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Progress of the UK Health Reforms and the Role of Information:
What can the 'Dismal Science' Contribute?

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DISCUSSION PAPER 145

PROGRESS OF THE U.K. HEALTH REFORMS AND THE ROLE OF INFORMATION: WHAT CAN THE "DISMAL SCIENCE" CONTRIBUTE?

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ABSTRACT

Five years after the implementation of the UK health and social care reforms it is still difficult to evaluate objectively their success or failure. It is an opportune time to stand back and assess what were the real objectives of the reforms, and what have been their essential features. The reason for this is not to dwell upon history, but rather to provide an objective assessment of the future contribution which economics can make to the markets which have evolved. Six main conclusions emerge from this overview of the UK health reforms and the contribution of economics. There is a need to guard against the development of local bilateral monopolies, which have considerable implications for the nature of market regulation required. Consideration should be given to ways in which competition can be stimulated on the **purchasing** side of the market; this is particularly important given the continued spread of GP fundholding and the lack of information available for consumers to assess the purchasing ability of their GPs, not to mention their host Health Authorities. The importance of culture needs to be recognised, in particular achieving a balance between co-operation and competition. The incomplete and asymmetric nature of information in health and social care must be recognised. There is a need to evaluate seriously the potential of information and communications technology in reducing the degree of imperfect information and thereby the level of transaction costs. Finally, improving the information base on the volume, quality and cost of services could do more than any structural reform to secure efficiency gains. It is a moot point whether this requires a quasi-market and competitive pressures, but **if** it is the demand/supply separation which has focused attention upon the general paucity of information, then the reforms have made progress.

At least three central themes demand attention from economists in any future research agenda in health economics: (1) the measurement and valuation of the impact of health and social care interventions ("outcomes research"); (2) analysis of health and social care markets; and (3) the economics of information. The last of these may in time become the most important, as the presence of imperfect information constitutes a significant constraint to outcomes research and the development of health and social care markets. Its importance should not be under-estimated given the conclusion of Rothschild and Stiglitz (1976) that "some of the most important conclusions of economic theory are not robust to considerations of imperfect information".

This paper takes a preliminary look firstly at the nature of information generally, recognising its public good and externality dimensions, and secondly at information within the context of health. Focusing upon informational asymmetries is critical in understanding the various forms of strategic behaviour which characterise health and social care markets. Given that such markets in practice are characterised by imperfect information, with perfect information an unattainable ideal, consideration is given to different definitions of efficient levels of investment in information about health and social care services. Individual patients and service users (either on their own or through the agency relationship), as well as parties to formal contracts, will expend time and energy attempting to reduce the degree of information imperfection. Useful insights can be gained from the literature on optimal search strategies, with important implications for the level of transaction costs generally in health and social care contracting. Recognising the importance of imperfect information and strategic behaviour in turn will influence the nature and extent of regulation required in monopolistic or oligopolistic markets.

1. OVERVIEW OF THE REFORMS: BACKGROUND AND PROGRESS

In evaluating what really lay at the heart of the UK health and social care reforms (Department of Health, 1989a and 1989b), a lot depends upon the political stand-point adopted. One view is that they were a natural extension of the 1980s' dogma which was shown by successive Thatcher Governments in relation to the public sector generally. Privatisation, contracting-out, increased efficiency were all popular terms which, it was argued by some, could simply be applied to the health field. From a wider societal viewpoint, the reforms were also undoubtedly a response to demographic features such as the changing age structure of the population, and to advances in medical technology. Without question, the reforms were concerned with making health professionals and consumers of health care services more aware of the costs of those services (Mechanic, 1995).

In more practical service terms, there were good reasons for the health reforms, as elucidated in Alain Enthoven's "Reflections on the Management of the National Health Service" (Enthoven, 1985). In particular, Enthoven pointed towards the perverse incentives which existed with regard to retrospective reimbursement of hospitals for undertaking cross-boundary work. There were also national concerns about waiting lists and some well-publicised cases about people who were not receiving treatment for particular conditions. The whole concept of rationing was therefore coming to the fore in debates about the nation's health.

Examining the ethos of introducing competition into the health and social care sectors, the theoretical starting point has to be a critical examination of the features which are normally expected in competitive markets, for example complete information and no information asymmetry across buyers and sellers, freedom of entry and exit for providers, constant returns to scale, and so on [these are the standard Neoclassical assumptions; other economic paradigms are relevant but not covered in detail here]. It takes little time to realise that none of these conditions is likely to prevail in any of the world's health care systems. In particular, the UK NHS has evolved explicitly in a centrally planned environment, in which the intention historically has been to exploit economies of scale and ensure non-duplication of services.

Furthermore, information asymmetries are always likely to characterise a health care market in which the patient's agency relationship with General Practitioners (GPs) and clinicians is significant. This is equally true of social care markets in which the care manager is assuming a more and more important role. Finally, freedom of entry is unlikely given the high capital and set-up costs involved; freedom of exit is more likely but in practice assumes greater political than economic importance (witness the inertia since the Tomlinson Report (Department of Health, 1992) into London's health services).

