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Gebreiter, Florian

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ORIGINAL ARTICLE

Accounting and the emergence of care pathways in the National Health Service

Florian Gebreiter

Aston Business School, Aston University, Birmingham, UK

CorrespondenceFlorian Gebreiter, Aston Business School, Aston University, Birmingham B4 7ET, UK.
Email: f.gebreiter1@aston.ac.uk**Abstract**

This paper examines the effects of New Public Management reforms on the information infrastructure underpinning the work of public service professionals. Focussing on the case of the British National Health Service (NHS), the paper argues that hospital accounting reforms played a significant role in the emergence of standardised models of clinical practice. The paper moreover argues that, under the label 'care pathways,' such standardised models of clinical practice became embedded in the information infrastructure of the NHS and concludes by discussing their implications for the work of doctors and hospital accountants.

KEYWORDS

care pathways, hospital accounting, information infrastructure, National Health Service, New Public Management

1 | INTRODUCTION

Since the early 1980s, governments across the developed world have implemented 'New Public Management' (NPM) reforms which, *inter alia*, aimed to increase the role of accounting in the management and delivery of public services (e.g. Hood, 1991). How, and to what extent, accounting has come to shape the practice of public service professionals in the 'New Public Sector' subsequently emerged as an important topic of accounting research (e.g. Hopwood, 1984; and Lapsley, 2008). Many of the studies addressing this issue have examined the direct effects of accounting reforms on the thoughts and actions of public service professionals (e.g. Blomgren, 2003; Kurunmaki, Lapsley, & Melia, 2003; Llewellyn & Northcott, 2005; and Skaerbaek & Thorbjornson, 2007). That is to say, they have investigated whether the increased prominence of costing and budgeting tools associated with NPM reforms turned public service professionals into cost-conscious managers, or made their practice more visible, accountable and cost-effective.

The present paper focusses on the more subtle, indirect effects of accounting reforms on public service professionals and their practice. It draws on the concept of information infrastructure (e.g. Bowker & Star, 2000) to investigate how accounting reforms have affected the categories, classifications and standards that underpin the work of public

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service professionals. The paper examines this issue in the context of the NHS during the period between the publication of the Griffiths Report (DHSS, 1983) and the launch of the Payment by Results initiative (DoH, 2002). Drawing on documentary data collected from professional journals, government publications and other sources, this paper argues that the hospital accounting reforms of the 1980s (DHSS, 1983, 1986) were substantially implicated in the emergence of standardised models of clinical practice, which set out explicit, operations-level guidelines for the treatment of specific conditions (e.g. Lamb & David, 1985; and Mosley & Fairbanks, 1992). The paper moreover argues that, under the label 'care pathways', such standardised models of clinical practice became a significant part of the medical information infrastructure in Britain, and discusses the implications of their emergence for the practice of clinicians and hospital accountants.

The remainder of this paper is structured as follows. The next section reviews the literature on hospital accounting reforms and their effects on medical professionals. The subsequent sections discuss the concept of information infrastructure, the methods employed by the study and the role of accounting reform in the emergence of care pathways, respectively. Finally, a concluding section discusses the findings of the paper.

2 | HOSPITAL ACCOUNTING REFORM AND THE MEDICAL PROFESSION

Since the 1980s, the health services have emerged as an important site for NPM reforms (e.g. Lapsley, 1991, 2001). Many of these reforms have involved the introduction of financial or hybrid financial/clinical categories, classifications and standards into the clinical domain (e.g. standard costs, clinical budgets, DRGs/HRGs¹). These categories, classifications and standards were constructed by accountants, economists and engineers, with relatively little medical input (Samuel, Dirsmith, & McElroy, 2005). How, and to what extent, such hospital accounting reforms have affected the thoughts and actions of medical professionals became an issue of considerable debate in the accounting literature (e.g. Jacobs, 2005; Jones & Dewing, 1997; Kurunmaki, 2004; Kurunmaki et al., 2003; and Llewellyn & Northcott, 2005).

