Nurse Staffing: The Context

The 2005 Healthcare Commission report *Ward Staffing*[9] investigated links between nursing workforce composition, health of the workforce and patient outcomes using available data from trusts. It found an increase in the amount of clinical/ quality data collected by trusts but inadequate baseline data for relating nurse staffing levels to NHS patient care and outcomes (which earlier work by the Audit Commission in 2001[10] corroborates). There was no rationale behind ward staffing levels and the Healthcare Commission concluded that these appear to be based on tradition and/or cost constraints rather than patient need or outcomes.

Other key findings are:

- Higher levels of bank and agency nursing staff relate to lower levels of patient satisfaction
- Patient satisfaction and clinical outcomes such as the incidence of pressure sores relate more to the numbers of experienced and skilled registered nurses employed by trusts (rather than total numbers of registered nurses in the workforce per se)

table, as an *average* for day and night shifts across all wards, a skill mix ratio of between 62% to 66% registered nurses and 34% to 38% health care assistants has remained more or less constant over the last 5 years:

Staffing and Patient Data for NHS Hospital Wards in 2001 and 2005[14]

	2001		2005	
	Day	**Night**	**Day**	**Night**
Number of beds	24	24	23.4	22.7
Total number of patients	22	22	22	21
Number of Registered Nurses (RNs) on duty	3.2	2.3	3.3	2.4
Number of HCAs/Auxiliaries on duty	2.1	1.3	2.1	1.3
Mix - % of nursing staff that are RNs	62%	65%	62%	66%
Patients cared for by individual respondent (mean)	10.6	14.6	10.3	13.5
Patients per RN (mean across ward)	8.0	11.1	7.7	10.1
Patients per nursing staff (mean across ward)	4.4	6.3	4.4	6.1

The majority of nurses surveyed by the RCN in 2005 believed there were still not enough registered nurses on the wards to provide a good standard of care[15]. Given that patient acuity and bed occupancy have all increased[16,] this is not surprising. Nurses still report they work beyond their contracted hours, and this has remained relatively stable over the last 10 years with around 60% of nurses who work full time reporting they work an additional 6 hours

[14] Employment Research/RCN 2002 and 2005
[15] Ball, J. and Pike, G. (2005) *Managing to Work Differently: Results from the RCN Employment Survey* 2005 RCN: London
[16] Employment Research (2003) *Op Cit*

unpaid overtime per week[17.] The RCN considers this to be evidence of a remaining underlying shortage of nursing staff.

The above also relates to the concept of health care workforce productivity, currently in vogue[18]. There is no universal agreement or consistency in how this is measured although the Office for National Statistics estimates NHS productivity by dividing health care outputs by inputs[19]. However, given that bed occupancy rates now average at between 97 – 99% on NHS general medical and surgical wards[20] , and staffing levels appear to have remained more or less the same but with increases in patient acuity overall, and patient throughput (length of hospital stay) in surgical settings, it would s

outcomes, and in the longer term is likely to impact upon health care costs and patient outcomes such as longer hospital stays or the development of complications such as infection. The RCN wants nurses to use this paper and the information within it including the benchmark of a ward staffing establishment of 65% registered nurses: 35% health care assistants as a tool to influence trust board and manager decisions on nurse staffing.

Background Nursing Workforce Data

Total numbers of registered nurses have increased over the last seven years by (whole time equivalents)[24:]

- England 23%
- Scotland 10%
- Wales 17%
- Northern Ireland (18%)

This increase in nursing numbers needs to be put into the context though of:

- Considerable reductions in the registered nurse workforce numbers in the 1990's from which we are only just recovering
- A similar percentage growth in the number of doctors and allied health professionals
- A much greater growth in healthcare assistants at around 95%[25]
- Differences between the four UK countries in numbers of registered nurses per population head
- The nursing population as an ageing workforce with around 16% of nurses on the nursing register aged over 55 years, with consequent impact on future nurse numbers as they retire[26.]

However workforce analysis in the UK is neither sophisticated nor detailed and therefore we do not know with certainty where the increased numbers and 'extra' nurses were deployed and into which health sector, for example NHS acute or mental health care, independent sector, NHS Direct. The RCN believes they haven't appeared in some community specialisms such as practice nursing or health visiting, as these numbers have remained static and district nurse numbers have declined[27] . They do not appear to have been significantly employed in NHS general wards either given that registered nurse: patient ratios appear to have remained the same over the last 5 years.

