

**Are you still here?: Reconciling patient access and GP
effectiveness in the management of a large medical practice:
a case study using QPID**

by

Will Liddell and John H. Powell
University of Bath School of Management
Working Paper Series
2003.06

**University of Bath School of Management
Working Paper Series**

University of Bath School of Management
Claverton Down
Bath
BA2 7AY
United Kingdom
Tel: +44 1225 826742
Fax: +44 1225 826473

<http://www.bath.ac.uk/management/research/papers.htm>

2003.01	Stephan C. M. Henneberg	The Conundrum of Leading or Following in Politics? An Analysis of Political Marketing Postures
2003.02	Richard Fairchild	Management's optimal financial contracts, the degree of alignment with investors, and the 'carrot and stick' role of debt.
2003.03	Richard Fairchild	An Investigation of the Determinants of BT's Debt Levels from 1998-2002: What does it tell us about the Optimal Capital Structure?
2003.04	Steve Brown & Felicia Fai	Strategic Resonance Between Technological and Organisational Capabilities in the Innovation Process within Firms
2003.05	Paul Goodwin	Providing Support for Decisions based on Time Series Information Under Conditions of Asymmetric Loss
2003.06	Will Liddell & John H Powell	Are you still here?: Reconciling patient access and GP effectiveness in the management of a large medical practice: a case study using QPID

Are you still here?: Reconciling patient access and GP effectiveness in the management of a large medical practice: a case study using QPID

Liddell W¹ and Powell JH²

Abstract

Current thinking on patient access policy in general practice stresses timeliness of provision as much as other, more traditional measures of effectiveness. Medical practitioners encounter a number of managerial dilemmas in implementing these patient access policies. For example, individual consultation times need to be limited while the often unpredictable needs of patients need to be met at the time of presentation; the need for continuity of access (i.e. seeing one's own doctor rather than another in the same practice) must be reconciled with the need for management of the consultation process as a whole to release practitioners to carry out other duties and indeed to maintain work-life balance. The management of this in a medical practice involves a number of constituencies, for example, doctors, nurses, reception staff and, not least, patients themselves.

The system which constitutes the operation of the practice is a hybrid one, having components which can be objectively viewed and quantified and others which remain qualitative, either because they are subjective by nature (e.g. patient satisfaction) or because data on that facet of the operation is simply not available. Such hybrid management problems are amenable to treatment by qualitative systems methods and this paper describes an *ex ante*, real-life intervention using a qualitative system dynamics approach known as QPID (Qualitative Politicised Influence Diagrams). The method ascribes agents and actors to the connections in

¹ Dr Will Liddell, Senior Partner, Frome Medical Practice, Somerset, UK

² Dr JH Powell, Senior Lecturer in Strategy, School of Management, Bath University, Claverton Down, BATH, UK, BA2 7AY (corresponding author Email: j.h.powell@bath.ac.uk)

an influence diagram of the system in focus. This subsequently structures thinking about the appropriate actions (aimed at these agents and actors) for managing the system behaviour.

The method is applied to the establishment of implemented patient access policies for a substantial practice in the South of England and shows the use of QPID to derive practical action plans for the management of this challenging aspect of General Practice management.

Are you still here? Reconciling patient access and GP effectiveness using system modelling.

Aims and Objectives of the Study

This study concerns a large medical practice in the United Kingdom which, in response to national policy directives, needs to improve the access of its patients to the General Practitioners or GPs. This is clearly a system problem since the various components of the practice, which include GPs, nurses, receptionists and the patients themselves, have to work together in order to improve the standards and speed of care.

The principal researcher, a senior partner in the practice, opted to apply the well-known techniques of Qualitative System Dynamics (QSD) and in particular a recent extension to those techniques known as Qualitative Politicised Influence Diagrams, or QPID. This extension, discussed more fully later, allows the examination of the roles and motivations of actors and agents in a managed system and is particularly effective at generating managerial action aimed at persuading those actors to use their position in the system to some collective, desired effect.

The aim of the study, then, was to make a substantial improvement to the time which patients in the practice had to wait before seeing a practitioner without detracting from other measures of medical effectiveness.

There were a number of necessary components to the managerial study.

- Firstly, it was necessary to obtain a fuller understanding of the *nature of the system*. The

receptionists' behaviour, for example, affected patients' expectations of service, and the way on which the workload of GPs would be affected was by no means clear at the beginning of the study.

- Secondly, the practice managers had to understand how the *dynamics of the system* were likely to be affected by policy changes.
- Lastly, and most importantly, it was a clear objective of the study to identify *clear, implementable actions* – a purely descriptive study would not be sufficient.

Characterisation of managerial problems in general medical practice

The problems facing the management of medical facilities such as a large general medical practice are, of course, specific in some respects, but in many others are typical of a wide class of management activities which we characterise as being 'hybrid system problems'. By this we mean that the problems involve the understanding and subsequent manipulation of a system which has both mechanistic and human components. The management literature (Simon 1957) refers to the former as bureaucratic processes, indicating that their outputs are dependent solely on their inputs; they are machine-like or mechanistic. This is in contrast with the human components which are universally understood to be at best boundedly rational (March and Simon 1993). It is beyond conjecture that the management of such hybrid systems is different in nature from the treatment of wholly mechanistic processes, say a chemical plant or a financial accounting system.