One set of studies suggested that the introduction of clinical costing and budgeting approaches into hospitals transformed doctors and their practice. Much of the early evidence to this effect emerged from studies of DRG costing conducted in countries like New Zealand and the United States (e.g. Chua & Degeling, 1993; Lowe & Doolin, 1999; and Preston, 1992). Drawing on the work of Foucault (1977), these studies argued that accounting reforms had rendered the practice of medicine more visible, standardised and susceptible to surveillance and intervention. Llewellyn and Northcott (2005) observed similar developments in response to the introduction of HRGs into the NHS as part of New Labour's National Reference Costing Exercise (NHS Executive, 1998b). Specifically, Llewellyn and Northcott (2005) argued that the adoption of HRGs had rendered British hospitals 'more average' and clinical practice 'more standardized' (pp. 556–57). More recently, Macinati (2010) argued that the adoption of clinical budgeting techniques in an Italian hospital resulted in the 'incorporation of efficiency evaluations into clinical practice' (p. 437), whilst Jackson, Paterson, Pong, and Scarparo (2014) suggested that the introduction of cash-limited drug budgets in Scotland resulted in significant changes in prescribing practices as well as in a 'shrinking medical jurisdiction' (p. 403).

Further evidence emerged which suggested that accounting reforms not only had significant effects on the practice of medical professionals, but also on the professionals themselves. Preston, Chua, and Neu (1997), for example, argued that DRG costing transformed doctors into 'economic agents, managers and sellers' (p. 156), whilst Kurunmaki (2004) suggested that Finnish doctors readily subsumed accounting techniques into their skill sets and turned themselves into hybrid professionals. Malmrose (2015) moreover suggested that Danish doctors started to adopt the language and vocabulary of management accounting in response to sustained NPM reforms.

A second set of studies, many of which were conducted in the UK, came to almost diametrically opposite conclusions regarding the impact of clinical costing and budgeting approaches on medical thought and action (e.g. Jacobs, 2005; Jones & Dewing, 1997; Pollitt, Harrison, Hunter, and Marnoch (1988); and Preston, Cooper, & Coombs, 1992). Early British studies conducted by Bourn and Ezzamel (1986) and Pollitt et al., 1988 suggested that the effects of accounting reform were constrained by the strong organisational culture of the NHS in general, and its emphasis on the notion of clinical freedom in particular. Indeed, Pollitt et al.'s (1988) study found that none of a large sample of NHS managers

interviewed 'could report any substantial example of managers being able to use budgets to persuade, still less oblige, clinicians to make significant changes in their clinical practice' (p. 224). Preston et al. (1992) also argued that clinical budgeting had few effects on medical practice. Drawing on the sociology of translation, Preston et al. (1992) suggested that management budgets had 'failed to create a network of people (particularly doctors) who would make use of [this] accounting technology' (p. 588). A longitudinal study conducted by Jones and Dewing (1997) similarly found few significant effects of hospital accounting reforms on medical thought and action. The study concluded that doctors decoupled their practice from accounting reforms and largely 'continue[d] their day-to-day medical activities as before' (Jones & Dewing, 1997, p. 276).

More recently, Kurunmaki et al. (2003) suggested that, in Britain, doctors did not absorb accounting ideas and tools into their practice but used them as a 'protective shield' under which their core medical activities could proceed as usual. Accounting was limited to a legitimising role. Jacobs's (2005) study of British, German and Italian hospitals similarly found 'no fundamental or wide-spread change to the values and practices of medicine' (p. 158). Jacobs reported a polarisation of the medical profession, whereby a relatively small number of financially adept clinicians absorbed the impact of accounting reforms and allowed the vast majority of their colleagues to continue their practice as before. Such a polarisation of the medical profession was also observed in the Norwegian health services (Martinussen & Magnussen, 2011). Finally, Gebreiter (2016) suggested that the reluctance of many doctors to engage with accounting information may reflect traditional notions of clinical medicine as an implicit, intuitive and essentially unquantifiable art.

The studies reviewed in this section reached a great variety of conclusions as to how NPM reforms affected doctors and their work. Yet, all of them share two important characteristics. They all examined the categories, classifications and standards used by accountants to operationalise NPM reforms (e.g. clinical budgets, DRGs), and their potential effects on the medical profession in terms of transforming doctors into managers and rendering their practice more visible and accountable. The possibility that accounting shaped medical thought and action in more subtle and indirect ways has received less attention in the public sector accounting literature. The present paper aims to make a step into this direction by investigating the categories, classifications and standards that doctors and other health service professionals developed in response to hospital accounting reforms, and their effects on medical practice. Specifically, it examines how accounting was implicated in the emergence of standardised, operations-level models of clinical practice, how such models became embedded in the information infrastructure of the NHS and how they affected the work of doctors and hospital accountants.

