The Demand for Medical Care

A study of the case-load in the Barrow and Furness Group of Hospitals

by Gordon Forsyth and Robert F L Logan

Published for the Nuffield Provincial Hospitals Trust
by the Oxford University Press

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Gordon Forsyth BA (Econ)
Research Fellow Department of Social Administration University of Manchester

Robert F L Logan MD MRCP
Reader in Social Medicine University of Manchester

Published for the Nuffield Provincial Hospitals Trust
by the Oxford University Press 1960
London New York Toronto

Oxford University Press, Amen House, London E.C.4

GLASGOW NEW YORK TORONTO MELBOURNE WELLINGTON
BOMBAY CALCUTTA MADRAS KARACHI KUALA LUMPUR
CAPE TOWN IBADAN NAIROBI ACCRA

PRINTED IN GREAT BRITAIN BY THE WHITEFRIARS PRESS LTD.
LONDON AND TONBRIDGE

AUTHORS' ACKNOWLEDGEMENTS

The authors are indebted to a number of people who read the original MSS with great care and contributed many helpful suggestions during prolonged discussion. Special thanks are due to Professor E. M. Backett, Dr. N. T. J. Bailey, Lord Cohen of Birkenhead, Mr. L. Farrer-Brown, Dr. J. Fry, Dr. G. E. Godber, Dr. F. N. Marshall, to the members of the Social Medicine Research Unit of the Medical Research Council, and to the consultants to the Barrow and Furness Group of Hospitals.

G. F.
R. F. L. L.

FOREWORD

by

Professor T. E. Chester, Dr. jur. (Vienna)

IN nearly all countries the costs of running health care services have risen by leaps and bounds in recent decades and it is often suggested that this situation is aggravated by the obsolescent nature of the present hospital services which make it necessary to 'practise twentieth century medicine with nineteenth century institutions'. Attempts to deal with health care comprehensively have to contend with the rise in the costs of building new hospitals. This is a common problem and the current position in the United Kingdom, with new hospitals costing over five thousand pounds per bed, is by no means exceptional. Moreover, the provision of comprehensive health care services absorbs large resources of skilled labour—the National Health Service now employs over half a million people of all grades—and it should be realized that of hospital running costs alone, 60 per cent. of the money goes on wages and salaries.

It is not surprising therefore that the Government, the hospital administrator, and the citizen, who in the last resort has to pay, are becoming more concerned with making the best use of the resources available. This has evoked a rising interest in the application of efficiency studies to the administration of the hospitals. For six years now the principles of organization and methods have been applied and work-study is changing from a mere catchphrase to the realistic appraisal of the detailed internal working of the hospitals. Where least progress has been made is in the application of scientific method to the wider and more fundamental problems of health administration. For example, although a study of the relative advantages and disadvantages of centralized linen storage clearly can be of great importance in improving internal efficiency, is it not more vital to see whether the existing hospital facilities are adequate or not to the community they serve ?

It is with this important question that this study is mainly concerned, but it should also be seen as a tentative and exploratory attempt to apply the technique of operational research to the field

of hospital administration. It was also experimental in another sense. The statistical or quantitative approach to the study of administrative problems is often accused of being too narrowly circumscribed and leaves out what often are the most important factors, the qualitative aspects. As a result it is now fashionable in many countries to demand 'inter-disciplinary' research. This is a neat phrase, but its translation into practice is often difficult because it raises complicated and deeply felt emotional issues in scientific attitudes and of course personal relations between different professions. With perfect truth, however, it can be claimed that in the case of the Barrow survey the inter-disciplinary approach was carried out smoothly and amicably. Although the research grant was formally made to the Department of Social Administration, and the full-time research worker, Mr. Forsyth, was a member of that Department, this study would not have been possible without the collaboration of Dr. R. F. L. Logan, Reader in the Department of Social Medicine.

If one were asked what the main results of the study are, they can be summarized under two headings:

(i) The follow-up of the well-known studies by the Nuffield Provincial Hospitals Trust into the case-loads at Norwich and Northampton has shown that even in the completely different circumstances of a less wealthy area in the industrial North the load factor is far less than that forecast by the Ministry of Health in the early days of the National Health Service and much closer to the earlier Nuffield findings.

(ii) In addition, however, the present study indicates that the methods so far pursued show the number of cases higher than they need be; in other words, that effective demand is not necessarily identical with medical need, which is in the National Health Service supposed to be the criterion determining admission to hospital.

The last part of the study, which includes a sketch of this issue, can only be called a pilot study and it cannot be claimed that the figures of cases admitted for social reasons because adequate home care facilities either were not available or were not used are of general validity. Far more work is clearly necessary in this field, but it is hoped that this survey has shown not only the possibilities, but also indicated some of the methods: for example, the ward surveys of the patients actually in hospital.

In short, if we want to see this great British experiment in free and comprehensive medical care successful, then our knowledge of the working of the hospital service, as the most costly component, must be far greater than it is, as the Guillebaud Committee pointed out in 1956. We can only consider as knowledge in this sense data which have been carefully established and sifted. There is no room for guesswork and subjective opinion.

It is left only for me, as head of the department responsible for this research study, to thank all those who have willingly given their time and services in the wholehearted co-operation necessary in a project of this kind. In particular, thanks are due to members and officials of the Manchester Regional Hospital Board, who selected the survey area, the Barrow and Furness Hospital Management Committee, especially the Group Secretary, Mr. J. Newman, who took a great personal interest and gave much active help, and the consultants and other staff who were completely frank and open at all times in discussing their work in great detail. The assistance of the Barrow Executive Council and the Local Medical Committee in freely supplying information relating to general practitioner services proved invaluable. Again thanks are due to Dr. I. D. M. Nelson, Medical Officer of Health to Barrow-in-Furness, and to Mrs. L. Porteous of the Women's Voluntary Service, who gave help in the field-work.

It goes without saying that any faults in the data or their interpretation are entirely our own and cannot be laid at the door of any of the above-named people.

Finally, I have to acknowledge a debt to the Governing Trustees of the Nuffield Provincial Hospitals Trust, whose grant made the research possible, and a special indebtedness to their Secretary, Mr. Gordon McLachlan, who helped in the planning of the research at all stages, and who made many useful comments and suggestions.

Department of Social Administration
University of Manchester

August, 1959

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PART I : INTRODUCTION

Introduction

1. *Planning to Meet Demand*

In 1948 the National Health Service Act brought under centralized control the variety of institutions which the three distinct streams of hospital development had produced in this country: the teaching and voluntary hospitals, the local authority mental, maternity, tuberculosis and isolation institutions, and the former Poor Law infirmaries.* Regional Hospital Boards were set up to supervise the administration of the hospitals and were also made responsible for planning the development of the community hospital service. The change took place at a time when various industries were nationalized as a practical expression of the belief current between the 1930s and the early 1950s that in administration size is everything and large-scale organizations are more efficient than small.† An essential feature of this movement towards centralized control was the assumption that the central authorities could plan long-term development in a way not possible when control was diffused. Thus the Regional Hospital Boards would be able to co-ordinate on a long-term and short-term basis the planning of facilities necessary to the provision of an adequate hospital service. Trends based on statistical information would (it was assumed) be one of the instruments used in planning to meet demand and forecasting the facilities necessary to its satisfaction.

In fact the Regional Boards have not yet progressed very far with their long-term planning, and the reasons for this are not difficult to ascertain. In the first place, planning cannot be separated from administration; it is most desirable that plans should not be envisaged in a vacuum, but should bear a close relation to the facts of the situation and therefore be made by those who really

* There were also some local authority general hospitals not connected with the Poor Law in the hands of progressive authorities after the Local Government Act of 1929.

† There were, of course, other reasons as well for recommending a regional structure of organization and a principal aim was the linking of provincial hospitals to the great teaching centres. The extent to which they are influenced by this attachment is questionable.

know what is going on. Inherent in this situation however is the danger that long-term considerations are often driven out by short-term necessities. The hospital service was non-existent as a comprehensive specialist service before 1948, and the structure of organization was an entirely new venture, providing hospital care for the first time on a regional basis. The Regional Boards had no experience of hospital planning and have therefore been too preoccupied with setting up the present structure to be over-attentive to the needs of the future. Most of the Regional Boards have set up statistical departments, but they tend to be more assiduous in the collection of information than in its interpretation or application, and this is perhaps inevitable in view of the continued emphasis on accountability in the public services. Even so, masses of facts and figures are collected for no apparent purpose other than to be concentrated into meaningless averages. This information may be of great value when national trends are in consideration, but it is of little use at the level of the hospital group serving a relatively small population and whose needs vary with local circumstances.

Apart from their burden of day-to-day administration and the initial need, starting from scratch, to concentrate on building the present structure (and let it not be forgotten that the present distribution of specialist skills represents an outstanding achievement and one unique to this country), the Regional Boards have had to face many other difficulties. The position was summarized very fairly in a report published by the Acton Society Trust in 1957 (1): 'Some Boards have worked out fairly clear ideas, but do not like to commit themselves to precise "blue-print" plans on paper, because if a plan is put on paper, they say, it is bound to create positive expectations that something is going to happen; this makes it very difficult to deviate from the plans if circumstances change—and experience goes to show that they do. Others point to the many variables in the situation which may render a whole planning exercise nugatory and quote the tuberculosis experience to prove their point. Rather than attempt to draw up a fixed long-term plan they prefer a policy of constant modification to meet changing needs. But the greatest difficulty of all has been the inadequacy of capital resources and the complete lack of certainty about what will be available in the future.' This last point has been the crucial factor for many Boards.

The difficulties involved in long-term planning cannot be too

strongly emphasized. Even the end to be attained is shrouded in doubt, let alone the means. For example, if the aim is to provide an adequate service, what is the criterion of adequacy? As the Guillebaud Committee pointed out in its Report (2): 'If the test of adequacy were that the service should be able to meet every demand which is justifiable on medical grounds then the service clearly is inadequate now . . . nor is it clear that such a service, even if it were to become adequate, would remain so . . . the growth of medical knowledge adds continually to the number of treatments . . . what might have been held to be adequate 20 years ago would no longer be so regarded today, while today's standards will in turn become out of date in the future.' There are numerous examples of the impact on services of progress in medical science. Anticoagulants may be prescribed by general practitioners but the tests determining whether they should be used involve more work for the pathological laboratory services. Other developments in medicine involve a reduction of services; it is estimated (3), for example, that if toxæmia of pregnancy could be controlled half the antenatal hospital beds in England and Wales would not be needed. Five years ago there was an acute shortage of beds for the treatment of tuberculosis; now, after the development of chemotherapy and streptomycin, sanatoria are being closed down and redundant chest physicians are becoming geriatricians in many cases. The impact of the last two developments suggests that, among others, a purely architectural problem is involved in hospital planning. With the prospect of rapid changes in need, the disappearance of some illnesses and the emergence of others, the hospital will have to be flexible in its use. Buildings meant to last at least 50 years must be so designed that they can be adapted to needs which may change in only five. Perhaps the hospital of the future must be comprehensive, with all the general specialisms represented. Certainly the changed attitude to mental illness, with emphasis on active treatment in the community often as out-patients rather than custodial care in remote barracks is bringing mental therapy into the general hospital, and a good case could be found for bringing in pædiatric and chronic services as well. It is one thing to appeal for flexible planning of course, but quite another to put it into practice. Even so, much work has been done to study the physical relationships of different departments by organizations such as the Nuffield Provincial Hospitals Trust: 'A hospital is a living, changing entity

and not a static composition and its constituent elements will change at different rates. Probably the best answer is found by regarding the problem as one of town planning and thinking of a hospital design from its earliest stage in terms of traffic flow and zoning.' (4)

Important as these obstacles to long-term planning are, however, more fundamental causes are at work. There can be little doubt that the fate of the isolated sanatoria, once drugs were developed to overcome tuberculosis and make feasible its treatment on a domiciliary basis, has left hospital planning under a cloud because the planners are afraid of being proved wrong in the event. This situation is born of a fundamental misconception (to which clinicians are particularly prone) of what statistical analysis can reasonably be expected to do, and this in itself is associated with a malaise to which Professor Devons has drawn attention (5): 'There is a passionate desire in our society to see all issues of policy decided on what we think are rational grounds. We rebel against any admission of the uncertainty of our knowledge of the future as a confession of weakness. What easier way to pander to this obsession than to have all issues debated in the scientific or pseudo-scientific language of statistics?' The future remains obdurate in its uncertainty and statistical analysis can never give a precise answer to the question of, say, how many beds to provide for a population of given size, and it is nonsense to suppose that it can. For example, the only purely objective information available is necessarily of the work-load carried in former years, and this cannot take account of needs which are unmet because needed services are not sought when it is known that they are not available. It is equally foolish, however, to make the best the enemy of the good, and because precise answers cannot be given, undertake little or no statistical analysis at all. Statistical analysis has its limitations, but sensibly applied it can fill gaps in our knowledge of present hospital conditions, reveal in broad terms the implications of different programmes, and bring to light facts which are relevant if not a final solution to the problem. In this connection it is of paramount importance to widen the scope of statistical enquiries on which plans are to be based, and for the planners to appreciate that the hospital operates in a wide context of comprehensive medical care; as Fleming has pointed out (6) 'greater savings could be achieved in a hospital service by improving the

quality of general practice than by any other single move.' In this country, studies concerned with the hospital service should be closely geared to the operation of the general medical services, and the local authority services as well, for the present tripartite structure of the National Health Service is merely an administrative convenience, and not a reflection of the treatment pattern. Moreover, the hospital, once merely the place where poor people went to die, has become an essential element in civilized society and now has demands made on it which are directly related to social changes generally. Given this interdependence of hospital, health services, and social policy, it follows that hospital administration and planning is as much a social and behavioural science as anything else. Social scientists are often overconscious of the 'unscientific' nature of their studies, but in this perhaps they are also overdeferential where the older sciences are concerned. They should remember that when an engineer is constructing a bridge he considers the stresses it will have to bear and then builds in a ten times safety ratio. Yet bridge-building is said to be an exact science. Statistics can be used as a basis for hospital planning if it is appreciated that in the nature of things precise answers are usually impossible; but by bringing out relevant factors in the situation statistical analysis can set limits at certain levels of accuracy and assist those who are responsible for making decisions on social policy, helping to make the guesses more inspired.

That is the spirit in which this report of a survey of the hospital service in Barrow-in-Furness is offered and should be interpreted; not as a forecast in precise quantitative terms of the area's medical needs, but as a study exploratory in nature seeking to reveal some of the factors involved in planning the future of the Health Service.

Our approach is reflected in Whyte's satirical words: 'The median income level of a hundred selected families in an urban industrial universe correlates 0·76 with population density—not 0·78 or 0·61 but 0·76 and that's a fact.' (7). In these early days of operational studies it is surely a prior step to establish that relationships exist at all.

2. *Earlier Studies*

Before coming to a precise statement of the aims of the Barrow survey it will be helpful to an understanding of the logical sequence of the approach used to consider first the experience of others

working in the same field of medical administration, since these earlier studies to some extent conditioned the method adopted at Barrow.

Broadly, three approaches to the problem of assessing medical care seem to be currently popular.

(1) The first method seeks to establish a control group of families and individuals, examine a sizable sample over one or two years, and record their need for hospital and other health facilities (an example appears in the studies by Columbia University at the Hunterdon County Medical Centre (8)). This approach seems ideal when interest is centred on the *normal* population, but suffers from its dependence on the co-operation of the people being studied. In this respect the validity of its application is suspect since it is generally recognized that the fact of social isolation in varying degrees is a contributory determinant of admission to hospital, and it is not likely that the person who has become isolated socially will be included in any voluntary scheme of periodic examination. Nevertheless the control group method has the great merit of allowing a wide interpretation of need at several levels. It makes possible the revelation of needs the patient is not aware of, for example in the cases of presymptomatic diabetes or tuberculosis, needs the patient is aware of but is not interested in having remedied, such as herniæ, pelvic prolapse, obesity, some neuroses and psychosomatic disorders, and of course the needs which also become effective demands on the available medical services.

(2) The second approach is essentially a 'follow-up': it hinges on a particular interpretation of need and seeks an appraisal of the quality of care given by hospitals or by those immediately responsible for the care of the patient after discharge. Thus at Salford, Lane (9) in a three-year follow-up of discharges from medical wards found that a third of the patients had since died, but that for the others rehabilitation services in the area were on the whole adequate. At Amsterdam, Querido (10) revealed the existence among the hospital population of a number of 'repeaters'—people with almost a life-history of hospital care. Among other recommendations he points to the need for considering the patient beyond the limits of merely physical symptomatology. In Saskatchewan, Roemer and Myers (11) also studied the problem of 'repeaters' and found over a five-year period that 61 per cent. of admissions were attributed to this group. The authors conclude:

'it is a challenge to public health and hospital administration to isolate that minority segment who account for a disproportionately large share of hospital days and admissions. If they can be identified perhaps health control efforts could be concentrated on them.' In Glasgow, Ferguson and MacPhail (12) have shown the effects of inadequate after-care services.

Over and above the detailed findings of studies of this type, they make a major contribution in emphasizing the interdependence of the various stages of medical care, and suggest the possibilities of reducing the hospital work-load either by a wider interpretation of the patient's needs while he is in hospital, or by ensuring that adequate after-care services prevent premature readmission.

(3) The third approach is to analyse the numbers of in-patient admissions in a given period arising from a known population and to use the results as a basis for estimating the number of hospital beds required. This method represents in fact the market analysis of consumer usage, regarding work-loads carried in the past as the best and most objective guide to the requirements of the future.

In Britain the most comprehensive enquiry into hospital provision was the survey organized jointly in 1941 by the Ministry of Health and the Nuffield Provincial Hospitals Trust (13). The appropriate bed-population ratio has long been a problem for hospital administrators and estimates of adequate ratios have been as varied as they have been common. The following table shows a number of these estimates:—

Estimates of Acute Beds required per 1,000 *Population*

Joint Survey 1941 (*a*)	4·5 to 6·4
Nuffield Provincial Hospitals Trust 1947 (*b*)	5·0
Ministry of Health 1950 (*c*)	7·0
Department of Health for Scotland 1946 (*d*)	8·0

(*a*) *The Hospital Services of England and Wales surveyed jointly by the Ministry of Health and the Nuffield Provincial Hospitals Trust in* 1941, *et seq.* Area publications, H.M.S.O., 1945.
(*b*) *Report on the Planning of Regional Hospital Services in Berkshire, Buckinghamshire, and Oxfordshire*, Nuffield Provincial Hospitals Trust, 1947.
(*c*) *Memorandum on the Development of Consultant Services.* Ministry of Health, H.M.S.O., 1950.
(*d*) *Department of Health for Scotland, Scottish Hospitals Survey*, H.M.S.O., 1946.

In 1952 Norris (14) showed that the various estimates were little more than guesswork and suggested: 'a reasonable target for the immediate future is the provision of sufficient beds so that the

bed : population ratio for each locality is equal to the national average.' This, however, would be to ignore local differences in needs.

The consumer usage method of estimating bed requirements has also been the one usually applied in Canada and the United States. Roth and others (15) hit on an overall figure for Saskatchewan of 7 beds per 1,000 population 'because North American and Canadian experience suggests it'. Palmer (16), in an illuminating review of American published work on the subject from 1900 to 1956, found estimates varied from 3·8 to 8·0 per 1,000 population. It was emphasized that bed needs varied with local conditions, but it also suggested that there is almost a fashion in bed : population ratios and at any particular time the appropriate number of beds is the number in existence.

In 1955 published studies by the Nuffield Provincial Hospitals Trust (17) based on surveys carried out at Norwich and Northampton in 1950 and 1951 took the consumer usage method a stage further and showed that a bed : population ratio of some 2 per 1,000 was adequate to the needs of the available acute specialities. These estimates are well below those envisaged in the early days of the National Health Service when suggestions varied between 5 and 7 per 1,000. Clearly, the findings represented a major contribution to the question of hospital provision and they are all the more important when it is remembered that at present the capital cost of building new hospitals is approximately £5,000 per bed. For example an increased bed provision of only 1·0 per 1,000 population would, in this country, involve some 45,000 beds or about 100 new hospitals at a cost roughly of £225,000,000. This is nine times the figure mentioned by the Minister of Health in his Report for 1958 (18) as being set aside annually for the provision of more hospitals over the next few years. The economic difficulties and stringency which have surrounded the health service during the first 10 years may prove in the long-run to have been a blessing if they have enforced a pause for reflection before embarking on large-scale construction of new hospitals perhaps resulting in over-provision, as in Sweden, for example, or in the United States (19).

The Nuffield Trust's report of 1955 stressed that, because of the assumptions used, the findings at Norwich and Northampton should only be applied locally and did not necessarily reflect the national position. Hospital authorities were urged to carry out their

own surveys. 'More hospital case-load studies might be expected to yield important demographic information and would certainly throw light on trends in hospital care in the community; but in detail the results of each survey would be applicable only in the local context.'

The method evolved at Norwich and Northampton (20) represented an interesting application of queueing theory and sought as its prime objective to establish a 'critical number' of beds. This is determined as follows: 'In any year the number of patients recommended for admission' (that is, in-patient deaths and discharges plus or minus the change in the waiting-lists) 'multiplied by the average duration of stay of the patients died and discharged gives the number of bed-days which would have been spent in hospital had all the patients recommended been admitted. This total of bed-days divided by the number of days in the year gives the critical number of beds at an occupancy rate of 100 per cent.' Thus, in hypothetical figures:—

Effective Population	*Patients discharged or died*	*Change in lists*	*Average stay*	*Critical number of beds per 1,000 population*
100,000	30,000	plus 500	20 days	$\frac{30{,}500 \times 20}{365 \times 100_{,}} = 16{\cdot}7$

The actual number of beds required can be estimated by adding to the critical number twice the standard error attached to the sample (with a 1 in 20 chance of error), plus one or more beds according to the rate at which it is desired to run down the waiting-lists. The method takes account of changes in the waiting-lists and, to ensure that demand is not suppressed because waiting periods are too long, that is, patients not seeking admission because it is not worth going on a waiting-list, enquiries can be made among local general practitioners to see whether or not this is in fact happening. These enquiries were made in the Nuffield studies and the investigators were satisfied that the waiting-lists represented the true level of unsatisfied demand. On the other hand, the method accepted every admission at its face value as a case genuinely needing in-patient treatment or investigation, and inevitably so, of course, since the enquiry was concerned with effective demand and was not attempting any evaluation of need. The survey at Barrow was undertaken

with the object of exploring further some of these assumptions underlying the method evolved in the Norwich and Northampton studies.

3. *Aims of the Barrow Survey*

The initial aims of the Barrow survey were therefore as follows:—

(*a*) To repeat in a Northern industrial area the Nuffield Trust's earlier studies in the South and East Midlands which, as we have indicated, found that a ratio of only about 2 acute beds per 1,000 population was adequate to the needs of the available acute specialties.

(*b*) As critical numbers are calculated for each specialty, and there are different lines of demarcation in different areas, so that in one place what is pædiatrics would be general medicine in another, the year's case-load was to be analysed by diagnosis. Thus comparison would be facilitated in quality as well as in quantity between the findings in Barrow and those in the Trust's companion studies at Luton* and on Tees-side.

(*c*) To project, with certain necessary assumptions, the population of the survey area into the future and attempt a forecast of the demand for hospital facilities in approximately 20 years' time.

(*d*) In exploring some of the assumptions necessarily involved in the method used at Norwich and Northampton particular attention was to be given to the possibility of formulating a stricter definition of need. Furthermore, apart from the possible effects on future hospital demand of changes in the size and age-structure of the population, the survey was to examine the impact on the hospital service of possible variations in the operation of other branches of the health service, in particular changes in the role of the general practitioner and the local authority medical services. The concept of need, and the operation of the various branches of the health service at any particular point in time are very much related questions, and the reasoning behind their inclusion in the Barrow survey requires further elaboration.

Any admission to hospital denotes a response to some human need; but it is not necessarily a clinical need. In the past the hospital has served to compensate for many social as well as medical inade-

* The Luton study was abandoned by the North-West Metropolitan Regional Hospital Board when it became apparent that the research could not be completed in a reasonable time.

quacies and it still does at the present day—witness geriatrics, chronic sickness, hospital confinements for social reasons and the relationship between marital status and admission to mental institutions (21). In an ideal system of comprehensive medical care every admission would be in response to purely clinical need. In *Measuring Bed Needs for General Hospitals* Palmer (22) lists the conditions for an ideal medical care situation: 30 items are given, but they can be grouped conveniently as follows:—

(1) Optimum availability and quality of medical care, including disease prevention activities and use of all advances in medical science.

(2) Optimum attitudes of the population towards medical care, with the elimination of psychological barriers.

(3) Optimum ability of the population to procure medical services through the absence of financial barriers.

(4) Optimum levels of utilization, with complete co-ordination and integration of facilities and the consequent avoidance of unnecessary hospital care.

In real terms these conditions would reduce the factors causing the need for hospital beds to approximate to morbidity rates in the population and occupational hazards. In fact, of course, the situation facing the hospitals is very different. No institution can be understood without its historical development, and in Britain the hospital served for many years as a place where poor people went to die—this was the tradition of the Poor Law infirmary (incidentally, the channelling of the aged and infirm poor to these institutions, which enjoyed little or no contact with the teaching and research institutes, was a serious handicap to the development of geriatrics). Those who could afford it could obtain treatment in the private nursing homes and in the teaching hospitals care could be had on a charitable basis. Apart from the few very good local authority general hospitals built after the Local Government Act of 1929 hospital care outside the teaching centres was limited to the voluntary and cottage hospitals staffed mainly by local general practitioners. In many instances their technical facilities and standards left much to be desired. Poor housing conditions, inadequate home-nursing facilities, and public expectations all tended to inflate the pressure for hospital care. Many of the voluntary hospitals held out-patient clinics, free access to which was often a condition of their endowment and a point of appeal for funds. The

sketchy arrangements for general practitioner services often produced the habit of admission for investigation, where the patient could afford the time off work, because the clinic sessions were too crowded. For many people the hospital became the only refuge in time of illness; for many others, particularly those in need of elective surgery, the hospital was an unattainable luxury.

The result of all this was that when the National Health Service was brought into being in 1948, the hospitals, in spite of their varied character and standards, and in spite of the financial barriers keeping many patients out, were the central point round which medical care services revolved. The National Health Service was intended to change the dominant role of the hospitals, but, of course, changes in the functioning of institutions, and in public attitudes to them, cannot be wrought overnight, and the operation of the hospitals is still conditioned by public expectations developed over many years of low-cost hospital care, expectations which take no account of the vastly increased costs of our own times.

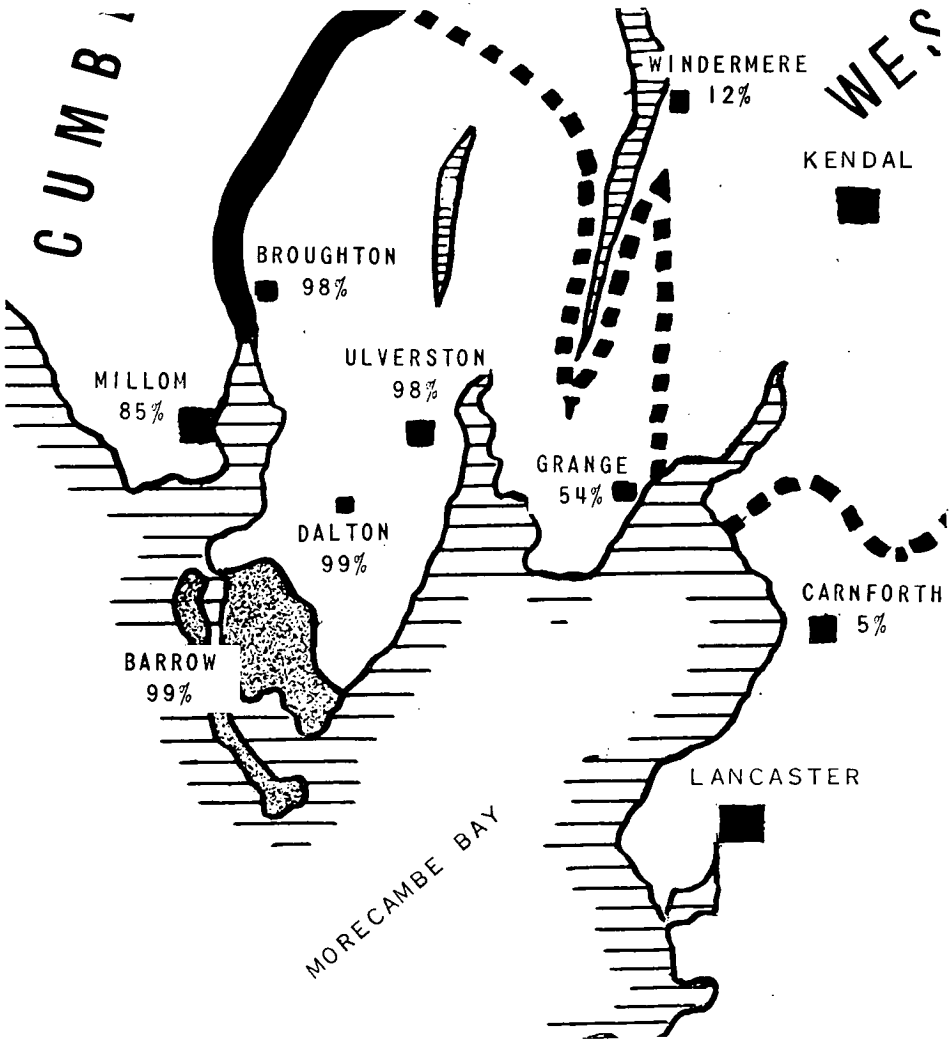
It is sometimes forgotten that the National Health Service is but part of a particular system of society in which the State accepts responsibility for the welfare of its citizens from cradle to grave. Thus the provision by local authorities of domiciliary nursing facilities and home helps, the existence of disabled resettlement and rehabilitation units of the Ministry of Labour, to name but two of many services provided, help to reduce some of the social inadequacies which in the past have inflated the demand for institutional care. The National Health Service itself contains a particular concept of comprehensive medical care in which the hospital is considered incidental and episodic in the patient's life-span (23). If this concept can be realized and made actual, there must inevitably be consequences for the number of hospital beds needed by the community. The decision to make the main provision of care under the National Health Service through the general practitioner has radically altered the alignment of publicly provided medical services. Previously these were orientated to a section of the public on the assumption that they did not have a general practitioner. Now the first assumption is that everybody does enjoy the services of a personal physician and the centre of gravity of our welfare services has been shifted. The change has been recognized in limited ways, for example in the closing of all hospital out-patient departments to direct access by patients. Else-

where the effects of the change have been postponed because the full implications will take time to reveal themselves or because of an underlying assumption that the general practitioner is too busy or not fully competent to accept his new position.

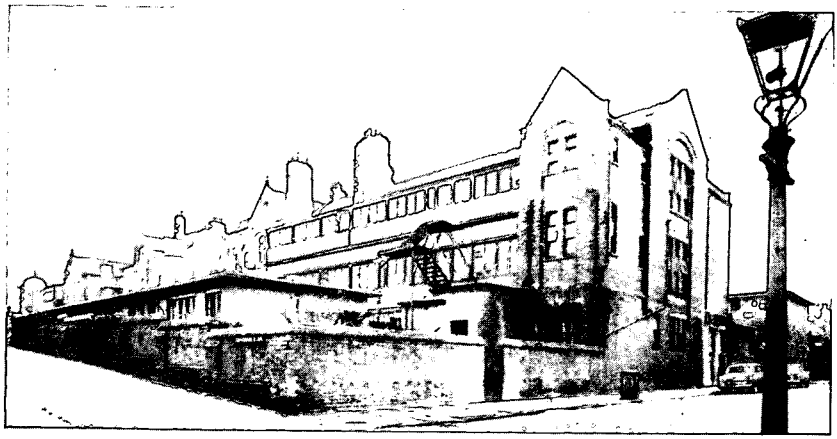
Nevertheless, the general practitioner is now cardinal, in the concept of the National Health Service, to a decision calling for admission to hospital since he is supposed to integrate and co-ordinate the many services provided, drawing on them as he interprets his patients' needs. (This essentially represents the approach taken by the Cohen Report (24) on General Practice within the N.H.S.) For this reason the approach adopted in the Barrow survey, proceeding as it does from an attempt to estimate the need for hospital beds to a consideration of the range of general practitioner services, is quite logical. It is not yet possible to measure the effects on hospital requirements of changes in the average size of the general practitioners' list or in the range and depth of his practice; all that has been attempted is a comparison in quantitative terms of some differences between the various practitioners in the demands they made on the hospital and ancillary services. An attempt has also been made to interpret need in the light of the new medical care structure and the services now available, so that an estimate is possible, albeit subjectively, of the proportion of hospital admissions not strictly necessary on clinical grounds, and attention can be drawn to some of the factors causing over-prolonged or unnecessary use of hospital beds.

