Selecting and Applying Methods for Estimating the Size and Mix of Nursing Teams

A systematic review of the literature commissioned by the Department of Health, April 2002.

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Glossary

Activity analysis: recording nursing activity (usually) by non-participant observation.

Acuity: average workload per occupied bed, used as a nursing benchmark. Associated with the workload index (WLI).

Associated work: non-nursing duties such as washing crockery.

Bed occupancy: the number of patients in a ward expressed as a percentage of bed numbers.

Bottom-up workforce planning methods: staffing levels calculated using factors known to influence a nurses' workload. These could be the number of stroke patients or the number of first-day postoperative patients in the ward.

Demand side: a shorter way of asking how many nurses are needed; the opposite of supply side.

Direct care: hands on care by nurses; for example, measuring a patient's temperature.

Empirical data: information collected systematically by, for example, observation; the opposite of anecdotal.

Establishment: an agreed level of staffing for a ward, unit, hospital, etc. The number of nurses working in the hospital is called the nursing establishment.

Indirect care: individual but remote patient care that is one step removed from the bedside; for example, writing a nursing report about a patient.

Non-participant observation: the role played by an independent observer; the purpose is to collect data objectively.

Patient dependency: a measuring and classification system comprising of two or more categories arranged in an hierarchical manner that indicate the amount of care patients receive from nursing staff.

Unproductive time: meal and drinks breaks, 'breathing' time, personal study and unoccupied time.

Regression analysis: a statistical technique for identifying the main factors that influence the relationship between variables such as those that predict the number of nurses needed in a ward.

Reliability: the strength a research instrument has in terms of consistency; for example, a rule should give the same measure of the same piece of wood every time.

Skill mix: the different types of practitioners making up the ward's establishment. Nurse managers strive to achieve the ideal mix; one that maintains or improves the quality of care at the least cost. Grade mix is sometimes used as a synonym for skill mix but the former includes only nurses. The latter, on the other hand, may include other health professionals.

Staff in post: or actual nursing establishment in a ward or unit.

Staffing levels: the actual or ideal number of nurses working in a ward or department expressed in whole time equivalents (WTEs).

Supply side: a shorter way of asking from where nurses come; the opposite of demand side.

Time-out: leave of all kinds including: sickness, holiday, compassionate, uncertified, certified, maternity, study, etc. The UK average is 22%; that is, one nurse in five is away from the ward at any given time.

Top-down methods: staffing levels calculated using predetermined formulas compiled from widespread health care data; for example, the number of nurses per occupied bed.

Validity: evidence that a research instrument measures what it is supposed to measure, for example, that a patient classification instrument is an accurate measure of a patient's dependence upon the nursing staff.

Variables: literally anything that is allowed to vary, for example, bed occupancy.

What if? spreadsheets: software that allows managers to manipulate numbers and see an immediate effect on related values. For example, the changes in the number of nurses required to cope with a sudden influx of highly dependent patients.

WTE (Whole Time Equivalent) or FTE (Full Time Equivalent): one way of expressing the actual numbers of nurses in an establishment. One nurse working 37.5 hours a week is one WTE. Two nurses working part-time; for example, one nurse working 20 hours (0.53 WTE) the other working 17.5 (0.47 WTE) hours a week is also one WTE. Another, less accurate, way of expressing the nursing establishment is a 'head count' - unhelpful because the count consists of both full and part-time nurses who are classified the same.

Workload index (WLI): a figure indicating the nursing work required to meet patients' needs in a given situation. Dividing the WLI by the ward's number of occupied bed is known as the acuity. Both WLI and acuity are necessary for bench marking purposes

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Introduction

Nurses, perhaps more than any other professional group, are affected by clinical, educational, and managerial developments in the health and social services. Consequently, decisions about the size and mix of nursing teams are critical areas for health service managers generally and nursing workforce planners specifically. Overstaffed, undermanned and imbalanced nursing teams have implications for the quality and cost of patient care. Nurses' job satisfaction and the effective education of student nurses and other staff may also be jeopardised by poorly configured nursing teams. In short, never before has it been so vital that nurses are armed with appropriate instruments and data to help them plan and implement efficient and effective nursing teams.

