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ABSTRACT

Despite radical reform in the NHS and the creation of purchaser-provider contracting, the pattern of doctors' remuneration remains largely unaltered. Doctors are the key agents in access to the health care system, and the services they control determines who survives and who lives in pain and discomfort. Does the present system of doctors' payment reflect their worth and produce efficient medical practice and good patient care?

General practitioners are paid a target income of £40,010 p.a. which is partly made up of capitation payments (about 60% of total income) and fees per item of service. The cost effectiveness of many of the GP services rewarded by fees is unproven.

Hospital consultants are paid a salary (£37,905 to £48,945 per annum) and as many as one in three also receive a distinction award at varying levels, the top grade of which (£46,500) can double a consultant's salary. Hospital specialist services appear to be organised in an anachronistic fashion (in medical and surgical "firms") of unproven cost effectiveness. The allocation of distinction awards is covert and, like the salary, does not efficiently relate workload and quality to rewards. In addition to their salary and distinction awards, some 12,000 consultants have private practices and earn from this source alone an average of £40,000 per year.

Could this be the time for NHS Trust managers to reform payment methods so that efficiency is rewarded appropriately? The US Medicare doctor remuneration system has been reformed so that fees are related to the work spent by doctors on particular services, in particular the time input and the intensity of activity, with an allowance for practice costs. This method of

relating pay to careful measurement of workload effort has led in the US to enhanced fees for family physicians and lower payments to some surgeons and to radiologists and pathologists, i.e. rewards are targeted more appropriately.

Ideally pay should be related to the outcome achieved, in terms of improved health. In the absence of measures of outcome, managers in the NHS could experiment with some UK variant of the new US remuneration system. If this alternative is not adopted, some other way of determining the worth of doctors must be found if efficient practices are to be rewarded and the providers of poor quality care penalised. The present system of remunerating doctors in the UK is an inefficient product of history and trade union (British Medical Association) power. Its careful reform, if evaluated thoroughly, is an essential element in the development of a more efficient and user friendly NHS.

INTRODUCTION

Throughout the world, policy makers in health care systems seek to achieve three objectives: efficiency, equity, and cost containment. In the UK the Government has adopted policies which, while using the rhetoric of competition and the "internal market", challenge medical dominance by creating expensive and extensive systems of management which will seek to control the price, volume and quality of care.

In the United States, such systems of regulation were initiated over a decade ago, by private insurers and health maintenance organisations (HMOs) using their purchasing power, and by the Federal Government anxious to control inflation in Medicare expenditure with price fixing devices such as diagnostic related groups (DRGs). There has been continuous advocacy of competition (e.g. Enthoven (1980) and Enthoven and Kronick (1989)) as well as increased regulation.

Cost containment policies used in the USA have been compared to squeezing a balloon: "constraining one end causes the other to bulge" (Schroeder and Cantor (1991)). The processes of continuing reforms in the USA and the UK over the last decade have had limited effects on expenditure growth and no demonstrable impact on the efficiency with which health care is provided.

Perhaps this outcome is not surprising as there has been both a reluctance to evaluate the efficiency of health care services and a failure to create appropriate incentives for providers, in particular doctors, to deliver services cost effectively.

Health care is a particularly labour-intensive industry with salaries and wages making up approximately 75% of total NHS costs (Health & Personal Social Services Statistics for England, 1991). It is important to refine the systems of reimbursement in the NHS to ensure that they encourage doctors to work efficiently. At present, payment systems for medical staff in the NHS contain few financial incentives to encourage efficiency.

This paper will consider current systems for the reimbursement of doctors. In sections 1 and 2 the NHS payment systems and problems associated with them are described. In the United States Medicare scheme a radical new system of remuneration has recently been introduced, known as the Medicare Fee Schedule. This is based on the Harvard Resource Based Relative Value Scale (RBRVS) which attempts to link the reimbursement of physicians with their workload.

Despite the recent wide-ranging reforms of the UK NHS, the issue of doctor reimbursement remains largely unchanged and anachronistic. Whilst minor modifications, such as a deprivation factor, have been introduced to the reimbursement system for general practitioners, these do not link payment with workload. The reimbursement of hospital doctors has remained constant with hospital doctors paid in a simple salary system, unrelated to workload and with standard scales applying across all specialties. The consequence of this payment system is that hospital doctors are neither penalised for poor performance nor rewarded for good work, and it is difficult to encourage specialisation in areas of short supply. Perhaps these problems may be ameliorated by linking reimbursement to workload in a way similar to the Medicare RBRVS. This system is outlined in section 3 and a final section reviews the implications of such a system for the UK-NHS.

With the Government implementing its reforms vigorously, there is a need to review carefully the efficiency of existing doctor payment systems. The chief executives of hospital trusts and primary-community facilities are required to deploy their resources efficiently. They cannot do this unless the remuneration systems they use are designed more carefully to reward the efficient and penalise the inadequate.

1 HOW ARE NHS DOCTORS PAID NOW?

The income of doctors in the UK National Health Service is determined by the annual report of the Review Body on Doctors' and Dentists' Remuneration, and the Government's funding response to it. The Review Body consults with the Department of Health (DoH) and the British Medical Association (BMA) before making final recommendations to the DoH. The implementation of these recommendations is subject to DoH authorisation, and they may therefore be altered before implementation.

General practitioners and hospital doctors are paid by quite different systems of remuneration. Both, however, are affected by the Review Body, which suggests salary levels for hospital doctors and also suggests a suitable target level of income for general practitioners.

1.1 General Medical Practitioners

Payments to General Practitioners (GPs) are not determined by a fixed salary scale. As independent contractors of services to the NHS, their remuneration depends on the number of patients on the GP's list, and on the provision of specific services. The Review Body recommends to the DoH a 'target' average intended net income for GPs. From April 1992 this is to be £40,010 per annum (Review Body 1992). Their gross income is made up of capitation payments, practice allowances, fees and direct reimbursements. Capitation payments are currently £13.85 per year for each patient under the age of 65, £18.20 per patient aged between 65 and 74, and £35.15 per patient aged over 75. The main allowance is the Basic Practice Allowance, which ranges from £2,660 for the first 400 patients to a

maximum rate of £6,384 for practices with 1,200 or more patients. GPs are directly reimbursed for expenses such as premises, 70% of staff costs, and some computer equipment.

Recent reforms have considerably changed the terms of service and remuneration of GPs. Capitation rates are now the main source of GPs' income, making up almost 60% of average income, compared to approximately 47% prior to the reforms. This increased emphasis on capitation is an attempt to introduce more competition by encouraging GPs to offer more services to attract additional patients to their practice.

Reforms also introduced a 'deprivation payment' - a factor linked to the Jarman index (Jarman 1983, 1984), intended to compensate inner city GPs for increased workload as a result of social factors. The Jarman index is however thought to be a poor measure of true deprivation (Carr-Hill & Sheldon 1991). Payments are given at three levels, according to the perceived level of deprivation. Current payments per year for each patient on the GPs list are £9.60 for the high level, £7.25 for the medium level and £5.50 for the low level. This is one attempt to link remuneration with workload as social problems are thought to cause higher than average work for GPs.

A more obvious attempt to link the remuneration of GPs with the work they perform is the new GP contract (DoH 1989), which specifies a number of services which GPs are required, for remuneration, to provide:

1. Health checks must now be offered to all new patients within 28 days of joining a GP's list. New registrations currently attract a fee of £6.10.

2. Health checks must also be offered to 'infrequent attenders' - patients between the ages of 16 and 74 who have not visited their GP in the last 3 years.

These health checks gather information about factors which may affect the patients health - medical history, social factors, information on immunisation and screening, lifestyle, and current state of health. In addition, a physical examination should be carried out, including measurement of weight, height, blood pressure and testing of urine for glucose and protein.

3. All patients over the age of 75 must be offered an annual consultation and domiciliary visit, to assess their need for medical services. To compensate GPs for the additional costs incurred by this compulsory annual check, the capitation payment for the over 75 age group has been increased to £35.15, more than double that for patients under 65.