3 | INFORMATION INFRASTRUCTURE

Over the last 25 years, a group of sociologists have developed the notion of information infrastructure to describe the categories, classifications and standards which constitute the 'scaffolding in the conduct of modern life' (Bowker & Star, 2000, p. 47; Bowker, 1996; Star, 2002; and Star & Ruhleder, 1996). This group of sociologists suggested that information infrastructure has five principal properties or characteristics (e.g. Bowker, 1996; and Star & Ruhleder, 1996). First, it is *embedded* into other structures and technologies. Second, it is *transparent* to use, that is, 'it does not have to be reinvented each time or assembled for each task, but invisibly supports those tasks' (Star & Ruhleder, 1996, p. 113). Third, it has *reach or scope* in the sense that it extends beyond a single event or location. Fourth, it is *learned as a part of membership* in the sense that a good understanding of the infrastructural arrangements supporting a community of practice is necessary to sustain membership of this community. Finally, it is *linked with conventions of practice*, that is, it 'both shapes and is shaped by the conventions of a community of practice' (Star & Ruhleder, 1996, p. 113).

Sociological studies of information infrastructure have developed a range of insights into its roles in society (Bowker & Star, 2000), two of which are of particular relevance for the present paper. The first such insight is that information infrastructure is a social, historical and political as well as a technical phenomenon. Whilst 'successful' categories, classifications and standards are often perceived as dry and neutral, sociological studies of

information infrastructure have argued that they are deeply political (e.g. Bowker, 1996; and Bowker & Star, 2000). Specifically, they have suggested that information infrastructures embody the political, social and cultural conditions under which they emerged. Bowker's (1996) study of the International Classification of Diseases, for example, argued that the shape and content of this ostensibly scientific nomenclature of illnesses reflected, *inter alia*, 19th century imperialism, positivist analytic philosophy and the religious sensibilities of the 1930s. Categories, classifications and standards are however not only reflective but also constitutive of their social and institutional environment. Information infrastructure is argued to play an important role in shaping thought and action in modern societies by valorising and legitimising certain ideas and practices whilst silencing and discrediting others (e.g. Bowker & Star, 2000).

The second insight relates to the ability of categories, classifications and standards to enable co-operation across different communities of practice (e.g. scientific disciplines, professions) in the absence of full agreement as to what exactly it is they are working on. Leigh Star coined the notion of boundary objects to describe this phenomenon (Bowker & Star, 2000; Star, 2010; and Star & Griesemer, 1989) and set out their characteristics as follows:

Boundary objects are those objects that both inhabit several communities of practice and satisfy the informational requirements of each of them. Boundary objects are thus plastic enough to adapt to local needs and constraints of the several parties employing them, yet robust enough to maintain a common identity across sites. They are weakly structured in common use and become strongly structured in individual-site use (Bowker & Star, 1989, p. 297).

Star and Griesemer (1989) illustrated the notion of boundary object with reference to specimens of birds collected for the Berkeley Museum of Vertebrate Zoology during the early 20th century. They argued that these specimens had fundamentally different meanings to the various stakeholders of the museum (e.g. biologists, bird watchers, trappers), yet their structure was sufficiently common to enable these groups to communicate and co-operate with each other.

This paper adopts the above insights from sociological studies of information infrastructure to explore the role of hospital accounting reforms in the emergence of standardised models of clinical practice, and the implications of their emergence for medical and financial professionals in the NHS.

4 | METHODS

The present study draws on historical data relating to the timeframe between the publication of the Griffiths Report (DHSS, 1983) and the launch of the Payment by Results initiative (DoH, 2002), a period which not only saw an increased emphasis on accounting and financial management in the health services but also a movement towards more standardised and scientific approaches to the practice of medicine. The Griffiths Report (DHSS, 1983) was selected as the starting point of the analysis because it is widely seen to mark the beginning of NPM-inspired reforms in the NHS (e.g. Lapsley, 2001). The launch of Payment by Results (DoH, 2002) was chosen as the end point of the analysis because it represented one of the most significant changes to the manner hospitals were funded in Britain since the creation of the NHS in 1948.

