

Managing Risk: A Taxonomy of Error in Health Policy

Paul Joyce,¹ Ruth Boaden,^{1,3} and Aneez Esmail²

This paper discusses the current initiatives on error and adverse events within healthcare, with a particular focus on the NHS, within the context of health policy. One of the key features of the paper is the proposal for an emergent taxonomy of the medical error literature, developed from the ideologies and rationales that underpin their approaches. This taxonomy provides details of three categories—empiricists, organisational rationalists and reformers of professional culture—and these act as an organising framework for the exploration of the potential consequences of current policy on errors and adverse events. This discussion highlights the tension between optimising health outcomes for patients and managing the health system as effectively as possible. In particular, the inherent tension between explicit managerial formulations of risk and implicit risk management strategies associated with medical professionalism are considered.

KEY WORDS: risk; patient safety; health policy; taxonomy.

INTRODUCTION

Led by developments in the US health care system, but also influenced by others, the UK has witnessed a renewed interest in patient safety in recent years. Influential studies such as *To Err is Human* (Norman, 1984) have resulted in the phenomenon of medical error becoming an ever more important health policy issue (see Brennan et al., 1991; Wilson et al., 1995; Leape, 1999). A cursory search of relevant databases reveals an apparently exponential rise in the number of academic papers and conference reports that examine the problem of adverse

¹Manchester Business School, The University of Manchester, Booth Street West, Manchester.

²Division of Primary Care, The University of Manchester, Rusholme Academic Unit, Rusholme Health Centre, Walmer Street, Manchester.

³Correspondence should be directed to Dr. Ruth Boaden, Manchester Business School, The University of Manchester, Booth Street West, Manchester M15 6PB; e-mail: Ruth.Boaden@manchester.ac.uk.

events and error within health care organisations (see DoH, 2003, p. 32). In the UK context, the prominence given in the media to instances of medical error, such as the Shipman or Bristol Royal Infirmary Heart Surgery Inquiries, appears to have only sharpened this desire to improve safety in the healthcare system. Recent UK policy initiatives outlined in such reports as *Organisation with a Memory* (2000) and *Building a safer NHS* (2001) have directly addressed the patient safety issue. This commitment has also been manifested in real terms by the creation of such bodies as the National Patient Safety Authority (NPSA). What is striking about these initiatives is the adoption of a new managerial language that frames the “problem” of patient safety, with the implication that the “old” organisational way of doing things will have to change. Central to the policy reports and subsequent guidance is the need to change “unhelpful cultures.” The proposed “safety cultures” are open and self-reporting and do not immediately seek to apportion blame to individuals. Many of these new cultures take their cue from industries other than health care such as aviation (Helmreich, 2000).

This paper develops an emergent taxonomy of approaches to medical error, derived from the relevant literatures. The taxonomy is emergent in the sense that it does not seek to be definitive but merely to provide a snapshot of current policy initiatives around error, acting primarily as an organising framework. However, it is argued that such a taxonomy offers the potential for some degree of analytical insight into the way errors and adverse events are discussed and “managed” within the context of health care governance. Moreover, this analytic power can be used to hint at some of the potential consequences of safety and errors policy within the health care system. The taxonomy is in effect a taxonomy of taxonomies, or to be more precise a taxonomy of the rationales/ideologies that underlie the various approaches. As part of this exploration, there is an explicit acknowledgement that the very same studies that provide the basis for the analysis paradoxically also generate the multiple discursive frameworks that subjectifies the phenomena into a coherent topic of practical and academic interest.

These taxonomies have emerged from a study of literature on error resulting from several different empirical studies, which are not described here. They are therefore not the result of a formal “systematic” review, as medical scientists might understand the term. However, a wide range of medical and social science literature was used at all stages and because of this, three categories emerged, which are associated with three distinct rationales. These could loosely be termed: the *empiricists*; the *organisational rationalists*; and the *professional culture promoters*. A description of each taxonomy is set out below, along with the way in which they may be linked and the implications of them.

THE EMPIRICISTS

This category could be characterised as those who seek to describe error—what it is, where and how often it may occur. In some ways, it is the least distinct

in the proposed three-way analysis of medical error because by definition it is free of the biases of *a priori* assumptions of what constitutes the field of knowledge around error. The function of the empiricist is to provide the basic information about error and iatrogenic events that becomes theorised by others to produce a deeper understanding of the problem.