A Glimpse of Barrow and some of its hospitals

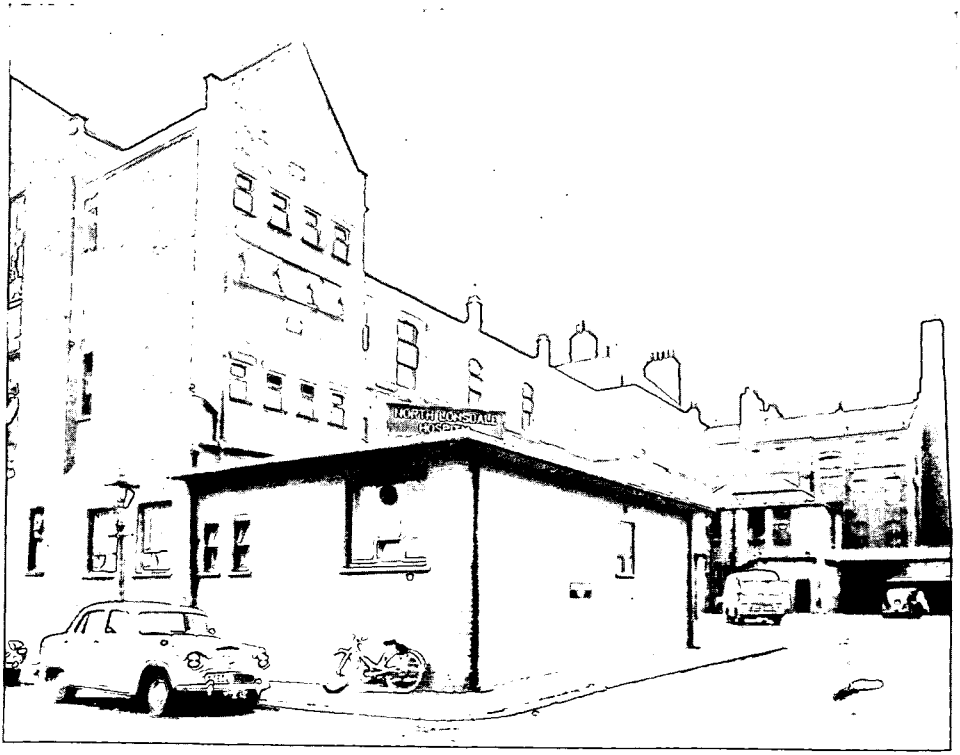

Map of Manchester Regional Hospital Board Area
WORKINGTON
WHITEHAVEN
Calder Hall
Gt. Gable
Scafell
Helvellyn
CUMBERLAND
WESTMORLAND
WINDERMERE
KENDAL
BROUGHTON
MILLOM
ULVERSTON
GRANGE
DALTON
BARROW
CARNFORTH
LANCASTER
MORECAMBE BAY
WEST RIDING OF YORKSHIRE
IRISH SEA
BLACKPOOL
PRESTON
BLACKBURN
BURNLEY
LANCASHIRE
BOLTON
BURY
ROCHDALE
WIGAN
OLDHAM
SALFORD
MANCHESTER
STOCKPORT
LIVERPOOL
CHESHIRE
DERBYSHIRE
BOUNDARY OF MANCHESTER HOSPITAL BOARD REGION
COUNTY BOUNDARIES
COUNTY BOROUGHS
SCALE OF MILES
C.L. WINDSOR



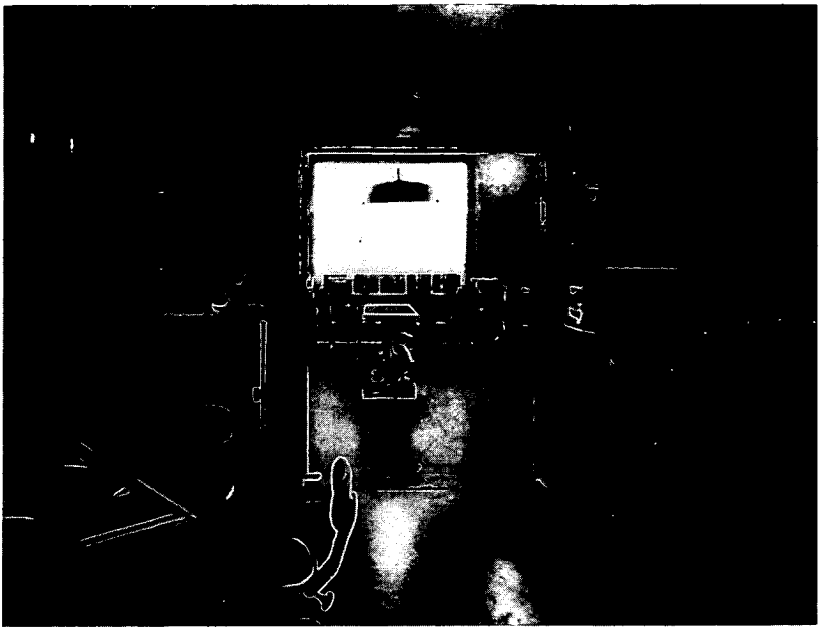
Area served by the Barrow and Furness Group. Percentage figures show the proportion of local populations catered for



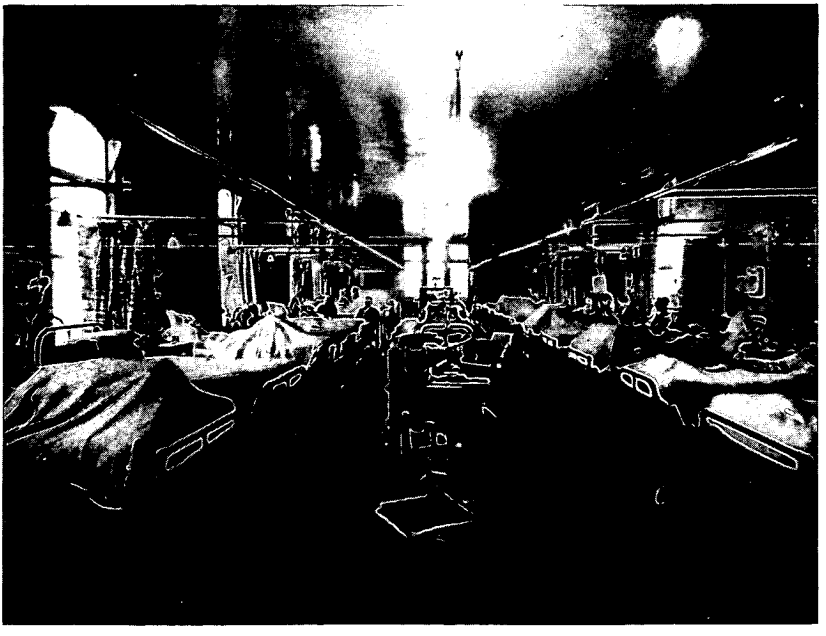
NORTH LONSDALE HOSPITAL : The main general hospital in the area



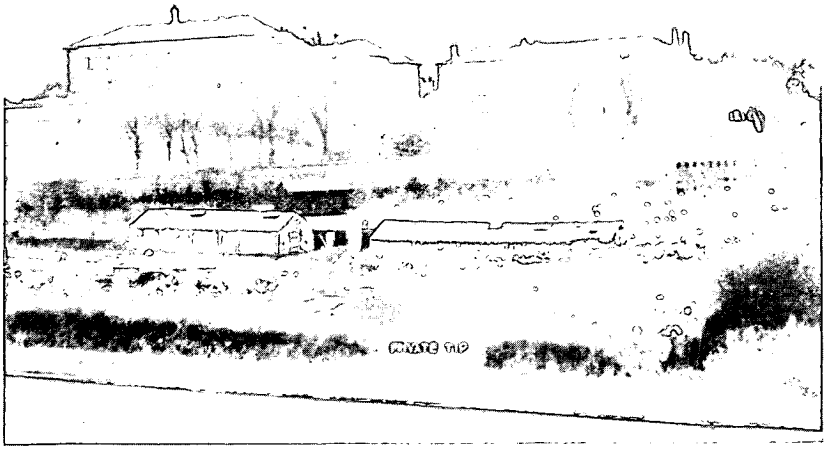
NORTH LONSDALE HOSPITAL : The main entrance



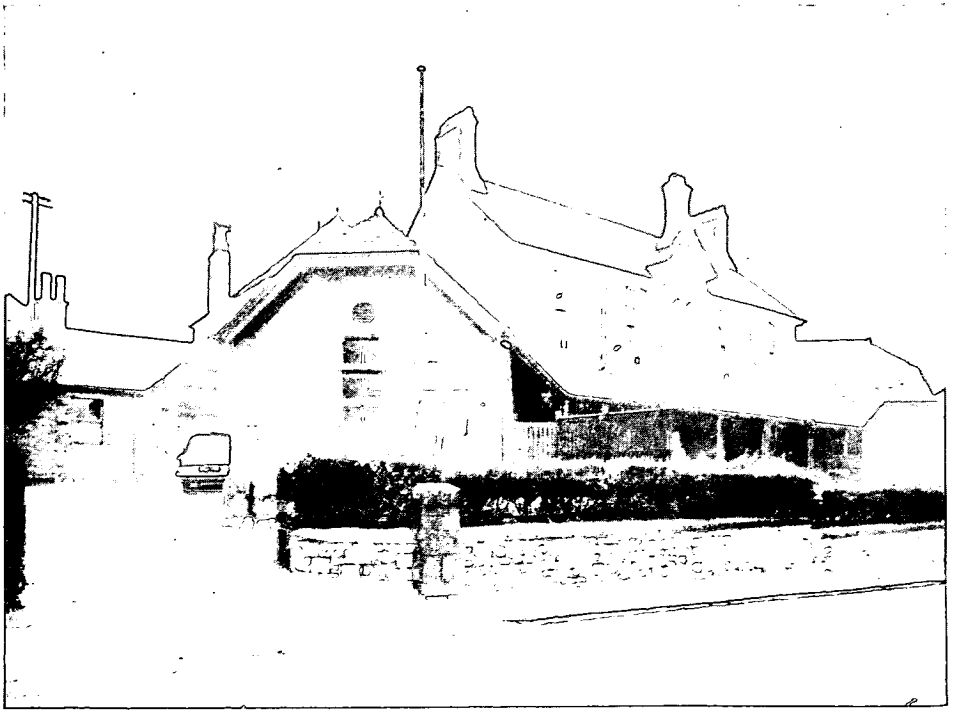
NORTH LONSDALE HOSPITAL : The operating theatre suite



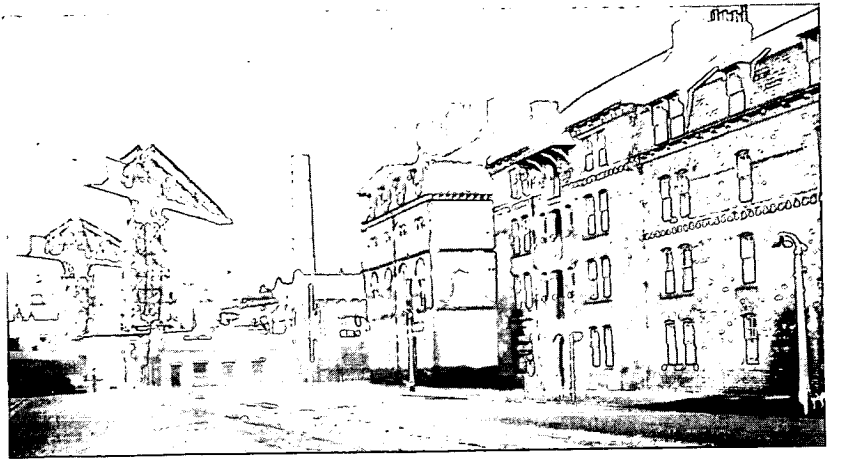
NORTH LONSDALE HOSPITAL : The male surgical ward



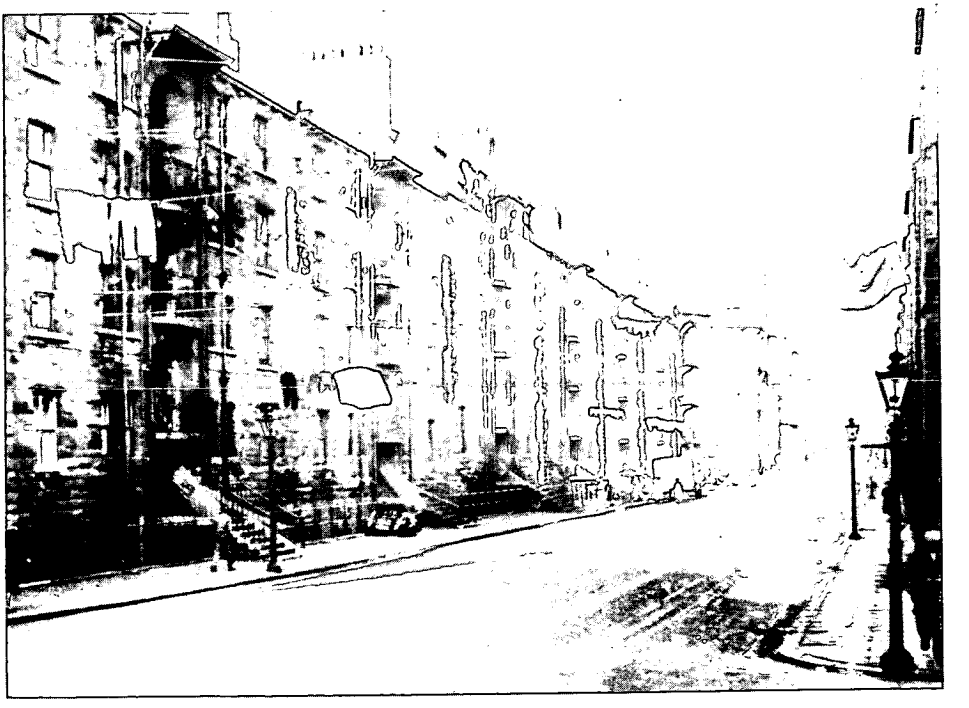
ROOSE HOSPITAL : a former public assistance institution, now mainly used for chronic sick and gynæcology



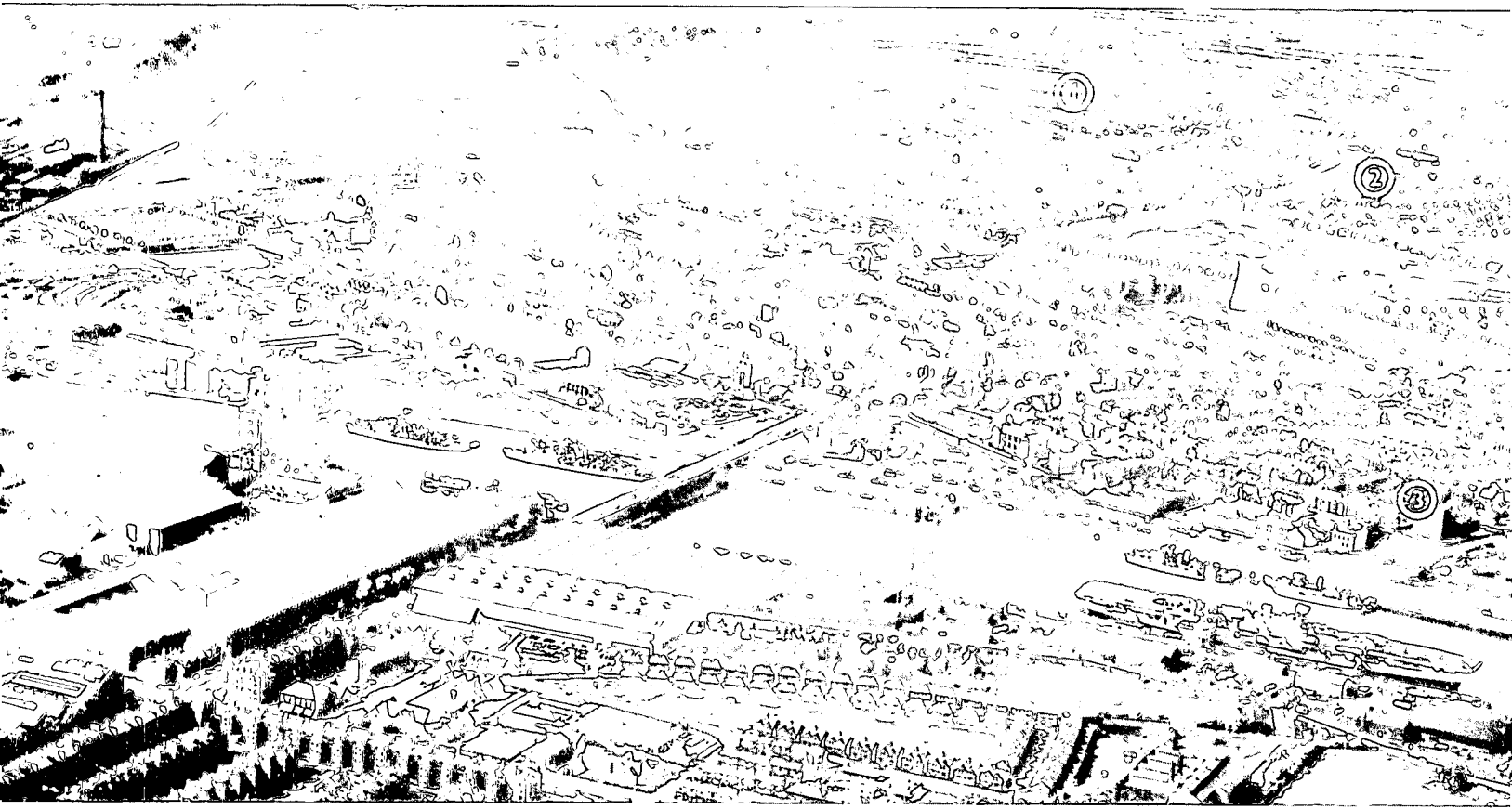
ULVERSTON HOSPITAL : a former cottage hospital



BARROW: Tenements near the shipyards



BARROW: Tenements on Walney Island



BARROW IN FURNESS—Showing Devonshire and Buccleuch Docks
(1) Devonshire Road Hospital (2) Risedale Maternity Hospital (3) North Lonsdale Hospital

PART II : THE SURVEY

1. GENERAL BACKGROUND

2. FACTS REVEALED BY THE SURVEY

The Survey

I. GENERAL BACKGROUND

(i) *The Survey Area*

The area served by the Barrow and Furness Hospital Management Committee was selected for the survey by the Manchester Regional Hospital Board because the population of the area could readily be defined.

The Furness peninsula, of which Barrow-in-Furness, lying at the southern tip is the principal town, is bounded to the west by the estuary of the River Duddon and the Irish Sea, and on the east by Morecambe Bay, the Leven and Lake Windermere: water boundaries on three sides and the Cumbrian fells and the hills of the Lake District to the north. The area is truly isolated and with its captive population is an attractive ground for market research. Before the coming of modern transport the only access to the main body of Lancashire was across the sands of Morecambe Bay at low tide. Administratively part of Lancashire, the area is geographically and ethnically part of the land mass of Cumberland. It would not be entirely true to suggest that the Furness area is typical of the industrial north; most of it is truly rural; but taking together the populations of Barrow (65,000), where industry is heavily concentrated, and Millom (14,000) in Cumberland, another heavily industrialized town, it can be said that approximately 65 per cent. of the population catered for by the hospitals there come from industrial towns. Industry is dominated by ship-building and heavy engineering, attracted to the area by local deposits of coal and iron ore, and the facility of the port.

For some reason Barrow is often associated with industrial depression—perhaps it is confused with Jarrow; in fact the district was never classed as a 'depressed area', although it had its full share of unemployment in the 'twenties and 'thirties. In 1923, for example, some 35 per cent. of the insured population was unemployed and in the 'thirties there was much 'relief work', the results of which can be seen in the coast road to Ulverston and the open-

air swimming pool on Bigger Bank. It is a matter for conjecture now how far the unhappy experience of those years has contributed to the hospital case-load of our times. There is a relatively high incidence of tuberculosis, gynæcological complaints, and male herniæ which may well be associated with the failure of many children to grow sturdy during these lean years.

In its appearance, too, Barrow is hardly typical of the grim industrial north. Residential districts are fairly distinct from workplaces, and the town is not unattractive with many trees lining its streets. The exception is the tenement area close to the docks, reminiscent of the worst parts of Glasgow and, of course, these tenements were built to house the shipyard workers who came down from there. Happily these tenements are being cleared and the inhabitants rehoused elsewhere.

(ii) *History of Medical Care in Barrow*

The history of medicine in Barrow reflects the pattern in the rest of the country. A place near Conishead Priory is known locally as 'Leprigarth', or Leper's Field, and is self-explanatory in its commemoration. Conishead Priory itself is now a miner's convalescent home but the original Priory was founded as a hospital by the Augustinians during the reign of Henry II, probably in 1167. Furness Abbey, on the outskirts of Barrow, was itself founded in 1127. Between the Dissolution of the Monasteries in the 16th century and the Public Health movement in the 19th there was the usual absolute lack of institutional provision for the sick. An incident of the 17th century is worth mentioning in this context for it demonstrates the complete absence of medical provision at the time.

The plague came to the Furness district in 1631 and the ensuing events were described by George Postlethwaite, Parish Clerk at Dalton (then the principal town) in his 'Lugubrious Lines on the Destructive and Violent Plague'. The inhabitants believed the plague was brought by a London trader called Lancaster and his wife. Before it had run its course over half the population had died and the rest of the terrified inhabitants were prevented from leaving the town by sentinels armed with clubs. Lancaster set up as a doctor, but was accused of administering poison in the guise of medicine. He set up as undertaker, and was accused of looting the dead of their possessions. When the plague was over he and his

wife were driven from the town and narrowly escaped death from stoning by what was left of a very angry populace.

The Poor Law of the 19th century produced two public assistance institutions in the Furness district: Roose Hospital at Barrow and the Stanley Hospital at Ulverston. As with the rest of the country before 1929 the needs of the acute sick were left to voluntary institutions. Barrow's first voluntary hospital was founded in 1867 as St. George's Cottage Hospital and moved to its present site and buildings as the North Lonsdale Hospital in 1876. The enterprise arose to deal with the large number of accidents occurring in local work-places, especially the new shipyards. It is interesting to reflect that during its first years this institution functioned very much in accordance with the current aim in hospital policy—that is, the short-term care of the acute sick and not as a compensation for other social inadequacies. The hospital maintained a close identity with the general community and from an early date employees of the Furness Railway Company and other large firms contributed a penny each week from their wages to the upkeep of the hospital. Inevitably admissions began to come from the community at large and in the 'eighties a deputation from the British Medical Association visited the hospital complaining that the institution was injuring the interests of its practitioner members in the district, especially as its out-patient department attracted many patients. This potential conflict of interest between the hospital and the general practitioner was virtually resolved after 1911 by the insurance panel system, with a capitation fee basis. The hospital then assisted the general practitioner in running a practice too large for effective care. This pattern was confirmed under the National Health Service with no payment for beds and consultant clinics. The coming of the National Health Service in 1948 with the transfer of hospitals in the Barrow area to the Manchester Regional Hospital Board resolved another conflict between groups engaged in medical care. This was between Barrow Corporation and North Lonsdale Hospital.

In 1939 the Corporation appointed a full-time gynæcologist-obstetrician and asked the hospital to allow him the use of beds. This the hospital refused to do, on the grounds that a local general practitioner already acted as honorary gynæcologist at the hospital. The Corporation then converted part of its Public Assistance Institution into a gynæcology ward (it had built the

Risedale Maternity Hospital in 1921) as it was able to do under the 1929 Local Government Act. When the Manchester Regional Hospital Board took over the hospitals in 1948 specialists were appointed to the new consultant posts, replacing the general practitioners who formerly staffed the hospitals on an honorary basis. The Corporation's gynæcologist became consultant to the Barrow Group and it is only fair to add that the gynæcology operations book reflects a variety of work which is exceptional for a provincial non-teaching hospital.

(iii) *How Healthy is Barrow?*

The estimates of bed requirements for the Furness area suggest a higher bed-population ratio than found at Norwich and Northampton. The question naturally arises, how healthy is the population? This is, of course, very difficult to measure, but some indication is provided by considering some vital statistics of 1957 such as rates and causes of death, hospital admission rates, and frequency and cost of drug prescriptions.

The Annual Report for 1957 of the Medical Officer of Health for Barrow gives the following figures:—

	Unadjusted	*Barrow Residents only*	*England and Wales*
No. of deaths	912	858	
Rate per 1,000 pop.	14	13·2	11·5
No. of live births	1,196	975	
Birth rate per 1,000 pop.	18·4	15·0	16·1
No. of infant deaths	30	26	
Infant mortality rate	25·1	26·7	23·1
Perinatal mortality rate	46·3	34·2	36·2

Although giving the gross death toll of the town, death rates such as these are unfortunately of little value in giving an indication of the state of health in any particular locality. Comparison between areas on this basis is dangerous because the figures are affected by the age and sex structure of the population. Standardized mortality ratios based on specific age and sex death rates are, however, of more value as a guide, and in Appendix I a table is provided comparing Barrow with the North-Western Region and England and Wales.

The principal causes of death are available for 1950–3 in the area mortality studies of the Registrar-General and are as follows:—

Principal Causes of Death, Barrow-in-Furness, 1950–3
Males and Females, all ages (population 65,000)

Cause	*Number*	*Rate per 1,000 (4 years)*
All causes	3,417	52·65
Arteriosclerotic heart disease	353	5·4
Vascular lesions of C.N.S.	475	7·3
Bronchitis and pneumonia	332	5·1
Cancer of the lung	84	1·2
Cancer of the stomach	95	1·4
Cancer of the breast and uterus	73	1·1
Ulcer of the stomach	47	0·72
Accidents	91	1·4
Suicide	27	0·41
Childbirth and pregnancy	4	0·06

Source: *Registrar General's Decennial Supplement*, 1951 (H.M.S.O. 1958) Area Mortality.

The standardized mortality ratios indicate the mortality pattern in Barrow in relation to the North-West generally and are exactly equal at an index of 111 for all causes of death in males (England and Wales = 100). For females Barrow may be healthier as its S.M.R. of 104 is lower than the North-West's 110. As we have tried to show, Barrow with the sea on three sides and a National Park on the other is not typical of the industrial north; but the results of this survey probably reflect the needs of other northern industrial areas better than the estimates for Norwich and Northampton. Barrow deviates from the North-West pattern, as far as males are concerned, only in its relatively low incidence of deaths from bronchial cancer (100–110), coronary heart disease (104–110), bronchitis (87–130) and also leukæmia (71–90), although here the numbers are small with only five deaths. On the other hand, there is a markedly higher incidence of fatal vascular lesions of the central nervous system, particularly in middle-aged men (160–120); peptic ulcer, particularly in the aged (where the incidence is double that of the North-West); cancer of the stomach (127–117) and pneumonia (135–107), although this may counterbalance the low incidence of deaths from bronchitis.

Standardized Mortality Rate 1950–3 by Sex and Main Causes of Death. Barrow compared to North-West (England and Wales S.M.R. = 100)

	Barrow		*North-West*	
	M.	*F.*	*M.*	*F.*
Low both sexes				
Bronchial cancer	100	67	110	106
Coronary heart disease	104	80	110	99
High both sexes				
'Strokes'	120	114	113	108
Peptic Ulcers	150	114	98	95
High Males only				
Diabetes	138	108	102	109
Stomach cancer	127	81	117	117
All causes	111	104	111	110

Suicide (122–106) and diabetes (138–102) were also higher but again the numbers involved are small.

Women follow the low rates for their menfolk in bronchial cancer (67–106), arteriosclerotic heart disease (80–99) and bronchitis (89–135) although again this is evened up by pneumonia (118–101). They also follow the high rates for males in 'strokes' (114–108) and peptic ulcer (114–95). The Barrow women deviate from the male pattern in very low rates for stomach cancer (81–117), for accidents (72–102), and suicides (56–104), but numbers here were small. The four deaths in complications of pregnancy and the puerperium raised the S.M.R. to 133. Cancer of the uterus (at 117) is also higher than the North-West's 106.

The figures quoted are for all ages in 1950–3. Death rates per thousand by age and sex show that on the whole, rates for Barrow are higher in the age groups under 4 years, but mainly decline thereafter except for accidents to schoolboys.

Expressed per 1,000 specific-age population the deaths from all causes in children are:—

	Males, years of age		*Females, years of age*	
	0–1	1–4	0–1	1–4
Barrow	41	1·2	31	2·4
North-West	36	1·5	29	1·3
England and Wales	32	1·3	25	1·1

The principal causes in the age group 0–1 years are pneumonia, bronchitis and accidents. There has been a marked improvement in the town in maternal and infant care particularly in the last few years and this is reflected in the perinatal rate in the town in 1957 which was lower than in England and Wales generally.

Barrow in 1950–3 had a relatively high maternal mortality rate. Deaths arising from delivery, complications of pregnancy, childbirth and the puerperium per unit population were:—

	Years of Age 15–24	*Years of Age* 25–44
Barrow	45	92
North-West	37	69
England and Wales	34	66

These death rates standardized by age and sex give a rough idea of the state of health in Barrow and it is interesting that for both men and women the rates for the modern 'killers', heart disease and lung cancer, are low, while those for peptic ulcer and strokes are high. It would be interesting to speculate in this context on the interplay of environmental aspects such as heavy industry, low income, and unemployment with the mixed genetic inheritance in the history of this isolated peninsula.

Hospital Admissions

So far we have considered only mortality rates as an indication of the state of health prevailing in the population served by the Barrow Group of Hospitals. There is, however, a relatively high hospital admission rate in this area as the table on p. 36 shows:—

The major departures from the national pattern occur in general surgery, chronic sick, gynæcology, and pre-convalescent departments. The reasons for the relatively high incidence of hospital admission in Barrow will be discussed later, but it can be mentioned at this stage that in chronic sick and pre-convalescent departments the admission rate is related to a reasonably adequate supply of beds; in gynæcology to the presence in the area since 1939 of an able full-time specialist who has developed a wide and intensive range of service in this branch; and in surgery to a concentration in the area on heavy engineering, with a high incidence of injury and strain, including hernia. On the whole Barrow reflects the

In-patient Deaths and Discharges per 1,000 *Population for England and Wales, Manchester Hospital Region, and Barrow and Furness Group,* 1956

Department	*England and Wales*	*Manchester Region*	*Barrow Group*
General surgery	18·5	15·6	22·5
Obstetrics	9·6	7·7	11·0
Gynæcology	6·1	5·7	9·1
Pre-convalescent	1·6	2·0	8·7
Chronic sick	2·4	2·8	5·6
Dentistry	0·5	0·4	0·7
G. P. maternity	1·5	2·9	3·6
General medicine	11·1	9·6	11·0
Pædiatrics	2·1	1·8	2·1
Orthopædics	5·0	4·2	4·8
Ear, nose and throat	6·9	5·9	6·0
Ophthalmology	2·0	1·0	1·8
Infectious diseases	1·6	1·6	0·3
Dermatology	0·4	0·3	0·4
Special care babies	0·6	0·7	0·3
G.P. medical	2·5	1·4	0·6
Private pay	1·6	1·3	0·8
All departments	74·0	64·9	89·3

(Extracted from information contained in Ministry of Health's *Digest of Health Service Statistics,* 1957.)

North-West pattern, but overall the general incidence of hospital admissions is much higher—37 per cent. above the rest of the Manchester Region.