A general practice has components which are essentially bureaucratic, such as an information retrieval system, a detailed rule-based appointments policy or even some of the rules governing prescription of drugs, but it clearly has human components which form the very

heart of its capacity for success, whether that success is viewed from the business point of view or from the specific viewpoint of the patients or of the medical practitioners, the nursing staff or the accountants. This plurality of viewpoint, where the different human components of the managed system have different constructions of the objectives and even of what the system itself consists of, is characteristic of hybrid systems (Quinn 1978). Similarly, an accompanying characteristic, an inevitable consequence of the plurality of the managed system, is the need for accommodation – policies, far from being imposed upon the organisation by an all-knowing all-powerful head, are, to some extent, negotiated among the various individuals and power groups in the organisation.

General practice management problems, then, are examples of types of managerial activities well-understood in the management literature, but they are nevertheless challenging in their nature. We present here the application of a particular technique of dealing with these hybrid problems, a technique widely used in more general management, but which has only recently come to the attention of health management practitioners. It presents particular attractions for the hybrid, highly negotiated environment of health systems, and we apply it to a particular, real-life example, namely that of the management of patient access in a large general practice in the South of England.

The patient access problem

The current UK Government has expressed a commitment to make the NHS more responsive to the needs and of the public (Health 2002). This has been driven in part by a desire to make the public services more accountable, but also by rising expectations of service provision within society. The recent Audit Commission Report on General Practice revealed that the public is generally satisfied with the service apart from the waiting time for appointments

(Various 2002). The NHS Plan set out a range of targets for general practice. One of these states that by 2004 patients will be able to see a primary care professional within 24 hours and a GP within 48 hours.

The NHS Plan targets represent a significant management challenge for general practice. Workload has increased steadily in recent years, driven by a number of trends including changes in demography, the transfer of work from secondary care to general practice, quality standards set by the National Service Frameworks (NSFs) and the involvement of GPs in external tasks such as managing Primary Care Organisations (PCOs), appraisal and professional development. At the same time there are increasing difficulties in recruiting and retaining GPs within the workforce.

The great majority of GP services are still delivered by GPs working in partnerships as independent contractors to the NHS. GPs retain responsibility for the management of the services they provide. This autonomy has enabled primary care services to be closely adapted to local needs and promoted innovation and flexibility in a way that a more centrally controlled system might not have allowed (Baker and Pringle 2000). However, there are also drawbacks. In particular practices do not generally benefit from access to high level management expertise. Management skills are rarely a part of the training of GPs and most practices lack the resources to employ managers with expertise in operations management.

Practices are faced with the complex task of balancing the competing needs of their organisations to deliver improvements in access to the service and achieving demonstrable improvements in quality of care within the constraints of a limited GP workforce. This is a source of considerable stress in the working lives of GPs (Gillam and Pencheon 1998).

There is a clear need to develop management skills in general practice and to identify tools

which are appropriate to the environment.

Approaches to access

Nearly everybody in the UK is registered with a GP, who provides medical care ‘from cradle to grave’. An appointment with the patient’s GP has traditionally been the single entry point to accessing healthcare resources. The ‘gatekeeping’ function of the GP has been seen as one of the key strengths of the UK health service, particularly in containing cost (De Maesener, Hjortdal et al. 2000). However, the volume of demand and the number of available GPs has dictated the need for change. Firstly, the NHS Plan has resulted in the establishment of alternative sources of healthcare advice which are easy to access, including NHS Direct and Walk-in centres. These services are nurse-led. They provide patients with an alternative to approaching their GP surgery for medical advice. These services are popular and appear to be safe, but there are doubts about their cost effectiveness and they are unlikely to significantly reduce the workload of GPs (Grant, Nicholas et al. 2002; Salisbury, Mnaku-Scott et al. 2002). Secondly, practice nurses, who have already taken on much of the work of chronic disease management from GPs, are now increasingly acting as the first point of contact with patients presenting with acute illness. Thirdly, there is an increasing emphasis on demand management (Pencheon 1998). This includes promoting self-care, using alternatives to the face-to-face consultation with a GP (such as telephone and e-mail) and matching the availability of appointments more closely to demand.

Practices use a variety of management systems to deal with same day appointment requests (Luthra and Marshall 2001; Stoddart, Evans et al. 2003). Murray and Tantau describe three types of access system (Murray and Tantau 1999). Traditional access systems, which are still common in UK general practice, make little attempt to match supply with demand. The

appointment systems tend to be permanently saturated, so same day access is difficult for patients. In first generation open access systems there is an attempt to predict same day demand and capacity is gained by carving out part of the schedule in anticipation. These systems still tend to overflow and are open to manipulation by both patients and practice staff. Second generation open access systems assume demand can be satisfied if enough capacity is available. All patients are seen on the day they wish and there is less time spent by reception staff in negotiation and less-game playing. It has been claimed that such systems lead to reduced waiting times, better attendance levels and increased continuity of care and satisfaction (Murray 2000).

In 2000 the National Primary Care Collaborative was set up to promote improvements in patient care including the management of practice appointment systems. This initiative brought together health care professionals from large numbers of practices to share ideas and experience. The NPCC promoted the PDSA cycle methodology for implementing quality improvement (Berwick 1998). The NPCC advocates an open access approach.

The Qualitative System Dynamics approach to hybrid system problems

The well-known System Dynamics approach is to prepare a graphical model of the system under consideration by considering the flows and levels of certain variables which together define the state of a system. In considering our present topic, patient access, for example, one would include (from a long list) such variables as *GP hours available for appointments*, *waiting time for a routine appointment*, and *demand for same day appointment*. Causality is expressed in the form of arrows connecting these variables, as shown in Figure 1. This is an extract from a larger diagram (Figure A1) which will feature centrally in our subsequent analysis.



