill, the mentally handicapped, and for maternity services *(Management Arrangements for the Reorganised National Health Service,* 1972). It is submitted that the design of population health programmes requires specialized design staff. To create the new developmental paediatrics system (and subsequently to work on other projects) an R & D unit of eight graduate staff was established in the county health department, over the course of a year, composed as follows:

Direction

1. Principle medical officer (community medicine) (K.C.).
2. Research and development officer (social science, computing accountancy) (A.T.).

Research section

3. Senior research assistant (PhD, physical sciences).
4. Senior research assistant (PhD, biological sciences) (J.D.).
5. Research assistant (mathematics and statistics).
6. Research assistant (social sciences).

System analysis section

7. Systems analyst/programmer (economics).

Control section

8. Administrative assistant (physical sciences).

The research section was made responsible for all theoretical work, including the design of systems and the provision of finished specifications for proposed projects; the systems analyst for the conversion of the agreed specifications to computer systems, for computer programming (with assistance as required) and for overseeing computer operations; the control section (which includes clerical staff) for the operation of implemented projects and for a continuous relationship with the information systems on the one hand and field staff on the other. Two of the unit's staff (1, 3) were in charge of operational sections of the health department, ensuring close integration of planning and operations.

The unit was brought into being by the creation of four new posts and by the revision of four previously existing posts. Their salaries amounted to £22,000 per annum but only £9,000 was due to the new posts. These figures should be seen in the context of the total expenditure on administration by the county health department. In 1971/2 this was £238,070. Therefore in 1972/3 salaries of R & D unit staff represented 9·2 per cent (and the salaries of the new posts 3·8 per cent) of that expenditure on administration. In 1968/9 (the last year for which relevant national data are available) expenditure on administration by the Derbyshire health department was 60 per cent of the average of English counties. Evidently the organization of an R & D unit is a matter of redeploying resources.

Chapter 2

The formation of clinical policy

The creation of an R & D unit to work with the existing clinical specialists and medical administration, not only on a profile of need and resources and a matching operational system, but also upon the collection and analysis of information relating to the policies and methodology to be adopted, was therefore an essential prerequisite to designing this scheme. Without this facility and the work which flowed from it, the effort to reach the objectives would have withered for lack of substance and confidence. For, before the technical specialists could turn exclusively to system design, it was necessary to undertake preliminary studies and discriminate between a number of hypotheses concerning developmental screening, at-risk registers and the content of the clinical examinations.

Developmental screening and at-risk registers

Early recognition of many handicapping conditions is important (Lindon, 1961; World Health Organization, 1967; Bax and MacKeith, 1969; Sheridan, 1971). This is particularly true of visual and hearing disorders (Gardiner, 1969; Stanworth, 1969; Fisch, 1957; Rawson, 1973) but early treatment has also been shown to be beneficial in neuromotor disorders and cerebral palsy (Illingworth, 1972*a*; Bobath, 1966). The standard of child care in the United Kingdom has changed continuously with advances in medicine and changing social conditions and with the provisions of the Midwives Act 1902, the Maternal and Child Welfare Act 1968, and the introduction of the National Health Service in 1948. Because maternal and infant mortalities have declined, an increasing number of infants with congenital abnormalities survive. Indeed with the improvement in the health of the mother and child and the decline in serious infectious disease, attention has turned increasingly to the study of child development and early assessment of children's abilities. However, although more handicapped children might respond to rehabilitative and educational programmes, infant welfare services have not been organized in a way which could optimise the early detection of potential or actual handicaps. A network of infant welfare clinics, together with health visiting, provides a preventive service easily available to the great majority, but the initiative has remained largely with the parents to bring a child forward when disability becomes apparent; perhaps long after effective treatment or counselling could have started. Furthermore, although there is a measure of common practice, individual clinicians may examine children without standardization of the techniques employed.

In an attempt to rectify this situation Sheridan (1962) suggested the introduction of risk registers, a concept based on the original suggestion by Fisch (1957) that a majority of deaf children would be found among a very small group whose pre- and perinatal history contained adverse factors which carried a high risk of subsequent deafness. The suggestion was that where resources were limited they should be concentrated on these at-risk children so that those who were deaf would be recognized at the earliest possible age. Lindon (1961) extended the concept to other handicaps, since limited resources at that time precluded examination of all children. He estimated that by thorough examination of 20 per cent of all infants, 70 per cent of defects could be diagnosed and treated earlier. By actively identifying the risk group the delay incurred by leaving it to parents to detect signs of disability in their children would be lessened.

In recent years many authors have shown or suggested that at-risk registers are of doubtful value (Walker, 1967; Richards and Roberts, 1967; Rogers, 1967, 1968*a, b;* Thomas, 1968*a, b;* Hamilton *et al.*, 1968; Knox and Mahon, 1970; *Lancet,* 1970; Neligan, 1970; Holt, 1971; Alberman and Goldstein, 1970*a, b;* Butler and Pringle, 1966). The current feeling against risk registers has been summarized by Rogers (1971). The main reason for their inadequacy has been that they tend to become very large (they may contain up to 60 per cent of the child population) while even the largest do not include

more than 70 per cent of those who eventually become handicapped. Oppe (1967) suggested stricter criteria for including children in the register, but although this produced registers of a more manageable size the proportion of eventually handicapped children contained was greatly reduced, often to less than 50 per cent (Rogers, 1967, 1971). In many cases reduction in the size of the register has meant that children not included are at almost as much risk of becoming handicapped as those who are registered (Rogers, 1968*a*; Drillien, 1965). Only in the case of deafness does the increased risk due to pre- and perinatal factors approach the level where an at-risk register is a sound proposition (Howarth, 1967; Richards and Roberts, 1967; Hamilton *et al.*, 1968).

It was, however, never originally proposed that a risk register should be an end in itself, but only that it might be of help in organizing the most efficient deployment of limited resources; until for instance large numbers of doctors had been trained in developmental paediatrics. Fisch (1957, 1967) who first proposed the at-risk concept made it clear that he regarded it as a compromise solution, dictated solely by the lack of resources necessary to provide a full service. In the ideal situation resources would be adequate for all children to be regarded as being at-risk and all should be placed under surveillance. This should take the form of regular developmental (see below) examinations by doctors who are adequately trained in this field. There should still be scope within such a system for children with known risk factors to receive extra surveillance if they fall into strictly defined high risk groups (for example, maternal rubella would be one example of a high risk factor) (Fisch, 1967; Rogers, 1971).

It was decided on consideration of this evidence that the community developmental screening programme to be adopted in Derbyshire should meet the following requirements:

1. (*a*) Achieve early detection of handicapping conditions.

(*b*) Obtain adequate diagnoses of handicaps detected.

2. (*a*) Provide appropriate treatment for individual children when that is technically possible together with advice for their parents.

(*b*) Ensure long-term planning in the county for the educational and social needs of handicapped children.

The early detection screening procedures should also adhere to the following principles (Rogers, 1971):

1. The procedures must be effective.
2. The programme must make better use of resources than the available alternatives.
3. Those providing the service should take the initiative in contacting and examining those concerned.
4. Those found to be affected must derive benefit from subsequent treatment and care.

Developmental techniques may be used successfully to predict a child's future attainments (Illingworth, 1971) but it was decided that this should not be an objective of a screening programme applied to a whole infant

population. The clinical examinations should detect disabilities as soon as possible so that intervention might be initiated, not attempt to provide 'developmental scores' or prophesy future intelligence or achievement.

Developmental paediatrics

Sheridan (1969*b*) has defined developmental paediatrics as

> 'being concerned with maturational processes (from foetal viability to full growth) in structure and function of normal and abnormal children for three purposes:
>
> 1. To promote optimal physical and mental health for all children;
> 2. To ensure early diagnosis and effective treatment of handicapping conditions of body, mind and personality;
> 3. To discover the cause and ultimately the prevention of these conditions.'

Holt (1969) has said that

> 'developmental paediatrics may be defined as a study of the growth, maturation and development of that most complex of organisms, the human being; the analysis and investigation of the underlying mechanism and the use of this knowledge to detect disorders in their early stages; and the study of the effects of diseases and other disorders upon these processes.'

Forfar (1972) has said that developmental assessment of both the normal and abnormal, disorders of development, and diseases which disturb development, all come within the ambit of developmental paediatrics. Rogers' definition (Rogers, 1971) agrees with those of Sheridan, Forfar, and Holt and states that developmental medicine is based upon an understanding of normal and abnormal development in all fields and a knowledge of paediatric neurology.

Sheridan devised a series of tests for developmental paediatric examinations as early as 1960. A revised edition was published in 1969 (Sheridan, 1969*a*). Frankenburg and Dodds (1967) have standardized 105 developmental test items on 1,036 children in Denver. Repeated at intervals either of these sets of tests would provide a useful means of recording developmental progress and thus bring about early detection of any potential handicaps (Frankenburg, 1969; Koupernick, 1968, 1969). Oppè (1967) agrees that a series of screening examinations should be carried out since there is no single age for examination which is optimal for all disorders. Many other authors (MacKeith, 1966; Richards and Roberts, 1967; Robson, 1967; World Health Organization, 1967) have agreed with these opinions.

Rogers (1971) has suggested a scheme by which all children could be examined regularly. Children who were suspected of running a high risk of disability would have more frequent examinations, but even children who appeared to run no risk whatsoever would be seen at predetermined intervals.

The content of the clinical examination

Examination of infants is based on groups of developmental sequences (see below, 'The testing steps'), and advance along one pathway is almost invariably reflected in the progress along other pathways. Motor behaviour is probably the most easily assessed function in early life. The other sequences can only be recognized with certainty by consideration of a constellation of findings. Thus it is essential for there to be order in the method of examination, for the results to be recorded in a standard way, and for the examining clinician to have not only adequate training in the specific clinical tests employed but sufficient insight into the maturation processes. Considerable experience of examining both normal and handicapped children in the appropriate age-groups and at each stage of development is essential.

Development proceeds cephalo-caudally, head control coming first. There is a gradual change from general to specific behaviour, both in the locomotor functions and in the intellectual functions. The clinician must be able to recognize the rate at which progress is being made and should have the opportunity to see and same child at appropriate intervals if he is in doubt about its progress. Standardized tests from scales already developed elsewhere have been included as the screening component of the Derbyshire clinical examinations. The delineation of developmental sequence is not, however, by itself sufficient for the understanding of handicap or developmental failure in an infant. Genetic, intellectual, emotional, somatic, and social factors must all be considered.

One of us (K.C.) studied different techniques at several centres and sought advice from a number of experts. Regular consultation with Dr L. J. H. Arthur, consultant paediatrician, Derby Children's Hospital, has been maintained since the inception of the scheme.

The screening tests which have been selected are simple, easy to apply, require minimal equipment, and can be done in most consulting rooms. Fig. 1 shows the form listing the thirty standard tests employed in the six-week examination. Details of feeding, routine measurements such as height, weight, and head circumference also have to be recorded. In addition a diagnosis and conclusion has to be made by the examining clinician. He is required to give his over-all assessment of the child which includes features which cannot be measured, such as alertness, reaction to persons in the room, social responsiveness, interest in his surroundings, determination and powers of concentration (Gesell's Insurance factors). A full segmental examination has not been included, but the infant is studied in prone and supine suspension. Other components are a physical examination and hearing and vision test. A social, antenatal, and perinatal history is taken. All children about whom there is doubt must be referred for detailed assessment carried out in an assessment centre by a multidisciplinary team.

