# Efficiency in the Hospital Service

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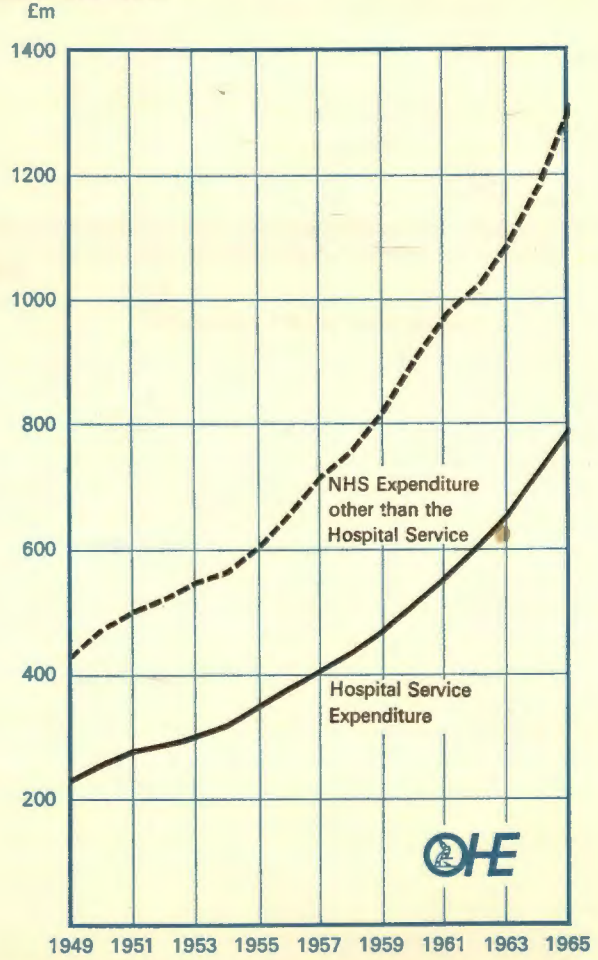
# EFFICIENCY IN THE HOSPITAL SERVICE

## Fig. 1

**Expenditure on the National Health Service and Hospital Service, 1949 to 1965, United Kingdom*.**

*Source:* Derived from National Income and Expenditure and Annual Abstract of Statistics, various years.




*Includes current and capital expenditure by Central Government and Local Authorities. The figures are for net expenditure plus payments made by patients.

*Note:* At 1949 constant prices the 1965 total NHS expenditure would have been £749 million and the 1965 Hospital Service expenditure £455 million.

# Patterns of Expenditure

IN 1965 the National Health Service cost the nation over £1300 million of which the Hospital Service absorbed almost £800 million (Fig. 1). Where such very large sums of money are involved, almost all of which are spent out of public funds, it is obviously important that the expenditure should yield the greatest possible value. This paper reviews trends in hospital spending and describes measures being taken to examine efficiency in the Hospital Service as well as the problems inherent in such efficiency studies.

A full account of the trends in hospital expenditure has been given elsewhere[1] but a brief summary of hospital costs and how they have developed since the inception of the National Health Service is necessary in order to put the need for efficiency into perspective.

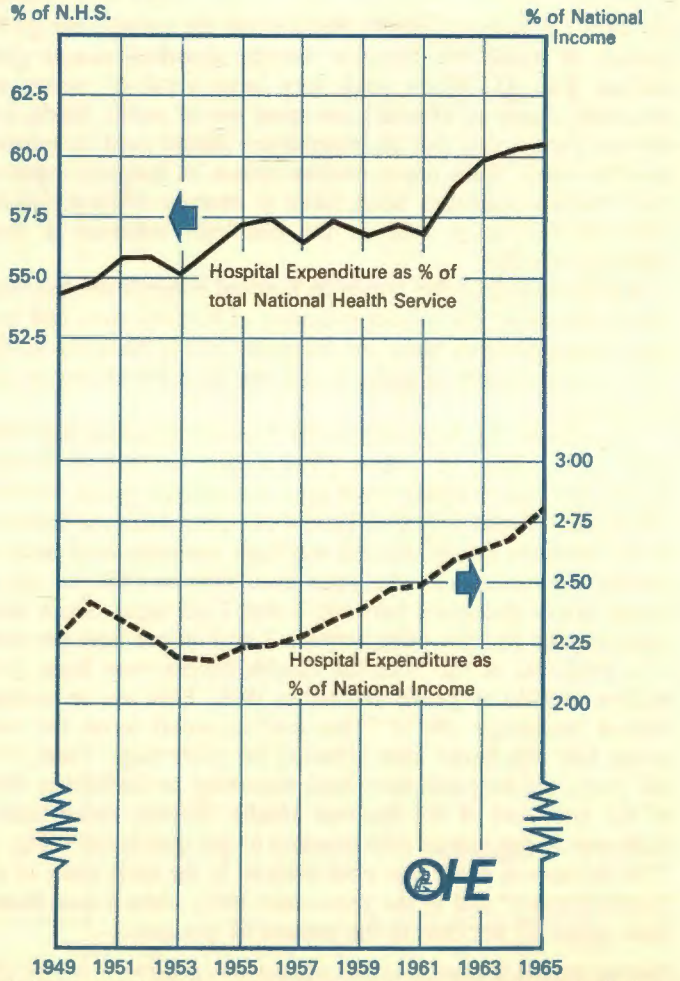
Expenditure on hospitals in the United Kingdom has risen from £235 million in 1949 to £794 million in 1965, an average annual increase of nearly 8 per cent. At constant prices however the increase would only have been 4 per cent. After the first year or so, when the rate of increase was high, attempts were made to control the rise and for the years from 1950 to 1954 the rise at actual prices fluctuated between 3 and 7 per cent. Since then, however, the rise has been between 7 and 10 per cent per year. The total cost of the National Health Service rose from £431 million in 1949 to £1308 million in 1965. This was an average annual percentage rise of 7 per cent in actual terms but only about half this figure after allowing for price rises. Thus, over the years, the hospitals have been absorbing an increasing share of the total cost of the National Health Service, rising from a little over 54 per cent in 1949 to nearly 61 per cent in 1965 (Fig. 2). This increase in share was most marked in the early years of the Health Service* and in the years since 1960, when it rose from a little under 57 per cent to the present 61 per cent.

