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THE ROLE OF HEALTH ECONOMICS IN FORMULATING AND EVALUATING HEALTH STRATEGIES

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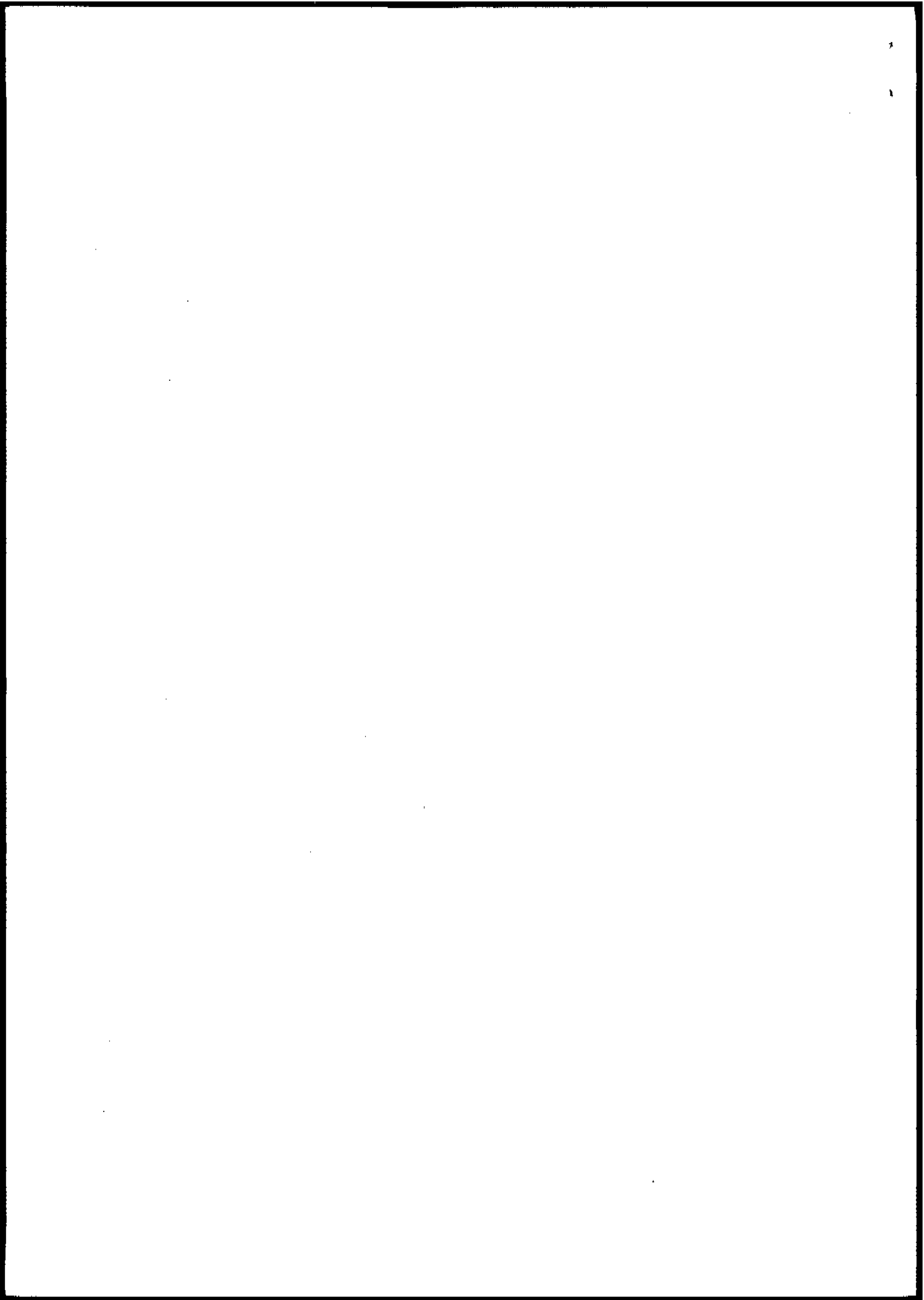


THE ROLE OF HEALTH ECONOMICS IN FORMULATING AND EVALUATING HEALTH STRATEGIES

The nature of health economics

Economic considerations have a major influence on almost all the basic aspects of our lives; the nature and level of economic development of a country is a major determinant of the health problems it is likely to face, and of the level of health service it is able to provide, while its economic philosophy and institutional organization will largely determine how such services are produced and distributed.

The health problems of the developed countries are largely those of affluence; degenerative and chronic diseases, often heavily influenced by lifestyle, stress and excessive consumption. Even the richest countries cannot meet all the health needs of their population, and the extension of health service coverage, increasing expectations by the population, and rapid progress in health technology, have been accompanied by massive increase in health sector costs.

There is a bewildering variety of mechanisms for financing and organizing health services, but are they adequate and suitable for our needs? Do they encourage efficiency and effectiveness?

Equally, there is a wide range of choices about the manpower and technology used to produce health services, but is more and more sophisticated manpower and technology always necessary, appropriate, and beneficial, regardless of cost?(1)

Many doctors and other health service staff encounter economics in the course of investigations into the costs of various things, and tend to equate economics with costing, which is rather like equating medicine with laboratory tests. A rather more accurate definition might be that economics is the study of production, distribution, exchange, and consumption as processes in the use of scarce resources for competing ends. One of the main practical purpose of such study is to maximize the improvements in welfare from the scarce resources used.

In other words, the basic concern is economic efficiency, and this may be considered at two levels:

- allocative efficiency - allocating scarce resources to those diseases, patients, and strategies which give the maximum net benefit to society; and

- operational efficiency - producing the quantity and quality of products and services required at the lowest cost.

However, economists have not traditionally worked in health sector, for though none of its economic characteristics are unique to it, almost no other sector unites such a combination of characteristics. In other sectors, supply and demand are relatively independent forces mediated by price and economic planning decisions. Demand for health services is largely determined by health service producers. The patient has some discretion over the first contact, at least in non urgent situations,but once this contact is made,it is the health professionals who mainly decide what services the patient needs and receive, for the patient lacks the skills and information to decide for himself. This transfer of demand decisions from the patient to the provider is made still more easily in Europe,where health services are either provided free or covered by insurance, so that the patient faces low or zero prices at the point of use. In addition, most health services, particularly institutional ones, are organized on a non-profit basis, their outputs are complex and hard to measure, and their evaluation is heavily dominated by professional judgement, so questions of price, cost and efficiency were not prominent. Economists have therefore only begun to work systematically in the health sector in the last two decades, with an upsurge in interest provoked by the rapid escalation in health care costs over the last five to ten years, at a time of worldwide economic recession.