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[24] DH Statistical Bulletin 2005/04; Northern Ireland – DHSSPSNI; Scotland – ISD Workforce Statistics; Wales – SB20/2005.
Note: Figures are rounded and England data includes bank nurses whereas the other three countries do not

[25] Buchan, J. and Seecombe, I. (2005) *Past Trends, Future Imperfect? A Review of the UK Nursing Labour Market 2004/5* RCN: London

[26] Buchan, J. and Seecombe, I. (2005) *Op Cit*

[27] Buchan, J. and Seecombe, I. (2005) *Op Cit*

Changing Health Care Roles

Registered nurses have a great deal to contribute to more efficient and appropriate health care services and continue to adapt and change their practice. Working differently is not just an issue for nursing staff though – as Lord Warner told the medical profession[28], changes in skills of other staff will also impact upon doctors and what they do. All who work in clinical health care are affected by changes such as the creation of new health care roles[29], skills extension in existing health professions, 'substitution' between professions and grades[30] and the increase in the number of assistants to professionals across the public sector[31]. Who does what, what technologies they use, in what clinical environ

How to Review Ward Nurse Staffing

There are four key components to ward nurse staffing reviews:

- Choosing appropriate indicators relevant to nursing
- Choosing a combination of methods for reviewing ward nurse staffing
- The timing of the review of ward nurse staffing
- Nurse leadership

Choosing Appropriate Indicators Relevant to Nursing

Indicators are defined in slightly different ways but generally are accepted to be measurement tools that aid the monitoring, evaluation and improvement of patient care. The challenge lies in identification of indicators that reflect the nursing contribution to care and are sensitive to changes in nursing inputs. Good quality data has to be generated for meaningful results but can be time consuming to collect and analyse. An RCN mapping exercise in 2005[35] found that data collected at ward level could begin to form the basis for developing patient care and patient outcome indicators relevant to nursing. Some relevant data is already collated for internal and external scrutiny by a number of agencies such as the Healthcare Commission, Health and Safety Executive, National Patient Safety Agency, Clinical Negligence Scheme for Trusts and the Risk Pooling Scheme for Trusts. Data from adverse incident reporting mechanisms within NHS trusts is also available such as:

- Medication errors
- Needlestick incidents
- Patient slips, trips and falls
- Serious healthcare associated infections/outbreaks (not all NHS trusts are currently collecting data on all HCAIs by ward)
- Patient complaints
- Serious untoward incidents

No one set of indicators can cover the entire breadth of the nursing contribution to patient health care so the development of data into indicators relevant to nursing has to be focussed - and also add value to nursing practice in that they are actionable and can lead to change. The following list of topic areas – whilst not exhaustive - is suggested as useful:

[35] Watterson, L., and Currie, L. (2005) *Report on Nursing Indicators Mapping Exercise* RCN: London (unpublished report)

Patient Perspective

- **Approaches**

The patient perspective is essential and could be drawn from sources such as trust patient experience/satisfaction surveys. Patient sensitive measures such as review of effective symptom control or pain management form another important approach.

Patient Safety

- **Pressure Ulcers**

Data on pressure ulcers is already collected by NHS trusts. However there are definitional and interpretation problems including categorisation of pressure ulcer severity that makes comparison within

Care benchmarks so arguably already a potential indicator of nursing input. A survey report by the Healthcare Commission[39] found that of patients who needed help to eat their meals, 18% said they never received help and 21% only sometimes (39% in total).

- **Length of Hospital Stay**

Good quality care should result in timely discharge of patients and time by which a patient's planned discharge is delayed, and the reasons for the delay, are arguably indicators relevant to nursing – but dependant upon whether nurses have been given authority to discharge patients when clinically fit to leave their acute hospital bed

- **Care Planning**

The absence of a nursing care plan, or failure to create and use one that is relevant, comprehensive and up-to-date, is data that is not collected nationally but could be useful in determining the impact of registered nurse input.

- **Communication**

Ward staff have a key

Choosing Methods for Reviewing Ward Staffing Levels

Many hospitals do not have a systematic approach to choosing or using methods to review ward staffing levels and there is no agreement about the 'best' method or tool to use'. There are essentially two different approaches:

- measuring nurse staffing levels and their impacts on outcomes (patient, staff and organisational)
- measuring what staff actually do

These are of course related but methods in use at present are centred on the second approach – measuring what staff actually do - as standardised means of capturing nursing impacts at ward level are not yet available.

There are advantages and disadvantages to the different methods and tools used to model staffing levels[40] (and also a view that none of them are able to capture the communication and 'emotional labour' aspects of nursing work [41] although not in itself a reason for not reviewing ward staffing). Hurst[42] reviewed the five commonest workforce planning methods used in UK alongside an extensive review of the nursing workforce planning literature. He categorised and tested each of the systems as:

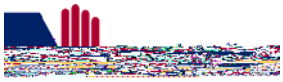
- Professional judgement approach
- Nurse per occupied bed method
- Acuity-quality method
- Timed-task/activity approaches
- Regression-based systems.

The detail of these is set out in Appendix 3.