Frequency of examination

Recommendations for the number of examinations in the first five years of life vary from four to twelve (Sheldon Report, 1967; Roberts, 1968*a*; Sheri-

EXAMINATION CHECK-LIST (DELETE THE INAPPROPRIATE RESPONSES)

	PHYSICAL								
1	NUTRITIONAL STATE	20	S/U ATISFACTORY / NSATISFACTORY	14	BACK	33	S/U ATISFACTORY / NSATISFACTORY	27	ASYMETRIC TONIC NECK REFLEX
2	SKIN	21	S/U ATISFACTORY / NSATISFACTORY	15	ANUS	34	S/U ATISFACTORY / NSAT.SFACTORY	28	MORO REFLEX
3	FONTANELLE	22	N/A ORMAL / BNORMAL	16	KNEE FLEXION	35	N/A ORMAL / BNORMAL	29	
					SPECIAL SENSES				PERSONAL/SOCIAL
4	EARS	23	S/U ATISFACTORY / NSATISFACTORY	17	EYES	36	S/U ATISFACTORY / NSATISFACTORY	30	RESPONSE TO MOTHER VISUAL FOLLOWING
5	MOUTH	24	S/U ATISFACTORY / NSATISFACTORY	18	CATARACT	37	A/P BSENT / RESENT	31	RESPONSE TO MOTHER SOCIAL SMILE
6	HEART	25	S/U ATISFACTORY / NSATISFACTORY	19	FIXES EYES ON DANGLING OBJECT	38	Y/N ES / O	32	MATERNAL ANXIETIES
7	LUNGS	26	S/U ATISFACTORY / NSATISFACTORY	20		39		33	
					DEVELOPMENTAL				FEEDING
8	ABDOMEN	27	S/U ATISFACTORY / NSATISFACTORY	21	VENTRAL SUSPENSION	40	S/U ATISFACTORY / NSATISFACTORY	34	HAS THE BABY EVER BEEN BREAST FED
9	FEMORAL PULSE	28	S/U ATISFACTORY / NSATISFACTORY	22	PULLED TO SITTING POSITION	41	S/U ATISFACTORY / NSATISFACTORY	35	IF SO WAS IT FOR MORE THAN 2 WEEKS
10	GENITALIA	29	S/U ATISFACTORY / NSATISFACTORY	23	SUPINE POSTURE	42	S/U ATISFACTORY / NSATISFACTORY	36	IF SO WAS IT FOR MORE THAN A MONTH
11	HIPS	30	S/U ATISFACTORY / NSATISFACTORY	24	PRONE POSTURE	43	S/U ATISFACTORY / NSATISFACTORY	37	IS IT STILL BEING BREAST FED
12	LIMBS	31	S/U ATISFACTORY / NSATISFACTORY	25	ASYMETRY OF LIMB MOVEMENT	44	A/P BSENT / RESENT	38	IS THE BABY HAVING SOLID FOOD
13	MUSCLE TONE	32	S/U ATISFACTORY / NSATISFACTORY	26	GRASP REFLEX	45	P/A RESENT / BSENT	39	IF SO IS IT OR

46	P/A RESENT / BSENT	
47	P/A RESENT / BSENT	
48		
49	Y/N ES / O	
50	Y/N ES / O	
51	A/P BSENT / RESENT	
52		
53	Y/N ES / O	
54	Y/N ES / O	
55	Y/N ES / O	
56	Y/N ES / O	
57	Y/N ES / O	
58	C/A BREAL ONLY / DDITIONAL FOOD	

DID THE CHILD ATTEND FOR EXAMINATION	59	Y/N ES / O
IF NOT, WAS AN EXCUSE GIVEN	60	Y/N ES / O
WEIGHT (IN GRAMMES)	61	65
LENGTH (IN CENTIMETRES)	66	67
CIRCUMFERENCE OF HEAD (IN CENTIMETRES)	68	69
WIDTH OF FONTANELLE (IN CENTIMETRES)	70	
	71	
OVERALL ASSESSMENT	72	D/R/N EFINITE ABNORMALITY / EQUIRES OBSERVATION / ORMAL
DIAGNOSIS	73	74
	75	76
ARE YOU REFERRING THIS CHILD TO HIS G.P.	77	Y/N/R ES / O / EFERRED PREVIOUSLY
SHOULD THIS CHILD BE REFERRED TO A SPECIALIST	78	Y/N/R ES / O / EFERRED PREVIOUSLY
HAVE YOU ASKED THE H.V. SPECIFICALLY TO KEEP THIS CHILD UNDER OBSERVATION	79	Y/N ES / O
IF YOU WOULD LIKE THIS CHILD RECALLED FOR RE-EXAMINATION STATE AFTER HOW MANY MONTHS	80	• •

SIGNATURE.....

PLEASE RETURN THIS LIST AS SOON AS THE EXAMINATION IS COMPLETE

Figure 1

dan, 1969*a*; Lloyd-James and Lambert, 1970; Egan, Illingworth, and MacKeith, 1971; Gardiner, 1972; Paterson, 1972; Court and Jackson, 1972). The most commonly recommended ages are 6 weeks, 6 months, 10 months, 12 months, 18 months, 2 years, 3 years, and 4½ years. In practice resource constraints limit the number of examinations which may be offered and it was thought that four in the first five years of life would be feasible. All the above authors agree that examinations at 6 weeks and in the year of school entry are important.

There was considerable debate about the timing of the remaining two examinations. Ages were chosen when it was thought that maximum information could be elicited from the examinations.

The 10-month examination was chosen because several important developmental signs become apparent at this age. Hand-eye co-ordination becomes more sophisticated, there is the beginning of digit and leg control, the average baby is crawling, can walk holding, wave bye-bye, play pat-a-cake, hold out an arm for a coat, say single words with meaning, is just beginning to develop finger-thumb apposition, and has developed the index finger approach. This is an extremely important development and Gesell (1947) refers to the use of the index finger at this age as the 'inquisitive index finger'. This contributes to the baby's third dimension and is an extremely important stage of evolution. Thirty-three tests have been included in this examination. They are extremely simple: for example, finger-thumb apposition can be demonstrated by the ability to pick up a pellet, therefore no complex apparatus or equipment is needed.

Two years was selected as the other key age. Advantages at this age are that sophistication of upright posture is achieved. The child can walk up and down stairs taking one step at a time, can mark time and can build a tower of six or seven blocks. Manual dexterity has improved and a sense of vertical and horizontal is beginning. The child can certainly imitate a vertical line and may also be able to imitate a horizontal line. He can drink with one hand and can turn pages of a book one at a time applying concentration to the task. This can be achieved because of increasing control of elbow and fine movement of the digits. At this age language is well developed and the preconceptual or symbolic stage of thinking progress has begun. The child understands the relationship of objects, he can communicate; he relates two or three words together, he says what he does and he does what he says. These developmental tests can be performed without any complex apparatus.

Six months has also been considered a key age. At this age cephalo-caudal development is continuing, good visual control has been established, good head and arm control has been established, development of sensory modality is occurring, the child is beginning to pick things up and has started to chew. This is a useful age to carry out a screening examination and would be the next one to be introduced if the number of examinations was extended to five in the first five years.

It was decided that health visitors should continue their previous practice of testing hearing between the ages of 6 to 9 months and again at 18 months.

Hearing tests are also included in the screening examinations at 10 months and 2 years.

The testing steps

Prechtl (1971) in his paper 'Strategy and validity of early detection of neurological disfunction', discussing the method of assessment and content of examination, states that 'Since it is practically impossible and not meaningful to evaluate all testable functions at a particular age a selection must be made . . . .' His diagram of decision steps which have to be made in the design of clinical and reliable neurological examination techniques illustrates the problems involved. Points which have been borne in mind in devising the county scheme include selection of age-specific tests, standardization, the design of a sequence of tests, and assessment of reliability and validity of the method.

Griffiths (1954) has devised a standardized test for assessing the ability of infants which is commonly used in clinical practice. It was devised for children up to the age of 2 years but has now been extended to include children up to the age of 8 years. This test produces a mental age score for the child. The chronological age when compared with the mental age gives the general intelligence quotient for that particular child. There are five main groups of test items (*a*) locomotor, (*b*) personal-social, (*c*) hearing and speech, (*d*) eye and hand, (*e*) performance. For the first two years in each group there are 52 test items, hence the total of items concerned in the first two years of life is 358. Examples of individual items at 10 months of age are:

Locomotor: Makes some progress forwards of backwards.
Personal/social: Pulls off hat.
Hearing and speech: Listens to stop watch.
Eye and hand: Dangles ring by string.
Performance: Rattles box.

This comprehensive developmental test takes well over one hour but does not include routine physical examination or antenatal, perinatal, or social history.

André-Thomas, Chesni, and Dargassie (1960) have described a well-recognized technique for the neurological examination of the infant which is

> 'conducted according to a segmental scheme with the infant supine, in a prone position, in a sitting position, in prone and supine suspension, in vertical position and finally in a suspended inverted position with the infant clasped by the legs. The infant's spontaneous motor activity and the postural behaviour and tone is observed as revealed by the responses to direct and indirect passive mobilisation of the various segments.'

The examination may take as much as an hour to complete.

Sheridan (1969*a*) has published a comprehensive table of milestones in the development of an infant by modifying some of the items from the

developmental testing scales used by Gesell (1925, 1938, and 1947), Stutsman (1931), Buhler and Hetzer (1935), and Cattell (1940). She states that these workers were chiefly interested in designing scales with which to establish norms and record a mathematical quotient of some kind. She herself has modified some of their norms and evolved a number of new tests. She has devised a profile under the four main headings of posture and large movement; vision and fine movements, hearing and speech; social behaviour and play; for example, at the age of 1 month:

Posture and large movements: Lies on back with head to one side; arm and legs on same side outstretched, or both arms flexed; knees apart, soles of feet turned inwards. Large jerky movements of limbs, arms more active than legs.

Vision and fine movements: Turns head and eyes towards light. Stares expressionlessly at brightness of window or blank wall. Follows pencil flashlamp briefly with eyes at one foot.

Hearing and speech: Startled by sudden loud noises, stiffens, quivers, blinks, screws eyes up, extends limbs, fans out fingers and toes, and may cry. Movements momentarily 'frozen', when small bell rung gently 3-5 in from ear for 3-5 sec with 5-sec pauses: may move eyes towards sound.

Social behaviour and play: Sucks well. Sleeps most of the time when not being fed or handled. Expression still vague, but becoming more alert, progressing to smiling at about 5-6 weeks.

This also is a comprehensive description of developmental sequence of an infant, but again does not include routine physical examination or perinatal, antenatal, and social history.

Chapter 3

The preparatory stage

A profile of resources and need

The preschool child population of the County of Derbyshire numbers 48,000 (excluding children in the Borough of Chesterfield, which has delegated authority for the provision of local health authority services). In the past the surveillance of the infant population has been undertaken by means of a network of infant welfare clinics held in twenty-five purpose-built clinics or health centres in main centres of population and in some seventy premises which were hired for the purpose. The object of these clinics was to provide a counselling service for mothers and to ascertain disabilities in infants which might require remedial attention or special educational provision.

The total number of clinic sessions held in 1969 was 3,960. Of these 1,176 or 30 per cent were attended by a doctor; the remainder were attended by health visitors.

If one doctor works 396 sessions per year then the number of doctors employed in giving the service was 1,176 ÷ 396 = 3 full-time equivalents. (Local authority medical officers have six weeks holiday and work on aver-

age of 440 sessions (half-days) a year. In making the calculations it was felt to be essential to allow a tolerance of one session a week free for training, study, and additional consultations in the clinic and the home arising out of greater demands for advice due to the generation of more surveillance activity.)

The following assumptions were made: that children would have four examinations in five years; that eight children would be seen by a doctor in one session; that there would be an 80 per cent response to appointments.

The following calculation was then made:

$$\frac{48{,}000 \times 80 \times 4}{8 \times 396 \times 100 \times 5} = 9{\cdot}8 \text{ doctors required.}$$

At this time the establishment in the health department was 23·5 doctors and there was 15·7 in post. Evidently it would be possible by recruitment within the establishment to operate a service using doctors. Investigation suggested that the locations of the main clinics were such that the bulk of the service could be provided at them but there would be problems in some rural and a few urban areas.

Given that the full-time equivalent of 9·8 doctors were required theoretically to do the work and that it would be done in the County Council's clinics, it was necessary to calculate what the requirements would be for the operation of a working system. An allowance would have to be made for the recall of children for additional examinations, over and above those in the primary programme of four examinations in five years. Experience would be the guide, but as a first approximation a 20 per cent increase in the number of examinations was assumed. Children would have to be seen of a particular age and clinics would have to be held even though the maximum number of children in the appropriate age-group did not require an appointment on the day the clinic was held. Some would fail to attend and the system would be unable to compensate fully for non-attendance.

All the purpose-built clinics were appropriate for developmental screening examinations but very few of the hired premises. In the event twenty-eight centres were selected for the clinical examinations.

Table 1 gives the estimates that were made for each clinic. The sessions in the second column are the theoretical minimum number necessary for the examination of all the children in a clinic catchment area reaching one of the key ages during one month. Calculations for each clinic were based on the birth statistics of the catchment area. The sessions in columns 3-6 are the predicted actual number of sessions necessary to ensure that children are seen at the precise key age. Thus, four sessions are necessary even where the total monthly requirements are only one, two, or three sessions, since children will reach the key ages at different times during the month.

If GPs came into the scheme some might wish to carry out the examinations in their own consulting rooms, many of which are eminently suitable. In a number of rural areas these would be the only appropriate facilities. This would remove the access problem for mothers, but probably tend to make the operation of the scheme less efficient in terms of medical time as

Table 1. Doctor requirements for the developmental paediatric screening programme.

Clinic code number	Sessions per month for one examination	Predicted actual sessions per month for 1st examination (6 weeks)	Predicted actual sessions per month for 1st and 2nd examinations (6 weeks, 10 months)	Predicted actual sessions per month for 1st, 2nd, and 3rd examinations (6 weeks, 10 months, and 2 years)	Predicted actual sessions for all four examinations
01	4	4	8	12	16
02	3	4	6	9	12
03	1	4	4	4	4
04	2	4	4	6	8
05	4	4	8	12	16
06	1	4	4	4	4
07	4	4	8	12	16
08	1	4	4	4	4
09	2	4	4	6	8
10	7	7	14	21	28
11	7	7	14	21	28
12	1	4	4	4	4
13	8	8	16	24	32
14	8	8	16	24	32
15	5	5	10	15	20
16	4	4	8	12	16
17	3	4	6	9	12
18	8	8	16	24	32
19	5	5	10	15	20
20	3	4	6	9	12
21	4	4	8	12	16
22	2	4	4	6	8
23	5	5	10	15	20
24	4	4	8	12	16
25	2	4	4	6	8
26	3	4	6	9	12
27	5	5	10	15	20
28	2	4	4	6	8
Total sessions	108	134	224	328	432
Full-time doctors required		4.1	6.9	9.9	13.1

less than eight children might be available for each session. Again, only experience would show what the effect of operating more screening centres would be. Because of the method of implementation the scheme would operate least efficiently when only examinations at 6 weeks were being carried out, but would become more efficient when the 10-month, 2-year and 4½-year examinations were introduced, because of the increased number of children in each clinic catchment area on which to draw for each session.