Drug Prescribing

Statistics arising from the administration of the general medical services indicate that Barrow is a relatively high consumer of drugs and dressings—

Out of 122 Local Executive Council areas for which figures are given, only 6 exceed Barrow in their consumption of drugs and dressings, and 4 of these (Wigan, Warrington, Blackburn and Blackpool) are also in Lancashire. So far as the average total cost per prescription is concerned, Barrow is exceeded only by Bournemouth and Blackburn. Thus we can say that the population of Barrow not only requires more prescriptions than the average, but that the drugs prescribed tend to be more expensive so that the

Frequency and Cost of Prescriptions for Drugs in Barrow and Some Other Areas in 1957

January-December, 1957	*Average total cost per person (pence)*	*Prescription frequency per person*	*Average total cost per prescription (pence)*
Barrow	465	6·0	78
Rural Lancs	353	5·0	70
England and Wales	347	4·9	70
London	343	5·1	67
Highest: Wigan	511	8·0	64
Lowest: Huntingdonshire	215	3·2	66

Source : Form P.D.1, Joint Pricing Committee for England.

total annual drug bill for Barrow is one-third higher than rural Lancashire, London, and England and Wales.

* * * * * *

The available statistics relating to death, hospital admission and the frequency and cost of prescribed medicines have been considered in an attempt to convey some indication of the state of physical health prevailing in the survey area. However, definite conclusions must be avoided, because death rates, especially if taken for specific age groups and diagnoses tend to show only marginal differences, and the certification of the cause of death is far from being uniform; hospital admissions may be related more to the facilities available and the standard of housing than to actual sickness, and drug prescribing may reflect local custom of both doctor and patient. Even so, the Furness area comes high on all these counts, and can fairly be described as having at least its full share of sickness. Certainly its consumption of medicines and hospital services places it high even in the industrial north.

(iv) *The Barrow Group of Hospitals*

All told, 9 institutions form the group of hospitals under the control of the Barrow and Furness Hospital Management Committee. All save 4 are in Barrow town—one at High Carley, 5 miles out, and three at Ulverston, 10 miles away. The following table indicates the function and character of these institutions:

Hospital	*Bed complement*	*Allocation of staffed beds*
North Lonsdale . .	189	75 general surgery 41 general medicine 20 E.N.T. 26 orthopædic 13 ophthalmology 4 G.P. maternity 10 private pay
Aldingham Hall . .	36	36 pre-convalescent
Roose	230	146 chronic sick 17 general medicine 6 orthopædic 27 gynæcology 34 mental illness
Risedale Maternity . .	47	44 obstetrics 3 special care babies
Devonshire Road . .	57	27 pædiatrics 12 general medicine 8 infectious diseases 8 dermatology 2 venereal disease
High Carley, with Children's Annexe . .	151	151 diseases of chest
Stanley . . .	201	121 chronic sick 80 mental deficiency
Ulverston Cottage . .	34	4 general medicine 6 general surgery 8 gynæcology 5 G.P. maternity 11 G.P. medical
Oubas House . . .	10	10 G.P. maternity
Total: . . .	955	

In 1943 Sir Ernest Rock Carling and Dr. T. S. McIntosh visited the Barrow hospitals during their survey of the North-West for the Ministry of Health and the Nuffield Provincial Hospitals Trust (25). It is interesting to recall their impressions. 'The general hospital accommodation in this district is insufficient and of poor quality. No existing hospital is suitable for expansion to meet the needs and the aim can only be the provision of a new hospital. A site on the outskirts of Barrow would presumably be the best situation for it.' This was to be the long-term policy, with North Lonsdale, by virtue of its convenient situation near the docks, retained only as an accident and out-patient clinic, with a few beds for emergencies. Even in the short-run, however, the opinion was that 'to remedy both quantity and quality of accommodation the

erection of a new hospital should be regarded as a matter of urgency.'

The new hospital was not built, and it seems is not likely to be built for some years to come. In the meantime medical and administrative officers of the group have made the best use possible of existing resources, and have made some additions and alterations, notably in the provision of a new out-patient block, casualty and X-ray departments and recently a new pathological laboratory.

North Lonsdale Hospital, as a result of the additions made to it from time to time since 1875, presents an overall design which is far from good. By modern standards the operating theatre, of one room and one ante-room, is inadequate to say the least. There are no separate corridors, changing room, or anæsthetic and sterilizing rooms. The surgeons change clothes in the dining room and the very tight operating schedule leaves no room for the E.N.T. surgeon who uses the very much better out-patient theatre. Some idea of the cramped nature of the accommodation in this hospital can be gained from the fact that within 15 yards are three doors opening respectively on to the operating theatre, Secretary's offices, and the medical staff's dining room, which is also the only common room or lounge for all the doctors.

The Carling-McIntosh team estimated the capacity of the hospital at 100 beds; the present complement of 189 has been achieved by the conversion of former staff quarters and the use of verandas. As a result some of the wards are too large from everybody's point of view, and this applies especially to the two surgical wards, one of which has 40 beds.

Roose Hospital, a former public assistance institution, is typical of its kind. It has all the attributes and characteristics one associates with the Poor Law infirmary. The hospital now is mainly used for the chronic sick, but it is not at all suitable for this purpose, having no physiotherapy, rehabilitation services or X-ray. There is a confusion of small rooms, narrow corridors, and steep staircases. There is no lift at all and in such circumstances the task of nursing the elderly infirm is even heavier than usual. Again the staff do their best and a rough division is maintained between ambulant and non-ambulant cases. The ambulant are installed on the ground floor so that in better weather they can walk in the garden. There is no day room. The section converted for gynæcology is better, but by modern standards is far from suitable.

Risedale Maternity Hospital has reasonably good physical amenities when compared with other hospitals in the district, but there is real need for improvement, e.g. the 15 beds in the separate house should be brought into the main building which itself needs smaller wards and more bathrooms. It is interesting to note that before the war Lancashire County Council had received the Ministry's approval for the construction at Ulverston of a hospital of 75 beds, a large proportion to be maternity, to serve the Furness area, excluding Barrow. At present Risedale, with 44 beds, is serving the whole district, including Barrow, with an additional 19 general practice maternity beds.

Ulverston Cottage Hospital (again to quote the Carling-McIntosh Report) 'is a poor building, and before the war it had been agreed that it should be closed'. Stanley Hospital, used for the chronic sick is not so thoroughly unsuitable as that at Roose. There are a number of small wards which make functional classification of patients possible, and the physical accommodation is fairly comfortable as chronic sick institutions go, which is not saying very much in all conscience.

The Devonshire Road Hospital has been converted from a former infectious diseases hospital to deal with certain medical cases, and children's diseases. The pædiatric unit is especially bright and, in view of the infant death rate already mentioned, this unit should meet a definite need.

Aldingham Hall, acquired since 1948, is a pre-convalescent unit of 36 beds, and has proved valuable in achieving a quicker turnover in the surgical wards at North Lonsdale. Ideally, such a unit would be attached to the main hospital, instead of several miles away, as cases go there still sutured, and it is not unknown for patients sent there to have to return to North Lonsdale.

Oubas House, a general practice maternity unit of 10 beds at Ulverston, used to be the tubercular children's annexe to the High Carley Sanatorium. Representing half the maternity beds available to general practitioners in the area it serves a much-felt need and helps to reduce pressure on the Risedale Maternity Hospital, where priority can thus be given to primiparæ and cases with an obstetric or gynæcological history or abnormality.

High Carley Sanatorium illustrates one of the immediate benefits of the National Health Service. This tuberculosis sanatorium used to serve Lancashire County, and those living in Barrow County Borough could not be admitted. Tuberculosis patients from

Barrow had to go to a sanatorium in Westmorland some miles away, passing *en route* this sanatorium only 6 miles outside their town. With centralized control under the National Health Service, of course, patients can be admitted from any administrative area. The sanatorium reflects the recent revolution in tuberculosis. Instead of waiting lists as up to 1950, beds now are empty, and the time is surely not far off when thought presumably will be given to a new use for it. This is an interesting problem in more ways than one. The likelihood is that it will present itself to hospital authorities at all levels as: 'Here is an institution: what can we use it for ?'—little thought being given to whether it is needed at all. It is not, of course, common for public authorities (any more than private) to think outside the context of their own function and one of the most fascinating aspects of Parkinson's Law is the fundamental difficulty of persuading people to accept less than the facilities they had in some past age when demand was greater. It would be quite natural for the Barrow Hospital Management Committee to seek new uses for its sanatorium and to this extent the very existence of the buildings may eventually create a demand for hospital care, if for example the use of the sanatorium for long-stay cases of bronchitis or heart disease or fractured femurs in the elderly creates expectations that institutional care of such cases is normal.

In general, and despite the very poor physical surroundings they have to work in, the medical and administrative staffs of the Barrow Group have maintained a high standard of work; waiting lists have been reduced to a matter of a few weeks even for elective surgery and a high bed turnover has been achieved. Perhaps benefiting from their somewhat isolated position, all sections of the hospital service there have worked very well together. But their success in overcoming the deficiencies of their physical surroundings should not be allowed to obscure the fact that they need and deserve better.

2. FACTS REVEALED BY THE SURVEY

i. THE EFFECTIVE POPULATION SERVED

The British hospital service is a national service: it is fundamental to this concept that a patient residing in one administrative

area should be able to seek and obtain treatment in another if he finds it more convenient. This situation, however, has its consequences for the hospital planner, and the population of an administrative area served by a hospital authority cannot be assumed to be the effective population catered for. At the Regional level the difference between these two definitions of population is not likely to be very great (with the exception of the Liverpool Region, which draws large numbers of patients from North Wales). At the group level, however, the difference can be of some importance, especially where the group in question is at the periphery of one Region and adjoining another as in the case of the Barrow Group.

Although the Barrow Group was chosen for this study because it was thought to be geographically and medically isolated, with the hospital population at risk 'captive' and easily defined, roughly coincident with that of the administrative area, steps were taken to establish precisely the effective population catered for, and it was found that in fact the Barrow hospitals served a population larger by about 11 per cent. than was supposed.

The method adopted was that used in the earlier Nuffield studies and described by Bailey (26). The only differences were that the period of observation was three calendar months instead of twenty-one days, so that relatively large numbers could be analysed, and that effective populations were calculated for each specialty rather than simply for the hospital group as a whole.

During the period January to March 1957 hospital admissions in Barrow and other groups of the Manchester Region and the neighbouring West Cumberland Group of the Newcastle Region were recorded. From this information was calculated the ratio of the number of admissions to Barrow hospitals to the total number of admissions in each administrative area. This ratio, applied to the population of the administrative area, gave the population of that area served by the Barrow Group. Expressed as a simple proportion, if the population of a given area is N, and there are X people admitted to hospital from the area, of whom Y go into survey hospitals, then the population of that area served by the survey hospitals is NY/X and the total hospital population is the aggregate of these proportions in the individual areas.

The enquiry was conducted over a wide field and in some detail. For all patients with a home address in Furness, admitted to any hospital between Crewe and Carlisle during the survey period, information was collected relating in each case to the patient's

address, sex, age, diagnosis, and specialty under which he was admitted. The results of the enquiry demonstrated that few people from Barrow went to hospitals outside the area. The exceptions were those seeking treatment under specialties not provided by the Barrow Group, e.g. vascular or neurosurgery, and radiotherapy, those taken ill or sustaining accidents while travelling outside the area, and a number of orthopædic cases, drawn away to an orthopædic hospital near Preston.

When the ratios of those admitted to hospitals in the Barrow Group were applied to the populations of the various local authority areas it was found that the effective population served by the Barrow Group was 11 per cent. higher—116,000 compared with an administrative population of 106,000.

Effective Population Served by Barrow Group of Hospitals

	Population (1)	*Percentage served by Barrow Group*	*Population to Barrow Group*
Barrow-in-Furness	64,700	99·2	63,962
Dalton-in-Furness	10,300	99·0	10,197
Ulverston R.D.	16,100	98·0	15,778
Ulverston U.D.	10,400	98·1	10,202
Millom R.D.	14,400	84·8	12,211
Grange-over-Sands	2,900	54·3	1,574
Windermere	6,400	12·0	768
Carnforth	3,850	5·5	211
Elsewhere (2)	—	—	1,000
Grand total			115,903

(1) From the Registrar General's Annual Estimates 1957 (30th June).

(2) Ships from many foreign and British ports call at Barrow, and as a typical year sees members of ships' crews admitted to hospital some addition to the hospital population has to be made. Furthermore, Barrow attracts many visitors on business and these too have to be taken into account. Unfortunately, hospital patients who thus happened to be in Barrow by chance when taken ill could not always be related to their usual place of residence and the figure of 1,000 included above is purely arbitrary. The population of the administrative area apportioned to the Barrow Group by the Manchester Regional Hospital Board is 106,000. The Board could not of course apportion the population of Millom because technically Millom is part of the Newcastle Region, though functionally served by the Barrow Group.

The most important factor in accounting for the difference between the effective population served and the administrative area population is that a high proportion of the population of

Millom turns to the Barrow Hospitals when needing hospital care. Millom is an industrial area in West Cumberland and is part of the West Cumberland Hospital Management Committee's administrative area; but facility of transport and general convenience makes Barrow rather than Whitehaven the natural centre for the people of Millom and it is significant that consultant surgeons from the Barrow Group now conduct regular out-patient clinics there, payment being settled at the Regional level, since Millom is part of the Newcastle Region.

The Effective Population Served by Each Department

The effective population served varied between the various departments and for the main acute specialties the effective populations are as follows:—

Department	*Effective population served*
General medicine	116,908
Pædiatrics	115,418
General surgery	120,441
Gynæcology	121,161
Obstetrics	116,616
Orthopædics	106,626
Ear, Nose and Throat	110,942
Ophthalmology	121,069
Average	116,147
Average all acute specialties	115,903
Administrative area population (Annual statistical returns of the Manchester Regional Hospital Board)	106,000

ii. THE OVERT DEMAND FOR HOSPITAL CARE

The first aim of the survey was to repeat in the Barrow Group the Nuffield Trust's earlier studies at Norwich and Northampton, and to facilitate comparison the same method was used to estimate the effective or overt demand for hospital care.

In any period the number of patients died and discharged, plus or minus the change in the waiting lists, gives the number of patients who would have been admitted had beds been readily available. This total, multiplied by the average duration of stay of those died and discharged, gives the number of bed days required at an occupancy rate of 100 per cent. This can be converted, by

dividing by the number of days in the period, into the 'critical number' of beds required. From the critical number of beds the 'actual number' required can be calculated by adding twice the standard error attached to the sample. Estimates can be made for various rates of occupancy to suit particular conditions or customs in different specialties. The actual number would hold the waiting lists constant: to reduce the waiting lists one or more beds would have to be added, according to the rate at which it is desired to run down the lists.

The items required to calculate the critical number are: the number of patients died and discharged, their average duration of stay, and the state of the waiting lists, all separated for the various specialties. Form S.H.3, used for making routine statistical returns to the Ministry of Health each year, contains this information and the hospital secretaries in Barrow were therefore persuaded to make an S.H.3 return monthly to the investigation, thus allowing an analysis of seasonal variation. Extra forms were kindly supplied by the Ministry of Health. As a change in the method of compiling the diagnostic analysis (see below) extended the survey period to 15 months, the opportunity was grasped to have S.H.3 forms made out for 15 months too, so that a tentative appraisal could be made of any changes in demand from one year to the next, at least so far as the January-March quarter was concerned. The practice of compiling the returns monthly instead of annually from the admission and discharge registers proved popular with the secretaries, since it prevented an arduous chore at the end of the year. All acute specialties were included; mental, mental defective, and tuberculosis beds were excluded.

(*a*) *General Medicine*

Actual beds allocated = 70
Actual beds estimated = 71

Table (*a*) in Appendix III shows the estimates of the number of beds required for general medicine; 74 beds were allocated to this department but 4 of these are at the Ulverston Hospital and it has not been practicable for the consultant to make use of them. Four beds do not justify the presence of a junior house physician, and Ulverston, at 8 miles, is thought to be too far from Barrow for these medical beds to be controlled from North Lonsdale Hospital. Thus there are really only 70 beds available for general medicine.

The heaviest demand for general medical beds occurred during the October-December quarter of 1957 because of the influenza epidemic. The unexpectedly slight seasonal variation—fifty-one per cent. of admissions occur during the six winter months—has affected the calculation of the critical number so that during October to December 1957 the number of beds estimated (71) falls short of the number required (80). This is the only exception, however, and during the other quarters throughout the 15-month period the beds required are within the number estimated. Had only 71 beds been provided during October-December the extra demand could have been met by raising the occupancy rate from 85 per cent. In fact throughout the period, which included the influenza epidemic, with only 70 beds available the occupancy rate was about 90 per cent. so that beds for emergency purposes were always available.

Waiting-lists for general medical beds were small throughout the period of the survey and showed little change (21 at January 1957 and 23 at March 1958); 90 per cent. of admissions were immediate. The majority of admissions were by telephone request by the patient's general practitioner to the R.M.O. or resident duty doctor. Only a minority could be classed as 'Emergency' in that there was urgent need that day for treatment or investigation only possible in hospital. Certainly few of the immediate admissions for the uncomplicated cases of peptic ulcer, diabetes in the elderly, or chronic recurring heart or lung disease were clinically urgent but they accounted for one-quarter of all medical in-patients. There was no difference in the respective waiting periods for men, women and children, and all cases admitted from waiting lists waited an average of only 6 weeks. (The waiting period for out-patient consultation was about 2 weeks.) A typical waiting-list, by sex, age, presumptive diagnosis (as noted by a records clerk) and duration of waiting period is reproduced on p. 47.

This list reflects the changed pattern of medical morbidity and therapeutic possibilities. It is significant that of the 15 patients 4 were waiting for an assessment of new hypotensive drugs and 2 for new anticoagulants with the hope of retarding the disease. Such treatment was not available for these cases before 1950. At the same time it might be asked whether some of these waiting cases, perhaps a third, could not have been investigated further, if not completely, as ambulant out-patients. Moreover, the nature of disease on a

	Age	*Presumptive diagnosis*	*Weeks on list*
Men:	53	Hypertension	5
	54	Anticoagulant treatment	4
	60	Anticoagulant treatment	4
	47	? Pleural effusion	8
	16	? Delayed puberty	10
	59	? Regurgitation of food	7
Women:	49	Stabilization of diabetes	15
	45	Diabetes	12
	43	? Peptic ulcer	8
	43	? Diarrhœa	2
	64	Hypertension	5
	58	Hypertension	5
	57	Migraine	28
	56	Hypertension	4
	48	Anæmia	8

waiting list for medicine is often different from that in surgery in that the former's pathology is usually progressive in contrast to the static or 'cold' surgery of elective repair.

(*b*) *General Surgery*

Actual beds allocated = 81
Actual beds required = 88

Table (*b*) shows the estimated number of beds required for general surgery. This recommends an increase of 7 beds over the number at present allocated. Again, however, there is a deviate quarter (January to March 1957) when, assuming an 85 per cent. occupancy rate, 12 extra beds would have been required. Throughout the period the rate of occupancy was over 90 per cent.

Six of the 81 surgical beds available to the group are at Ulverston Hospital, and in view of the distance from the North Lonsdale centre it is not possible to provide full-time supervision by a house officer. These 6 beds therefore cannot be said to have the same value as the beds at North Lonsdale and their use is mainly limited to appendicectomy, hernial repair and stripping varicose veins. For most purposes therefore the surgical bed complement is only 75. On the other hand, it should be remembered that the 36 beds at Aldingham Hall are virtually used as recovery beds in a continuation hospital rather than as pre-convalescent. By achieving a high occupancy rate it has been possible to reduce the surgical waiting lists: in January 1957 the surgical waiting lists totalled 317 and

only 245 in March 1958. The average waiting period for men, women, and children was 10 weeks. There was, of course, considerable variation about this mean. For example, most herniæ waited about 12 weeks while varicose veins waited about 10 months, circumcision 2 months, hypospadias 2 years and so on. As all the waiting surgery was elective, the waiting period was determined by medical and social priorities. The important waiting time is really for out-patient consultation, which in the case of general surgery was only one week in Barrow. Even so the average waiting period for a bed in Barrow is relatively short compared with the rest of the Manchester Region or the country as a whole, and it is emphasized that this situation has been reached by the surgical and nursing staff achieving a rapid bed turnover. The number of beds available is not the only consideration in reducing waiting lists for surgery. At present in Barrow, for example, it is doubtful if additional beds would make much appreciable difference to the rate at which the lists are being reduced because the use of the one available theatre at North Lonsdale is rationed and shared with other specialties. Extra beds would, however, permit an increase in the duration of stay which in some cases is probably desirable. At present many surgical cases go to the recovery and pre-convalescent home at Aldingham Hall with their wounds still sutured. In one or two cases discharge from North Lonsdale has probably been too soon and the patient has had to be readmitted to North Lonsdale from the recovery home for additional treatment.

(*c*) *Pædiatrics*

Actual number of beds allocated = 27
Actual number of beds required = 15

There has recently been discussion about the possible closing down of a children's hospital. The hospital concerned is mainly for long-stay cases with a case-load largely composed of chronic heart and lung diseases, cerebral diplegia, and crippling conditions of bone and joint, for example from old osteomyelitis. The passing of chronic children's diseases of this type (except for the spastic) is one of the reasons advanced in suggesting that the hospital is no longer needed in its present form. Be that as it may, the event certainly indicates the current trend in pædiatrics. It is often said that apart from the newborn the problems confronting the child specialist now are mainly emotional or connected with

congenital malformation—and the pædiatrician is neither a psychiatrist nor a highly specialized surgeon. In Barrow, however, pædiatrics is a new and developing specialty. Before 1956 the area was served from Lancaster by a visiting pædiatrician, but a consultant pædiatrician has since been attached permanently to the Group and a ward block of the former infectious diseases hospital at Devonshire Road was converted into a pædiatric unit with 27 beds. It was opened in June 1957. There was undoubtedly a need for a child health service in the Furness area in view of the high mortality rates there among young children:—

Specific Infant and Child Death Rates per 1,000 (*all causes*)

	Males aged		*Females aged*	
	0–1	1–4	0–1	1–4
Barrow	41	1·1	30	2·4
England and Wales . .	32	1·3	24	1·1

(Registrar General's Decennial Supplement 1951, Area Mortality.)

While one applauds the provision of this service and the quality of the pædiatric unit one cannot help wondering if the bed provision is not perhaps too generous (although the number was settled by the ample size of the available building). Table (*c*) shows the estimated number of beds needed for pædiatrics at 15 against 27 actually available. During the period January to March 1958, 17 beds were needed at 85 per cent. occupancy, but this was somewhat inflated by the admissions caused by the outbreak of Asian 'flu (the critical number is based on the number of patients discharged and during January patients admitted late in 1957 were being discharged). However, as the unit was only established in mid-1957 it is very likely that its full contribution has yet to be made, and as the service becomes more appreciated the pædiatrics case-load may well increase and need more beds than the calculation based on the survey period suggests. Experience in medical care usually shows that the provision of a new facility reveals needs which were previously unmet. Moreover, as it becomes increasingly realized that the seeds of mental health and emotional stability are sown in childhood and in the close family circle, the contribution

of the child health specialist towards reducing the long-term burden of adult neurosis might be greater in effect than individual psychotherapy of the middle-aged. Thus the appointment of a pædiatrician before a psychiatrist may be sound planning, although by the same token the focus of attention should be on the home, with the pædiatrician working closely with the family doctor, rather than placing the child in the isolation of a hospital bed.

(*d*) *Traumatic and Orthopædic Surgery*

Actual number of beds allocated = 35
Actual number of beds required = 30

This department showed a greater variation in bed occupancy than any other during the survey period. The range was from 53 per cent. in March 1957 to 93 per cent. in May 1957, with an average for the 15 months of 74 per cent. There is of course a high proportion of casualty admissions included in this specialty and in Barrow it is higher than usual as relatively little other orthopædic work is done and an even occupancy rate is difficult to maintain. The waiting-list showed no change in total during the period (it remained low at 26 cases) but a reduction was achieved in the average waiting time from 6 weeks to less than 4. The beds given to this specialty total 35, but 9 of these (at the former Public Assistance Institution) are rarely used because Roose, without X-ray or a lift, is obviously unsuitable for orthopædic work and, practically speaking, the bed complement in orthopædics is only 26. Estimates of the critical number required suggest (Table (*d*)) that 30 orthopædic beds are needed. Again there is a deviate quarter, January to March 1958, when 34 beds (critical number plus twice the standard error) would have been required at 85 per cent. occupancy. Again, a raised rate of occupancy would have overcome the bed deficiency.

(*e*) *Ophthalmology*

Actual number of beds allocated = 13
Actual number of beds required = 13

A consultant ophthalmologist is attached to the Barrow Group on a basis of seven sessions per week. He is the only eye specialist in this corner of Lancashire and naturally has many commitments (e.g. Local Education Authority clinics). The effective population

served by this specialty is over 120,000, second only to gynæcology, where there is a full-time consultant. The average waiting time is the longest of all specialties with 5 months for men, 3 months for women, and 1 month for children, after excluding cataract patients from the waiting lists. (Cataracts have been excluded because they often have to wait for some years until they are 'ripe' for removal.) The average waiting period for out-patient consultation is 5 weeks. Enquiry among local general practitioners revealed that, alone among the specialties provided by the Barrow Group, there is reason for the G.P. to recommend private consultation where he thinks the patient can afford the fee. Even so, the waiting-lists fell over the 15 months from 40 to 33. It is therefore difficult to say whether or not the 13 beds recommended by Table (*e*) represent the true need of Barrow for ophthalmic beds. There seems little doubt that the district could provide work for perhaps an ophthalmic registrar and more clinic sessions, possibly with a G.P. clinical assistant who had acquired further post-graduate training in ophthalmology. A G.P. ophthalmologist, however, is a rare combination, partly because there are ample opportunities for people with ophthalmic training to reach specialist posts.

(*f*) *and* (*g*) *Ear, Nose and Throat*

E.N.T.

Actual number of beds allocated = 10
Actual number of beds required = 15

Tonsils and Adenoids

Actual number of beds allocated = 10
Actual number of beds required = 4

Twenty beds, all at the North Lonsdale Hospital, are allocated equally between tonsils and adenoids and other ear, nose and throat purposes, according to the Group statistical return. But this division does not represent actual usage. For example on this artificial book-keeping the occupancy rate for tonsils and adenoids would have averaged 41 per cent. and for other operations over 135 per cent. The estimates in Tables (*f*) and (*g*) suggest that 4 T. and A. beds and 15 others would be adequate to the needs at 85 per cent. occupancy. The waiting list for tonsillectomy and adenoidectomy fell from 138 to 55 while that for other operations

remained steady at 37. The average waiting period for a bed was 3 months for adults and 1 month for children, and for out-patient consultation only 2 weeks for adults and 1 week for children.

The E.N.T. ward at North Lonsdale is situated in former staff quarters, and is really a suite of small rooms. By using folding partitions the allocation of beds between the sexes or between adults and children can be varied to suit needs, and the wards come remarkably close to the mixed wards favoured by modern hospital planners.

(*h*) *Dermatology*

Actual number of beds allocated = 8
Actual number of beds required = 9

Table (*h*) shows the estimates of beds needed for dermatology. The recommended number of 9 beds shows an increase of only 1 bed over the present allocation. There are two deviate quarters, April to June 1957, and October to December 1957, when respectively 17 and 11 beds were required. To some extent this is explained by the fact that Barrow shares a consultant dermatologist with some other groups of the Manchester Region. He has small numbers of beds at various places, and admits his patients on a semi-regional basis; that is, if he has the temporary use of beds normally allocated to other specialties at Barrow, he sometimes admits patients from groups other than Barrow. The estimates in Table (*h*) are therefore somewhat inflated in the deviate quarters. The average occupancy rate of over 100 per cent. is also inflated because beds allocated to other departments were thus used at the Devonshire Road Hospital.

The average waiting period for in-patients was less than 4 weeks, but it was 6 weeks for out-patients. There are, however, allergy clinic sessions, run by a local general practitioner as clinical assistant in dermatology, for which the out-patient waiting period is only one week.

(*i*) *Gynæcology*

Actual number of beds allocated = 35
Actual number of beds required = 41

At present 35 beds are allocated to gynæcology in the Barrow Group; 27 are at Roose Hospital and 8 at Ulverston Hospital. As

with the general surgery beds, those at Ulverston are not functionally of the same value as the beds in the main hospital because the range of the case-load they can carry is limited. Table (*i*) suggests that at 85 per cent. occupancy 41 gynæcological beds are needed in Barrow. The occupancy rate prevailing throughout the survey period was 96 per cent. The actual numbers estimated for the various quarterly periods are affected by the size of the standard error attached to the critical number and the standard error for a 3-month period is much larger than for 15. Thus, in only one quarter—October to December 1957—does the annual estimate exceed those for the quarters. The greatest difference occurs in the period April to June 1957 when 52 beds would have been required if the occupancy rate were 85 per cent.

The Barrow Group has a first-class gynæcology service which preceded the National Health Service by 10 years. The present consultant was employed before the appointed day by Barrow Corporation and Lancashire County Council as full-time consultant and thus has had more time than his fellow-consultants to develop his specialty there. A wing of the former public assistance institution at Roose has been converted into a gynæcology unit but the design of the building (constructed in the 1870s) sets limits to the general comfort and convenience of the place. Even so the range of work done in this department and the variety of the case-load are unusual for a provincial non-teaching hospital. The department serves an effective population larger than any other specialty in Barrow, over 121,000. The waiting-list increased from 70 to 99, the average waiting period being 6 weeks, but in many gynæcological cases this is fixed ahead to relate to menstrual dates. The average waiting period for out-patient consultation was only one week.

(*j*) *Obstetrics*

Actual number of beds allocated = 44
Actual number of beds required = 44

The estimates in Table (*j*) apply only to the 44 beds available at the Risedale Maternity Hospital and not to the general practice maternity beds at North Lonsdale (4), Ulverston (5), and Oubas House (10). It is now accepted that maternity homes should be used for confinements appropriate to institutions on social grounds, leaving the maternity hospital beds for the vulnerable clinical

groups: e.g. toxæmia, the older primiparæ, those with a parity of 4 and over, and those with an obstetrical or gynæcological history of complication. These factors certainly determine admission to Risedale and the estimates suggest that the present bed complement is adequate to such cases as seek admission. Yet 42 mothers in the high-risk groups were delivered at home by a midwife or G.P. (see p. 72).

(*k*) *Infectious Diseases*

Actual number of beds allocated = 8
Actual number of beds required = 4

(*l*) *Consultant Dentistry*

Actual number of beds allocated = 0
Actual number of beds required = 1

Tables (*k*) and (*l*) show the estimates of beds required for infectious diseases and consultant dentistry respectively. In the case of infectious diseases the calculation of the critical number is not particularly useful owing to the uncertain nature of the demand. The present allocation of 8 beds for this department is probably best left unaltered, and treated as a reserve, the beds meanwhile being used for some other purpose. This flexible approach is, of course, most feasible where the beds are controlled by one specialist.

Chronic Sick

The Barrow Hospital Group was fortunate in 1948 in inheriting two former Public Assistance Institutions which could be used for the care of the chronic sick. Roose Hospital has 146 beds and Stanley Hospital at Ulverston 121, making 267 beds in all. There is therefore no shortage of chronic sick beds in Barrow but neither is there an abundance, an incorrect impression gained from looking only at the ratio of beds to the population of the administrative area. The effective population actually served in this section is over 135,000. To relieve the shortage of chronic beds in other groups cases have been admitted from as far away as Lancaster, Preston and Blackpool. In Barrow too there is the common problem of the administrative conflict between the Hospital Management Committee's function of providing for the chronic sick, and the Local

Authority's responsibility for providing for Part III Accommodation for the aged, but not sick, poor. It is often not possible to discharge patients from the chronic sick wards, although they are no longer in need or receipt of medical attention, perhaps because they have no home (and refuse transfer to Part III Accommodation) or because their relatives will not have them. Transfer to Part III is often resisted by patient and relatives because a charge can be levied for the inmate's upkeep by the local authority, whereas, of course, the Hospital Management Committee cannot charge for the care of the chronic sick. There have been cases where the physician-geriatrician has judged the patient fit for discharge to Part III, but acceptance has been refused by the lay opinion of the welfare officer. Some hospital groups have attempted to solve this problem by making a single joint appointment to the post of geriatrician and medical officer of health, assuming that the incumbent in his dual capacity could hardly quarrel with himself (and this has not always been a correct assumption). In Barrow, however, there seems to be a genuine shortage of Part III Accommodation and homes for the care of old people. At times the situation has developed where a direct admission to a chronic sickbed is only made on condition that another patient is moved to Part III. The position might perhaps be eased somewhat if minor nursing could be undertaken at the two old people's homes in Barrow. As it is, the mildest onset of bronchitis usually results in transfer of the patient to Roose Hospital. In general, however, there appears to be little difficulty in transferring patients from acute beds to the chronic wards. This, of course, is not unexpected as the transfer is within the hospital service and, moreover, under the ultimate clinical responsibility of one consultant physician.