Health checks are now contractual obligations for GPs, and they are aimed at early detection of illness and detection of risk factors for illness. Other preventive measures given high priority by the new contract include:

4. Cervical cytology services for women aged between 25 and 64 years. Previously paid for on a fee for service basis, payment now depends on reaching a target. If 50% of women in this age group have had an adequate cervical smear test during the past five and a half years, GPs are paid an extra £760. If 80% of this group are screened, GPs receive £2,280.

5. Immunisation and vaccination services. Again, this payment (previously fee for service) now depends on reaching targets of coverage. GPs receive £600 for covering 70% and £1,800 for covering 90% of all 2 year olds on their list, who have complete courses of all three groups of immunisations.
6. Health promotion clinics. GPs are paid a fee of £45 for each clinic, which should be a one hour session with at least 10 patients. These can include well person clinics, diabetic clinics, alcohol control, stress management or any others considered suitable by the FHSA.

GPs are still paid on a fee for service basis for family planning and maternity services. In addition, they can provide other optional services for remuneration, including:

7. Child health surveillance. Adequately trained GPs (as defined by the FHSA) can be paid £10 per child per year for monitoring the health of children under the age of 5. This service has the objective of freeing health visitors to work more with the elderly.
8. Minor surgery services. Again if adequately trained, GPs can be paid £100 per 5 minor operations, up to a maximum of 3 payments per quarter. This initiative, it was hoped, would reduce hospital waiting lists for minor surgery.

The new GP contract considerably changed the methods of reimbursement of GPs, attempting to link payment to workload and emphasising the ability of the GP to influence the health status of patients, particularly by preventive measures and health promotion services. The

success of the contract in increasing efficiency in primary health care provision remains to be evaluated (Scott and Maynard 1991).

Another important change to the remuneration system for GPs was contained in the reforms resulting from the white paper 'Working for Patients' (DHSS, 1988). These reforms allowed GPs, initially with more than 9,000 patients on their list, to control their own budgets, thus giving them more influence on which hospitals their patients attend for diagnostic tests and cold elective surgery, and allowing them to use any budget income surplus over expenditure to develop their practices.

The recent reforms of the NHS have attempted to address the systems of remuneration of GPs (unlike hospital doctors, payment of whom has been largely ignored by the reforms). The success of these reforms in creating a payment system which encourages efficiency in primary health care will be discussed in Section 2.

1.2 Hospital Doctors

Hospital doctors are paid on a salaried basis, with fixed salary scales applying across all specialties. The salary scales are determined largely by the recommendations of the Review Body. Doctors enter hospital at the level of House Officer, and may rise through the promotion hierarchy to the level of Consultant. Promotion to another scale within a grade and to higher levels depends on examination and the recommendation of consultants, but the system means that doctors can languish for years at each stage, waiting for retirements to create vacancies (Roberts 1991).

The staffing hierarchy, and current (April 1992) levels of pay for hospital doctors is as follows (Review Body 1992):

House officer: £13,000 - £14,680

Senior house officer: £16,225 - £20,585

Registrar: £18,395 - £22,310

Senior registrar: £21,185 - £26,810

Staff grade practitioner: £20,275 - £30,205

Associate specialist: £22,475 - £39,105

Consultant: £37,905 - £48,945

With this formalised structure, and automatic annual salary increments, there is little opportunity to encourage individual physicians or to persuade physicians to specialise in areas of need. Salary levels, and in most cases promotion, are not linked to individual performance.

The only financial rewards for good performance in this remuneration system are the 'awards of distinction' given to senior consultants. These are additional payments to "the very best consultants" as defined by the Advisory Committee on Distinction Awards. This committee, made up of 22 members from the royal colleges and faculties, the BMA Central Consultants and Specialists Committee and the Medical Research Council, approve nominations for awards sent in by regional panels. There are no formal criteria for selecting consultants for awards, but regional panels are advised to look for performance over and above the normal level in service to patients, management and development of services and teaching at undergraduate and postgraduate level. The criteria are very vague, and regional committees

tend to concentrate on consultants' publications, "international fame" and "exceptional expertise" in their field (Dawe 1992). The awards tend therefore to be based on imprecise measures of "prestige" rather than actual work done.

There are four different levels for awards of distinction, based on a percentage of the maximum pay for consultants. Current values of the awards are:

A+ awards (95%) - £46,500

A awards (70%) - £34,260

B awards (40%) - £19,580

C awards (20%) - £9,790

By retirement, approximately 60% of all consultants will have held an award. In 1990, a total of 5,798 awards were held (36% of all eligible consultants), of which 3,454 were 'C' awards, 1,511 were 'B' awards, 648 were 'A' awards and 185 were 'A+' awards (Dawe 1992). Prior to the 1990 reforms distinction awards were given to consultants for life, but there is now a five-yearly review of the awards, and they can theoretically be removed.

The system of awards of distinction has been widely criticised, and is a source of great controversy both within and outside the medical profession. The shortcomings of the distinction award system have given rise to a number of suggestions for reform. Within the medical profession, reforms suggested tend to be in the form of seniority payments, which still do not link payment with workload or with outcomes of care, but solely with age.

In a recent note (cited in Limb, 1992), the DoH asked the Review Body on Doctors' and Dentists' Remuneration to consider the possibility of awards for clinicians for clinical excellence and efficient use of resources. This initiative has been interpreted as a sign that the government intends to extend the principle of performance related pay in the health service to doctors. It has been suggested that doctors could earn extra money for treating more patients, cutting waiting lists, working longer hours and meeting national health targets.

Performance related pay may represent a method of encouraging greater activity and possibly efficiency in health care, but it is important for the performance measures used to be appropriate. Measures should take account of the work input of doctors and the value of outcomes from this, rather than just encouraging doctors to meet political targets.

Remuneration systems for hospital doctors have changed little since the inception of the NHS, with both the salary system and distinction awards largely in the form in which they were introduced in 1948. Even the wide-ranging reforms contained in Working for Patients (DHSS, 1988) did not really address payment of hospital doctors. One potentially important change was introduced - self governing hospital trusts were given leave to appoint their own consultants and set their own pay rates. This means that in future doctors could be employed on short term contracts, and pay could be negotiated locally, rather than at a national level. As yet, however, few of the hospital trusts have taken up this opportunity.

Also in the 1989 NHS reforms the distinction award procedure was very slightly altered. Age limits of 60 for 'C' awards and 62 for higher awards were introduced, and new awards presented must now be reviewed every five years. In addition, attempts have been made to

involve management more in the award selection process, by modifying the criteria for 'C' awards. To qualify for these awards (and therefore for higher awards), consultants must demonstrate not only clinical skills but also "a commitment to the management and development of the service" (DoH 1989). The effects of these changes have not been evaluated.

Other recent alterations to the terms of service and remuneration of hospital doctors have largely concentrated on the problems of long working hours and "low morale" of hospital doctors, which is an important political issue. Attempts to address the problems have included a relatively large pay increase for junior doctors, and amendments to their system of overtime payments. Finally, following the report 'Achieving a Balance' (DHSS 1988), approximately 100 new consultants have been recruited, with money available for at least 50 more.

Thus the recent NHS reforms have led only to minor changes in the remuneration systems for hospital doctors. The efficiency of these changes and the existing payment system is rarely analysed by policy makers or in the research literature.

2 PROBLEMS WITH CURRENT NHS REMUNERATION SYSTEMS

2.1 General Practitioners

Attempts have been made to link the pay of GPs to the work they perform by target setting initiatives and other items in the new GP contract. However, the objective of achieving efficiency in the work of GPs may not be achieved because of the creation of perverse incentives. An example is target payments given to GPs for population coverage by screening and immunisation programmes. These standard payments ignore the fact that targets are achieved more easily in certain areas. In inner cities, populations tend to be highly mobile, making targets difficult to reach. If some GPs realise that they cannot reach the higher target they have no financial incentive to attain coverage beyond the lower level. They may therefore decide to maintain their income in other ways, such as by offering more health promotion clinics, or they may just consume more leisure. The incentives created may result in inefficient use of GP time, or may direct GPs away from inner city areas. This issue is not sufficiently addressed by deprivation payments, which although targeted at inner city GPs, were designed to compensate for general problems arising from social factors affecting health, not for specific problems for GPs attempting to reach health promotion targets. Furthermore, there is no guarantee that, even if targeted on deprivation, resources will be used efficiently.