Figure 1: Expression of causality in SD diagrams

As is usual, positive and anti-positive correlations are indicated by + and – signs on the arrows. In its numerical form the SD approach takes these diagrams and turns them into sets of differential equations whose behaviour can then be investigated. The effects of candidate policies are compared against the existing system behaviour (known as the reference mode) in order to identify appropriate strategies for managing the system under consideration.

Many, indeed most, managerial systems, however, are not easily represented entirely numerically in such a fashion. To represent as a simple number some human descriptor, such as *morale* or *well-being* or *quality of explanation achieved in a consultation* is problematic. Such things are scalable but not necessarily declarable as a precise number. There exists, in other words, a wide class of managerial problem where complete quantification of the components of the problem is not possible or desirable, a set of problems we have described above as hybrid and which includes patient access and many other health management problems.

The response of SD practitioners (Wolstenholme 1990; Coyle 2000) to this difficulty of representing system variables adequately in numerical form has been to seek approaches

which avoid the necessity for numerical representation while retaining the causal information contained in the ID. One does not need to place a number on a system variable to express causality: a death causes grief; one does not need a precise numerical measure of the intensity of that grief in order to accept and act upon that causality. The essential analysis tool in this qualitative embodiment is the concept of loop behaviour. Figure 2 shows another extract from the full patient access ID of Figure A1. It has two cyclic structures marked **A** and **B**.

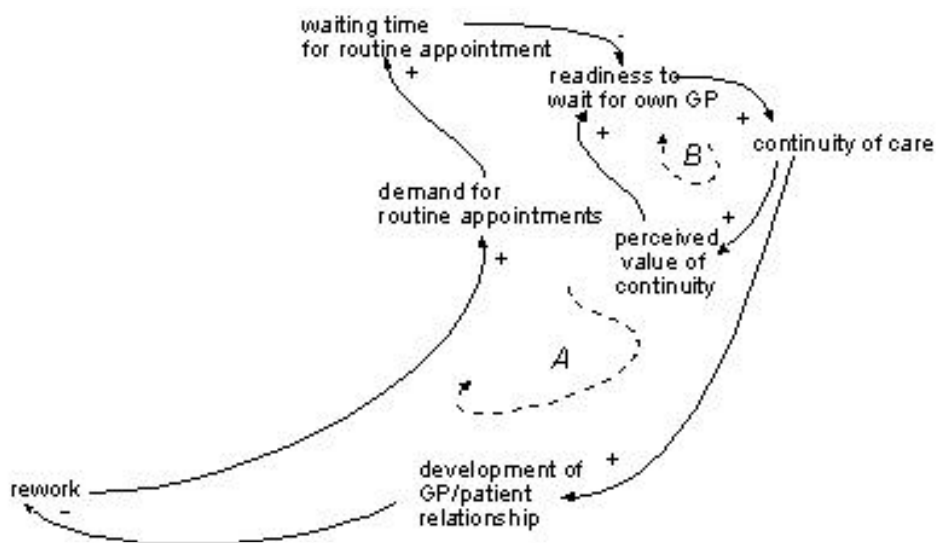


Figure 2: Two loops extracted from the full model

Loop A shows how, as patients become more ready to wait for a consultation with their own GP, the continuity of care improves. The GP/patient relationship develops and rework is reduced, easing the pressure on routine appointment waiting times which in turn encourages patients to wait that little bit longer for an appointment with their own doctor. If there were no other mechanisms in operation a slight decrease in waiting times propagates round the loop, reducing rework and eventually producing a further decrease in waiting times and an increased willingness to wait for one's own doctor. This type of loop is called a reinforcing loop. Clearly, if system managers can initiate a beneficial rise in the variables in this loop

and, critically, can act so as to increase the strength of desired connections, the effect on the patients' health will be positive.

Loop B can be seen to have a similar structural behaviour.

The qualitative form of SD uses such arguments to move directly from the structure of the system under consideration (the ID) to proposing sets of actions aimed at manipulating the system variables and the strengths of the connections between them towards a beneficial system behaviour without having to go through the intermediate stage of predicting the behaviour of the system as expressed in a somewhat arbitrary numerical representation. Of course some connections can be captured very well by numerical investigation. Here, for example, one could carry out a study of the correlation between waiting time for routine appointments and willingness to take an appointment with a doctor other than one's own, but while such knowledge can be easily incorporated in the qualitative SD method, it is relatively rare in the type of problems considered here.

A recent refinement (Powell and Bradford 1998; Powell and Coyle 2003) of the approach, known as QPID (Qualitative, Politicised Influence Diagrams) attaches symbols to the causal arrows indicating the actors or agents who are able to affect the strength of the connection.

Figure 3 shows the actors for the loops of Figure 2.