The principal data sources for the present study were reports, White Papers and other documents published by the British government as well as articles collected from the *British Medical Journal*, *Health Services Management*, *Public Finance* and *The Lancet*.² Other relevant contributions published in books, reports and a range of other publications were identified by following up references as the study progressed. In total, 359 documents were selected for the purposes of this study. The data were analysed by means of a qualitative content analysis, whereby it was manually coded according to an inductively developed set of categories. The following sections draw on the results of this analysis, as well as on insights from sociological studies of information infrastructure (e.g. Bowker & Star, 2000), to examine how hospital accounting reforms were implicated in the emergence of care pathways, and how such pathways affected the work of doctors and hospital accountants.

5 | HOSPITAL ACCOUNTING REFORM AND THE EMERGENCE OF CARE PATHWAYS

In 1983, the British government led by Margaret Thatcher decided to extend its public sector reform programme to the health services. The first step in this direction was the commissioning of a report on the 'effective use and management of manpower and related resources' in the NHS (DHSS, 1983). Consistent with the government's belief that private sector organisations and their management practices were more effective and efficient than their public sector counterparts, the government appointed Roy Griffiths, a supermarket executive, to prepare this report. The Griffiths Report, as it came to be known, was highly critical of the management and accounting arrangements of the NHS. Among other things, the report repeatedly criticised the absence of 'pre-determined standards and objectives' (operational or financial) against which the performance of organisational units could be compared, and the 'lack of a clearly defined general management function' (DHSS, 1983, pp. 10–11). To illustrate his criticisms, Griffiths famously suggested that 'if Florence Nightingale were carrying her lamp through the corridors of the NHS today, she would almost certainly be looking for the people in charge' (DHSS, 1983, p. 12).

Griffiths drew on his experiences in the private sector to recommend two principal changes which, in his view, would address the shortcomings identified by his report. First, he called for the appointment of general managers who would pursue 'major change and cost improvement' as well as co-ordinate and provide leadership across professional divides (DHSS, 1983, p. 13). Doctors would be encouraged to co-operate closely with general managers, or to take up this position themselves. Second, Griffiths called for the introduction of 'management budgets' which would 'relate work-load and service objectives to financial and manpower allocations' (DHSS, 1983, p. 7). This would allow for pre-determined standards to be set and actual performance to be measured against them. Clinicians, Griffiths hoped, would actively participate in the budgeting process.

The Thatcher government pursued hospital accounting reform with great determination. By the time Griffiths published his report, management budgeting was already being trialled at four 'demonstration sites' across the country (DHSS, 1983). Clinicians' initial reception of management budgeting was 'lukewarm' (Stewart, 1984, p. 731) and deteriorated as its strong financial focus became apparent. In response to professional resistance, the DHSS dropped management budgeting in 1986, only to replace it with resource management, a somewhat broader initiative which nevertheless retained the core principles of management budgets – clinician involvement in management and greater emphasis on financial controls (DHSS, 1986). Resource management was initially trialled at six test sites and, despite little evidence of clinician engagement, rolled out to all NHS acute hospitals in the late 1980s and early 1990s (DoH, 1989; and Scott, 1991).

Practitioner and academic accounts of management budgeting/resource management suggested that these accounting initiatives had little effect on the thinking and practice of hospital doctors (e.g. Hucklesby, 1985; and Pollitt et al., 1988). A number of sources attributed this lack of impact on medical practice to technical problems and pointed to the rudimentary nature of the computer systems supporting management budgeting and resource management (e.g. Buxton, Packwood, & Keen, 1989). Others however identified more fundamental obstacles to accounting's ability to influence medical practice. Bourn and Ezzamel (1986) and Pollitt et al. (1988) pointed to the notion of clinical freedom in this context. The perceived inability of clinical costing and budgeting approaches to account for the outcomes or quality of medical care was also repeatedly cited as a reason why doctors did not engage with accounting information (e.g. Dearden, 1990; Hucklesby, 1985; Pollitt et al., 1988; and Sanderson, 1992). In the words of one hospital accountant, because of clinical budgeting's 'emphasis on quantity rather than quality of service [it] appeared to the clinician more as a potential weapon of financial control to be used against him than as an aid to management' (Hucklesby, 1985, pp. 7–8).³

Whilst the hospital accounting reforms of the 1980s had few effects on the thinking and practice of most medical professionals, they stimulated interest in standardised, operations-level models of clinical practice. Specifically, management budgeting and resource management prompted a small number of doctors, hospital administrators and management consultants to develop such models as part of experiments to relate costs to clinical activity (e.g. Lamb