So what is the likely outcome of introducing competition into a public service? It is in fact that natural alliances will be made between neighbouring providers; competition will be extremely limited and tend to exist at the margins, eg. between providers for GP fundholder business. Large purchasing organisations are developing where District Health Authorities (DHAs) and Family Health Services Authorities (FHSAs) are combining to form one large commissioning organisation. The health care market is thereby tending towards a bilateral monopoly situation - albeit with contestable elements - as some commentators warned (Akehurst & Ferguson, 1993) in which the likely outcome will be determined by the respective negotiating power of purchaser and provider.

It is also worth noting that the introduction of competition into a setting characterised by a long-standing commitment to the principle of "public service" raises its own problems: it immediately changes both the rules and the nature of the game. Can public service and public accountability really be given the highest priority when the nature of the game for NHS Trusts is survival first and foremost? [The UK Treasury's financial regime is strict for NHS Trusts and demands the meeting of financial targets which are, of course, more readily measurable than information on quality of service]. For those providers whose market position is relatively unsafe - for whom 'exit' is at least a possibility - maximising throughput and remaining financially viable, possibly at the expense of quality and wider purchaser goals, will be the reality.

Where a provider is long-established and in a safe market position (ie. unlikely to lose significant parts of its market share), the model from the economic literature to which hospital behaviour will correspond is not the competitive model, but rather models based on monopolistic competition and oligopoly, possibly involving an emphasis on satisficing rather than maximising behaviour (see, for example, Cyert & March, 1963). Here the individuals involved in managing hospitals set 'satisfactory' levels of performance; if these are exceeded then aspirations are raised and so are the satisfactory levels of performance. It would equally not be surprising to witness long-established providers placing more emphasis upon intangibles such as prestige, status and managerial perks, possibly resulting in X-inefficiency (or internal inefficiency), as opposed to facing a high degree of competition which is expected to drive price down and quality up.

In fact, local monopolies will inevitably remain for certain services, together with incentives for cartel behaviour which can be expected to occur in the health care market. Competition is not generally then on the basis of price (although it may be at the margins, for example where NHS Trusts are competing for GP fundholder business), but on aspects of quality which do not have a direct impact on patient health status (levels of amenity, etc.). This was highly predictable from earlier US literature (eg. Robinson & Luft, 1985) which emphasised the importance of non-price factors in hospital competition. Ironically, the cartel behaviour which was apparent between two major providers in one English city (whereby informal agreements were made by the Chief Executives for each Trust to specialise in different services) has turned into openly aggressive competition for emergency services. This is having a deleterious effect on patient care as elective surgical procedures are cancelled because consultants are performing high amounts of out-of-hours work (for the emergency cases). Clearly, more sophisticated analyses of market behaviour are required which recognise the multi-product nature of hospitals and examine explicitly their objective functions. Evaluation of the quasi-markets in health and social care generally must focus not only upon the interactions between different market agents but also the dynamics of intra-organisational behaviour.

The largest component of NHS total costs is the labour cost (around 70% - see Mayston, 1990). Much was made in the initial NHS reforms Working Papers (see Department of Health, 1989c, Working Paper 1) about the freedom which NHS Trusts would be given to set local pay and conditions for medical and nursing staff. This has only recently begun to happen and is being strongly resisted in some quarters. Little evidence exists, other than anecdotal, to determine the impact which this and the wider NHS reforms are having on staff morale; the signs are that morale in some quarters is extremely low. The reforms have brought about some good changes in this respect: for example GP fundholders who welcome the freedoms which they have been given to purchase care for their practice populations. However, there is a very clear tension for hospital doctors and GPs in providing the best care which they perceive for their patients, as opposed to managing budgets and competing for patients with their colleagues.

The potential for cost-shifting is a matter of concern, where there may be little incentive for GPs to take on 'difficult' patients who are likely to consume high proportions of their (eg.) drug budgets in any one year. Glennerster et al (1992) noted that "'cream-skimming' through the exclusion of high-risk patients has always been a troubling aspect of the (fundholding) scheme". Fears of a two-tier service are difficult to assuage, in particular given the incentives for hospitals to market their services actively to GP fundholders who have more potential than Health Authorities to switch contracts around providers. Again there is little hard evidence from the literature, but as soon as such incentives are introduced to a quasi-market, the rules of the game change. Dixon and Glennerster (1995) have noted that giving GPs budgets has provided more leverage to secure improvements in hospital services; however, one of the key messages from their paper is that research into the impact of fundholding generally "has been uncoordinated and often methodologically weak".

Perhaps the greatest difficulty associated with the reforms lies in putting the rhetoric around the purchasing function into practice. The purchaser's role can be characterised in economic terms as attempting to achieve allocative efficiency across the whole spectrum of health and social care services. This demands a wealth of information on the impact which different health and social care interventions have upon people's health status. The theoretical models of Quality

Adjusted Life Year (QALY) maximisation and Healthy Year Equivalents (HYEs) have been around for some time - for a useful summary, see Mehrez and Gafni (1989). The difficulty lies in implementation: the health service remains sceptical about the feasibility of introducing explicit rationing on the basis of QALY-type measures, leaving aside all the methodological issues which have still to be resolved (Williams, 1995a). In the context of social care, the problem is even more intractable, given the multi-dimensional nature of outcomes and the added difficulty of an explicit externality dimension with the role of carers in providing certain forms of support.