Though a wide range of issues have been tackled, there has been remarkably little analysis of the basic appropriateness of our health services to our health problems. This is partly because economists have felt incompetent to examine the question, and partly because they have taken it for granted that the health professions, in the absence of the usual market mechanisms, are providing the services we most need, and know how best to produce them.

Four critical propositions

For an audience of leading health administrators it would be inappropriate to present an academic exposition of the methods and techniques of health economics. Instead, this paper focusses on key issues. Specifically it presents four propostions which challenge some of the basic assumptions made about the health sector and its functioning.

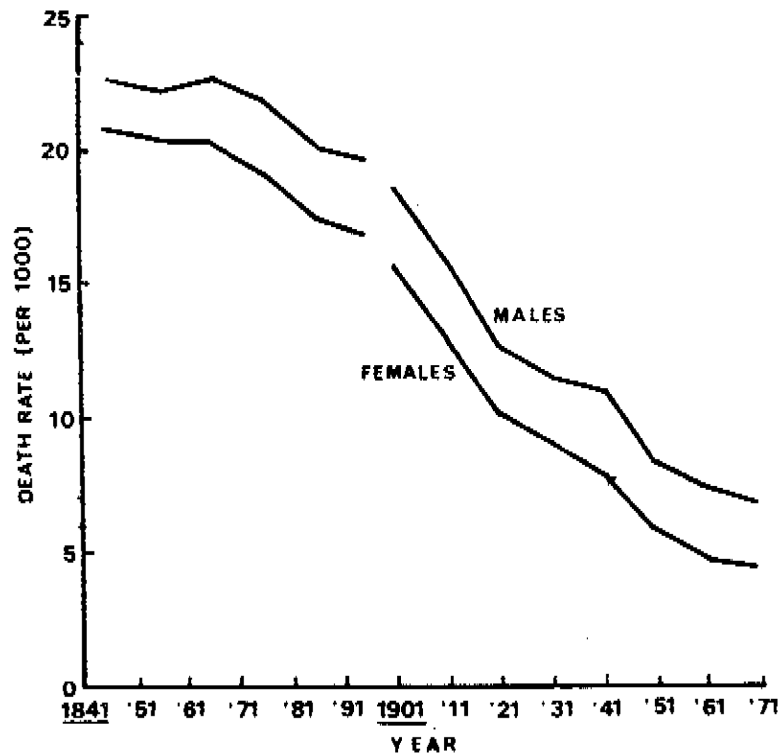
1. Misdirection

The first proposition is that many of our health policies and services are misdirected. Health is determined much more by factors related to socio-economic development, notably nutrition, hygiene, housing and behaviour, than by the intervention of modern medicine. Health sector policies continue to ignore this to a considerable extent. Rather than make sweeping generalizations let us quickly examine the British experience as an example. Britain led the industrial

revolution, typifying the kind of socio-economic changes that produced the developed countries as we know them, and it has a national health service approach broadly similar to those of Eastern Europe.

The population of England and Wales tripled between 1700 and 1841 mainly because of the large fall in mortality rates. From the mid 1860s to 1901, mortality rates again fell, with a sharp acceleration in the first two decades of the twentieth century, slowing in the depression of the 1930s, and accelerating again after the war, before levelling off in the 1960s. Of the fall in mortality rates from 1700 to 1971, one third occurred before 1850, one fifth from 1850-1900, a third or so again from 1901-1941 and only about a sixth from 1941-1971 (Figure 1).

Figure 1. Death rates for England and Wales 1841-1971 (Standardized to 1901 population).



Source: (2)

From 1841 onwards the details of the decline in mortality rates are known: infectious diseases caused nine-tenths of the reduction from 1841 to 1901, and almost three-quarters of that from 1901 to 1971. (2) The remaining quarter or so came from a wide range of other causes (notably low birth weight, infant diseases, and diseases of the digestive system).

Why did these reductions in infectious disease mortality occur from the time of the agricultural and industrial revolutions? The growing concentrations of people in urban areas would suggest rather that they should have increased. There is no evidence that the diseases themselves had become less virulent, or less infectious, or that the population had acquired natural immunity. There is no doubt that improvement in nutrition, and consequently resistance to disease, was by far the most important factor, supported by improvements in hygiene, housing, and working conditions, which substantially reduced water-, food-, and vector-borne diseases. Thirdly, these improvements were protected and enhanced by a fundamental behavioural change, the reduction in the birth rate.

In contrast, much of the modern armamentarium of the health services in immunization and vaccination, drug therapy, and many areas of surgery has been developed only since the late thirties, and the financial and organizational systems to deliver them to the whole population, the British National Health Service, did not start until 1948. The contribution of modern health technology was therefore to reinforce and accelerate these underlying trends, by providing effective therapy for a wide range of conditions.

This experience is confirmed by a recent American study, which found that although modern health technology had a very favourable benefit-cost ratio overall, it accounted for only some 40% in the reductions in mortality and morbidity since 1900. (3)

On the basis of the above analysis we should be able to predict our health problems from our standard and style of living, and indeed we can. Three main disease groups now account for around three quarters of all deaths in developed countries; two-thirds to four-fifths of these deaths occur after the age of 65, and only 1-3% occur in infants under one year old. The most important group is diseases of the circulatory system notably ischaemic heart disease, cerebrovascular diseases, hypertensive conditions, and diseases of the arteries, which together account for half of all deaths. Neoplasms come next, accounting for a fifth to a quarter of all deaths. Accidents, poisonings and violence, the third largest cause of death, are of considerably less importance, accounting for 3.5%-8% of deaths. However, the great majority of these occur in the younger age groups and therefore have a disproportionate impact in terms of years of life lost. Road traffic accidents, domestic accidents, and suicides account for a substantial proportion of deaths from this cause.(4)

Ironically, nutrition is still a major factor, but now lack of resistance through malnutrition has been replaced by circulatory diseases and cirrhosis of the liver through over-eating and drinking, exacerbated by low-physical-effort production systems and sedentary life-style. Industrial development has led to urbanized, high-density, impersonal, achievement-oriented social structures, requiring continual rapid adjustments which are often anomic and stressful. All these factors are known to be important in heart disease, suicide, psychiatric morbidity, excessive drinking and accident prone behaviour. Finally, smoking, particularly of cigarettes, contributes considerably to deaths and morbidity from circulatory and respiratory diseases, and cancers of the lung, throat and mouth. In Britain, the 13-year increase in life expectancy from 1850 to 1970, for persons over 25 years old who are non-smokers, is almost halved for those smoking more than 25 cigarettes a day. (2)

In short, it is still factors related to our socioeconomic development that chiefly affect our health, but the emphasis has largely shifted from environmental constraints, like inadequate food and environmental hygiene, to personal behaviour concerning eating, drinking, smoking, and stress.