The aim of this report, therefore, is to help nurses make better decisions about cost-effective numbers and mixes of nurses. It aims to help them make sense of the complex and uncertain world of nursing workforce planning. Commonly used nursing workforce planning methods are reviewed and classified. Indeed, the review of the nursing workforce planning literature in this report is the most extensive since the DHSS manpower studies in the mid-eighties (see for example, DHSS 1982 in the reviews of nursing workforce planning systems on p.22).

Considerable effort is made to explain the strengths and weaknesses of contemporary nursing workforce planning systems. Hospital-based scenarios and supporting data are used to help readers apply commonly used staffing and grade mix formulas. Real nursing and patient data are used throughout the report. In short, readers should recognise the staffing problems and issues raised. They should also be able to apply the methods and data to similar situations in their wards.

The main nursing workforce planning systems described in the literature have been grouped in five ways:

1. Professional judgement (Telford) approach.
2. Nurses per occupied bed (NPOB, also known as the top-down method).
3. Acuity-quality (also known as the bottom-up method).
4. Timed-task/activity approaches.
5. Regression-based systems.

Consequently, this report is sectioned using these headings. Annotated bibliographies are provided in the last section from where the reader can follow-up theoretical and practical points that are raised. Selections from 500 plus articles, books and reports on the subject of demand-side nursing workforce planning and related issues are listed in the annotated bibliography. Owing to the size of the bibliographies, two methods of locating materials have been created for the reader. He or she can identify publications in a specific category. For example, this introductory section is paired with an annotated bibliography of articles, books and reports (p.22) selected from the 500 that give an overview of nursing workforce planning generally. Alternatively, the reader can look up texts listed alphabetically in the full Harvard-style reference list. However, owing to the Harvard listing's 91-page size and the problem of repetition, the full alphabetical list of references isn't included in this report. The reader can, on the other hand, access the full list of 500 texts on the following web site:

<http://www.nuffield.leeds.ac.uk/content/research/health_social_care_systems/main.asp>.

However, it is hoped that specific annotated bibliographies at the end of each section in this report will suffice.

The dilemma about including older articles, books and reports in the bibliographies, which include data that are irrelevant today, was a tough decision. Dated texts have been included because their principles remain pertinent. The reader will notice regular caveats, however, that warn him or her about outmoded findings.

Another efficient feature of the annotations is that articles, books and reports by the same author(s) have been conjoined as themes that conclude with only one summary. However, all texts are fully referenced in the conjoined sections so that readers have a choice about which to follow-up.

Although this systematic review has been a world-wide one, the majority of articles are from the UK. The remainder are North American, European and Antipodean. Finally, a sizeable proportion of the texts summarised in the annotated bibliographies are 'grey literature'; that is, some may not be easily found in the public domain. The British Library at Boston Spa held some of these publications and others were obtained from health authorities, hospitals and sometimes the authors themselves. Some web site addresses are given.

How to use this report

Explanations and exercises for the five commonly used methods for estimating or evaluating the size and mix of your nursing teams follow. The order goes from simple to complex. However, it is anticipated that you'll want to try a triangulation approach; that is, exploring your situation from more than one angle. If any issue within each method isn't clear, or you want to follow-up some theoretical or practical point then go to the appropriate annotated bibliography at the end of the how-to-do-it section.

Software

Some of the five main methods require tedious calculations that can be simplified using simple to use spreadsheets. These too can be downloaded from the web site address given above.

Supplementary Workshops

Finally, this report will be supplemented by at least two seminars in early 2003. These events are free of charge and will be offered on a first-come first-served basis. If you would like to pre-book places then please e-mail the author, Keith Hurst, <k.hurst@leeds.ac.uk>. Alternatively, he can be contacted on telephone number 0113 343 6985 or fax number 0113 2460899.

The Professional Judgement Method of Estimating the Size and Mix of Nursing Teams

Telford's early work using expert health care professional judgement to agree the most appropriate size and mix of ward nursing teams has stood the test of time. Simply put, this technique helps managers convert duty rota decisions into whole time equivalents (WTE's). This method is simple to use and is an excellent starting point for ward managers.

In the following example from a 15 bed surgical ward, a decision is made to employ three nurses for the morning and afternoon shifts, and two nurses for the night shift. A 30 minute morning shift to afternoon shift hand-over period, and a 15 minute afternoon shift to night shift hand-over is included because it is part of the usual work pattern. You can substitute local times and your preferred number of staff for different contexts.