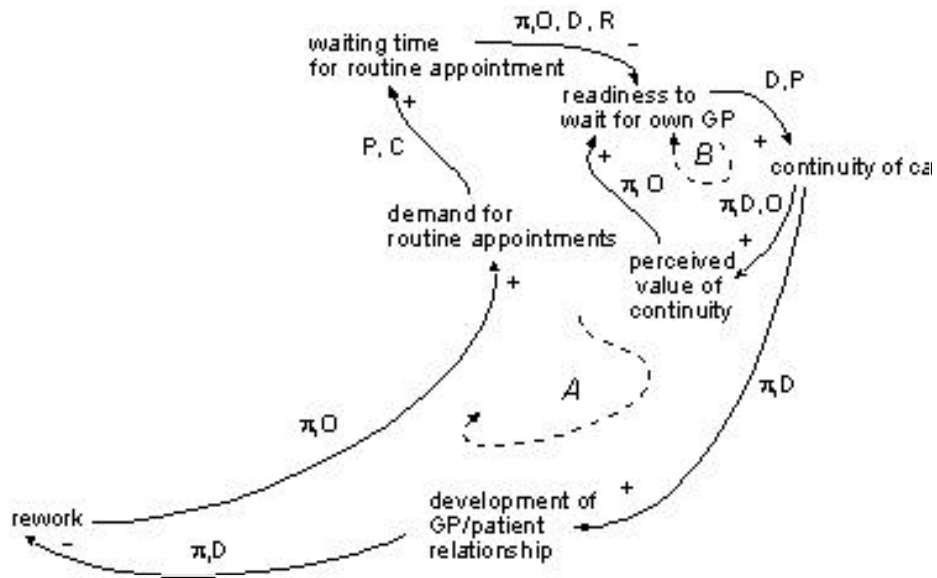


Figure 3: Two loops showing the actors which control the strength of correlation between variables

The key to the symbols for all of these diagrams is shown at Table 1.

Key

π	Individual patient
D	The GP
P	The practice 'executive'
C	The PCT
R	Reception staff
O	Other patients and relatives

Table 1: Key of symbols designating actors

Thus we see that the degree to which patients are willing to wait for their own GPs is influenced by the patient (**p**), the patient's family and friend (**O**), the GP (**D**) and the reception staff (**R**). To the extent that we can identify actions aimed at motivating these actors to encourage patients to wait for their own doctors, even though the waiting time for such an appointment has increased, the more we will be able to use the inherent dynamics of Loop A (Figure 2) to our patients' benefit. Similarly, if we allow the actors to behave in such a way as to provoke patients to demand appointments with GPs other than their own as soon as routine waiting times increase, we will induce a deleterious effect in loop A.

The case now described in detail illustrates the practical use of the QPID method in deriving a set of actions from an ID from which Figures 1, 2 and 3 were taken.

Application to patient access in a general medical practice

Specific Context

In 2000 the Frome Medical Practice, the subject of this investigation, participated in the National Primary Care Collaborative, the NPCC. The practice changed from a traditional system where same day access was achieved through provision of an unbooked 'emergency surgery' for urgent cases at the end of the day to a first generation system with twice daily booked 'same day surgeries'. Capacity was increased with the employment of more salaried GPs. The practice also started to gather data on waiting times and patient satisfaction. The changes were embraced by reception staff and initially there was a demonstrable improvement in waiting times and patient satisfaction. Two years later, however, the appointments system was once again saturated and there was a growing sense of dissatisfaction amongst the GPs. The partnership identified access and workload as the key area for management attention within the practice and as a direct result the investigation

reported here was started.

It was obvious from the beginning that the patient access problem at Frome was, as might be expected, being a system problem. Receptionists, GPs, nurses and other contributing parties demonstrably needed to work together to produce an amelioration of a rapidly worsening situation.

Study method

The study was designed as an action research project. The active researcher was a partner in the practice and was formally engaged in the debate regarding the prioritisation of strategic aims and the operational approach to improving access. The methodology was broadly based on a study by Hazell and Powell (Hazell and Powell 1997) describing the use of QSD in addressing a marketing problem in the defence industry. The stages are outlined below:

Stage 1: Defining the basis for discussion

In order to initiate the process of developing a QSD model a simple diagram was prepared to represent a part of the system. The main aim at this stage was to have basic model to demonstrate the principles of model building to interviewees at stage 2 and to provide a foundation on which to build a more complete diagram.

Stage 2: Confirming the basis for discussion

An experienced GP and practice manager were approached to work on the development of a baseline influence diagram. During the course of two unstructured interviews the main components of the system were defined and relationships between these components were explored. The product of these meetings was a baseline influence diagram.

Stage 3: Interviews

The baseline diagram was used as a basis for eight interviews with practice members. These comprised four were GP partners, one nurse and three managers (reception manager, practice manager and general manager). Each interview lasted approximately one hour. The interviews were not recorded, but notes were made, including specific statements made by interviewees, and these were written up within 3 hours of the interview.

Although each interview covered a range of issues, each had a different emphasis reflecting the preoccupations and interests of the individual. In all but one case some adjustment to the baseline diagram was proposed. A large number of questions were raised about the nature of relationships between different factors and several ideas emerged for influencing the system in ways not previously considered. Some of these questions were addressed at this stage of the study by reference to data from the practice appointment system and the general practice literature.

Stage 4: Condensing the data

After completion of one cycle of interviews the notes were reviewed and a final diagram (Figure B1) was drawn incorporating the modifications suggested by interviewees. The final diagram adheres as closely as possible to the rules suggested by Coyle (1996).

Stage 5: Final output and loop analysis

At this stage information was extracted from the final diagram. A number of loops were identified.

Stage 6: Group discussion

The final diagram and loop analysis was presented at a meeting of the partners. Several of the participants had contributed to the influence diagram, but as some of the partners were unfamiliar with the technique a brief description was given of the methodology. Three of the more important loops were chosen as the basis for discussion.

Stage 7: Final interviews

Five of the partners present at the meeting when the influence diagram was discussed were interviewed about their reactions to the diagram and its usefulness.

