The use of e-rostering in the NHS is increasing, with nurses’ rosters subject to greater scrutiny than ever. Nurses and managers need to address a number of dilemmas.

Five dilemmas associated with e-rostering

In this article...

- Why e-rostering may increase
- The need for flexibility and fairness
- How e-rostering can be empowering

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Increased use of e-rostering is likely to benefit nurses and patients, but will also create dilemmas for staff. Rosters may not be flexible enough to accommodate day-to-day changes, and may also foster unfair treatment and disempower staff.

An author's note: In hindsight, January 2014 may prove to have been a significant, if unnoticed, milestone for nurses. The London School of Economics published a report calling for a greater use of e-rostering in the NHS to improve care and save money (Hockley and Boyle, 2014), and the government invited expressions of interest for a centrally procured workforce management system for NHS organisations (including e-rostering software) at a cost of up to £1bn (Lintern, 2014).

Despite its importance, staff scheduling has been largely unrecognised, unrewarded and undervalued, and terminology is often used imprecisely (Box 1). While this indifference is reflected in healthcare research, operations management research has thoroughly examined the “nurse roster problem” for more than 40 years (De Causmaecker and Vanden Berghe, 2011).

Manual rostering systems have sometimes failed to deliver appropriate staffing levels, and e-rostering is being increasingly used as a way to solve this problem. However, from a practitioner’s perspective, e-rostering involves five important dilemmas (Box 2), reflecting the following: boundaries between scheduling and staffing levels; inflexibility imposed by attempts to codify rostering rules; accommodating changes that occur after the roster is approved; delivering fairness in the ward environment; whether rosters enable managerial control or staff empowerment.

The boundary dilemma

Operations management research assumes that rostering is a mathematical optimisation problem, looking at how to fill as many shifts as possible while breaking as few rules or constraints as possible. Early work sought to resolve staffing and scheduling simultaneously to maintain the relationship between them. This was complex, and later research divided the problem into requirement, scheduling and reallocation (the maintenance of the schedule after approval).

Today, the short-term scheduling of staff is the focus of both research and commercial e-rostering systems. However, the separation of requirement from rostering is not without its critics and, given that satisfying requirement is the key purpose of the roster, this criticism appears valid (Kellogg and Walczak, 2007).

In practice, requirement changes rapidly due to fluctuations in patient flows and varying levels of need. Research, spanning 2008-12 that examined the rosters from 28 wards in 14 hospitals, found that every ward suffered unfilled duties, some by more than 30% (Drake, 2013). In short, current models of nurse rostering assume a static target while, in practice, that target changes frequently and unpredictably.

This boundary dilemma is not easily resolved. Data analysis has shown early promise in the forecasting of ward requirement, offering the potential for suitably enhanced e-rostering systems (Rudin and...
Vahn, 2013). However, this may transform the problem from one of technology to one of working practices. This raises the prospect of future employment contracts comprising a specified number of hours that trusts may call upon at short notice, where all nursing hours are on-call hours.

The constraints dilemma
A roster rule or constraint may be deemed “hard” if it must be satisfied at all costs, or “soft” if its compliance is desirable but not essential. For example, prohibiting a nurse from working two shifts simultaneously may be considered a hard constraint, whereas preventing senior nurses working junior nurse shifts may be a soft constraint. In this way, the roster and the rules it embodies determine the relationship between staff behaviour and organisational processes. In the absence of transparent negotiation, unofficial rules and objectives emerge that may result in politicking and conflicting priorities between management and clinical staff. In practice, rules are often decided on the ward, sometimes in a highly politicised environment with complicated group dynamics (Drake, 2013).

One of the most important contributions of e-rostering is that it requires trusts to make rostering rules explicit within a formal roster policy. This introduces greater transparency to how rules are set and ensures that staff and managers understand the constraints that shape the roster.

However, this transparency comes at a cost. Enshrining rules in a policy document requires that those rules are highly codified and that an authorisation process exists for changing them. The price of this codification is a loss of discretion about how and when the rules are applied. Also, rostering systems apply all soft rules equally, whereas in practice one rule might be considered to be softer than another. Furthermore, the approval bureaucracy impedes the flexibility of frontline staff wishing to change rules to suit situations on the ward.

Consequently, a four-year longitudinal study, based on an 800-bed private hospital, found one ward had rule breakages on fewer than 10% of shifts, while another broke rules on more than 35% of shifts (Drake 2014). This discrepancy could mean that: the roster rules are more applicable to one ward than another; one ward manager is more diligent in maintaining the rules than another; or one ward is safer than another. The implication is that greater transparency does not necessarily equate to greater understanding.

The robustness dilemma
Traditionally, research has focused on the design of rosters, while research into their maintenance after approval and publication has been neglected.

