

FROM PERFORMANCE TARGETS TO SERVICE DESIGN AND HEALTHCARE INFRASTRUCTURE

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ABSTRACT

Challenging performance targets have been set for the UK National Health Service. In order to respond to these targets, the NHS has adopted approaches such as Lean Healthcare to reduce waste and improve its effectiveness. This paper explores the topic of Performance Management and the consequent redesign of services in the NHS. Using the lens of the TFV model, changes in the NHS are examined in an effort to understand the impact on the demand for infrastructure. The traditional approach in the health service is based on a transformation model concept where functional areas are central and the emphasis is on clinical specialties. Lean Healthcare concepts are now being applied to reduce lead times in the NHS. This represents a transition from a transformation model to one where the flow of patients is the main perspective. In an effort to reduce the lead time for patients to access services, major service redesign efforts have led to changes in the demand for infrastructure and the need for refurbishment and new buildings where functional areas are co-located.

The NHS is also moving towards being 'patient led' and increasing value to the taxpayer and to the patient. It has been demonstrated that infrastructure has a high impact on patient satisfaction and their choice of health service provider. Thus, as the NHS moves towards a competitive healthcare marketplace, high quality infrastructure is of increasing importance.

KEY WORDS

healthcare, operations, performance, management, infrastructure

INTRODUCTION

The importance of appropriate buildings in which healthcare services are delivered has been widely recognised (Evans, 1998; Ulrich et al.,

2004). In the UK, there is currently a major healthcare building programme underway (DoH, 2001). The programme aims at improving existing and providing new primary, community and secondary healthcare buildings across the country.

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In parallel, the UK National Health Service (NHS) is undergoing a transformation from a centralised organisation into a network of collaborating and competing health service providers (Talbot-Smith and Pollock, 2006). The control of this network of organisations is through a system of contracts and Performance Targets. These targets are driving a range of initiatives, under the umbrella of 'Lean Healthcare' with the aim of redesigning and streamlining services to reduce waste and improve service efficiency. (NHS, 2008a)

Performance Management can be seen as a top-down management approach which focuses on setting strategic direction and developing and monitoring metrics to ensure the organisation is achieving its goals. A Performance Measurement System is the set of measures used to quantify both the efficiency and effectiveness of actions of an organisation (Neely, 1998). These measures are then expanded into more detailed targets for individual parts of an organisation. In the 'New NHS' setting and monitoring performance targets is a means of setting direction and maintaining control across a network of organisations providing healthcare and associated services (Talbot-Smith and Pollock, 2006).

Service design, based on Operations Management (OM) principles and concepts such as 'Lean Healthcare', may be viewed as the response of healthcare providers to the need for improved processes in order to achieve targets. OM concepts and techniques were developed to improve efficiency and effectiveness of manufacturing processes (Liker, 2004). For example, in the field of healthcare, application of lean concepts may

involve redesigning processes in order to reduce waste and maximise value, enabling increased patient satisfaction (Butler et al., 1996; Brandeau et al., 2004; Chase and Apte, 2007).

Service redesign, where the emphasis is on reducing patient waiting times, often results in relocation of services to more accessible areas. For example, within the NHS, there is currently a pull of functions such as minor medical operations from secondary to primary care. This provides greater service accessibility and reduces waiting times at a lower cost than specialist secondary care units. Such a radical rethink of service location requires changes in the supporting infrastructure i.e. refurbishment or new build. The drive to eliminate waste from health services can result in the demand for closer proximity of services and reduce the need for waiting areas and stores. Building design can support 'new ways of working', and should also enable flexibility to adapt to future changes (Tzortzopoulos et al., 2008). Our view of the link between Performance Management, Service Design and Delivery and Infrastructure is illustrated in Figure 1.

The objective of the paper is to assess the impact of UK National Health Service (NHS) targets in influencing service design and the requirements for infrastructure. In this context, the TFV model (Koskela, 2000) provides a useful metaphor to describe the transition of the health service into one which is more patient centred and focused on patient flows. This paper firstly looks at Performance Targets in the NHS, next the TFV model is described. The model is then used to understand current initiatives

twenty national targets for 2005/6 to 2007/8 (DOH, 2004); over half of these relate to healthcare outcomes including:

1. Improving the health and well-being of the population (e.g. mortality rates from heart disease).
2. Supporting people with long-term conditions (e.g. reducing the use of emergency beds).
3. Improving access to services (e.g. nobody waiting longer than 18 weeks from GP referral to hospital appointment).
4. Improving patient or user experience (e.g. increasing the number of elderly people supported to live at home).

The national targets express the strategic direction which the NHS wishes to pursue and are used to direct funding to healthcare providers. Inevitably, the targets influence the flow of funds for infrastructure projects and the priorities for new buildings and refurbishment projects. Furthermore, in response to challenging performance targets, healthcare providers look to Operations Management and initiatives such as lean healthcare to improve service efficiency (Vissers and Beech, 2005).