Table 1. Seven Day Ward Professional Judgement Staffing Formula

Step 1. Calculate the number of working hours needed:

Early shift: 0700 to 1430	= 7.5 hrs x 3 nurses x 7 days	157.5 hrs
Late shift: 1400 to 2130	= 7.5 hrs x 3 nurses x 7 days	157.5 hrs
Night shift 2115 to 0715	= 10 hrs x 2 nurses x 7 days	140 hrs
Total	=	455 hrs

However, these hours assume that nurses are never sick or don't take holidays, etc. A 'time-out' adjustment to cover paid, unpaid, sick and study leave, therefore, is necessary. The 22% allowance used in the formula below was obtained from a 'time-out' study of 300+ general wards in the UK. However, if you wish then you can substitute a local figure (probably obtainable from your personnel department).

Step 2. Adding the time-out allowance.

455 hrs x 1.22 (time-out) = 555.1hrs/37.5hrs (1 WTE) = 14.8 WTE's.

A staffing pattern of three nurses for the morning, three nurses for the afternoon and two nurses at night, therefore, requires almost 15 full-time nurses for this small surgical ward.

The same approach can be used for five-day wards. Different shift-hand over allowances are used in Table 2 below.

Table 2. Five Day Ward Professional Judgement Formula

Early shift: 0700 to 1445	= 7.75 hrs x 3 nurses x 5 days	116.25 hrs
Late shift 1400 to 2145	= 7.75 hrs x 3 nurses x 5 days	116.25 hrs
Night shift 2115 to 0730	= 10.25 hrs x 2 nurses x 4 days	82 hrs
Total	=	314.5 hrs

The time-out value would not be as great as a seven-day ward; therefore, 315 hrs x 1.18 (time out) = 371. 7 hrs/37.5 hrs = 9.9 WTE. Again, you can substitute local time-out values.

Calculating Nurses per Shift

One spin-off from the professional judgement staffing formula used in the seven-day and five-day ward examples above is that the technique can be 'reversed' to calculate the available nurses per shift from a ward's actual (names on the duty rota) or funded (what the budget allows) nursing establishment. The process goes as follows:

1. A seven day ward requires 21 shifts (7 days x 3 shifts per day) to be staffed by nurses.
2. Each full-time nurse works 5 shifts.
3. Therefore, 4.2 WTE nurses provides 1 nurse per shift (21/5 = 4.2).
4. Two nurses per shift requires 8.4 WTEs, and so on.
5. However, we're faced with the same time-out problem discussed above. That is, the 4.2 WTE nurse figure lacks an allowance for paid, unpaid, sick and study leave.
6. Therefore, 4.2 x 1.22 (22% time out) = 5.1 WTE nurses provide one nurse per shift.

Applying this technique to the specimen ward in Table 3 below shows its value to managers.

Table 3. Calculating Shift WTE from Funded Nursing Establishments

Grade	Funded WTE's	Divisor	Nurses per Shift
G	1	5.1	0.2
F	1.5	5.1	0.3
E	2.5	5.1	0.5
D	5.5	5.1	1.1
C	5	5.1	1
B	5	5.1	1
A	5	5.1	1
Total	25.5	5.1	5

Interpreting and applying Table 3

The funded nursing establishment in Table 3 allows:

1. One G or F Grade nurse on duty every other shift.
2. One E grade nurse on duty every other shift.
3. One D grade nurse on duty every shift.
4. One C grade health care assistant on duty each shift.
5. One B grade nursing assistant on duty each shift.
6. One A grade nursing assistant on duty each shift.
7. In total nearly five nurses per shift. In practice, the 25.5 nurses would be equitably distributed between day, night and weekend shifts.
8. The next logical step would be to build a nurses' duty rota from these findings.

Strengths and Weaknesses of the Professional Judgement Approach to Nursing Workforce Planning

Strengths

1. Quick, simple and inexpensive to use. The method can be applied to any speciality, no matter how many hours a day the service operates.

2. Acts as an excellent springboard to more sophisticated methods.

3. The method is often used to triangulate results from other approaches, a kind of belt and braces approach to operational management. Similar results from two or more methods adds confidence.

4. Easy to update.

5. Little adjustment required for different care groups.

6. New and sometimes unmeasurable variables; for example, the introduction of new technologies are easily handled by simply agreeing how many/fewer nurses are needed to deal with new ways of working.