Very little effort and resources have been devoted to changing these basic factors. Indeed, attempts to modify our personal behaviour, no matter how dangerous, tend to arouse suspicion and resistance. For example, efforts to reduce smoking have been limited to restrictions on advertising and timid warnings on cigarette packets; speed limits, which reduce road traffic accidents, owe more to oil prices than safety considerations; safety-belts and crash helmets were hotly contested; and anti alcoholism campaigns are generally conspicuous by their limited means and conception.

2. Efficiency and Expenditure

The second proposition is that the levels and mixes of inputs used to produce particular health services vary widely and are often neither technically justifiable nor cost-efficient, ie. other levels and mixes of inputs would produce the same quantitiy and quality of service outputs more cheaply.

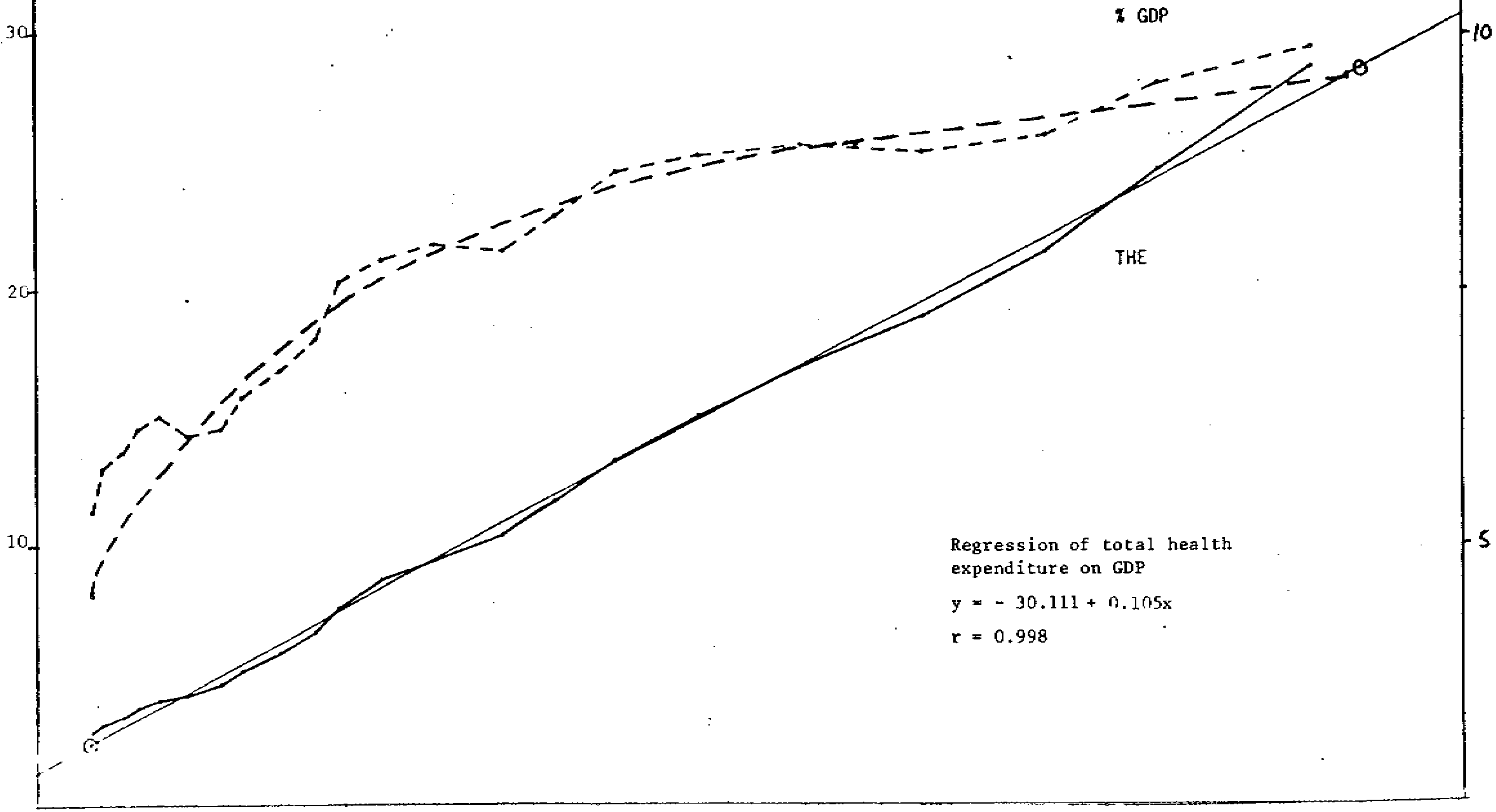
Extensive international data on health expenditure, published by the Organization for Economic Cooperation and Development (OECD) in 1977, shows that the developed countries spent an average of 5.7% of their gross domestic product (GDP) on health services in the mid 1970s and that around 80% of this expenditure was publicly financed. The range of health expenditure varied from 3.5% of GDP in Greece to over 7% in the Netherlands, Sweden, and the USA. (5) More limited recent studies indicate that the top end of the range is now 10%. Health expenditure has increased by over three percentage points of the GDP in the richest countries in a little over a decade. (1,6-8)

Analyses of health expenditure and GDP over time in a given country show a very high correlation. For the USA, the UK and France (Figures 2-4) the correlation coefficient between health spending and GDP is $r = 0.998$. Only the elasticity of health expenditure to increases in GDP differs. In the USA health spending increases by $10.5 per $100 increase in GDP, in the UK the rate is £6/£100, and in France F8.3/F100. This strong correlation also holds for cross-sectional analysis of different developed countries at the same point in time Figure 5, ($r = 0.948$, with an increase of almost $7 per $100 increase in GDP). However, the percentage of GDP allocated to health seems generally to flatten off as GDP rises ie. the elasticity of expenditure to increases in GDP declines as GDP rises, regardless of the financing system. Similarly, high or low spending at a given level of GDP is not related consistently to any particular kind of system, eg. Switzerland, with a similar GDP per capita to Sweden, spends significantly less of its GDP on health, and the same is true of Belgium compared to the Netherlands and France.

Breakdowns of health expenditures show considerable variation. The average distribution for public expenditure in the countries covered by the OECD study (5) was 52% on hospitals, 23% on medical services, 11% on medical supplies, and 14% on various other services. However, Canada, Iceland, Sweden and the United Kingdom spent around two-thirds of the total on hospitals, compared with well under one-third in the case of Belgium and the Federal Republic of Germany. Expenditure on medical services varied from 8.5% in Iceland, and 14.5% in New Zealand to 35.7% in Belgium. Medical supplies varied from 4.6% of the total in Denmark to 22.8% in the Federal Republic of Germany. Though differences in public coverage and in definitions explain some of these variations, strategies of provision clearly differ enormously, and we have no clear idea of their relative efficiency in producing any given kind of service, or the extent to which the services are complementary or substitutable.