Hurst concurs with research by Cockerill et al[43] that different systems applied to the same care environment can give different answers, and so recommends combining two or three methods to improve validity of the results. Standardising the methods chosen within organisations is important too for internal consistency and comparison[44].

[40] Hurst, K. (2003) *Selecting and Applying Methods for Estimating the Size and Mix of Nursing Teams* Nuffield Institute of Health: Leeds

[41] ICN (2006) *Safe Staffing Saves Lis 39 BaiD52 3999 26520002 0 0 1002 10 1002 41599295 139 26552 3*



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Principles for Appropriate Ward Nurse Staffing

1. A ward staffing establishment skill mix ratio of 65% registered nurses to 35% health care assistants must be maintained as a *benchmark* for general wards unless or until a thorough review of ward staffing levels has been undertaken.

2. Changes to the overall numbers and competence or specialist expertise of registered nurses must also be based on ward staffing reviews.

3. Executive nurse sponsors and nurse leaders such as matrons must lead staffing reviews.

4. Ward leaders and their staff must be directly involved in all stages of the staffing review.

5.

11. Registered nurses must be enabled to work effectively and not undertake work that less skilled staff could do. Ward staffing reviews must consider how all ward staff are deployed.

12. Ward establishments must have an allowance of at least 25% built in to the ward staffing budget for annual leave, sickness absence, other types of leave, and training and development.

13. The ward establishment should be the focus for ward staffing reviews and staff time spent on services additional to the ward establishment such as ward based outpatient clinics and that of specialist nurses employed out with the ward should be excluded.

Conclusion

Nurse staffing matters because of the evidence that links patient outcomes to registered nurse input[50] [51], staff morale, staff turnover and job dissatisfaction[52]. Nurse staffing is also a patient safety issue[53] and it should be accepted that human interventions are at least as important as technologies such as drugs, devices and techniques in health outcomes and so require an equally robust evidence base and commensurate research funding.

There are challenges in standardising approaches to ward nurse staffing and determining optimum nurse staffing levels. Further research is needed on:

- How some NHS trusts appear to perform well against the patient outcomes measured despite being in the lower quartiles for nurse staffing[54]
- Which indicators matter most when setting staffing levels and maximising patient care

Appendix 1

Mandatory Set Nurse Staffing Levels

In two countries national mandatory ward registered nurse staffing levels have been adopted (though not necessarily always implemented at health care

and maternity services[68] [69]. They have not all been developed from a robust evidence base and are not always adhered to in the NHS.
The key concern in relation to national set nurse staffing levels is that these will be based on a minimum level (rather than an optimum or appropriate level) with the minimum becoming the maximum, regardless of context or changes to patient care and staff experience. There is therefore scepticism about setting national levels because of their inbuilt inflexibility which cannot be directly related to context or evidence and can become a hostage to fortune[70]. Buchan reviewed the literature around set staffing levels and concludes: “nurse: patient ratios are a blunt instrument for achieving employer compliance, where reliance on alternative, voluntary (and often more sophisticated) methods of determining nurse staffing have not been effective”.[71]

Other disadvantages include:

- Fixed ratios are an unsophisticated way of calculating patient need – every situation is dependent on the skill of the nurse, complexity of patient’s needs and physical environment

Pennsylvania in 1998/9 were more likely to die from developing avoidable complications in hospitals with lower registered nurse: patient ratios. Her research links a 10% increase in the proportion of graduate nurses with an associated 5% decrease in the likelihood of surgical patients dying within 30 days of admission and/or being the subject of failure to rescue events[83].

Rafferty et al[84] have been replicating Aiken's US study in the UK. Their research in 30 English acute hospital trusts suggests that surgical patients in the hospitals with the lowest nurse: patient ratios have an increased risk of mortality.

Patient Health Status: Morbidity and Adverse Incidents

The incidence of patient adverse incidents in hospital is a matter of international concern[85]. The relationship between morbidity and adverse events with ward staffing levels[86] [87] suggests that the incidence is reduced when registered nurse; patient ratios are higher. Some research has found links between registered nurse numbers and increased length of stay (and costs)[88].

There is evidence that patients on wards with lower registered nurse: patient ratios are more likely to develop pressure ulcers[89] [90] [91], fall more often[92] [93] [94], are exposed to more medication errors[95] [96] and are more likely to develop healthcare associated infections (HCAIs)[97] [98] [99]. They also appear to be readmitted more often[100] and develop illness complications such as pneumonia[101] [102] [103] [104].

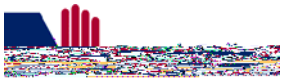
[83] Aiken L.H. et al (2003) 'Educational Levels of Hospital Nurses and Surgical Patient Mortality' *Journal of American Medical Administration* 290(12): pp

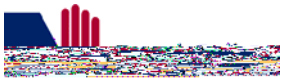
There is an economic and cost perspective to these findings. An economic review of health services by Wanless[105] suggests that a reduction of 15% in healthcare associated infections in acute care by 2012/13 would save £300M a year (2000/01 prices). In addition a £70M saving is estimated from a 10% reduction in other adverse incidents, including medication errors (£50M alone), of which Leape[106] attributes 38% to nurses. There is no doubt about the nursing contribution to these areas and work is urgently needed to measure and link them to registered nurse staffing levels.