Central government initiatives such as the Cochrane Collaboration and the NHS Centre for Reviews and Dissemination (Sheldon & Chalmers, 1994), Effective Health Care Bulletins (Nuffield Institute and Centre for Health Economics, 1993) and the Cost-Effectiveness Register (Mason and Drummond, 1994) were established to rectify the information deficiencies in relation to effectiveness/cost-effectiveness. Nevertheless the absence of such information in the short to medium term means that the purchasing function is developing slowly, with Health Authorities having "not yet fully exploited the potential for using cost-effectiveness data in purchasing" (Drummond, 1995). Improvements are nevertheless being made and it is unthinkable that outcomes research will not continue to form a vital strand in future health economics research. The challenge for economists working in this field lies in providing workable models which aid purchasers in their decision-making process, while we await longer-term cost-effectiveness information.

In the shorter term, purchasers need timely and accurate information on price and quality (input and process aspects rather than health outcomes) with which to make informed comparisons across providers. Much progress has yet to be made in the development of information systems which would allow GPs, for example, to 'tap into' wider databases containing comparative price and waiting time information. The NHS reform principle of money following the patient is therefore some way from the current reality. Progress is being made through the Government's Information Management & Technology (IM&T) Strategy, for instance in the development of national networking and common contract terms (see Ferguson and Keen, 1996).

The lack of serious evaluation of information and communications technology (ICT) in the NHS is remarkable given the sums involved (Anderson, 1995). Given the potential of information systems to reduce transaction costs in the market, and to speed up the process of patients receiving treatment, there is surely a strong case for evaluating ICTs as seriously as clinical interventions. There must first be a realisation that there is a link between the implementation of ICTs and health outcomes, however indirect.

The conclusion about whether the UK NHS reforms have been a success or failure is as difficult to make as it was two years ago, when le Grand (1994) wrote: "anyone who has come to this book hoping to find a definitive answer to the simple question as to whether, overall, the NHS reforms have had a positive or negative impact will be disappointed" (Robinson & le Grand (eds.), 1994, p.242). Pointing to a single piece of evidence to say "costs are lower" or "quality of service is higher", **as a result of the reforms**, is virtually impossible. On the other hand, proponents of the reforms would say that the culture has changed, with increased emphasis upon costs, outcomes and innovation (eg. through the GP fundholding scheme). The question remains, however, why the culture needed to be changed; the NHS has long been recognised in world terms as 'efficient' in macro terms given the relatively low percentage of Gross Domestic Product (GDP) devoted to health care expenditure, unlike the USA where nearly 15% of GDP is spent on health care (Maynard, 1995). Recent figures show that over nine million cases are treated in UK hospitals at a cost of around £20 billion on hospital services (The Independent, 12th June, 1995) - a very crude average cost per case treated of between £2,000-£2,500. The £40 billion which is currently spent on the NHS represents a *per capita* spend of considerably less than £1,000 *per annum* (approximately £700 *per capita* based upon 1993 OECD health data). Nevertheless, UK health service reform has rightly focused upon the need to improve efficiency while still containing costs: what Maynard (1995) refers to as attempting to "minimise the cost of producing the maximum 'health gains' from a limited budget".

Specific changes were also needed to address specific problems, in particular the perverse incentives to which Enthoven (1985) referred. Introducing a market philosophy without careful piloting was an altogether more radical step, bringing with it the risk of conflict with public

service ideals. This is nicely encapsulated in a **non**-fundholding GP's recent remarks about why he remains a "fundholding refusenik" (The Independent, 13th June, 1995). These remarks pointed to the incentives which exist for fundholders to under-refer, under-treat and under-investigate. Furthermore, they raised a suspicion that "being efficient" - that is, having a year-end surplus to re-invest (in theory) in the GP practice and patient care, might ultimately not be rewarded: "Budgets are for cutting, that's why you set them". It is wrong to generalise from cynical observations and one-off statements, but the fact remains that economic incentives will ultimately play a small part in relation to political imperatives, ie. the UK Treasury managing the whole of public sector expenditure. This is recognised fully by Carol Propper in her recent discussion of regulatory reform of the NHS internal market, highlighting "the importance of political constraints on the behaviour of any regulator where assets are publicly owned and finance is raised by taxation.....These issues are matters as much of politics as economics" (Propper, 1995a, p.82).

At least three central themes emerge from this overview for any future research agenda in the economics of health: (1) the measurement and valuation of the impact of health and social care interventions ("outcomes research"); (2) analysis of health and social care markets; and (3) the economics of information. The last of these may in time become the most important, as the presence of imperfect information (see Section 3) constitutes a significant constraint to outcomes research and the development of health and social care markets. The information deficiencies with regard to health outcomes are obvious, and a number of authors (eg. Drummond, 1995; Propper, 1995b) have pointed towards the need for better consumer information if markets are to work efficiently.