THE TFV VIEW OF HEALTH SERVICE REDESIGN

Within the field of Operations Management, the TFV model (Koskela, 2000) has provided a useful viewpoint for the construction industry to consider process improvement. The remainder of this paper examines the use of the theory and its applicability to the domain of health service improvement. The TFV theory

suggests that in order to achieve a holistic improvement of a service, it must be viewed from three perspectives: as a transformation, a flow and as a value generation process. In a Transformation Model, the emphasis is on functions which transform 'inputs' into 'outputs'. A 'flow' model represents a time-based series of activities and waiting times encountered in a process, it can be the focus of lean initiatives on elimination waste and unnecessary delays. A 'value' model focuses on the added value of the process in terms of what is delivered to the customer.

HEALTHCARE PROCESS – TRANSFORMATION VIEW

Healthcare processes have often been expressed using a transformation view (Vissers and Beech, 2005; Johnston and Clark, 2005). Inputs may include medicines and materials. Resources used include finance, space, equipment, technology, buildings, staff and subcontractors. Controls (in the sense of IDEF0 modelling) on the process are health service targets and treatment guidelines and governance standards as well as the ethics of professional bodies. Outputs include health outcomes and client perceptions.

The Transformation model may be used in a functional way within a health service, emphasising the importance of clinical domains rather than being centred on the end-user of the health service. Indeed, the user or 'patient' may be seen as rather passive and one of the inputs into the transformation model. This type of model focuses on clinical areas but does not represent the active participation of the end-user in making choices about their own healthcare and participating in their treatment.

In addition, there are many difficulties in describing what the 'outputs' of such a system would be in terms of health outcomes. Porter and Teisberg (2006 p.180) recommend Performance Measurement of health services should be based on collecting information about medical conditions including results of treatment (outcome measures specific to the disease, costs and prices); experience (a proxy for skill and efficiency of provider); methods and patient attributes (to control for initial conditions and further explain results). The same authors state that the slow acceptance of outcome measurement has been due 'more to provider discomfort and apathy about the importance of results measurement than to substantive measures'. However, Smith and York, 2004 note real problems in measuring health outcomes for particular groups of patient e.g. those suffering from mental health problems.

The subdivision of processes supported by the transformation view has created problems in healthcare services, as evidenced in the following quote: *'Indeed, one of the main causes of bottlenecks in hospitals is the insistence of these semi-autonomous departments on optimizing their own throughput – the patients or procedures per hour – without considering how their actions affect the performance of upstream or downstream departments. In many cases, it would be better to sacrifice local speed for global predictability'* (Mango and Shapiro, 2001:80).

Recognition that problems occur in the interfaces between services has led to various initiatives in the NHS to reduce lead times. For example, the '18 week' initiative refers to a national

target of a maximum of 18 week delay from referral to start of hospital treatment. This 'waiting time' is due to waiting lists and administration and is a time of high anxiety for patients, delays in starting treatment may result in poor health outcomes (NHS, 2008a).

PATIENT PATHWAYS – FLOW VIEW

The term 'Patient pathways' has been used to focus on patient journeys within a healthcare system. It has been defined as an "outline of anticipated care, placed in an appropriate timeframe, to help a patient with a specific condition or set of symptoms move progressively through a clinical experience to positive outcomes" (Middleton et al., 2001:1). Care Pathways represent the flow view on healthcare, in which the focus is on the patient flow through the system. These have been used in many ways throughout the NHS in focusing on reducing the time taken for the patient to access services. The drive for many of these initiatives has been Performance Targets such as '18 weeks from GP referral to treatment in secondary care' and 'four hour target' for treatment at Accident and Emergency departments.

There are challenges in mapping actual patient pathways and obtaining a clear picture of journeys that cross boundaries between primary and secondary care (Young et al., 2004; Tzortzopoulos et al., 2008). In practice, the links between the patient pathways and buildings in which healthcare services are often abstracted away. However, this approach has proved useful in understanding the high-volume flows through the health service and this has prompted changes in infrastructure in some cases to speed up patient flow through the system. For example, services may be

relocated to central areas for high volume patient flows. Alternatively, the flow of staff may be examined to reduce, for example, the very long distances traveled by nurses on ward-rounds. By reducing these distances (by for example, reconsidering policies on transit and storage of medicines) transit time can be minimized and more time is available for clinical services.

The flow model is the basis of the 'No Delays Achiever' project which is supported by the NHS Institute for Innovation and Improvement (NHS, 2008b). This provides information, tools and case studies to help service designers to focus on patient flows and achieve and sustain the 18 week target.

THE PATIENT EXPERIENCE – VALUE VIEW

There are two elements to the value view of healthcare. Firstly, how does the patient perceive value? Secondly, how is value perceived by funding bodies? There is an increasing trend within the NHS to move towards a service which is patient led – allowing patients greater choice of health service options and paying closer attention to patient satisfaction levels.