*Between 1949 and 1952 there was a sharp reduction in the proportion of the total NHS cost spent on the dental and supplementary ophthalmic services; this accounted for much of the proportionate increase in expenditure on other parts of the Service.

## Fig. 2

**Hospital Service Expenditure as a proportion of total National Health Service Expenditure and as a proportion of National Income, 1949 to 1965, United Kingdom*.**

*Source:* Derived from National Income and Expenditure and Annual Abstract of Statistics, various years.




*Includes current and capital expenditure by Central Government and Local Authorities. The figures are for net expenditure plus payments made by patients.

In terms of the nation's resources, the Hospital Service absorbed a declining proportion of National Income from 1950 to 1954, since when the proportion rose steadily from 2·19 to 2·81 by 1965. It was not until 1960 that the 1950 share was reached again (Fig. 2).

**Capital Expenditure**

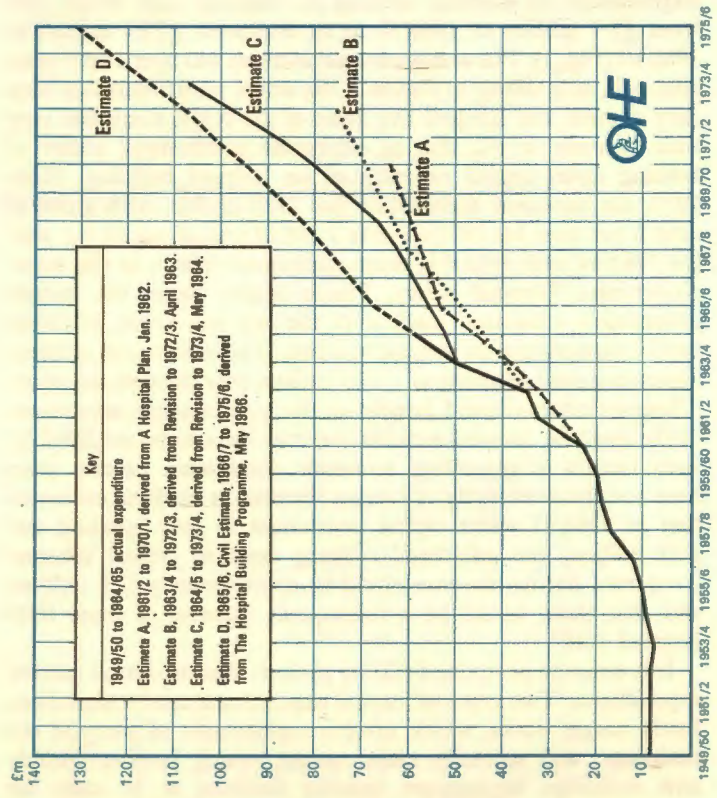
Expenditure on hospital building in England and Wales rose from £8·7 million in 1949/50 to an estimated £73·3 million in 1966/67 (Fig. 3). The average annual increase was over 13 per cent, although, as is shown in Figure 3, the actual yearly increases were very uneven. For the first five years of the NHS there was very little increase at all, due to deliberate government policy of holding down capital expenditure on hospital building. Since 1955, the increased expenditure has been erratic, with a rise of only 6 per cent for 1959/60 over 1958/59 and about 40 per cent for 1963/64 over 1962/63; these differences reflect, in the main, government financial policy. Figure 3 also shows the various government estimates, made over the last few years, of future capital expenditure on hospital building. The most recent estimate forecasts a total spending of £1000 million over the next ten years. These estimates depend largely on the government's assessment of the need for hospital services but may have to be modified by such factors as prevailing economic conditions, general price rises and the availability of current revenue. It has been estimated that in 1966/67 when capital investment in new building was £73 million, the additional running costs of capital schemes completed during the year would be approximately £10 million, and that there would be a consequent increase of some 8000 hospital staff[2].

It is easier to postpone building projects than to curtail current expenditure. Two types of capital expenditure can be identified; firstly minor works, which involve replacement of parts of old buildings, and secondly major works, which involve entirely new buildings to improve existing facilities or to cater for increases in population. In the short-run curtailment of capital investment restricting it primarily to replacement, does not seriously interfere with the effectiveness of medical care. In the long run, however, if medical care is to improve, new buildings are necessary.

# Fig. 3

## Hospital Building Expenditure, 1949/50 to 1975/76, England and Wales.

*Source:* A Hospital Plan for England and Wales, 1962. Revisions, 1963, 1964 and 1966. Civil Estimates, 1965/66. Ministry of Health Annual Reports, various years.




*Note:* Each estimate is based on current prices for the year in which it is made. This fact is responsible in part, at least, for the increase in successive estimates.

The trend in capital investment for the UK in four sectors of the economy, health, education, roads and sewerage, is shown in Figure 4. Until about 1960 health expenditure was rising more slowly than schools and roads, but since then has been rising at a comparable rate.