Care Quality and Patient Satisfaction

It is important to distinguish between patient health status, patient quality of care, and patient satisfaction, although these are complex inter-relationships. The NHS is monitored annually by the Healthcare Commission on patient satisfaction through national patient surveying. Meeting patient expectations has become more important to NHS trusts who appear to be increasing their use of local patient surveys, although the extent to which findings influence investment decisions is more dubious.

The UK NHS Centre for Reviews and Dissemination[107] found registered nurse hours were related to patient complaints, which is corroborated in research by the Commonwealth Steering Committee for Nursing and Midwifery[108]. The Healthcare Commission more recently also found evidence of a relationship between patient satisfaction and higher levels of registered nurses ratios and a worrying correlation between numbers of temporary nursing staff – bank and agency - and levels of patient dissatisfaction[109]. Higher levels of bank and agency nurses were in turn strongly linked to high vacancy rates. The Healthcare Commission recommends that trusts where care is ‘demonstrably poor’ (for example high numbers of complaints, high incidence of pressure ulcers and poor patient satisfac





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Appendix 3

Methods of Reviewing Ward Nurse Staffing

This appendix is based on the work of Keith Hurst[119]

Professional Judgement Approach

This involves an experienced nurse judging the number of registered nurses and non-registered staff (NRS) needed by a ward and then using a simple formula:

[shift length x number of RNs (by grade) x 7 days] + [shift length x number of NRS (by grade) x 7 days] = number of wte RNs & NRS (by grade) the establishment should contain + a % allowance for annual leave, training, maternity leave, sickness absence/unplanned leave.

It is simple to use and understand, easy to involve ward staff in, and applicable to a range of wards. The main risk is that the nurse who determined the number of staff needed per shift misjudged it.

Results can and should be re-checked regularly particularly in any of the variables affecting patient need (e.g. speciality, acuity, clinical techniques or technologies used) or the nature of the workforce (new competencies acquired by existing staff, length of breaks or shifts) change.

Nurse per Occupied Bed Method

Benchmarking data for actual worked establishments (rather than funded) is used which enables this second simple method to identify how many RNs and NRS each occupied bed needs in 24 hours. The formula is therefore:

[Number of RNs (by grade) who worked per 24 hours ÷number of occupied beds] + [Number of NRSs (by grade) who worked per 24 hours ÷ number of occupied beds] + a % allowance for annual leave, training, maternity leave, sickness absence/unplanned leave = number of whole time equivalent (wte) RNs and NRS (by grade) per occupied bed needed.

The main risks are that:

- Base staffing was rationally determined
- Standards to improve quality are not built in
- Patient dependency may be inadequately described by ‘occupied bed’ (for example, it may underestimate the nursing time needed if the bed

[119] Hurst, K. (2003) *Op Cit*

is occupied by 3 different patients in 24 hours or some patients are more ill/dependent than others)
- The physical size, shape and layout of wards impacts upon staffing requirements
- The contribution of, and demands from, learners are ignored.

It is also simple, allows staff to engage with it, and it can be used at frequent intervals.

Acuity/Quality Method

This method evaluates the size and mix of nursing teams needed to care for the assessed patient dependence/acuity and the care quality to be delivered. It is useful in wards where patient needs vary considerably (e.g. short stay assessment units).

It involves categorising patients by dependency levels, and agreeing quality standards that must be met as a baseline. There are many patient dependency rating scales which Hurst identifies. The formula used to calculate the establishment is:

Number of patients in each dependency category x number of minutes of RN and NRS each dependency category receives = ratio of staff time per grade to each patient dependency category.

Then multiply the ratios by the average number of patients per dependency category to obtain the workload index or acuity and apply the results to the number of occupied beds. Do not forget to add on the % allowance for annual leave, training, maternity leave, sickness absence/unplanned leave. In addition, a % allowance for non-direct patient care workload needs to be added.

It is important that the calculations are based on wards that have passed an agreed quality standard.

One of the advantages of this more sophisticated method is that the quality tools and patient dependency scoring systems can be selected, increasing staff involvement in the staffing review. Another advantage is that this method enables nursing benchmarks and performance indicators like nursing cost per occupied bed to be worked out.

Disadvantages of this method include:

- It can be used to ‘fit’ the number/dependency of patients into the available workforce and though some clinical services cannot, in practice, restrict access in this way, others such as some tertiary services can

- It (and others) fail to take account of patients' emotional health needs