2. THE CONTRIBUTION OF ECONOMICS

As the study of scarcity and choice, economics can clearly contribute much to the analysis of health and social care markets. Section 1 referred to the allocative efficiency decisions which characterise the purchasing function; similarly, providers are concerned with technical efficiency: that is, producing a given level of service at minimum cost, or conversely,

maximising the level of service within a given budget. The contribution of economics in assisting purchasing choices lies in the application of marginal analysis: how much additional benefit will be achieved by extending or withdrawing investment in a particular area of health or social care. Production function analysis may be able to contribute to analysis of the provider's problem, concentrating upon processes rather than final outcomes.

As a social science, economics is concerned with behaviour. Given that providers in the UK NHS have little incentive to profit-maximise within the current financial regime, what factors will be in the objective functions of managers and clinicians? Relaxing the existing financial rules would alter incentives and allow providers to behave on the basis of long-term investment decisions rather than simply short-term targets. Similarly, the theory of purchasing suggests that purchasers' key objective will be to maximise the health of their resident populations. Measurement of output and identifying the relationship with different forms of input (skill-mix or labour substitution issues) will continue to be a fruitful line of enquiry for health economists.

Consumer behaviour is critical given that much of conventional economic theory rests upon the assumption of consumer sovereignty. It is vital to know how this is affected by the agency relationship, which gives rise to information asymmetries (recognised as long ago as Arrow, 1963). The study of agency relationships is emerging in the literature on both health and social care (see for example Propper, 1995b; Smith & Wright, 1994). The agency relationship between patient and GP is long-established in the NHS, and other interesting relationships are emerging in the field of social care with the development of care management (Department of Health, 1989b).

The field of industrial economics can add much to the study of health and social care markets. Several authors have discussed pricing, quality, competition and regulation in relation to health care markets (eg. Culyer and Posnett, 1990; Ferguson and Posnett, 1991; Dawson, 1995a & 1995b; Ferguson & Palmer, 1995; Propper, 1995a; Chalkley & Malcolmson, 1995). Similarly, Wistow et al (1994) have provided a useful summary of how the social care market is evolving as part of the implementation of "Caring for People" (Department of Health, 1989b). Different

strands can be detected in the approaches adopted but there are some common themes: for example, discussions around the concept of transaction costs and agency relationships. Much work remains to be undertaken in this important area, in particular with regard to the level and nature of regulation required in health and social care markets. As Propper (1995b) has pointed out, the behaviour of NHS Trusts remains heavily regulated by the Department of Health (much more so than the private health care sector), which sits somewhat uncomfortably with the concept of competition. The NHS Executive guidance on regulating the health care market (Department of Health, 1994) is a starting point in the discussions, raising (as Propper notes) the very real question of **who** should be the regulator.

Before addressing this question, the **objectives** of regulation also need to be clarified. For example, legitimate objectives could centre around the avoidance of local monopolies but at the same time ensuring non-duplication of high-cost services. The extent to which such concerns are primarily local or central will determine who is the appropriate regulator (eg. Health Authorities, Regional Offices, NHS Executive). Among the options to be considered should be an independent regulator which had a sound understanding of the way in which health markets are operating and which had no vested interests, the latter of which is an obvious drawback of "the Centre" taking on such a role.

All of these (and other) aspects of economic analysis will demand considerable attention from health economists in the coming years. As proposed in Section 1, so too will the **economics of information**, taken in its broadest sense. The lack of high-quality and timely information is perhaps the major constraint towards the development of health and social care markets. Le Grand (1994) noted that information problems are not confined to Health Authority purchasers, with one study exploring the views of GPs finding a surprising lack of information on waiting times across different providers. The extent to which available information is actually used in making purchasing decisions remains unclear and would form the basis of an interesting research study in itself. Even in the absence of a quasi-market system, the achievement of wider societal goals (maximising health and well-being) will be hindered by the absence of good information.

This has been recognised in the market for health care with specific Government initiatives such as the Patient's Charter. Such initiatives are, however, only the tip of the iceberg, and the consumer remains relatively uninvolved in the health care sector. Other Government Departments have progressed more rapidly in the direction of providing consumers with more information: for example, in education consumers have information on schools in the form of league tables. Such developments should in principle be welcomed cautiously, leaving aside questions about data accuracy and criteria used for comparisons. In social care markets (see Wistow et al, 1994) there is a similar recognition that information difficulties pose a major constraint in taking forward the Caring for People reforms.

Of all the aspects of economics which might be considered in relation to health and social care, therefore, the remainder of this paper will focus upon the economics of information.

3. THE NATURE OF INFORMATION

Clearly some information contains the typical characteristics of public goods, for example jointness of supply and non-excludability in consumption. High-quality and timely information can also confer positive externalities on others (eg. by reducing their search costs); conversely, a party to a contract who does not provide high-quality and timely information can confer a negative externality upon other parties to the contract (see Phelps, 1995; Ferguson and Keen, 1996). There are also types of information which have mostly private benefit: for example, where a patient is given the results of a screening test for a non-infectious disease.

As well as recognising the public good and externality dimensions of information, it is important to highlight other characteristics such as incomplete and asymmetric information. Milgrom and Roberts (1987) provide a useful taxonomy in this respect, pointing to three different information structures:

1. one with COMPLETE information;
2. one with INCOMPLETE information but NO ASYMMETRY;

3. one with ASYMMETRIC information.