To operate the full scheme in the administrative county of Derbyshire, excluding Chesterfield, 13·1 doctors would be needed, an increase of 3·3 over the initial theoretical calculation of 9·8 full time equivalents. The population of this area (mid 1971) was 595,670. The comparable figure for all England and Wales was 48,815,000. The requirement for the whole country would be

$$\frac{48{,}815{,}000 \times 13{\cdot}1}{595{,}670} = 1{,}074 \text{ full-time equivalent doctors}$$

If the work were split equally, as in Derbyshire, between GPs and departmental medical officers, 537 of each would be required. There were 22,091 general medical practitioners in England and Wales in 1971. Thus to provide half of a developmental paediatrics service 2·4 per cent of their time would be needed. There were 2,415 doctors employed by local and school health authorities in 1971. Assuming that on average 4 doctors in each of the 174 local health authorities are not engaged in clinical work, there remained 1,719 doctors available for all local and school health purposes. To provide the other half the service would require 31·2 per cent of their time.

Finance

The county health department was already committed to operating some form of child health service. Therefore, it was more relevant to consider the additional costs incurred in introducing a developmental screening programme than to calculate the programme's total cost. This section analyses the marginal costs of the scheme.

There are six categories of cost incurred in the operation of a developmental paediatric screening programme:

1. Doctors' salaries and expenses.
2. Health visitors' salaries and expenses.
3. Equipping and running clinics.
4. Administrative staff salaries and office overheads.
5. Computer processing.
6. Stationery and postage.

For items 2 and 3 there is no true marginal cost. The time spent by health visitors attending developmental paediatric sessions is balanced by reductions of both infant welfare clinic sessions and home visits. No additional health visitors have been or will be employed because of the developmental paediatric screening programme.

Similarly, no new clinic premises have been specifically provided. A fuller utilization of existing county council premises is achieved. Since these premises are in any case open throughout the working day there is very little extra cost incurred by holding sessions in consulting rooms that would otherwise be unused at that time. To allow for any additional heating and lighting costs there may be, the salary costs of departmental medical officers have been calculated at the rate of £7.80 per session, although the actual average cost per session of a medical officer's salary and expenses is about 10 per cent less. General practitioners providing sessions for the county are paid £7.80 per session. Where they use their own premises they meet their own expenses.

The annual cost of the special equipment required for paediatric screening is negligible.

Cost categories 1 and 4 comprise both new costs and amounts redeployed from services supplanted by or absorbed into the new scheme. Thus although 5,184 sessions per year are required for the fully implemented programme, such a programme eliminates the need for doctors to attend infant welfare sessions. On average 1,225 sessions per year at infant welfare clinics were attended by departmental medical officers during the period 1967-71. Therefore the additional sessions needed for the developmental paediatric programme are 5,184 – 1,225 = 3,959.

The control section which administers the scheme is (1973) staffed by one officer on salary grade AP3 (£1,803-2,100), one on grade C2 (£1,311-1,530), and four on grade C1 (£597-1,203). However, two of the C1 grade staff are concerned wholly with immunization procedures, and the C2 officer previously operated the birth notification and statistics system which was absorbed into the information system now serving the developmental paediatric programme. Additions to the administrative staff amount to one grade AP3 officer, and two grade C1 staff.

Computer processing costs include charges for data preparation, computer running and a contribution toward recoupment of programming costs.

Table 2 shows the annual marginal costs of the programme. The total expenditure for local and school health purposes by Derbyshire County Council in 1971/2 was £1,851,782. The marginal cost of the developmental paediatrics scheme represents 2·8 per cent of this figure. The percentage for most counties would be less as of the forty-five English counties, Derbyshire ranks forty-fourth in its spending for these purposes. Average expenditure of English counties in 1971/2 was £3,202 per 1,000 population; the highest expenditure by a county was £4,087 per 1,000 population. Derbyshire spent £2,782 per 1,000 population.

Table 2. Annual marginal costs of the fully implemented system (in £1,000s). (Estimate at 1971/2 costs.)

Doctors' salaries and expenses	40·4
Administrative staff salaries and office overheads	4·7
Computer processing	5·5
Stationery and postage	2·0
Total	52·6

The marginal cost does not rise to its full amount in the first year of the programme's operation because of the gradual method of implementation. It is worth analysing the cost of running the six-week examination alone (as is the case for most of the first year) since performance figures are already available for this stage (Table 3).

Table 3. The annual marginal cost of examinations at six weeks only (in £1,000s) (1972/3).

Doctors' salaries and expenses (1,608 sessions – there is no reduction of IWC work at this stage)	12·5
Administrative staff salaries and office overheads (the number of staff required is not significantly affected by the number of examinations)	4·7
Computer processing (actual cost for one year – the major component of this (register maintenance) is not affected by the number of examinations)	4·7
Stationery and postage	1·2
Total	23·1

During the year mid-June 1972 to mid-June 1973, 8,568 infants became eligible for a six-week examination. Of these, 6,460 (75 per cent) were examined at least once. Some of them were recalled for extra examinations. The cost per child examined was

$$\frac{23{,}100}{6{,}460} = £3{\cdot}58$$

The unit costs of examinations will decline as the programme proceeds to fuller levels of implementation. Assuming that the same attendance rate is attained for the three later examinations as for the six-week, the marginal cost of a full course of examinations, including recalls, will be

$$\frac{43{,}100}{6{,}460} = £6{\cdot}67 \text{ per child}$$

Staff roles

In devising a community paediatric programme all three sectors of the health service have to be considered, not just the local health authority and its staff. The hospital paediatrician is becoming increasingly involved with chronic handicaps and their treatment. Many children with severe handicaps now have a greater chance of survival than they would have had ten years ago. For example, about 41 per cent of children born between 1959 and 1963 with spina bifida survived beyond the age of 7. Of these only 3 per cent have no handicap and 82 per cent have severe physical handicap (DHSS, 1973). In treating such cases and in the comprehensive assessment of all handicapped children the paediatrician has a vital role to play. Similarly the GP has become more intimately concerned with the management of children with handicapping conditions because of the increasing emphasis on domiciliary care and day attendance at schools and special schools.

Some authorities advocate the use of health visitors or other allied personnel for carrying out the examinations (Frankenburg and Dodds, 1967; O'Donovan and Moncrieff, 1967; Frankenburg, 1969; Ferrer, 1970; Frankenburg *et al.*, 1970; Belville and Green, 1972). Ferrer (1970) and Bryant *et al.* (1973) have carried out studies which suggest that screening can be effectively performed by health visitors. Apart from these works there is little evidence that effective screening can be undertaken by lay or paramedical professional workers. Gray (1972) suggests that ancillary staff can carry out screening tests with good reproducibility provided that they are regularly retained and supervised. However, he points out that there is a higher degree of concordance amongst more professional personnel. Sandler *et al.* (1970) used medical students to carry out screening examinations and in the London Borough of Westminster health visitors carry out an initial screening examination to decide which children should go forward for full screening by doctors (Paterson, 1972). Richards and Roberts (1967) have suggested that health visitors could carry out simple screening tests, but that only doctors could detect more subtle disabilities such as minimal cerebral damage, cerebral palsy, and some congenital malformations. However, most paediatricians agree that doctors with specific training in developmental paediatrics are the only people fully capable of carrying out developmental paediatric examinations (Sheridan, 1962, 1967*b*; Jepson, 1967; MacKeith, 1967; World Health Organization, 1967; Koupernick, 1968, 1969; Egan, Illingworth and MacKeith, 1971; Rogers, 1971). Sheridan (1969*a*) states that her developmental screening schedule is intended only for the use of doctors. She has also said that interpretation of apparently simple tests is sometimes very difficult and it requires a sound background of paediatric knowledge and the basic principles of child psychology (Sheridan, 1967*a*).

Both medical officers and health visitors were in short supply in the health department when the developmental screening programme was planned.

Considerable importance was attributed to the general medical appraisal and the counselling service which doctors could give mothers and which they would be likely to expect, because infant welfare services have always included a clinic doctor service. It was thought that general practitioners might be interested in developmental paediatrics and be prepared to do sessions and so contribute to the work of the medical staff of the department. Integration with medical practitioners for the provision of community services was desirable in view of the forthcoming reorganization of the health service. With respect to the health visitors it was thought that there might be advantage in encouraging their redeployment with greater emphasis on work with the elderly. In any event they would continue to contribute to the general surveillance system for children by undertaking specific screening tests and also by holding their own clinics, which would not be withdrawn.

Medical officers in local health authority departments acquire considerable expertise about handicapped children. Their knowledge and experience of physical and psychological disabilities and of the educational and social problems to which these give rise, is a skill of a very special kind. They have

a close knowledge of the provision made by the local authorities for such children and are able to give realistic prognoses of value to parents, teachers, social workers, and to administrators concerned with policy. It was felt to be important that these skills should not be diluted but rather developed, in any new arrangements.

It was therefore decided to use doctors to carry out the developmental screening examinations. Probably a two-tier system was desirable. The screening clinics would identify children who required a more detailed examination, or about whom specialist advice would be essential. Some would need to see a consultant paediatrician or visit a hospital assessment centre. A larger number would require advice from doctors in the community service. It was decided to appoint four senior medical officers, chiefly by promotion within the department, to participate in multidisciplinary assessment sessions intermediate between the basic screening clinics and the hospital consultant sessions (Younghusband *et al.*, 1971). Certain of the department's full-time medical staff possessed substantial experience in this field and they could easily be given further advanced training at university centres. Each would work in an office adjacent to that of an area nursing officer (who is responsible for health visiting at the local level). Together these two would provide a local advisory centre for both preschool and schoolchildren.

Staff recruitment and redeployment

Fifteen whole-time equivalent doctors in post in 1971 were represented by 24 individuals. Of these 12 were given the initial course of training. With such a corps it was thought that the scheme would not founder if recruitment proved difficult. This was not the case and by 1973 the full time equivalent of 28 staff were in post (the establishment having been increased by 4·5 doctors meanwhile).

General practitioners were recruited to work part-time and a target was set at 30 doctors, each undertaking one session a week (the equivalent of 3 full-time medical staff). In July 1972 a letter was sent to each Derbyshire GP inviting him to participate in the developmental paediatric screening service, to undertake up to one or two sessions a week. It was stated in the letter that each participating doctor would be required to attend training sessions for instruction by a consultant.

By September 1972 50 doctors had indicated their interest and it became evident that about half the work (equivalent to the work of 6 or 7 full-time medical staff) would eventually be done by GPs. By June 1973 89 doctors drawn from 54 practices had asked to join the scheme to work, on average, two sessions a month.

General practitioners may elect to see infants in clinics or in their own surgeries (provided they are adequate for the purpose). In the former circumstance they may see other doctors' patients (the local medical committee debated and agreed to this) but in their own surgeries the computer restricts appointments to infants in their own practice. Of the 41 practices so far included, 29 are conducting sessions in their own surgeries. In organizational terms, this means that the accessibility of the clinics to patients is

greatly enhanced, particularly in rural areas where the surgery accommodation (often purpose built) is all that is available. The number of locations at which screening examinations are being carried out doubled in the first year of operation.

The health visitors had a major responsibility for maintaining the network of infant welfare clinics, for which there was and is a strong demand. A common arrangement was for a clinic to be held weekly, a member of the medical staff attending one week in two, or one week in four. Obviously such a service could not be just withdrawn, certainly not abruptly. This would have been undesirable because the clinics did represent a surveillance system and there would be a substantial transitional period before the new screening system would include all preschool children; it was decided therefore, steadily to reduce the number of clinics which doctors would attend, the health visitors' clinics continuing as a lower tier service. Initially it was thought that the paediatric screening sessions might frequently be held at the same time as the health visitors' infant welfare clinics so that a doctor would be on the premises and available for referral of a case by a health visitor if that was required. In the event the two clinics are usually held separately and there have been no problems.

Training

It is important that all screening personnel should receive thorough training in the practice and interpretation of developmental examinations. Rogers (1971) stresses the need for this when he says that a developmental approach to child health requires an orientation other than the traditional one of the doctor to the sick patient. Sheridan (1967*a*, 1969*a*) states that all children's doctors should be trained to recognize 'the early signs of deviation' from normal developmental progress and Holt (1971) has also stressed the need for training of screening personnel. Courses of training are given at many centres and their work has recently been reviewed (Rosenbloom, 1972).