7. The effects of adjusting staffing on the quality of care and job satisfaction can be measured by one of several nursing quality and nurses' job satisfaction surveys.

Weaknesses

1. The relationship between staffing and nursing quality is hard to explain using this method. That is, how do we know if 25.5 WTE nurses is enough to maintain an acceptable standard of care, or to ensure equitable workloads, job satisfaction and therefore, a desire to stay in the job? Following on from point 7 above, a follow-up study of nursing care quality and nurses' job satisfaction is essential to check the adequacy of the ward's establishment. Indeed, Telford himself devised a comprehensive nursing quality measure (see the quality of care annotated bibliography on p.89).

2. This relatively fixed nursing establishment is inflexible to changing patient numbers and especially patient dependency mix. That is, sometimes the ward will be over staffed and sometimes vice-versa.

3. Viewed too subjective by some managers.

4. The calculations get awkward when unusual shifts are worked such as long days. However, computer spreadsheets ease the burden.

Nurses per Occupied Bed Method

Using average nurses per occupied bed is another popular method of determining or evaluating ward staffing. The formulas in Table 4 below are compiled from a study of 308 hospital wards in the UK. The 1.34 WTE nurses per occupied bed (NPOB) figure for the medical wards for example, was obtained from the wards' actual nursing establishments. The actual establishment differs from funded in that actuals include overtime, agency and bank hours. A ward 'overhead' is built into the formulas below. This factor adds the indirect care and associated work components of nursing. A 22% time out allowance also is added to cater for paid and unpaid leave.

If nothing else, these data provide opportunities to benchmark your wards. The method can be used to verify professional judgement method finds. Clearly, the NPOB method comes into its own if your ward bed complement changes and you need to modify the nursing establishment accordingly.

Table 4. Calculating Staffing from Average NPOB

Care Group	Medic.	Elderly	Surg.	Ophth.	ENT	Gynae.	Ortho.	Paed.
Number of wards	83	54	66	5	9	11	53	26
Average occupancy	24	24	22	13	16	20	22	15
G/H/I per occ. bed	0.06	0.05	0.05	0.11	0.09	0.06	0.05	0.13
F grade	0.12	0.06	0.07	0.09	0.15	0.09	0.05	0.2
E grade	0.32	0.24	0.27	0.22	0.45	0.14	0.24	0.49
D grade	0.48	0.31	0.38	1.03	0.55	0.45	0.38	0.53
C grade	0.07	0.04	0.06	0.07	0.03	0.02	0.05	0.11
Nursing assistant	0.3	0.51	0.31	0.25	0.23	0.12	0.44	0.27
Total	1.35	1.21	1.14	1.77	1.50	0.88	1.21	1.73

Interpreting and Applying Table 4

In the elderly ward example, one patient requires 1.21 WTE nurses to meet his or her needs. An average of 24 patients requires a nursing establishment of 29 WTE nurses (24 x 1.21), or put another way, 30 full-time nurses on the duty rota. Remember, leave of all kinds comes out of this establishment, and we saw above that at any time one nurse in five is away from the ward. These formulas are less generous in this light.

Calculating grade mix follows the same process - multiplying the average number of occupied beds with the grade mix proportion.

Strengths and Weaknesses of NPOB Staffing Formula

Strengths

1. This method, like the professional judgement one above, epitomises the-keep-it-simple approach to demand-side workforce planning.

2. Staffing and grade mix formulas are empirically derived. The formulas use data collected routinely; for example, bed occupancy and payroll information.

3. Formulas for the main care groups (for example, medical wards) are unique because they are derived from data collected only in medical wards. Moreover, the wards providing these data have passed a quality test; that is, none fell below a pre determined quality standard (discussed later on p.13).

4. Learners are supernumerary in the staffing projections. Also, if the base wards' staffing is fair then an allowance for mentoring and supervision ought to have been included.

5. This approach not only makes determining establishments easy but also generating the ward's grade mix too since the formula is broken down by grade. The C grade in Table 4 is an health care assistant.

6. Even though you may not have the financial or staffing resources to boost your establishment to levels recommended by NPOB formulas, then at least you can benchmark your own establishments.