## Current Expenditure

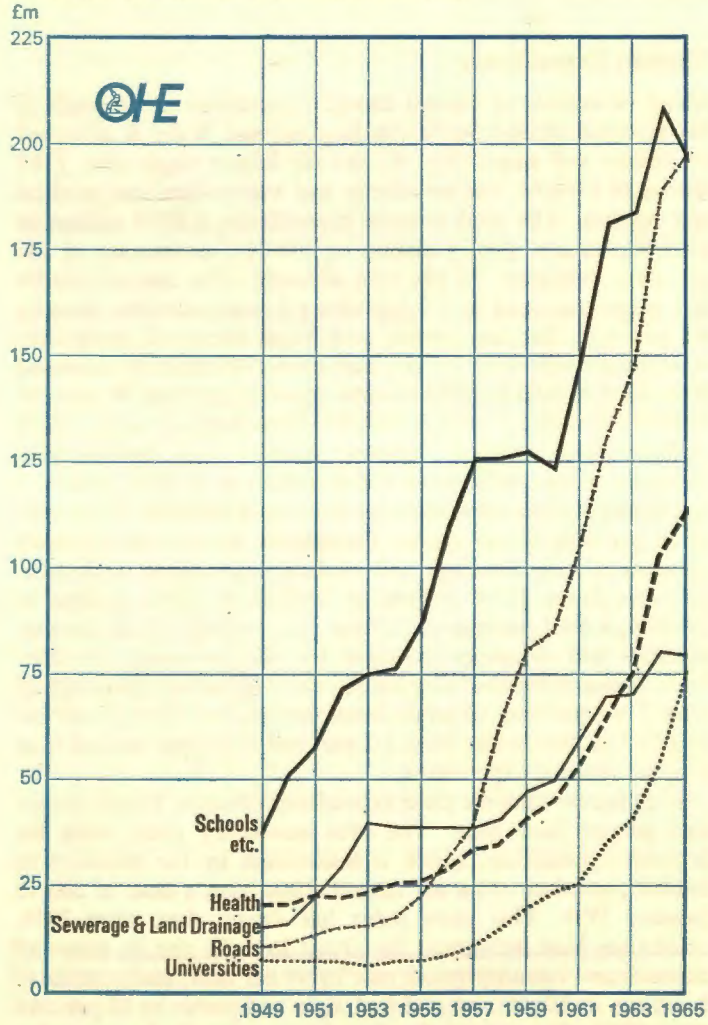
About two-thirds of current annual expenditure on hospitals in the National Health Service in England and Wales is absorbed by salaries and wages (Fig. 5), and the largest single cost, £165 million in 1964/65, was for salaries and wages other than medical and nursing. The total revenue expenditure, £205·3 million in 1949/50, reached £587·9 million by 1964/65, an increase of 186 per cent, averaging 7·3 per cent annually. The cost of salaries and wages increased by 7·9 per cent per year and other items by 6·2 per cent. Because salaries and wages increased faster than most other items (over 215 per cent since 1949/50) they increased their share of total hospital revenue expenditure from 58 per cent in 1949/50 to 64 per cent in 1964/65. Housekeeping items, which include food, heating, lighting, laundry and maintenance, increased more slowly from £50·8 million to £113·0 million, a rise of 122 per cent; consequently their share fell from 25 per cent to 19 per cent of the whole. Therapeutic items, which include pharmaceuticals, dressings and medical and surgical appliances increased from £13·6 million in 1949/50 to £45·5 million in 1964/65, a total increase of 235 per cent (within which pharmaceuticals and dressings increased by 169 per cent); all these items' share of the total hospital revenue expenditure rose slightly from 7 to 8 per cent. Central administration, rose from £5 million to £15·7 million, a rise from 2·4 per cent to 2·7 per cent of total hospital revenue expenditure.

Four factors underlie these expenditure changes. Firstly, prices and salaries have risen. The total non-salary price index for hospital expenditure, which is maintained by the Ministry of Health[3], stood at 134·6 for August 1966 from a base of 100 in January 1956. This price index has shown that, since 1956, price rises have accounted for about half the rise in non-staff expenditure. Laundry prices rose by 61 per cent, maintenance of buildings by 50 per cent and fuel, light and power by 42 per cent since 1956. The price index for pharmaceuticals, however, has

## Fig. 4

**Gross Fixed Capital Formation in Education, Health, Roads and Sewerage and Land Drainage, 1949 to 1965, United Kingdom*.**

*Source:* National Income and Expenditure, various years.




*Expenditure on Land is excluded; both private and public expenditure are included.

**Fig. 5**
Hospital Service Gross Revenue Expenditure, 1949/50 to 1964/65, England and Wales.

*Source:* Ministry of Health Annual Reports, various years.

fallen*. As far as salaries are concerned, consultants, at the start of their career, earned £1700 per year in 1948. Under their new pay structure, which came into force in 1966, they will start at £3200. The salaries of House Officers in their first appointment increased from £350 per annum in 1948 to £1100 per annum in 1966. In the main, the level of the incomes obtained by hospital employees is determined by that in the rest of the community. Thus, rising living standards, reflected by higher incomes, a shorter working week and longer holidays, all tend to result in greater hospital expenditure on salaries.

Secondly, the rise in workload as well as the shorter working week has necessitated more staff, more provisions, and other increased costs. Between 1949 and 1965 the number of nursing and midwifery staff (whole-time equivalents) increased from an estimated 140,000 to 220,000, a rise of 58 per cent, and the number of medical and dental staff (whole-time equivalents) rose from 11,900 to 18,900, or a rise of 59 per cent. The total number of domestic workers in the Hospital Service was 129,000 in 1949; it reached 187,000 by 1965, a rise of 45 per cent. These rises were concurrent with an increase in patients treated. The annual number of in-patients who were treated increased from 2,937,000 in 1949 to 4,818,000 in 1965, a rise of 64 per cent; and the number of new out-patients seen at consultant clinics increased by 22 per cent, from 6,148,000 to 7,490,000. The substantial rise in the number of in-patients treated resulted primarily from a corresponding reduction in the length of stay in hospital rather than from an increase in the number of beds†.