Note:
In its informational structure, (1) typifies most of standard microeconomic theory; (2) lies in the domain of decision theory and the economics of uncertainty; and (3) leads to the economics of imperfect information (Milgrom and Roberts, 1987, p.184; Phlips, 1988, p.4).

Recognising information asymmetries is vital in understanding different forms of strategic behaviour. Phlips (1988) defines the information structure as asymmetric where "complete information prevails on one side of the market (eg. on the selling side) while incomplete information characterises the other side (eg. the buying side), or in that some agents have information which other agents on the same side of the market do not have" (p.2).

Hence, two key aspects of information emerge from this brief discussion. Firstly, some information has public good characteristics, one aspect of which is that positive externalities can be generated by its production and dissemination. Secondly, in attempting to analyse and understand the strategic behaviour which characterises most markets for goods and services, the focus should be upon information asymmetries. As Phlips (1988) notes: "....when the focus is on informational asymmetries, then strategic interplay becomes essential and the application naturally concerns markets characterised by monopolistic competition or oligopoly. The economics of imperfect information is therefore an integral part of the theory of industrial organisation" (p.4).

4. INFORMATION AND HEALTH

In 1961 George Stigler wrote: "information is a valuable resource: knowledge *is* power. And yet it occupies a slum dwelling in the town of economics". With regard to its place in the village of health economics, information is down among the sewers. Yet, as Hsiao (1995) pointed out recently: "Unlike in the markets for groceries or clothing, asymmetry of information between buyers (patients) and sellers (physicians) vastly undermines consumer sovereignty".

Any study of health and social care markets must, therefore, include some discussion of the way in which information is produced and disseminated. Furthermore, property rights associated with different types of information should be clear, in particular where there are significant transaction costs and informational differences between parties to the exchange (ie. informational asymmetry) (Coase, 1960). The significance of asymmetries is more than purely academic: differential information between contracting parties will in itself prevent some efficient contracts from being made (Arrow, 1984). Within principal-agent theory two types of information asymmetry are identified. The first is hidden information (adverse selection) which exists *ex ante* but the information becomes available after the transaction. The second is hidden action asymmetry (moral hazard) which exists *ex post* in that the outcomes cannot be monitored very well by the principal. These two types of information asymmetry have differing implications for optimal contract design.

In relation to the field of health, Smith (1990) makes the valuable point that information is a resource, not a free good. The deployment of that resource "should be subject to the same economic criteria as other resources, such as hospitals, personnel and drugs. As with these other resources, the ultimate aim of information is to improve the effectiveness of the health services in terms of the health outcome for patients" (p.111). The logical implication of this is that ICTs which seek to improve the level and quality of available information should be subject to the same degree of scrutiny (ie. investment appraisal) as other capital developments or new technologies in the health care sector.

4.1 Types of information

There are some forms of information which will remain largely private to the individual patient (possibly including his or her close family). An example of this would be the screening test result for a cervical smear. The next level which could be considered is information obtained during a GP consultation which tells the patient that he has influenza. The patient then has the choice as to whether this information should be shared with others: there is an externality dimension both in relation to the information itself (does the patient tell his work colleagues,

thereby giving them the chance to avoid him?), and in respect of the patient's consequent behaviour (does he put himself in isolation as far as practically possible?). Although of some interest, these examples of largely private information are of less concern here.

Phelps (1995) does, however, point to a related area of private information which would assume more importance in the NHS if consumers became better-informed. The demand for information can be altered by raising public awareness about specific initiatives. For example, the Patient's Charter is a minor example of making the public more aware of their rights in respect of waiting times for inpatient procedures and outpatient appointments. If more information were made available to people about, for example, how to obtain surgical mortality rates for different procedures across hospital consultants, then the demand for information itself could be shifted (a supplier-induced demand for information). Similarly, Phelps uses the example of patients in the US system offering to pay for second opinions from another doctor when one doctor recommends surgery.

This raises a number of ethical issues. As Arrow (1984) points out, every profession - including the medical profession - "owes its economic function to the inequality of information between the professional and his client; what the latter is buying is most of all the superior knowledge of the former". What is particularly interesting about Arrow's analysis is the observation that it is precisely this type of situation in which markets would be least likely to function. Instead there is an element of trust and clearly-defined ethical constraints designed to ensure that doctors act in the best interests of their patients, rather than a system of legal contracts (which of course the patient could not enforce due to lack of information/knowledge!).

Information relating to the volume, quality and cost of health and social care services is much more clearly of the public good type. Crudely this may be referred to as "management information", improvements in which could lead to productivity gains in the NHS, according to Mayston (1992). It is in this area that Phlips' discussion of the economics of imperfect information assumes most importance. Stigler's statement that "knowledge *is* power" is highly relevant in the UK health care market where, in general, providers are better informed than

purchasers about the cost and quality of health care services. Phlips' conclusion was that such informational asymmetry would lead to interesting forms of strategic behaviour in markets characterised by monopolistic competition or oligopoly.