The field is best illustrated by reference to the proliferation of studies on error and adverse events in healthcare in recent years. Many influential international studies, such as the Harvard Medical Practice Studies (Brennan et al., 1991; Leape et al., 1991) and the Quality in Australian Health Care Study (Wilson et al., 1995) have highlighted the scale of adverse events in a wide range of healthcare systems. The two studies mentioned have shown that the rate of adverse events is anything between 4 and 16% of inpatient episodes. Tacit within all of the studies is the clear assumption that the same problems of error-prone activity have always been present but remained unmonitored, ignored or hidden from public scrutiny until the research “uncovered” them. Clearly, many instances of malfeasance and error attributed to medical intervention were documented at the time, but for some reason they had little collective impact on the professional and public psyche. However, given the enormity of the revealed problem and the realisation that this cannot be a new phenomenon, it is surprising that it is only recently that medical errors have achieved this prominence and been the focus of organisational initiatives

However, this idealisation is more than slightly disingenuous. The generation of data does not take place in a contextual vacuum, there has to be some reason why it has become the initial focus of a research process. Nevertheless, the implicit (and often explicit) theorising that informs the collection of data does not detract from the overwhelming importance this generated knowledge brings to the debate. Much of the data *can* be viewed as independent from the theoretical perspectives that formed the rationale of the research process. The data might be incomplete or partial but it is still useful in the context of other studies of errors and adverse events, whatever their theoretical perspective. Collectively this data highlights the scale of the “problem” and provides the baseline to measure the effectiveness of error reduction strategies: its theoretical basis is rarely explicitly considered.

Moreover, the complex causality associated with adverse events lends itself to multidisciplinary forms of analysis (for example Department of Health Patient Safety Research Programme: <http://www.publichealth.bham.ac.uk/psrp>). In this respect, the empiricist category has a dual role in both being the locus of data generation but is also the site where different rationales meet and reflect on the data. The research process (of which the data is a product) in itself may have led to the construction of a discourse that saw of error and adverse events as a ‘problem’ within health care systems. If the field develops as a legitimate area of research, this analysis of the data will inevitably lead to a self-referential cycle of theory-building and data collection.

This cycle of theory-building and data collection can be described as reification. In this context this implies that meaning has been projected or solidified

through the production of an object, such as a book, a set of rules, a code of practice, a procedure, a tool so that they coalesce meaning/knowledge into a fixed form—in this case a dataset describing the nature and extent of error. The strength of the reification process is that it is succinct and sharpens that debate about the thing that has been produced—in this case data about the revealed “problem” of errors in the health care system. However, there is the equal danger that the solutions and tools to counter the perceived “problems,” which are the products of dominant theories, can themselves be a source of ossification, hiding broader meanings in blind sequences of operations that comprise the “solution.”

THE ORGANISATIONAL RATIONALISTS

This category could be characterised as those who seek to analyse and describe organisations as systems. The theoretical perspectives that comprise this category are from a variety of academic disciplines that include cognitive psychology, human factors research and the sociology of organisations. However, the principle that unites them is their analysis of complex organisational systems and more specifically complexity in relation to high-risk technologies. From all these theoretical perspectives there is an emphasis on the potential for complex systems themselves to be a potential source of danger. Moreover, errors within large organisations have the potential to produce untoward effects on large sections of the population and environment; such as the nuclear, oil and aviation industries. One of the dominant features of these approaches to error and error-related behaviours is the shift away from individualised blame to look at collective and system concerns within organisations.

In terms of health care systems, this taxonomy has a subtle attraction. Traditionally, the medical profession (as a self-regulatory entity) was seen to be averse to external oversight. Pointing out the latent potential in complex systems to be error prone militates against the danger of individualised blame and hence is less likely to come into conflict with medical professional structures or disciplinary procedures. There are other approaches within this taxonomy that also appear to be attractive in the health care context.

Despite the input into the errors literature from other disciplines (see Perrow, 1984; 2nd edition 1999, for a sociological perspective), the new emphasis on errors in health care systems appears to derive from the approaches of cognitive psychologists such as Rasmussen and Jensen (1974) and Reason (1990, 1997). These approaches provide a sophisticated conceptual framework within which to contextualise individual errors in a complex system. Rasmussen and Jensen (1974) suggest a multi-level understanding of error using a skill-rule-knowledge framework. At the skill-based level, activity is predominantly unconscious, relying on stored sets of behaviour to be applied in the correct circumstances. In rule-based activity, decisions are made through the application of reasoning of the “if

... then” variety to familiar conditions. Knowledge-based reasoning is applied in novel situations where skill and knowledge have to be synthesised in real time to meet a particular problem. At this level of activity, error can occur when the individual’s knowledge is incomplete or their available heuristics lead them to a false conclusion given the known probability of outcomes.