& David, 1985; Mosley & Fairbanks, 1992). The DRG, patient or specialty costing approaches promoted by the British government during the 1980s sought to calculate average costs per case by linking cost information to records of past medical practice (e.g. Bardsley, Coles, & Jenkins, 1987; DHSS, 1984; and Greenhalgh, 1986). These average costs were not deemed meaningful by clinicians as they were 'historic' in nature and unable to provide information on 'what was good, better, or best' practice (Lewis, 1985, p. 175). From the mid-1980s onwards, a number of 'grassroots' experiments were conducted which attempted to address this criticism by relating costs not to how patients suffering from a specific condition had been treated in the past but to models of how they ought to be treated in the future (e.g. Mosley & Fairbanks, 1992; and Scott & Sherwood, 1984). To this end, a number of doctors, hospital administrators and management consultants started to articulate 'treatment profiles' (Scott & Sherwood, 1984), 'resource recipes' (Lamb & David, 1985) or 'care profiles' (Mosley & Fairbanks, 1992).⁴ These tools had a number of characteristics. First, they provided explicit, detailed, operations-level guidance as to which processes, drugs and interventions the treatment of typical patients suffering from a specific disease ought to entail. Second, they enabled the calculation of 'variances' which indicated 'how treatment has varied from the anticipated profile, and the financial effects of those changes' (Mosley & Fairbanks, 1992, p. 29). Finally, they were multidisciplinary in nature in the sense that all professionals involved in patient care were asked to contribute to their design and operation, including 'registrars, senior house officers, nurses, physiotherapists, dieticians [and] medical illustrators' (Lamb & David, 1985, p. 650).

The advent of standardised, operations-level models of clinical practice from the mid-1980s onwards was not restricted to the UK. Similar events occurred in the United States in response to the introduction of a prospective hospital payment system based on DRGs in 1983. The most notable development in this respect was the emergence of 'nursing case management', which aimed to address the 'DRG paradox' – the perception that 'cost effectiveness and quality of care [are] mutually exclusive' (Zander, 1988a, p. 503). The proponents of nursing case management suggested that this 'cost/quality puzzle' could be resolved by developing a 'clear understanding and restructuring of clinical production processes' (Zander, 1988a, p. 503). At the heart of the nursing case management approach were 'critical paths'⁵ (Zander, 1988a, p. 516), which closely resembled the treatment profiles, resource recipes and care profiles discussed above. They provided a detailed account of the nature and timing of clinical interventions to be performed for specific conditions, against which actual practice could subsequently be compared. By using such paths, their proponents suggested a number of objectives could be achieved, including 'expected or standardised clinical outcomes', the 'promotion of collaborative practice' between different health care professions and the 'use of appropriate or reduced resources' (Zander, 1988b, p. 28). Other early American sources discussing standardised models of clinical practice at an operational level included McKenzie, Torkelson, & Holt (1989), Olivas, Del-Togno-Armanasco, Erickson, & Harter (1989) and Dunston (1990).

In the 1990s, standardised models of clinical practice, under the label 'care pathways' (occasionally also 'integrated care pathways' or 'pathways of care'), emerged as a theme in mainstream medical discourses in Britain (e.g. Campbell, Hotchkiss, Bradshaw, & Porteous, 1998; Johnson, 1997; Kitchiner, Davidson, & Bundred, 1996; and Riley, 1998). Care pathways were very similar to the treatment profiles, resource recipes and critical paths discussed in the paragraphs above. They set out standardised, operations-level guidelines as to how patients suffering from specific conditions ought to be treated, highlighted the multidisciplinary nature of clinical work processes and emphasised the perceived importance of comparing actual against prescribed practice (Johnson, 1997). They moreover mandated that any divergence from the prescribed operational course of action ought to be investigated by means of a process labelled 'variance analysis' (e.g. De Luc, 2000, p. 486; Ellis & Johnson, 1999, p. 137; and Kitchiner, 1997, p. 26). Care pathways did however differ from earlier British and American tools in one respect. Perhaps in response to the well-documented aversion of many British doctors to financial management practices (e.g. Jones & Dewing, 1997), the proponents of care pathways downplayed their links to accounting and cost-effectiveness. In the UK, care pathways were promoted as a tool for improving the quality of clinical care (e.g. Lowe, 1998; Riley, 1998).