Thirdly, changes in the practice of medicine which provide a better standard of care within the Hospital Service can cause increases in expenditure. For example, the introduction of intensive care units and very complex heart or brain surgery will add to expenditure. Also patients are now better informed

*The significance of this fall, which amounted to 14 per cent over the ten years, is limited because of the difficulties involved in maintaining an index of pharmaceutical prices. The innovation rate for medicines is comparatively high and when a new product is introduced it is entered into the index at 100. The index, therefore, is based on the change in price of individual products over time and does not take into account the price relationship of the new medicine to the one it has replaced; many, bearing research and development costs, are more expensive. In addition most new medicines, after an initial period, tend to fall in price and it is primarily this pattern which is reflected in the falling price index. A new system of compiling the pharmaceutical price index has recently been introduced by the Ministry of Health.

†The length of stay was, for all hospitals, on average, 49 days in 1949; by 1965 it was 30 days.

and expect diagnosis to be accurate, treatment effective and the Service to provide the best that modern medicine can offer.

Finally, a further important factor in rising hospital costs is the standard of living people enjoy in their own homes. A nation with a low level of living does not expect a very high standard of care and hospital costs tend to be low. On the other hand, the citizens of a prosperous nation would find the standards prevailing in the hospitals of a poor country, or those which prevailed in their own country in the past, quite intolerable. They expect standards in hospitals to be related to their living conditions at home, in terms of food, warmth, and surroundings, and this must increase hospital costs.

# Measures of Performance

MUCH information has been, and is being, collected to measure and compare costs and use of resources. These can be measured in money terms as, for example, with the cost of keeping a patient in a specific type of hospital per week; alternatively, they can be measured in other terms such as the length of stay in, or discharge rates from, hospital. In almost every case the statistics reveal very great superficial variations between different hospitals and between different parts of the country. These cannot generally be explained by attempting to relate costs to readily ascertainable standards of need or performance.

Table A, shows the number of hospital beds per 1000 population by hospital region for 1960, and also the estimates for 1975 upon which the hospital building programme is based. In 1960 the total number of beds varied between 8·1 per 1000 population and 12·1 per 1000. Within the regions themselves there are even greater variations between individual towns or districts. The Hospital Plan commented on the fact that beds per 1000 population are not directly related to morbidity in the different areas[4]. 'These variations are largely due to historical reasons though they *sometimes also** reflect differences in morbidity, in social conditions and in the scale of local authority services.' The 1975 estimates, which were based on bed-ratios obtained from a handful of small-scale regional studies, indicate a considerable levelling of regional variations and an overall reduction in ratios. The acceleration of physical improvements, the greater concentration of treatment in district general hospitals and greater efficiency generally are all expected to increase the average number of patients treated per bed and thus to reduce the ratio of beds to population. It is realised, however, that these estimated ratios do not fully take into account the potential development of services outside the hospitals, for example by the Local Health Services, or of the scope for management efficiency within the hospitals themselves. Thus it is foreseen that revision will have to

* Italic added.

## Table A

**Hospital beds per 1000 population, by type and region, 1960 and 1975, England and Wales.**

*Source:* A Hospital Plan for England and Wales, 1962.

| | 1960 (*Actual*) | | | | 1975 (*Estimated*) | | | |
|---|---|---|---|---|---|---|---|---|
| *Region* | *Acute* | *Geriatric* | *Mental illness and Sub-normality* | *Total** | *Acute* | *Geriatric* | *Mental illness and Sub-normality* | *Total** |
| Newcastle | 3·8 | 1·0 | 3·9 | 9·2 | 3·4 | 1·3 | 3·1 | 8·4 |
| Leeds | 3·8 | 1·7 | 5·0 | 11·0 | 3·4 | 1·4 | 3·0 | 8·4 |
| Sheffield | 3·1 | 1·2 | 3·4 | 8·1 | 3·0 | 1·3 | 2·9 | 7·7 |
| East Anglia | 3·0 | 1·7 | 4·4 | 9·5 | 2·9 | 1·5 | 2·9 | 7·8 |
| Metropolitan Regions | 4·2 | 1·1 | 5·3 | 11·1 | 3·6 | 1·2 | 3·4 | 8·7 |
| Wessex | 3·6 | 1·4 | 5·1 | 10·5 | 3·3 | 1·3 | 3·0 | 8·1 |
| Oxford | 3·3 | 1·5 | 4·1 | 9·3 | 3·3 | 1·2 | 3·1 | 8·2 |
| South Western | 3·7 | 1·7 | 5·6 | 11·4 | 3·3 | 1·7 | 3·5 | 9·0 |
| Birmingham | 3·3 | 1·3 | 4·1 | 9·1 | 3·1 | 1·3 | 3·0 | 7·9 |
| Manchester | 3·6 | 1·5 | 3·8 | 9·4 | 3·4 | 1·4 | 3·2 | 8·6 |
| Liverpool | 5·6 | 1·2 | 4·8 | 12·1 | 3·5 | 1·3 | 3·2 | 8·6 |
| Wales | 4·5 | 1·1 | 4·4 | 10·5 | 3·5 | 1·5 | 2·8 | 8·4 |
| England and Wales | 3·9 | 1·3 | 4·6 | 10·3 | 3·4 | 1·3 | 3·2 | 8·5 |
| Range of Variation | 2·6 | 0·7 | 2·2 | 4·0 | 0·7 | 0·5 | 0·7 | 1·3 |