Against the background of this multi-level framework, Reason makes the further distinction of *active* and *latent* failures. Active failures are slips, mistakes and rule-violating activity committed by those at the ‘sharp end’ of organisational systems that have immediate adverse consequences. In contrast, latent failures reflect more the collective psychology of the organisation in which individuals are embedded. The latent factors he lists could be as simple as poor design, inadequate tools and equipment, limited supervision, and so on (ibid). Individuals make mistakes but the conditions in which decisions are made cannot be ignored. Therefore, organisational culture plays an important part in determining the production of error related behaviours. What Reason proposes is the creation of a “safety culture” within organisations. He identifies four critical subcomponents of this culture: a reporting culture where there are no barriers for individuals to report their own errors and near-misses; a just culture in that people are encouraged (and rewarded) to provide safety information; a flexible culture in which organisation structures become less hierarchical to meet the challenge of reducing errors; a learning culture where there is a willingness to learn from mistakes and make reforms when needed. (Ibid. 195–196).

It is self evident that such ideas, including the skill-rules-knowledge framework, are applicable to health care systems. The delivery of health care is complex—arguably the most complex of all organisational structures—and health care systems are necessarily populated by individuals who possess the entire range of skill levels. Therefore it is no surprise that the ethos and more importantly the rhetoric of latent and active errors have been adopted wholesale by some health care organisations. A case in point are reports such as *Organisation with a memory* and *Building a Safer NHS*, which are full of references to learning and safety cultures. It is clear that many of the ideas they put forward are a reflection of an unmediated “Reason model” for error reduction. However, what is also apparent is that many of the injunctions to create a reflexive, self-aware, self-reporting culture within the NHS can be considered as an extension of managerial quality programmes such as audit and Clinical Governance. As Reason himself points out:

The model emphasises the necessity for proactive measures of ‘safety health’... it has much in common with Total Quality Management. Indeed, the organisational model deliberately blurs the distinction between safety-related and quality-determining factors. Both are viewed as important for increasing the system’s intrinsic resistance to its operational hazards. Both are seen as being implicated in organisational accidents. (Reason, 1997, p. 226)

However, the promotion of what is a predominantly managerial discourse on quality (and safety) will have implications for professional medical practice

within the health care system and it is for this reason that the third taxonomy has developed.

THE PROFESSIONAL CULTURE PROMOTERS

This category could be characterised as those who seek to describe error as having a central role in defining professional identity, and who therefore promote this aspect of professional culture as key to understanding medical errors. In many respects, the approach to error represented by this loose grouping has much in common with the organisational rationalists. Both see error as an inevitable consequence of managing complex situations within health care regimes. However, for the “culture promoters” this is just the start of the process. Error is seen as more than an epiphenomenon of complexity to be managed and contained—error, along with risk, plays a central role in shaping medical professional culture and even more importantly, in defining professional identity. The distinctiveness of these approaches, and their contribution to the debate on medical error, is that in concentrating on the professional discourse within medicine and the development of professional identity they provide a direct link between the management of error and large-scale organisational structures.

There have been many studies into the development of maintenance of medical cultures (Fox, 1957; Bosk, 1979; Freidson, 1977; Mizrah, 1986). Within this body of work there are a number of recurrent themes, perhaps the most fundamental of which is what Fox (1957, 1989) describes as “training for uncertainty.” Fox identifies three basic types of uncertainty that the medical student faces: uncertainties over their mastery of the complex body scientific knowledge; uncertainties over the limitations of that knowledge; and uncertainties over distinguishing personal levels of competence from “the intrinsically imperfect, enigmatic, and tentative properties of medicine itself” (1989, p. 83). What is clear is that coping with uncertainty is the defining characteristic of medical practice. However, what is equally apparent is that in many instances there are no clear-cut “correct” ways of doing things. On one hand the medical professionals are expected to act promptly and decisively (and take responsibility for their actions). Yet, on the other hand, there may be a lurking doubt as to the best form of intervention. Moreover, given the circumstances and the information available at the time, the same decision might be made again, even if in hindsight the outcome for the patient was less than ideal. In these circumstances it is not surprising that a professional discourse has evolved that is ultimately about the process of decision-making, and not the outcomes.