4.2 Information and markets in health and social care

It is important to note that virtually all markets are characterised by imperfect information. The quest for perfect information is therefore likely to prove a fruitless one. A more realistic aim is to seek an efficient level of investment in information about health and social care services. Smith (1990) highlights three different types of efficiency in this respect:

(a)	Input Price Efficiency:	refers to the optimal level of investment in information in relation to all other resources, given their input prices.
(b)	Technical Efficiency:	refers to the success with which the organisation translates information and the other resources into outputs.
(c)	Allocative Efficiency:	refers to information in its role as an outcome of health care, and will be secured if the efficient level of such information is provided in relation to all other outputs.

Each of these is now considered in turn specifically in relation to health care markets.

(a) Input Price Efficiency

From the provider's perspective, there are a number of considerations here. Direct costs of installing appropriate ICTs will be incurred, together with the recruitment and training of relevant personnel. Significant **search** and **negotiating** costs may be involved in determining the appropriate systems for specific tasks (eg. invoicing systems through to radiology workload recording systems). In addition there will be significant infrastructure costs in networking to ensure appropriate sharing of information among interested parties. Providers typically resolve such issues by allocating a particular

proportion of their overall budget to 'the information function', which in itself involves an implicit judgement about the importance of information relative to other hospital resources. This judgement will be made at least in part on the basis of the relative prices of inputs to the information production process. 'Efficiency' will be achieved when the ratio of each input's marginal product to its price is equal.

(b) Technical Efficiency

For a hospital generally, technical efficiency may be defined as success in minimising the cost of providing a given level of service (at an agreed and specified quality), or, equivalently, maximising the level of service (at an agreed and specified quality) within a given budget constraint. Information is clearly one of several inputs to the process of delivering hospital services. For example, diagnoses provided by radiological equipment are directly related to patient care. The link may be more indirect, for example where an information system provides data on comparative waiting times for a particular procedure in different geographical areas. A further example relates to the spread of telecommunications technology which allows 'remote' diagnoses to be made and information relayed between different health care professionals in various settings.

The success with which a hospital utilises such information in assisting the process of delivering care (or, in contractual terms, meeting its obligations with purchasers) will determine the level of technical efficiency being achieved. For a given volume and quality of service, the costs of the information function need to be minimised. In practice these costs are difficult to define comprehensively. There are, as discussed above, several direct costs of **providing** information. In addition there are many costs associated with **disseminating** information to all relevant parties within a hospital setting. The distinction between managerial and clinical information has become increasingly blurred in this respect as clinicians are expected to be involved in the process of managing the hospital. Hence, waiting time data are not simply 'management information'; they should equally be information which clinicians pass on to colleagues and patients. These dissemination costs are much more difficult to quantify but crucial

to the delivery of an efficient, high-quality health service. The importance of such information is not under-estimated by Mayston (1992), who goes as far to say: "Since many busy hospitals treat patients from dozens of individual health authority districts, finding and processing the correct postcode of the individual patient, along with his or her clinical details, will become as financially important as carrying out the correct surgical treatment of the patient".

(c) Allocative efficiency

This is perhaps the most difficult type of efficiency to define in practice. A useful starting point is to define what is meant by allocative efficiency for the purchaser. Given complete information on the costs and effectiveness (defined in terms of impact on patients' health status) of the range of health and social care interventions purchased, allocative efficiency would be achieved when the ratio of marginal benefit to marginal cost was equalised for all such interventions. If the purchaser's objective is to maximise the health of its resident population, the only reason for 'purchasing' information *per se* would be because it helps in some way to improve health. From the examples already quoted, clearly information does help to do so, and it is worth reiterating some of these examples here, this time from the purchaser's perspective.

Purchasers allocate a proportion of their budget to screening programmes. This is undertaken in the belief that early detection of particular conditions will result in cost savings at some point in the future (eg. screening for diabetic retinopathy in high-risk populations). Part of what is being purchased from providers is information which will help the purchaser to plan services and allocate budgets accordingly; in this example, there is clearly also private information for the patient. Mayston (1992) provides a useful example relating to the early NHS reforms' principle of money following the patient. He envisages a Prestel-type information exchange whereby purchasers might simply call up page x of the system to discover information on hospital excess capacity for a particular procedure (say, hip operations). This type of rapid on-line information could be made available to Health Authority and GP fundholder purchasers, and would

have an indirect but tangible impact on patients' health. [Mayston goes on to note that the NHS reforms risk losing the potential advantages of such developments given the emphasis on formal contracting arrangements: the flexibility needed to realise the benefits of these developments is difficult to achieve due to the relative shortage of funds available for extra-contractual referrals].

In each of these cases (a) to (c), the aims are to determine the efficient level of investment in information and to make optimal use of available information, through investment in ICTs and other resources (mainly labour). The information which results will be less than perfect, either because it is incomplete or because there remain informational asymmetries. This has important implications for the economic techniques used to study markets in which information is imperfect; as Rothschild and Stiglitz (1976) point out: "some of the most important conclusions of economic theory are not robust to considerations of imperfect information".