Research Question/hypothesis

The problem facing Frome Medical Practice was to derive actionable policies for the practice which would improve patient access (under existing and expected NHS policy) consistent with the needs and motivations of the members of the practice (being the GPs, patients, nurses, receptionists and others)

The model

The principles of constructing an ID were quickly grasped by the informants. All those participating appeared to engage readily with the technique and enjoy the process of exploring relationships between different parameters. It was notable that none of the informants had difficulty perceiving the access and workload issue from a systemic perspective. The interviews produced a number of modifications to the baseline ID.

A number of themes emerged repeatedly - for instance the balance between the number of patients seen and the quality of the consultation, the responsiveness of the practice and the

tendency of patients to seek advice about minor illness, speed of access and continuity of care. These coalesced around a central triad expressed by the relationship between practice policies, the consulting behaviour of doctors and the behaviour of patients with respect to illness and health service use. Despite a range of opinions regarding the nature of relationships, it was eventually possible to produce an ID which was felt to reflect truly the perceptions of all participants. The final ID is shown in Figure B1 in Annex B.

The analysis

Analysis of the final ID comprises two stages. The first stage is to identify the important loops within the main ID and determine the nature and strengths of the relationships depicted. The second stage is to determine the actors or agents able to affect those relationships and analyse their actual and potential roles. Space does not permit a discussion of all the loops, but three were highlighted for particular attention.

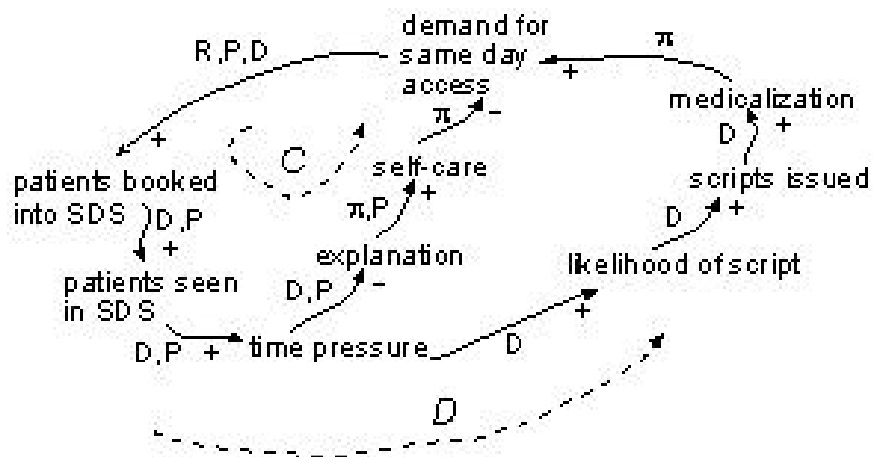


Figure 4: Minor Illness loops

Firstly, the minor illness loop (in Figure 4) is a reinforcing loop which describes the relationship between same day demand, time pressure and doctor’s consulting behaviour. It is closely related to a second reinforcing loop in the same figure which describes the effect of

explanation on future self-care. Clearly increased demand for same day appointments under an open access appointments system results in more patients seen on the day and greater time pressure on the GP responsible. While some of the patients who need to be seen on the day have symptoms or conditions which GPs would also perceive as needing medical attention on an urgent basis, many of those requesting same day appointments have minor symptoms such as coughs, colds and sore throats which could either be seen in a routine surgery or, indeed, managed at home with simple remedies from the pharmacist or local store. GPs frequently express frustration at the level of consultations for minor ailments (Morris, Cantrill et al. 2001). In the present study several GPs felt they were more likely to issue a prescription for a minor ailment in the context of a busy same day surgery. Often this results in antibiotic prescriptions for upper respiratory tract infections. There is good evidence that antibiotics have limited effectiveness in the treatment of URTI. Furthermore the issue of a script for a minor ailment like a sore throat increases the likelihood that the patient will reattend in the future with the same ailment (Little, Williamson et al. 1997). Ironically, there is evidence to suggest that patients expect to receive a prescription less often than GPs believe (Britten and Okuomunne 1997; Cockburn and Pit 1997). So although GPs may believe their prescribing in minor ailments is driven by patients' expectations, it may be the GPs' own perceptions which drive this loop.

A second reinforcing loop involving continuity of care was discussed earlier in this article and is shown in Figure 2. Informants generally considered that continuity of care had declined as a result of changes in practice arrangements. The short term result of a patient consulting with a GP whom they did not know was a greater likelihood of returning for further reassurance or for a follow-up with their own GP resulting in more rework. This perception was confirmed by analysis of data on repeat presentation after a same day surgery

Figure 5: Reception skills loop

The third pair of reinforcing loops (E and F in Figure 5) concerns the work of receptionists. Enhancing the skills of receptionists and allowing them greater discretion (loop *E*) may enable them to offer a sign-posting service. Rather than acting as a block (under traditional appointment systems) or as a passive conduit for access to a GP (under open access) the skilled receptionist has the potential to carry out a limited diagnosis, thus potentially avoiding the need for a consultation with a GP by diverting the patient to secretaries, practice nurses and health visitors as appropriate. Diversion of work should reduce the time pressure on GPs leading to better quality consultations and more effective preventative work. Since GPs' remuneration is likely to become increasingly target-based this trend should increase practice income (GPC 2002). Higher levels of income should, at the discretion of the partners, make more resources available for training and rewarding receptionists. Concurrently, enhancing receptionist's skills (loop *F*) is likely to increase job satisfaction and retention (Pfeffer 1998).

Key actions resulting from the exercise

Table A1 in Annex A sets out as an example the results of analyzing one of the three loops in terms of the desired effect on the strength of each relationship, the actors influencing each relationship and the actions likely to achieve the desired outcome. The key actions implemented immediately following the study are shown below.