The new GP contract has not been evaluated. It has not been demonstrated that changing the use of GP time, for example by introducing health promotion clinics (HPCs) improves the health of patients. The HPCs and screening programmes encouraged by the new contract are

as yet largely of unproven clinical value, and have not been subject to economic evaluation (Scott & Maynard 1991). Even if one HPC does promote health more effectively than offering advice during normal consultations, this does not necessarily follow for all HPCs, and there is no reason for them all to be treated equally. It may be that a clinic on smoking proves more effective in improving health than does a clinic addressing cholesterol reduction. The standard HPC payment however assumes all clinics are of equal value, and this may not facilitate the achievement of the best allocation of resources in general practice. The cost-effectiveness of each HPC should be compared with other HPCs and with other uses of GP time.

Payment for health promotion clinics and all other activities of GPs should reflect value in terms of effects on health of patients and the work expended by GPs in achieving these effects. To ensure that the production of 'health' is maximised with the resources allocated to general practice, it is essential that the marginal cost of all activities is equated with the marginal benefit from them. The main reason why marginal costs and benefits are not equated is, as usual, lack of information. The relative benefits of the services which GPs must now provide are largely unknown. Similarly, little is known about how these activities use GP resources (time and effort of the GP and other practice staff, use of equipment etc).

As well as the new GP contract, another recent initiative attempted to link GP payment with workload. This is the introduction of deprivation payments, linked to the Jarman index (Jarman 1983, 1984). These payments are intended to compensate GPs for additional workload caused by social factors. However, the Jarman index does not adequately measure deprivation (Carr-Hill 1988; Carr-Hill & Sheldon 1991), and the payments do not relate to

specific aspects of increased workload. In addition, no mechanism exists to ensure that deprivation payments are allocated by GPs in an efficient way. It is not sufficient to give funds to GPs in deprived areas, even if deprivation is adequately measured. A mechanism must be devised to ensure that these funds are managed efficiently, targeting appropriate, cost-effective activities.

Whilst the recent reforms have attempted to link payment of GPs with their work, their impact has been limited. Any services which GPs are obliged to provide should be carefully evaluated to ensure that they represent the most efficient method of providing health care to their patients. This evaluation requires investigation both of health outcomes achieved and of resources expended in achieving them. At present, this condition is not met: GP targets were set with the best of intentions in a data free environment. Furthermore there is an unthinking acceptance both of group practice and the recruitment of practice nurses and other support. What is the optimal size of such a group practice? What tasks can be allocated efficiently to practice nurses? For example, should they have a prescribing role? Could other practitioners take over some medical tasks? For example, why shouldn't the skills of local pharmacists be exploited more efficiently, with them having the authority to prescribe? Issues such as these are rarely articulated, let alone investigated by researchers.

2.2 Hospital doctors

Hospital doctors in the NHS are paid on a salary basis and there are a number of fundamental problems with this system. Salaries make no distinction between physicians practising in different specialties, and are not related to the amount or value of the work performed. It is

therefore difficult to reward individual doctors, and the only way of targeting specific problems or encouraging doctors to specialise in areas of need is by controlling the creation of posts. This may not ensure that resources (time and effort expended by hospital doctors) are utilised in the most effective or efficient way.

Salary payments are essentially prospective and unrelated to the input of doctors and the patient outcomes they achieve. There are no penalties for poor performance and poorly targeted rewards for good work. The present system lacks financial incentives to motivate doctors in their work activities. It may also induce consultants to delegate routine duties to more junior doctors, freeing their time to carry out more interesting or innovative tasks. This has the benefit of ensuring innovation, but these activities are usually unevaluated, and may not be efficient use of time and other resources.

The existing work practices of hospital doctors, in particular the hierarchical organisation of medical and surgical firms led by single specialists served by groups of trainees of varying competence and experience, are a product of history insulated from change by existing incentive structures, particularly remuneration. There is no evidence to show that this organisation produces effective training or the best patient care. Its reform, with the creation of more consultant posts, might resolve the issue of juniors' hours and enhance activity rates, although it may be resisted because of the threat to private practice.

The Department of Health require that pay increases in the medical profession should be "what is sufficient to recruit, retain and motivate staff of the right quality" (Review Body 1989). However, with the current system of salary increases across the board these aims can

be approached only indirectly. Annual salary increases may be inadequate to ensure goodwill let alone target resources to their most effective use. The only method of targeting resources in the NHS is by volume controls - creating additional posts in areas of need, and this fails to address any problems of motivation, morale or efficiency. Recruitment has remained relatively steady in terms of the number entering the medical profession, but there has been a long term decline in applications to study medicine relative to other subjects.

Jessop (1991) reports on a survey of 900 hospital consultants which shows that half of the consultants were suffering from low morale and three quarters of them felt less valued by the government than they did five years previously. Forty per cent of consultants have considered early retirement and 18% have thought of private practice.

The only financial inducement used to retain consultants in the NHS is the distinction award system. These awards are widely viewed as unfair and outdated. Committees deciding who receives these awards are made up almost exclusively of current award holders, and the decision process is surrounded by an air of secrecy. The awards appear to be based on prestige rather than the amount of work actually done, and are often given to consultants with substantial private practices. There are wide variations in the proportions of consultants in each specialty who receive awards, and the system is thought to be biased against women and against certain specialties. There are also large differences in the number and value of awards between regions. Both of these apparent inequities were identified in a 1972 study (Lavers and Rees, 1972) and the situation has changed little since then. For example, in December 1990, 19.3% of consultants in mental health held distinction awards compared with 63.6% of consultants in neurosurgery (Health Trends 1991). Awards tend to be presented to consultants

in high-tech, high prestige specialties. They do not encourage junior doctors to specialise in areas where service needs have been prioritised. The minor alterations introduced in the recent NHS reforms have not addressed the more fundamental problems of the award system, which has failed even in its basic aim of maintaining the morale of senior consultants in the NHS.

The problems of low morale in the medical profession are most obvious in junior doctors. "In this time of upheaval and change in British medicine all professionals are worried. But none seem as truly miserable as junior doctors" (Roberts, 1991). The excessive working hours of junior doctors have been well publicised and these problems are exacerbated by uncertainty about how long doctors will remain at each stage of their career. Doctors can remain for some years at each stage, waiting for retirement to create vacancies. Some assert that promotion depends on luck as much as on good work.

Following the report 'Achieving a Balance' (DHSS 1988) legislation has been introduced to ease the problem. Junior doctors hours are eventually to be reduced to 72 hours, with work allocated amongst teams and non-medical staff taking on extra duties. In addition, the number of consultancy posts has been increased, which should at least temporarily relieve the bottleneck of doctors confined to lower grades. Shift systems have been introduced at some hospitals to reduce hours of work for junior doctors (Nasmyth et al 1991). However, all these initiatives take considerable periods of time to work through the present system, due to shortages of human and financial resources.

2.3 Conclusions

Unless workload and outcomes are given specific attention in any future remuneration system, the aims of ensuring recruitment, retention and motivation will not be addressed. The morale of doctors at all levels may be improved if they were financially rewarded for long hours or intense periods of work. Recent initiatives have introduced overtime payments for junior doctors, but this still neglects the intensity of work, just addressing the hours worked. Current systems of payment for GPs, and particularly for more senior hospital doctors, do not link pay to work performed.