The rise of care pathways was, of course, not a simple function of the hospital accounting reforms of the 1980s. As suggested by Bowker and Star (2000), categories and standards emerge and proliferate in response to a wide range of historical factors. Care pathways were no exception in this respect. In addition to hospital accounting reform, two developments are argued to have played particularly significant roles in their emergence. The first such development

was the rise of evidence-based medicine (EBM), a new approach to clinical medicine promoted by a group of clinicians, medical researchers and epidemiologists from the early 1990s onwards (e.g. Chalmers, Dickersin, & Chalmers, 1992; Sackett & Cook, 1994; and Sackett, Rosenberg, Muir Gray, Haynes, & Richardson, 1996). The proponents of EBM were highly critical of traditional notions of clinical medicine which emphasised the expertise of individual clinicians as the basis of clinical practice (Armstrong, 1977). Instead, they suggested that the practice of medicine should be grounded in statistical evidence regarding the effectiveness of clinical interventions (Horton, 1992; and Sackett et al., 1996). In order to support such an 'evidence-based' approach to clinical practice, large databases of randomised controlled trials, meta-analyses and systematic reviews were compiled (Chalmers et al., 1992). Finally, clinical guidelines were produced which set out recommendations to practitioners regarding the most appropriate ways of treating various conditions in light of the 'best-available' evidence (Haines & Feder, 1992). Despite these efforts, the proponents of EBM found it difficult to promote awareness and use of clinical guidelines amongst 'frontline' medical practitioners (e.g. Delamothe, 1993; and Thomson, Lavender, & Madhok, 1995). In the late 1990s, care pathways came to be seen as the solution to this problem (e.g. Kitchiner & Bundred, 1998; and West & Newton, 1997). Rather than promoting clinical guidelines to individual practitioners, hospitals would be encouraged to base care pathways on clinical guidelines. As a result, the abstract guidelines articulated by epidemiologists and medical researchers could be embedded at the operational level, whilst care pathways would come to reflect the content and authority of 'evidence-based' guidelines (e.g. Campbell et al., 1998; De Luc, 2000).

The second important development which contributed to the rise of care pathways were the health policies of the 'New Labour' government elected in 1997. Against the background of the Bristol Heart Scandal, New Labour vowed to place quality at the heart of its health service reforms (DoH, 1997, 1998). The government created National Service Frameworks and a National Institute for Clinical Excellence, which articulated national standards that would provide a 'guarantee of excellence for all patients' (DoH, 1998, p. 5). Care pathways were envisioned to play an important role in operationalising this policy in hospitals across the country by translating national standards into local guidelines and monitoring compliance (NHS Executive, 1998a; and Norris & Briggs, 1999).

Care pathways had their critics, with some doctors suggesting that they promoted a 'cookbook' approach towards the practice of medicine (e.g. Patterson, 2002). However, compared to management budgeting and resource management, care pathways encountered much less overt resistance from medical professionals. Unlike these accounting reforms, care pathways had a clear clinical rationale and had been developed by doctors and nurses rather than imposed by politicians and administrators (cf. Bragato & Jacobs, 2003; and Zander, 2002). Their strong focus on quality and their links to EBM may have also contributed to the more favourable attitudes to care pathways as compared to accounting tools amongst medical professionals.

The use of care pathways in the NHS increased quickly towards the turn of the 21st century. In 1996, 80 NHS trusts were piloting or had fully implemented at least one care pathway (Johnson, 1997). A survey conducted by Currie and Scrivener (2002) suggested that this figure had increased to 321 by 2001, which corresponded to 79% of the trusts which participated in the study. The survey also found that in 2001 approximately 2,900 care pathways were operational or under construction in the NHS, and that they were most frequently used for high volume conditions like strokes, hip replacements and myocardial infarctions (Currie & Scrivener, 2002).

Qualitative studies moreover suggested that care pathways were not only adopted by NHS trusts but also used by medical professionals. Grubnic (2003), for example, reported that doctors both helped establish and made use of a care pathway in a children's hospital. Bragato and Jacobs (2003) found mixed evidence for the use of pathways in a Scottish hospital trust. On one hand, attempts to introduce care pathways into the trauma orthopaedic unit, which treated complicated and highly variable conditions, were frustrated by resistance from significant parts of the medical and nursing staff. On the other hand, care pathways were successfully adopted by the elective orthopaedic unit of the same hospital trust. The doctors working in this unit initially displayed a variety of responses to care pathways, ranging from enthusiastic support to deep scepticism. However, as the implementation of pathways progressed, care pathways 'managed to secure a high level of involvement and commitment from all of the staff within the unit' (Bragato & Jacobs, 2003, p. 177).