The critical number of beds required by the chronic sick department was calculated, but has not been included in these tables (the average appears in the summary) because the quarterly fluctuations were too wild. The method does not seem at all appropriate for chronic sick, partly because the result is affected by the average stay of patients died and discharged and this is in months or years rather than days. Thus when patients die who have been in hospital for two or more years the average stay for that quarter soars and with it the estimate of the critical number of beds. The position of the chronic sick requirements for hospital beds cannot be separated from the question of Part III Accommodation under

the local authority. For technical reasons it was not possible to include Part III in the survey.

Summary

The volume of work done by the Barrow group of hospitals is an impressive record. During the 15 months of the survey period the acute specialties dealt with nearly 10,000 in-patients, 13,000 new out-patients, and 56,000 out-patient attendances. Adjusted for the 12 months of 1957 and expressed per thousand average effective population these figures show that 70 people in every 1,000 were admitted to hospital (89 when all types of bed are included, such as general practice maternity, and pre-convalescent) while nearly 100 in every 1,000 attended as a new out-patient. Compared with England and Wales the admission rate in Barrow is high—89·3 to 74·0 per 1,000: based on the administrative population it

In-Patient Deaths and Discharges per 1,000 *Population, and Average Duration of Stay in Days by Department, England and Wales and Manchester Region* 1956, *and Barrow Group* 1957.

Department	*England and Wales*		*Manchester Region*		*Barrow Group*	
	Number	*Stay*	*Number*	*Stay*	*Number*	*Stay*
General medicine	11·1	22·0	9·6	20·3	11·0	16·9
General surgery	18·5	13·5	15·6	13·0	22·5	10·3
Pædiatrics	2·1	16·7	1·8	17·9	2·1	15·3
Gynæcology	6·1	10·8	5·7	11·1	9·1	10·9
Obstetrics	9·6	11·7	7·7	11·9	11·0	9·6
Orthopædics	5·0	25·8	4·2	25·9	4·8	11·9
E.N.T. (T. and A.)	4·5	4·5	3·5	3·6	3·0	3·6
E.N.T. (Other)	2·4	8·3	2·4	8·8	3·0	11·1
Ophthalmology	2·0	13·3	1·0	14·2	1·8	18·3
Infectious diseases	1·6	21·0	1·6	19·4	0·3	13·7
Dentistry	0·5	3·7	0·4	5·1	0·7	2·2
Dermatology	0·4	30·6	0·3	32·8	0·4	44·3
Pre-convalescent	1·6	15·5	2·0	13·6	8·7	10·0
Chronic sick	2·4	170·8	2·8	167·0	5·6	140·6
Special care babies	0·6	16·6	0·7	16·5	0·3	33·1
G.P. maternity	1·5	10·9	2·9	9·9	3·6	9·7
G. P. medical	2·5	15·1	1·4	12·1	0·6	2·9
Private pay	1·6	14·2	1·3	15·6	0·8	12·4
All departments	74·0		64·9		89·3	

Source: Ministry of Health's *Digest of Health Service Statistics*, 1956 and Form S.H.3 applied to the Barrow Group 1957 using the average effective population.

is 99·1; in most departments, however, the average duration of stay in Barrow is lower, a measure of the efforts made by all concerned with the running of the hospitals. The higher admission rates and the shorter duration of stay can be seen in the table on p. 56.

Figures of particular interest are the shorter duration of stay in all departments except ophthalmology and dermatology. The consultant dermatologist is aware that he tends to keep his patients longer than some of his colleagues in other groups, but rightly bases this on his experience that premature discharge in this specialty often results in readmission. In Barrow admissions to private pay beds are only half the national average indicating the relative absence of opportunities for private work and the area's concentration of lower social classes. Compared with England and Wales admissions in Barrow for general surgery are 20 per cent. higher, for obstetrics 20 per cent., for gynæcology 56 per cent., and for chronic sick 100 per cent. higher. These four departments account for over half (48·2 per 1,000) of the total annual admissions to hospitals in Barrow.

Summary of Present Beds and Estimate of Number Required

Department	*No. of beds at present allocated*	*Estimate of Actual number of beds required*	*Estimated No. of beds required per 1,000 effective population**
General medicine	70	71	0·607
Dermatology	8	9	0·076
Pædiatrics	27	15	0·13
General surgery	81	88 (1)	0·733
Orthopædics	35	30	0·28
Ear, nose and throat	20	19	0·171
Gynæcology	35	41	0·338
Obstetrics	44	44 (2)	0·376
Ophthalmology	13	13	0·109
Dentistry	—	1	0·013
Infectious diseases	8	8	0·08
Total acute specialties	341	339	2·913
Chronic sick	267	258	1·9

(1) Excluding recovery and pre-convalescent beds.
(2) Maternity hospital beds only; i.e. excluding G.P. maternity beds.
* i.e. using effective population for each specialty.

iii. CASE-LOAD ANALYSED BY AGE, SEX, DIAGNOSIS AND DURATION OF STAY

Comparisons between the respective case-loads of different areas are difficult because local conditions tend to determine different interpretations of the lines dividing the specialisms. For example, what would be a pædiatric case in one district might well be dealt with under general medicine in another, peptic ulcer is shared between medicine and surgery and within surgery itself, trauma, particularly to the head, may be retained as a casualty case or go to the general or the orthopædic surgeon. So that the quality of the case-load in Barrow could be compared with those revealed in the companion studies at Luton and on Tees-side a diagnostic analysis was prepared. Initially the attempt was made to base this analysis on a 10 per cent. sample, but after a trial period of three months (January to March 1957) it became apparent that the number of admissions involved was too small to give effective cover to the wide range of diagnoses coming forward. Accordingly the sample approach was abandoned (except in gynæcology, where a sample of three-months' operations was used) and a diagnostic analysis was prepared for all cases admitted between 1st April 1957 and 31st March, 1958, inclusive (see Appendix IV). In each case the diagnosis was given on discharge by the consultant or house officer in charge on forms specially prepared for the survey. Other information for identification purposes (name, age, sex, address, etc.) was compiled on admission by members of the survey team. It is gratifying to note that although there are nine hospitals in the Barrow group, and consequently many transfers, only 3 per cent. of patients were not caught in the survey.

General Surgery

Tradition dies hard. When Barrow was served largely by the North Lonsdale Voluntary Hospital, staffed by general practitioners acting as honorary consultants, the case load was predominantly surgical in character; and today general surgery dominates all other available specialties there, accounting for one-quarter of all patients admitted in the hospital group. This is almost double the medical patients and equal to obstetrics and gynæcology combined. One-quarter of the bed-days are taken up by surgical cases. The average duration of stay, 10 days, is shorter than the average

of both the region and the nation (each 13 days). This average duration was uniform for both sexes and all age groups, except those aged over 65, being 16 days for elderly men and 19 days for the women.

As the Summary Table in Appendix IV shows (page 140), patients were divided fairly equally between the sexes and evenly distributed over the various age groups; exceptions are boys under 15, and young women between 16 and 45. The high admission figure for boys can be attributed to the 36 circumcisions (perhaps an unnecessary operation), 43 head injuries (only 19 to girls in this age group) and 22 herniæ (to 8 girls). The high representation of young females is accounted for by thyroidectomy (24 to 1) and their increased proneness to undergoing appendicectomy (137 to 83).

The progress of modern surgery and anæsthesia, in enabling successful operation on the fragile aged, is reflected by the fact that 322 patients were aged over 65. Indeed, this almost equals the 346 in the medical wards out of the total 911 elderly in acute beds.

Analysis of diagnostic groups (p. 61) shows that appendicectomy is outstanding, accounting for 24 per cent. of admissions and 21 per cent. of bed-days. Of these operations, 158 were on boys or young men and 234 on young females, which is about the overall pattern of the country.

The second largest group were the 300 patients admitted for genito-urinary operations of various kinds, amounting to 14 per cent. of all surgical admissions. This may reflect the particular interest of one of the two consultant surgeons in this special field. There were 54 men admitted for prostatectomy, 44 of them being aged over 65, and these required on the average three weeks in hospital. On the other hand, the 51 men with papilloma of the bladder were not so elderly and stayed in the acute wards for an average of only five days. With waiting times for cold elective surgery only a few months (in contrast to years in most other hospitals) there were 438 venous or hernial repairs in the year. With fewer urgent admissions and less seasonal variation than in general medicine, the surgical beds can call in such cases and so achieve a planned turnover of beds with a high and economic occupancy rate of over 90 per cent. The 79 operations on varicose veins were mainly in middle age for both men and women, but the tendency was for hæmorrhoidectomy to be performed on older women. Together, these two venous operations accounted for about 10 per

cent. of patients and bed-days, just about equalling repair of herniæ. Of the 140 cases of inguinal hernia 48 were men aged between 46 and 65, a further 18 men were young and 20 were youths.

Other diagnostic groups appear relatively unimportant in terms of numbers of patients, but are high consumers of bed-days. Peptic ulcer, cancer, and cholecystectomy all appear in this sector of around 5 per cent. each. The peptic ulcer cases undergoing surgery were predominantly middle-aged men, staying an average of 18 days. As pointed out before (p. 33) the Standardized Mortality Rate for 1950–53 of men with peptic ulcer in Barrow was 150 and this 50 per cent. surplus for all ages was indeed almost double in elderly men, accounting for some 30 deaths in the four years. In 1957, 24 men over 65 were treated as medical in-patients and a further 14 in surgical wards, although only 7 underwent gastrectomy. It is speculative to ask if, perhaps, more dyspeptic old men in Barrow might need hospital care. Of the 81 cases who had the gall bladder removed, over half were women over 45 who stayed three weeks. The 116 cancer cases stayed an average of three weeks also. The figure of 116 for total cancer cases may seem low, and although it should be remembered that Barrow is visited by a specialist in radiotheraphy from Manchester, and these tables do not include the cases dealt with in the regional centre, such cases are mainly accessible cancers and not treated by internal surgery. Again, it is interesting that after investigation there were only 21 cases of simple breast lumps, while another 32 had mastectomy for cancer of the breast, but none had ablution of adrenals or pituitary for advanced disease. This reflects the conspicuous absence of rare diagnoses and rare or only recently popular techniques in all the clinical tables. All the categories are common and 'workmanlike' and with such short waiting lists such a policy must promote the bringing of early surgical benefit for the greatest good to the greatest number in the area.

Injuries caused only 9 per cent. of admissions and took up only 5 per cent. of bed-days; the average stay for injury was only seven days, but 20 cases of burns averaged over a month in hospital.

Of the 191 cases in the injuries group a remarkable feature is the large number (101) of head injuries admitted with concussion or for observation, staying in hospital for less than three days. Other short stay cases included 79 superficial infections, whose abscesses were incised and who stayed about a week, and cases of minor surgery.

To these we may add three groups of cases on whom no surgery was performed: a miscellaneous 33 where conservative treatment sufficed, 28 for investigation only, and 25 where no diagnosis was made. With simple head injuries including concussion, minor surgery and superficial infections, all these cases amount to 14 per cent. of patients and 7 per cent. of bed-days. One wonders whether

Summary Table of Main Groups in General Surgery with the Total Number of Patients and Bed-days

	Total Number of Patients	*Total Bed-days*
Appendicectomy	539	5,289
Peptic ulcer—Gastrectomy	79	1,523
Other	31	435
Total	110	1,958
Cholecystectomy	81	1,774
Carcinoma stomach, colon, rectum	67	1,771
Carcinoma breast	32	802
Carcinoma, other	17	407
Total cancer	116	2,980
Prostatectomy	64	1,204
Papilloma of bladder	62	342
Other genito-urinary	174	1,567
Total G.U.	300	3,113
Hæmorrhoidectomy	87	882
Varicose veins operations	124	1,171
Hernia repair: Inguinal	195	2,031
Other	32	326
Injury: Burns	20	591
Head	128	532
Other	43	277
Total injury	191	1,400
Miscellaneous other	171	1,407
	1,942	22,251

Note.—This table combines the general surgery in North Lonsdale Hospital in Barrow with the Cottage Hospital in Ulverston to give the total surgery in the Group.

it might not be desirable to provide some sort of observation ward or a few '48 hour' beds in Barrow (there is no such facility at present) to deal with many of these minor cases, probably at some saving on other hospital services. Nevertheless, the amount of 'solid and sensible' surgery in the wards is impressive.

General Medicine

Of all patients admitted under the acute specialties in the Barrow group, general medicine accounted for 15 per cent. and 24 per cent. of the total bed-days. The average duration of stay was 19 days on the study calculation (which excludes transfers) but 17 on the Hospital Form S.H.3 calculation, which is the standard comparison for England and Wales (22 days) and the Manchester region as a whole (20 days). The distribution and average duration of stay was much the same for all age and sex groups, with the exception of middle-aged men; here the average stay was 28 days. This dominant group of men represented 23 per cent. of all medical patients, and took up 25 per cent. of medical bed-days. Coronary heart disease (52 men to 15 women) and influenza with chronic bronchitis and its complications (50 to 10) are the main reasons for a relatively higher admission rate among middle-aged men.

It is interesting to compare the proportions of patients and bed-days for the various diagnostic groups. (See Summary Table (p. 65) and Appendix IV.) Thus, non-tubercular chest diseases account for 30 per cent. of the patients but only 25 per cent. of the bed-days, while heart disease, despite the low Standardized Mortality Rate for Barrow, provides 20 per cent. of the patients and 30 per cent. of bed-days—each case of coronary heart disease and hypertensive heart disease had an average stay of 30 days. Peptic ulcer and its complications represented only 10 per cent. of patients, but 17 per cent. of bed-days; here the emphasis of treatment in Barrow was on a four-week régime of diet and bed-rest away from home, in terms of medical and nursing requirements, very similar to that of coronary heart disease.

Coronary heart disease in 52 men aged 46–65 is the largest single diagnosis in any age group, but equalled by combined chronic chest disease of the same age and followed by peptic ulcer in 32 men aged 16–45. Between them, heart disease, peptic ulcer, and chronic chest disease represent 60 per cent. of the medical case-load in terms of patients and 70 per cent. in terms of bed-days. It is noteworthy

that during the winter 'flu epidemic only 41 patients required admission to hospital, and remarkable that rheumatic fever has so declined that even in a northern industrial area there were only 3 hospital cases in 1957, in contrast to 5 poliomyelitis cases.

The diagnosis requiring the longest in-patient care appears to be carcinoma of the bronchus (the average stay of those who survived to discharge was 38 days). Although ranking fifth in cause of death, the fact that there were only 14 cases of lung cancer admitted during the year probably reflects the realization that medically little can be done for such cases. Similarly there were only 18 cases (staying an average of 29 days) of cancer of the intestinal tract. A further 9 cases of carcinomatosis in the medical wards were usually in advanced stages, requiring only terminal care. There were also only 11 patients with leukæmia which may reflect the low S.M.R. for the area, but their stay of 16 days each could appear brief for such an illness, unless it is noted that the less rare myeloid type is delayed in its advance by the new antimitotic drugs given to out-patients in Barrow so that most of the in-patient days are taken up by the terminal stages, which would be distressing at home. It should be remembered, of course, that this survey was confined to the specialties provided specifically by the Barrow group, and did not apply to services organized on a regional basis, e.g. radio-therapy. Cancer cases admitted in Barrow do not, therefore, reflect the incidence of the disease in the Barrow area, because 'accessible cancer' and other new or hopeful types, were dealt with through the regional service with consultants based on Manchester travelling on circuit for out-patient interviews in peripheral hospitals. Again, cases of cerebral tumour would be transferred, often directly from out-patients, to the neuro-surgeons at Preston or Manchester so that only 7 were listed in beds in Barrow.

Despite the S.M.R. of males 138 to females 102, of the 68 cases of diabetes there were twice as many women as men, but over all the average duration of stay was short at 16 days. There were only 7 cases of cholecystitis in the medical wards and these all in women, although 8 men and 7 women were treated conservatively in the surgical wards while 81 had their gall bladders removed there. Of the 14 rheumatoid arthritics only 3 were men while there were 7 osteoarthritic men and 7 women. There were only 4 patients with pernicious anæmia and 12 with iron deficiency anæmia requiring beds. These low figures reflect, on the one hand, that the more

serious disease in each group occurs rarely, and even then seldom demands a hospital bed, while the common disease in each group is largely met by the G.P. himself, with the occasional help of the out-patient department. In the 34 cases of barbiturate poisoning and overdosage, too, women provided twice the incidence of men, the average stay being one week. The 25 epileptics admitted stayed an average of only 3 days, and the 34 psycho-neurotics 11. Some, of course, were awaiting transfer to Lancaster Moor Mental Hospital. It is to be hoped that the Barrow Hospital Management Committee, in the absence of a locally resident psychiatrist, is successful in its efforts to appoint a full time psychiatric social worker to the group; perhaps many of these admissions might have been avoided if facilities had existed to tackle the underlying emotional illness at a much earlier stage, particularly in the home with support to the family and skilled guidance to the G.P.

A remarkable feature of the analysis by age, sex and diagnosis is that despite an S.M.R. for vascular lesions of the C.N.S. of 120 for males and 113 for females, and an average annual urban death toll of 120, only 6 men and 20 women over the age of 65 were admitted with a 'stroke' or cerebral arteriosclerosis. It is more likely that most of these elderly 'strokes' were immediately fatal or were cared for at home by relatives and the family doctor, rather than admitted directly to the chronic sick hospital. The few cases admitted to acute wards occupied beds for less than 3 weeks on the average, due to the ease of transfer to chronic sick beds under the same physician. Acute beds blocked by such elderly cripples appear to be conspicuously absent in Barrow, indeed, out of a total 1,129 acute medical in-patients, only 346 were over age 65, a marked contrast to most other general hospitals.

SUMMARY TABLE OF MAIN GROUPS OF MEDICAL DIAGNOSES WITH THEIR TOTAL NUMBER OF PATIENTS AND BED-DAYS

	Total Number Patients	*Total Bed-days*
Heart Disease		
Coronary thrombosis: acute	129	3,887
Hypertensive	58	1,571
Mitral Stenosis	34	663
	221	6,121
Chest Disease		
Chronic bronchitis and emphysema	91	1,407
Cor pulmonale	34	695
Broncho-pneumonia	35	582
Influenza	41	466
Carcinoma of bronchus	14	531
All other chests, asthma, pneumonia, etc.	116	1,596
	331	5,277
Peptic Ulcer		
Peptic and duodenal ulcer	75	2,350
Hæmatemesis from peptic ulcer	34	706
Hæmatemesis undefined	12	460
	121	3,516
Carcinoma gastro-intestinal	18	523
Diabetes mellitus	68	1,059
Cerebral hæmorrhage	35	621
Thrombophlebitis	20	560
Other	315	3,982
TOTAL:	1,129	21,659

Orthopædics

This department accounts for 7 per cent. of patients and 10 per cent. of bed-days the average duration of stay being 12 days. This average stay is in sharp contrast to the figure for the Manchester Region and England and Wales—26 days. The relatively short stay in Barrow no doubt reflects the fact that less than 15 per cent. of the case-load is non-traumatic and long staying, and consequently there is an emphasis on shorter staying injuries. This emphasis on injury is shown by the number of admissions among men of working age, 220 to 127 women.

The injuries themselves were somewhat dominated by the fractured femurs. This diagnosis contributed 20 per cent. of the patients but 60 per cent. of the bed-days. Indeed, their 5,000 odd bed-days were half those of all obstetrics, less than all heart disease, and equalled by appendicectomy in general surgery. Nearly half of the fractured femurs were elderly ladies who stayed an average of 53 days. No other specialty has to face such a large and specific need from a single diagnosis and, moreover, predominant in one sex. These fractured femurs are, of course, of the neck of the femur in the elderly and of the shaft at other ages. With an ageing population, particularly of women, the prospect of an increase in this large group has to be faced, because the actual fracture is only the result of several processes of a degenerative senile kind of osteoporosis aggravated by disuse atrophy of muscle and bone and with the increased risk of falls and accidents to the elderly from vertigo or lack of exercise. The social and pre-geriatric aspects of encouraging physical activity suggest hope of 'secondary' prevention in reducing and postponing the chances of fracture. Because of this burden of elderly women the average patient in this specialty tends to be much older than the average for other acute specialties, thus over one-fifth of all patients were over age 65, in contrast to less than one-tenth over all other specialties.

Most of the other fractures involved a duration of stay of only one week or less. Exceptions were the 102 cases of fractured feet (of whom 73 were women) staying for 9 days, and 63 cases of fractures of the tibia and fibula with a stay of 10 days. Four-fifths of all cases were fractures, yet another 191 cases of injury came under general surgery, giving a total of in-patients for accidental injury of 574 out of a total for general surgery and orthopædics of 2,481, i.e. only 23 per cent. The remarkable feature of the case-load is the very low amount of non-traumatic surgery. Osteomyelitis is, of course, a disappearing disease as the G.P. uses antibiotics in early sepsis. It could be that some of this sort of work is done in out-patient departments, keeping the patients ambulant, but it should be remembered that no observation or special '48 hour' beds are available in Barrow. On the other hand it should be recalled that the effective population draining into Barrow in orthopædics was the lowest of all the specialties, being 13 per cent. less than general surgery, gynæcology or ophthalmology. Moreover, in the sample period of three months some 20

orthopædic cases, mainly children and often long stay cases, were found as 'exports' in other hospitals in the region. It is thus more likely that with the relative absence of special skills and facilities in the isolated peninsula the need for 'cold' orthopædic correction is not usually translated by patient or family doctor into demand for hospital care, apart from the few who seek it with inconvenience in other hospitals. The following table shows the distribution of the main groups:—

	Patients	*Bed-days*
Fractured femur	106	5,274
Fractured feet	102	872
Fractured tibia and fibula	63	671
Fractured humerus	24	180
Fractured hand	24	110
Other fractures upper limb	42	148
Fractured other bones	49	456
Total fractures	410	7,711
Knee cartilage	46	502
Osteoarthritis	10	148
Osteomyelitis	9	128
Other conditions	39	331
Total non-fractures	104	1,109
Total Orthopædic	514	8,820

Surgery of the Ear, Nose and Throat

The sole E.N.T. surgeon in Barrow accounted for 9 per cent. of all patients and 5 per cent. of bed-days. Although removal of tonsils and adenoids took only 1 per cent. of bed-days with an average of 3 days (equal to Manchester but less than the national 4½ days) all the other operations took 4 per cent. of bed-days at an average of 11-day stay (in contrast to less than 9 elsewhere). These other operations were evenly spread through the age groups, except for 119 men of working age in contrast to 69 women. The table on p. 68 shows the age distribution in childhood and adolescence for the 305 T.s and A.s. This distribution reflects the pattern for the country, with the increase starting at age 4 and rising sharply to a peak by ages 5 and 6, falling later, although girls, of whom there are more anyway, decline less rapidly even as young women.

A total of 305 T.s and A.s in an effective population of 110,000 is a rate of 2·8 per 1,000. This compares with a 1955 finding by the

Tonsillectomy and Adenoidectomy: Distribution by Age, Sex, and Days in Hospital

	Male			*Female*		
Years of age	*Number of patients*	*Mean days*	*Total days*	*Number of patients*	*Mean days*	*Total days*
1						
2				1	3	3
3	2	3	6	5	4	20
4	12	3	36	15	3	45
5	29	3	87	25	4	100
6	24	3	72	28	3	84
7	20	3	60	19	3	57
8	12	3	36	15	3	45
9	6	3	18	8	3	24
10	8	3	24	6	3	18
11	1	3	3	6	4	24
12	1	7	7	6	3	18
13	4	3	12	2	3	6
14	2	3	6	4	3	12
15	1	3	3	3	3	9
16–45	9	5	45	29	4	116
46–65	2	5	10	—	—	—
Total	133		425	172		581

Note.—These cases represent 94 per cent. of the patients discharged. A further 18 were discharged untreated (usually because they had colds at the time and were unfit for operation).

Registrar General of Urban 4·2 and Rural 2·7. However, these overall rates conceal wide variations between town (the Glover (27) effect described by Morris) and between individual practices, as one would expect in view of the well-known range of opinions on the value of the operation in a self-limiting malaise whose natural history reaches a peak within a year or two after the child begins school and then quickly declines (as described by Fry (28)). The following table gives the range of variation by type of practice in Barrow-in-Furness.

There is little obvious difference between the large industrial practices and those based on the small villages, farms and the upper-class country residences. It should be emphasized that all operations are done by the single E.N.T. surgeon in the area and there is scarcely any private E.N.T. practice. Thus the main factors in hospital demand stem from outside, that is, from the anxiety of the parent interacting with the outlook of the family

Rate for Removal of Tonsils and Adenoids by General Practice, Type and Size

		List size 000	Number of Patients Male	Female	Total	Rate per 1,000 list
Urban						
Partnership	1	3·5	5	7	12	3·4
	2	5·2	9	9	18	3·5
	3	5·3	9	5	14	2·6
	4	7·0	12	12	24	3·4
	5	7·4	8	14	22	3·0
	6	10·2	19	20	39	3·8
	7	10·3	7	11	18	1·7
Single-handed	8	1·3	0	0	0	0
	9	1·4	2	1	3	2·1
	a*	2·9	—	1	1	0·3
	b*	4·0	7	6	13	3·2
Rural						
Partnership	10	3·8	1	6	7	2·0
	11	5·3	11	7	18	3·4
	18	5·0	—	2	2	0·4
	19	3·8	—	—	—	0
	20	3·0	—	—	—	0
Single-handed	12	1·7	2	3	5	3·0
	13	1·9	1	1	2	1·0
	14	2·0	1	2	3	1·5
	15	2·3	3	8	11	4·8
	16	4·6	3	6	9	2·0
	17	2·9	2	6	8	2·8
	21	1·4	6	3	9	6·4
	22	1·4	2	2	4	2·8

* See Note to Table X, Appendix V.

doctor. The School Health Service did not appear to affect the variation between practices.

Ears

With antibiotics freely available in general practice, it was a little surprising to find 41 acute infections out of the total 112 ear cases treated successfully by antibiotics alone, whilst a further 23 went on to mastoidectomy. Nevertheless, this picture must be only a minute reflection of the proportion two decades ago before antibiotics. Still, today they account for well over half the ear in-patients in Barrow.

Nose

Of the 131 nasal cases the largest group were the 48 operations for sub-mucous resection. As well as being almost one-third of nasal

in-patients they accounted for one-third of bed-days with an average stay of one week. A further one-fifth of patients were in hospital beds for treatment for epistaxis. Of these 27, 11 were over 65 years old but the elderly only contributed one more with sinusitis, 3 ear cases and 9 throat cases, mainly for endoscopy.

Throat

Of the 76 throat cases 53 were males. The outstanding procedure was laryngoscopy and œsophagoscopy, 31 cases in all, and a further 12 who needed foreign bodies removed from their throats.

The restricted range of diagnoses, investigations and operations may, as in orthopædics, reflect the limited skills and facilities in the area and this is also seen in the effective population attracted to the hospital, which is second lowest. E.N.T. is the only specialty without full consultant grade in the area.

Eyes

The ophthalmic surgeon accounted for 3 per cent. of the in-patients and 4 per cent. of the bed-days, the average length of stay being 16 days, compared with 14 for the Manchester Region and 13 for England and Wales. The rate of 1·8 per 1,000 population compared with the regional 1·0 and 2·0 for the nation. The drainage area was one of the three largest, equalled only by gynæcology and general surgery. There was a fairly even distribution between males and females, except for 71 men of working age to 39 women (mainly due to injuries). Indeed, all but 6 of the 51 injuries were to men, and of these 22 were burns. On the other

Distribution of Eye Patients by Diagnosis. Age Group and Bed Usage

	Predominant age	*Number of patients*		*Bed-days*	
Cataract	Elderly	38		810	
Retinal detachment	Young adults	11		505	
			(49)		(1,315)
Injury	Working men	51		604	
Strabismus	Children	52		745	
Glaucoma	Elderly	20		392	
Other		61		736	
		233		3,792	

hand there were 31 women over 65 in contrast to 18 elderly men, mainly admitted for cataracts. The heavy individual users of bed-days were 11 cases of detachment of the retina consuming 505 days, and 38 cataracts consuming 810 days as shown in the table on p. 70.

It is noteworthy that over half all patients were either children under 15 years or the elderly over 65 years. It may be asked if these extremes of age were the best companions in a hospital ward.

Obstetrics

Pregnancy and its complications accounted for almost 18 per cent. of all hospital patients and almost 13 per cent. of bed-days. The average stay in Barrow was 9 days in contrast to almost 12 days in both the Manchester Region and England. These figures do not include the 19 beds available to general practitioners. The admission rate per 1,000 population in the hospital area was 11·0 compared with 7·7 for the region and 9·6 for the nation. Indeed, between 1950 and 1957 there was an increase of 10 per cent. to 69 per cent. of births in the town being delivered in hospital in contrast to the national average of 64 per cent. and the recommended 70 per cent. of the Cranbrook Report (29) as shown in the table below:—

Percentage of Births in Institutions in Barrow and Lancashire County Compared with Range in County Boroughs and in England in 1950 *and* 1957

Administrative area	*Percentage of births in institutions*	
	1950	1957
Barrow-in-Furness C.B.	59	69
Lancashire County Council	62	68
Lowest C.B.—Sunderland	46	40
Highest C.B.—Southport	85	91
England	61	64

The admission rate to maternity beds per 1,000 N.H.S. list of individual practices (see Appendix V p. 144) showed two distinct groups. In 12 out of the 16 on which rates were obtainable there was a remarkably steady rate of between 4 and 8 for both urban and rural practices. This fits in well with the estimate (Cranbrook

Report, para. 193) that if 70 per cent. of mothers are confined in hospital then a G.P. can expect to look after 5 cases a year at home for every 1,000 on his list. The other 4 practices, however, gave rates of 13, 20, 21 and 27 and were all in the town. About one-third of the town's citizens were in these 4 practices, which were not obviously overloaded with young and fertile women. Assuming a standard age and sex distribution, this suggests that practically all these mothers were delivered in hospital.

In 1957 for Barrow residents there were 704 births in hospital including those in the 4 beds for use of G.P.s in the North Lonsdale Nursing Home. 271 mothers were delivered in their own homes by the 6 municipal midwives and a further 32 in 'other places'. The further medical aid of the family doctor was summoned for 36 deliveries and the 'obstetric flying squad' was called out once to a case of postpartum hæmorrhage.

The average of one maternal death each year since 1950, at least for the town itself of 60,000 inhabitants, and a further one for rural mothers delivered in the town's hospital from the surrounding 50,000 country folk, is one-third higher than expected and, indeed, for mothers aged 25 to 44 gave a S.M.R. almost 50 per cent. above the national rate.

There were 42 mothers delivered outside hospital in the vulnerable groups described by Heady and Morris (30) which are liable to treble the risk of fœtal loss, e.g. old primiparæ, 'elderly' multiparæ and women with twins or a history of four pregnancies or previous fœtal loss. Indeed, of the mothers in their fourth parity or over, 32 were delivered at home and 13 were over 35 years old, while only 35 were in hospital. On the other hand, of the young mothers under age 25 having their second or third child, i.e. the age and parity group with the lowest fœtal risk, 71 were delivered in hospital but only 52 in their own homes. Again, for the similarly safe parity of 2 or 3 and age 25–34 years, the figures were 189 in hospital to 108 at home. The mother may have conflicting loyalities between caring for the young children at home and the obstetric need to leave them and enter hospital.

Of the 43 births to the 42 mothers in the high-risk groups, one was a still-born twin-birth to a woman in her early thirties and her fifth pregnancy. One baby, live-born to a mother of 5 others in her late thirties, died at home on its second day and a third baby within the first month to a woman over 40 years old after her sixth preg-

nancy. Two further babies were still-born at home to two young women, one of whom was unmarried. Thus, 3 if not 4 out of the total of 5 baby deaths at home occurred within the vulnerable high-risk categories. These mothers susceptible to fœtal loss can be defined even before conception.