7. The data are easily built into a computerised spreadsheet for what-if? purposes.

Weaknesses

1. This methods assumes that the base staffing data were rationally determined. However, there's evidence in the literature that ward establishments can sometimes bare little relationship to ward size or occupancy.

2. As it happens, the averages in Table 4 are derived from 'quality assured' wards. That is, staffing and grade mix averages projected from these base data should maintain the same standard of patient care. There's no guarantee, on the other hand, that averages derived from other sources (such as ones that you find in the literature) come from wards that deliver an acceptable standard of care. If you decide to gather your own data then you should try accommodate this important issue.

3. These staffing formulas are insensitive to dependency changes; that is, the formulas recommend the same number of nurses for patient populations that are predominantly low dependency as it does for high dependency inpatients. As we'll see later, patient dependency can have a striking effect on nursing workload.

4. Formulas are costly to update. Extensive fieldwork is required to alter formulas for a care group that changes nursing practice in some way.

5. Routinely collected data, such as bed occupancies used in staffing formulas, are more error-prone than those that are deliberately and systematically collected because accuracy and reliability of the latter are usually confirmed.

6. Learner nurses' contributions or alternatively their demand on qualified staffs' time warrant special consideration to which the NPOB method may be insensitive.

7. The formulas contain hidden structures and processes that need to be made explicit. For example, the ophthalmic ward data are drawn from wards where nurses also staff the operating theatres, hence what seems to be a generous number of nurses per occupied bed. Similarly, some of these data may be drawn from wards that are geographically different from yours; for example hub and spoke vs. Nightingale-type wards have subtle staffing differences because nursing activity is different in wards with different layouts. However, ward layout is a much less important workload variable than say patient dependency.

Acuity-quality Method

A third way of estimating or evaluating the size and mix of ward nursing teams is (in full) the dependency-activity-quality or acuity-quality method for short. This staffing method overcomes most of the weaknesses highlighted in the professional judgement and nurses per occupied bed methods. It is especially useful in wards where patient numbers and mix fluctuate. Medical and surgical admission unit managers have found the acuity-quality method valuable.

Formulas are not only sensitive to the number of and mix of patients in the ward but also have a floor below which nursing care standards should not fall. Formulas are, therefore, more complex to construct and operate. Analysis usually requires computer spreadsheets especially when 'what-if?' questions are asked such as what to do if the ward has a sudden influx of high-dependency patients. The following algorithm and tables, however, make the task much simpler. The results below can easily be checked with a calculator.

The acuity algorithm method is set out below (the data averages in this example are from 83 UK medical wards, see Table 5 below).

Step 1.   Obtain the average number of patients in dependency categories 1 to 4. From Table 5, the dependency numbers are obtained by multiplying the bed occupancy by the proportion of dependency 1 patients, etc.:

Dependency Category	*1*	*2*	*3*	*4*	*Total*
Number of patients	5	10	7	3	25

Dependency category 1 patients are virtually independent of nurses. Dependency 4 patients, on the other hand, are dependent on nurses for most if not all their needs. We use a four-group dependency model in this algorithm but other configurations work equally well. The patient dependency annotated bibliography on p.54 provides several sources of dependency rating scales. Alternatively, e-mailing Keith Hurst on <k.hurst@leeds.ac.uk> will generate one.

Step 2. Record the average amount of direct care time given to each dependency category per day (using data only from quality assured wards, see Table 5):

Dependency Category	*1*	*2*	*3*	*4*
Daily time in minutes	46	106	197	336

The daily time in minutes were obtained from observing 3,310 hours of nursing care in 83 medical wards (see Table 5). In short, the lowest dependency (1) patients gets three-quarters of an hour of hands-on care each day. The most dependent (4) patient, on the other hand, receives 5.6 hours of nursing care a day. Because this care is direct or hands-on care, the 'ward overhead' needs to added later. The annotated bibliography on p.73 provides several sources of activity analysis instruments from which these direct care times can be generated. Alternatively, e-mailing the author <k.hurst@leeds.ac.uk> will generate one.

Step 3. Convert time differentials into ratios by dividing dependency category 1 minutes into dependency 2 minutes, dependency 1 into dependency 3 and dependency 1 into dependency 4:

Dependency Category	1	2	3	4
Ratios	1	2.3	4.3	7.3

This seems an odd step but calculations using ratios of care make the remaining task easier. In short, we can see that dependency 4 patients get seven times more nursing care than dependency 1 patients (which reflects the 4's higher dependency).