The three main methods of payment of doctors are on the basis of salaries (currently used to pay hospital doctors), capitation (currently forming the basis of GP pay), and fee for service. There are problems with each of these methods. Paying a fee for each item of service creates incentives for doctors to treat as many patients as possible, and may encourage unnecessary intervention. This causes problems of cost escalation, as seen in the US. Fee for service payment is therefore rejected as a basis of payment for doctors in the UK NHS. Capitation and salary payment are probably the most suitable systems for NHS GPs and hospital doctors respectively. They do not encourage unnecessary treatment, but unfortunately they also do not contain sufficient incentives to encourage high quality service.

The recent NHS reforms introduced the possibility of NHS Hospital Trusts employing doctors on short term contracts. This may provide a way of increasing performance incentives for hospital doctors. Presently, most hospital doctors have unlimited term contracts, and are accountable only indirectly to other doctors. Short term contracts would also make hospital doctors accountable to managers - going some way towards redressing the highly uneven

balance of power, but are costly. However, like performance related pay, short term contracts could encourage doctors to concentrate their efforts in areas where service needs have been prioritised.

In recent months, the Department of Health has asked the Review Body for Doctors' and Dentists' Remuneration to consider bonus payments for clinical excellence and efficient use of resources. This has been interpreted as a desire to make doctors' pay related to performance, and it has provoked swift condemnations from the doctors' trade union, the BMA. The concern of the union is that performance related pay could be used to persuade doctors to meet political targets.

Any system of performance related pay should make payment sensitive to work performed. Whilst ideally doctors should be paid for improving the health outcome of patients, the measurement of health outcomes causes such fundamental problems that this is unlikely to be feasible in the near future. Assessing the work input of doctors, while potentially complicated, is not impossible. Turnbull et al (1990) examined the work patterns of junior doctors, estimating time spent on four categories of work: patient contact, communication, waiting and administration and other activities. Extending this type of work to incorporate intensity of work in each situation may reveal important information regarding the workload of doctors.

In the United States, the system of payment of doctors treating patients covered by the Medicare scheme is currently being radically changed. The Resource Based Relative Value Scale, upon which the new fee schedule is based, provides a means by which doctors' pay can be related to work activity.

3 PHYSICIAN PAYMENT SYSTEMS IN THE UNITED STATES

3.1 Background

The United States health care system is "market" oriented, and doctors are paid on a fee-for-service basis. Whilst this system does not contain the incentive problems of the UK salary system, it has contributed to cost escalation in US health care. Cost containment in health care is an issue of great importance in the USA. Third party payment has resulted in rapid cost escalation - national health care expenditures are estimated to have consumed \$820 billion in 1991, nearly 14% of gross national product (US Department of Commerce). Various measures have been introduced to slow the rapidly increasing expenditure. Insurance companies have introduced coinsurance schemes and deductible payments, and require second opinions for most procedures, to reduce patient demand for health care. Health Maintenance Organisations and Preferred Providers have been encouraged, and incentives created to join these schemes. US federal and state governments have reduced eligibility and payment levels for patients receiving Medicaid. The controversial Oregon experiment has attempted to maintain coverage of Medicaid by limiting the treatments available under the scheme.

Perhaps the most visible and controversial of the recent changes in the system of financing US medical care was the introduction of the Medicare prospective payment scheme (PPS) for hospitalised patients. The Medicare programme, introduced in 1965, aims to ensure that elderly citizens have equal access to quality health care. State payment of health care bills for Medicare patients is split into two parts - Part A, which pays hospital bills, and Part B, which pays the fees of physicians. The PPS was aimed at reducing Part A costs. Before its

introduction hospitals were paid retrospectively on a fee for service basis. This contributed to rapidly increasing costs as neither suppliers nor patients had any incentive to restrict consumption. Hospital expenditures under Medicare had been rising annually by nearly 16% prior to the introduction of prospective payment in 1983 (Greenberg 1991). The scheme involves patients being allocated to a Diagnosis Related Group (DRG). Hospitals are then reimbursed by a fixed prospective payment for each DRG, creating incentives for hospitals to limit costs. The overall success of the programme is not yet clear. Rises in hospital charges quickly dropped to 6.3%, but evidence regarding the effects on quality of care, location of treatment and patient outcomes is mixed (Feder et al 1987, Draper et al 1990). The Prospective Payment Scheme was aimed at Part A bills - the cost of hospital care. Part B costs, associated with physician reimbursement, were largely ignored until 1986.

Medicare was designed to maintain patient choice in health care; patients covered by the Medicare system have the freedom to choose any doctor for their treatment. Following resistance by doctors to the imposition of a standard fee schedule, the 'customary, prevailing and reasonable' (CPR) system for reimbursing doctors was developed. Under this system, Medicare paid 80% of an allowable charge for covered services, with the allowable charge being the lowest of these three:

- 1) the physician's actual charge
- 2) the physician's customary charge for that service, and
- 3) the prevailing charge for the service in that location.

Services were distinguished by a coding system in the Current Procedural Terminology,

edition 4 (CPT-4).

The CPR system has been widely criticised. It was very complicated, making the formula unpredictable - doctors often had no idea how much they would be reimbursed after submitting their bills. Wide disparities existed in payments across geographic areas and specialties (Scalettar, 1990). Payments for evaluation and management services such as family medicine and general internal medicine were generally lower than those for technology based services, such as surgery and imaging (Levy et al 1990). This created incentives for too many medical students to specialise in high tech services and too few in evaluation and management services. The system also failed to direct doctors to underserved areas, particularly rural areas.

The CPR system contained inflationary tendencies, and maintained existing distortions in physician charges. Doctors were likely to set charges with as much consideration of their charge profiles (and future allowable charges) as for the costs of service provision (Jencks and Dobson 1985). Young doctors particularly, with no previous record of charges, could effectively choose their 'usual' fee. From 1975 to 1990 physician charges in the Medicare scheme increased from \$3 billion to \$29 billion, despite many attempts to restrict expenditure, including a price freeze between 1984 and 1986.

The CPR payment system also failed to reflect changes in relative costs over time. New procedures, requiring a high level of skill and attention, are naturally priced more highly. However, under CPR charges almost never decreased, even if experience or technological change lowered costs (Jencks and Dobson 1985). This is illustrated particularly in the case

of coronary artery surgery (Roe 1981).

The problems associated with CPR have led to consideration of two major alternatives. The HCFA have experimented with 'bundled' payments - paying providers a fixed amount for a given set of services, including the services of physicians. This has been implemented in an experimental programme with coronary artery bypass surgery in four participating hospitals (Wilensky 1991) and is currently under evaluation.

In 1986 Congress and the HCFA created the Physician Payment Review Commission (PPRC) to advise on reform of the methods used by Medicare to pay physicians. The basic system of paying doctors on a fee-for-service basis was not questioned, but a more rational fee schedule was required. The Commission favoured the implementation of a relative value scale based on the resource costs of service provision. In 1989 they accepted the findings of a group of Harvard economists (Hsiao et al 1988) who had devised the Resource Based Relative Value Scale (see below). This was later amended by the PPRC, and is being implemented in 1992 as the Medicare Fee Schedule.

3.2 The Harvard RBRVS

In response to the seriously flawed CPR system of reimbursing doctors under Medicare, a research team at the Harvard School of Public Health, led by Professor William Hsiao, developed the Resource-Based Relative Value Scale (RBRVS). The objectives of their study were to develop reliable and valid methods of estimating the relative resource input costs required to perform physician services, and to produce resource-based relative values

(RBRVs) for physicians' services.

The RBRVS does not attempt to estimate the value of health outcomes from physicians' services. Instead it concentrates on resource inputs, using a systematic process to derive the relative prices that would have emerged from a reasonably competitive market in physicians' services. Under competition, relative prices reflect the relative cost of efficient producers, and social efficiency in the allocation of scarce resources is promoted. This concept represents the theoretical underpinning of the RBRVS (Hsiao 1989).

To measure the resource costs of physicians' services, a model was developed to estimate:

- i) Work expended by the physicians on particular services, encompassing time spent before, during and after a service, and the intensity with which that time is spent.
- ii) Practice costs necessary to supply the service, which vary considerably between specialties.
- iii) The opportunity costs of training, which represents the income foregone by physicians who spend extra years training to become specialists.