The table below outlines this fœtal loss:

Outcome of Births at Home of Women in Five 'Vulnerable' Groups Resident in Barrow

Vulnerable group	*Live-birth*	*Still-births*	*Neo-natal deaths*
Primiparæ age 35+	1		
Multiparæ age 40+	14		1
Loss previous child	19		
Twins *	1	1	
Previous births 5+	14		1
**Total	49	1	2
Other perinatal loss			
Primiparæ age 20–24			
Legitimate	31	1	
Illegitimate	4	1	
Total domiciliary births	271	3	2
Total hospital births	704	17	10

* Twin and four previous pregnancies.
** Of the 42 pregnancies, 6 were doubly vulnerable and 1 trebly.
Of the total 32 perinatal deaths in the town 18 were premature births but only one had been born at home, the others were in the Maternity Hospital.
(Figures from Medical Officer of Health of Barrow.)

The biological indications for choosing home or hospital confinement are obviously and grossly flaunted and in the face of this upside down picture it is not very realistic to discuss demand as reflected in clinical need. It should be emphasized that no mother in these vulnerable groups or with other clinical need is ever delayed admission if she or the doctor desire it. Indeed, the average length of stay of 9 days (so short for Britain but still twice that of North America) results from normal births being discharged early to make room for the abnormal or poor risk. In fact, the co-operation between the municipal midwives and the hospital obstetrician is so effective that the number of early discharges from hospital to the care of the midwife for follow-up nursing at home increased from 31 in 1956 to 53 in 1957. These 6 midwives are also responsible for reporting on the home conditions which are stated as

unsuitable in the applications for hospital delivery. Only 2 extra beds, or a reduction in stay of less than one day would suffice to admit the 42 vulnerable mothers. In the northern states of the U.S.A. almost all children are born in hospital with an average stay of 8 days after Cæsarian and 4 days after other deliveries, but, as one-third more pregnant women are delivered in hospital, the days demanded for maternity beds per 1,000 population are about the same. The American mothers settle for fewer days in hospital but hospital for all births. Indeed, it is a cultural and social stigma for a healthy mother to have her baby in her own home, while midwives only exist in the poor coloured states of the Deep South. By marked contrast, the cultural tradition of Holland is quite the opposite for place of confinement, accoucheur and technique. The Dutch mother prefers, and almost 80 per cent. choose, their own bedroom with the local midwife in attendance, no anæsthetic but often the support of the husband during the actual delivery. Shortly after delivery a 'mother's help' (a maternity aide with 3 months' theoretical and 12 months' practical training) arrives to help and live with the family for about 10 days. The attitude of the British mother is between those of Holland and the U.S.A., while the Swedes, with 96 per cent. confinements in hospital, emulate the practice of white Americans.

Despite the opposing rituals surrounding childbirth it is of interest that they appear to have little, if any, effect on the clinical

Comparative Rates of Mortality in Infancy in some Western Countries and Towns

	1956 Sweden	*1957 Holland*	*1957 England & Wales*	*1957 Manchester*	*1957 Barrow*	*1957 Rotterdam*	*1955 U.S.A.*
Crude birth rate per 1,000 population	15	21	16	18	15	18	25
Still-births per 1,000 total births	17	17	22	26	19	16	13
Infants within 7 days per 1,000 live births	12	10	14	18	15	10	—
Perinatal death rates	29	27	36	43	34	26	—
Neonatal death rate (within 28 days)	13	12	16	21	15	11	19
Post-natal death rates (29 days-12 months)	4	5	7	9	12	5	—
Deaths under 1 year and stillbirths	34	34	45	55	46	32	39
Infant mortality	17	17	23	30	27	16	26

results. The table on p. 74 shows the lowest fœtal and infant loss is in large Dutch towns. Moreover, such figures show that although the infant mortality rate in Barrow has fallen from 38 in 1952 to 27 in 1957 and that its rates for still-birth and neo-natal deaths are below the average for England and Wales, nevertheless, its total fœtal and infant death toll is almost 50 per cent. higher than the average large Dutch town. Differences in actual housing accommodation, nutrition and standard of living are very difficult to establish. Hope of reducing the gap will probably be more in the attitudes and quality of motherhood and housekeeping and medical care rather than in the physical environment or availability of clinical skills.

Pædiatrics

The case-load in the separate pædiatric ward represented 3·6 per cent. of all patients and also 3·5 per cent. of the total bed-days; these cases were pædiatric medical cases. However, the total demand made on hospital services by children aged 0–15 represented over 9 per cent. of all patients, spread over most of the available specialties, but of the total 1,281 juvenile patients, 609 or

Barrow In-Patients Age 0–15 Years by Sex and Cause

	Boys	*Girls*
Tonsillectomy	122	143
Acute ear infections	18	30
Pædiatrics	120	130
General medicine	17	14
Appendicectomy	75	97
Circumcision and genital	55	0
Inguinal hernia	20	4
Injury—Head	43	19
Other	19	17
Other general surgery	54	47
General surgery total	(266)	(184)
Strabismus	14	31
Orthopædic fracture	46	28
Orthopædic other	13	7
All other conditions	58	40
Total all specialties	674	607

almost half were surgical and confined to three clear groups, 265 in tonsillectomy, 172 in appendicectomy and 172 in accidents, mainly fractured limbs or head injuries. Thus, less than half of all children were under the direct supervision of the pædiatrician and, indeed, the majority were in the separate North Lonsdale Hospital, under the other specialties, as shown in the table on p. 75.

The original 9 beds in the main hospital for medical pædiatrics were insufficient and it must have been tempting to convert an empty fever hospital into 28 children's beds even though it was two miles away from the main hospital with its pædiatrics out-patients' department, and the sole diagnostic facilities of X-ray and clinical pathology. Nevertheless, it might have been better to keep in physical contact with the other specialties, as pædiatrics (and possibly geriatrics too) is defined by age span but does not represent any disease group and indeed 31 juveniles were treated in the general medical beds.

Indeed, the case-load in the adapted isolation hospital included some cases where liaison with the other hospital departments might have been needed by the pædiatrician, e.g. 3 superficial abscesses, 5 tonsils, 11 otitis media, 3 impetigo, 15 infectious diseases, 6 poliomyelitis, and 13 meningitis.

Considering the first locally resident pædiatrician only arrived in 1956 it is noteworthy that the 2·1 admission rate per 1,000 population was higher than the regional 1·8 and already equal to England and Wales. The average stay in the pædiatric medical wards was 15 days compared with 17 days in England and Wales and 18 in the Manchester Region, but still a long time for children to be away from their parents. The analysis by age for medical pædiatrics shows that of the 250 children admitted under this specialty, only 60 were aged 6 or over. Thus, the majority of patients were under school age. During the year, out of 975 births registered in Barrow town itself, there were 63 premature babies, but only three of these were admitted to the pædiatric unit (beds for 'special care babies' are also available at Risedale Maternity Hospital).

The diagnostic analysis shows that one-quarter of the bed-days was consumed by respiratory infections, mainly infections of the upper and lower respiratory tract and pneumonia. Other large groups were feeding problems and babies with gastro-enteritis. Only 6 were diagnosed as neuroses. Cases of epilepsy and poliomyelitis tended to stay in hospital for the longest period. As in

the categories of diagnoses under medicine and surgery it is noteworthy how rarely rare diseases occur or are diagnosed in 12 months in a population of 110,000.

The changed picture of child health today, even in an industrial town, is reflected in the conspicuous absence of the recent epidemic diseases of tuberculosis, both bovine and pulmonary, rickets, malnutrition, anæmia and even rheumatic fever. Again, 88 per cent. of children were less than 6 years old. Pædiatrics today is often concerned with two large 'new' groups, congenital defects, particularly as modern investigations define them, and modern therapy increases their chances of survival, and with the still ill-defined group of psychosomatic disorders in upset children where little or no physical 'cause' can be found. It is surprising that no child with cerebral diplegia or asthma was an in-patient although they could well have been out-patients. Rare disease illustrates the problem of setting up and maintaining clinical skills, technical facilities and maintaining professional contact. In an isolated population of 110,000 the hospital consultant has the basic problem of the general practitioner with his population of two or three thousand. There cannot be a neuro-surgeon in every town and a G.P. cannot be a neurologist. But someone has to suspect the rare cases and know where to send them.

Barrow infants, however, still have a post-natal mortality from the second to the twelfth month inclusive of 12 per 1,000 births. These are from common infections, mainly of lungs and less of intestine, and are much higher than even Manchester and treble such infants in Sweden and South Holland, including Rotterdam. Again, the range in the rates of hospital admission from 1,000 population in individual practices varies from 0·6 from rural practices with a mean of about 1·0 to between 1·4 to 15·9 with a mean of 3·0 in town practices. The pædiatrician maintains 'that if the G.P. requests admission the case must be accepted', but also she feels she 'could rightly do more domiciliary work with young babies'. All this suggests that the mere provision of hospital beds and a consultant pædiatrician alone do not meet the needs with real death risks of a child population. Rather the increasing co-operation with the pædiatrician and the Medical Officer of Health suggest new ways and opportunities for improving the level of child health in the area by focusing on the home and the family doctor.

Gynæcology

Gynæcology accounted for 14 per cent. of the case-load in terms of patients and 12 per cent. in terms of bed-days. As the only specialty established in Barrow before the health service—and that by nine years—it had the largest effective population draining into the town compared with the other specialties. This larger denominator reduced the rate per 1,000 population estimated by the Regional Board from 9·1 to 8·5 but this is still 50 per cent. higher than the regional rate of 5·7—England and Wales is 6·1.

The average length of stay of 11 days is the same as the Manchester Region and the rest of England in general. This remarkable volume of work kept the average waiting time for a bed at 6 weeks and much of this was fixed by menstrual dates. Elsewhere such waiting time is often in months, if not years.

Without the usual burden of a large waiting list for a bed and with out-patient appointments within a week, both the patient and the gynæcologist have no restriction on clinical skills and techniques in meeting demand. This may explain the striking point about the age analysis in that 75 per cent. of the patients were aged 44 or less, women still of child-bearing years. Furthermore, the case-load is very evenly spread over all diagnoses and conditions, and no single item can be said to predominate as in most of the other departments. This refutes the saw that only five operations can be done in this area including repair of the ureter! Indeed, hysterectomy accounts for only 11 per cent., less than the 14 per cent. of dilation and curretage for abortion. Repair of the pelvic floor was done in 15 per cent. and in half before the menopause. Infertility was investigated in almost 9 per cent. of in-patients and abnormal bleeding in 8 per cent.

The range of work in this department in the provinces is very extensive, as the diagnostic analysis reveals. Certainly for an isolated population it is in marked contrast to E.N.T. and orthopædics. Perhaps a few cases could be classified as general surgery, but the reason is that in Barrow the gynæcology and general surgery wards are in different hospitals, and rather than transfer patients to another hospital, surgical conditions are operated on while the patient is still in the gynæcology unit—a sensibly flexible arrangement. These surgical operations are, of course, close to the confines of gynæcology. Also in an emergency when the gynæco-

logist is not available one or other of the general surgeons operates in territory held to be gynæcological. Radiotherapy is under the regional specialist based in the centre in Manchester. Thus operations on the cervix accounted for only 69 cases. When the technical facility of Papanicolaou histopathology with specially trained laboratory assistants becomes available in Barrow, besides the huge increase in clinical pathology work from cervical smears taken in out-patients and general practice there will be a smaller increase in cone biopsies and also in ward patients. This may lead to a reduction in the 1950–3 Standardised Mortality Rate for uterine cancer in Barrow of 117 in contrast to the North-West's 106 and the national 100.

iv. THE CASE-LOAD TO BE EXPECTED (PROJECTION OF POPULATION TO 1977)

What effect will changes in the future age and sex structure of the population have on the demand for hospital services? It is obviously impossible to answer this question with any degree of precision because there are so many variables in the situation and so many assumptions have to be made. Nevertheless it is an interesting speculation, and if the aim is limited to a rough indication, bearing all the necessary assumptions in mind, the statistical exercise of forecasting future demand may be useful.

Population by Sex and Age Group served by the Barrow Group of Hospitals projected from 1951 *to* 1977

Age-group	*Population* 1951 (*a*)		*Population* 1977 (*b*)	
	Male	*Female*	*Male*	*Female*
0–15	13,600	12,900	13,200	12,500
16–45	23,500	23,600	24,700	23,800
46–65	13,500	14,500	14,100	14,300
66–	6,800	7,500	9,400	10,100
All ages	57,400	58,500	61,400	60,700

(*a*) Population at the 1951 Census.
(*b*) It is assumed that the population of the Furness area will experience the same relative changes as the population of the rest of the country. Migration is assumed to be nil.

The table suggests that in 20 years' time the population at risk will have increased overall by about 5 per cent. The likely effect of this change on the demand for hospital services, however, will be greater, because the various age-groups made different demands on the hospitals in 1957, and there are differences in their relative change over 20 years. The analysis by age, sex and duration of stay shows the differences between the age and sex groups in their consumption of bed-days.

Total Acute Specialties in Barrow: Percentage Distribution of Patients and Bed-days by Sex and Age Group in 1957

	Male		*Female*	
Age Group	*% All Patients*	*% Total Bed-days*	*% All Patients*	*% Total Bed-days*
0–15	8·7	7·1	7·9	6·5
16–45	9·2	9·1	36·0	30·5
46–65	9·6	12·8	9·9	11·1
66–	5·0	9·9	13·3	12·6
All ages	32·5	38·9	67·1	60·7

In total, it appears that fewer men than women go into hospital but tend to stay longer. Elderly men over age 65 are only 5 per cent. of all patients but account for 10 per cent. of all days, while elderly women, although 13 per cent. of patients, needed only 13 per cent. of bed-days. (The proportion of women going into hospital is of course inflated during the ages of childbearing and menstruation by the Obstetric and Gynæcology Departments.)

The effects of age on the demand for bed-days are shown clearly by the fact that patients of both sexes below the age of 45 represented some 62 per cent. of all patients but took up only about 53 per cent. of the total bed-days. Ages above 45 were 38 per cent. of all patients and took up 47 per cent. of all bed-days.

Assuming this pattern of demand will be repeated in 20 years' time, and applying the proportionate changes in age and sex structure to the bed-days consumed by the respective age and sex

groups, that is, assuming all things remain constant except population, we find:—

Total bed-days estimated for 1977 for Acute Specialties by Sex and Age-Group

Age-Group	*Male*	*Female*
0–15	6,234	5,657
16–45	8,638	27,534
46–65	11,948	9,870
66–	12,264	15,192
All ages	39,084	58,253

This total of 97,337 bed-days represents an increase of 8·8 per cent. over the corresponding total for 1957. Thus, bearing in mind all the necessary assumptions, an increase of 5 per cent. in the population is likely to lead to an increase of nearly 9 per cent. in the bed-days required to meet demand. As the average rate of occupancy for most departments in Barrow in 1957 was 90 per cent. or higher, it is apparent that the extra demand can only be met if hospital provision is raised above the current level—always assuming that the disease pattern and the treatment pattern remain unaltered.

This, of course, is most unlikely. Indeed the disease pattern and its treatment are changing so markedly as to overshadow the comparatively small demographic changes of age and sex distribution. The new and increasing epidemic diseases alone of coronary thrombosis and lung cancer in middle and later life, with new methods of control of the former, will produce effects on hospital demand far beyond 8·8 per cent. extra beds in 1977. On the other hand, the continued fall in duration of stay in hospital (15 per cent. in the past 10 years) and more home care could swing the arithmetic back again. Even today in many English hospitals the stay for coronary infarct has been reduced from four to three weeks. Applied to Barrow this reduction would have meant 5 per cent. fewer medical bed-days or beds freed to take another 70 patients. Possibilities of variation in the pattern of treatment form an interesting question and it is largely the subject of the next section.

V. 'NEED'—CLINICAL, SOCIAL AND TRADITIONAL

As was stated in Part I, one of the objects of this survey was to examine some of the assumptions on which the critical number method is based. In particular, it was considered desirable to see how far effective or overt demand for in-patient care corresponds with purely clinical need, rather than with the needs caused by social inadequacies, gaps in the health services, or medical traditions.

Some would have it that with the removal of financial obstacles to securing admission to hospital, demand would become elastic in one direction only and any beds provided would be used irrespective of need. In this respect it is relevant to note that in North America, where hospital care is chargeable by item of service and also by the day, the average duration of stay is much lower than in Britain (31), (see Appendix IV p. 141). For example the average duration of stay in American maternity hospitals is 4 days: in Britain it is 10 days. For all acute beds the average American stay fell between 1937 and 1957 from 13 to 7 days and in Britain from 14 to 12 days.

To estimate clinical necessity in Barrow, the medical adviser to the investigation made quarterly tours of the wards, discussing in each case with the consultant or his deputy the patient's condition and the possibility of the case having been dealt with in the out-patient department or on a domiciliary basis by the patient's general practitioner. In each case an assessment was made of the clinical necessity for admission, and where admission was not deemed strictly necessary on clinical grounds alone, the main reason for the admission was specified (no home, home nursing too difficult for elderly relatives, etc.). This assessment is admittedly subjective, but given this limitation the strictest medical criteria were used (their general nature can be derived from the selected case-studies following the tables showing the results of this enquiry). Certain assumptions were made as well: for example it was assumed that general practitioners were fulfilling their role inherent in the structure of the National Health Service and were willing, aided by the domiciliary services of the local authority, to undertake home care. It was assumed also that out-patient departments could be organized as polyclinics and had all the diagnostic facilities readily available. In fact, of course, none of these conditions applied. Neverthe-

less, the assessment of clinical need does indicate some of the possibilities inherent in the present structure of the Health Service, for we must assume that future policy can only aim at bringing the promise to reality.

The following table shows the percentage distribution of patients in Barrow who, during four quarterly ward surveys, were considered:

(*a*) To be in need on clinical grounds of care which could only be given as an in-patient;
(*b*) Not, on clinical grounds alone, in need of in-patient care;
(*c*) Doubtful of classification.

Percentage Classification of Patients

	Male			*Female*		
	a	*b*	*c*	*a*	*b*	*c*
General medicine						
1 . . .	—	—	—	50	40	10
2 . . .	50	29	21	52	43	5
3 . . .	70	18	12	30	45	25
4 . . .	45	32	23	40	40	20
All surveys . .	54	25	21	43	42	15
General surgery						
1 . . .	88	6	6	84	10	5
2 . . .	95	5	0	89	7	4
3 . . .	80	10	10	83	9	9
4 . . .	69	14	17	81	11	8
All surveys . .	81	9	9	84	9	6

	Both sexes combined		
Pædiatrics	*a*	*b*	*c*
1 . . .	64	23	13
2 . . .	58	25	15
3 . . .	76	18	6
4 . . .	65	25	10
All surveys . .	67	23	10

Note.—The figure for 'All surveys' is different from the average of the four individual surveys because different numbers of patients happened to be in hospital on each occasion.

It is outstanding that on the four surveys 40 per cent. of the women in medical beds were not on clinical grounds alone

in need of in-patient care, and in a further 15 per cent. there was doubt. The corresponding estimates for men were 25 per cent. and 21 per cent. Much of this difference between the sexes is, of course, an expression of the obvious fact that a sick woman cannot readily be nursed at home when her husband and other relatives are out at work during the day.

Surgical cases showed no difference by sex and few cases were doubtful of classification because once the decision to operate had been taken the assumption had to be that the patient needed a bed. Nevertheless, in 9 per cent. of cases it was agreed that on clinical grounds alone a hospital bed was not needed.

In pædiatrics there was doubt in classification in only 10 per cent. as the outlook of the consultant and medical assessor could be deemed 'English orthodox', and certainly at the time the latter was unaware of the extent of the Newcastle practice or of the Paddington experiment (Lightwood, 32). If the Newcastle criteria for admission to the ward were applied in Barrow those children not on clinical grounds alone in need of a hospital bed might rise from one-quarter to at least one-third, and the Paddington practice of even lumbar puncture in the home might raise the figure further to one-half if not two-thirds.

vi. SOME CASE STUDIES ILLUSTRATING CRITERIA OF CLINICAL NEED

The following case-studies may prove helpful to an understanding of the 'strict medical criteria' used in making the assessment of clinical necessity for in-patient care.

(1) A woman aged 56, married, living in Barrow. Suffering from chronic bronchitis with emphysema and much bronchospasm, she had been admitted to hospital every winter since 1953 for 3 or 4 weeks. This was an arrangement between the patient, consultant, and general practitioner to anticipate relapse or the first exacerbation with the onset of winter, and have the patient in for a month now rather than for 3 months later on. This is intelligent anticipation on the consultant's part, but the patient received nothing in hospital she could not have been given at home by her G.P. Domiciliary nursing and tetracycline for the same period may have had the same result. After all, it hardly changed the patient's climatic surroundings to admit her to an ordinary hospital ward,

with open ventilation, in the town where she normally lived. A chronic rheumatoid arthritis without severe exacerbations was another example of the hospital providing bed rest and nursing care which could have been given at home.

(2) Two cases of a group admitted for investigation: a woman of 47, married and living in a village 8 miles from Barrow. Admitted for investigation by electrocardiogram and also to see the visiting psychiatrist. Another woman aged 49 with dysphagia and angina. Both could have been further investigated in the out-patient department if it were not so inconvenient and if E.C.G. and X-ray had been readily available there and, also, possibly endoscopy.

(3) Another group whose admission to the ward is often considered unnecessary are those patients who faint or are 'found unconscious' in the street or at home but without paresis. Most recover fully, but once in hospital they can stay for up to a week, either because the 'rest does them good' and one can never exclude cerebral neoplasm, or for investigation and treatment which could be given to them as ambulant out-patients or by their general practitioner. For example, a girl of 17 who fainted at work, knocking her head on a toilet seat. Admitted via the casualty department she was transferred to the medical ward after one day when investigation revealed her hæmoglobin to be only 45 per cent. She had iron deficiency anæmia and simple menorrhagia, but these had not been investigated or treated in general practice. She stayed in hospital a week. The decision to make such 'emergency' admissions is usually made by the casualty officer in office hours, but during evenings, nights and week-ends by one of the rota of young resident doctors. Without observation beds, immediate facilities for special investigation, e.g. blood sugar, or E.C.G., or skill at registrar level or over, the recently qualified doctor must 'play safe and admit to the ward.'

(4) Another group reflects the absence of any immediate specialist psychiatric help in the area. The 34 psychoneurotic patients were mainly young or middle-aged adults presenting usually as problems in diagnosis to the G.P. and/or physician. Because the specialist psychiatrist lived and worked mainly in Lancaster, two hours away, and visited Barrow for only two sessions a week, such patients were admitted to the medical ward for some investigations to exclude physical disease, to see generally how they settle down away from the family and to await the psychiatrist's visit. Although

it has been said that psychotherapy and psychiatric first-aid should be the province of the general practitioner first, it must be recognized that no medical school has yet provided such undergraduate training as to make him so competent. Thus to the gap in medical education is added the gap in locally available specialist service.

(5) Another group of admissions reflect essentially inadequate home nursing facilities or the reluctance of the general practitioner to make the fullest use of the domiciliary services available or the medical custom or tradition of hospital treatment in some diseases. Many examples were among the 75 peptic ulcers without hæmatemesis or melæna or other complications. The British G.P. rarely, if ever, does a blood hæmoglobin or fæcal occult blood test (although they take less than five minutes to complete) and although direct access to barium X-ray was available in Barrow it was not widely used by the G.P. The custom in Barrow was admission to hospital for investigation, bed rest and diet of the peptic ulcer whose symptoms persisted on ambulatory treatment at home. Many men, indeed, seem to prefer bed rest in hospital rather than in their own homes. Other examples of medical tradition in Britain restricting the scope of the G.P.'s care were in the many uncomplicated cases in the 68 diabetics and 25 asthmatics.

(6) Those who live alone or as lodgers tend to go into hospital more often and for relatively minor clinical reasons and stay longer as there is 'nobody to look after them'. For example, the single labourer of 32 who fell at work and hurt his ribs. He needed an X-ray which revealed no fractures, and had a week's rest in hospital because his landlady would not look after him at her house. Again, a widow of 70 who lived alone and had collapsed at home stayed 6 weeks in the acute ward, although she was really only mildly confused. She had a married daughter who could not take her for the time being because she was herself in the last months of her second pregnancy. The recent introduction of an almoner should provide much needed social advice and help in such cases, as well as in perhaps up to half all female medical patients. Husbands or relatives are naturally not as proficient in running the house as the wife herself. Home helps and district nurses may not be considered in these cases even when available because they are seen as intruders. On the other hand with the changing pattern of disease, especially at young ages, and oral antibiotics replacing the need for such injections, some 58 per cent. of the district nurse's task in

Barrow now is for patients over 65 and then it is largely geriatric or social.

(7) In surgery the possibilities of assessing clinical necessity were limited compared with general medicine. Much of the surgery was, of course, elective, and once it had been decided to operate then it followed that the operation had to be performed in the hospital. The estimate of clinical need was therefore limited to the other cases, e.g. those admitted for investigation or minor treatment only or for observation. For example: a woman of 56, a mild asthmatic and diabetic, with cellulitis of the legs which she had neglected. She was admitted for one week of antibiotic injections which her general practitioner could have given her. A man of 40 with renal colic, whose pain had gone after a few hours, awaited an X-ray for 4 days, and was discharged after a week. A fit woman of 70 stayed one week with cholecystitis. Why could such cases not have been investigated as out-patients and treated at home? The criteria for clinical necessity did not go as far as to consider injury and minor surgery. In the absence of 24-hour observation beds and perhaps a co-ordinated policy on brain injury with the neuro-surgeon at Preston (3 hours away by car) it is not surprising that 101 head injuries were admitted to the general surgical ward, but for only 2 or 3 days. Again, in the absence—customary in Britain—of minor surgery in urban general practice, some 79 superficial and infected abscesses had to be admitted for incision and dressings to the general surgical ward, where the bulk of work is 'cold' sterile surgery (and where, moreover, there is no bacteriological routine for monitoring cross infections).

It is worth pausing to compare the two extremes between which doctors in Britain can ask for specialist help outside out-patients departments. In a '? acute abdomen', for example, the family doctor may call his surgical friend in for consultation on a domiciliary visit to the home. They may decide it is safe to watch events at home, perhaps overnight, on the understanding that the surgeon may call again or, of course, admit immediately and directly to hospital. In this case natural anxiety of the family is relieved as the situation is under good social and clinical control. Many such cases, particularly in children, settle down and never proceed to operation, but this method requires close professional co-operation and clinical time. Compare the level and possible result of decision-making at the other extreme of a busy G.P. telephoning the clerk

at the bed bureau or a strange house officer (who changes every year anyway). Each at a distance has got to decide alone on admission to hospital on an earlier and lower level of diagnosis, and (in the evening or night or weekend) the decision to operate or not will be made without the patient being examined by a consultant. Apart from the difference in quality of clinical care, hospital bed stay is expensive and may far outweigh the cost of clinical time in the first method. These possibilities in making a surgical decision seemed to contribute little, if anything, to the wide range in rates of referral by G.P's for appendicectomy and tonsillectomy. (See p. 146.)

Similar variation per 1,000 G.P. list for common and fairly standard diseases and operative procedures appears in hospital treatment of coronary thrombosis, peptic ulcer and repair of hernia and varicose veins. This variation suggests that the decision on hospital need is apparently made largely independently by the G.P. and before submitting the patient to the hospital.

(8) Among the pædiatric cases deemed inappropriate for in-patient care were: a girl of 3 with tonsillitis, admitted by a busy and harassed general practitioner unseen, and only on what the over-anxious parents told him by phone, as a case of 'blue pneumonia'. A girl of 6, a psychiatric case of 'chronic constipation' (probably encopresis) who as a result of her condition had been causing no little unpleasantness at school, was in hospital 4 weeks awaiting psychiatric examination. The case, i.e. mother and child, would have been cared for at home more suitably. A girl of 4 admitted as P.U.O., a straightforward uncomplicated case of measles, could have been cared for at home, which was suitable. A boy under observation for heart murmur. He had been in hospital the year before when the murmur was not found to be rheumatic; this had not been mentioned in the report to the G.P. who thought the murmur was something fresh. This admission could have been avoided by out-patient consultation or a domiciliary visit by the pædiatrician. The criteria did not include the 20 infants with feeding problems nor the 24 cases of gastro-enteritis or boils or impetigo with their risk of infecting others. These amounted to almost 18 per cent. of all pædiatric admissions.

On the other hand and in view of the high death rates still from 'pneumonia' in infants in Barrow as in most industrial towns, there are probably many sick children nursed at home who would have

been safer in hospital. Living in an overcrowded barrack tenement near the shipyards or in an industrial street there may well be delay in calling in the G.P. and perhaps further delay in giving antibiotics energetically. Thus the child may rapidly become a candidate for an oxygen tent which can only be adequately managed in hospital. It will take a few years after the arrival of the first pædiatrician for her and the local doctors to sort out the kind of sick child who will benefit most from hospital admission.

vii. GENERAL PRACTICE IN BARROW

The criteria of clinical necessity used in the foregoing estimates and case-studies hinge on the general practitioner as the pivot of the National Health Service, for in the concept of comprehensive medical care embodied in the N.H.S. it is he who should have the first contact with the patient and decide whether or not the patient requires hospital care or investigation. In this sense, therefore, the general practitioner is instrumental in determining the case-load to be borne by the hospitals. This was recognized in the Trust's earlier studies, and an essential feature of the estimates of bed requirements based on the 'critical number' is an enquiry among general practitioners to see if there is any unrevealed demand caused by doctors refraining from putting patients on waiting lists because waiting periods are too long. Because of the general practitioner's important role the attempt was made at Barrow to analyse the case-load in terms of the practitioners referring the patients to hospital, and to relate hospital usage to size of practice list, location and type of practice, use of direct access diagnostic facilities, and frequency and cost of drug prescribing. (See Appendix V.)

Although documentary evidence alone was used, it was recognized at the outset that there are two important objections to such a procedure. In the first place, one would not only judge a wicket-keeper by the catches that he takes but also by those that he misses, and the same principle no doubt should be applied to doctors; but for obvious reasons these cases cannot be documented. Secondly, a doctor's practice is essentially a dynamic situation with changes and developments in the patients perhaps before the particular doctor came in charge of them. But the documentary evidence of one year is a static approach, and may not be at all appropriate. The alternative, of course, would be a study over a very long period, or

an attempt to assess quality and range of investigation by first-hand observation of the doctors at work, as Peterson did in North Carolina (33). This too presents obvious difficulties; for one thing the observed would be aware of the observer and react accordingly. Nevertheless, the attempt at analysis of general practice on the basis of documentary evidence alone was considered worth while and the results are shown in Table 2 and Table 3 of Appendix V.

Throughout 1957 in-patients were classified according to their general practitioner, and the results were related to size and type of practice, average cost and frequency of prescribing, and direct use of hospital diagnostic facilities. The striking thing about these figures is their range of variation:—

Range in In-Patient Rate per 1,000 *Practice List by Specialty*

	Medicine	*Surgery*	*E.N.T.*	*Gynæcology*	*Obstet.*	*Total*
Rural Furness	2–7	13–27	1–8	3–15	6–27	41–66
Barrow Town	8–13	20–35	1–12	4–8	5–7	60–108
Average	11	22	6	9	11	90

The range is equally apparent in the use of direct access diagnostic facilities:—

Range in G.P. usage of Pathological Laboratory and X-ray per 1,000 *Practice List*

	Path. Lab.	*X-ray*
Rural Furness	1–23	7–31
Barrow Town	0–68	6–85

The second striking thing about these figures is the absence of any apparent relationship between size of list and any of the other rates, or between use of direct access facilities and in-patient rate. One would expect either a positive or an inverse correlation between these two, for the G.P. who does his own investigations would either send fewer patients to hospital for investigation, or if he revealed more illness send more patients to hospital. But these series show neither to be the case:—

Rates per 1,000 *Practice List*

	In-patients	*Path. lab. usage*
Urban practices only	61	0
	62	22
	62	42
	71	17
	71	40
	79	18
	83	15
	93	68
	108	14

There is not even any apparent relationship between direct use of the pathological laboratory and the X-ray services. All these figures, of course, relate to partnerships and not to individual general practitioners; this was inevitable, as it was not possible to ascertain whether or not patients had been referred by their own G.P. or one of his partners. Even so, they cast doubt on the theories that practitioners who use direct access facilities most send least patients to hospital, and that relatively expensive prescribing may be offset by lower referral to hospital.