**Note:* The total column includes provision for maternity beds which is not shown in the table.

## Table B

**Admission to hospital by region, sex and age, per 1000 diagnoses from general practitioners, 1955/56, England and Wales.**
*Source:* Morbidity Statistics from General Practice. Vol. I, 1958.

| | Rate per 1000 Diagnoses | | | |
|---|---|---|---|---|
| | *North* | *Midlands and Wales* | *South* | *Total* |
| *Males* | | | | |
| 0–14 | 24 | 23 | 25 | 24 |
| 15–44 | 26 | 25 | 29 | 27 |
| 45–64 | 37 | 37 | 45 | 40 |
| 65+ | 50 | 46 | 59 | 52 |
| All | 31 | 30 | 35 | 32 |
| *Females* | | | | |
| 0–14 | 19 | 19 | 19 | 19 |
| 15–44 | 33 | 29 | 32 | 32 |
| 45–64 | 26 | 30 | 31 | 29 |
| 65+ | 38 | 33 | 45 | 40 |
| All | 29 | 28 | 31 | 30 |

be made from time to time, and some of the figures have already been amended by the Ministry of Health.

The limited extent to which hospital beds and hospital admissions are directly linked to need can be seen from Table B. Of 1000 men diagnosed in general practice 30 were admitted to hospital in the Midlands and Wales whereas for men living in the South some 35 were admitted to hospital.

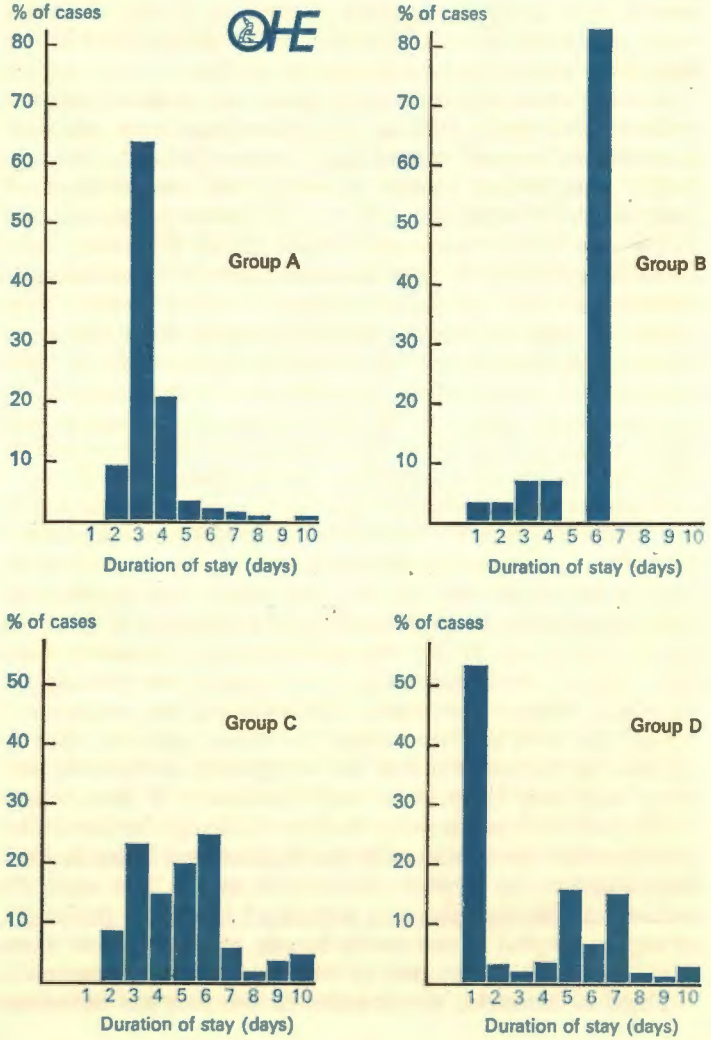
A further example of variations between hospitals can be found in the annual Hospital Costing Returns[5]. In England and Wales in 1965/66, one acute, medium-sized, hospital was spending £5 16s. 4d. per occupied bed per week on medical salaries; another similar sized acute hospital was spending only £2 1s. 9d. (For hardware and crockery the cost ranged from 3s. 9d. to only 4d. per occupied bed per week.) Total expenditure ranged from £68 13s. 9d. to £29 0s. 2d.

There are, no doubt, many explanations for the differences. For example, even within acute hospitals the type of case treated

## Fig. 6

**Distribution of duration of stay of children under 15 with hypertrophy of tonsils and adenoids with mention of operation in four selected hospital groups, 1960, England and Wales.**

*Source:* M. A. Heasman, *Lancet* 2, 1964.



may vary considerably. A study[6] which examined hospital costs showed that more than 25 per cent of the variation in total ward cost per case can be accounted for by the very different type of medical work done in different hospitals. Other explanations include age and sex differences of the patients and the geographical locations, age and layout of the hospitals. However, there is very rarely any measure of how the quality of service varies or whether a patient receives 'better' medical care in one part of the country or hospital than in another.

In other cases where attempts have been made to measure performance equally striking differences have been revealed. According to a study[7] carried out between 1956 and 1959 case fatality rates among patients admitted with complications of diabetes varied between 6 per cent for teaching hospitals and 14 per cent for non-teaching hospitals; similar differences were found for a number of other illnesses. Research is continuing to identify the causes of these variations. It seems probable that patients treated in teaching hospitals benefit from the more advanced medical techniques and higher standards of care provided in these hospitals. The costs of teaching hospitals are correspondingly greater, £55 19s. 2d. for an average patient week in a London acute teaching hospital in 1965/66 compared with £39 11s. 9d. for an acute non-teaching hospital.