Telephone triage: A nurse with telephone triage experience was recruited to work jointly with a salaried GP providing a telephone triage service and face-to-face consultations every morning for patients requesting same day appointments. Approximately 70% of these requests are now dealt with over the telephone

Clinical receptionists: Receptionists received training to allow them to elicit more information from callers and to direct them to the most appropriate source of advice. A script was prepared to ensure consistency and respect for patient confidentiality.

List size adjustment: Patients were transferred from some GPs' lists so that the size of the list more closely reflected the availability of each GP for routine consultations. This measure has improved continuity.

Availability of health visitor and social worker: These professionals agreed to make themselves available to answer patients' requests at defined times during the day.

Guidelines for the use of same day surgery: A definition of the purpose of same day surgery was agreed so that patients were given consistent advice on how to use the service appropriately.

Guidelines for minor illness management: Evidence-based guidelines for the management of minor ailments were prepared to ensure consistency between GPs and nurses with respect to treatment and advice given to patients.

Increasing nurse capacity: The working patterns of nurses have been closely examined to maximise effectiveness and certain services (for instance the Wart Clinic) withdrawn as a result of reviewing the evidence on effectiveness.

It might appear in retrospect that some of these actions could have been identified without the use of an explicit system description method but there are a number of clear benefits from such an approach.

- The consequences of taking action and thereby altering the system dynamics are easily seen. Moreover these consequences are assessed within a system diagram which

is, to some extent agreed by the different parties. While the parties may not agree about which loop is the strongest, they will have agreed about the potential mechanisms of behaviour of the system under consideration.

- The consequence of not taking action are easily seen. An option for action may be rejected, ultimately, because of resource limitations but the codification of the system behaviour allows investigation and indeed debate of the effects of such inaction.
- There is a sense of completeness about the study. Within the inescapable limitations of the system representation we can be sure that all actions have been investigated. There is a political point here; because all action options emerge equally and formally from the loop analysis, it is rather difficult for some interested party to suppress arbitrarily debate about a particular style of response. While at times this may be managerially uncomfortable, the benefits in achieving wide consensus and assessment of action are well substantiated.

The targeting of more detailed, often numerical, analysis (such as in the case of the Wart Clinic above) is enabled.

Relevance to other medical management problems

Health system management has, as its focus, systems which occupy most of the continuum from hard to soft systems. Wholly numerical, hard analysis might be appropriate for, say, the detailed specification of the number of vehicles required in an ambulance service to meet a specific demand whereas the establishment of appropriate modes of dialogue among cardiac care professionals (surgeons, GPs, nurses, dieticians, social workers) is an example of a soft system which it would be unwise to address purely numerically.

QPID, as used here, addresses the softer end of that continuum, but it provides clear and mutually supportive connections into the harder forms of analysis.

- Specifically, where clear numerical connections occur in the ID, this numerical evidence is easily mobilised in the analysis. In the present case, if there were data relating, let us say, triage skills to waiting time it would be wholly appropriate to include it, particularly in the very last stage where the action sets are reconciled against resource availability and application efficiency.
- One of the advantages of QPID (and to some extent of all the soft methods), is that it targets further, more detailed study, and where this is best done by numerical methods, it is easy to specify the more detailed numerical investigation within an explicit system representation.

To some extent our perspective as health system managers is coloured by the availability of tools for managing such systems. If, because of a paucity of tools, we can only address narrow, numerical problems, we will tend to focus on them. The availability of softer tools means that we can feel confident in taking on a wider managerial ambition where the aim is

not just to codify those parts of the problem tractable by numbers, but to make a difference and give a voice to the other parts of a health system – human beings

Future Work on Methodology

QPID is being used extensively in hybrid system practice in areas other than medical system management. A good example is the use of the method by British Telecom to map and improve the mechanisms of customer satisfaction. The customer satisfaction system is demonstrably hybrid in the sense we have use here which perhaps explains why a series of wholly numerically-based interventions have been less than successful in the past..

The current research direction is towards the further analysis of the agents' and actors' intervention in the system. For example, a fertile area appears to be the identification of the knowledge and competence sets used by the agents and actors to implement their influence. A recent study (Powell and J 2003) uses QPID to map the system of operation of a small business services firm in the UK and thence to identify the knowledge and skills used by staff to make business decisions. This information was then used by the firm to identify training actions, to identify key staff and to take appropriate measures to protect key information from the competitive intelligence activities of competitors.

References

Baker, M. and M. Pringle (2000). Is there a future for independent contractor status in UK General Practice? London, Royal College of General Practice.

Berwick, D. (1998). "Developing and testing changes in the delivery of care." Annals of Internal Medicine 128: 651-656.

Britten, N. and O. Okuomunne (1997). "The influence of patients' hope of receiving on doctors' perceptions and the decision to prescribe: a questionnaire survey." British Medical J 315: 1505-1510.

Cockburn, J. and S. Pit (1997). "Prescribing behaviour in clinical practice: patients' expectations and doctors' perceptions of patients' expectations - a questionnaire study." British Medical J 315: 520-523.

Coyle, R. G. (2000). "Qualitative and quantitative modelling in system dynamics: some research questions." System Dynamics Review 16(3): 225-244.

De Maesener, J., P. Hjortdal, et al. (2000). "Fix what's right, not what's wrong with general practice in Britain." British Medical Journal 320: 1616-1617.