These three factors are combined to produce the resource-based relative value of a service, which can be represented by the following formula:

$$RBRV = (TW)(1+RPC)(1+AST)$$

where TW denotes total work input of the physician, RPC is an index of relative specialty costs and AST is an index of the amortised (depreciated) value of the opportunity cost of specialist training. The values are expressed in non-monetary units - to establish a fee schedule RBRVs must be multiplied by a monetary conversion factor.

Work was separated into the three components: intraservice, which involves direct patient contact, preservice and postservice, which include other work such as reviewing and updating patient records, preparing for surgery and consulting with other specialists. Total work correlates strongly with the severity of the patient's condition, which affects both time and intensity of work. After interviewing 20 specialists, Hsiao postulated four main dimensions of work: 1) time 2) mental effort and judgement 3) technical skill and physical effort and 4) stress. These four dimensions were used in devising reference services for analysing intensity of work.

The study was designed in consultation with various professions, including physicians, health economists, statisticians and members of the American Medical Association (AMA). Technical Consulting Groups (TCGs) were appointed, comprising up to five physicians in each specialty under review. These groups provided guidance on the study, helping to define physicians' work and its dimensions, commenting on methods of measurement and their validation, and evaluating the reasonableness of the results. A sub-group from each specialty also served on the cross-specialty panel, which linked the work of all the specialties in a common RBRVS.

The first phase of the study looked at 18 specialties, concentrating on 373 of the 7000

available CPT-4 codes. These services account for 36.7% of total Medicare charges. The results obtained were then extrapolated to non-surveyed services and linked to form a common scale. Phase II of the study expands the original survey to include 15 additional medical and surgical specialties. This phase is still in progress.

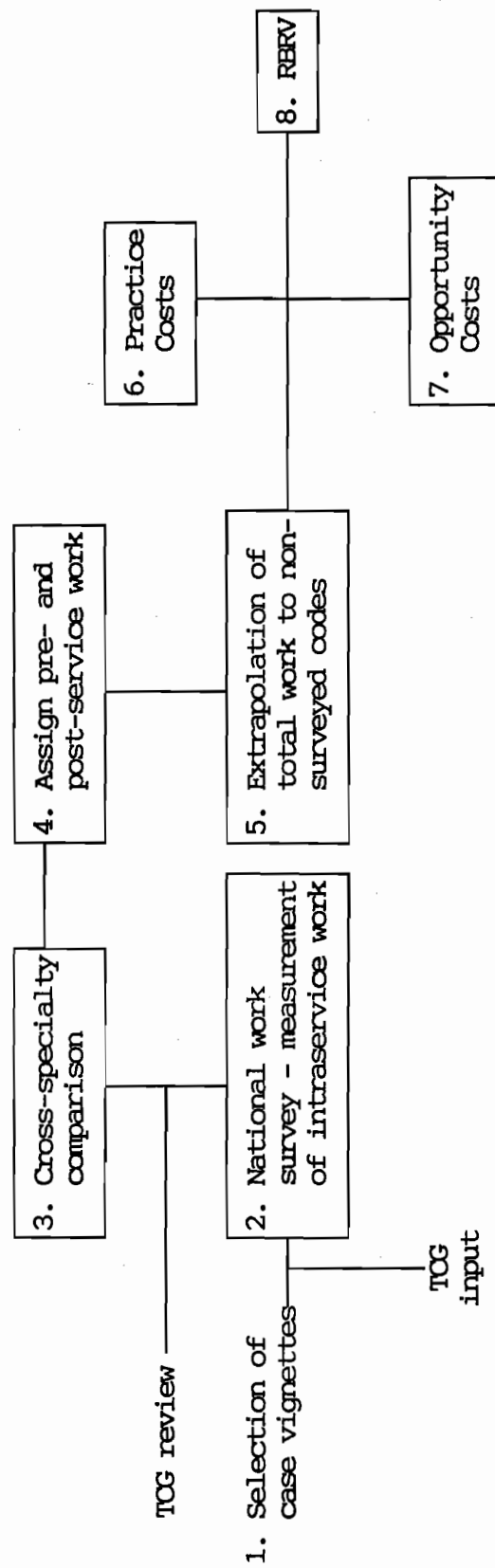
The RBRVS was constructed by a multi-step process, which can be summarised by a flow diagram (McMahon 1990), Figure 1.

3.2.1 Selection of case vignettes

Panellists in each specialty TCG were asked to select 23 cases or patient types and describe case vignettes for which doctors would be able to estimate length and intensity of work. The cases selected encompassed a broad range of mental effort, technical skill and stress, and attempted to include the most common services. Panellists also identified typical patients who may be treated by more than one specialty, to serve as a basis for cross-specialty comparison. The 23 services selected for each specialty were intended to cover four categories of activity: 1) evaluation and management, 2) invasive services, 3) laboratory services and 4) imaging and pattern recognition.

The case vignettes, describing average patients or circumstances, were then matched with their CPT-4 codes. An example in obstetrics and gynaecology is "routine periodic gynaecological examination by primary care physician, established patient, without complaints". This was thought typical of CPT-4 code 90060 - "established patient, intermediate service".

Figure 1: Construction of the Harvard RBRVS



Source: McMahan (1990)

Finally, TCG panellists were asked to designate a commonly performed procedure which would serve as a reference standard for each specialty, in relation to which work and time estimates for the other vignettes could be compared. General surgeons, for example, selected as their reference standard "uncomplicated indirect inguinal hernia repair, 45 year old man".

3.2.2 National work survey

A sample of practising physicians was surveyed in order to estimate the total intraservice work involved in caring for patients described by the clinical vignette. Following a feasibility study, a telephone survey was conducted, with physicians taking part in a 30-minute interview. Of the 3164 physicians contacted, 1977 responded, 62.5% of the total. The response rate differed between specialties, from 56% of obstetricians and gynaecologists to 69% of radiologists.

To assign estimates of the work involved in each case vignette, the magnitude estimation technique was used. Physicians were asked to rank the work involved with each of the services in relation to the specialty's reference standard, which was set equal to 100. For example, for orthopaedic surgery the reference procedure was "decompression of carpal tunnel in 48 year old woman, unilateral, ambulatory surgery visit". Orthopaedic surgeons rated "a comprehensive office visit for initial evaluation of a 48 year old man with low back pain radiating to the leg" at 56 units, slightly more than half as much work as the reference case, despite being more time consuming.

Using the survey information obtained, the functional relationship between work and its

dimensions (time, mental effort, technical skill and stress) was analysed with respect to the validity of the model, the relevance of each component, and the differences between specialties. The results showed a high level of agreement between physicians in a given specialty. None of the four dimensions of work could be discarded without significantly devaluing the model, and the relation between the ratings of work and its dimensions was found not to differ significantly from specialty to specialty. Researchers concluded that the ratings were reliable and valid, and it was thought reasonable to use direct measures of work rather than separate measures of the dimensions of work in constructing RBRVs.

3.2.3 Cross-specialty comparison

The results obtained from the national survey enabled construction of separate specialty-specific RBRVSs. These however cannot be related directly to each other since the reference standards used in rating relative work within specialties differed from specialty to specialty. To construct a common scale for payment of all physicians the Harvard group linked specialties by services which require equal levels of work.

To link the specialties, TCGs identified services carried out in more than one specialty, which were regarded as the same service. In addition different services were regarded as equivalent if they involved the same amount of intraservice work - comparing the four determinants of work (time, mental effort, technical skill and stress). A cross-specialty panel, made up of a subset of TCG physicians, made subjective judgments of the work involved in different services for this link.

Once case vignettes viewed as being the same or equivalent between specialties were identified, a weighted least squares regression technique was used to assign these cases to a common scale. After the link cases were placed on a common scale, the non-link cases in each subspecialty were ordered in relation to the link cases, resulting in a common intraservice work scale for all the surveyed clinical vignettes.