There are wide divergences too between the lengths of stay in different hospitals for the same condition. Figure 6 shows for four different hospital groups the length of stay of children in hospital for tonsil and adenoid operations. The majority of children in group A spent three days in hospital, in group B six days, in group D one day and in group C between three and six days. The methodology of the surgeon, the pressure on beds and perhaps even some differences in the patients are among the more obvious reasons for these variations. But if children discharged after one day are, in fact, perfectly fit and happy why keep them in for six? Conversely, if they in fact benefit from a longer stay why are some discharged so soon? The costs involved are considerable. In England and Wales in 1961 hospitalisation for hypertrophy of the tonsils cost over £6 million[8]. Are all the operations necessary? How far is the length of stay in hospital related to the benefit for the patient? Both questions might be answered by long-term controlled studies.

Thus, in the main, the situation in the past has been that

although many statistics on costs or use of resources have been produced, the majority defy interpretation because measurements of benefit have rarely been attempted. Useful comparisons cannot be made from the recorded statistics without further data.

## The Meaning of Hospital Efficiency

Efficiency in the hospital service is concerned with costs and with the benefits produced and should describe their relationship. The object of efficiency studies should be to show how the most effective medical care can be achieved as economically as possible. Medical care can, broadly, be considered in two parts; firstly, clinical or technical factors, and secondly, organisational factors. Clinical efficiency can be achieved by correct diagnosis, effective treatment and by technical competence in the application of medical procedures. For example, in the case of tonsillectomies, they must be shown to be justified, to be beneficial and to be well performed. Organisational efficiency is concerned with the non-clinical aspects and involves such factors as the way the hospital is run and the work-load of the staff. Obviously, some aspects of medical care concern both parts. For example, the length of stay in hospitals can be regarded as either a clinical or organisational matter. (In this paper it is included under the latter category.) In an overall appraisal of medical care both the technical and the organisational aspects have to be considered, because an unnecessary procedure efficiently carried out is nevertheless still ineffective. However, this paper deals in the main with organisational efficiency.

Within efficiency studies or 'organisational' research there are also two basic divisions: firstly organisation and method (O & M) or work studies, and secondly management efficiency studies. This paper is concerned primarily with the latter type of study. Nevertheless, in this case also no clear cut distinction can be made and much overlap exists between these divisions. (Even hospital research as such often overlaps with non-hospital health problems, as for example in the balance between hospital and domiciliary care or in the relative roles of the hospital, the local health service and the general practitioner.) The most obvious differences between work study and management efficiency studies are in the method and the scope of the research. Manage-

ment efficiency studies are generally on a very much larger scale than work studies. The latter tend to be related to specific items of expenditure. For example, it was estimated that, by 1961, the implementation of organisation and method and work studies which had been completed could save £160,000. By contrast, management efficiency studies tend to look more broadly at the Service. If they could result in savings of 1 per cent of the total cost of the hospital service, it would mean a national gain of £8 million which could be released for further health developments. Studies of this nature within commerce and industry have produced savings much larger than 1 per cent.

The efficiency of hospital organisation may change as a result of costs or benefits rising, falling or remaining constant. There are thus many alternative patterns of change which may affect efficiency*. Studies in the hospital service should consider each of these alternatives which lead to a gain in efficiency. This avoids the danger of the approach to hospital efficiency being narrowly conceived, limited to the most obvious relationship of cost reduction in association with existing or constant benefits. The difficulties of studying the broad range of relationships resulting from changes in costs or benefits are considerable, particularly as reductions in costs can usually be measured (not necessarily in money terms) while improvements in the benefits are less easily quantified. However, this difficulty should not prevent the broader question of efficiency in the hospital service being posed and investigated. Indeed, unless it is, the objectives will become too limited and, in the development of efficiency and standards in the hospital service, many investigations will not be undertaken.

## The Growth in the Study of Efficiency

Within the National Health Service itself very little cost efficiency research was undertaken during the first decade. King Edward's Hospital Fund had, however, pioneered the field before the war

*For example, costs may rise while benefits rise, fall or remain constant. Cost increases, with constant or decreased benefit, represent a decline in efficiency while cost increase resulting in an increased benefit would represent improved efficiency if the extra benefits outweigh the extra cost. Alternatively, further conditions exist where costs remain constant as benefits rise, fall or remain the same. Again, there is a clear gain in efficiency where costs remain constant but benefits rise and a loss where benefits fall. There are finally, conditions where costs fall but benefits rise, fall or remain constant. Again, there is a clear gain in efficiency where costs fall but benefits improve or remain constant. There is also possibly a gain where costs fall and benefits fall but the loss of benefit is less than the reduction in costs. Such could be the case where hospital stay is reduced, involving perhaps some slight risk and a small reduction in the standard of medical care, but a substantial saving in cost.

and the Nuffield Provincial Hospitals Trust were undertaking investigations in the early 1950's. These organisations gave impetus to the growing awareness of the usefulness of this type of research and in July 1954 an Organisation and Methods Service was set up by the Ministry of Health on an experimental basis. In 1958 it became permanent, and the number of authorised posts has increased to 227 in the Regional Hospital Boards and to 35 in the Ministry. The studies undertaken by their units are mainly concerned with assisting hospital authorities to provide better services, to conduct their affairs more efficiently within existing expenditures, to improve services to patients and to ensure that additional expenditure is no higher than necessary to achieve desired results. Most of the research is carried out by the individual Regional Hospital Boards but there is also a Central Organisation and Method Unit at the Ministry which undertakes investigations itself and also acts as a co-ordinating centre. Examples of items on which this type of study have been made are the ordering and receipt of pharmaceutical supplies, the centralisation (within the hospital) of washing-up arrangements, recording sickness of nursing staff and the use of changing cubicles in X-ray departments. Subjects of general interest are published by the Ministry in six publications, namely: *Hospital O & M Service Reports* (9 published to date), *Abstracts of Efficiency Studies in the Hospital Service* (93), *Hospital Technical Memoranda* (16), *Hospital Building Notes* (32), *Hospital Building Bulletins* (5), and *Hospital Equipment Notes* (32).