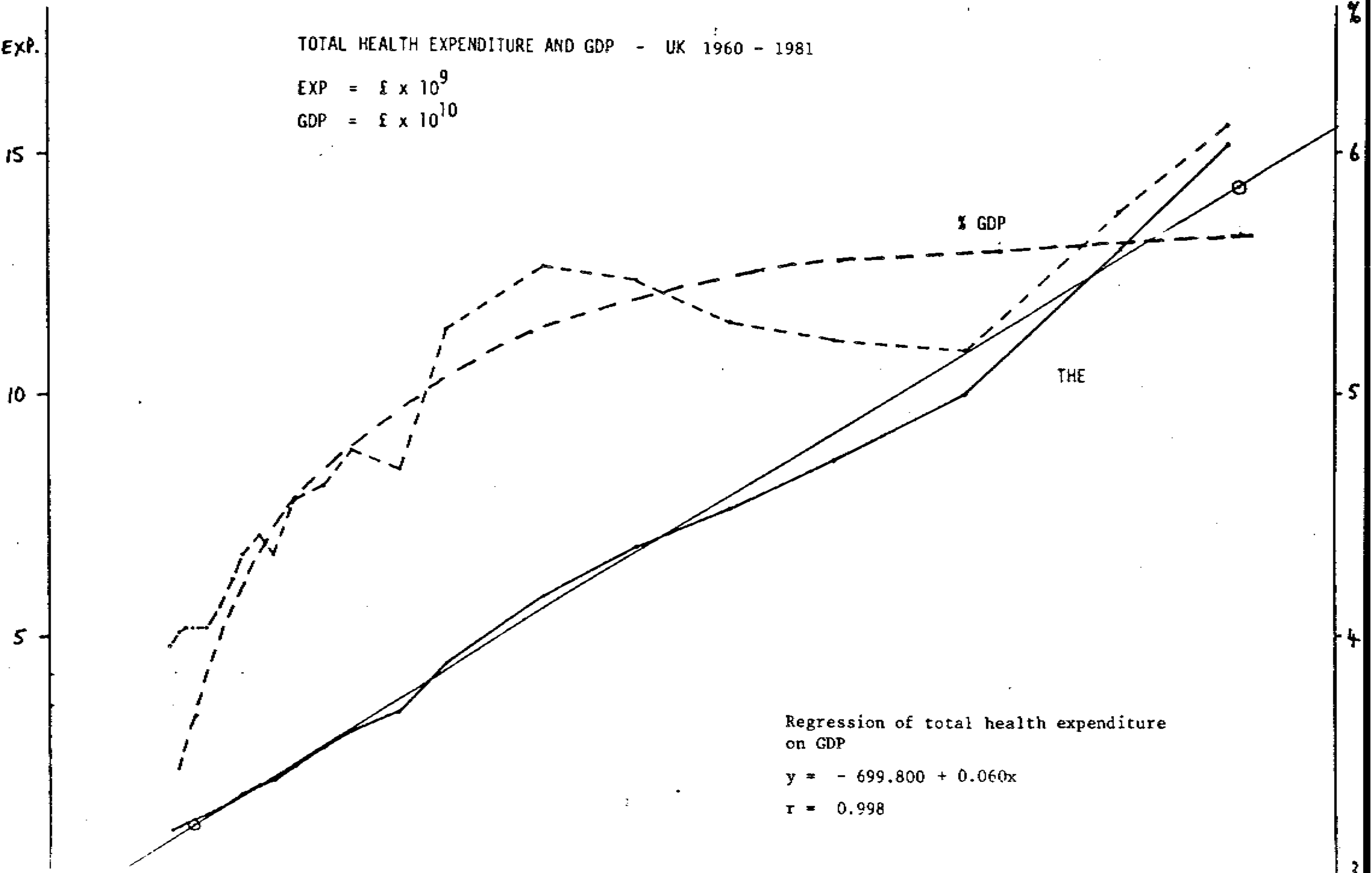
The same unpredictable variation occurs for the levels and mixes of resources, such as staff and hospital beds. While staff per bed seems to have nearly doubled in the last decade, levels and rates of change in different inputs reveal no consistent rationale. (9) Eg. Figure 6 shows bed provision rates over a quarter of a century. The range was wide in 1975 as it was in 1950, and though there has been considerable change (both increases and decreases) there is little sign of convergence. Doctor provision rates in the late seventies varied from 1 per 1000 in Portugal to well over 2.6 per 1000 in the USSR. If some countries