Sensitivity analysis validated the methods used, illustrating that disagreement between specialties about where to locate the intraservice work of a given service was only 7%, and also showing that the results were not sensitive to choice of links or to any grouping of these links.

3.2.4 Assignment of preservice and postservice work

The intraservice phase of a doctor's work, such as patient consultations or performing surgery, is the most visible of a doctor's tasks. However, this is often preceded by review of patient records, consultation with other professionals and preparation for procedures. After patient contact, a doctor must update records, plan treatment and often communicate further with other professionals, the patient and relatives. The work involved in the three phases differs considerably. Pre- and post-service work is diverse and fragmented, often intermingling with other activities. An alternative methodology to that used for measuring intraservice work was therefore required.

To determine relative values for preservice and postservice work the Harvard group combined estimates of time and work per unit of time (Dunn et al 1988). The following formula was

estimated:

$$W_p = (T_p)(W/T)$$

where W_p is pre- or post-service work, T_p pre- or post-service time and W/T work per unit of time.

Activities were identified according to service and setting. Combinations of different services and settings revealed eight major classes of reasonably homogeneous groups with distinct preservice, intraservice and postservice work: evaluation and management in office, hospital and emergency departments; imaging services; invasive services in office, surgical centre and hospital; and anaesthesia.

To arrive at estimates of time spent, physicians were surveyed on a subset of 154 of the original case vignettes. Regression analysis was used to predict mean times for the remainder of the 373 services. The dependent variables were the mean preservice and postservice times for the 154 services surveyed, and the independent variables were the mean intraservice work levels and time for the same set of services from the national survey:

$$T_p = a + (b \times W_i) + (c \times T_i)$$

where T_p indicates pre or postservice time, W_i intraservice work and T_i intraservice time.

To estimate work per unit of time (W/T) it was assumed that pre and postservice work

consists essentially of evaluation and management, and that W/T is positively correlated with the corresponding intraservice work. For the 144 evaluation and management services in the national survey, W/T was computed using the mean rating of intraservice work in relative work units and the corresponding mean rating of intraservice time in minutes. These values were then aggregated into four homogeneous groups, assuming that the mean W/T value for each group is typical for each of four levels of preservice and postservice W/T. All 373 services were allocated to one of these four groups according to the intraservice work they entailed.

Results of the telephone surveys and regression analysis indicated that pre and postservice work and time account for a substantial portion of physicians' total work and time in performing a service, particularly for anaesthesia and invasive services. Percentages of total work accounted for by pre and postservice work can vary widely between services, from 7% to 70%. However, for three quarters of services, this percentage is between 25% and 50%. This implies that for the majority of services, relative work relationships are not changed greatly by incorporating preservice and postservice work into calculations of total work.

3.2.5 Extrapolation of total work for surveyed services to unsurveyed services

The national survey examined total work values for 373 different services, from a total of approximately 7000 CPT-4 codes. Applying the same methodology to all services would be progressively more expensive as procedures are performed less frequently. The Harvard group therefore devised an extrapolation method, making use of existing charge data without building inherent distortions into the extrapolated scale (Kelly et al 1988). This method used

small, homogeneous families of services arrived at through a hierarchical system. Within specialties, procedures were subdivided by:

- i) Setting (eg hospital, office)
- ii) Category of service (eg evaluation and management, invasive)
- iii) Type of patient (eg new, established)
- iv) Body system (eg digestive, auditory)
- v) Anatomic part (eg liver, internal ear)
- vi) Type of procedure (eg insertion, excision)

Within each family, a surveyed service was used as a benchmark for calculating relative work values for the unsurveyed services. The ratios between mean Medicare charges (from Medicare Part B, 1986) for unsurveyed services and the benchmark were calculated, and these ratios were then multiplied by the survey derived rating of total work for the benchmark service. For example, for biliary tract procedures, the surveyed procedure (cholecystectomy) was used as a benchmark, with a work value of 991 units. Comparing the mean charges of cholecystectomy with choiangiography (\$1184) with the mean charge of the benchmark procedure (\$1109) gives a ratio of 1.07. This yields an extrapolated work value of 1060 units for the unsurveyed procedure.

This method assumes that charges are reasonable indicators of relative work within the families used. This assumption was tested by regression analysis which suggested that mean charges alone explain a high proportion of overall variation in work, especially as services are disaggregated into smaller homogeneous groups. The method allowed the calculation of

total work values for about 2000 services. Remaining services were performed too infrequently for this methodology to be used, having mean charges varying significantly from year to year.

3.2.6 Relative Practice Costs

Practice costs typically consume about 50% of physicians' total gross revenues (Hsiao et al 1988). These costs include all economic costs other than the physician's time and effort - for example office rental, staff salaries, equipment, supplies and professional liability insurance. Average practice costs vary greatly between geographical regions and specialties. The Harvard group decided not to attempt to assess practice costs specifically for each service, as physicians do not appear to submit bills with service-specific components for their practice, but rather allocate overheads over the entire mix of services provided (Becker et al 1988). Geographic variations in practice costs were also thought beyond the scope of the study, as this can be incorporated into a monetary conversion factor when the RBRVS is implemented. The Harvard group therefore developed a relative index accounting for only specialty-specific practice costs differences, using average rather than marginal costs.

Variation in practice costs between specialties result from differences in the nature of work and methods of delivery. Family doctors are likely to employ more staff than are psychiatrists. Physicians based in offices may have higher costs than those using hospital facilities. Some specialties are more likely to organise in groups and therefore benefit from economies of scale.

Practice costs were assessed in proportion to the total work input required. A practice cost index value for each specialty was derived using specialty-specific practice costs and gross revenue data from the 1983 Physician Practice Cost and Income Survey data, adjusted to reflect increased levels of professional liability insurance. The practice cost factor for each specialty (PCFs) was arrived at using the following formula:

$$\text{PCFs} = 1/[1-(\text{practice costs/gross revenue})]$$

These values for each specialty were then standardised to a single specialty (general surgery) to arrive at the Relative Practice Cost index (RPC):

$$\text{RPC} = \text{PCFs}/\text{PCF general surgery}$$

Among most specialties, the relative difference in practice costs as a proportion of gross revenue falls within a range of 15%. For four specialties, the RPC is outside this range. Pathology and psychiatry show PCF values 23% and 33% below that of general surgery. In rheumatology and orthopaedic surgery, PCF values were 14% and 24% higher than for general surgery, the standard specialty.

3.2.7 Opportunity costs of training

Each additional year of specialty training involves loss of income to physicians. The length of time spent training varies according to specialty - from one year after medical school for a GP to seven years for a neurosurgeon. The opportunity cost of a year of training can be

approximated as the difference between a resident's salary and the income the resident could earn in practice.

The Harvard group calculated the specialty-specific opportunity cost of each year of residence, summed the costs of all years of residency and then amortised the total over the average working lifetime of a physician in each specialty. An index, measuring the difference in opportunity costs across specialties, was derived for each specialty (s) relative to that of general surgery:

$$ASTs = (1+Ds)/(1+Dgs)^{-1}$$

where Dgs is the annual opportunity cost as a percentage of net income for general surgery.

The AST index ranged from -0.01 to 0.05, giving a maximum relative impact of 6% on total work values.

3.2.8 Evaluation and management services in the RBRVS

The four service categories considered in measuring physician work for the RBRVS were invasive services, evaluation and management, laboratory services and imaging. Of these, evaluation and management (E/M) are the most commonly performed procedures, and important part of clinical practice in every specialty. E/M encompasses a wide range of services - including making diagnoses, psychiatric counselling for potential suicides, developing strategies of care and emergency hospital consultations. Services are much more

diverse than those in the other three categories. They are also very important in monetary terms - Medicare spends more on this category of services than all others. In addition, E/M takes place in other categories, for example before and after invasive procedures.

E/M services posed a number of specific problems in constructing the RBRVS. CPT-4 codes only 100 services as E/M out of a total of around 7000 codes. Definitions are less explicit, leading to the potential for ambiguity, and often necessitating the use of one code for widely disparate services.