Freeman, G. (1985). "Priority given by doctors to continuity of care." British J of General Practice 35: 423-426.

Gillam, S. and D. Pencheon (1998). "Managing demand in general practice." British Medical Journal 316: 1895-1898.

GPC (2002). Your Contract, your Future. London, General Practice Committee of the BMA.

Grant, C., R. Nicholas, et al. (2002). "An observational study comparing quality of care in walk-in centres with general practice and NHS Direct using standardised patients." British Medical Journal 317: 1556-1563.

Guthrie, B. and S. Wyke (2000). "Does continuity in general practice really matter?" British Medical J. 321: 734-735.

Hazell, P. J. and J. Powell (1997). "The future strategic dynamics of ceramic armour technology." Defense Analysis 16: 53-72.

Health, D. o. (2002). Achieving and sustaining improved access to Primary Care. London, HMSO.

Hjortdahl, P. and E. Laerum (2002). "Continuity of care in general practice: effect on patient satisfaction." British Medical J 304(1287-1290).

Howie, J., D. Heaney, et al. (1999). "Quality at general practice consultations: a cross-sectional survey." British Medical J 319: 738-743.

Kearley, K., G. Freeman, et al. (2001). "An exploration of the value of the personal doctor-patient relationship in general practice." British J of General Practice 49: 273-276.

Little, P., I. Williamson, et al. (1997). "An open randomized trial of prescribing strategies for sore throat." British Medical J.

Luthra, M. and M. Marshall (2001). "How do general practices manage requests from patients for same-day appointments?" British Journal of General Practice.

Mainous, A., R. Baker, et al. (2001). "Continuity of care and trust in one's physician: evidence from primary care in the United States and the United Kingdom." Family Medicine 33: 22-27.

- March, J. and H. Simon (1993). Organizations. Cambridge MA:, Blackwell.
- Morris, C., J. Cantrill, et al. (2001). "GPs' attitude to minor ailments." Family Practice 18: 581-585.
- Murray, M. (2000). "Patient care: access." British Medical Journal 320: 1594-1596.
- Murray, M. and C. Tantau (1999). "Redefining open access to primary care." Managed Care Q'ly 7: 45-55.
- Pencheon, D. (1998). "Matching demand and supply fairly and efficiently." British Medical Journal 316: 1665-1667.
- Pfeffer, J. (1998). The Human Equation. Boston, Harvard Business School Press.
- Powell, J. and J. Bradford (1998). "The security-strategy interface: using qualitative process models to relate the security function to business dynamics." Security Journal 10: 151-160.
- Powell, J. and R. Coyle (2003). "Identifying strategic action in highly politicised contexts using agent-based qualitative system dynamics." JORS in press.
- Powell, J. and S. J (2003). "Mapping knowledge and competence sets in a small firm using explicit system representation." J of Knowledge Management in press.
- Quinn, J. (1978). "Strategic change: logical incrementalism." Sloan Mgt Review 20: 7- 21.
- Salisbury, C., T. Mnaku-Scott, et al. (2002). "Questionnaire survey of users of NHS walk-in centres: observational study." British Journal of General Practice 52: 554-560.
- Schers, H., S. Webster, et al. (2002). "Continuity of care in general practice: a survey of patients' views." British J of Gneral Practice 52: 459-462.

Simon, H. (1957). Models of Man. New York, J Wiley.

Stoddart, H., M. Evans, et al. (2003). "The provision of same day care in general practice: observational study." Family Practice(120): 41-47.

Various (2002). A focus on General Practice in England. London, The Audit Commission.

Wolstenholme, E. F. (1990). System Enquiry. Chichester, John Wiley.

Annex A: Table A1 – Action list resulting from loop analysis of loops A and B

Loop	Arrow	Intent	Actor	Action
Rework loop (Loop A of Figure3)	waiting time > readiness to wait for own GP	weak	π	<ul style="list-style-type: none"> • Ensure patient understand importance of seeing own GP. • Ensure that ‘other’ GPs make patients aware of limitations of treating ‘other’ patients
			D	<ul style="list-style-type: none"> • Ensure that ‘other’ (i.e. not patient’s) GPs refer whenever appropriate.
			O	<ul style="list-style-type: none"> •
			R	<ul style="list-style-type: none"> • Instruct to advocate waiting as beneficial
	readiness to wait for own GP > continuity of care	strong	D	<ul style="list-style-type: none"> • Ensure that if a patient chooses to wait they do get to see their own GP.
			P	<ul style="list-style-type: none"> • Ensure that IS system allows visible use of patient’s history
	continuity of care > development of	strong	π	<ul style="list-style-type: none"> • Ensure patients know the benefit to the doctor of personal, continuing consultation

			D	<ul style="list-style-type: none"> • Ensure GPs use and are seen to use case history and informal knowledge in that case history. • Make sure patient understands the value to GP of consistent consultation
			O	<ul style="list-style-type: none"> • Encourage other practices to agree on benefits of continuity
	development of GP/patient relationship > rework	strong	π	<ul style="list-style-type: none"> • Use close relationship to impart realistic timescale information on curative processes to patient – expectation setting
			D	<ul style="list-style-type: none"> • Use close relationship to investigate and deal with medical/social context
	rework > demand for routine appointments	weak	π	<ul style="list-style-type: none"> • Set realistic expectations for rate of progress of condition.
			O	<ul style="list-style-type: none"> • Encourage other local practices to establish expected standards of service

	demand for routine appointments > waiting time for routine appointments	weak	P	<ul style="list-style-type: none"> Consider demand shaping (putting more GPs on at busy periods) Consider alternative routes to treatment (practitioner nurses, for example)
<i>Perceived value loop</i> (loop B of Figure2)	continuity of care > perceived value of continuity	strong	π	<ul style="list-style-type: none"> Seek examples of positive and negative effects
	perceived value of continuity > readiness to wait for own GP		D	<ul style="list-style-type: none"> Explain to patient the role of knowledge in the diagnostic and curative process
	readiness to wait for own GP > continuity of care	strong	π	<ul style="list-style-type: none"> Convince patient of worth of waiting relative to benefits.
	readiness to wait for own GP > continuity of care	strong		