PART III : CONCLUSION

Conclusion

1. SOME COMPARISONS

The initial aim of the Barrow survey was to repeat the Trust's earlier studies at Norwich and Northampton and it is convenient at this point to compare the results of the various surveys. It will then remain to consider the effects on the estimated bed-population ratio for Barrow of the attempts made to refine some of the assumptions necessarily involved in the critical number method, and of course consider the assumptions involved in the refinements. As we indicated when outlining the aims of the survey, this will lead to a consideration of the present range of general practitioner services and the role of the general practitioner himself, for in the present structure of the Health Service the general practitioner is supposed to be a key figure in determining the needs for hospital admission. In the following table the results obtained at Barrow are compared with the critical numbers estimated as appropriate in three other areas:—

Four Hospital Groups: Ratio of Acute Beds to Population. Estimates of the Critical Number of Beds Required per 1,000 *Population at an Occupancy Rate of* 85 *per cent.*

Department	*Northampton*	*Norwich*	*Reading*	*Barrow*
General medicine	0·274		0·48	0·573
Pædiatrics	0·135 } 0·43	0·434	0·12 } 0·60	0·110 } 0·738
Dermatology	0·021		—	0·055
General surgery	0·689	0·689	0·56	0·675
Gynæcology	0·211	0·107	0·14	0·300
Obstetrics	0·269	0·204	0·30	0·355
E.N.T.	0·117	0·122	0·10	0·143
Orthopædics	—	0·305	0·23	0·244
Ophthalmology	0·072	0·059	0·07	0·099
Dental. Incl. in	Gen. Surgery	In E.N.T.	0·003	0·006
Total	1·788	1·920	2·003	2·560

Source: The figures for Northampton and Norwich are for 1950 and 1951 respectively and are taken from *Studies in the Functions and Design of Hospitals*, Chapter 7 (Nuffield Provincial Hospitals Trust). The figures for Reading are for 1956 (Barr, A., 1957, *The Lancet*, **2**, 1105). The figures for Barrow are for 1957.

These estimates of the critical number of beds required at an assumed occupancy rate of 85 per cent. suggest that Barrow needs a higher bed-population ratio than the other groups: expressed per 100,000 population the bed requirements are 256 for Barrow, 200 for Reading, 192 for Norwich, and 179 (excluding orthopædics) for Northampton. Nevertheless the estimate for Barrow is still well below—indeed *half*—the figures envisaged during the early days of the Health Service, when figures of between 500 and 700 were thought necessary.

The main differences between Barrow and the other groups occur in general medicine, gynæcology, and obstetrics:—

Critical No. of Acute Beds Required per 100,000 *Population at* 85 *per cent. Occupancy*

	Northampton	*Norwich*	*Reading*	*Barrow*
General medicine .	27	43*	48	57
Gynæcology . .	21	10	14	30
Obstetrics . .	26	20	30	35

* Including pædiatrics and dermatology.

In all these departments Barrow has a greater effective demand of 25 per cent. than the other areas; on the other hand Barrow has slightly less demand in traumatic and orthopædic surgery than Norwich—24 beds per 100,000 as against 30. Comparisons between the specialties are difficult of course because of the different interpretations of the clinical area appropriate to any particular department; nevertheless, the overall figure for all the available acute specialties is considered significant of the relatively greater demand for beds in Barrow-in-Furness, even though the surveys were conducted in different years. The cause of the difference in bed requirements is much too complex a question to be explored here: it may well, however, be related to different local customs in the division of medical care and investigation between home and hospital, founded on a difference in the range of general practice, or of course to differences in morbidity.

The difficulty of comparing specialties in different places is less restrictive in the case of out-patients if comparison is based on admissions per 100 new out-patients and new out-patients per hundred out-patient attendances.

	Admissions per 100 new O.-P.		*New O.-P. per 100 O.-P. attendances*	
	Norwich	*Barrow*	*Norwich*	*Barrow*
General medicine .	62	110	35	13
Orthopædics .	19	76	36	23
Gynæcology . .	64	80	45	36

Note.—'Admissions per 100 new O.-P.' Admissions here means all admissions, and not merely patients admitted direct from the out-patient department.

In each case Barrow has more admissions per hundred new out-patients than Norwich, but fewer new out-patients per hundred attendances. In the Norwich survey no interpretation of these figures was attempted. But from what is known about the Barrow group it can be said that in orthopædics the case-load contains an abnormal proportion of fractures (invariably immediate admissions) and few patients admitted for arthritic conditions. In gynæcology a first-class service has been developed over the years and with waiting periods for admission down to only a matter of weeks there is no pressure to deal only with urgent cases. The tendency is for early admission from out-patients and to have elective surgery, such as the repair of prolapse, rather than have the patient wear a 'ring'. It may well be that in Norwich there was some unmet need in this respect, although, of course, we have no evidence on this. In general medicine in Barrow there is considerable pressure on the out-patient department and in some cases patients are admitted for investigation because the clinic sessions are too busy to permit investigation on an out-patient basis. Furthermore one-third of the catchment area served by the Barrow group is rural in character with sketchy transport facilities, and where a patient comes from some remote place it is often found convenient to admit for investigation or series of investigations rather than have the patient make several journeys.

For every 100 attendances at the out-patient clinic there are fewer new out-patients in Barrow than in Norwich. This may suggest a tendency on the part of the Barrow consultants to retain the patients rather longer before returning them to the care of the general practitioner. Or perhaps the out-patient departments at Norwich functioned more as diagnostic polyclinics.

We can only speculate here and draw attention to the need for a study of the operation of out-patient departments, with a functional

medical assessment of the case-load as this report has attempted for the in-patients.

2. THE CRITICAL NUMBER

Some of the assumptions necessarily involved in estimating bed needs in different areas on the basis of the critical number method can now be considered in more detail. To state the method once again in broad terms, the critical number takes as its objective material the number of in-patient admissions occurring in a defined population, thereby equating these effective demands with need, and estimates the number of beds required on the basis of the number of bed-days which would have been necessary had it been possible to admit as well all those who were placed on a waiting-list. Further, by enquiring among local general practitioners, the attempt is made to see how far the waiting-list suppresses demand, because doctors may not seek admission at all for their patients if they think waiting-periods are hopelessly long. It goes without saying that the mathematical operation of the critical number is perfectly sound: our purpose here is only to consider whether some of the assumptions can be refined, and whether there are wider issues involved in the number of beds required which may not be revealed by the case-load of former years. The assumptions and further considerations will therefore be considered under the following headings:—

(i) How far can demand, as revealed by the number of patients being admitted or placed on waiting-lists, be equated with need?

(ii) How far is it possible to test the nature of waiting-lists by enquiry among local general practitioners?

(iii) What effect do these two related drawbacks have on the critical number, and how far do they cause it to reflect less the need of an area than the services it has available and uses?

(iv) Is the bed-population ratio itself, however calculated and whatever the variables used, necessarily a reliable indicator of the adequacy of hospital provision?

(i) *Unnecessary Admissions.* How far does effective demand equate with need? When a medical assessment was made of the in-patient case-load at Barrow (see Part Two, 2 (v)) it was found that a number of patients on clinical grounds alone need not have been treated as in-patients. When the critical number of beds is

adjusted in the light of this assessment it is found that Barrow needs 2·3 beds per 1,000 population instead of 2·5, bringing the figure much nearer the estimates for the other areas. It should be clearly understood, of course, that we have no reason for supposing Barrow to be unique in admitting patients for other than strictly clinical reasons. On the contrary, recalling Barrow's short duration of stay, it is more than likely that in the other areas too the case-load could have been reduced if out-patient departments had been organized as polyclinics, or general practitioners had been more prepared to make use of local authority domiciliary services and undertake home care. The difference between the critical number and the adjusted figure reflects the impact of conditions external to the hospital service—local housing conditions, availability of domiciliary services, attitudes of general practitioners and so on. In other words, even patients suffering from the same disease may vary in the demands they make on the hospital, and the variation depends on their social circumstances. It may well be that there is as much variation in these circumstances between areas as in the pattern of disease. We have no means of knowing how far these social conditions inflate the critical number estimates in other areas, but in Barrow in general medicine and surgery and pædiatrics alone, they inflate demand to the order of 8 per cent. or 0·2 acute beds per 1,000 population. It appears, therefore, that the critical number method overstates the number of beds actually clinically needed and that the number of in-patient admissions does not necessarily reflect the need for in-patient care.

(ii) How far does the estimate of bed-needs based on the critical number suppress demand because waiting-lists do not reflect the true extent of unmet need? An attempt has been made in earlier studies to deal with this aspect of the situation by conducting an enquiry among local general practitioners to see if they hesitated to present patients for admission because they knew waiting-periods to be very long. The enquiry held in Barrow revealed nothing to suggest that the waiting-lists (which are short anyway) were in any way suppressing demand, but it is difficult to know what value to give to enquiries of this kind. These enquiries are really opinion polls and attitude surveys, and as such are valuable if deficiencies are so marked that general practitioners are immediately conscious of them; but in none of the areas where these enquiries have been carried out has this proved to be the case.

General practitioners are no more able than anyone else to think outside the confines of their everyday tasks and environment; they are usually busy people, the enquiry is retrospective and dependent on memory, and they may have spent years in the particular conditions governing admission to hospital in the locality. This is seen in the paucity of non-traumatic orthopædic surgery and perhaps in the dearth of psychotherapy in Barrow. In practical terms, a general practitioner may become resigned and accustomed to issuing trusses to his herniæ patients as a permanency rather than send them to hospital to go on a three-year waiting-list, or the woman herself put up with the discomfort of her feet and not complain or be aware of the possibility of relief.

In these circumstances enquiry about a shortage of beds tends to become narrowed to a consideration of beds for emergency cases only.

(iii) As we have seen, estimates based on the critical number reflect the actual number of admissions rather than the need for in-patient care, and the success of measures to test the extent of unmet need is open to question: how far therefore does the critical number reflect the services available and used? The issue is somewhat obscured because estimates of the critical number of beds required are usually given for an occupancy rate of 85 per cent., without reference to the occupancy rate actually prevailing in a particular area. Thus when estimates are given at 85 per cent. occupancy for areas where the occupancy rate is customarily higher it appears that more beds are needed, whereas in fact the estimate is saying the occupancy rate in this or that area is 'too high'—a different question altogether. A high rate of occupancy is too readily assumed to be a sign of overcrowding: it may well be a sign of good teamwork and efficiency (it certainly is in the hotel business). The practice of comparing bed-population ratios in different areas at a set occupancy rate is perhaps inevitable if the aim is to compare on a standardized basis; but the actual occupancy rate prevailing is one of the most important factors in the situation and to remove it from consideration renders the comparison unrealistic for most purposes.

All these related points can be seen in the following table, which compares general surgical beds in six provincial regions. Here the estimates of the critical number of beds required are given for 85 per cent. occupancy, and for the rate of occupancy actually

prevailing, and compared with the number of beds actually available:—

Six Hospital Regions (three Northern, three Southern)

Estimates of the Critical Number of Beds required per 1,000 *Population at* 85 *per cent. Occupancy, and at the Occupancy Rate prevailing compared with the Number of Beds available (General Surgical Beds only)*

	Newcastle	*Leeds*	*Manchester*	*East Anglia*	*Oxford*	*South west*
(1)	0·7	0·6	0·64	0·63	0·48	0·57
(2)	0·7	0·56	0·64	0·6	0·48	0·52
(3)	84%	89%	85%	86%	85%	94%
(4)	0·7	0·57	0·64	0·62	0·48	0·51

(1) Critical number of beds required per 1,000 population at 85 per cent. occupancy.
(2) Available beds per 1,000 population.
(3) Occupancy rate prevailing through the year.
(4) Critical number per 1,000 population at the rate of occupancy prevailing.
Source: Calculated from information contained in the *Digest of Health Service Statistics*, 1956, Ministry of Health.

The results for general surgery in these six provincial regions are very close and suggest that estimates based on the critical number are affected by the number of beds available and used. The same pattern can be shown for other acute specialties as well (see Appendix II). *It appears that the number of beds used is the number available!* In theory the critical number could be ques-

Extra Beds required to Clear Surgical Waiting List

General surgery	*Admissions per* 1,000 *population*	*Bed turnover* (1)	*Extra beds required* (2)	*Extra beds per* 1,000 *population*
Newcastle . .	16·2	23·1	275	0·09
Leeds . .	14·5	25·5	163	0·05
Manchester .	15·6	24·1	552	0·12
East Anglia .	15·7	26·0	154	0·13
Oxford . .	13·4	27·8	120	0·07
South Western .	14·4	27·4	297	0·10

(1) Discharges and deaths divided by the number of available beds (daily average).
(2) Extra beds required to clear the waiting lists in one year, assuming maintenance of the same bed turnover.
Source: Based on information contained in the *Digest of Health Service Statistics*, 1956, Ministry of Health.

tioned because it takes account of changes in the waiting-list but not the absolute size of the list, which is said to be important because it determines the period of waiting for admission. The table on p. 101 estimates the extra beds which would be required to clear surgical waiting-lists in one year in the same six regions (after which the beds would be surplus).

The region with the greatest need, East Anglia, requires on this basis only an extra 13 beds per 100,000 population. Apparently the importance of the size of waiting-lists has been exaggerated.

This approach suffers from one of the defects of the critical number method—that admission is not related to clinical need. The originators of the critical number were, of course, careful to write in terms of 'effective demand', and if this reservation is kept in mind the method is certainly a useful way of recording how beds in a particular area were used, and what is the effect of changes in the waiting-lists on the number of beds required given unchanged criteria of admission.

(iv) The survey of the Barrow hospitals revealed certain points relevant to the general fields of hospital administration and the provision of medical care, and these points suggest that too much emphasis is placed in public discussion on the number of beds as an indicator of the adequacy or otherwise of hospital provision. An approach, such as the critical number analysis, based on the bed-population ratio, tends to overlook some important considerations.

(*a*) For example, in the general surgery department at Barrow (and the same can be said of the gynæcology, orthopædics, ophthalmology and ear, nose, and throat departments as well) experience suggests that the real determinant of patient-turnover is not so much the number of beds available as the operating time available. It is manifestly no use providing additional beds if there is not an adequate operating theatre and the staff (nurses, porters, etc.) to run it efficiently. Otherwise, the bottleneck is merely transferred elsewhere.

(*b*) Again, the restricted range of operations which could be carried out at Ulverston shows how misleading it is to consider an area's hospital provision in terms only of the bed-population ratio. Clearly, the situation of the beds is of great importance, because if they are scattered in small numbers among small hospitals it may not be possible to staff them adequately, and their effective use will be strictly limited—as with the surgical beds at Ulverston, where

simple non-toxic thyroidectomy was the most serious operation attempted.

(*c*) As for how medical needs in a community are being satisfied by the existing facilities, even the average waiting-period for admission is not the most useful guide. From everybody's point of view the really important factor is the waiting-period for out-patient consultation—the sooner the consultant can see the patient the greater the possibilities of varying the pattern of treatment; it may still be possible to deal with the case without in-patient care. In many cases a long period of waiting for consultation makes in-patient admission inevitable. The waiting period for out-patient consultation depends on the number of clinic sessions held, the effect of the appointment system (if any) and the number and kind of new cases seen per session by the consultant.

(*d*) To concentrate on the bed-population ratio as an indicator of the need for hospital provision is also to ignore the educational function of the hospital. For example, the planning of a teaching hospital must at least involve considering, quite apart from the community's needs for in-patient care, the volume and variety of case-load it is desired to demonstrate to the students. Because hospitals are not classified as teaching hospitals attached to a medical school it does not mean that they have no teaching function, and it became apparent during the Barrow survey that the important question of raising the standards of care in the provincial hospitals cannot be separated from the two related aspects: research opportunities for provincial consultants and the quality of junior medical staff.

The spreading after 1948 of freely available consultant and specialist services throughout the provincial regions was a major contribution to the general theory of medical organization and administration and a great achievement of the National Health Service. It was, however, only the first step necessary towards bringing uniform standards of specialist care to the community at large, a need created by the ethos of an egalitarian society demanding that what is possible for some should be readily available to all. But it was only the first move in this direction. The study by Lee and others (34) of differences in mortality rates from specific diseases between teaching and non-teaching hospitals suggests that we still have some way to go in spreading the teaching hospital standards to the provincial non-teaching

hospitals. Opportunities for research are important to this question. In Barrow a number of pædiatric cases could fairly be classed as research. Should this be discouraged by reducing the number of pædiatric beds ? Emphatically one would say not. Research and the facilities necessary to conducting it, which include beds, are inseparable from rising standards of investigation and therapy. Provincial hospital consultants must be allowed freedom to conduct research and the facilities to make research possible, including of course follow-up studies and 'operational research' similar to this report. The plea has been made by Lord Stopford of Fallowfield, a former Vice-Chancellor of Manchester University and a Founder-Member and Chairman of Manchester Regional Hospital Board (35). Research facilities are also of great importance in encouraging a better distribution of junior medical staff, which is itself important in standards, since the junior staff in the provincial hospitals are often faced with greater responsibility. At present the best medical graduates continue to seek their hospital training in the teaching centres, partly because it is thought the best opportunities for research are there, and that the case-load is more varied, but also because some of the professional colleges specify certain hospitals as appropriate training grounds for those wishing to qualify for membership. The specification, however, attaches more weight to the number of beds in a hospital than the range of the case-load. Thus in Barrow there is no noticeable competition for the junior post in gynæcology, although the range of work done here is varied, and a good opportunity for training is wasted in consequence. This applies to other departments in Barrow as well.

3. CLINICALLY UNNECESSARY ADMISSIONS

What significance can be attached to the results of the survey showing that proportions of patients in some departments were admitted to hospital unnecessarily ? In general medicine, for example, approximately one-quarter of the patients received treatment or investigation which could have been given elsewhere, either in the out-patient department or at home by the general practitioner.* What are the implications for future hospital policy ?

* A study of a 10 per cent. sample of 5,400 medical patients in a Birmingham hospital in 1955 estimated that 25 per cent. had no diagnostic or therapeutic requirement at hospital level: 'Many patients who at present occupy medical beds strictly require only hotel care.' (Crombie, D. L. and Cross, K. W., 1959, *The Medical Press*, 242.316.)

The fact that a proportion of the case-load could have been dealt with on some basis other than in-patient care suggests that in the future less hospital bed accommodation may be provided, given better out-patient clinics, more home-nursing facilities, a better standard of housing, and willingness on the part of the general practitioner to undertake home care. The last point is crucial to the whole situation and led this enquiry to a consideration of the role of the general practitioner. Although 'inadequate home nursing facilities' figures prominently as a reason for admission it should not be too readily assumed that Barrow's domiciliary nursing facilities are in fact inadequate. The decision to admit to hospital is often not rational, based on alternatives and implications: it is usually a matter of custom and tradition and rather than the home nursing facilities being inadequate there was lack of awareness by the general practitioner and others of their full potential. It may seem odd to estimate the efficiency of a hospital in terms of a decrease in the number of days care given; but this can be justified on many grounds: economic, psychological and emotional (particularly in children), medical (early ambulation after surgery reduces the risk of thrombosis, while early discharge assists rehabilitation, especially in the case of middle-aged men, for whom resettlement in the former occupational setting becomes increasingly difficult the longer the patient is away from it). In the long run would it be a good thing to pare down the hospital in-patient facilities until they accorded with the medical needs as envisaged above? We cannot be at all sure that, however it is organized, general practice will fulfil its theoretical promise within the National Health Service. No public service operating on a national scale can hope to recruit the necessary numbers of altruists, and medical schools are only just beginning to think of teaching medical care outside hospital (36). Nevertheless, the estimates of unnecessary admission indicate that social planners have fairly wide margins within which they can allocate their priorities, assuming, of course, that if they wished they could persuade people to accept less than the facilities needed when demand was at its maximum, and assuming further that it is in fact possible for the general practitioner to become the most important functionary in the National Health Service, integrating all the other incidental and episodic services into a system of comprehensive medical care. The supposition that the general practitioner could perform these tasks is fundamental to the cri-

teria used in estimating the amount of clinically unnecessary in-patient care: the possibility of the supposition becoming the reality must now be examined.

4. GENERAL PRACTICE WITHIN THE NATIONAL HEALTH SERVICE

Under the National Health Service the general practitioner is supposed to co-ordinate all the services provided—consultant, hospital, local authority domiciliary and so on—drawing on them as he interprets his patients' needs. There are of course those (37) who doubt whether the general practitioner, if he continues in his present role and skills, has any really useful part to play in comprehensive medical care. The argument runs that in the past two decades medical knowledge has expanded so rapidly that it can only be applied effectively by the specialist. There is much to be said for this point of view: medicine is moving from the realm of occult mysticism to that of highly-skilled technology. On the other hand as the Cohen Committee (38) on General Practice within the National Health Service in 1954 stated:—'General practice, as it is understood in this country, is fundamental to the best practice of medicine and to the best interests of patients. It cannot be replaced by a congeries of specialisms, for only general practice can ensure that the patient is treated both as an individual and in relation to his family background and general environment, and it alone provides for continuity of treatment at all times by one doctor. The general practitioner by the exercise of this responsibility for his patient can link together preventive, social and curative medicine. Thus, the general practitioner service is an essential not a subordinate service, indeed, in a sense the general practitioner must hold the key position in the Health Service.'

Systems of medical care are called on to face the problem of all large-scale organizations where there is a high degree of division of labour—someone has to integrate the activities of the specialists. There is too the position of the general practitioner in relation to preventive medicine—not primary preventive medicine in the sense of that which produced the triumphs of public health in the past; but secondary prevention in anticipating many degenerative diseases. The general practitioner has a unique opportunity of contact at the presymptomatic stage when diagnosis can be life-saving. The need for early diagnosis has arisen with the emergence

of new drugs and techniques of therapy. Up to recent times it was only of academic interest to diagnose meningitis, much cancer, thrombosis, deafness or melancholia. The best available agency for early diagnosis is at present the general practitioner.

In this context of what the role of the general practitioner ought to be it is interesting to consider the operation of the National Health Service during its first decade. The following three broad comments can be made:—

(i) It is all very well in theory to cast the general practitioner as the leader of the new advances in preventive medicine because he has the best chance of undertaking presymptomatic detection. But has he the necessary clinical skill to take up the challenge? The death-rate from coronary thrombosis in middle-aged men, with anticoagulants available, suggests that he has not. Again, one-fifth of diabetics are undiagnosed and untreated until they present complications. In mental illness some 25 per cent. of cases in general practice are emotional rather than physical and many go undiagnosed until the manifestations become sufficiently serious to project them into the mental therapy service.

(ii) It must be confessed also that the removal of the general practitioner from the hospital as a consequence of the regional spreading of consultant services has not helped him to keep in touch with technical advances which have been applied in the hospital and not in general practice. The overall impression must be that the hospital service has been the most successful aspect of the Health Service so far (39). The first onset of demand previously unsatisfied and released in 1948 by the removal of financial restraint has been met by a reduction in the average duration of stay. Even so the average duration of stay in British hospitals continues to be much longer than in North American hospitals, and one of the reasons, as we have shown in Barrow, is the failure of the general practitioner to integrate the hospital and domiciliary services, for it is at the point of integration that the Health Service has been least successful.

(iii) Even in that sphere becoming peculiar to British medicine, the activities involved in the emotional term 'family doctor', certain aspects of the Health Service suggest that after all the general practitioner is not operating as the kingpin of the system. For example, the consultants established in the provinces are general consultants and are far less specialized than their teaching hospital

colleagues. Furthermore the development of almoner and social services attached to the hospitals, and functioning to assist the consultant to relate his treatment to the patient's social and domestic circumstances, can be taken as a reflection of the general practitioner's failure to provide the necessary link between treatment, after-care and rehabilitation.

The way in which the Health Service has developed in relation to general practice is not an encouraging picture. If there is really to be a renaissance of general practice, instead of merely lip-service to the general practitioner, then efforts must be made to bring the general practitioner back to the hospital, perhaps with an extension of clinical assistant posts, accompanied by modifications in the method and incentives of remuneration (40).

General Practice in Barrow

The range of general practice in Barrow was found to be varied. Being a fairly isolated, closely-knit community, Barrow has no social barriers between hospital consultants, administrators, and general practitioners. The essential ingredients of effective co-ordination, frequent contact on an informal basis between interested parties, is apparent to a degree unfortunately not possible in larger cities. Many of the general practitioners hold clinical assistantships in the hospitals, which some of them formerly staffed as honorary consultants before the inception of the National Health Service. This situation has undoubtedly been of some value in helping to bridge the gap between the hospital service and the general medical services.

The figures relating hospital referral to size of practice, cost and frequency of prescribing, and use of direct access diagnostic facilities, reveal no relationship between these variables in Barrow. It may be wondered whether it matters who applies the technique of investigation to the patient, the consultant or the general practitioner, as long as someone does. The answer is that it does matter, and for the very good reason that the consultant and general practitioner use these techniques in different ways, the consultant seeking a definitive diagnosis and the general practitioner seeking to exclude possibilities. That the general practitioner is using these facilities denotes that he is considering the patient as a being whose needs and risks change as he passes through development to decline. He is attempting to contribute towards comprehensive

medical care, including presymptomatic diagnosis, and against this the question of whether use of diagnostic facilities results in a lower admission rate is relatively unimportant.

At the same time, these wide and unrelated variations in usage by the general practitioners suggest similar variations in range and depth of investigation and medical care. This would be expected in a period of rapid advance in medical science, coinciding with the free hospital and consultant services of the National Health Service and freely available specific drugs. Thus, studies of hospital demand must continue to pay attention to developments in other branches of the medical care system. They are complementary and need to be studied together.

5. SUMMARY

(i) The initial task of this report, which is one of three current case-load studies (the others are in Luton and on Tees-side) was to repeat the Trust's studies at Norwich and Northampton where it was estimated that a bed-population ratio of about two beds per 1,000 population was adequate to the needs of the available acute specialties. The same method applied to the effective population of the Barrow area suggests a ratio about 25 per cent. higher—2·5 beds per 1,000. This figure is still of course well below (in fact half) that envisaged by hospital planners at the start of the National Health Service, and compares with the present national average provision for these acute specialties of 3·1 per 1,000 population. To emphasize the importance of this it is worth reflecting that at present costs (at £5,000 per bed in new hospital construction and £1,500 for a new council house) even to provide 1 bed per 1,000 population in England and Wales, a total of 45,000 beds, would have meant building 150,000 fewer houses. Again the cost of these beds would represent about one-third of the annual running costs of the National Health Service. These estimates provide sharp illustrations of the risk of overbuilding hospitals.

(ii) The survey went on to test some of the assumptions and limitations necessarily involved in the method used in reaching these estimates, and brought out several points of interest to the general field of hospital administration. Briefly, these are that it can be misleading to look simply at the available acute beds without

paying attention to the location of the beds. Beds situated at small and somewhat isolated hospitals may be severely limited in their usefulness because it is not likely that medical staff and other facilities can be based in small units. If there is overprovision of beds already it may be necessary, from the national point of view, to risk upsetting local loyalties by closing down small units and in future building to think in terms of hospitals which are big enough to cater for all the general specialties. The beds allocated to the separate departments should be determined by the respective populations served, for in Barrow certain differences were observed between the departments in the size of the respective catchment areas.

Waiting periods for beds in Barrow were found to be surprisingly short, but perhaps more significantly in most cases the waiting period for out-patient consultation was found to be only one week. The waiting period for out-patient consultation is considered one of the best indices of the adequacy of hospital and consultant services in any particular area. The advantages from the patient's point of view of having almost immediate access to specialist opinion are obvious: from the consultant's point of view it enables him to allocate his bed resources in relation to his concepts of medical and social priorities—he is subject to less pressure. This, of course, is still accepting 'consultation' at its present level—an aspect of the poverty of communication between the specialist and the general practitioner.

(iii) The method used in the earlier Nuffield studies was based on in-patient admissions as the only objective information available. At Barrow the attempt was made to see how far effective demand of this kind could be equated to clinical need. It was found that a proportion of patients could have been dealt with in some other way; for example, in the male medical wards one-quarter of cases were found to have been admitted for reasons other than strictly clinical, and this applied to nearly half the female medical patients—a sharp indication of the fact that when the mother of a family falls ill there is nobody to manage the household and look after an invalid as well. Instead of domiciliary services being used to facilitate treatment at home the case is transferred to hospital. This brings into clear relief the need for a close link between the hospital service and the other services provided under the National Health Service. When the estimate of beds needed was adjusted

to take account of clinically unnecessary admissions a ratio of 2·3 beds per 1,000 population was suggested.

(iv) The estimate of clinical necessity involved its own assumptions, and cardinal to the whole approach was the supposition that the general practitioner is functioning according to the theory of the National Health Service—namely, that hospital and consultant services are only incidental and episodic in the patient's life-span, and that the entire system of medical care revolves round the general practitioner who integrates the many services provided. This assumption is not yet valid, and a consideration of certain trends in the Health Service does not encourage the belief that it will become valid. The conclusion must be that the work-load of former years, although exaggerated in demand, is still the best guide to the needs of the future for hospital provision, and the critical number method of analysis, based as it is on this objective information, is the most reliable approach yet developed.

(v) The survey tried to relate the hospital case-load to the general medical services, and found that the rate of referral to hospital did not vary with the size of practice list, frequency and cost of drug prescribing, or most surprising of all, even with the use of direct access diagnostic facilities such as pathological laboratory and X-ray. In fact the last two were not even related to each other.

The failure to establish direct relationships between rate of referral to hospital and type and size of general practice is surprising and must inevitably cast doubt on the assertions that a reduced hospital case-load could be effected by alone raising the capitation fees and reducing the average size of practice list. It is emphasized however that the analysis described in this report was entirely experimental and confined to available objective documentary information. Unfortunately, it was not possible at this stage to take full account of all the complex factors at work in the situation, particularly the so far unmeasured aspects relating to the general practitioners themselves. If this line of approach is repeated elsewhere in the future (and general practice in the present context of the Health Service is certainly the obvious starting point in view of the interdependent nature of all the home and hospital services provided), then an assessment could be made of the variation in range and depth of work of the general practitioners and the relevant aspects of their social and professional circumstances as they affect their usage of, and need for, hospital facilities.