However, once approved, a roster is frequently changed because of emergency leave, sickness and changes in bed occupancy. Post-approval changes can affect as many as 50% of the rostered shifts (Kerr and Timony, 2009), while other demands on staff time mean the implications of these changes are rarely examined (Silvestro and Silvestro, 2008). Consequently, it cannot be assumed that worked rosters are safe or fair based on existing approval processes. A major benefit of e-rostering is that it allows rapid, accurate analysis of worked rosters.

Roster “robustness” may be defined as the ability to tolerate post-approval changes without breaking roster rules. It is determined by the quality of the approved roster and the number of changes made after approval. Post-approval changes may be driven by demand (such as fluctuations in bed occupancy) or supply (such as unplanned staff shortages). Demand-driven changes result from factors such as admission policies, clinical scheduling and patient length of stay, while supply-driven changes may reflect a poor work environment with high levels of absenteeism.

Rosters produced using the auto-rostering function within e-rostering require fewer post-approval changes and, of the changes made, fewer break rostering rules (Drake, 2014). Conversely, the number of manually assigned shifts and the number of rule breakages are correlated. Despite this, many ward managers using e-rostering systems choose to use the system manually. This may be due to inherent limitations of the auto-roster system, incorrect rules in the roster policy, poor staff training or a reluctance to cede control.

The fairness dilemma
Initial results from my analysis of roster policies at 28 NHS trusts show “fairness” is stated to be the most common policy objective. Unfortunately, this prioritisation is not reflected in e-rostering systems, which are designed to optimise the filling of shifts rather than the quality of individual rosters. Furthermore, while many systems are claimed to produce fair rosters, none define the term “fairness” beyond a handful of simple measures, such as the number of approved requests per person or rule breakages as a percentage of shifts worked. This represents a major shortcoming in quantitative approaches to rostering.

Impersonal fairness – the use of standardised bureaucratic rules to mandate...
Discussion

ensuring that their own needs and the needs of the ward are served equally. Accordingly, the National Audit Office (2006) has found that self-rostering is viable only if it includes specific rules designed to ensure fairness.

Conversely, e-rostering symbolises managerial need for control and monitoring. My research among trusts shows that “productivity” and “monitoring” are the second and fourth most common objectives stated on hospital roster policies. The codification of rules serves to disempower ward staff, who lose control over their rosters (Rogers, 2011), and restricts the discretion of ward managers in organising rosters to meet requirement.

This is not to suggest that e-rostering cannot be empowering. The question is: how might e-rostering be used to address the challenges of self-rostering?

Conclusion

A roster can be a symbol of managerial control or an instrument of staff empowerment. Until recently, illegible paper-based systems and undocumented procedures put roster analysis beyond the scrutiny of many managers.

However, the growing popularity of e-rostering has seen the pendulum swing the other way and, on the basis of “what can be measured can be managed”, rosters are now being scrutinised as never before. Managers look to standardise and automate rostering in the drive for greater efficiencies. Meanwhile, staff seek to retain a measure of control over when and how they work.

Used well, e-rostering can provide safer, more robust rosters, but it can also be used to disempower and demotivate staff. Today’s systems, despite their limited functionality, are the forerunners of much more sophisticated systems that will change forever how nurses work. Whether that will be for the good or not will depend upon where the pendulum finally comes to rest.

References


equality – offers a shallow perspective of fairness within a tight-knit clinical team. In practice, the notion of fairness is rooted in ward culture and goes beyond unbiased allocation of requested shifts. Therefore, what may be considered fair on one ward may be perceived as unfair on another. For example, should junior and senior nurses be rostered for the same number of unsocial shifts? One senior nurse suggests not: “I now realise that as nurses get older the roster is almost like a bargaining tool – a rite of passage. I have put my time in therefore I am entitled to have more choice.” (O’Sullivan, 2012)

Many roster policies state that responsibility for roster fairness lies with the ward manager, but what if the system rules are at odds with the ward manager’s view of what is fair? Indeed, is it actually possible to codify and standardise what rostering fairness means in a ward environment?

The empowerment dilemma

The term “empowerment” is high on the list of management jargon. On his appointment as leadership adviser to the NHS, Sir Stuart Rose said “leadership, motivating staff and creating a culture where people are empowered to do things differently are key” (Drake, 2014) the stage is set for greater efficiencies. Managers look to standardise and automate rostering to meet requirement.

The benefits of self-rostering are well documented (Hung, 2002) and the system has been trialled in a number of hospitals. Nonetheless, self-rostering requires staff members to observe a dual agenda, ensuring that their own needs and the needs of the ward are served equally. Accordingly, the National Audit Office (2006) has found that self-rostering is viable only if it includes specific rules designed to ensure fairness.

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References