Figure 2



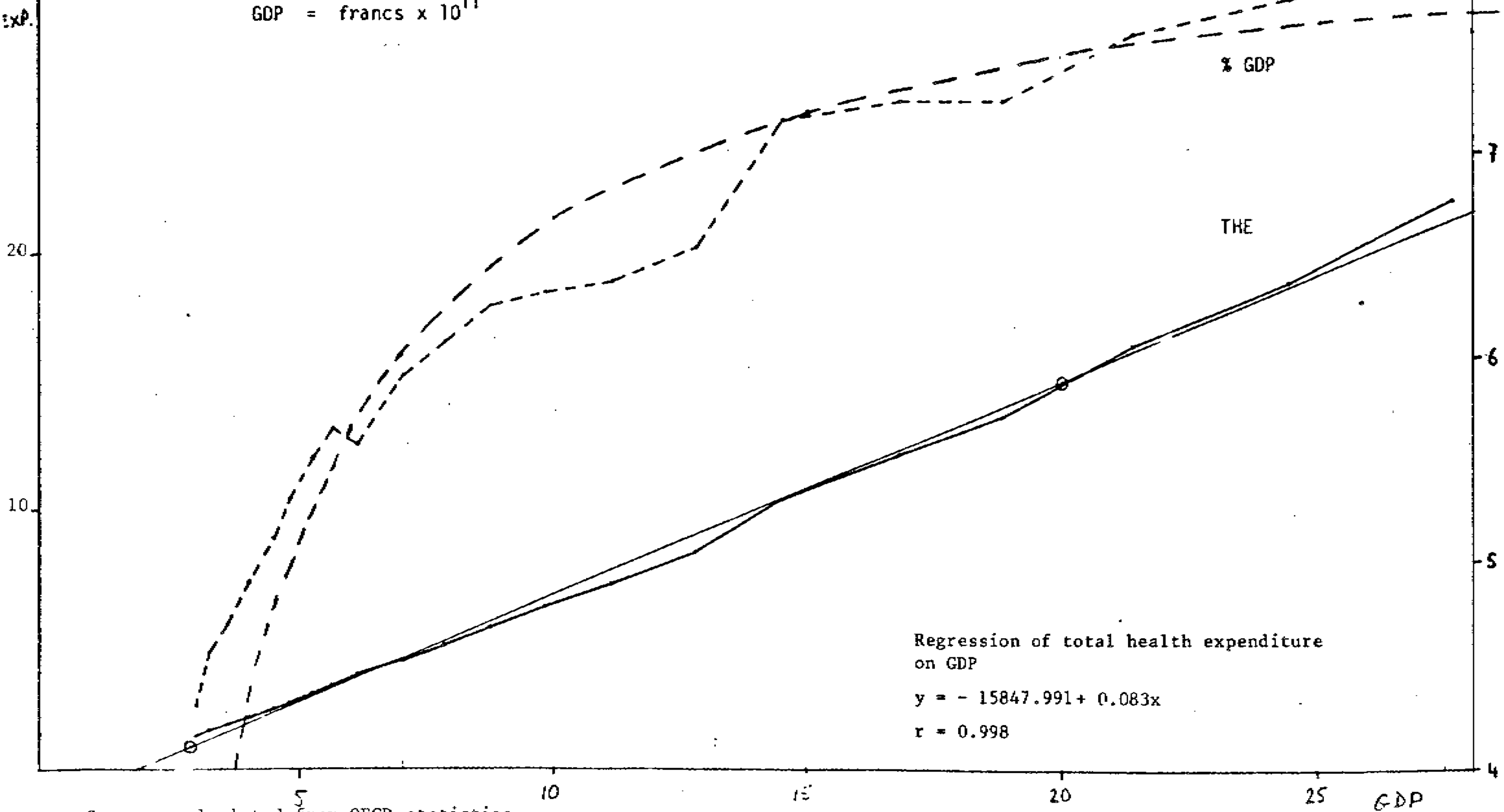
Source: calculated from OECD statistics

Figure 3



Source: calculated from OECD statistics

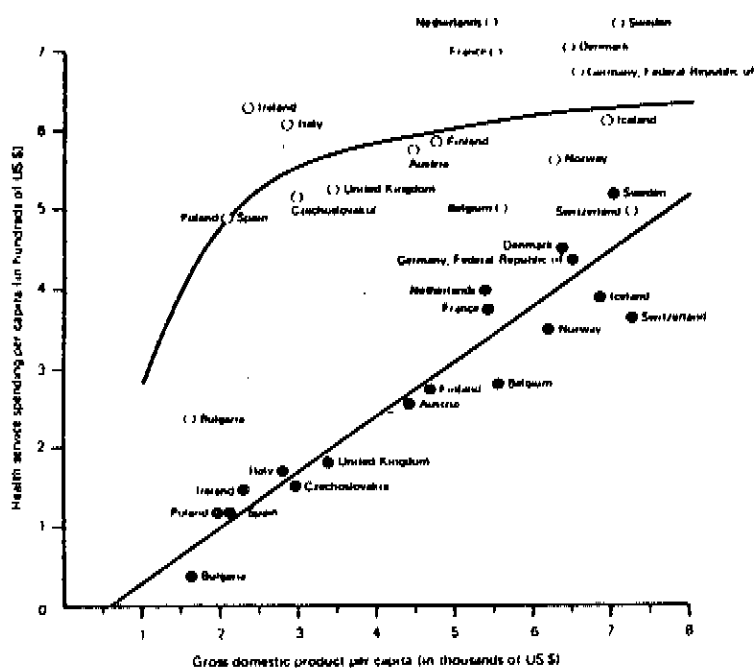
Figure 4



Source: calculated from OECD statistics

Figure 5.

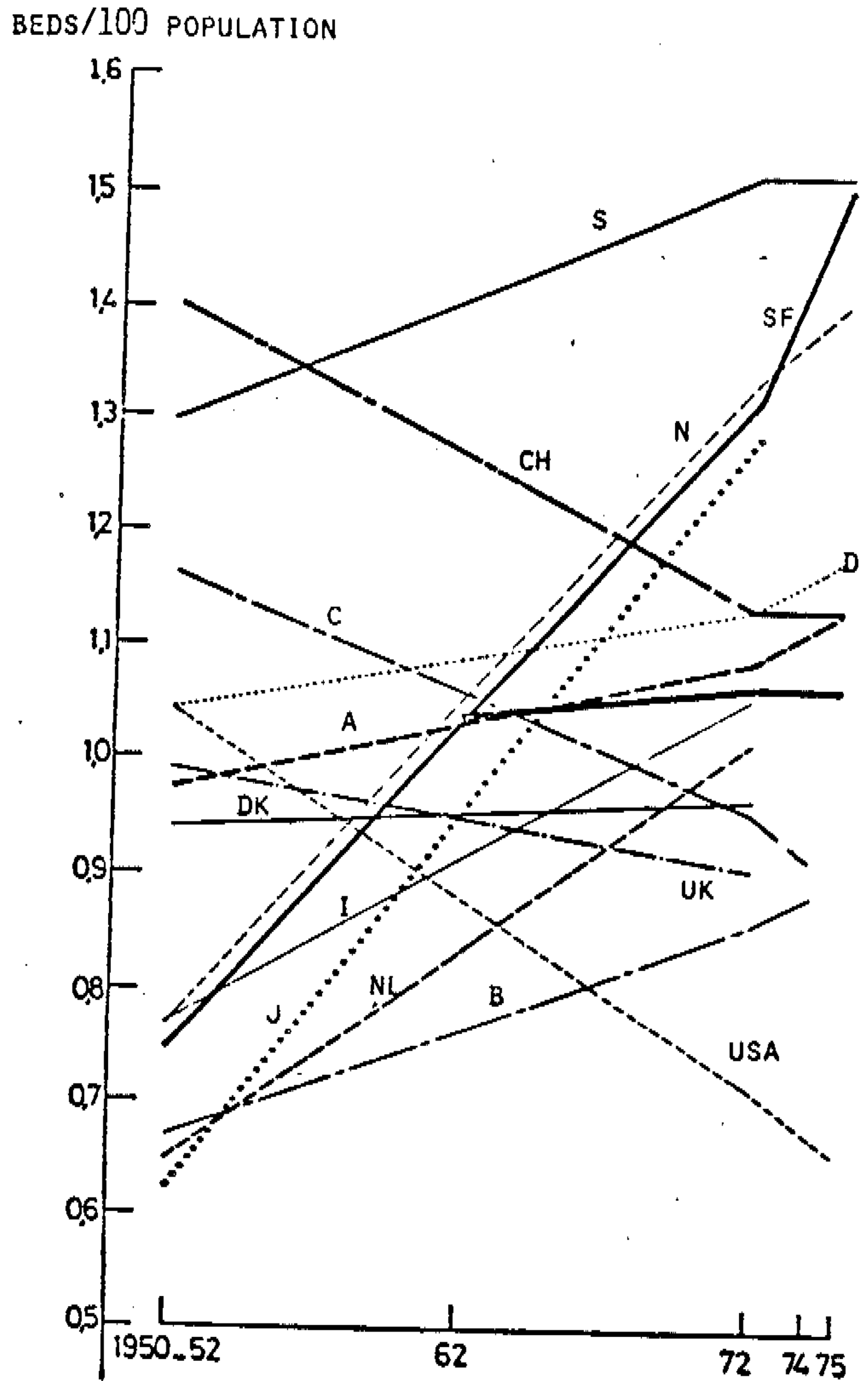
Health service spending and gross domestic product for 18 selected European countries