The training scheme in Derbyshire was designed in collaboration with Dr Arthur, and incorporated the following principles:

1. Great emphasis would be put on in-service training.

2. No doctor should participate in the screening programme unless he had been to the in-service training course.

3. Teaching would be in accordance with a standard course given in the context of the screening programme. Initially it would consist of six sessions, each of which would be devoted about equally to instruction in developmental screening tests and to general clinical paediatrics. All teaching would be centred round infants in the clinical situation. One session would include instruction on the general administrative arrangements of the scheme, together with information about provisions for handicapped children. Two or three students would attend each session and the sessions would extend over a period of three weeks.

4. Most important, when all participating doctors have completed their

initial training a subsequent training course of a more advanced nature would be arranged. The organization would be such that, from time to time, doctors would attend a series of training sessions instead of screening sessions.

5. Senior medical officers would be encouraged to go on extensive training courses at university centres.

6. Regular seminars would be given at which visiting speakers would give their views on child health services and participating Derbyshire doctors could discuss the subject with them and among themselves.

Twelve departmental medical staff attended the training course between January and June 1972. The GPs' courses commenced in October 1972. Two consultants, Dr Arthur and Dr M. W. Moncrieff, consultant paediatrician, Derby Children's Hospital, participated and one of us (K.C.) also gave a training session. Four GPs each attended seven sessions in a four-week course, with one or two doctors being present at each training session. By June 1973, thirty GPs had completed the course.

The large number of GPs wishing to join the scheme meant that some would have to wait a considerable time until there was a vacancy on the training course. A two-tier training system was therefore introduced in March 1973. Three of the senior medical officers gave primary courses of three sessions at a county council screening clinic, after which the GPs were invited to conduct screening sessions. A total of fifty-two GPs and seven new departmental staff completed these primary courses by September 1973, when they were withdrawn. When a vacancy for the consultants course becomes available, the doctors will be invited to attend training sessions instead of, or as well as, their screening sessions. Arrangements have been made for a few general practitioners some distance from Derby to attend hospital courses in Worksop or Manchester. All participating GPs will have completed a hospital course by the end of 1974 and it will then be possible to commence more advanced training.

Phasing

Considerable thought was devoted to the possible methods of introducing the service. A variety of options were available:

1. All children under 5 years old in the county could be included in the scheme as soon as it was introduced. They would receive their first examination as soon as they reached one of the key ages.

2. At first the scheme could be introduced into one pilot area of the county only. All the under-5s in this area would be included. The scheme could then gradually take in other areas of the county until all under-5s were being seen.

3. The scheme could be introduced over the whole of the county, but initially only a proportion of the under-5s (for example, under 2 years old) would be included. The scheme could then gradually expand to take in all under-5s.

4. The scheme could be introduced over the whole county but include only children born after a specified date (preferably the date on which the

scheme is introduced). In this way the old system would be phased out as the new system was phased in.

5. The scheme could be as in 4, but starting in a pilot area and gradually expanding to include the whole county.

Options 1, 2, and 3 would be the most difficult to implement, since there would be a tremendous amount of work involved in compiling a computer register of all under fives from the clerical records available in the county. Options 2 and 3 would spread this work over a longer period of time, but would not obviate the need for it. Options 4 and 5 would avoid this problem completely, since only new births would be included, and these could easily be notified to the county Medical Officer of Health in a form suitable for the creation of a computer register with little extra work. After consideration it was decided that if the scheme was introduced in this way it would be most satisfactory to make it county-wide from the start. The introduction would be a gradual process and so there would be no good reason for restricting the speed of its implementation by initially limiting it to a pilot area.

The essentials of the proposed scheme may now be summarized as follows. An appointment would be sent to every Derbyshire child for four examinations during the first five years of life. Developmental paediatric techniques would be employed but the content of the examinations not restricted to a battery of screening tests. It would include both the general appraisal of the child, comprising educational and social as well as medical factors, and a counselling service for parents. The computer would be employed as the organizing tool of the programme; to schedule appointments and maintain records.

Chapter 4

The operating system

The operation of a developmental paediatric programme relies upon matching each child with a trained doctor at a convenient clinic at the right time for that child. The matching operation is centrally controlled. Control can only be exercised if the controllers have information about the children, the doctors and the premises.

Elements of the system

For every child included in the scheme the following information is required:

1. Full names.
2. Full postal address.
3. Whether his mother wishes him to have developmental paediatric examinations, and if so at which clinic.
4. Date of birth.
5. Dates and results of previous examination appointments.

To provide this information a register of all those children in Derbyshire born since the commencement of the developmental paediatric programme

has been created. The register is held on magnetic disc packs and is accessed by programs run on the County Council's IBM 370/145 computer.

The initial identifying data needed to create a new record for each child is obtained at the time of the child's birth. It is a statutory requirement that all births within a county must be notified to the county Medical Officer of Health by qualified informants. Neighbouring local health authorities forward notifications of births to the Derbyshire health department when births to Derbyshire-resident mothers occur in their areas. County midwives, maternity homes, and hospitals within the county, and neighbouring local health authorities, are provided with forms on which births are notified. The forms are four-part sets and are serially numbered. The number on the form selected to notify the birth of a child identifies that child uniquely within the system. The four parts of the form are:

1. Birth notification form.
2. Health visitor's first visit report.
3. Parents' consent form.
4. Notification of discharge (from the care of the hospital or domiciliary midwife).

The serial number appears on every part of the form.

A section of each form in the four-part set is carbon-backed. Thus when the surname and address of a child are entered on the birth notification form at the time of birth, they automatically appear on the other three forms in the set. The identity data is then securely associated with the child's unique reference number.

At the time of birth only the birth notification form is completed. This alone provides nearly all the information required to schedule appointments for the child. Within thirty-six hours of birth the top three forms are despatched to the health department. The midwife retains the notification of discharge form until the child is discharged from her care.

At the health department information from the birth notification form is fed into the computer, creating a new record in the register of children. The form is then affixed to a child record book, initiating the individual child's clerical record which is sent, together with the second and third forms from the notification set, to the health visitor who will be responsible for the child. The first visit report and the parents' consent form are completed on her first visit to the child and are then returned to the health department. The parents' consent form contains the remaining items of information necessary to schedule appointments for the child (agreement to attend for examinations, and choice of a convenient clinic). The information is used by the computer to amplify the record in the register. Subsequently the forms are sent back to the health visitor who fixes them into the child record book. Similarly, the notification of discharge form passes through the health department where information is extracted from it for the register, before going to the health visitor for inclusion in the child record book.

A child record book is the only clerical record kept for a normal child. The book was specifically designed to be introduced at the same time as

the developmental paediatric system, to replace all the forms of records previously kept. Its purpose is to reduce clerical recording to the minimum. The same forms which create a record in the computer register become part of the child record book, eliminating the need for the health visitor to write in the identity and birth information. The child record books are always available at clinics and notes may be made in them by doctors or health visitors at any time when they see or examine children.

Thus each child has a clerical record which accompanies him in the field and a centralised computer record which consists of personal and coded medical, social, and demographic data and details of responses to clinical examinations. It was considered impractical to include detailed clinical narrative in the computer record. The information system therefore has two complementary parts, one clerical, held peripherally, open-ended and non-schematic in format, the other computerized, held centrally, brief and schematic in format.

The computer record for each child is held in a hierarchy of data sets. The basic information which is particular to any one child, and which is supplied at the child's birth, is held in the master data set. Included in this basic information are codes, for example, for the child's GP and chosen developmental paediatric clinic. Libraries which amplify these codes are held as subsidiary data sets which can be accessed by relative record addressing or index-sequential methods, using the codes as keys, to provide a full description on printed output. Events which occur during a child's life, such as a developmental examination or an immunisation, are recorded in further subsidiary data sets, and linkage to these is provided in the basic record.

A control section (with a staff of one administrator and five clerks) is responsible for the register of children and for all the scheduling procedures which use it. Much of the information on the four initiating documents has to be coded by the control section before it is fed into the computer. A great number of other input documents are available to the control section and are used to keep the register records up to date. In particular it is necessary to track migration of children within the county and across its boundaries. By providing a dense pattern of services for children during their first two years of life absences will quickly be noticed through lack of response to appointments. Children moving into an area are noticed by health visitors (who are all attached to GPs). Regular contact between health visitors and the control section ensures that the latter is kept informed of movements of children and the computer register is kept up-to-date.

The computer system is run daily to add new records to the register and to update existing ones. It also performs whatever additional functions the control section requests. These may be connected with the scheduling of appointments or with the maintenance of the library data sets. All output from the computer is monitored and routed to its ultimate destination by the control section.

A weekly cycle is followed by the control section to arrange appoint-

ments for developmental paediatric screening three weeks in advance. The cycle has the following stages:

1. Estimation of the number of sessions needed at each clinic.
2. Matching doctors to clinic sessions.
3. Priming (notifying the computer of the details of) those clinics where sessions can be provided.
4. Matching children against available sessions and making appointments.

In general a standard pattern of clinic sessions is provided throughout the county to meet the forecast requirements. The forecasts were made before the implementation of the system, and were based on the number of births in the different parishes of the county. The standard pattern is changed from time to time as experience leads to revision of the forecasts. However, from week to week there are fluctuations in demand, and these are monitored in order to optimize the deployment of doctors at clinics. Therefore once a week a suite of programs is run to calculate, from the information in the register, the number of children who will actually require an appointment in the week concerned. Where the number differs from the long-term forecast, extra sessions can be provided, or planned sessions may be cancelled.

Before clinics can be primed for appointments to be made at them the control section must ensure that a doctor will be available. Up-to-date information on the availability of clinics and doctors is required, and the programming of doctors is an essential component of the system. This has made it necessary to reorganize the workloads of the department's medical officers and has involved some redeployment of staff.

That section of the information system concerned with doctors and clinics deals with a relatively small number of individual items (approximately thirty clinics and twenty doctors). It has not been automated, and the matching of doctors to clinics is a clerical operation. For clinic sessions within the standard pattern a doctor will normally be available as part of his regular programme. It is the duty of the control section to make sure that holidays, etc., are covered and to find doctors to take any extra sessions which may be necessary.

Most of the information required to schedule appointments at a clinic is stored in the register. Before this information can be used the control section must prime the clinics at which they wish to hold sessions by notifying the computer of the times and days of the week on which the sessions are to take place. From this information, expanded by using information from the library of clinics data set, a list of clinic sessions primed for appointments is produced. This list is checked by the control section before any appointments are made.

A suite of computer programs searches the register for those children who are due for an examination either because they have reached one of the prescribed ages or because the interval elapsed since their previous examinations matches the required recall period specified by the doctor at that earlier examination. The list of selected children is matched against the list of primed clinics. In so far as there is time available at the clinic each child will be

given a timed appointment to attend at the clinic selected by his mother as most convenient. The system attempts to obtain eight attendances at each full clinic session. If shorter sessions are requested the programs automatically adjust the number of children to be seen. Further adjustments to the number of children given appointments are made to allow for the different response rates at each clinic. The system automatically monitors the attendance rate at each clinic and uses this rate to calculate how many children must be given appointments to obtain the desired number of attendances.

Those children who cannot be given an appointment because there are insufficient sessions available, are allocated first priority for appointments in the next cycle of scheduling.

For every child for whom an appointment can be made, a postcard is printed by the computer, telling his parents the time and place at which the developmental paediatric examination will take place. For every health visitor a list is printed of the children for whom she is responsible and who are to be examined during the week concerned. The health visitors can then inform the control section of any anomaly before the appointment postcards are sent out and can also ensure that the child record books are available to the doctors carrying out the examinations. Also health visitors may wish to be present at the clinic where the examinations are to take place.

For every child for whom an appointment is made an examination form is produced by the computer. This the doctor has before him (Fig. 1), together with the child record book, when he examines the child. The form provides a checklist of all the tests to be carried out, and the doctor indicates on the form whether the response to each test is satisfactory or unsatisfactory. A further section of the form is used to record measurement of weight, height, and head circumference. The doctor also records his over-all assessment of the child and a summary of his recommendations.

The objective of the system is to separate out the 'abnormal' children, while leaving the remainder to be recycled for examination at the next prescribed age for assessment. Inevitably there are children about whom clinicians are unable to make up their minds. There is therefore the facility to recall these children for extra examinations. The period of recall is indicated by the doctor on the examination form. Clinical commentary may be written at length in the child record book which will be produced again at the subsequent examination.

The completed examination forms are all submitted to the computer and the results are stored in a new section of the child record created on the subsidiary event data set devoted to developmental paediatric examinations. Every examination causes a further 25 characters of information to be added to the basic 250-character record.

If a child fails to attend for an examination, the doctor records this on the examination form, together with a note of whether a reason for non-attendance is known. The computer will automatically make a repeat appointment during a subsequent scheduling cycle, except that after three consecutive non-attendances without excuse no further appointments will

be made, but a notification for the health visitor to visit the child will be printed.