It is worth pausing to consider what is typically meant by *perfect* information. The following passage from Phlips (1988) is illuminating:

> "Perfect information is sometimes equated with zero costs of information. This makes sense if one means to say that perfect information can be obtained at zero cost. When the costs of information are positive then information is imperfect in the sense that the customer must compare the marginal cost of an additional piece of information with the expected marginal gain in terms of increased surplus, and some may thus be led to stop searching before the lowest price is found, even if by paying the cost perfect information can be obtained." (pp.23-24)

Relating the above to the field of health and social care, individuals - either on their own behalf or through the agency relationship (eg. with GPs or care managers) - will expend time and energy attempting to reduce the degree of information imperfection. In the case of a patient, examples include obtaining a second opinion about a surgical procedure, or trying to find out in which parts of the country waiting times are shorter for that procedure. Meanwhile, Health Authority purchasers or GP fundholders may be seeking better comparative data on the price of

particular procedures. Local Authority purchasers may be attempting to identify the best quality of long-term residential care across several providers in statutory and independent sectors.

The above passage from Phlips (1988) fits well with what has been proposed so far: it is unlikely that individual patients or parties to formal health and social care contracts will attempt to achieve information perfection. What is more likely is that additional information is sought up to a point, after which diminishing returns set in; for example, a patient may seek a second, even a third opinion, after which the expected pay-off from other opinions is unlikely to be worth the additional search costs (unless all three opinions are widely differing). Similarly, a purchaser will allocate a certain proportion of its budget towards obtaining comparative data across providers (through information and contracting functions), but will recognise that beyond a certain level of information further search will be unproductive.

This will, however, depend upon the nature of the information being uncovered by search. The logic of diminishing returns is that increased search will produce less and less gain to the purchaser, as measured by (say) the expected reduction in contract price. However, if the price information obtained through search reveals a wide dispersion of prices, the expected saving from further search may justify the process (see Stigler, 1961). Of course, the optimum level of search will be found by equating the marginal cost of obtaining an additional piece of information with the expected marginal gain/return. As ever in the field of health and social care, it is the expected gain (in terms of health, either directly or indirectly) which is most problematic to define and measure. Nevertheless, the analysis of authors such as Stigler (1961), in focusing upon the additional costs and returns associated with search, provides a useful insight to the process of acquiring relevant information.

Search costs are only one type of transaction cost incurred in health and social care contracting. Other transaction costs include contract negotiating, monitoring and enforcement costs. Dahlman (1979) proposes the view that imperfect information is really the sole cause of transaction costs: in the context of purchaser/provider relationships in health and social care, the imperfect nature of information supplied by providers imposes additional costs upon purchasers

(eg. additional search costs). As Ferguson and Keen (1996) point out: "this leads to real resource consequences and an inefficient market outcome unless some form of corrective action is taken". This standard Neoclassical approach has to be set alongside other approaches to studying markets and information, for example the Austrian theorists who accept that information imperfections exist in markets and that these do not necessarily cause inefficiency. They may in fact act as an incentive to efficiency, as entrepreneurs - eg. GP fundholders or care managers - take advantage of information gaps to secure their market share. From this viewpoint information imperfections may actually be good for quasi-markets, with no need for corrective government regulation. A compromise approach is clearly to accept a degree of information imperfection and focus debate upon the optimal level.

Deviations from a competitive outcome are not surprising when Phlips' (1988) observation is recalled that it is informational asymmetries which lead to interesting forms of strategic behaviour. As soon as information is recognised to be imperfect, parties to a contract are able to behave strategically. Competitive outcomes become irrelevant and the market structures of importance are monopolistic or oligopolistic in nature. There are many reasons why UK health and social care markets are not characterised by high degrees of competition, but a major reason must be the existence of imperfect information. Hence, providers are not selected on the basis of true price/quality trade-offs, but on more intangible features. A powerful example of this in the field of social care markets is the analysis by Wistow et al (1994), summarising early reactions in twenty-five local authorities to the full implementation of the Government's community care changes. The authors' report of progress and prospects for the development of social care markets pointed out that:

> "twenty one of the sample authorities were using some form of select, or approved, list of providers, rather than engaging in open purchasing.....The main reasons given for using preferred provider lists were known reputations, close working relationships and shared knowledge.....select lists can reduce competition and hence restrict choice and efficiency. In choosing such a system, authorities were, in effect, balancing the transaction costs associated with these alternatives". (Wistow et al, 1994, p.8)

Given the public sector ethos which has evolved over many years in health and social care, the reliance on trust and long-term relationships is hardly surprising, and undermines seriously any

notion of widespread competition in these sectors. The same report highlighted one of the potential disadvantages of social care markets as "the possibility of cartels and monopolies" forming. Finally, to complete the circle, the report pointed to information difficulties as a significant source of market failure, with one of its key recommendations to "improve the information flows from authorities to current and potential providers". At risk of taking the argument *ad nauseam*, one of the barriers to the promotion of a mixed economy of care was reported to be "the continuing inadequacy of funding to rectify long-standing information systems and information technology deficiencies"!