APPENDIX I

DEATHS FROM SELECTED CAUSES 1950–53, ENGLAND AND WALES, NORTH-WESTERN REGION, BARROW-IN-FURNESS C.B.
(*Registrar General's Decennial Supplement* 1951, H.M.S.O. (1958))

(1) *Males*

	All Ages			*Rates per* 1,000,000 *by Age Group*					
	No.	*Rate* (per 1,000,000)	*S.M.R.*	–1	1–4	5–14	15–44	45–64	65+
All causes:									
E-W	1,060,126	12,611	100	32,010	1,302	600	1,858	14,371	82,347
N-W	167,946	13,739	111	36,333	1,507	620	2,061	16,775	88,756
B-W	1,923	14,455	111	41,223	1,192	1,097	2,356	16,397	88,341
Malignant Neoplasm: Stomach :									
E-W	32,278	384	100	—	—	—	38	625	2,363
N-W	5,416	443	117	—	1	—	42	748	2,727
B-W	66	496	127	—	—	—	72	705	3,035
Carcinoma Trachea, Lung, Bronchus:									
E-W	46,282	551	100	1	—	—	72	1,361	2,149
N-W	7,385	604	110	—	—	—	86	1,508	2,283
B-W	76	571	100	—	—	—	181	1,257	1,946
Leukæmia, Aleukæmia :									
E-W	4,196	50	100	25	53	30	24	68	155
N-W	547	45	90	9	50	27	23	61	135
B-W	5	38	71	—	99	—	—	92	78
Diabetes Mellitus :									
E-W	4,597	55	100	1	3	3	10	54	396
N-W	692	57	106	—	3	6	12	65	389
B-W	11	83	138	—	—	—	—	61	700
Vascular Lesions affecting Central Nervous System :									
E-W	114,098	1,357	100	38	4	5	56	1,138	14,360
N-W	18,189	1,488	113	24	5	7	69	1,367	12,535
B-W	223	1,676	120	—	—	—	54	1,870	12,375
Arteriosclerotic Heart Disease including Coronary Heart Disease :									
E-W	149,636	1,780	100	—	—	—	115	2,717	11,678
N-W	23,502	1,920	110	—	—	—	149	3,244	12,000
B-W	255	1,917	104	—	—	—	199	3,126	11,052
Pneumonia:									
E-W	43,321	515	100	5,166	173	26	47	441	3,079
N-W	6,649	544	107	6,289	230	23	55	516	2,957
B-W	98	737	136	7,874	199	50	72	674	4,047

(1) *Males—continued*

	All Ages			*Rates per 1,000,000 by Age Group*					
No.		*Rate* (per 1,000,000)	*S.M.R.*	-1	1-4	5-14	15-44	45-64	65+
Bronchitis :									
E-W	77,434	922	100	718	42	7	33	1,179	6,566
N-W	14,401	1,178	130	886	42	2	56	1,662	8,180
B-W	110	827	87	926	—	—	—	1,316	5,059
Ulcer of the Stomach and Duodenum :									
E-W	16,012	190	100	4	1	—	38	342	1,003
N-W	2,249	184	98	—	—	—	44	347	909
B-W	39	293	150	—	—	—	72	337	1,868
Accidents:									
E-W	36,309	432	100	1,126	274	206	364	404	1,167
N-W	5,197	425	99	1,257	351	235	313	406	1,218
B-W	68	511	117	1,390	296	349	399	582	1,090
Suicides :									
E-W	11,524	137	100	—	—	1	84	260	423
N-W	1,776	145	106	—	—	1	87	274	466
B-W	22	165	122	—	—	—	91	388	389

(2) *Females*

	All Ages			*Rates per 1,000,000 by Age Group*					
No.		*Rate* (per 1,000,000)	*S.M.R.*	-1	1-4	5-14	15-44	45-64	65+
All causes :									
E-W	1,000,568	10,999	100	24,812	1,110	424	1,418	8,379	62,438
N-W	161,723	11,924	110	28,995	1,268	442	1,660	9,471	67,332
B-W	1,494	10,915	104	30,847	2,404	206	1,745	8,995	62,360
Malignant Neoplasm, Stomach :									
E-W	25,490	280	100	—	—	—	23	288	1,584
N-W	4,405	325	117	—	—	—	24	345	1,847
B-W	29	212	81	—	—	—	53	149	1,308
Malignant Neoplasm, Trachea, Lung, and Bronchus :									
E-W	8,556	94	100	1	—	—	18	163	367
N-W	1,358	100	106	—	—	—	21	173	385
B-W	8	58	67	—	—	—	—	90	311
Malignant Neoplasm, Breast :									
E-W	32,376	354	100	—	—	—	88	633	1,288
N-W	4,594	339	96	—	—	—	88	596	1,221
B-W	46	336	98	—	—	—	142	657	997
Malignant Neoplasm, Uterus :									
E-W	16,166	178	100	—	1	—	41	341	603
N-W	2,559	189	106	—	2	—	44	363	631
B-W	27	197	117	—	—	—	89	418	496

(2) *Females—continued*

	All Ages			*Rates per* 1,000,000 *by Age Group*					
	No.	*Rate* (per 1,000,000)	*S.M.R.*	-1	1-4	5-14	15-44	45-64	65+
Leukæmia, Aleukæmia :									
E-W	3,727	41	100	30	45	24	19	52	107
N-W	522	38	94	40	43	22	22	47	90
B-W	5	37	100	—	209	—	16	30	62
Diabetes Mellitus:									
E-W	9,322	102	100	1	3	5	12	91	592
N-W	1,504	111	109	—	2	3	12	98	657
B-W	14	102	108	—	—	—	—	149	561
Vascular Lesions affecting Central Nervous System:									
E-W	156,508	1,720	100	23	4	4	57	1,178	11,180
N-W	24,817	1,830	108	25	3	5	67	1,356	11,893
B-W	252	1,841	114	—	—	—	107	1,225	12,771
Arteriosclerotic Heart Disease, including Coronary Heart Disease :									
E-W	86,608	952	100	—	—	—	17	720	6,104
N-W	12,663	934	99	—	—	—	24	848	5,767
B-W	98	716	80	—	—	—	71	837	4,112
Pneumonia :									
E-W	39,707	436	100	4,093	171	23	38	221	2,324
N-W	5,920	436	101	5,104	241	20	49	256	2,100
B-W	67	490	118	4,144	418	—	71	506	2,056
Bronchitis :									
E-W	45,418	499	100	548	37	5	18	269	3,296
N-W	9,012	664	135	669	40	3	27	441	4,306
B-W	57	416	89	921	—	—	—	130	3,177
Ulcers of the Stomach and Duodenum:									
E-W	5,228	57	100	10	—	—	7	60	315
N-W	732	54	95	10	—	1	9	65	272
B-W	8	58	114	—	—	—	—	120	249
Accidents:									
E-W	21,741	239	100	858	185	79	53	128	1,198
N-W	3,258	240	102	924	226	90	48	128	1,437
B-W	23	168	72	921	314	—	36	120	748
Suicides :									
E-W	6,508	72	100	—	—	1	42	142	147
N-W	1,020	75	104	—	—	—	40	142	180
B-W	5	37	56	—	—	—	—	90	125

Delivery, Complications of Pregnancy, Childbirth, and the Puerperium :

				(15-24)	(25-44)
E-W	2,211	24	100	34	66
N-W	346	26	106	37	69
B-W	4	29	133	45	92

APPENDIX II

RATIO OF BEDS TO POPULATION IN SIX HOSPITAL REGIONS

ESTIMATES OF THE CRITICAL NUMBER OF BEDS REQUIRED PER 1,000 POPULATION AT 85 PER CENT. OCCUPANCY COMPARED WITH THE AVAILABLE BEDS AND THE PREVAILING OCCUPANCY RATES IN 1956

	Gen. Med.	*Pæd.*	*Gen. Surg.*	*Derm.*	*Gynæc.*	*Obstet.*	*E.N.T.*	*Orthop.*	*Ophth.*
NEWCASTLE									
(1)	·58	·1	·7	·18	·18	·31	·1	·43	·06
(2)	·58	·13	·7	·16	·19	·32	·15	·44	·07
(3)	86	78	84	100	81	83	59	83	79
(4)	·57	·11	·7	·15	·19	·32	·14	·44	·06
LEEDS									
(1)	·61	·14	·6	·047	·17	·32	·08	·37	·05
(2)	·58	·19	·56	·05	·17	·33	·13	·33	·06
(3)	89	66	89	82	82	81	55	83	79
(4)	·58	·18	·57	·048	·17	·32	·12	·37	·05
MANCHESTER									
(1)	·62	·1	·64	·03	·2	·29	·11	·35	·04
(2)	·59	·12	·64	·03	·19	·3	·14	·32	·05
(3)	90	74	85	74	88	82	66	91	76
(4)	·58	·11	·64	·03	·19	·3	·14	·32	·04
EAST ANGLIA									
(1)	·47	·04	·63	·013	·09	·21	·07	·27	·06
(2)	·37	·07	·6	·008	·09	·22	·08	·27	·05
(3)	104	52	86	141	83	79	95	88	83
(4)	·38	·06	·62	·007	·09	·22	·06	·26	·061
OXFORD									
(1)	·41	·09	·48	·033	·14	·19	·08	·42	·04
(2)	·39	·13	·48	·032	·13	·19	·1	·37	·04
(3)	90	57	85	87	86	83	70	95	79
(4)	·38	·13	·48	·032	·13	·19	·09	·37	·04
SOUTH-WESTERN									
(1)	·43	·06	·57	·018	·12	·22	·08	·4	·06
(2)	·39	·07	·52	·019	·1	·26	·13	·38	·08
(3)	95	79	94	81	95	82	72	91	70
(4)	·38	·06	·51	·018	·1	·22	·09	·37	·07

(1) The critical number of beds required per 1,000 population at 85 per cent. occupancy.
(2) Available beds per 1,000 population.
(3) Occupancy rate prevailing during the year.
(4) Critical number of beds per 1,000 population at the prevailing occupancy rate.

Source: Based on material contained in the *Digest of Health Service Statistics, Ministry of Health*, 1956.

APPENDIX III

BARROW AND FURNESS GROUP OF HOSPITALS

SUMMARY OF ESTIMATED NUMBER OF BEDS REQUIRED UNDER EACH SPECIALTY, WITH ALLOCATION AT THE TIME OF THE SURVEY

Department	*Estimated number* of beds required at 85% occupancy*	*Number of beds at present allocated*
General Medicine	71	70
General Surgery	88	81
Pædiatrics	15	27
Traumatic and Orthopædic Surgery	30	35
Ophthalmology	13	13
Ear, Nose and Throat, Tonsils and Adenoids	4	10
Ear, Nose and Throat, Other	15	10
Dermatology	9	8
Gynæcology	41	35
Obstetrics	44	44
Infectious Diseases	4	8
Consultant Dentistry	1	0
Total	335	341

* i.e. the critical number plus twice the standard error.

(See pages 117–122 for details.)

DATA FOR ESTIMATING THE CRITICAL NUMBER OF BEDS AT SELECTED OCCUPANCY RATES BY EACH SPECIALTY

(a) *General Medicine:*

	No. of Patients recommended for admission	*Average stay of Patients discharged & died (days)*	*Estimate (with standard error) of critical number of beds required at various rates of occupancy:*					
			100%		95%		85%	
1957								
January	116	17·9						
February	117	13·2	59·9	2·7	63·0	2·8	70·4	3·1
March	99	18·3						
April	100	18·9						
May	98	16·1	57·1	2·8	60·1	3·0	67·0	3·2
June	88	19·6						
July	98	14·7						
August	78	16·8	50·1	4·1	52·7	4·3	58·9	4·8
September	118	15·7						
October	158	13·8						
November	117	16·0	62·6	3·6	65·8	3·7	72·6	4·2
December	100	17·1						
1958								
January	98	17·7						
February	95	16·1	56·4	1·0	59·3	1·0	66·3	1·1
March	99	18·4						
Average January 1957 to December 1957:			57·3	2·2	60·3	2·3	67·4	2·5
Average April 1957 to March 1958:			56·6	2·1	59·5	2·2	66·5	2·4
Average January 1957 to March 1958:			57·1	1·8	60·1	1·8	67·1	2·1

(b) *General Surgery:*

1957								
January	207	10·4						
February	229	10·2	79·5	4·1	83·6	4·3	93·5	4·8
March	256	10·3						
April	237	10·3						
May	265	10·2	72·5	6·2	76·3	6·5	85·2	7·2
June	164	10·5						
July	215	8·9						
August	209	9·2	63·9	1·8	67·2	1·8	75·1	2·1
September	214	9·6						
October	236	8·9						
November	209	9·1	65·5	1·0	68·9	1·1	77·0	1·1
December	221	9·2						
1958								
January	201	9·2						
February	231	8·7	62·1	4·0	65·3	4·2	73·0	4·7
March	163	10·5						
Average January 1957 to December 1957:			70·9	2·8	74·6	2·9	83·4	3·2
Average April 1957 to March 1958:			66·7	2·6	70·2	2·7	78·4	3·0
Average January 1957 to March 1958:			69·2	2·6	72·8	2·7	81·4	3·0

(c) *Pædiatrics:*

	No. of Patients recommended for admission	*Average stay of Patients discharged & died (days)*	*Estimate (with standard error) of critical number of beds required at various rates of occupancy:*					
1957			100%		95%		85%	
January	16	17·0						
February	25	11·5	9·1	0·14	9·5	0·14	10·7	0·16
March	17	16·7						
April	22	16·9						
May	17	18·2	9·9	1·1	10·4	1·1	11·6	1·2
June	19	11·7						
July	16	16·5						
August	8	18·7	6·2	0·9	6·5	0·9	7·2	1·0
September	20	7·8						
October	38	11·5						
November	23	12·0	11·4	1·1	12·0	1·1	13·4	1·2
December	21	16·3						
1958								
January	20	19·2						
February	38	15·3	14·5	3·0	15·2	3·1	17·0	3·4
March	30	21·4						
Average January 1957 to December 1957 :			9·2	0·7	9·6	0·7	10·8	0·8
Average April 1957 to March 1958:			11·2	1·4	11·7	1·4	13·1	1·6
Average January 1957 to March 1958:			11·0	1·1	11·5	1·1	12·7	1·2

(d) *Traumatic and Orthopædic Surgery:*

1957								
January	42	15·5						
February 43	43	10·9	16·4	2·2	17·2	2·3	19·2	2·5
March	30	12·0						
April	48	12·1						
May	55	13·5	21·1	2·1	22·1	2·2	24·8	2·4
June	66	9·2						
July	49	12·6						
August	53	11·5	18·9	0·7	19·8	0·7	22·2	0·8
September	45	11·5						
October	44	25·0						
November	42	14·4	26·8	3·7	28·2	3·8	31·5	4·3
December	39	19·8						
1958								
January	40	22·3						
February	36	21·4	28·0	0·8	29·4	0·8	32·9	0·9
March	48	19·0						
Average January 1957 to December 1957 :			20·8	1·5	21·8	1·5	24·4	1·7
Average April 1957 to March 1958 :			23·7	1·5	24·9	1·5	27·8	1·7
Average January 1957 to March 1958:			22·2	1·5	23·3	1·5	26·1	1·7

(e) *Ophthalmology:*

	No. of Patients recommended for admission	*Average stay of Patients discharged & died (days)*	*Estimate (with standard error) of critical number of beds required at various rates of occupancy:*					
			100%		95%		85%	
1957								
January	12	22·5						
February	14	23·6	9·8	0·5	10·3	0·5	11·5	0·5
March	20	14·1						
April	25	11·8						
May	15	18·4	9·4	0·2	9·8	0·2	11·0	0·2
June	23	12·5						
July	18	18·4						
August	15	21·5	11·6	0·7	12·2	0·7	13·6	0·8
September	25	16·9						
October	19	16·9						
November	9	17·7	9·4	1·7	9·8	1·7	11·0	2·0
December 19	19	20·8						
1958								
January	22	16·6						
February	17	17·1	10·5	0·4	11·0	0·4	12·3	0·4
March	23	13·2						
Average January 1957 to December 1957 :			10·1	0·6	10·6	0·6	11·6	0·7
Average April 1957 to March 1958 :			10·2	0·5	10·7	0·5	12·0	0·5
Average January 1957 to March 1958:			10·2	0·5	10·7	0·5	12·0	0·5

(f) *Ear, Nose and Throat (Excluding Tonsils and Adenoids):*

1957								
January	36	13·5						
February	36	12·5	14·4	1·1	15·1	1·1	16·9	1·2
March	34	10·6						
April	34	9·8						
May	25	12·7	10·3	0·3	11·8	0·3	12·1	0·3
June	37	7·8						
July	28	9·5						
August	20	8·3	5·9	1·1	6·2	1·1	6·9	1·2
September	19	11·5						
October	38	10·5						
November	15	11·9	10·8	2·0	11·3	2·1	12·7	2·3
December	33	13·1						
1958								
January	38	15·8						
February	23	16·7	15·2	1·7	15·9	1·7	16·7	2·0
March	33	11·8						
Average January 1957 to December 1957 :			10·4	1·0	10·9	1·0	12·2	1·1
Average April 1957 to March 1958:			10·5	1·2	11·0	1·2	12·3	1·4
Average January 1957 to March 1958:			11·3	1·0	11·8	1·0	13·2	1·1

(g) *Ear, Nose and Throat (Tonsils and Adenoids):*

	No. of Patients recommended for admission	*Average stay of Patients discharged & died (days)*	*Estimate (with standard error) of critical number of beds required at various rates of occupancy:*					
1957			100%		95%		85%	
January	18	4·3						
February	14	3·5	1·6	0·4	1·6	0·4	1·7	0·4
March	6	4·0						
April	18	3·6						
May	16	3·5	2·2	0·1	2·3	0·1	2·5	0·1
June	28	2·8						
July	29	3·7						
August	25	2·4	2·5	0·3	2·6	0·3	2·7	0·3
September	15	4·6						
October	18	3·9						
November	19	4·4	2·5	0·1	2·6	0·1	2·7	0·1
December	22	3·7						
1958								
January	22	3·0						
February	30	4·0	3·4	0·5	3·5	0·5	4·0	0·5
March	33	3·8						
Average January 1957 to December 1957 :			2·2	0·1	2·3	0·1	2·5	0·1
Average April 1957 to March 1958 :			2·6	0·1	2·7	0·1	3·0	0·1
Average January 1957 to March 1958:			2·4	0·2	2·5	0·2	2·8	0·2

(h) *Dermatology:*

1957								
January	5	25·4						
February	5	44·6	4·7	1·4	4·9	1·4	5·5	1·6
March	2	33·5						
April	8	55·8						
May	4	53·0	10·8	1·9	11·3	2·0	12·7	2·2
June	6	53·6						
July	4	34·7						
August	3	24·0	2·8	0·6	2·9	0·6	3·2	0·7
September	10	5·0						
October	5	26·0						
November	0	0	4·6	2·2	4·8	2·3	5·4	2·5
December	8	37·0						
1958								
January	4	46·0						
February	4	46·3	4·6	1·3	4·8	1·3	5·4	1·5
March	1	43·0						
Average January 1957 to December 1957 :			5·7	1·2	6·0	1·2	6·7	1·4
Average April 1957 to March 1958 :			5·7	1·2	6·0	1·2	6·7	1·4
Average January 1957 to March 1958:			5·5	0·9	5·7	0·9	6·4	1·0

(i) *Gynæcology:*

	No. of Patients recommended for admission	*Average stay of Patients discharged & died (days)*	*Estimate (with standard error) of critical number of beds required at various rates of occupancy:*					
1957			100%		95%		85%	
January	87	8·6						
February	108	11·4	34·5	4·5	36·2	4·7	40·5	5·2
March	101	11·0						
April	123	11·0						
May	107	10·6	35·4	4·8	37·2	5·0	41·6	5·0
June	66	11·3						
July	78	11·0						
August	77	10·5	30·1	2·7	31·6	2·8	35·4	3·1
September	130	8·5						
October	65	10·7						
November	49	11·6	24·1	5·0	25·3	5·2	28·3	5·8
December	107	9·0						
1958								
January	72	9·4						
February	85	10·6	30·9	4·2	32·5	4·4	36·3	4·9
March	107	11·3						
Average January 1957 to December 1957 :			31·0	2·4	32·6	2·5	36·4	2·8
Average April 1957 to March 1958 :			30·1	1·8	31·6	1·8	35·4	2·1
Average January 1957 toMarch 1958:			31·0	2·0	32·6	2·1	36·4	2·3

(j) *Obstetrics:*

1957								
January	87	10·0						
February	97	9·0	31·0	1·4	32·6	1·4	36·4	1·5
March	112	9·4						
April	113	10·0						
May	104	9·8	37·9	2·9	39·8	3·0	44·5	3·4
June	133	9·8						
July	103	9·0						
August	109	10·6	33·2	1·7	34·9	1·7	39·0	2·0
September	95	10·3						
October	110	11·0						
November	90	11·3	38·5	2·0	40·5	2·1	45·2	2·3
December	115	11·5						
1958								
January	103	11·0						
February	97	10·5	35·4	0·7	37·2	0·7	41·6	0·8
March	105	9·9						
Average January 1957 to December 1957 :			35·1	1·3	36·9	1·3	41·2	1·5
Average April 1957 to March 1958 :			36·2	1·1	38·1	1·1	42·5	1·2
Average January 1957 to March 1958:			35·2	1·1	37·0	1·1	41·4	1·2

(k) *Infectious Diseases:*

	No. of Patients recommended for admission	*Average stay of Patients discharged & died (days)*	*Estimate (with standard error) of critical number of beds required at various rates of occupancy:*					
1957			100%		95%		85%	
January	3	10·3						
February	7	30·0	3·2	1·7	3·3	1·7	3·7	2·0
March	2	17·5						
April	2	8·5						
May	4	9·0	0·8	0·1	0·8	0·1	0·9	0·1
June	3	7·5						
July	9	21·7						
August	3	18·6	3·1	1·3	3·2	1·3	3·6	1·5
September	3	11·3						
October	—	—						
November	3	11·6	0·8	0·3	0·8	0·3	0·9	0·3
December	4	11·2						
1958								
January	3	44·0						
February	6	91·3	3·1	0·5	3·2	0·5	3·6	0·5
March	4	9·2						
Average January 1957 to December 1957 :			2·0	0·6	2·1	0·6	2·3	0·7
Average April 1957 to March 1958 :			1·9	0·5	2·0	0·5	2·2	0·5
Average January 1957 to March 1958:			2·2	0·5	2·3	0·5	2·5	0·5

(l) *Consultant Dentistry:*

1957								
January	11	2·5						
February	5	2·0	0·4	0·1	0·4	0·1	0·4	0·1
March	5	2·2						
April	9	2·1						
May	7	2·0	0·6	0·1	0·6	0·1	0·7	0·1
June	6	1·8						
July	8	2·6						
August	9	1·7	0·5	0·1	0·5	0·1	0·5	0·1
September	9	1·8						
October	6	2·5						
November	5	3·6	0·7	0·3	0·7	0·3	0·8	0·3
December	8	2·1						
1958								
January	7	2·1						
February	2	2·0	0·5	0·5	0·5	0·5	0·5	0·5
March	6	2·3						
Average January 1957 to December 1957 :			0·6	0·1	0·6	0·1	0·7	0·1
Average April 1957 to March 1958 :			0·6	0·1	0·6	0·1	0·7	0·1
Average January 1957 to March 1958:			0·6	0·1	0·6	0·1	0·7	0·1

APPENDIX IV

BARROW AND FURNESS GROUP OF HOSPITALS: HOSPITAL CASE-LOAD BY AGE, SEX, DIAGNOSIS AND DURATION OF STAY APRIL 1957 TO MARCH 1958

1. General Surgery

SUMMARY TABLE OF MAIN SURGICAL GROUPS WITH THEIR TOTAL NUMBER OF PATIENTS AND TOTAL BED-DAYS

	Total Number of Patients	*Total Bed-days*
Appendicectomy	539	5,289
Peptic Ulcer—Gastrectomy	79	1,523
Other	31	435
Total	110	1,958
Cholecystectomy	81	1,774
Carcinoma Stomach, Colon, Rectum	67	1,771
Carcinoma Breast	32	802
Carcinoma Other	17	407
Total cancer	116	2,980
Prostatectomy	64	1,204
Papilloma of Bladder	62	342
Other Genito-Urinary	174	1,567
Total G.U.	300	3,113
Hæmorrhoidectomy	87	882
Varicose Veins operation	124	1,171
HERNIA. Repair. Inguinal	195	2,031
Other	32	326
INJURY. Burns	20	591
Head	128	532
Other	43	277
Total injury	191	1,400
Miscellaneous other	171	1,407
	1,942	22,251

Note : This table combines the general surgery in North Lonsdale Hospital in Barrow with the Cottage Hospital in Ulverston to give the total surgery in the Group.

General Surgery

IN-PATIENTS BY SEX, AGE-GROUP AND DIAGNOSIS

Upper Figure—Number of Patients
Lower Figure—Mean duration in days of Patients surviving to Discharge

Male				*Female*				
0–15	16–45	46–65	66–	0–15	16–45	46–65	66–	Total
Appendicectomy								
75	83	18	4	97	137	17	7	438
9	10	11	18	9	9	16	18	4,279
Mesenteric Adenitis—Conservative Treatment only								
5	—	—	—	2	—	—	—	7
8	—	—	—	4	—	—	—	48
Acute Abdomen—Observation only								
3	2	3	—	7	3	1	1	20
5	3	12	—	4	2	11	12	114
Intestinal Colic, Observation etc.—Conservative								
3	2	2	1	3	3	1	1	16
8	1	3	3	2	3	13	8	71
Intestinal Obstruction—Surgical Relief								
3	2	5	1	—	5	6	5	27
8	14	15	18	—	10	21	14	391
Diverticulitis								
—	—	1	—	—	—	2	2	5
—	—	7	—	—	—	18	31	105
Pyloric Stenosis								
5	—	—	—	—	1	—	—	6
9	—	—	—	—	12	—	—	57
Peptic Ulcer—Gastrectomy								
—	29	26	7	—	4	9	4	79
—	18	20	21	—	15	18	28	1,523
Perforated Duodenal Ulcer—Repair								
—	3	3	3	—	2	—	—	11
—	16	18	25	—	12	—	—	201
Perforated Ulcer—Conservative								
—	6	3	4	—	5	1	1	20
—	8	12	14	—	12	17	17	234
Oesophagus—Stricture, etc.								
—	—	2	2	—	2	5	3	14
—	—	14	3	—	3	5	5	80
Cholecystitis—Conservative								
—	1	3	4	—	1	3	3	15
—	3	13	8	—	7	6	9	126
Cholecystitis—Cholecystectomy								
—	5	10	6	—	12	26	13	72
—	22	20	21	—	17	21	30	1,576
Carcinoma Stomach								
1	—	7	10	—	—	4	6	28
26	—	21	27	—	—	25	31	729
Carcinoma—Pancreas								
—	—	1	3	—	—	1	3	8
—	—	9	27	—	—	33	27	204
Carcinoma Colon								
—	—	5	9	—	—	5	9	28
—	—	21	25	—	—	21	28	687

Male				*Female*				
0–15	16–45	46–65	66–	0–15	16–45	46–65	66–	*Total*
Carcinoma Rectum								
—	2	3	4	—	—	—	2	11
—	31	31	31	—	—	—	38	355
Carcinoma Breast								
				—	4	14	14	32
				—	22	23	28	802
Breast Lumps—Excision and Biopsy								
—	—	1	—	1	16	3	—	21
—	—	3	—	3	3	3	—	63
Miscellaneous Carcinomas								
—	—	1	—	—	1	5	2	9
—	—	—	—	—	23	36	—	203
Phimosis—Circumcision								
36	2	3	1					42
2	10	2	6					104
Hypospadias								
6	—	—	—					6
12	—	—	—					72
Undescended Testicle								
7	1	—	—					8
10	12	—	—					82
Cyst of Epididymis								
—	—	4	—					4
—	—	9	—					36
Hydrocele, Spermatocele, etc.								
5	2	6	2					15
10	12	14	14					186
Frequency of Micturition								
1	1	3	1	—	5	2	—	13
3	8	3	14	—	10	3	—	90
Urethritis, Pyelitis								
—	2	1	—	2	5	4	—	14
—	7	21	—	7	14	16	—	183
Papilloma of Bladder								
1	6	25	20	—	1	5	4	62
4	3	3	8	—	9	4	14	342
Ureteric Calculus								
—	2	1	—	—	—	2	1	6
—	18	18	—	—	—	18	—	90
Renal Colic, Stones—Conservative								
—	2	6	—	—	5	2	—	15
—	5	4	—	—	3	5	—	59
Renal Calculi—Operation								
—	1	6	1	—	3	1	—	12
—	17	14	15	—	15	34	—	195
Hydronephrosis								
—	—	2	—	—	—	2	2	6
—	—	28	—	—	—	28	28	168
Urinary Retention—Conservative								
1	1	3	2					7
1	1	18	9					74
Prostatectomy								
—	—	20	44					64
—	—	14	21					1,204

Male				*Female*				
0–15	16–45	46–65	66–	0–15	16–45	46–65	66–	*Total*
Miscellaneous Genito-Urinary								
1	4	1	—	—	1	3	3	13
14	8	15	—	—	7	3	7	98
Hæmorrhoids								
1	16	14	—	—	15	15	8	69
6	10	10	—	—	10	10	12	702
Fissure in Ano								
—	3	2	—	—	2	2	—	9
—	11	9	—	—	11	15	—	103
Varicose Veins								
—	15	14	2	—	28	18	2	79
—	9	11	11	—	8	9	12	721
Thrombophlebitis and other vascular—Anticoagulant treatment								
—	1	4	4	2	2	4	2	19
—	10	12	12	18	11	18	10	256
Vascular legs.—Sympathectomy and Amputation								
—	1	4	4	1	—	1	3	14
—	57	28	28	24	—	15	44	452
Thyrotoxicosis—Subtotal Thyroidectomy								
—	1	—	—	—	24	13	1	39
—	40	—	—	—	11	12	13	473
Hernia Repair—Inguinal and Femoral								
20	18	48	18	4	11	15	6	140
9	11	11	12	7	8	11	13	1,481
Umbilical								
1	1	3	—	4	1	2	2	14
1	11	10	—	9	10	11	12	134
Epigastric								
1	1	—	1	—	2	—	—	5
6	14	—	13	—	6	—	—	45
Hiatus								
—	1	—	—	—	—	1	3	5
—	16	—	—	—	—	3	16	67
Injuries								
Burns and Scalds								
6	5	1	—	7	—	—	1	20
21	23	3	—	44	—	—	39	591
Accidental Swallowings								
1	1	—	—	3	—	—	1	6
1	2	—	—	1	—	—	1	7
Head—Observation								
24	13	2	3	9	8	3	3	65
2	2	3	3	2	3	3	8	164
Concussion—Observation								
8	14	1	—	6	4	3	—	36
2	2	3	—	3	4	7	—	102
Fractured Skull								
11	7	—	—	4	2	3	—	27
9	9	—	—	12	10	12	—	266
Fractured Ribs, Vertebræ, Face								
—	2	1	—	1	1	1	2	8
—	2	1	—	28	6	5	7	59
Other Injuries—No Fracture								
9	1	—	—	6	2	2	2	22
7	14	—	—	6	3	9	19	175

Male				*Female*				
0–15	16–45	46–65	66–	0–15	16–45	46–65	66–	*Total*
Abdominal Viscera								
3	2	1	1					7
3	5	7	10					36
Superficial Infections—Abscess incised								
12	9	11	4	9	21	7	6	79
10	10	6	3	6	8	8	10	626
Miscellaneous—Conservative Treatment								
8	4	3	3	3	—	8	4	33
5	1	3	2	19	—	10	10	236
Minor Surgery—Plastic and Cosmetic								
5	5	4	2	7	11	3	2	39
14	8	9	10	11	7	8	7	358
Miscellaneous Investigations								
3	3	3	6	2	3	6	2	28
4	5	5	4	9	10	8	14	184
N.A.D. No Diagnosis. No Surgery								
—	2	1	2	4	5	4	7	25
—	1	2	5	3	6	7	14	182

Notes : The above tables represent 1,932 cases or 90 per cent. of the case-load carried by the Surgical Department at North Lonsdale Hospital. The remaining 10 per cent. is accounted for by re-admissions and transfers, cases admitted under Surgery but discharged under Medicine or some other specialty, and a small number (less than 1%) not caught in the survey. A further 451 patients were treated in Ulverston Hospital. Of these 64 were re-admissions, transfers, or minor investigations. The remaining 387 are classified as follows :

Appendicectomy	101
Hernia : Inguinal	55
Umbilical	4
Epigastric	4
Hæmorrhoids	18
Varicose Veins	45
Varicocele	2
Cholecystectomy	9
Laparotomy	2
Colostomy	1
Thyroidectomy	9
Ovarian Cyst	1
Simple Mastectomy	5
Undescended Testicle	5
Hydrocele	6
Cysts	2
Miscellaneous	7
N.A.D.	6
Sigmoidoscopy and Minor Surgery	105
Total	387

2. General Medicine

SUMMARY TABLE OF MAIN GROUPS OF MEDICAL DIAGNOSES WITH THEIR TOTAL NUMBER OF PATIENTS AND BED-DAYS

	Total Number Patients	*Total Bed-days*
Heart Disease		
Coronary thrombosis : acute	129	3,887
Hypertensive	58	1,571
Mitral Stenosis	34	663
	221	6,121
Chest Disease		
Chronic bronchitis and emphysema	91	1,407
Cor pulmonale	34	695
Broncho-pneumonia	35	582
Influenza	41	466
Carcinoma of bronchus	14	531
All other chests, asthma, pneumonia, etc.	116	1,596
	331	5,277
Peptic Ulcer		
Peptic and Duodenal Ulcer	75	2,350
Hæmatemesis from peptic ulcer	34	706
Hæmatemesis undefined	12	460
	121	3,516
Carcinoma gastro-intestinal	18	523
Diabetes mellitus	68	1,059
Cerebral hæmorrhage	35	621
Thrombophlebitis	20	560
Other	315	3,982
TOTAL :	1,129	21,659

General Medicine

IN-PATIENTS BY SEX, AGE GROUP AND DIAGNOSIS

Upper figure—Number of patients.
Lower figure—Mean duration in days of patients surviving to discharge.