Note: the regression equation for the lower line is $y - 40.537 + 0.069x$, $r = 0.95$. The upper line is the predicted spending given by this regression equation expressed as a percentage of gross domestic product.

Source: (1)

FIGURE 6. EVOLUTION OF TOTAL BED RATIOS 1950-1975

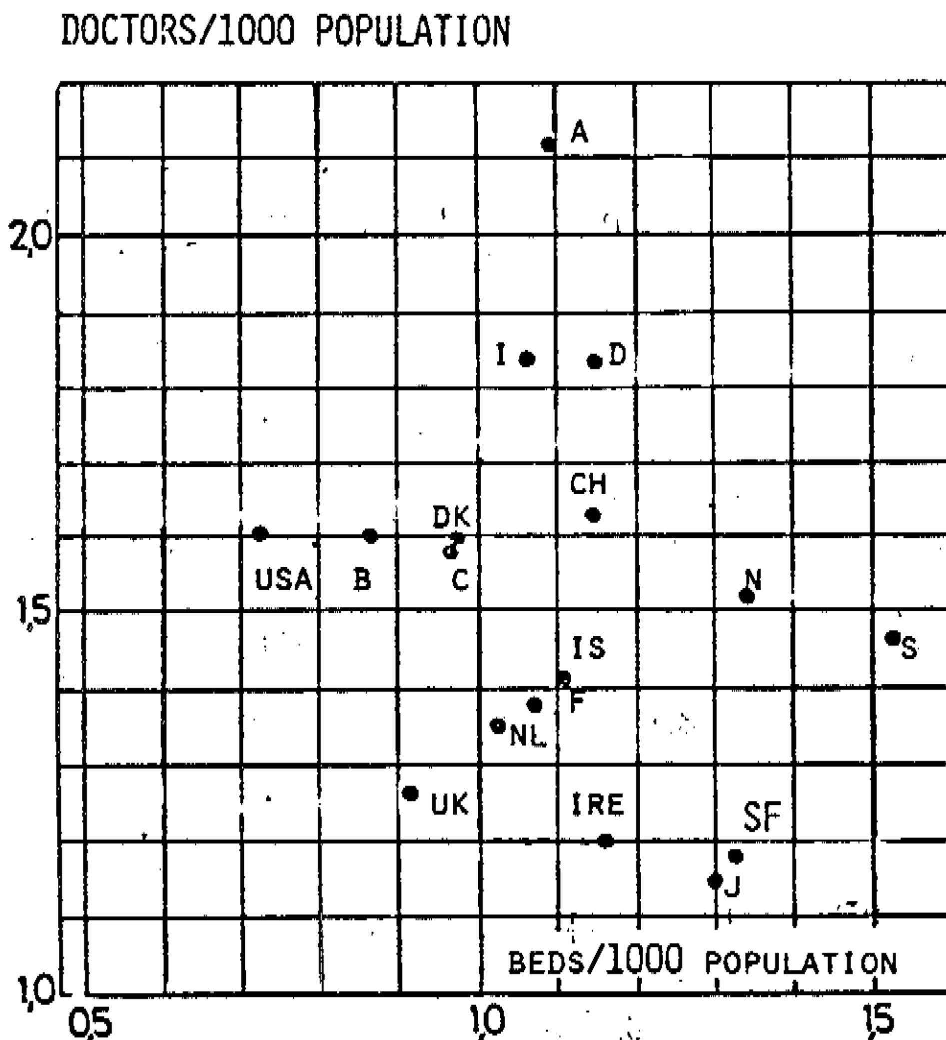


SOURCE: (9)

had very high densities of doctors and medium densities of beds, (eg. Austria, the Federal Republic of Germany, and Italy) others, (eg. Norway and Sweden, had the reverse - medium doctor and high bed densities, while the United Kingdom had low densities for both inputs. There is only a slight suggestion of substitution, with high bed and low doctor densities in Finland and Japan and low bed and medium doctor densities in North America, Belgium and Denmark (figure 7).

The answers to these large variations ill not be found by macro-level comparisons. What is required, is micro-level analyses of the tasks to be done and the relationship between them, so that appropriate skills, facilities, and materials can be identified and provided. Such analyses are impossible without close collaboration between health professionals, managers, and researchers, and useless without close collaboration for change between these and governments.

Figure 7. DOCTOR AND BED DENSITIES



Source: (8)

3. Effectiveness and Cost-Effectiveness

The third proposition is that a large proportion of widely used medical procedures are of unproven effectiveness, and of those that are proven, many are not the most cost-effective: cheaper procedures and strategies would be equally or more effective.

Despite its increasingly scientific content, medicine is still an art. If often requires quick decisions on incomplete, uncertain information. Fortunately, in most specialties 20-30 syndromes account for 70-80% of the workload, and doctors quickly learn to recognize these. However this approach tends to blur the normal steps in scientific problem and decision analysis, so when syndrome recognition fails, it is replaced by the "diagnostic shotgun approach", applying a large battery of tests in the hope that some diagnostic clues will emerge. Indeed, it is increasingly common to find batteries of tests being used to create diagnoses rather than to confirm, reject, and differentiate them. This approach, together with the prestige and fascination associated with sophisticated technology, and the clinic... freedom to use it without having to consider its costs or justify its clinical value, provide the ingredients for the problems illustrated below.

Ideally, health technology should be subjected to a systematic review before it is introduced or extended. The kinds of questions which should be asked are listed in Figure 8; they are almost never answered.(10)

Lack of critical evaluation of common procedures may be demonstrated at the most elementary level. For example, we are all familiar with the practice of swabbing the skin with alcohol to kill skin bacteria immediately before giving an injection, In fact, unless the skin is actually dirty (in which case soap and water would be just as good) this procedure is virtually useless, for it requires several minutes for alcohol to kill skin bacteria, not the few seconds generally allowed, between swabbing and injection. Randomized controlled trials have confirmed that patients given routine injections without such swabbing suffered no increase in infection rates. Yet this ritual practice is still virtually universal.