The further treatment of children in whom a definite handicap is detected is handled outside the basic developmental paediatric screening system, as is their information requirement. Full case-files are created and handled clerically. However, a coded description of the handicap is included in the computer record, and the child will continue to be screened at the prescribed ages so that possible additional problems are not overlooked.

As a further feature of the system the computer is used to produce test forms (which also act as reminders) which are completed by health visitors when they carry out hearing tests. The test results are stored in the child's computer record.

A population register and scheduling system such as this clearly has uses beyond developmental paediatrics. The operating system was therefore designed so that it could be used to operate other similar programmes.

From the outset it was decided that the immunization of the children would be controlled in this way, and immunization appointments are now run in parallel with those for developmental screening.

Computer programming

Fig. 2 shows the network which was drawn up and approved in February 1971 for the specification and programming of the information system required to service the developmental paediatrics and other child health services.

Initially 62 programs were required, to operate (when augmented by numerous sort and copy utility programs) in 20 different semi-independent subsystems. Over thirteen months these programs were written and tested, requiring the full-time equivalent of 1·5 systems analyst/programmers.

Programs were all written in PL/I high level programming language to run under the control of IBM's DOS operating system on an IBM 360/30 computer, although provision was made for the programs to run under the more powerful OS operating system which would become available when the 360/30 was replaced by the present machine, an IBM 370/145, during the first year of operation.

Programme of work for development of a computer system for child health services

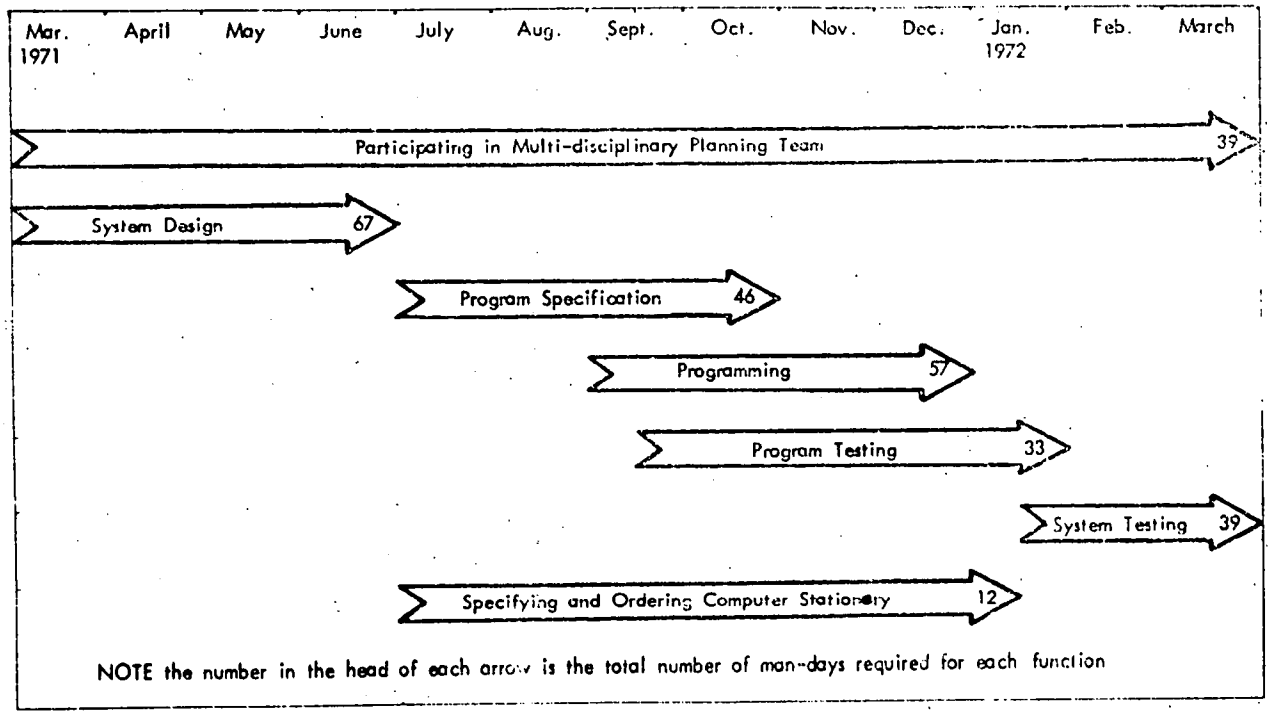

Figure 2

Chapter 5

Summary and prospects

The developmental paediatrics scheme provides a series of clinical screening examinations for all children born in Derbyshire on or after 1 April 1972. The aim is to diagnose and ascertain at an early age children with handicaps, both physical and mental. Computer techniques have been adopted for the management of the system. Summary records appropriate for management and research purposes are held centrally on the computer and detailed clinical records are held peripherally in the clinics.

An on-going in-service training scheme has been established at the Derby Children's Hospital in association with the consultant paediatricians, who act as tutors for the training of all the participating doctors and are responsible for all the technical aspects of the clinical content of the scheme. The doctors are both departmental medical officers and now some ninety participating general practitioners (paid sessionally). They attend the Children's Hospital in groups of three for clinical sessions, ward rounds, and formal clinic tuition, and it is intended that the training sessions will continue indefinitely. Supplementary training will include postgraduate courses at university centres, together with seminars which will be held once or twice each year and which will provide a forum for all the clinicians (together with, from time to time, invited teachers, educational psychologists, social workers, and the education department's administrators) to exchange ideas and suggest changes in the scheme.

The design of surveillance programmes

The analysis of priorities and methodology, the creation of a profile of need and resources and the design of a system and an operating procedure were dependent on the work of a 'house' R & D unit created within the staff of Derbyshire County Health Department. Without the existence of this unit, it would not have been possible to design and implement this developmental paediatric scheme. The unit was conceived as being concerned primarily with 'information engineering systems', not with 'intelligence systems' (Knox, Morris, Holland, 1972).

Such a unit may have two functions, research and scientific management, the relationship of which will vary depending on the nature of a project. The two functions may be complementary, and equally important; a programme which provides services for a particular population may at the same time contain a research element which is concerned, for example, to analyse groups of findings or validate particular diagnostic tests. Other projects may be restricted to problems of management, for example, redeployment of staff. Alternatively, research may be the sole or main object of an exercise. The validation of diagnostic tests, for example, may require their application in quite a different way from their use in a service context.

It is essential, if design and implementation are to cohere in the planning process, that the R & D team should not be alienated from the management

of the services with which it is concerned. The planner inside a system is in possession of the power to change it. He may apply his scientific skills directly by manipulating the controls of its organization. The planner outside the systems he is studying relies upon a different power to change things. He observes the processes of the health service, constructs models, and evolves formulae to estimate the effects of changes. He depends on theory and theoretical demonstration to motivate the managers of a system to alter it. In any social organization the desirable ratio between insiders and outsiders is constantly changing and for continued vitality it is necessary to avoid disequilibrium between them. Hitherto insufficient provision has been made for the former and a prime object of reorganization must surely be to redress the balance. For this the greater involvement of clinicians in the management process and the introduction of the community physician, important though these innovations are, will be inadequate. Managers who are scientists are required to design systems in which it is possible to measure benefit and so make a scientific case for changes in resource allocation. Therefore qualification for entry into the scientific management of the NHS should be the PhD or its equivalent, not just the MFCM. There is a clear analogy with scientists in the hospital service, in academic departments of social medicine and on the scientific staff of the MRC. Secretariat and hotel management functions are quite different from scientific planning of health care systems and the term administration should not include scientific work in social medicine and the operation of the health services, whether institutional or community.

It is therefore imperative not only that clinicians should facilitate research in health care systems by providing access to the services they control and by co-operating in experiments in their organization, but also that the interests of medical research, whether clinical, laboratory, or epidemiological, should be identified with those of scientific management. Otherwise the findings of the most carefully conducted randomized controlled trials may be adopted only very slowly by clinicians and undue emphasis put on the organization and delivery of services by managers: on resource planning at the expense of outcome planning. Identification of interest is however unlikely to be achieved unless scientists with the required skills (as distinct from administrators) are admitted *inside* the planning process. A relationship will have to be worked out, it is suggested, between design staff and health care planning teams, because systems cannot be designed in committee any more than research can be conducted in committee. Also, with respect to community health programmes, though academic departments will no doubt initiate many new developments, experience with computing packages should preclude facile assumptions about the transplantation of systems of organization. Every district will need to have access to the services of scientific design staff in the same way as they have those of both medically and non-medically qualified laboratory scientists.

Future development of community health programmes

A population may be represented as a spectrum composed of individuals who are (*a*) healthy, (*b*) healthy but at risk, (*c*) have presymptomatic disease, (*d*) have disease which is manifest but not receiving treatment, and (*e*) are known to be ill and are receiving treatment. Community health systems may be concerned with prevention, screening, or care of one or more of these categories; preventive programmes chiefly perhaps with the first, screening systems with the second and third and care systems with the fourth and fifth. In practice programmes may adopt all three approaches and have several objectives and target populations. It is argued here that the point of departure in the planning of community health systems for whole populations should be the provision of an integrated suite of programmes in accordance with the resources that are available to undertake them. The hypothesis which motivates community health programmes is that recognition of a disease or potential disease makes it possible to prevent the development of the disease process, delay it, arrest it altogether, or prevent exacerbations or complications. There are two basic issues, the validation of the techniques employed, which is fundamental and applies equally to diagnostic tests and to methods of treatment or care (and which is not the primary concern here) and the organizational problem of achieving by the application of such techniques results which are of epidemiological value. In screening systems to identify a single morbid condition the design of the programme is likely to be governed by the findings which established the validity of the appropriate special case of the general hypothesis. Sometimes the organizational problem may have to be solved before the validity of the programme can be determined. The restructuring of existing surveillance systems may have to be a compromise between the requirements of existing services, the techniques they employ, and conditions that have to be fulfilled to demonstrate the value of alternative methods which are new.

Thus the paediatric screening system will serve a hierarchy of objectives. These may be represented as follows:

1. To obtain greater benefit from care of handicapped children.

↑*A*

2. Detect and identify handicaps at earlier ages.

↑*B*

3. Increase the proportion of children screened for signs of handicap.

Ultimately the effectiveness of the programme must be evaluated in terms of its highest objective. Monitoring care outcomes (if that should prove to be possible) will not measure the contribution of the screening programme to any observed improvement in child health. During the inevitably long period of evaluation many other factors affecting the success of care will change. Therefore, in practice, evaluation must proceed from the bottom up by measuring the effectiveness of the programme in achieving its lower objectives, and verifying the assumed links between objectives.

The assumed links, represented by the arrows *A* and *B* on the hierarchical model, are:

A. That early detection and identification of handicaps does improve the measure of success achieved in caring for them.

B. That screening for handicaps does lower the age at which they are detected.

Special studies are required to test these hypotheses and contributions towards them will be made by the information which is produced by the screening system. The intention of the Derbyshire scheme is to facilitate such trails by providing a framework for them rather than to provide the answers itself, though consideration has been given to designing studies of hypothesis *B.* Comparisons will be possible of ages at which handicaps are detected now with the ages at which they were detected before the screening programme was introduced. It should also be possible to compare detection ages in Derbyshire with those in counties with other types of child health service.

It is difficult to obtain a true control population for the system as a whole because the screening programme is being introduced throughout the administrative county. The number of children being screened is closely monitored but there are difficulties in comparing this number with the number surveyed for handicaps by a non-systematic service. First, there is difficulty in deciding to what extent a contact between a doctor and an infant in an unstructured service constitutes a screening examination. Secondly, even if it is assumed that the contacts are equivalent, there are difficulties which arise because the recording methods which serve unstructured and non-standard examination procedures are themselves likely to be non-structured and unsystematic. This problem certainly arises in any attempt to compare present and past performance of the infant health services in Derbyshire.

The efficiency of the system in its use of resources will be assessed in relation both to numbers of children screened and to numbers of handicaps detected, to provide a basis for comparison with other services and with future variations introduced into the Derbyshire service. Another aspect of efficiency relates to the structure of each of the examinations. Reference has been made to the constellations of test results which are needed to detect developmental delays. In addition to testing the validity of each constellation as a true early indicator of handicap, it is necessary to consider which of the tests within the constellation are independent sources of information. Where a clear relationship between tests can be shown it will be possible to eliminate items from the examination list and thereby streamline the system. Test results must be continually reviewed for evidence of correlations or relationships between them.

Many evaluation studies of importance to the system may be undertaken outside it, for example, the value of early detection for a particular handicap may be investigated in a department of paediatrics, or the handling and education of children with the handicap may be studied in an institute of education. The most important limitation of the developmental paediatric programme is that it aims to put the child in the right diagnostic box but

makes little contribution to what should be done about him when he is in the box. To do that requires the kind of clinical-educational research which has not been attempted in Derbyshire but which should be a natural concomitant of the scheme. What will be available as a result of the new recording methods is a body of information about the health of infants which will make it possible to monitor the service provided and future variations in it. Also, comparisons with other surveillance systems for different sections of the population will be facilitated, for the value of such a service can only be judged in relation to the value of its competitors for resources.