Male				*Female*				
0–15	16–45	46–65	66–	0–15	16–45	46–65	66–	*Total*
Coronary Thrombosis: acute								
—	6	52	26	—	2	15	28	129
—	49	31	38	—	18	19	24	3,887
Hypertensive Heart Condition								
—	3	18	8	—	5	17	7	58
—	13	26	31	—	21	27	36	1,571
Mitral Stenosis								
—	3	8	—	—	2	7	14	34
—	24	21	—	—	26	13	20	663
Pulmonary Heart Disease								
—	1	11	12	—	3	1	6	34
—	39	21	13	—	14	17	35	695
Thrombophlebitis								
—	2	4	1	—	7	3	3	20
—	16	16	16	—	19	60	45	560
Cerebral Hæmorrhage								
—	2	8	4	—	—	6	5	35
—	21	19	28	—	—	10	17	621
Subarachnoid Hæmorrhage								
—	—	3	1	—	—	6	2	12
—	—	15	19	—	—	9	11	140
Cerebral Tumour								
—	1	2	—	—	1	3	—	7
—	7	14	—	—	4	21	—	102
Cerebral Arteriosclerosis								
—	—	—	1	—	—	—	3	4
—	—	—	30	—	—	—	19	87
Epilepsy								
—	10	5	—	—	7	2	1	25
—	4	4	—	—	2	4	3	85
Disseminated Sclerosis								
—	1	—	1	—	3	—	5	10
—	30	—	28	—	5	—	5	98
Poliomyelitis								
—	3	—	—	1	1	—	—	5
—	43	—	—	20	20	—	—	169
Other Diseases of the Central Nervous System								
—	2	2	1	—	1	3	1	10
—	10	10	32	—	11	14	14	139
Hypopituitarism								
—	—	2	1	—	—	1	—	4
—	—	11	12	—	—	4	—	38
Influenza								
3	9	9	2	1	15	—	2	41
10	10	12	21	21	9	—	20	466
Acute Bronchitis								
—	4	2	—	—	2	3	8	19
—	6	5	—	—	11	11	17	225

Male				*Female*				
0–15	16–45	46–65	66–	0–15	16–45	46–65	66–	*Total*
Broncho-Pneumonia								
—	2	7	5	—	5	7	9	35
—	14	12	21	—	15	17	19	582
Virus or Lobar Pneumonia								
1	4	4	1	—	2	2	3	17
17	17	20	23	—	13	11	21	299
Bronchiectasis								
—	—	5	3	—	—	2	5	15
—	—	14	28	—	—	14	21	287
Chronic Bronchitis and Emphysema								
4	9	30	16	6	3	9	14	91
4	16	14	28	11	9	10	14	1,407
Pleural Effusion (? T.B.)								
—	2	4	1	—	—	1	—	8
—	3	21	8	—	—	14	—	112
Asthma								
2	—	7	2	—	6	4	4	25
21	—	14	21	—	7	15	21	368
Carcinoma Bronchus								
—	1	7	3	—	2	1	—	14
—	—	33	40	—	89	2	—	531
Miscellaneous Chest								
—	5	4	—	—	—	3	1	13
—	11	27	—	—	—	16	9	220
Investigations Chest N.A.D.								
—	5	4	3	—	2	3	2	19
—	5	7	4	—	5	2	2	85
Duodenal and Peptic Ulcer (without hæmatemesis)								
—	27	15	12	—	8	5	8	75
—	27	30	56	—	28	31	30	2,350
Hæmatemesis from Peptic Ulcer								
1	4	5	8	—	2	7	7	34
7	19	14	21	—	14	25	26	706
Hæmatemesis—undefined								
—	1	4	4	—	1	1	1	12
—	36	30	48	—	27	52	33	460
Cholecystitis								
				—	1	3	3	7
				—	9	8	30	123
Spastic Colon								
1	—	—	2	—	2	4	1	10
4	—	—	7	—	14	12	18	112
Sonne Dysentry, Investigations of Diarrhœa								
1	2	1	1	—	2	—	1	8
8	11	9	38	—	19	—	9	124
Carcinoma Gastro-intestinal								
—	1	5	6	—	1	1	4	18
—	7	28	33	—	34	24	30	523
Iron Deficiency Anæmia								
—	—	2	1	—	7	2	—	12
—	—	12	13	—	14	9	—	153
Pernicious Anæmia								
—	—	1	1	—	—	2	—	4
—	—	8	18	—	—	12	—	50

Male				*Female*				
0–15	16–45	46–65	66–	0–15	16–45	46–65	66–	*Total*
Leukæmia								
—	1	1	1	—	—	4	4	11
—	14	5	17	—	—	17	17	172
Diabetes Mellitus								
—	7	9	7	—	14	17	14	68
—	15	11	27	—	12	12	21	1,059
Acute Nephritis, Pyelitis								
1	4	1	—	1	5	1	—	13
30	10	8	—	5	25	55	—	263
Thyrotoxicosis								
				—	3	3	—	6
				—	25	27	—	156
Rheumatic Fever								
—	2	—	—	1	—	—	—	3
—	48	—	—	48	—	—	—	144
Rheumatoid Arthritis								
—	1	1	1	—	2	5	4	14
—	10	19	105	—	16	28	15	366
Osteoarthritis								
—	3	2	1	—	2	2	3	13
—	9	30	28	—	7	21	18	225
Advanced Carcinomatosis								
—	2	2	1	—	1	2	1	9
—	41	21	—	—	13	34	24	229
P.U.O.—N.A.D.								
—	2	—	—	—	5	—	—	7
—	9	—	—	—	14	—	—	88
Infectious Fever and Parasites								
—	2	—	—	1	3	—	—	6
—	17	—	—	5	12	—	—	75
Investigation—N.A.D.								
1	2	1	1	1	1	5	1	13
8	4	7	3	19	7	7	19	106
Barbiturate Poisoning								
—	9	1	2	—	11	8	3	34
—	4	7	10	—	6	7	7	206
Superficial Infections								
1	2	1	1	—	1	4	—	10
5	8	1	9	—	7	17	—	106
Psychoneurosis								
1	7	7	—	2	8	6	3	34
52	3	7	—	25	15	8	10	370
Miscellaneous Syndromes, etc.								
—	2	3	7	—	3	3	6	24
—	4	7	8	—	5	5	21	183

3. Orthopædics

Male				*Female*				
0–15	16–45	46–65	66–	0–15	16–45	46–65	66–	*Total*
Fractures								
Femur								
7	3	11	18	8	6	2	51	106
33	55	55	55	35	38	36	53	5,274
Pelvis								
1	5	3	—	—	3	3	—	15
5	21	8	—	—	3	7	—	164
Tibia and Fibula								
10	24	12	—	3	8	3	3	63
6	10	23	—	2	10	2	1	671
Ankle								
1	5	—	—	—	—	3	1	10
3	5	—	—	—	—	2	1	35
Feet								
12	7	10	—	12	28	28	5	102
8	10	10	—	9	9	7	10	873
Spine								
—	—	4	1	—	1	—	—	6
—	—	20	18	—	9	—	—	107
Neck								
1	2	—	—	—	1	—	—	4
11	3	—	—	—	1	—	—	18
Chest								
1	—	2	—					3
13	—	3	—					19
Ribs								
—	3	4	1	—	2	1	—	11
—	9	9	21	—	10	9	—	113
Shoulder								
1	5	5	—	—	3	3	—	17
1	2	1	—	—	2	5	—	37
Humerus								
2	5	2	3	2	1	1	8	24
4	9	13	4	1	6	9	9	180
Elbow								
7	2	—	—	2	—	—	—	11
7	1	—	—	1	—	—	—	53
Forearm								
—	2	10	—	—	3	—	—	15
—	3	2	—	—	3	—	—	35
Wrist								
—	4	2	—	—	3	3	2	14
—	3	2	—	—	5	7	3	58
Hand								
3	14	2	—	—	5	—	—	24
3	4	5	—	—	7	—	—	110
Head Injuries								
—	10	—	—	1	—	2	—	13
—	4	—	—	1	—	8	—	57

Male				*Female*				
1–15	16–45	46–65	66–	0–15	16–45	46–65	66–	*Total*
Other Conditions								
Cartilage, etc.								
1	21	15	—	—	7	—	2	46
13	11	11	—	—	11	—	8	502
Osteoarthritis								
2	3	2	3					10
8	20	21	10					148
Osteomyelitis								
5	—	1	—	3	—	—	—	9
10	—	15	—	21	—	—	—	128
Miscellaneous								
5	15	5	—	4	4	3	—	36
6	8	7	—	9	5	11	—	274
								539
							Grand Total :	8,856

4. Ear, Nose and Throat

(*a*) TONSILLECTOMY AND ADENOIDECTOMY

Age	*Male*			*Female*		
	No. Patients	*Mean days*	*Total days*	*No. Patients*	*Mean days*	*Total days*
1						
2				1	3	3
3	2	3	6	5	4	20
4	12	3	36	15	3	45
5	29	3	87	25	4	100
6	24	3	72	28	3	84
7	20	1	60	19	3	57
8	12	3	36	15	3	45
9	6	3	18	8	3	24
10	8	3	24	6	3	18
11	1	3	3	6	4	24
12	1	7	7	6	3	18
13	4	3	12	2	3	6
14	2	3	6	4	3	12
15	1	3	3	3	3	9
16–45	9	5	45	39	4	116
46–65	2	5	10	—	—	—
Total :	133		425	172		581

Note : These cases represent 94 per cent. of the patients discharged. A further 18 were discharged untreated (usually because they had colds and were unfit for operation at the time).

(*b*) EAR, NOSE AND THROAT SURGERY (other than T.s and A.s)

Male				*Female*				
0–15	16–45	46–65	66–	0–15	16–45	46–65	66–	*Total*
Otitis Externa—Toilet only								
2	2	—	—	5	3	2	1	15
25	18	—	—	22	7	18	21	274
Oral Polyp—removal								
—	2	—	—	—	5	2	—	9
—	4	—	—	—	5	4	—	41
Acute Otitis Media—Antibiotics								
10	2	—	—	24	5	—	—	41
9	24	—	—	10	12	—	—	438
Mastoidectomy								
6	6	4	—	1	6	—	—	23
48	21	28	—	55	19	—	—	695
Miscellaneous, Ears								
9	2	5	2	4	3	—	—	25
14	9	9	18	21	7	—	—	330
								112
							Total :	1,778
Epistaxis								
2	1	7	2	2	—	4	9	27
3	3	5	8	8	—	3	3	115
Fractured Nose								
2	5	—	—					7
7	4	—	—					34
Sub-Mucous Resection of Septum								
1	21	8	—	—	10	8	—	48
6	7	7	—	—	7	7	—	335
Sinusitis								
—	4	—	—	—	—	1	1	6
—	10	—	—	—	—	7	13	60
Nasal Polyp								
1	5	5	—	—	—	2	—	13
21	7	7	—	—	—	—	—	101
Antral Wash Out								
4	—	—	—	6	—	—	—	10
11	—	—	—	8	—	—	—	92
Intra-nasal Antrostomy								
1	2	—	—	5	—	—	—	8
13	12	—	—	15	—	—	—	112
Miscellaneous, Nose								
4	2	3	—	4	3	—	—	16
1	18	4	—	7	10	—	—	110
								131
							Total :	959
Laryngoscopy-Oesophagoscopy								
5	7	4	1	—	3	10	1	31
18	12	3	3	—	3	4	13	249
Foreign Body in Oesophagus								
1	4	2	1	2	—	—	2	12
3	1	3	1	3	—	—	8	36
Carcinoma Mouth and Larynx								
—	1	5	3	—	1	1	1	12
—	27	12	21	—	5	8	31	214
Miscellaneous Mouth and Throat								
7	3	7	2	2	—	—	—	21
9	3	12	34	6	—	—	—	236
								76
							Total :	735

5. Ophthalmology

Male				*Female*				
0–15	16–45	46–65	66–	0–15	16–45	46–65	66–	*Total*
Burns (incl. Lime, acid, molten metal, etc.)								
4	9	9	—	—	—	—	—	22
4	10	9	—	—	—	—	—	187
Corneal Ulcer								
1	3	2	1	—	4	4	3	17
18	2	16	9	—	11	12	14	217
Injuries—Conservative								
6	6	1	1	2	—	1	—	17
17	10	5	3	10	—	14	—	204
Penetrative Injuries : Evisceration								
1	5	2	1	1	2	—	—	12
46	25	30	7	63	6	—	—	313
Infections								
2	1	3	—	1	6	2	3	18
10	10	15	—	17	10	11	7	195
Ectropion								
—	1	—	—	—	1	1	4	7
—	4	—	—	—	5	9	9	54
Cyst								
1	—	—	2	2	—	1	1	7
12	—	—	21	16	—	8	9	103
Strabismus								
14	2	1	—	31	4	—	—	52
14	12	12	—	15	12	—	—	745
Cataract								
2	6	4	5	1	1	5	14	38
24	11	24	25	15	19	21	24	810
Glaucoma								
—	1	5	7	—	1	1	5	20
—	6	20	17	—	29	38	20	392
Retinal Detachment								
1	3	1	—	1	3	1	1	11
10	28	64	—	31	90	36	10	505
Miscellaneous								
1	3	3	1	2	1	1	—	12
7	7	5	4	3	7	7	—	67
								233
							Grand Total:	3,791

6. Pædiatrics

	Male			*Female*			
	0–5	6–10	11–15	0–5	6–10	11–15	*Total*
Prematurity	2	—	—	1	—	—	3
	12	—	—	21	—	—	45
Feeding Problems	8	—	—	12	—	—	20
	20	—	—	14	—	—	328
Gastroenteritis	8	1	—	6	2	1	18
	6	11	—	6	14	14	137
Poisonings	3	—	—	3	—	—	6
	1	—	—	1	—	—	6
Abscess-Superficial	1	—	—	1	—	1	3
	10	—	—	9	—	7	26
Tonsillitis	1	2	—	2	—	—	5
	7	7	—	6	—	—	33
Otitis Media	5	—	—	6	—	—	11
	8	—	—	7	—	—	82
Infection of Upper Respiratory Tract							
	7	—	—	10	—	—	17
	7	—	—	6	—	—	109
Infection of Lower Respiratory Tract							
	10	—	4	9	—	—	23
	14	—	9	8	—	—	248
Pneumonia—Broncho-Pneumonia							
	11	8	4	14	1	2	40
	9	11	10	11	11	9	410
Convulsions	3	—	—	3	—	—	6
	6	—	—	8	—	—	42
Epilepsy	1	—	—	4	—	—	5
	13	—	—	28	—	—	125
Meningitis	5	—	—	8	—	—	13
	24	—	—	25	—	—	320
Poliomyelitis	2	—	—	4	—	—	6
	24	—	—	25	—	—	148
Pyelitis	1	—	—	4	4	2	11
	9	—	—	5	7	9	75
Nephritis	—	1	3	—	1	—	5
	—	28	28	—	12	—	125
Rheumatism	2	3	1	—	1	—	7
	28	36	21	—	23	—	208
Diabetes Mellitus	1	—	2	2	3	—	8
	18	—	18	12	11	—	111
Henoch-Schoenlein Syndrome	2	—	—	—	2	—	4
	8	—	—	—	16	—	48
Impetigo	2	—	—	1	—	—	3
	10	—	—	10	—	—	30
Infectious Diseases	3	1	3	5	—	3	15
	10	18	10	16	—	14	200
Neurosis	—	1	—	—	1	4	6
	—	20	—	—	20	23	132
Miscellaneous	2	5	1	3	4	—	15
	21	12	1	4	5	—	135
							250
					Grand Total :		3,122

7. Gynæcology

	Number of Operations by Age-Group		
	15–45	46–65	66–
Pregnancy			
Infertile : EUA Endobiopsy	30	—	—
Rubins	57	—	—
Abortion: Inevitable D & C	36	—	—
Incomplete D & C	102	—	—
Breech : EUA and Version	21	—	—
Dyspareunia D & C Plastic Enlargement	12	9	—
Other	30	—	—
Uterine			
Dysmenorrhœa D & C	33	—	—
EUA D & C	15	—	—
Fibroid : Myomectomy	15	6	—
Hysterectomy	9	3	—
Pan Hysterectomy & Implant	48	51	3
Parametritis Pan Hysterectomy & Implant	3	3	9
Endometriosis Testosterone Implant	9	3	—
Cervix			
Cervicitis	24	—	—
Erosion : Cautery, D & C, Pack	33	3	—
Polyp : Removal, Cautery, D & C, Pack	3	6	—
Leucorrhœa			
and Pelvic Hyperæmia : D & C Biopsy	33	—	—
Vagina			
Vaginitis	12	—	—
Other	3	9	3
Ovarian Cyst			
Removal, Ovary and Appendix	9	—	—
Fallopian Tubes			
Pomeroy Sterilization	15	—	—
Pelvic Floor			
Vaginal Prolapse: Fothergill	9	21	18
Vault Prolapse : Gilliam Suspension	30	—	—
Other	6	15	—
Congestive Retroversion : Gilliam Suspension	18	—	—
Procidentia : Vaginal Hysterectomy	—	6	6
Bladder			
Stress Incontinence : Urethroplasty	15	9	—
Other Dysuria	6	3	—
Urethral Caruncle	—	6	6

Investigation	*Number of Operations by Age Group* 15–45	46–65	66–
Menses : Amenorrhœa : Laparotomy	12	—	—
Menorrhagia : D & C, Biopsy, Pack	24	—	—
Metrorrhagia :	21	6	—
Postmenopausal bleeding : EUA, D & C, Biopsy	—	21	9
Pelvic and Abdominal Pain : EUA	18	—	—
Pelvic Mass or Infection	18	—	—
Other	6	6	—
Menopausal Symptoms			
Double Implant	15	—	—
Miscellaneous	15	24	—
Total :	765	210	54
%	74·3	20·4	5·3

Note.: These figures are based on a sample of four months : they have been adjusted to a full year's work. Data from Gynæcological Theatre Operation Book.

8. Dermatology

Male				*Female*				
0–15	16–45	46–65	66–	0–15	16–45	46–65	66–	*Total*
Eczema (Flexural, Contact, etc.)								
—	6	—	3	1	4	8	3	25
—	42	—	47	48	18	25	52	869
Dermatitis (Contact, Neuro, etc.)								
—	1	2	—	—	3	6	4	16
—	40	40	—	—	17	30	48	543
Urticarial Rash								
—	—	—	—	—	2	1	—	3
—	—	—	—	—	7	7	—	21
Ulceration								
—	1	1	2	—	—	—	—	4
—	60	60	68	—	—	—	—	256
Other								
1	—	4	—	—	4	—	—	9
18	—	18	—	—	28	—	—	202
								57
							Grand Total :	1,888

9. Consultant Dentistry

Male				*Female*				
0–15	16–45	46–65	66–	0–15	16–45	46–65	66–	*Total*
Impacted Wisdom Teeth								
—	2	1	—	—	11	4	—	18
—	2	1	—	—	2	2	—	36
Dental Caries								
1	6	—	—	2	8	6	—	23
2	2	—	—	2	2	2	—	46
Retained Roots								
—	2	—	1	1	5	3	1	13
—	2	—	2	2	2	2	2	26
Unerupted Teeth								
—	—	2	—	1	3	3	—	9
—	—	2	—	3	2	2	—	19
Cysts								
—	1	1	1	—	—	—	1	4
—	2	2	2	—	—	—	2	8
Osteitis								
—	1	—	—	—	1	3	—	5
—	4	—	—	—	2	2	—	12
Other								
—	3	—	—	—	2	3	—	8
—	5	—	—	—	2	2	—	25
								80
							Grand Total :	172

10. Summary Table—Patients and Bed-days in Sex and Age Groups by Specialty

Upper figure—Number of patients.
Lower figure—Total duration in days of patients surviving to discharge.

Male				*Female*				
0–15	16–45	46–65	66–	0–15	16–45	46–65	66–	*Total*
General Medicine								
17	136	260	149	14	152	184	197	1,109
219	2,569	5,290	4,129	234	2,181	3,185	4,079	21,886
Pædiatrics								
120				130				250
1,565				1,557				3,122
Dermatology								
1	8	7	5	1	13	15	7	57
18	352	212	277	48	249	387	348	1,891
General Surgery								
266	285	292	179	185	358	235	143	1,942
1,932	2,938	3,497	2,896	1,735	3,195	3,310	2,750	22,251
Orthopædics								
59	130	90	26	35	75	52	72	539
595	1,220	1,450	1,071	498	767	404	2,851	8,856
Ophthalmology								
33	40	31	18	41	23	16	31	233
475	526	510	309	649	494	275	554	3,792
Ear, Nose and Throat (Tonsils and Adenoids)								
122	9	2	—	143	29	—	—	305
370	45	10	—	464	116	—	—	1,006
Ear, Nose and Throat (Other)								
55	69	50	11	55	39	30	15	324
818	665	457	187	674	358	197	121	3,477
Consultant Dentistry								
1	15	4	2	4	30	22	2	80
2	41	8	4	9	60	44	4	172
Gynæcology (1)								
				—	765	210	54	1,029
				—	8,515	2,310	594	11,419
Obstetrics (2)								
				—	1,277	—	—	1,277
				—	11,493	—	—	11,493
Totals:								
674	692	736	390	607	2,761	764	521	7,145
5,994	8,356	11,434	8,873	5,867	27,428	10,112	11,301	89,365

(1) Duration of stay was not available for individual cases in Gynæcology; numbers of bed-days were derived by multiplying by the average stay of all patients.

(2) Obstetrics was not included in the age analysis, and it has been assumed that all cases were in the age group 16–45.

Table 11.

AVERAGE LENGTH OF STAY (DAYS) IN HOSPITAL IN BARROW AND U.S.A. FOR CERTAIN CONDITIONS

	BARROW 1957		**U.S. July* 1957 *–June* 1958	
Operation	*M.*	*F.*	*M.*	*F.*
Varicose Veins	10	8	12	6
T. and/or A.	3·2	3·4	1·6	1·9
Appendicectomy	10	9	7	7
Hernia repair	11	11	9	9
Hæmorrhoid	10	11	8	7
Gall bladder	21	21	14	14
Hysterectomy	—	13	—	10
Cæsarean Delivery	—	14	—	8
All other Delivery	—	9	—	4
Total Operations	11	12	9	6
Average all Surgical	11		7·5	
Average non-Surgical	19		10	
Heart Disease : Medically treated	28		15	
Peptic Ulcer : Medically treated	29		8	

* (Source : Reports from U.S. National Health Survey. U.S. Public Health Service. Publication No. 584. Series B.5.)

Table 12.

ALL DISEASES OF APPENDIX—HOSPITAL IN-PATIENTS PER 10,000 POPULATION IN BARROW (NORTH LONSDALE), WALES AND EAST ANGLIA BY SEX AND AGE GROUP

	Male					*Female*				
	0–15	16–45	46–65	66	*All ages*	0–15	16–45	46–65	66	*All ages*
Barrow (Number of patients) . . .	83	85	21	4	193	106	140	18	8	272
North Lonsdale (Rate per 10,000) . .	62	36	16	6	34	82	59	13	10	47
Wales*	32	36	11	11	28	22	49	13	5	31
East Anglia*	21	29	15	13	24	19	28	10	10	20

When the 101 cases of all ages and both sexes in Ulverston Hospital are added to the 465 cases of North Lonsdale, the total 565 for an effective population for General Surgery of 120,000, the overall rate is 46 per 10,000 population, in contrast to 30 for Wales and 22 for East Anglia.

* (Source : Registrar General's Statistical Review of England and Wales for 1955. Supplement on Hospital In-Patient Statistics, 1959. H.M.S.O.)

APPENDIX V

TABLES RELATING TO GENERAL PRACTICE

Table 1.

PERCENTAGES OF PATIENTS ON LISTS OF VARIOUS SIZES OF GENERAL PRACTITIONERS AT 1ST JULY, 1957, IN BARROW COMPARED WITH LANCASHIRE AND ENGLAND

Executive Council	*Percentage on Lists of* 1–2,500	*Percentage on Lists of* 2,500–3,000	*Percentage on Lists of over* 3,000
Barrow in Furness	50	28	22
Manchester	46	17	37
Lancashire County	42	27	31
Total : County Boroughs (England)	42	27	31
Total: Counties (England)	51	25	24

Source : Table G. p. 207 Appendix XVII. Annual Report of Ministry of Health for 1957. Part 1. Cmnd. 495, H.M.S.O.

Table 2.

BARROW AND FURNESS AREA:

TYPE AND SIZE OF PRACTICE WITH IN-PATIENT ADMISSION RATES PER 1,000 PRACTICE POPULATION

	Per cent. Urban	*N.H.S. List*	*Admission rates (patient incidence) per 1,000. Gen. Med.*	*Gen. Surg.*	*E.N.T.*	*Orth.*	*Pæd.*	*Ophth.*	*Gyn.*	*Obst.*	*Total*
Urban Partnerships :											
(1)	98·0	3,487	11·7	24·8	12·3	0·8	2·0	1·6	2·8	5·7	61·7
(2)	99·1	5,176	8·0	25·5	8·3	4·7	2·5	1·9	15·4	27·0	93·3
(3)	98·6	5,284	12·1	19·8	7·3	5·4	3·9	2·3	7·5	13·2	71·5
(4)	100·0	6,962	12·8	24·9	10·3	3·5	3·4	1·4	7·1	20·1	83·5
(5)	96·4	7,354	10·1	22·1	10·3	6·1	2·1	2·8	10·8	6·7	71·0
(6)	96·2	10,162	14·8	24·0	9·3	5·9	4·5	2·1	10·8	7·8	79·2
(7)	99·0	10,258	11·2	23·4	7·2	4·0	1·9	1·6	4·8	7·8	61·9
Urban single-handed :											
(8)	100·0	1,336	11·2	22·6	1·5	1·4	1·4	2·2	12·4	8·1	60·8
(9)	97·4	1,440	11·1	35·0	7·6	3·4	15·9	2·0	12·1	20·8	107·9
Rural Partnerships :											
(10)	2·5	3,821	5·9	27·7	6·0	3·0	3·7	2·1	13·0	5·2	66·6
(11)	1·8	5,298	3·9	22·8	9·4	3·7	0·8	1·5	6·2	5·5	53·8
Rural single-handed :											
(12)	0	1,731	4·5	18·4	6·3	3·4	1·7	2·1	4·9	7·5	48·8
(13)	0	1,873	4·1	20·3	3·2	7·4	1·0	3·6	8·7	4·1	52·4
(14)	0	2,011	2·3	16·4	1·0	9·9	0·9	0·8	7·8	5·3	44·4
(15)	0	2,828	7·4	21·2	8·4	2·1	1·4	0·9	8·5	6·4	56·3
(16)	1·5	4,558	5·1	12·9	5·7	4·8	0·6	2·1	4·5	5·6	41·3

Sources : List sizes were provided by the Barrow Executive Council and relate to mid-1957. Admissions were available for each general practitioner through the operation of the diagnostic analysis.

Notes : 'Admissions' here are taken as patient incidence, i.e. multiple admissions but excluding transfers.

For each department except Gynæcology and Obstetrics all cases during April 1957 to March 1958 have been included. In Gynæcology and Obstetrics the figures are based on a ten per cent. sample during the same period.

Table 3.

ANALYSIS OF G.P. USAGE OF HOSPITAL BEDS, DIRECT ACCESS, DIAGNOSTIC FACILITIES AND DRUG PRESCRIBING BY TYPE OF PRACTICE

		N.H.S. List (000)	*Hospital I.P. admission per* 1,000 *list*	*Direct use per* 1,000 (*Four month sample* 1957 *Day Book*) *Path. Lab.*	*X-ray*	*Prescribing Frequency in* (*a*) *Feb.* 1958 (*b*) *Mar.* 1958	*Average drug cost pence per person on list*
Urban Practice							
Partner-						(a)	(a)
ship	1	3·5	62	22	62	·48	36
	2	5·2	93	68	81	·54	39
	3	5·3	71	40	85	·52	53
	4	7·0	83	15	6	·52	54
	5	7·4	71	17	34	·47	42
	6	10·2	79	18	29	·56	39
	7	10·3	62	42	52	·38	31
Single	8	1·3	61	0	47	·44	30
	9	1·4	108	14	42	·36	46
				Average for Barrow		·49	42
Rural Practice							
Partner-						(b)	(b)
ship	10	3·8	67	1	31	·74	46
	11	5·3	54	0	0	·36	29
Single	12	1·7	49	0	0	·55	56
	13	1·9	52	0	22	—	—
	14	2·0	44	0	0	—	—
	15	2·3	56	23	0	·40	31
	16	4·6	41	3	7	·60	29
Average for Lancashire County (excl. County Boroughs)						·40	31
Average for all England and Wales . . .						·39	30

Table 4.

ADMISSION RATE PER 1,000 G.P. LIST BY TYPE OF PRACTICE FOR REMOVAL OF APPENDIX AND TONSILS COMPARED WITH OTHER COMMON SURGERY AND OBSTETRICS

		List Size 000	*Appendicectomy*	*Other General Surgery*	*T. & A.*	*Other E.N.T.*	*Gyn.*	*Obst.*	*Total all Specialties*
Urban Practice									
Partnership	1	3·5	4·6	20·2	3·4	8·9	2·8	5·7	61·7
	2	5·2	7·0	18·5	3·5	4·8	15·4	27·0	93·3
	3	5·3	5·3	14·5	2·6	4·7	7·5	13·2	71·5
	4	7·0	4·9	20·0	3·4	6·9	7·1	20·1	83·5
	5	7·4	3·6	18·5	3·0	7·3	10·8	6·7	71·0
	6	10·2	5·6	18·4	3·8	5·5	10·8	7·8	79·2
	7	10·3	3·5	19·9	1·7	5·5	4·8	7·8	61·9
Singlehanded	8	1·3	4·6	18·0	0·0	1·5	12·4	8·1	60·8
	9	1·4	10·0	25·0	2·1	5·5	12·1	20·8	107·9
	a	2·9	10·0		·3				
	b	4·0	2·7		3·2				
Rural Practice									
Partnership	10	3·8	2·6	25·1	2·0	4·0	13·0	5·2	66·6
	11*	5·3	2·1	20·7	3·4	6·0	6·2	5·5	53·8
	18	5·0	4·6		·4				
	19	3·8	3·2		0·0				
	20*	3·0	·7		0·0				
Singlehanded	12*	1·7	1·2	17·2	3·0	3·3	4·9	7·5	48·8
	13	1·9	3·2	17·1	1·0	2·2	8·7	4·1	52·4
	14	2·0	3·5	12·9			7·8	5·3	44·4
	15*	2·3	·9	20·3	4·8	3·6	8·5	6·4	56·3
	16	4·6	1·3	11·6	2·0	3·7	4·5	5·6	41·3
	17*	2·9	·3		2·8				
	21*	1·4	1·4		6·4				
	22*	1·4	·7		2·8				

* Practices in or near Ulverston where a further 101 elective appendicectomies were done in the year.
a. and b.: one doctor's name only identified in two partnerships of two where the other partner had the same surname.

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INDEX

The Demand for Medical Care

How many hospital beds do we need? This question has long exercised the minds of administrators. It is one of particular interest and importance to this country at the present time when new hospitals are being built to replace those of the last century and when hospital care is becoming increasingly expensive in its consumption of public funds and skilled manpower. In a detailed analysis of the demand for medical services in a northern industrial area the authors raise challenging questions on the future of health care services in Britain as a whole. Making a plea for planning authorities to broaden the scope of their statistical inquiries they themselves range far beyond the demands merely for hospital services and consider the impact of the National Health Service in general with its aim of providing comprehensive medical care. The hospital, local authority, and general practitioner services are considered in their essential interdependence and the need for hospital beds is estimated accordingly. This is about half the official estimates made in the early days of the National Health Service.

Decades of low-cost hospital care, with publicly-provided medical services orientated to a section of the people on the assumption that they did not enjoy the services of a personal physician, have engendered medical and social traditions which sometimes result in unnecessary admission to hospital and over prolonged stay. The authors urge the need to question the alignment and the customs of health care services in general.

The authors also discuss many of the problems to be solved if waste is to be avoided and the inherent promise of the National Health Service is to be fulfilled. Of particular importance is their analysis of the present role of the general practitioner, but their work will commend itself to all engaged in the provision of comprehensive medical care, whether as doctor, administrator, patient or taxpayer.

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