The field studies conducted by Bragato and Jacobs (2003) and Grubnic (2003) indicate that, at least in parts of the NHS, care pathways started to display many of the properties of information infrastructure as identified by Star and Ruhleder (1996). Care pathways became *embedded* in the systems and structures of the NHS, linking into medical records, or, as reported by Bragato and Jacobs (2003), even replacing 'the traditional documentation for every patient' (p. 173). Care pathways became *transparent*, in the sense that they had firmly established themselves and did not need to be re-invented or re-assembled for each task. Care pathways developed *reach or scope* as they were used in a routine manner at different times and locations. Care pathways needed to be *learned as a part of membership* as they started to 'belong to the staff' who used them and served as a 'common language' for clinical teams (Bragato & Jacobs, 2003, p. 173). Finally, care pathways developed *links with conventions of practice* as their operation resulted in shorter lengths of stay, greater patient focus and an 'increased visibility and accountability' of clinical practice (Bragato & Jacobs, 2003, p. 177).

6 | DISCUSSION AND CONCLUSIONS

This paper has examined the effects of NPM-inspired hospital accounting reforms on the information infrastructure underpinning the practice of medical professionals. It has suggested that, alongside changes in government policy and the rise of EBM, the introduction of clinical costing and budgeting tools during the 1980s was a significant factor in the emergence of standardised models of clinical practice at the operational, hospital level. The paper has moreover suggested that, under the label care pathways, such standardised models of clinical practice became embedded in the information infrastructure of the NHS.

The paper has argued that, in Britain, care pathways were promoted as a quality tool. The links between care pathways and accounting or cost-effectiveness were downplayed in order to build and retain support for these tools amongst clinicians, many of whom were suspicious of financial management practices (e.g. Jones & Dewing, 1997). However, as emphasised by Bowker and Star (2000), categories, classifications and standards tend to reflect the conditions of their emergence. Care pathways, although ostensibly promoted as a clinical tool, had the ideas and language of NPM reforms firmly inscribed in them. Consistent with the recommendations of the Griffiths Report (DHSS, 1983) and NPM doctrine more generally (e.g. Hood, 1991), care pathways articulated clear and explicit clinical performance standards and encouraged routine comparison of actual results with those standards. Even the terminology describing this process, 'variance analysis' (e.g. Ellis & Johnson, 1999; Kitchiner, 1997), was reflective of the private sector financial management practices favoured by the proponents of NPM reforms.

Information infrastructure is however not only reflective but also constitutive of its environment (Bowker & Star, 2000). Once categories, classifications and standards become naturalised in a particular context, they tend to do more than merely support work, they 'change the very nature of what it is to do work, and what work will count as legitimate' (Bowker & Star, 2000, p. 239). Reflecting its historical links to NPM reforms, care pathways promoted a model of clinical practice which was suffused with notions of explicit performance standards and continuous monitoring. As care pathways became naturalised in at least parts of the NHS, they started to shape medical practice in accordance with these notions, rendering it more visible and accountable (Bragato & Jacobs, 2003). Thus, the findings of the present paper suggest that whilst hospital accounting reforms in the NHS did not *per se* make medical practice more visible and accountable (e.g. Jones & Dewing, 1997; Kurunmaki et al., 2003), they contributed to the emergence of tools like care pathways which have done exactly this. It would therefore appear that, at least in the UK, the principal effects of hospital accounting reforms on medical work were indirect rather than direct during the timeframe examined by the present paper. Accounting reforms, by and large, did not transform British hospital doctors into cost-conscious managers, or make their practice more visible and standardised. They did, however, contribute to the advent of standardised, operations-level models of clinical practice which started to underpin and shape medical practice at the start of the 21st century.

The potential implications of the emergence of care pathways were however not restricted to the work of medical professionals. As suggested by sociological studies of information infrastructure, infrastructural devices like care

pathways can become boundary objects – objects which are naturalised in several communities of practice and have the interpretive flexibility to satisfy the informational needs of each of them (Bowker & Star, 2000; Star, 2010; and Star & Griesemer, 1989). The interpretive flexibility offered by care pathways is apparent from the following quotation from an orthopaedic surgeon interviewed as part of Bragato and Jacob's (2003) study:

Nurses see [care pathways] as protocols, instructions; doctors see them as treatment plans to achieve goals for the patients; managers see them as a road to cost control; the medical director sees them as a road to clinical governance and for patients they are a road for recovery. (p. 174)

Sources from the turn of the 21st century suggest that care pathways not only fulfilled the informational needs of doctors, nurses and administrators, but also of hospital accountants (Jones, 2001; and Jones, De Luc, & Coyne, 1999). Jones et al. (1999), a group of accountants and nurses, suggested that the principles underlying care pathways were very similar to those of scientific management (Taylor, 1993 [1911]), which were closely related to the emergence of standard costing in industry (Miller & O'Leary, 1987). In consequence, Jones et al., 1999 argued that '[c]are pathways have a structure that is entirely consistent with standard costing techniques' (p. 11).