Resources

Is a developmental paediatric programme justified in terms of the resources it consumes? Is it too expensive of medical time? Should health visitors be employed for this work rather than doctors? Table 4 summarizes the requirements for doctors for four community preventive health programmes servicing children, the elderly and women in a population of a million. A population of one million is served by about 400 GPs and by some 450 community nurses. Perhaps 30 doctors are employed exclusively in full-time preventive clinical work. The calculations assume that each doctor and nurse works a 40-week year and 10-session week (session = ½ day), ie 400 sessions per annum. This is, of course, a low figure, particularly for the GPs.

Table 4. Requirements for medical time for four community health programmes servicing a population of one million.

Programme	*Patients*	*Response %*	*Tests PA*	*Nos./session*	*Sessions*	*W/T Drs*	*GP time %*
(*a*) Immunization	0·23m	100	0·73	50	3,358	8	2·0
(*b*) Geriatrics	0·11m	70	0·44	6	5,717	14·3	3·6
(*c*) Gynaecology	0·22m	70	0·20	20	1,540	4	1·0
(*d*) Paediatrics	0·08m	80	0·80	6	8,533	21·3	5·3
Totals	0·64m				19,148	47·6	11·9

In programme (*a*) the requirements are determined by the immunization schedule and by the response of the population. The latter is generally over 80 per cent. Neither deliberate limitation of the programme nor special provision for non-responders is required; the whole population of children is for practical purposes at equal risk and 80 per cent plus is an epidemiologically satisfactory response.

It is otherwise with the geriatric population (programme (*b*)). With present knowledge it is impossible to say whether individuals should be routinely examined and if so, how often; what the true morbidity indices are; whether, or to what degree intervention is likely to be helpful; what the response of the public is likely to be to a surveillance service; which medical and nursing personnel are most competent to provide it. The criteria adopted in designing a model programme must necessarily be arbitrary. Table 5 relates to provision in one possible scheme.

Table 5. A geriatric surveillance scheme for a population of one million.

Age	*Medical examinations*	*HV home assessments*
65	9,000	9,000
70	7,000	7,000
73	-	6,000
75+ (seen annually)	33,000	33,000
Total	49,000	55,000

The health visitors would visit the homes of all residents in the population at the stated intervals and medical examinations would take place in clinics. It is assumed that there will be a 70 per cent attendance at clinics and that six patients will be seen at each session. This means that 5,717 clinic sessions are required each year and the full-time equivalent of 14·3 doctors. There are 130 health visitors available and if each works 400 sessions per annum and visits every patient at a rate of four visits per session, then 26 per cent of the time of the health visitors would have to be devoted to this work.

Taking the four programmes together, as in Table 4, it will be seen that about half the population of one million are served by some 300,000 medical contacts each year. This would require 12 per cent of the time of the GPs at present employed in providing general medical services in the community. About a quarter of the time of health visitors would have to be devoted to the geriatric service alone, so that a major redeployment of their work would be required. Perhaps one-third of their time could be given to children, one-third to general attachment work on behalf of general medical practitioners, and one-third to a community geriatric service and this it would be practicable to bring about, though considerable retraining would be required. The contribution of doctors in preventive clinical medicine to primary screening would be inversely related to that made by GPs. It will be important for the former to specialize in the handling of some of the cases detected by community health programmes and to work closely with both hospital doctors and GPs in this connection.

The objection arises, of course, that in such general surveillance systems some patients will require additional examinations or visits because of the particular problems they have. The elementary mass of resources available to the community health services is, however, a fixed quantum and if it is found from practical experience that the higher age-groups require more resources because of the greater prevalence of morbidity among them, then younger age-groups must be given less; the epidemiological data will determine where the best investment can be made. Cervical cancer illustrates the importance of assessing the contribution of each section of the population to total morbidity or mortality when operating a screening programme. Table 6 gives the deaths from cervical cancer in different groups in the population (Registrar-General's sample census 1966) in England and Wales classified according to husband's occupation. These figures demonstrate that the importance of high (and low) risk groups within the general popula-

tion depends upon the contribution each makes to the total prevalence, not upon the prevalence within a particular group. Over half the deaths occur in social class III which usually has good response rates in screening programmes.

Table 6. Estimated deaths from cervical cancer in women over 20 years in England and Wales.

Social class	Class distribution %	No. of women over 20 years (millions) Married	Single	SMR Married	Single	No. of deaths Married	Single	Total deaths	Total deaths for all classes %	Death-rate per 100,000 Married	Single
I	4·4	0·6	0·1	64	40	69	2	71	2·8	11·5	2·0
II	10·8	1·4	0·3	75	61	191	10	291	4·0	13·6	3·0
III	55·3	7·3	1·7	98	87	1,298	81	1,379	55·1	17·7	5·0
IV	17·8	2·3	0·6	105	121	458	40	498	19·5	19·9	7·0
V	8·3	1·1	0·3	134	115	267	18	285	11·2	24·3	6·0
Forces, students and others	3·4	0·4	0·1								

A further objection is that no allowance has been made in Table 4 for treating non-responders. Special resources devoted to handling non-responders to community health programme have to come from the common pool and must be allocated according to the volume of morbidity the non-responding population represents and the effectiveness of the special measures adopted to capture it. For example, it was found in a cytology programme that for 8 visits to non-responders at home, only one accepted the test. This greatly increased the cost (£2.50) of the test for non-responders. For class V non-responders it was increased much more. This is prohibitively expensive of health visitor time and has to be judged against the modest contribution made by social class 5 to the total prevalence of cancer of the cervix, despite the high risk for each individual in this group in the population. While it may be sensible to exclude some members of the population from the programme, for example, women under 35, if the natural history of the disease suggests that they are not seriously at risk to the disease in question, the resources required to keep women at greatest risk under adequate surveillance may also be unduly excessive when the total yield of disease they represent is taken into account. There comes a point when the return per unit cost must be less than the return from effort in some other sector of the same or a parallel programme. The mere identification of high risk is inadequate; what is required is an assessment of the yet yield, optimised for investment, that can be obtained in practice by an organized approach to the population group in question.

The four programmes to which reference has been made are not exhaustive. Ten further screening programmes were critically reviewed in *Screening in Medical Care* (Nuffield Provincial Hospitals Trust, 1968). The resources required to operate new programmes will depend greatly upon the extent to which re-deployment is possible and the extent to which greater complexity

in the surveillance of the population is likely to lead to a greater intensity of examination of each contact rather than to an increased number of contacts. However, if growth in the whole community health sector is at the rate of 2 or 3 per cent per annum, new programmes (whatever their validity) will still be difficult to realize because of resource constraints. Two things may be expected to happen: they will be introduced nationally without adequate epidemiological investigation; they will be implemented sub-optimally, ie made available. As a consequence the enthusiasts, medical and lay, are likely soon to be at loggerheads with their critics over the allocation of new resources and so called 'political pressures' or the 'climate of opinion' will determine policy. It is an old story, familiar to everyone. Model operating systems are needed to enable the evidence to be acquired for appropriate population studies and the reorganization of the health service, to make every district responsible for a defined community, will make population studies far easier to carry out in future. Costs must be judged in terms of total expenditure on community health services. The resources required for screening programmes are not so very great in this context (see Table 7). Indeed the restructuring of the community health service should not be made dependent upon the acquisition of new monies; and the cost-benefit principle is really just a far more complex, sometimes intangible, embodyment of the same idea. Progress is far more likely to be made by manipulating the base expenditure, which is what the health authorities and their managers have the power to do. The first call on new monies in the community sphere should therefore be to pay for this.

Table 7. Local health authority and school health expenditure.

	£	
Total local health, 1971-2	130,587,000	(£2,675 per 1,000 population)
Total school health, 1971-2	34,363,000	(£704 per 1,000 population)
Total	164,950,000	(£3,379 per 1,000 population)
Local health expenditure includes:		
Health centres and clinics	13,915,000	(£3.55 per child under 5)
Midwifery	12,714,000	(£59.03 per confinement)
Health visiting	13,467,000	(£1.13 per visit)
Home nursing	24,050,000	(£0.81 per visit)
Ambulance	57,571,000	(£0.39 per vehicle/mile)
Chiropody	5,068,000	(£1.14 per treatment)
Family planning	617,000	(£12.64 per 1,000 population)
	127,402,000	
+ Family planning via voluntary agencies	917,000	(£18.79 per 1,000 population)
	128,319,000	

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CONGENITAL MALFORMATIONS IN DEVON THEIR INCIDENCE, AGE, AND PRIMARY SOURCE OF DETECTION

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Although a number of surveys reporting the incidence of congenital malformations have been published, there is little to be found in the literature about the age at which malformations are discovered, or by whom they are first detected. In this preliminary paper, we report and analyse our data on the age of detection and the primary source of detection of children with congenital malformations in the first five years of life. We believe that this is the first time that such information has been published in this country, and we hope that it will lead to an evaluation of the methods of detection which are used at present.

Definition of congenital malformations

There is no universally accepted definition of a congenital malformation, as reference to papers written by Richards and Lowe (1971); Elwood (1970); Leck, Record, McKeown, and Edwards (1968); Smithells (1968); Stevenson, Johnston, Stewart, and Golding (1966); and Ward and Irvine (1961) will show. We have included defects detected up until the age of 5 years, the vast majority of which were confirmed by a hospital consultant. Thus macroscopic, microscopic, and metabolic defects were included, as were tumours of known genetic origin. It will be seen from Table 1 that, as in all previous surveys, we have used our own classification of malformations, based on the *International Classification of Diseases.*

We have included inguinal and umbilical herniae, when surgery was undertaken; similarly hypospadias, hydrocoele, and syndactyly of the toes were included only where surgery had been performed, or was planned for the future. Talipes was included when treatment with plaster, or by physiotherapy lasting for at least one year, was required. Hip dysplasia treated by splinting was included in the figures for true dislocation of the hip. Naevi were counted only if referred to a consultant and found to be more than 1 in. in diameter. Finally, there was a group of 'undiagnosed but probable' heart malformations which were included as such, only if they were still

Table 1. Numbers of infants in single or multiple malformation groups for the period 1967-70 only and incidence rates of malformation groups (per 1,000 total births).

Malformation group	Alone		In association		Total			Percentage in association		Incidence of malformation group/1,000 total births	
	M	F	M	F	M	F	Total	M	F	Alone	Total
1. Anencephaly, iniencephaly	8	12	7	8	15	20	35	46·7	40·0	0·79	1·38
2. Meningocoele with/without hydrocephaly	13	11	19	22	32	33	65	59·4	66·7	0·94	2·56
3. All other CNS malformations	9	9	6	8	15	17	32	40·0	47·1	0·71	1·26
4. Eyes	13	11	4	3	17	14	31	23·5	21·4	0·94	1·22
5. Ear, face and neck	13	0	9	7	22	7	29	40·9	100·0	0·51	1·14
6. VSD	23	28	16	12	39	40	79	41·0	30·0	2·01	3·11
7. All other heart malformations and malformations of circulatory system	57	31	23	15	80	46	126	28·8	32·6	3·46	4·95
8. Cleft palate and/or lip	22	5	10	8	32	13	45	31·3	61·5	1·06	1·77
9. Pyloric stenosis	46	10	2	0	48	10	58	4·2	0·0	2·20	2·28
10. Inguinal hernia	117	12	17	1	134	13	147	12·7	7·7	5·07	5·78
11. All other gastro-intestinal malformations	18	20	19	11	37	31	68	51·4	35·5	1·49	2·67
12. Genito-urinary system malformations	26	3	22	12	48	15	63	45·8	80·0	1·14	2·48
13. Talipes	81	74	22	18	103	92	195	21·4	19·6	6·09	7·67
14. Congenital dislocation of hip and hip dyspasia	8	53	6	9	14	62	76	42·9	14·5	2·40	2·99
15. All other muscular-skeletal malformations	41	42	30	32	71	74	145	42·3	43·2	3·26	5·70
16. Skin	32	40	6	9	38	49	87	15·8	18·4	2·83	3·42
17. Mongolism	9	12	9	7	18	19	37	50·0	36·8	0·83	1·45
18. Glutenenteropathy	10	5	0	0	10	5	15	0·0	0·0	0·59	0·59
19. Endocrine and inherited metabolic malformations	16	8	1	5	17	13	30	5·9	38·5	0·94	1·18
20. Deafness	7	5	2	2	9	7	16	22·2	28·6	0·47	0·63
21. All other malformations	29	18	14	13	43	31	75*	32·6	41·9	1·85	2·95*
Total infants in single malformation groups	598	409	–	–	–	–	1,008*	–	–	39·64*	–
22. Infants classified by two or more malformation groups	–	–	98	79	–	–	177	–	–	6·96	–
Total number of infants	598	409	98	79	696	488	1,185*	–	–	46·59*	–

*Includes one infant of unknown sex.

under consultant supervision for at least one year after the initial ascertainment.