There is evidence to suggest that the healthcare environment and facilities are an important factor in determining patient satisfaction. For example, a patient survey reported in the NHS Plan (DoH, 2000) identified priorities for the health service. In this, three of the top ten factors were facilities issues: cleanliness, hospital food and a safe, warm and comfortable environment. Baldwin (2005) reports that patient use subjective assessments of the environment (ease of parking, facilities for visitors and perceived cleanliness) to make their choices. The impact of the hospital environment on

patient choice is also reported by Coulter et al. (2004) and Miller and May (2006). Andaleeb (1998) reports that facility quality was a critical factor in influencing the overall satisfaction of healthcare users.

From the customer's perspective, service is the combination of the customer experience and their perception of the outcome of the service. The healthcare experience is created through the way in which the patient, information and materials are processed and how they link together (Johnston and Clark, 2005). One interesting study in which perceptions of the health service was investigated in detail is the 'Experience Based Design Project'. A case study at the Luton and Dunstable Hospital Head and Neck Cancer Services is described in Parker and Heapy (2006). NHS Staff and patients were asked to record their experiences of the service in logbooks recording their thoughts, ideas and frustrations about the service. Patients were also invited to record their views of the service on film and this provided a very powerful illustration of their stories and pathways. Showing the patient films to the service redesign team created a deeper understanding of the patient journey and resulted in service redesign and changes in the use of clinic space. Instead of the consultants having rooms which the patients move in and out of, patients now have rooms and staff move to see them.

From the perspective of those who fund the health service, value is seen as efficient use of public money in delivering high quality healthcare. To ensure this, a system of fifteen high-level indicators has been set up to measure the efficiency of health services in general terms (NHS,

2008c). These measures are in three areas: financial; productivity (reducing length of hospital stay) and workforce (staff turnover, absence and agency costs). There are problems for health service providers when patient requirements clash with those of the funding bodies and hence many publicized cases of patients being dissatisfied where their choice of healthcare cannot be provided due to funding limitations.

DISCUSSION

The paper has discussed the impact of performance targets on the NHS and the consequent changes of requirements for infrastructure. As targets for health services become more demanding and the NHS moves to become more patient centred, the requirements for infrastructure change to enable delivery of care in locations which are more convenient for the patient rather than for the health service. For example in the 'Closer to Home' initiative, the Cumbria NHS Primary Care Trust is reconsidering the delivery of services and moving from centralized hospitals to local clinics. The consequent reduction in demand for hospital services is predicted to save £20 million over three years (Cumbria PCT, 2007).

As performance targets evolve, priorities for services change to reflect them. Thus, there is a need for infrastructure to be flexible to meet the changing demands of health service providers. The design team is unlikely to know the full user requirements over the lifetime of the infrastructure and hence performance assessment is an ongoing through-life process.

Many lean initiatives are taking place in healthcare organisations - these emphasise the elimination of

waste (such as non-productive waiting times). Maps are created showing the movement of staff and patients in the course of their duties and treatment. These 'spaghetti diagrams' often highlight long journey times spent accessing services and/or equipment in different parts of a healthcare facility. For example, some infrastructure related recommendations a case study of a blood sampling and testing process (Jones and Mitchell, 2006) included:

- Removing walls between rooms to avoid staff having to use corridor;
- Relocating equipment to minimize staff walking time between stages of the process;
- Relocating receiving point for blood samples.

The combined effect of these changes is to reduce the number of physical steps on a blood sample's journey from 309 to 57. The distance traveled by staff every day would reduce by 80% and the processing time for certain samples could be reduced from up to 30 hours to less than 3 hours. This shows that even small changes in infrastructure and location of services can have a huge impact on the time taken and the capacity of the health services. Consequently, a re-examination of how services are delivered and consideration of lean concepts is recommended as a pre-requisite to infrastructure design.

CONCLUSIONS

Performance Targets are having a major impact on how health services are delivered in the UK National Health Service. The TFV model has proved a useful way of understanding

the transition of the NHS from one based on functional areas and 'transformation' models to one based on patient flows with an emphasis on reducing time taken in the healthcare system and eliminating waste and delay. Value to the taxpayer is an ongoing concern in the health service with healthcare costs and demands increasing globally. Health services are also exploring ways to increase the perceived value to the patient and levels of patient satisfaction. There is a growing recognition that the totality of the patient experience influences their level of satisfaction with the service. Studies have shown that well designed infrastructure and attention to facilities management issues (such as hospital food, cleanliness and accessibility)

have a high impact on patient satisfaction. This influences their choice of healthcare provider and is increasingly important in a health service market place. In addition, this paper has shown that infrastructure can support flow and value models of health service delivery.

The paper set out to describe how performance targets necessitate redesign of health services and this often requires new or refurbished infrastructure. Private sector partners often provide and support the facilities management of the infrastructure on a long term basis. Further work involves investigating how infrastructure and associated services can support the delivery of services and the ongoing achievement of performance targets.

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