5. CONCLUDING REMARKS

Perhaps the key motivator for the 1989 health and social care reforms was the recognition that existing structures were leading to perverse incentives and perceived inefficiencies. This could be summed up in one quote from Enthoven (1985): "the system contains no serious incentives to guide the NHS in the direction of better quality care and service at reduced cost....the structure of the NHS contains perverse incentives" (p.13). The solution of the day was to apply basic textbook economic principles: introduce a purchaser/provider (demand/supply) split and foster an ethos of competition. Efficiency would be improved as high-cost providers were driven out of the market, securing improvements in the quality of patient care and driving prices downwards.

Two fundamental flaws in this approach are highlighted in this paper and need to be addressed before progress can be made with UK health and social care reform. The first of these arises from the introduction of competition and market forces into a **public service** (or, more accurately, a publicly-financed service). Many of the proposed reforms have taken a long time to filter through the system simply because people feel uncomfortable with the connotations of a market philosophy. Hospital doctors and managers now have to compete for patients, whereas their instinct is perhaps more to cooperate with their fellow health professionals. There is a feeling amongst some GPs that the pressure of having their own budgets will lead them to under-refer and under-treat, possibly also to turn away patients who appear high-risk. Local

Authorities' instinct is to select providers on the basis of known reputations and close working relationships, not on the basis of explicit price/quality trade-offs.

None of this is an argument against competition *per se*: indeed, as Maynard (1995) notes, co-operation and collaboration alone are unlikely to change practitioner behaviour in any cost-effective way. It is, however, a cautionary note to distrust the standard textbook models in the field of health. Economics is a **social** science, and therefore involves the study of individual and group behaviour as much as prices and markets. If people are motivated primarily by a notion of public service and not by profit, then their behaviour cannot be expected to conform to the standard competitive paradigm. David Mechanic's balanced discussion of the "Americanization of the British NHS" is an excellent example of recognising the behavioural aspects to change, as highlighted by two contrasting quotes from his paper:

> "Local authorities were instructed to reduce direct provision and purchase social services largely from the private sector....Studies by the Department of Health indicate serious continuing difficulties." (Mechanic, 1995, p.56)

and

> "....the reforms have initiated a process of examination and local involvement that has brought new enthusiasm to many participants." (Mechanic, 1995, p.63)

In short, the culture in some quarters has changed, but in significant parts of the system there remains great resistance to the language of the market. Further analysis of this is perhaps best left to the sociologist. The economist, however, may well point out (see, for example, Chalkley and Malcolmson, 1995) that it is not necessary to have competition in the market for efficiency to prevail. They note that, given the nature of investment in health care and the locational dimension, long-term contractual arrangements will be efficient. Such arrangements are implicitly based on trust and will have evolved over many years, before formal contractual obligations were in place. The implication for regulation is clear: monopolistic competition and oligopoly are the relevant market structures for analysis, and, with the development of combined DHA/FHSA commissioning organisations, there is every likelihood of local bilateral monopolies. Consideration should be given to ways in which competition can be stimulated on

the **purchasing** side of the market; this is particularly important given the continued spread of GP fundholding and the lack of information available for consumers to assess the purchasing ability of their GPs, not to mention their host Health Authorities.

The second major flaw relates to the incomplete and asymmetric nature of information in health and social care markets. These imperfections (especially asymmetrical information) led Arrow (1984) to the conclusion that markets would be least likely to function in such situations. There are many reasons why UK health and social care markets will function imperfectly, but a major constraint is simply the existence of imperfect information. Again this is not an argument to 'call a halt' to the health and social care reforms: it is, however, a warning that little real progress can be made until the information base is improved. Many central initiatives alluded to in this paper aim to do so, for example in seeking to improve information about the effectiveness of different interventions. There nevertheless remains little or no serious evaluation of the systems which have the most potential to improve the information base: information and communications technologies (ICTs) themselves.

Mayston (1992) highlights the 'acid test' that the benefits from providing information should exceed the costs, obvious at face value but rarely applied in practice with any degree of rigour. Everyone recognises that information in most markets is imperfect. Imperfect information, however, increases the level of transaction costs, and ICTs have the potential to reduce the level of transaction costs. This raises interesting policy questions (Ferguson and Keen, 1996) regarding the optimum level of transaction costs and the scope for ICTs to assist in achieving the optimum.

In conclusion, the "dismal science" can offer much in the future analysis of health and social care reform issues. The essential caveat is provided by Williams (1995b) who highlights the dangers of traditional economic models which "are totally inappropriate for dealing with the public sector in general, and with the health sector in particular". Perhaps the most fruitful area for research lies in the economics of (imperfect) information, not least because the existing state of information is more dismal than economics itself. The jury remains out on whether the UK

health and social care reforms are working. Improving the information base on the volume, quality and cost of services could do more than any structural reform to secure efficiency gains. It is a moot point whether this requires a quasi-market and competitive pressures, but **if** it is the demand/supply separation which has focused attention upon the general paucity of information, then the reforms have made progress.

Samuel Butler, a British author, wrote in 1912: "All progress is based upon a universal innate desire of any organism to live beyond its income" (Butler, 1912). The challenge for the UK reforms, and for health economics research, will lie in achieving the Holy Grail of securing efficiency gains while still constraining health and social care expenditure to historical proportions of total government expenditure.

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