As part of this distinction between process and outcomes, Bosk (1979) has pointed out the functional role played by error in the socialisation of medical professionals. In his seminal work *Forgive and Remember*, Bosk studies the training of surgeons “to determine how error is detected, categorised, and punished.” He notes that “technical” errors within practice, as long as they are not repeated, are

characterised as part of the educational process and are lessons to be learned. However, what he defines as “moral” errors, failure to act “professionally,” were viewed more harshly and punished. They represented moral shortcoming inasmuch as they signalled that individuals did not “possess the skills or honour the commitments that a lifelong practice in a specialty requires” (Bosk, 1986, p. 466). What Bosk demonstrates is that the process of inculcating “good” medical practice, as defined and regulated by the profession itself, acts as a proxy for the totality of the medical experience. As Bucher and Stelling (1977) point out, “it is perhaps not surprising that the trainees, in evaluating themselves and others, come to give greater emphasis to the actual process of doing their work than to the results of the process” (p. 23).

The oft-quoted injunction for medical intervention is at the very least to “do no harm” to the patient. However, the conundrum for the medical professional, given the degree of uncertainty around practice, is that inaction itself will constitute some kind of risk that an error or adverse outcome might be produced. The medical practitioner has no choice but to choose, and when treatments and outcomes are uncertain then to choose is to enter into risk. Although it is fair to say that a large amount of medical practice has been standardised and reduced to routine rule following behaviour, medical practice is still predicated on individual judgement. For each decision made there is at least an implicit calculation of risk. Where the promoters of professional culture differ is that they place these phenomena at the heart of practice from the outset. They are the concomitant by-products of autonomous professional practice and the generation of professional identity. Therefore, in this context it can be seen that the whole edifice of professionalism and professional responsibility has evolved to manage risk.

As Atkinson (1984, 1995) has argued this leads to an interesting paradox. Practitioners are all too well aware of the limits of medical scientific knowledge (and their command of that knowledge), yet they must act decisively “as if” that knowledge is certain. Additionally, as professionals they must at the same time present a public persona to maintain the trust of the patient. The dilemma of promoting a culture of professionalism (which in the public view is often associated with being “right”) whilst recognising that within this professional identity there is an inherent risk of error, is something that all medical professionals are faced with, although it may not be universally recognised.

DISCUSSION

Although this paper ostensibly presents a simple taxonomy of error, it highlights that the underlying approaches to error are very different. There are policy implications arising from each of these taxonomies.

In the empiricist grouping one has to ask why the “problem” of errors and adverse events has arisen now. It can surely be no coincidence that many of the initiatives to control error, both in private and publicly funded health systems, have

evolved at the same time as cost control and effective resource utilisation appear to have become defining characteristics of health management. The “quality” and “excellence” agendas promoted both within the UK and wider afield have the added advantage of potentially providing a mechanism to exert more influence over the autonomous professionals who make the ultimate decisions about care. This invariably taps into the long-standing debate on the de-professionalisation of medicine in modern health systems (Döhler, 1987; Freidson, 1970; Harrison and Schulz, 1989; Haug, 1975, 1988; Haug and Lavin, 1983; Starr, 1982) but will also impact on the efforts of the professional culture promoters. The empiricists are developing a body of evidence but have yet to consolidate the theorising that may contextualise this evidence and enable it to be “used” by those providing healthcare.

The dominance of cognitive psychology approaches to error can be viewed on one level as an extension of the process of “managing quality.” However, more practically, the notion of error as the consequence of highly complex and high-risk systems has other attractions in the form of established and well regarded solutions from industries other than health care. The introduction of more holistic and apparently “proven” management models into health care holds forth the promise of a more coherent strategy for managing the system as a whole while at the same time keeping the inherent problem of error at an acceptable level. In effect, the system/cognitive psychology models create a transparent and highly functional risk management strategy and as such, their relatively wide and speedy acceptance is a reflection of their intuitive appeal.

However, as the professional culture promoters suggest, health care systems already have a sophisticated, if implicit, risk management structure. It can be argued that professionalism and professional identity has itself evolved to manage the “problem” of uncertainty and risk within the practice of medicine. This illustrates a clear difference in the conceptualisation of risk between the organisational rationalists and the professional culture promoters. While both see error as an inevitable consequence of high complexity, *high-risk* systems, one sees risk as a unwanted by-product to be controlled and limited, the other puts the management of risk and error as *the* defining characteristic of professional practice. It is possible that these approaches, though conceptually very different, may not be mutually exclusive.