Table A2 – Action list resulting from loop analysis of loops C and D

Loop	Arrow	Intent	Actor	Action
Self-care loop (Loop C of Figure 4)	Demand for same day access > patients booked in SDS	weak	<i>P</i>	<ul style="list-style-type: none"> Promote awareness of other sources of help and advice (e.g. community pharmacist and health visitor) are used
			<i>R</i>	<ul style="list-style-type: none"> Train clinical receptionists as sign-posters as well as filters
			<i>P</i>	<ul style="list-style-type: none"> Develop nurse triage for same day problems with clear protocols Develop alternatives to a face-to-face consultation with a GP
			<i>D</i>	<ul style="list-style-type: none"> Support triage by nurses and receptionists
	patients booked into SDS > patients seen by GP in SDS	strong	<i>P</i>	<ul style="list-style-type: none"> Develop minor illness nurse or nurse practitioner
	patients seen in SDS > time pressure	weak	<i>p</i>	<ul style="list-style-type: none"> Discourage regular use of SDS as a means of obtaining medical care
			<i>D</i>	<ul style="list-style-type: none"> Ensure that dealing with time pressure is part of GP's personal development plan Identify GPs who have difficulties and offer help at team level
			<i>P</i>	<ul style="list-style-type: none"> Move to longer appointments for SDS in the long term Encourage GPs to help out colleagues when demand is high
	time pressure > explanation	weak	<i>P</i>	<ul style="list-style-type: none"> Written information for patients on minor illness
			<i>D</i>	<ul style="list-style-type: none"> Ensure uniform approach to management of common problems Educational meetings for GPs and staff about minor illness Develop communication skills and participative consultation style
	Explanation > self-care	strong	<i>p</i>	<ul style="list-style-type: none"> Provide written materials to support verbal advice Consider self-care manuals.
			<i>O</i>	<ul style="list-style-type: none"> Increase community awareness of simple measures for self treatment Involve schools and carers

	Self-care > demand for same day access	strong	p	<ul style="list-style-type: none"> • Ensure patients feel confident they will be able to access advice when they need it
Prescribing loop (Loop D of Figure 5)	Time pressure > likelihood of script	weak	p	<ul style="list-style-type: none"> • Promote awareness of the disadvantages of antibiotic use in minor illness
			D	<ul style="list-style-type: none"> • Encourage GPs to elicit patient's expectation with regard to prescriptions • Reinforce consequences of over-prescribing • Ensure uniformity of management of minor illness
	Likelihood of script > script issued	weak	D	<ul style="list-style-type: none"> • More use of 'delayed' script
	Script issued > Medicalization	weak	D	<ul style="list-style-type: none"> • Provide clear explanation of reasons for issuing script • Provide clear advice on how to manage similar illness in the future
	Medicalization > demand for same day access	weak	C, P	<ul style="list-style-type: none"> • Community health education

Table A3 – Action list resulting from loop analysis of loops E and F

Loop	Arrow	Intent	Actor	Action
<i>Receptionist loop</i> (Loop E of Figure 6)	Quality of reception skills > quality of reception triage	strong	R	<ul style="list-style-type: none"> • Develop receptionist script • Enable receptionists to elicit details of patient’s needs • Provide adequate numbers of reception staff at busy times
	quality of reception triage > patients booked into SDS	weak	P	<ul style="list-style-type: none"> • Promote confidence in discretion and competence of the reception staff
			P	<ul style="list-style-type: none"> • Ensure alternatives exist for dealing with patient’s needs (eg secretaries to deal with sick notes)
	patients booked into SDS > patients seen in SDS			
patients seen in SDS > time pressure				
<i>Income loop</i> (Loop F of Figure 6)	time pressure > quality of consultation	weak	D	<ul style="list-style-type: none"> • Promote effective communication and consultation skills • Get more done in the consultation • Encourage health promotion activities
			P	<ul style="list-style-type: none"> • Ensure IS system generates clear reminders for routine checks and interventions
			P	<ul style="list-style-type: none"> • Ensure patients are aware of the time constraints
	Quality of consultation > targets met	strong	D	<ul style="list-style-type: none"> • Ensure excellent record keeping
			P	<ul style="list-style-type: none"> • Ensure adequacy of IS
	targets met > quality payments	strong		P

	quality payments > practice income	strong	-	<ul style="list-style-type: none"> • Subject to new GP contract
	Practice income > investment in staff	strong	<i>P</i>	<ul style="list-style-type: none"> • Allocate resources for training and development of staff
	investment in staff > quality of reception skills	strong	<i>P</i>	<ul style="list-style-type: none"> • Concentrate on recruiting staff with people skills and potential • Ensure training is effective and appropriate
<i>D</i>			<ul style="list-style-type: none"> • Support development of reception staff 	
<i>R</i>			<ul style="list-style-type: none"> • Promote empowerment of front-line staff and teamwork • Stress importance of receptionist role in the health care delivery 	