Far more serious is what might be called 'technological creep' in the consumption of diagnostic services. Existing capacity is used increasingly because it is there, and improving productivity expands it further. As pressure on capacity grows, small increments are added each year, leading to large increases in the long term. As long as such increases do not have to be shown to be necessary and effective, the technological creep easily passes unnoticed in the short term, and is hard to control. For example, pathology test requests in England increased by around 7% a year throughout the 1960s and into the mid 1970s, ie. they roughly doubled every ten years. During the same period, the decennial increase in hospital doctors was about 55%, in hospital admissions only about 25%, and in outpatient consultations about 20%. This meant that the request rate per doctor grew by a third or more while the rate per patient grew by over half. (11-13)

Figure 8. KEY QUESTIONS IN HEALTH TECHNOLOGY ASSESSMENT

(The questions may be asked of existing or anticipated technology):

1. Is it acceptably safe?
2. Is it socially and professionally acceptable?
3. What parameters does it measure, and how accurately and reliably? (diagnostic technology only)
4. What is the diagnostic usefulness of this information? (diagnostic technology only)
5. What therapeutic changes are made possible?
6. How do these changes affect the outcome for the patient- positive and negative effects?
7. What other procedures are replaced or avoided?
8. What is nature and frequency of the condition(s) for which the technology is or may be used?
9. What resources are needed to provide for the anticipated acceptable range and level of use?
10. What is the unit cost of production?
11. What is the anticipated total cost for the intended level of provision?
12. How cost-effective is the technology (compared to others or to no action at all)?
13. What are the costs and benefits of the provision and uses of the technology?
14. Does the technology have particular organizational and financing requirements, if so what are they and can they be satisfied?
15. What, if any, are the broad policy implications eg. in terms of R+D goals, national self sufficiency, industrial development etc.?

Source: (10)

In France, over a similar period, the consumption of radiology grew by an average of over 10% a year, ie. it roughly doubled every seven years. (12) Much of this growth is due to increasing staff(eg. in England pathology laboratory staff grew by over 6% annually, and in France radiology staff grew by over 8% annually) and better equipment (eg. multichannel auto-analysers and small fast radiography machines).

However, closer analysis reveals large variations in consumption rates. Eg. a regional variation of 1 : 3 in radiology consumption per head has been shown in France.(13) Large variations in consumption rates of both pathology and radiology have also been shown between hospitals of the same type, and even between clinicians in the same speciality treating standardized diagnoses. Eg. an examination of 1800 cases covering 15 standard diagnoses in 8 English hospitals failed to find any clear explanations for the variations in clinical resources used. For 148 simple hernias in 6 hospitals, the average pathology consumption was 17 standard units per case, but the lowest hospital average was only 2 units and the highest was 53 units. Likewise for radiology, the average consumption was 0.8 units per case, but the hospital averages varied from 0.1 to 2.4 units per case. In short, the use of the diagnostic services has increased very heavily, but closer scrutiny shows considerable variations and little discernible rationale to explain them.

The same applies to new diagnostic technology, what might be called 'technological jumps'. If the equipment is not too costly, or if effective controls are lacking, new technology can spread rapidly and widely, propelled not only by those who produce it, but by doctors and others who find prestige, and in some systems extra income, from having and using the latest technology. The implicit philosophy is that all that is possible is necessary. This is neither logical nor feasible when costs are high and resources limited.

E.g. electronic foetal monitoring (EFM) was introduced in the late 1960s and is now used to monitor the majority of births in the USA. A thorough review by the National Center for Health Service Research in 1979 found that, electronic monitoring of foetal heart rate and foetal scalp blood sampling,

> 'even when used together are imprecise with 44 per cent false positives and 19 per cent false negatives... Assuming relatively high rates of sensitivity of 80 per cent and specificity of 90 per cent, the PV (Predictive Value = percentage of abnormal tests denoting true abnormalities) of a positive or abnormal test is only 14.0 per cent. This indicates that an abnormal EFM pattern incorrectly predicts outcome 86% of the time.'

It follows that EFM considerably increases the risk of inappropriate intervention. The rate of Caesarian delivery is twice or three times higher for women undergoing EFM, than for those monitored by auscultation, even in randomized controlled trials. The authors conclude,

'The evidence for benefit from EFM is contradictory and confined to a small decrease in mortality among high risk patients, particularly low birth weight patients.'

The annual financial cost of this foetal monitoring for half the births in the USA amounted to: US$ 80 million for monitoring and US$ 222 million for consequent Caesarean sections; US$50.5 million for neonatal morbidity and mortality; and US$58.5 million for maternal morbidity and mortality, making a total of $411 million annually.

The same rapid dissemination of new technology may be found even when it demands large investments. The most recent example of this is computed tomographic (CT) scanning, arguably the greatest development in radiology since X-rays were discovered. At 1980 prices a scanner cost £300,000 to install and around £70,000 a year to run and maintain. Between 1973, when the first commercial brain scanner was introduced, and 1977, 30 brain and 11 body scanners were installed in Britain (1 per 1.3 million population). In the USA, with much less effective control, and fee for service reimbursment, over 760 scanners were installed in the same period, including 200 body scanners (1 per 0.3 million population).(15) It may be argued that Britain introduced too few, but it is virtually certain that the USA introduced too many, and that they were not as well distributed or used as they might have been.

Clearly, CT scanners have enormous diagnostic potential, but their high cost sharpens the question of how they should be used and how many are needed. At what point would the money for an extra machine be better spent otherwise? How justified is it to go on pursuing diagnostic precision at vast cost if it far exceeds therapeutic effectiveness?

Mass programmes, such as screening, are another area where costs are often high and evaluation, including economic evaluation, are inadequate. Though the epidemiological, clinical and economic criteria for assessing the desirability of screening programmes (Figure 9) are now well established, many programmes have been started, expanded or maintained despite the fact that they do not meet these criteria. Eg. a recent review of 34 potential screening programmes for adults found that only 7 could be unequivocally recommended, the recommendation for a further 8 was uncertain and the remaining 19 were rejected. (17)

Surprisingly, the situation is much the same for routine hospital care. Eg. the average stay in general hospitals varies from under nine days in the USA to around two weeks in France, and almost three weeks in Sweden. This is only partly explained by international differences in the role and case-mix of hospitals, for similar differences have been shown for specific diagnoses, and surgical operations, such as tonsillectomy, hernia repair, cholesystectomy, hysterectomy, dilatation and curetage, and so on. An even better-known example is in obstetrics, where length of stay for normal deliveries with adequate home conditions seems to vary from 48 hours to a week or ten days, with no apparent difference in outcome.