Certain handicaps which in some cases may be due to a malformation were not included. We refer specifically to defects of vision such as squints, refractive errors or astigmatism; 'isolated' speech defects, although clearly children with speech defects due to such structural malformations as cleft palate or due to deafness are included *per se*; the category covering mental retardation included only children who in association with their mental retardation showed anatomical abnormalities such as microcephaly, hydrocephaly, mongolism, or other chromosomal abnormalities.

Material

A prospective survey was started in March 1967 of infants and children born with congenital malformations as defined above. This has included all births in the five-year period from March 1967 to February 1972, the mothers being resident in Exeter and defined parts of the administrative area of the County of Devon, as shown in the map (Fig. 1). Account is taken of all malformations which come to medical attention in this cohort of children during their first five years of life.

Methods of ascertainment

The cases were ascertained from six sources.

1. Birth notifications and Notifications of Discharge forms. Any congenital malformations noted at, or soon after birth, were notified to the local authority by the attendant at birth and were collected weekly.
2. Hospital records. Paediatric in-patient and out-patient notifications referring to congenital malformations were received weekly. All orthopaedic and surgical in-patient records and orthopaedic out-patient records were seen weekly and the relevant cases abstracted. Malformations of the skin were ascertained from records kept by the dermatological department.
3. Stillbirth and death certificates were seen weekly and malformations ascertained both from the certificates and from examination of autopsy report when autopsies were performed.
4. Letters sent to the local authorities, concerning children who were born in the area but referred or admitted to hospitals outside the area, were seen weekly.
5. Local health authority records of handicapped children provided information regarding children with malformations especially of vision and hearing.
6. A small number of cases were ascertained by direct notification from GPs.

Verification of cases ascertained

As we had decided that congenital defects should be verified by a hospital consultant before being included in the survey, hospital records were examined soon after notification. A few cases were included, however, despite the fact that they had not been seen by a consultant for one of the

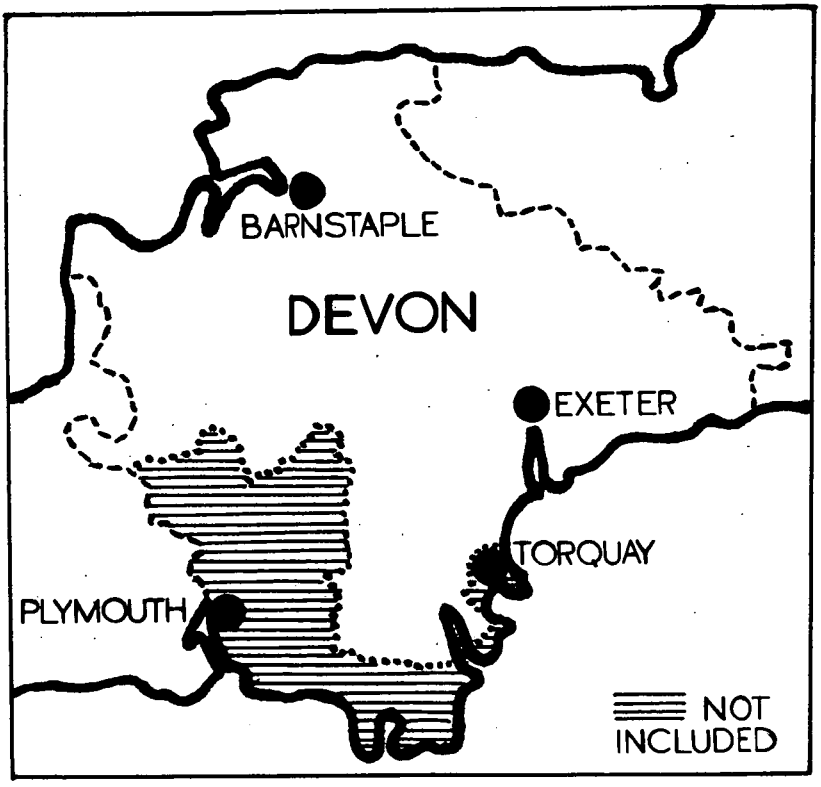

Figure 1

following reasons. First, if the child had died within a short time of birth; secondly, if treatment such as removal of extra digits or accessory auricles had been undertaken before the child left the maternity unit; and thirdly if a decision was made by the GP to defer referral until the child was older.

A follow-up examination of the records of each was made one year after the first notification of a malformation. This allowed time for the further confirmation of the first malformation and for the detection during that year of any other malformations occurring in the same child. To maintain a standard of uniformity, all ascertainment had been done and all records seen by one examiner (M. V.) with the assistance of the consultant concerned where there has been any doubt as to the precise diagnosis.

A number of cases (114 during 1967-70) were removed from the survey at follow-up because investigations during the intervening year had not confirmed an initial presumptive diagnosis of a congenital abnormality.

Results

Although by definition congenital malformations, or factors predisposing to their development, are present at birth, some may not be detected for weeks, months, or even years after the birth of the child.

This paper has been mainly restricted to information concerning malformed infants and children born between March 1967 and December 1970 inclusive, the total birth population for this period numbering 25,432, as data for the remaining years is incomplete at present. It is estimated that a further 2 per cent, 10 per cent, and 25 per cent of children with malformations born in 1969, 1970, and 1971 respectively will be identified during the next two years.

Furthermore we have restricted our results to data concerning congenital malformations detected and confirmed in the preschool (0-5) years. When we report the findings of the complete survey period, March 1967 to February 1972 inclusive, we shall include those children with malformations detected not only by sources 2-6 already described under 'Methods of Ascertainment', but also those detected by the first school medical examination.

Table 2 shows the number of still and live births in the defined clinical area, together with the number of infants and children so far found to have malformations in the first five years of life, during the study period March 1967 to February 1972. The live births with malformations are further subdivided to indicate whether or not they were referred or admitted to hospital.

Incidence of malformations

During the period under discussion in this paper (March 1967 to December 1970 inclusive), ascertainment continuing up until December 1973 has shown that 1,185 infants and children born with congenital malformations have been identified, giving an over-all rate of 46·6 per 1,000 total live and still-births. This figure probably slightly underestimates the final incidence rate for this period, because a few more children born in this period may yet be detected.

Table 2. Numbers of live, still-born, and malformed infants in the Exeter area.

Year of birth	No. of births in Exeter area Still-births	Live-births	No. of malformed infants Still-births	Live births Referred/ admitted to hospital for mal-formation	Not referred or admitted to hospital for malformation
1967*	72	5,559	6	275	8
1968	77	6,695	11	255	10
1969	85	6,422	19	272	11
1970	71	6,451	18	289	11
1971	86	6,400	17	212	12
1972*	6	808	1	36	0

*In this table and Tables 4 and 5 all figures for 1967 correspond to the period March-December inclusive, and those for 1972 refer to January-February only.

If inguinal herniae, which appear to be included in our survey only, were excluded, the over-all incidence rate would drop to 41·5 per 1,000 births. On the other hand, if we had included the 127 cases of talipes treated by short-term physiotherapy only, then the over-all incidence would be increased to 51·6 per 1,000 births.

All the malformed infants and children have been classified into 22 major groups, Table 1, columns 2 and 3. Of these 1,185 cases 85·1 per cent can be placed in one of the first 21 groups. The remaining 14·9 per cent in group 22, are composed of 10·1 per cent with malformations from 2 groups, 2·6 per cent from 3 groups, 1·5 per cent from 4 groups, and 0·7 per cent from 5 or more groups.

We would like to point out that in Table 1, many cases in group 6 (VSD) were detected clinically and not by catheterization, and that group 7 (all other heart malformations) includes some cases not yet finally diagnosed.

The reader is warned that it would be fallacious to add together incidence rates of malformation groups which could be considered as one group under another classification. For example, all neural tube malformations will appear in either group 1 or group 2 (anencephaly or spina bifida) if no other malformations are present, but also in group 22 if two or more defects have been found, for example anencephaly and spina bifida (1 and 2); anencephaly, spina bifida, and hydronephrosis (1, 2, and 11).

The occurrence of combinations of malformation groups is of interest, but only those which include at least ten cases are presented in Table 3. This table demonstrates the associations between pairs of groups, shown by the figures in brackets in the columns and also reveals how many of these pairs are associated with yet another malformation. For example, VSD and one or more other heart malformations were found in fifteen infants; only fourteen of them had this combination alone, leaving one infant who had

Table 3. Numbers of infants with at least pairs of malformation groups (and with pairs of malformation groups only).

	VSD (6)	Other heart (7)	Other gastro-intestinal (11)	Genito-urinary (12)	Talipes (13)	Congenital dislocation of hip (14)	Other muscular-skeletal (15)	Meningocoele (2)
Anencephaly, iniencephaly (1)	1 (0)	0 (0)	1 (0)	4 (1)	3 (0)	0 (0)	3 (0)	12 (4)
Meningocoele (2)	2 (1)	2 (0)	1 (0)	9 (2)	18 (10)	3 (0)	14 (3)	
Other muscular-skeletal (15)	1 (0)	6 (1)	12 (3)	15 (3)	17 (6)	10 (2)		
Congenital dislocation of hip (14)	0 (0)	0 (0)	2 (0)	6 (1)	6 (2)			
Talipes (13)	3 (0)	4 (1)	4 (0)	10 (0)				
Genito-urinary (12)	2 (0)	6 (1)	8 (3)					
Other gastro-intestinal (11)	2 (0)	2 (0)						
Other heart not VSD (7)	15 (14)							

Table 4. Incidence rate per 1,000 total births of malformed infants in Exeter area 1967-70.

Malformation group*	Exeter Alone	Exeter Alone† in association	Devon Alone	Devon Alone and in association
1, 2	1·85	4·25	1·90	3·25
3	0·18	1·48	0·84	1·20
4	0·92	1·29	0·95	1·20
5	0·55	2·95	0·50	1·15
6†, 7	8·31	10·15	5·40	6·75
8	0·92	1·85	1·10	1·75
9	1·66	1·85	2·35	2·40
10	5·35	6·28	5·00	5·65
11	1·85	3·32	1·40	2·50
12	1·11	2·77	1·15	2·40
13	6·09	8·49	6·10	7·44
14	2·21	3·69	2·45	2·80
15	3·51	7·38	3·20	5·25
16	2·95	3·51	2·80	3·40
17	0·55	1·29	0·90	1·50
18	0·92	0·92	0·50	0·50
19	0·74	1·11	1·00	1·20
20	0·55	0·92	0·45	0·55
21	1·35	2·77	1·90	3·00
22	8·49	—	5·65	—
All	50·6		45·5	

*See Table 1 for composition of groups.
†Statistically significant difference in rates between Devon and Exeter.

this combination associated with a malformation in another group.

Incidence rates of malformations of the City of Exeter and the rest of the survey area (entitled 'Devon') are shown on Table 4, so that the urban and predominantly rural areas may be compared and contrasted. The City of Exeter has a higher over-all rate (50·6 per 1,000 live births) than the rest of the area (45·5 per 1,000 live births), but the difference is not statistically significant. The only statistical significance in incidence rates between the two areas is in the combined cardiac malformation groups 6 and 7 (VSD and all other heart malformations). This figure has been re-computed so that the relevant cases from group 22 (infants classified by two or more malformations) have been included.

First age of detection

The cumulative distributions of the first age of detection of malformed infants and children relating to the birth years 1967-72 are shown in Table 5. For infants born in 1967 and 1968 the present patterns of detection are similar, with for example, approximately 45 per cent of the total detected at birth, and about 82 per cent within twelve months of birth. As mentioned earlier, the data for the later years of the survey are not complete as yet, and we have restricted the analysis in this section to the period 1967-70.

The age of first detection of malformations is well known to vary substantially, with the majority of macroscopic structural defects being detected at, or soon after birth (groups 1, 2, 5, 8, and 17). Ninety-eight per cent of cases of pyloric stenosis (group 9) were detected within three months of birth. Sixty per cent of gastro-intestinal malformations (group 11), excluding pyloric stenosis and inguinal herniae, are detected within one week of birth, and 97 per cent within two months.

The cumulative distribution of age of first detection for some of the other major groups are shown in Fig. 2. The curves relate to infants with malformations in one group only, thereby avoiding the interaction effect of age of detection of one malformation group with another. The plots for groups 6 and 7 are very similar, and have been amalgamated, being shown in Fig. 2 as a combined group (67).

Table 5. Cumulative distribution of first age of detection of infants with confirmed malformations.

Age of detection	*Year of birth*					
	*1967**	*1968*	*1969*	*1970*	*1971*	*1972**
At birth	0·46	0·43	0·48	0·49	0·58	0·59
End of 1 week	0·51	0·47	0·52	0·57	0·64	0·62
End of 1 month	0·56	0·53	0·61	0·65	0·72	0·76
End of 3 months	0·67	0·62	0·76	0·79	0·86	0·84
End of 6 months	0·72	0·71	0·81	0·87	0·94	0·92
End of 9 months	0·79	0·75	0·88	0·88	0·97	1·00
End of 12 months	0·83	0·80	0·92	0·92	0·99	
End of 24 months	0·90	0·91	0·97	0·99	1·00	
End of 36 months	0·97	0·94	0·99	1·00		
End of 60 months	1·00	1·00	1·00			

*See footnote to Table 2.