Step 4. Multiply the ratios by the average daily number of patients in each dependency category to obtain the workload index (WLI) or acuity (hence the method's name):

Dependency Category	1	2	3	4	Total
Ratios	1	2.3	4.3	7.3	
Number of patients	5	10	7	3	25
Workload index/Acuity	5	23	30	22	80

Step 5. In other words, the WLI/Acuity is equal to the nursing work needed to care for 80 dependency 1 patients. Dividing WLI by the occupancy (80/25 = 3.2) gives the bed acuity. The WLI (80) and the bed acuity (3.2) are good benchmarks. However, you need both values because bed acuity is meaningless if the number of occupied beds isn't known.

Step 6. The nursing time required for good quality care for a dependency 1 patient, as we saw above, is 46 minutes per day (see Table 5). It's a good time to reiterate that the 83 medical wards used in this example have passed 'the quality test' so that we don't extrapolate from poor practice wards. The annotated bibliography on p. 89 lists several quality rating scales. Alternatively, the author <k.hurst@leeds.ac.uk> can provide one.

The direct care time for all patients is:

80 (WLI) x 46 minutes = 3680 minutes/60 minutes = 61.3 hours per day.

Step 7. We also know from our studies of nursing care in 83 medical wards that nurses spend 42% of their time in direct nursing care. Adding the indirect care component (or ward overhead), therefore, involves:

61.3/42 x 100 = 146 hours per day x 7 days = 1022 hours per week.

Step 8. Nurses in the 83 medical wards took unpaid meal breaks averaging 10% of their working day (see Table 5). As you might expect, this time was included in the activity analysis but it is not part of the 37.5 hour week. Ten percent, therefore, is deducted:

1022 hours - (1022 x 0.1) = 920 hours

Step 9. The nursing hours calculated so far assume that ward staff do not take annual or sick leave, etc. Again from our study of 83 medical wards, we note that nurses account for a 22% time-out value (see Table 5). An allowance for paid and unpaid leave, therefore, is added:

920 x 1.22 = 1122 hours

Step 10. Convert the total nursing hours for the week into whole time equivalents:

1122/37.5 hours = 30 WTEs.

This specimen medical ward, therefore, requires just over 30 full-time nurses to care for patients 24 hours a day seven days a week.

Step 11. In recent years, we've embellished the acuity-quality method by adding a grade mix component. The grade proportions below were obtained from our study of 83 medical wards. These data are up-to-date at the time of publication. They are, however, revised at least yearly. In short, we multiply the required WTEs (from Step 10) by the appropriate grade mix proportion from the medical column in Table 5.

Grade	Medical Ward Proportion			WTE
G/H/I	4%	(30 x 0.04)	=	1.2
F	11%	(30 x 0.11)	=	3.3
E	21%	(30 x 0.21)	=	6.3
D	33%	(30 x 0.33)	=	10
C	12%	(30 x 0.12)	=	3.6
Nurs.Ass.	19%	(30 x 0.19)	=	5.7
Total			=	30

In practice, there's only likely to be one ward leader and the other WTE decimal places will be adjusted to create more realistic contracts such as 3.5 full time HCA grade C.

Table 5. Acuity Method Base Data

Variable	Care Group							
	Medic.	Elderly	Surg.	Ophth.	ENT	Gynae.	Ortho.	Paed.
N wards	83	54	66	5	9	11	53	26
Occupancy	25	24	22	13	16	20	22	15
Dep 1	19%	12%	19%	23%	28%	29%	21%	8%
Dep 2	42%	23%	40%	55%	39%	44%	36%	31%
Dep 3	28%	47%	28%	21%	26%	17%	34%	47%
Dep 4	11%	18%	13%	1%	7%	10%	9%	14%
Daily mins								
Dep 1	46	26	67	62	79	79	53	67
Dep 2	106	79	98	170	156	120	106	110
Dep 3	197	154	240	178	164	185	185	218
Dep 4	336	214	295	276	278	271	278	341
Direct care	42%	45%	43%	29%	34%	39%	42%	41%
Meal break	10%	8%	9%	8%	11%	8%	9%	9%
Time out	22%	23%	21%	22%	25%	23%	22%	21%
Grade mix								
G/H/I	4%	4%	4%	4%	4%	4%	4%	4%
F	11%	8%	10%	11%	12%	10%	9%	10%
E	21%	15%	21%	23%	24%	22%	19%	21%
D	33%	30%	35%	32%	34%	35%	33%	39%
C	12%	15%	12%	11%	10%	12%	14%	10%
Nurs.Ass.	19%	28%	18%	19%	16%	17%	21%	16%