Figure 9. CRITERIA FOR ASSESSING SCREENING PROGRAMMES

A. General Criteria

1. The condition should be clearly defined.
2. There should be reliable evidence that the condition is an important public health problem (incidence, prevalence, effects).
3. The condition should have a recognizable relatively long latent or early symptomatic period when it can be detected early.
4. The natural history of the condition, particularly the transition from latent to overt disease, should be adequately understood.
5. There should be acceptable and effective early treatment for cases discovered, which is clearly better than later treatment in terms of reduced morbidity, mortality, or cost or any combination of these.
6. There should be a suitable and acceptable screening test for early detection.
7. Resources and services should be available to treat the cases detected.
8. There should be a clear policy on whom to treat.
9. The net benefit of the programme should be better than any alternative strategy for dealing with the condition.

B. Specific criteria for screening tests

Screening tests should be:

1. Safe - involve little or no risk to those screened
2. Simple - conveniently and quickly applicable to large populations
3. Acceptable - in terms of comfort, convenience and cultural beliefs.
4. Affordable - cheap enough to be affordable for large populations
5. Accurate - provide a true measure of the attribute sought
6. Reliable - consistently reproducible in repeated use
7. Sensitive - correctly identify a high proportion of true cases
8. Specific - correctly identify a high proportion of true non-cases

Source: (16)

Remarkably little effort has been made to do cost-effectiveness analyses of different care policies, and even less to do specially designed studies, despite the very high cost of a hospital day, most of which is incurred whether the patient uses the services available or not. The enormous economic implications of variations in length of stay were emphasized in a French study, which concluded that if the average hospital stay in France were the same as in the USA, France would need only 55% of its beds.(8)

Similarly, costs are often ignored in choosing between investigation and therapy strategies for given conditions. Eg. in England, cost-conscious diagnosis of hypertrophy of the thyroid has been shown to be equally precise, faster, and 30% cheaper than the traditional approach and, in the USA, cost-conscious use of urography suggests economies of over 40%, representing annual savings of over US$300 million nationally. In therapy, a British study showed that for a considerable proportion of varicose veins patients, inpatient surgery and outpatient sclerotherapy were equally effective, but surgery treatment cost four times more, both to the health service and to the patient (in terms of lost earnings during convalescence).(19)

Many of these problems arise from the planning and evaluation systems themselves. They tend to focus too much on inputs - bed and staff ratios, staff qualifications etc. without paying adequate attention to how these inputs are used. When they go beyond this they still often stop at measuring process, ie. they check whether certain procedural standards were observed. However, such evaluation is only valid as a measure of quality if the procedures have been scientifically tested, and are regularly reviewed and updated, otherwise the system simply generalizes ill-conceived methods and stultifies progress. The only ultimately valid measure of quality is effectiveness in improving health status ; this is remarkably infrequently measured, and even less frequently related to cost.

4. Financing and remuneration of health care providers

The final proposition is that the methods of financing and remunerating health services commonly used are often economically perverse. At best they lack incentives to economic efficiency, at worse they actively discourage it. (1)

Inappropriate methods of financing and remunerating health care providers are an important cause of economic inefficiency. The most widely used methods of paying providers of health care in Europe are salary and various forms of fee for service.

The basic problem with salary systems in the health sector is that

they are bureaucratic in nature ie. pay is not related to performance. At a given grade good and bad performers receive the same pay. The quality and efficiency of care is therefore highly dependent on professional standards and non-financial incentives. However, standards can only be maintained if professionals place high value on them, and if there is an effective information system which makes the quality and efficiency of care transparent. Few health systems can boast such an information system. The parameters of good performance are often ill defined, and even when they are specific they are not always easy to measure.

The fee for service system is rather more positive as far as the social aspects of care are concerned, for patients who feel they have been treated rudely or kept waiting too long are likely to go elsewhere,and the provider of care loses the fees he would have earned. However, since the providers' incomes depend on the services they provide they have a very strong incentive to supply the maximum of expensive services, and if the health insurance system covers costs, there is no incentive to be efficient. Governments and private insurers have reacted to this in various ways, the commonest being co-payments by patients, limitations and differential rates of reimbursement, and utilization controls by peer review or statistical monitoring systems. None of these are very effective, for the basic system encourages consumption but not efficiency.

Prepaid health insurance, or Health Maintenance Organizations (HMO) provide an interesting alternative. This system, which originated in Europe is now gaining popularity in the USA. The basic concept is simple. Instead of paying a health insurance premium or having state health services funded from taxes, the persons covered choose an HMO and pay it a fixed premium. In return the HMO supplies whatever health care may be needed. The HMO therefore has a strong incentive to keep its clients healthy and to use the most cost-effective methods to treat them when they are ill. On the other hand, competition checks the tendency to economize by providing inadequate care, for the client is free to change to another HMO or back to traditional insurance if he is dissatisfied.

This system also has its practical problems, but it has one major merit, its basic conception encourages economic efficiency, and it does not need a large administration to prepare and pay bills or to inspect quality.

Conclusions

This paper has presented four challenging propositions. If they are true, it is because clinical medicine is traditionally concerned with applying the best modern knowledge to curing individual patients. This individual approach does not encourage statistically based evaluation and thinking, and the emphasis on cure places a premium on successful treatment, whatever the cost.

The conclusion of the first proposition is that a broader longer-term view demonstrates the enormous potential for members of the health professions as active agents in change behaviour, not simply as increasingly sophisticated human mechanics reacting to disease when it is presented to them.

The conclusion of the second proposition is that clinical epidemiology and economics in no way contradict either the ethos of clinical medicine or the clinical freedom to practice. All they seek to do is to establish a medically and economically rational basis for individual clinical decisions.

The conclusions of the third and fourth propositions are perhaps the hardest to accept and answer, because they require flexibility to change and rechange the way in which services are organized and produced and the way in which staff are reimbursed, as well as an open attitude to who does what in a sophisticated labour-intensive service. Change in capital-intensive industries means replacing obsolescent machines. Change in health services means flexibility of roles and retraining of people. If this cannot be achieved in a secure, participative, and systematic way, the health services will be forced towards medical and economic rationality by economic constraints and outside intervention instead of being led there by their own leadership.

We have the tools to answer these four propositions. It is well within our capacity: to devise organizational and financial systems that encourage prevention and efficiency; to institute more objective evaluation of what we do, using the techniques of epidemiology and cost-effectiveness analysis; and to analyse and improve the way we produce services, using cost-efficiency analysis, task and skill evaluation, and modern training techniques. Perhaps the key question is whether our vested interests will allow us to do so: whether we are sufficiently motivated to go any further than we have to.

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