On further investigation of E/M services (Braun et al 1988) the Harvard group found that E/M services take about twice as long as imaging and laboratory services, but about half the time of invasive services. Physicians closely agreed in rating the work of particular E/M services as depicted by case vignettes in the national survey. Ratings of work related closely to time. Problems were caused however as it became apparent that there may be large differences in the way different specialties use the billing codes available for E/M services. In addition, the work involved in some of the E/M services may vary considerably. For example, intraservice time for an initial complex consultation varied from 45 minutes in family practice to 131 minutes in psychiatry. Intraservice work for this service varied from 108 units in ophthalmology to 330 units in psychiatry. The service for all three specialties is classified under the same code (CPT-4 90630 "initial consultation, complex").

Inclusion of time specifications in the code system may reduce the problem, as time does appear to represent variation in workload in this area. Code definitions will have to be made more explicit, including information on work (and/or time) content if the RBRVS is to be

used to accurately estimate relative work in E/M services.

3.2.9 Invasive services in the RBRVS

Invasive procedures include a wide variety of diverse techniques, both diagnostic and therapeutic, ranging from endoscopic examination of the bowel to coronary artery bypass surgery. They are different from other categories of procedure in three main respects. They tend to be episodic, contrasting with E/M services which are often ongoing. They generally consist of a well-defined series of actions, with there being a high level of professional agreement as to what constitutes appropriate treatment. Finally, the CPT-4 codes for invasive services are very specific and detailed, with minor variations in procedures being assigned different codes.

Further analysis of invasive services (Braun et al 1988) revealed that, for most procedures, the preoperative and postoperative period represents 60%-70% of a physician's total service time, but only 35%-50% of the total service work. This is because the intensity of work is higher during the intraoperative phase, which requires greater physical and mental effort. Intraoperative work per unit of time varies greatly. Work per unit of time for invasive procedures is two to three times that of E/M services, and also appears to be considerably greater for ophthalmology, orthopaedic surgery and urology than for other specialties.

Physician charges did not appear to reflect relative resource costs - there was a threefold variation, across invasive services, in the ratio of mean current charges to RBRVs. This is partly because charges are not reduced when technical innovations become less risky and

complex, for example pacemaker insertions. The variation suggests that a fee schedule based on RBRVS would redistribute payments significantly, both between and within specialties.

3.3 Impact of the Harvard RBRVS

To assess the potential impact of the RBRVS, the Harvard group developed a model to simulate an RBRVS-based fee schedule for the Medicare programme (Hsiao et al 1988). In applying the RBRVS a monetary conversion factor was used, based on the assumption of budget neutrality - no change in total Medicare expenditure on physician services. Payments which would have been received had the RBRVS been in operation were then compared to those actually received under Medicare's existing CPR system in 1986.

Results for 30 commonly performed procedures revealed that existing charges did not consistently reflect the resource costs of services. The payment rates of certain E/M services could rise by 70% whereas payment for some invasive procedures could be reduced by as much as 60%. For the general categories of service, total Medicare payments for E/M services would have been increased by 56%, whereas fees for invasive, imaging and laboratory services would have decreased on average by 42%, 30% and 5% respectively.

The impact of the RBRVS on specialties would vary considerably. Family practitioners could gain 60%-70% more revenue from Medicare, whilst ophthalmic or cardiovascular surgeons may receive Medicare revenues reduced by as much as 40%-50%.

3.4 The Medicare Fee Schedule

In November 1989 the US Congress passed legislation to reform Medicare physician payment, replacing the 'customary, prevailing and reasonable' system with a fee schedule based primarily on resource costs. Implementation is gradual, beginning in January 1992 with a five year transition period so that all payments are based on the new Medicare Fee Schedule (MFS) by 1996. Legislation was devised on the basis of the report of the Physician Payment Review Commission (PPRC), created in 1986. The PPRC evaluated the work of Hsiao and the Harvard research group, and they found the RBRVS methodology to be fundamentally sound. The relative value scale recommended for the MFS draws heavily on the Harvard RBRVS, and the Commission called for additional research to be carried out at Harvard to strengthen the results of the study. This work is now under way - researchers have widened the scope of the study, including another 15 specialties and studying further the original 18.

The MFS consists of:

- a relative value scale (RVS), made up of relative physician work and practice costs
- a conversion factor, translating the RVS into a fee for each service
- a geographic multiplier, indicating differences in payments between regions.

Under the MFS, payment is determined by the following formula:

$$\text{Payment} = (\text{RVU}_{\text{wk}} \times \text{GAF}_{\text{wk}}) + (\text{RVU}_{\text{oh}} \times \text{GAF}_{\text{oh}}) + (\text{RVU}_{\text{mp}} \times \text{GAF}_{\text{mp}}) \times \text{CF}$$

where RVU_{wk} is the procedure's relative value for work, oh and mp are overhead and malpractice costs for a given procedure, GAF is an index that adjusts for geographic variation and CF is a conversion factor that converts the relative values for work, overhead and malpractice into payment amounts. The formula is a considerable contrast to the Harvard formula (detailed previously):

$$RBRVS = (TW)(1 + RPC)(1 + AST)$$

The MFS formula is different in three major respects:

3.4.1 Practice costs

In Hsiao's formula, practice costs are proportional to total work, so that if workload decreases by 30%, so too do payments for practice costs. The PPRC decided that this was inappropriate - practice costs are not necessarily proportional to physician work, and therefore should be determined independently. In the MFS, the relative value for practice costs is divided into two components - one for overheads (RVU_{oh}) and one for malpractice (RVU_{mp}). Relative values for a procedure are currently calculated by multiplying the national average allowed charge for the procedure by the percent of gross revenue spent on overhead and malpractice averaged across all specialties by the frequency with which each specialty performs the procedure. This method is not ideal and is under revision.

3.4.2 Specialty differentials

Under Hsiao's formula, specialties with long training would receive more for a given amount of work than specialties with shorter training. The PPRC argued that specialties should receive the same payment for performing the same procedure, and they considered that opportunity costs of training were already reflected in higher work values for complex procedures. Including an additional factor may therefore be double counting. The amortised opportunity cost of training (AST) was therefore dropped from the MFS.

3.4.3 Geographic adjustment

The Harvard research group did not account for differences in the costs faced by physicians in different geographic areas. The MFS introduced procedure and locality specific adjustments (GAF) related separately to physicians' work, overhead costs and malpractice costs.

Levy et al (1990) illustrate the impact of the MFS by simulating physician payment under MFS, comparing this with the existing CPR system and the projected impact of the Harvard RBRVS. Simulations indicated that redistributions of Medicare payment across specialties would still be considerable under the MFS, but approximately half the size projected by Hsiao under the RBRVS. For all specialties, redistributions are smaller under the MFS than they would be under the RBRVS, although in general the gainers and losers remain the same. This result is partly attributable to the change in the definition of practice costs. Levy et al also illustrate the considerable redistributions among geographical areas, which tend to compound

the specialty redistributions. The introduction of the geographic variation factor means that under MFS rural areas gain at the expense of urban areas, which should help to redress the manpower balance between the two localities. Finally, Levy et al show that there will be wide variation in payment to individual physicians within specialties. This is because of geographic location and the different mixes of procedures performed by physicians.

Although amendments have been made, the Harvard RBRVS still forms the basis of relative values for physician work in the MFS. Work on the RBRVS is continuing, and the MFS methodology will be refined over the transition period.

3.5 Implementation issues and opposition to the MFS

The Harvard RBRVS has limitations, most of which are acknowledged by Hsiao and the research group. It considers inputs and not outputs of health services, as health outcomes are difficult to measure. It does not take into account differential quality of services, or patients' demand for services. It pays as much for good care and good outcomes as for bad care and poor outcomes. However these problems are inherent in any charge-based system and not specific to the RBRVS.

It is based on the CPT-4 coding system which has been criticised as not giving enough detail, particularly in evaluation and management services, where codes cover vastly different types of patients and intensities of cognitive effort.