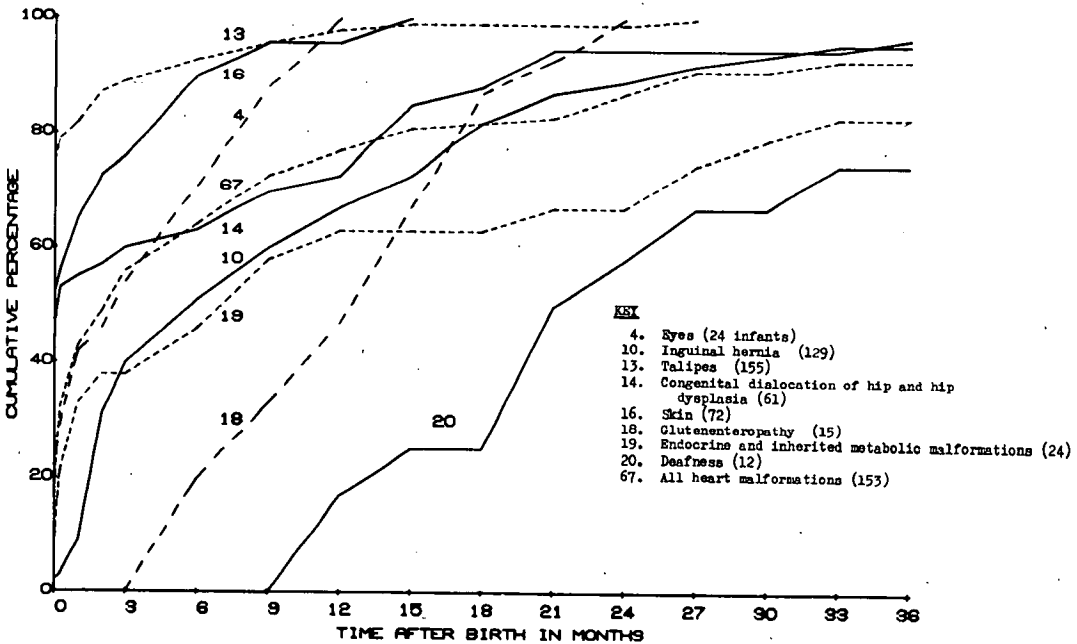

Figure 2. Cumulative distribution of first age of detection for infants with defects in single malformation groups, 1967-70.

Primary source of detection

As has already been shown, many infants are not suspected of having a congenital malformation until some time after birth, and therefore there are a number of people who may play a part in their initial identification.

The attendant at birth (doctor or midwife) responsible for the notification of malformations to the local authorities during the first ten days of life, detects approximately 50 per cent of infants who prove to have confirmed malformations by the age of 5 years. Thereafter, our figures shown in Table 6 suggest that the GP and others, such as the health visitor and the doctor at the child health clinic, who care for the child after the first ten days of life, are the principal sources of detection; it is likely that in some cases the attention of the GP is drawn to the possibility of a malformation being present by either the health visitor or the clinic doctor, and that he then refers the child to the appropriate hospital consultant.

Table 6. Primary source of detection of first confirmed malformation of infant.

	Year of birth			
Primary source	*1967**	*1968*	*1969*	*1970*
Attendant at birth	144	127	151	167
General practitioner, Health visitor, Health clinic	125	122	119	104
Hospital out-patient doctor	7	11	18	20
Hospital in-patient doctor	10	11	11	21
Morbid pathologist	1	1	1	6
Other	2	4	2	0
Total	289	276	302	318

*See footnote to Table 2.

Children with malformations who attend hospital fall into three groups. First, some have been followed up in a hospital out-patient clinic for some other reason, for example prematurity, and are found by the hospital doctor to have a congenital malformation; the primary source of detection of these cases is shown in Table 6 as the 'Out-patient doctor'. Secondly, there are those who either attend a consultant's out-patient clinic or are admitted as in-patients, both at the GP's request, when they may have signs and/or symptoms of an illness caused by a congenital malformation, for example, diarrhoea due to glutenenteropathy; in such cases the GP has been considered to be the primary source of detection even though he may not have made the ultimate diagnosis. Thirdly, a few cases are either referred or admitted on account of an illness or malfunction in no way attributable to a congenital malformation, and are found by the hospital doctor to have a hitherto unsuspected defect; here the initial identification is attributed to either the hospital out-patient or in-patient doctor, whichever is applicable.

The information in Table 7 relates only to infants with malformations in one group (see Table 1 for classification of malformations), except for group 22 which contains all infants with defects from two or more of the

Table 7. Percentage of malformed infants by primary source of detection 1967–70

*Malformation group**	*Birth attendant*	*Health visitor Health clinic*	*Hospital out-patient doctor*	*Hospital in-patient doctor*	*Morbid pathologist*	*Other*
1	100	–	–	–	–	–
2	100	–	–	–	–	–
3	33	56	6	6	–	–
4	25	63	8	4	–	–
5	92	8	–	–	–	–
6	16	63	12	6	4	–
7	25	45	14	14	1	1
8	96	–	–	–	4	–
9	2	96	–	2	–	–
10	2	83	6	5	–	4
11	50	32	16	–	3	–
12	66	21	7	3	3	–
13	79	19	1	1	–	–
14	52	39	–	8	–	–
15	61	31	1	6	–	–
16	54	39	1	4	–	1
17	95	5	–	–	–	–
18	–	100	–	–	–	–
19	17	67	4	13	–	–
20	–	83	–	8	–	8
21	33	35	15	13	4	–
22	78	15	4	2	1	–
All	49·7	39·7	4·7	4·5	0·8	9·7

*See Table 1 for composition of groups.

major groups 1-21. Variations in the rates of detection of malformations are reflected by the figures for detection by birth attendant.

Discussion

Only a reasonable degree of accuracy in the determination of the incidence rate of malformations is possible for the following reasons. First, complete detection of malformations of infants is difficult to achieve in any community with a moderate shift of population rate. Secondly, too short a period between the detection of the first defect and the first follow-up will underestimate the incidence of some malformations, and also their association with other malformations in the same infant. A second follow-up, therefore, at the age of 5 (for example, by school medical examination) of all infants in a given area is considered desirable, not only for further detection of initial malformations, but also to see whether further defects have been observed in those infants found earlier to have at least one congenital malformation. However, to delay reporting our findings until such an exercise has been completed would mean deferring for several years any contribution this study might make in the meantime.

Some criticisms, in previous papers on congenital malformations, have been levelled at the lack of explanation as to how incidence rates are deter-

mined; whether figures relate to malformed infants or to defects, whether multiple births are included or not, and which classification is used. In this paper both text and tables relating to the incidence of single malformations (Table 1, group 1-21) are designed to overcome such criticisms. The infants in the multiple group (group 22) have been allocated to the appropriate groups (Table 1, 1-21, columns 4 and 5) in order to establish the total number of infants with defects from any particular group. Infants with defects in one group may have some defects classified in one or more other groups (Table 1, columns 9 and 10). For example, 42 per cent of males and 30 per cent of females with a VSD also have one or more other defects from other groups.

In making our calculations we have, therefore, presented incidence rates based on:

1. Those infants with defects in one group only.
2. All infants who have defects in both single and multiple groups.

Our results show the incidence of malformed infants per 1,000 total births to be 46·6, this figure including 7·0 with defects from more than one group. To take an example from Table 1 the incidence of mongols is 0·83 per 1,000 total births for infants with mongolism only, but is 1·45 for infants with mongolism both with and without malformations from other groups.

For certain malformations early diagnosis is of particular importance in that it may make the difference between a successful result of treatment while the child is still young, and a child subjected to prolonged therapy, or even, in some cases a child who is permanently handicapped. This applies in particular to congenital dislocation of the hips, talipes, visual and hearing defects.

One of the most important findings in the survey was that only 47 per cent of cases of congenital dislocation of the hip were detected at birth, the oldest to be detected having reached the age of 5 years. Similarly, although 75 per cent of talipes sufficiently severe to be treated with plasters or prolonged physiotherapy were found at birth, some cases were not detected until 27 months of age.

Visual defects, excluding squints and astigmatism, continued to be detected up until the age of 1 year unless there was a structural abnormality of the eye obvious at birth. Hearing defects were by no means always detected when all infants underwent their routine screening for deafness at 9 months of age, which was already taking place in Devon, excluding Exeter, prior to December 1970, but continued to be picked up until the age of 5 years. As the survey continues, further cases of malformations in these groups affecting the 1967-70 cohort of children may well be detected at even more advanced ages.

We would like to suggest five possibilities for the delay in detection of these conditions. In the first place, there is known to be variability in the age of onset, particularly of defects of hearing; for example when infants have had a rubella viraemia *in utero* they may have normal hearing for

several years before developing deafness (Dudgeon, 1972): the same may apply to congenital defects of vision, and furthermore may apply not only to defects caused by the rubella virus, but also to those caused by other viral or infective agents. Secondly, the tests used for detecting these malformations may be imperfect. Next, the tests may be inadequately carried out. Fourthly, there may be an inability of the observer, however conscientious and however well trained, to make a complete assessment, as has been found by Dr Bench of the Regional Audiology Research Unit, Royal Berkshire Hospital, Reading (personal communication). Finally, as shown in the report of the National Child Development Study, social environment affects both the physical and mental development of children, so we would like to suggest that there may be social implications in the age of detection of malformations in that there may be a different pattern of parent-discussion of their children with the health visitor, clinic, or family doctor in the different social classes. This will be analysed in a later paper when a greater number of cases will have been collected.

It is demonstrated in the tables that the primary source of detection is closely related to the first age of detection. Such malformations as were detected at birth or during the first ten days after birth were detected either by the doctor or by the midwife in attendance, with the exception of the few cases admitted to hospital during this period, where a hospital doctor was the source of detection. At the other end of the age scale, it is interesting to note that so far only four cases (which are not included in the current tables as they have not yet been followed up) have been observed by the school medical officers, although virtually all the children born in 1967 are now attending school. This would appear to indicate that the pre-school medical services are almost 100 per cent efficient in picking up congenital malformations which become apparent before 5 years of age.

Table 4 shows firstly that there is no statistical significance in the different over-all rates of incidence of malformations ascertained in the City of Exeter and the rest of Devon, and secondly that the only significant finding in the rates of individual malformations is in that pertaining to congenital heart disease (6 and 7). We feel that this is unlikely to represent a 'real' difference in incidence as such a heterogeneous group of malformations as is included under the classification 'congenital heart disease', and would suggest that it may reflect differences in the frequency of infants and children visiting the GP, who is the major source of detection in this group, according to whether they live in Exeter City or the rest of Devon.

We believe it is difficult to compare the incidence of congenital malformations in different areas of the United Kingdom owing to the problems of definition, classification, and other parameters mentioned earlier in the discussion. However, as in well-documented studies of the incidence of anencephaly and spina bifida from different localities, there may be very real differences in the occurrence not only of neural tube defects, but also of other major malformations. We would like to suggest that our findings of 1·38 per 1,000 children with anencephaly, 2·56 with spina bifida, 1·45 with mongolism, 1·77 with cleft lip and/or palate and 2·99 with dislocation or

dysplasia of the hip can be compared with the findings of the authors of other papers on surveys similar to ours.

In conclusion, it is to be emphasized that this is a preliminary report on some of the findings of a survey of congenital malformations in Exeter and part of the administrative area of the County of Devon. The trends herein suggested are unlikely to be reversed as more figures obtained from a total birth population of 32,732 become available. We await with interest observations made at the first school medical examination to see whether the preschool detection rate of congenital defects is as satisfactory as it would appear so far. We consider it impossible to infer whether or not the south-west of England has a higher over-all incidence rate of congenital malformations than elsewhere for reasons given in the discussion. We feel, however, that there is sufficient evidence of failure of early detection of four important malformations, namely congenital dislocation of the hip, talipes, defects of vision and hearing, to warrant a closer look at the screening and/or other procedures used for finding these defects in the infant population.

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Summary

A preliminary report is presented of a prospective investigation into congenital malformations occurring in a defined population of 25,432 infants born in Exeter and Devon between March 1967 and October 1970. Methods of ascertainment and of verification of diagnoses are described. Infants with congenital malformations, as we have defined the term, are divided into 22 major groups, the total incidence of affected infants being 46·6 per 1,000 births. The variations in the first age of detection of malformations are either described in the text or plotted in Fig. 2. The primary source of detection is shown to be closely related to age of detection.

Only 47 per cent of cases of congenital dislocation of the hip and hip dysplasia, and only 73 per cent of cases of severe talipes were detected at birth. Defects of vision were detected up until 1 year of age, congenital hearing defects were still being detected up until the age of 5 years. Possible reasons for the delay in detection of these four malformations are discussed. Results indicate that preschool medical services are almost 100 per cent efficient in detecting congenital malformations which become apparent before 5 years of age.

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