However it can be postulated that while holistic, quality-led managerial technologies—such as clinical governance, and error reduction strategies—will lead to new ways of delivering health care within the system. This will not only have an effect on the way in which the system works, but will have the potentially added bonus of empowering the patient to monitor their own care. Deviation from care pathways will have to be explained and justified, not just when adverse events occur. How does the medical professional react in these circumstances? Is defensive medicine an attractive option? Evidence suggests that it is becoming more of an issue in many health systems (see Ennis and Vincent, 1994; McQuade, 1991; Summerton, 1995).

The area of primary care may feel the impact of this more than others, given its current gatekeeping role within the NHS. If care possibilities become more transparent and options more circumscribed, how does the primary care professional adjust to the new risk environment? Is risk passed on to the next level of care or is risk minimised by retreat into specialised practice? In either case, an increase in costs to the system is not just likely but is probably inevitable. It is also likely that, without other influence, gatekeeping systems will undermine the system. The irony is that a quality/excellence regime that offers more managerial control over the health care system may result in less “control” and a more expensive system.

The process of understanding error and how the “problem” of errors may be addressed is multi-disciplinary and still under development. There is a clear need for the implications of these differing perspectives to be thought through—in particular, where the organisational rationalist models conflict fundamentally with those who wish to promote their professional culture and the risk management system inherent within it. The resource implications of the various initiatives to reduce error should be carefully considered, since no intervention is neutral in its effect, and the resultant changes in professional practice may well lead to increased cost and more risk and errors, rather than less.

REFERENCES

- Atkinson, P. (1984) Training for Certainty. *Social Science and Medicine* **19**, 949–956.
- Atkinson, P. (1995) *Medical Talk and Medical Work*. London: Sage.
- Bosk, C. (1979) *Forgive and Remember: Managing Medical Failure*. Chicago: University of Chicago Press.
- Bosk, C. (1986) Professional Responsibility and Medical Error. In L.H. Aiken, and D. Mechanic (Eds.) *Applications of Social Science to Clinical Medicine and Health Policy*. New Brunswick, NJ: Rutgers University Press.
- Bosk, C. (2000) [book review] Medical Harm: Historical, Conceptual, and Ethical Dimensions to Iatrogenic Illness. *The Hastings Centre Report* **30**(4), 44.
- Brennan, T.A., Leape, L.L., and Laird, N.M. (1991) Incidence of Adverse Events and Negligence in Hospitalised Patients. *New England Journal of Medicine* **324**(6), 370–376.
- Bucher, R., and Stelling, J. (1977) *Becoming Professional*. Beverly Hills, CA: Sage.
- Department of Health (1998) *A First Class Service: Quality in the New NHS*. HSC 1998/113 London: Department of Health.
- Department of Health (2000) *Organisation With a Memory*. London: Department of Health.
- Department of Health (2001) *Building a Safer NHS*. London: Department of Health.
- Department of Health (2003) *Making Amends*. Report by the Chief Medical Officer. London: HMSO.
- Döhler, M. (1989) “Physicians’ Professional Autonomy in the Welfare State: Endangered or Preserved?,” In G. Freddi and J.W. Björkman (Eds.), *Controlling Medical Professionals: The Comparative Politics of Health Governance*. London: Sage.
- Ennis, M., and Vincent, C. (1994) The Effects of Medical Accidents and Litigation on Doctors and Patients. *Law and Practice* **16**(2), 97–122.
- Esmail, A., and Everington, S. (1993) Racial Discrimination Against Doctors from Ethnic Minorities. *British Medical Journal* **306**, 691–692.
- Fox, R. (1957) Training for Uncertainty. In R. Merton, G. Reader, and P. Kendall (Eds.) *The Student Physician: Introductory Studies in the Sociology of Medical Education*. Cambridge, MA: Harvard University Press.