Hospital accountants discovered care pathways as a way of linking costs to the practice of medicine (Jones, 2001; Jones et al., 1999; see also Plumridge, 2007, 2008). Earlier costing categories like specialty or DRG/HRG costs (e.g. Bardsley et al., 1987; DHSS, 1984; and NHS Executive, 1998b) had been imposed on doctors in an 'imperialist' manner (Bowker & Star, 2000, p. 297). Their reliance on calculating cost averages on the basis of records of past medical interventions could not account for the quality of medical care (e.g. Hucklesby, 1985; NHS Executive, 1998b; and Sanderson, 1992), or provide information on what was 'good, better or best' practice (Lewis, 1985, p. 175). Hence, they did not fulfil the informational needs of medical professionals. Care pathways, on the other hand, seemingly fulfilled the informational needs of doctors and became naturalised elements of clinical work processes in at least some parts of the NHS (Bragato & Jacobs, 2003; Grubnic, 2003). They offered a 'standard' of medical care which was not derived from historical financial averages but from clear, operational and 'evidence-based' guidelines. Hospital accountants could attach costs to this standard in order to calculate 'care pathway costs' which were argued to be 'directly relevant' and 'more meaningful' to medical professionals (Jones et al., 1999, p. 17). Jones (2001) moreover suggested that since such costs were based on evidence-based pathways, they represented 'true standard costs' for hospitals, which accounted for the quality of clinical care (p. 38).

Thus, whilst hospital accounting reforms contributed to the emergence of care pathways, such pathways in turn opened up new possibilities for accounting in the health services. Care pathways constituted a boundary object (Bowker & Star, 2000; Star, 2010; and Star & Griesemer, 1989) that, at least according to some sources (Jones, 2001; Jones et al., 1999; and Plumridge, 2007, 2008), enabled hospital accountants to relate costs to the quality of clinical care, an objective that had eluded them since the earliest days of the NHS (e.g. Bates, 1952; Feldstein, 1967; and NHS Executive, 1998b). Future research could help to substantiate such claims and examine their potential implications for the roles, power and influence of accounting in British hospitals and beyond.

NOTES

¹ The term DRG, or diagnosis-related group, refers to a classification of originally 467 groups of diseases, which are roughly similar in terms of both their clinical characteristics and the resources required for their treatment. DRGs were initially developed in the United States in the 1960s and exported to many other countries from the 1980s onwards. HRGs, or health care resource groups, are an adaptation of DRGs used by the NHS.

² *Health Services Management*, the journal of the Institute of Health Services Management, was published under the name *Hospital and Health Service Review* before 1988. *Public Finance*, the journal of the Chartered Institute of Public Finance and Accountancy, was published under the name *Public Finance and Accountancy* before 1995.

³ Management budgeting and resource management were not the only hospital accounting reforms introduced into the NHS during the timeframe investigated by this study. Other significant reforms included the various costing for contracting initiatives conducted under the Major government (NHS Executive, 1993) and the National Reference Costing Exercise performed under New Labour (NHS Executive, 1998b). These reforms were not linked to the initial emergence of standardised models of medical practice in the NHS discussed in the subsequent paragraph. A number of sources however indicate that they played a role in extending and reinforcing interest in such standardised models from the mid-1990s onwards (e.g. Thornton, 1997).

⁴ The willingness of some doctors to engage with costing in this manner against the background of the rejection of accounting practices by the wider profession may represent an early example of 'polarisation' in the British medical profession (Jacobs, 2005).

⁵ A number of sources have related critical paths to Gantt charts and Program Evaluation and Review Techniques which emerged in the 1890s and 1950s, respectively (e.g. Bragato & Jacobs, 2003; and Schrijvers et al., 2012). Zander (1988a, 1988b) however makes no reference to these concepts.

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