In 1959 the Minister of Health set up an Advisory Council for Management Efficiency, to be concerned with issues of major importance surrounding efficiency studies within the National Health Service and also with examining their extension and their profitable application. The Council set up three committees, to deal with management efficiency techniques, with statistical and financial comparisons covering the compilation and effective use of such data for improving efficiency, and with efficiency requirements in the design and equipment of hospital buildings. The work of the Council and of its successor, a smaller Advisory Committee, furthered permanent machinery for studies of hospital efficiency, operational research and of management training. The Committee was disbanded in 1966 having played a part in the formation of the new Ministry of Health Division of Statistics and Research. This has four branches, the Organisation and

## Table C

Expenditure on Hospital Efficiency Studies authorised as a charge to Central Government Research Funds. 1963/64 to 1966/67, England and Wales.

*Source:* Ministry of Health, personal communication.

| | *Expenditure via Hospital Boards* | *Central Ministry of Health Expenditure* | *Total* |
|---|---|---|---|
| | £ | £ | £ |
| 1963/64 | 12,000 | 6,000 | 18,000 |
| 1964/65 | 45,000 | 37,000 | 82,000 |
| 1965/66 (est.) | 70,000 | 69,000 | 139,000 |
| 1966/67 (est.) | 90,000 | 160,000 | 250,000 |

Method Service; Research and Development of Services and the Management Efficiency Study Branch (which originated in about 1961); the Statistical Branches and the Computer Policy Branch. Since 1963, hospital studies concerned with the effectiveness of services have been authorised as a charge to research funds and Table C shows how expenditure has risen rapidly since then, although it still represents only 0·03 per cent of total hospital expenditure.* In addition to these studies (some 55 had been started by 1965) and a few small scale studies conducted and financed by Regional Hospital Boards, other current work is still financed by the Universities and, as previously mentioned, the charitable organisations such as King Edward's Hospital Fund and the Nuffield Provincial Hospitals Trust.

At present, a number of major projects are in progress. One, financed mainly by the Ministry, is the Hospital Activity Analysis which is now starting in nearly all Hospital Regions and is operating on a considerable scale in several of these†. This study will replace the need for the Hospital In-Patient Enquiry and will help with the interpretation of costing data given in the Hospital Costing Returns. It includes data for social, administrative and clinical purposes both at a national, regional and individual

*In addition to the estimated £250,000 for 1966/67 further considerable sums are spent on other types of research.

†The cost to the Ministry of this study is not included in Table C.

hospital level. This study recognises that as staff account for by far the major part of hospital costs, analysis of 'costs' can be thought of in terms of people, and the work they do, rather than in money terms.

The Ministry has also itself undertaken studies on the work of hospital porters and hospital nursing staff. The latter study was concerned with the deployment of nurses, taking into account such variables as the type of patient, ward-layout, and case-load. Further work on nursing care has recently been started. Another Ministry study, on food in hospitals, has, by assessing nutritional needs and the price of food, recommended set standards to all Regional Hospital Boards. Sponsored by the Ministry is work being conducted at Oxford with the aim of developing improved measures of hospital efficiency by statistical analysis, exploring the applicability of several statistical methods to the study of hospital performance and in finding relationships between costs, staffing, patient workload, length of stay per case and other variables.

The Nuffield Provincial Hospitals Trust is sponsoring work at Manchester University on how measurable statistics such as length of stay and staff turnover are affected by variables which include communications, aptitude and morale in hospitals. It is also aiding a study at Oxford into an operational research approach to the Health Service generally. This is being done by considering the demand for medical care and the ways in which it is or might be satisfied.

These are only some of the studies being conducted. In addition, research into devising measurements of quality and investigating efficiency studies themselves is currently in progress. Apart from the work at Oxford previously mentioned, King Edward's Hospital Fund is attempting to devise criteria of good hospital management. The Ministry is attempting to develop techniques for the introduction of administrative efficiencies in hospital groups; to isolate the management problems into which research will be most rewarding and to devise suitable research methods; to construct 'models' of management processes and to identify aspects of management which will repay further study.

# The Future

IN the early years of the National Health Service the control of the infections, particularly tuberculosis, released many hospital beds and facilities for other uses. Similarly, in recent years it has been possible to reduce substantially the number of hospital beds occupied by the mentally ill. The pressure on hospital expenditure has been alleviated to some extent by the consequent reallocation of resources. In the foreseeable future, however, the pattern of medical progress is unlikely to release correspondingly great resources for reallocation. The need for greater organisational efficiency has thus taken on an added urgency.

Throughout the last twelve years expenditure on the hospitals has risen slightly faster than national income and for the past five years has absorbed a growing share of total expenditure on the National Health Service. At least the first of these trends is likely to continue in the future. Costs have increased, and will continue to increase because of rising prices, salaries and wages, improved facilities and the rising expectations of the population.