The potential impact of the Harvard RBRVS on redistribution of income between specialties

was considerable. Not surprisingly therefore the response to the system was largely political. Specialties likely to benefit were in favour of the system - the American Society of Internal Medicine distributed an action brochure identifying five steps that physicians can take to build support for the RBRVS. Family practice physicians "were almost delirious with joy and excitement when the PPRC recommended to congress that Medicare adopt a new policy of physician payment based on the RBRVS" (Jones 1991).

Surgical specialties, likely to lose under the new system were understandably less keen. The Society of Thoracic Surgeons stated that the Harvard group "simply did not understand our specialty" (Miller 1991). They therefore commissioned their own study of thoracic surgery, conducted by Abt Associates (Miller 1991). The study was more detailed than the Harvard research, with more physicians surveyed and a broader range of procedures included. This formed a basis for negotiating with the PPRC and HCFA. Radiologists also conducted their own survey (Liang et al 1991), re-estimating the intraservice work values of 12 radiology services included in the original RBRVS. This showed standard errors much greater than those of the RBRVS study, which they used to suggest that the Harvard group had not presented accurately the spread of perceived work values among radiologists.

The American Medical Association (AMA) accepted the need to replace the 'customary, prevailing and reasonable' system, which was widely viewed as no longer tenable. They co-operated fully with the Harvard research group, advising on study methods and execution, and representing the perspectives and experiences of practising physicians. After publication of Phase I of the Harvard study the AMA decided, after considerable debate, that this study and data "when sufficiently expanded, corrected and refined, would provide an acceptable basis

for a Medicare indemnity payment schedule" (Scalettar 1990).

The Medicare Fee Schedule, as outlined earlier, redistributes payment less than the RBRVS, although the gainers and losers largely remain the same. In June 1991 however, the HCFA published a Notice of Proposed Rulemaking, detailing the actual levels of the conversion factor and geographic adjustment factors. This outlined a conversion factor which leads to an average payment for a midlevel office visit of just under \$27. This conversion factor has resulted in a great deal of controversy and debate. The suggested level has nullified many of the benefits primary care physicians would have received under the RBRVS, and surgical specialties will face reductions in payments even greater than those expected. In general, with this conversion factor, physicians are estimated to lose approximately 16% per service when the MFS is fully phased in. This has been widely condemned, and is viewed by physicians largely as a way to save the Treasury money. This was not the original aim of the Harvard research team or the PPRC.

The reason for the low conversion factor is that the HCFA have introduced a "behavioral offset" factor. Doctors are likely to respond to reductions in payment, possibly by increasing the volume of services provided (a recognised problem known as supplier induced demand). The HCFA have assumed that medical practices receiving a reduction in payment will offset 50% of the reductions by increasing service provision, while practices with increasing revenues will not respond. This offset is thought to be too large - there is great uncertainty about how physicians will respond, and the HCFA have used a worst case assumption. The considerable opposition to this has meant that the conversion factor is again under review.

The controversy caused by the RBRVS and the resulting Medicare Fee Schedule is only to be expected from a system that redistributes payment among specialties, causing in some cases actual reductions in payment. However, the fee schedule is being implemented, gradually and with continuous evaluation and review.

A payment system based on relative resource inputs does offer a systematic and rational approach to physician payment, as this approximates relative fees in a free market. A system such as the RBRVS could therefore provide a fair and equitable method of reimbursing physicians for their services, removing distortions and providing at least a neutral incentive structure for doctors to make clinical decisions.

4. HOW MUCH IS A DOCTOR WORTH?

Efficiency in the provision of health care is an increasingly important factor both in the US health care system and in the operation of the UK NHS. Recent changes in the US Medicare Fee Schedule have attempted to reduce the inefficiencies of the previous 'customary, prevailing and reasonable' system of reimbursing doctors through Medicare. The recent NHS reforms have addressed some efficiency questions in health care, but as yet the question of inefficiencies in the payment systems of doctors has not been considered. It is clear that, in the labour-intensive health care industry, systems of reimbursement should be scrutinised, ensuring that they provide incentives for the efficient provision of health care.

The salary system which forms the basis of reimbursement of UK hospital doctors has a number of advantages. It does not give inappropriate incentives to carry out unnecessary procedures, as the US fee-for-service system does. UK doctors have little choice but to contract with the NHS and accept their terms of service and salary levels, which controls inflationary wage pressures. However, the salary system fails to encourage doctors to increase their activity or efficiency. Review Body recommendations result in across the board salary increases, which fail to address fundamental problems. They may temporarily prevent doctors leaving the profession, and temporarily placate junior doctors with long working hours, but they do not provide a systematic means of addressing the main objective of employers - "to recruit, retain and motivate staff of the right quality" (Review Body 1989). The distinction award system - unfair, outdated and shrouded in secrecy, also fails in its basic aim of maintaining morale amongst senior consultants in the NHS. These problems may be increased by income from private practice which, for the average hospital doctor in private

practice was worth £40,000 in 1990 (Laing (1992)).

In recent months, the idea of performance related pay for doctors has been raised by Government. This may improve motivation in the medical profession by rewarding doctors who work long hours and giving an obvious incentive to increase productivity. It is important however to devise a rational basis for any such system. Reimbursement should be related to actual work performed. This requires a method by which doctors' activities can be assessed.

The Harvard RBRVS appears to be a reliable and valid method of measuring the work performed by physicians. Although there have been certain problems in the implementation of this system, it represents a great improvement on the previous 'customary, prevailing and reasonable' method of reimbursing US doctors for services provided to Medicare beneficiaries. However it would be expensive to replicate in the UK and would require that Government abandon its previous reluctance to evaluate performance in NHS innovations.

NHS managers are now considering the question of reimbursement of doctors. Both hospital doctors and general practitioners should be paid in a way which enhances efficiency, encouraging value for money in health care. While it is difficult to measure accurately the outcomes of health services, it should be possible at least to measure the inputs. Estimation of physician work is a crucial part of this process.

The Harvard RBRVS, whilst it was designed to address the problems of the 'CPR' Medicine Reimbursement System (vastly different to the UK NHS salary system) does appear to confirm the incentives which are lacking in current UK reimbursement. It may be possible

to adapt the methodology of the Harvard RBRVS for use in assessing the resource based relative values of the work of hospital doctors and general practitioners in the UK NHS. Because of significant differences in US-UK work practices the US-RBRVS system could not be adapted without revision in the UK. For example the surgical treatment of cataracts in the US (wholly day case) differs from that of the UK (where there is inefficient use of hospital beds). The creation of a UK-RBRVS system would entail a great deal of work: a survey of doctors in the UK would be required to assess the time and intensity of work spent on different procedures, as in the Harvard research. The system could perhaps be simplified, as there are no present fees charged to influence the work value placed on different procedures. ICD-9 codes could form a basis for valuing procedures in the same way as the Harvard group used CPT-4 codes. The ICD-9 codes may need to be adapted to increase their detail and specificity, but they provide a starting-point for describing 'case vignettes', including patient condition and severity, as carried out by the Harvard group. There are a large number of potential benefits of carrying out this work, not least the information that would be generated by such a survey about the actual work that different doctors in different specialties perform.

A UK RBRVS may provide a method of assessing the workload of doctors, and therefore provide a foundation upon which to build an open and systematic method of reimbursement. This would contribute to efficiency in health care by providing incentives for efficiency in doctors' work, encouraging them to work in the most productive way and directing them to specialise in areas of need. It would also enable more accurate estimation of the relative costs of different specialties and procedures, contributing to increased economic evaluation and increased efficiency in the overall allocation of resources in health care.

The UK system of doctors' remuneration is an inefficient product of history. In its present form it is indefensible and ensures that doctors' skills are used inefficiently. Tinkering with this payment system, with ad hoc changes introduced in an uncoordinated and untested manner by Government and the Pay Review Body, ensure that limited resources available in the NHS continue to be used inefficiently. Systematic reform and careful evaluation of any changes that result is essential if resource allocation is to be improved.

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