- Fox, R. (1989) *The Sociology of Medicine: A Participant Observer's View*. New Jersey: Prentice-Hall.
- Freidson, E. (1970) *Profession of Medicine: A Study in the Sociology of Knowledge*. New York: Dodd, Mead and Co.
- Freidson, E. (1994) *Professionalism Reborn: Theory, Prophecy and Policy*. Cambridge: Polity Press.
- Freidson, E. (1977) The Future of Professionalization. In M. Stacey, M. Reid, C. Heath, and R. Dingwall (Eds.) *Health and the Division of Labour*. London: Croom Helm.
- Griffiths, L. (2003) Making Connections: Studies of the Social Organisation of Healthcare. *Sociology of Health and Illness* **25**, 155–171 (Sp. Iss. SI 2003).
- Harrison, S., and Schulz, R.I. (1989) Clinical Autonomy in the United Kingdom and the United States: Contrasts and Convergence. In G. Freddi and J.W. Björkman (Eds.). *Controlling Medical Professionals: The Comparative Politics of Health Governance*, London: Sage.
- Haug, M. (1975) The Deprofessionalisation of Everyone? *Sociological Focus* **3**, 197–213.
- Haug, M. (1988) A Re-Examination of the Hypothesis of Deprofessionalisation. *Milbank Quarterly* **66**, (Suppl. 2): 48–56.
- Haug, M., and Lavin B. (1983) *Consumerism in Medicine: Challenging Physician Authority*. Beverly Hills, California: Sage.
- Hughes, O. E. (1998) *Public Management & Administration*, Basingstoke: Macmillan.
- Johnson, T. (1977) Professions in the Class Structure. In R. Scase (Ed.). *Industrial Society: Class, Cleavage and Control*. London: Allen Unwin.
- Joyce, P. (2001) Governmentality and Risk. *Sociology of Health and Illness* **23**(5), 594–614.
- Helmreich, R. L. (2000) On Error Management: Lessons from Aviation. *British Medical Journal* **320**, 781–785.
- Leape, L.L., Brennan, T.A., Laird, N.M., et al. (1991) Incidence of Adverse Events and Negligence in Hospitalized Patients: Results of the Harvard Medical Practice Study II. *New England Journal of Medicine* **324**(6), 377–384.
- Marshall, M. N., Mannion R., Nelson, E., and Davies H.T.O. (2003) Managing change in the Culture of General Practice: Qualitative Case Studies in Primary Care Trusts. *BMJ*, **327**, 599–602.
- McLaughlin, K., Osborne, S.P., and Ferlie, E.(Eds.) (2002) *New Public Management: Current Trends and Future Prospects*, London: Routledge.
- McQuade, J. S. (1991) The Medical Malpractice Crisis—Reflections on the Alleged Causes and Proposed Cures: Discussion Paper. *Journal of the Royal Society of Medicine* **84**, 408–411
- Mizrachi, T. (1986) *Getting Rid of Patients: Contradictions in the Socialization of Physicians*. New Brunswick, NJ: Rutgers University Press.
- Norman, D.A. (1984) *To Err is Human*. New York: Basic Books.
- Perrow, C. (1999) *Normal Accidents: Living With High-Risk Technologies*. Princeton: Princeton University Press.
- Rasmussen, J., and Jensen, A. (1974) Mental Procedures in Real Life Tasks: A Case Study of Electronic Troubleshooting. *Ergonomics* **17**, 293–307.
- Reason, J. T. (1990) *Human Error*. Cambridge: Cambridge University Press.
- Reason, J. T. (1997) *Managing the Risks of Organizational*. Accidents Aldershot: Ashgate.
- Rosenthal, M. (1999) How Doctors Think About Medical Mishaps. In M. Rosenthal, L. Mulchay, and S. Lloyd-Bostock (Eds.), *Medical Mishaps: Pieces of the Puzzle* Buckingham: Open University Press.
- Rosser, W. W. (1996) Approach to Diagnosis by Primary Care Clinicians and Specialists: Is There a Difference? *Journal of Family Practice* **42**(2), 139–144.
- Sheaff, R., Marshall, M., Rogers, A., Roland, M., Sibbald, B., and Pickard, S. (2004) Governmentality by Network in English Primary Healthcare. *Social Policy and Administration* **38**(1), 89–103.
- Stacey, M. (1988) *The Sociology of Health and Healing: A Textbook*. London: Routledge.
- Starr, P. (1982) *The Social Transformation of American Medicine*. New York: Basic Books.
- Summerton, N. (1995) Positive and Negative Factors in Defensive Medicine: A Questionnaire Study of General Practitioners. *British Medical Journal* **310**, 27–29.
- Wilson, R.M., Runciman, W.B., Gibberd, R.W., et al. (1995) The Quality in Australian Health Care Study. *Medical Journal of Australia* **163**(4), 458–471.