The National Health Service now employs over half a million people and is the fifth largest 'industry' in the country. This paper is concerned with only one part of the health service, the hospitals. Ideally, they should be regarded as only one sector of an integrated whole. However at present they are managed and financed separately from other parts of the Service, and they account for the major part of the total expenditure. Thus, although efficiency studies should eventually cover all aspects of medical care, their immediate importance within the Hospital Service is obvious. Not only must efficiency studies pin-point variations in performance of similar organisations by the use of statistics, but they must also play a more positive role in evaluating the success or failure of different methods of medical care and organisation and eventually attempt to define acceptable levels. To do this, careful and widely based experiment is necessary; medical care trials should be conducted along lines similar to existing clinical trials.

In the first instance, these studies must relate efficiency to financial incentives. The possibility that the Hospital Activity Analysis might be used in conjunction with current procedures of revenue financing of Hospital Authorities is a significant development. It represents a step towards relating efficiency to revenue. The danger, however, is that the hospital authorities will regard the procedures and standards as being imposed under the threat of reduction in revenue allocations. This reaction undoubtedly hinders the spread of an efficiency-minded administrative attitude within the hospitals. Until recently the system of financing hospital expenditure relied heavily on historic costs; that is, on previous experience as analysed in detail in the Hospital Costing Returns. Both the past performance of the hospital and the average in the Region became the standard against which finance was granted, after allowing for modifications to take account of special circumstances of individual hospitals. In this structure of control, the question of efficiency does not arise, and real costs can change without corresponding changes in benefits. It may be important not merely to introduce some element of efficiency measurement into this system, but also to relate the financing system itself to the performance of the hospital service. It is possible, for example, to conceive of various means of allocating finance on the basis of work done; for example, as specific payments per patient treated, or per patient week, or per head of the population served on a departmental or unit basis. Each of these systems of payment has its obvious limitations but the possibilities of this approach should be considered. Clearly, such a system would operate best if the revenue hospitals received was related proportionately to the benefits provided. It would, therefore, require the development of more accurate ways of measuring benefit. Some work along these lines has recently been initiated but very much more is needed if satisfactory measures are to be obtained.

There is also the problem of implementing research findings. As efficiency studies become more widespread it is essential for the role of many doctors and others responsible for medical care in hospitals to change. There is a need for the medical profession to become even more critical of its own standards of performance, as the Americans have done with their system of medical audit. Some doctors are already concerned with organisation and serve on Hospital Management Committees and Regional Hospital

Boards but it is becoming increasingly important that no doctors remain isolated from the problem of administration, management and planning. A recent report[9] has commented that 'the hospital doctor should be given organised training in the management of the resources of the health service'. They must all play a practical role in considering costs and efficiency as well as clinical factors. If the medical staff are unwilling or unable to do this they may have to accept further administrative control, even in areas where it would be indirectly concerned with clinical problems. In addition, the attitudes of mind engendered by this research must pervade the non-clinical staff, from the Minister of Health to the hospital porter. Not only must the hospital staff be made aware of possible improvements in efficiency but they must also be trained in an atmosphere which accepts change. This aspect must be realised at the initial stage of research and be built into the research programme itself. Already a scheme has been organised to train nurses in the problems and practice of efficiency research; this may be extended to include other members of the health service. Schemes to train hospital administrators have been in existence for a number of years largely under the auspices of King Edward's Hospital Fund, the professional organisations and certain Regional Hospital Boards. These, however, need to be enlarged to cover all administrators.

The responsibility for management efficiency studies is a subject which raises further questions. In the past much of the research was left to outside charitable organisations and to local groups, such as the Regional Hospital Boards. With the growing realisation of the importance of such research it would seem desirable that, while local groups are given freedom for modification and experiment, the results of their experiments should be assessed centrally. Those which are successful must be given national publicity. It is hoped that the Ministry of Health, which is now assuming this function, will continue to play a vital role.

The Hospital Service in the United Kingdom will probably cost more than £900 million during 1967. That is some £50 per household. As the greater part of this expenditure is financed from general taxation the public are entitled to know that it is being well spent. In the past no one was in a position to give such re-assurance, because there were no criteria by which the benefits accruing from this expenditure could be judged. No adequate

explanation could be given for the very substantial variations which occurred in the expenditures and performances of different hospitals.

The evaluation of different patterns of medical care has been restricted mainly to subjective comment. The training of professional administrators, who are aware of the importance of such evaluation, has been left largely to the charitable organisations. The situation now has changed. It is to be hoped that within a few years the planning and organisation of the hospital service will be based on results of the extended programme of management efficiency studies now being started. These are unlikely to reduce the cost of the service, but they should very significantly raise the quality of medical care which can be provided for a given expenditure.

# References


1. *Hospital Costs in Perspective.* Office of Health Economics, 1963.
2. *The Hospital Building Programme.* Cmnd. 3000. HMSO, 1966.
3. *Hospital Price Index.* Ministry of Health. Pers. Comm.
4. *A Hospital Plan for England and Wales.* Cmnd. 1604. HMSO, 1962.
5. *Hospital Costing Returns,* 1965/66, *Part I.* HMSO, 1966.
6. FELDSTEIN, M. S. (1965), *Studying Hospital Costliness.* Hospital Service Finance. 13.2.
7. LIPWORTH, L., LEE, J. A. H. and MORRIS, J. N. (1963), *Case-fatality in Teaching and Non-teaching Hospitals,* 1956-59. Medical Care. 1.2.
8. *The Cost of Medical Care.* Office of Health Economics, 1964.
9. *Management Functions of Hospital Doctors.* Ministry of Health, 1966.

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