Strengths and Weaknesses of the Acuity-quality Method

Strengths

1. The reader can substitute the database averages in Table 5 with local data. For example, the medical ward five dependency 1 patient average, ten dependency two patients, etc., can be replaced with the local number of dependency 1, etc., patients in the ward. Readers without patient dependency data, on the other hand, can convert the occupancies into typical dependency mixes simply by multiplying the bed occupancy by the proportions in Table 5. This alternative, however, diminishes the acuity-quality method's power.

2. More recently, high patient throughput wards, such as medical admission units, convert the short stay patients into patient whole-time equivalents (PWTE) by not simply counting heads at some census point but by summing daily patient hours for each dependency group in the ward and dividing by 24 to arrive at the PWTE. This new approach better reflects nursing workload in high patient throughput wards. The author <k.hurst@leeds.ac.uk> can provide documents to gather these data.

3. Other default values in Table 5, such as direct care and time-out components, can also be overwritten with local values, which unlike substituting dependency numbers, does not reduce the method's sensitivity. However, the direct care and time-out percentages in Table 5 are robust data and have been corroborated not only empirically but also by the literature (see the annotated bibliography on p.101). Therefore, we should not overwrite the averages on a whim.

4. Changing ward variables, especially patient numbers and dependency mixes, is easily accommodated by the acuity-quality algorithm.

5. The data in Table 5 are drawn only from wards that achieve a pre-set level of quality. In theory at least, therefore, the algorithm should recommend establishments that achieve the same quality of care in different settings.

6. The ward manager can turn the acuity-quality method around and adjust the ward's occupancy and patient dependency mix to suit the available nursing resources. Either way, nurses are matched to the peaks and troughs of ward activity. This method is one way of deploying nurses where the need is greatest thereby making workloads more equitable.

7. If a computer is set up then it is possible to calculate staffing numbers for individual shifts. Software also allows manipulation of a single or a combination of variables in a 'what if?' way.

8. Nursing benchmarks and performance indicators (such as nursing cost per occupied bed) for any speciality at different times are a natural spin-off from the acuity-quality method. These data are often staggering; for example, the daily nursing cost per occupied bed in some wards can be double that in apparently similar wards.

Weaknesses

1. Compared to the professional judgement and the NPOB staffing formulas, the acuity-quality method is complex. However, it is felt that the extra effort pays dividends since more variables, known to influence nursing workload, are accommodated.

2. The daily direct care minutes for each dependency category have to be accepted unless local nursing activity values can be obtained. Adopting patient and nursing activity from other hospitals may be unpalatable to some nurses. Moreover, the sense of ownership that is engendered by using local data, may be lost by using values from elsewhere.

3. In order to capitalise on the acuity-quality method's power and flexibility, computer software such as spreadsheets are needed.

4. Collapsing patient numbers and related nursing activity data into dependency groups may ignore individual patient characteristics. The effect of one patient's special care needs has little effect on acuity-quality staffing formulas. A similar criticism levied at acuity methods is that nursing activity, used to obtain the amount of nursing time required, sometimes fails to measure the psychological component of patient care. However, most of the alternative methods are even less sensitive to these issues.

5. Acuity-quality methods in some situations can recommend nursing establishments insufficient to provide at least one qualified nurse per shift because the formula is workload as well as occupancy-based. Patient populations less than 12, especially if the patients are low dependency for example, can create this problem. We saw in the professional judgement method above that 5.1 WTE nurses are needed to have at least one nurse on duty each shift.

6. Acuity-quality systems add to ward nurses' workload because additional patient information is required. For example, the patient's named nurse is the best person to assess dependency. Obtaining up-to-date data can also be expensive. For example, finding representative, independent nursing activity and nursing quality data may mean two non-participant nurse observers spending several days in the ward.

7. Despite matching nursing activity with nursing quality, the relationship between the two can be confounded. That is, some understaffed wards achieve high-quality care and vice-versa. The relationship between staffing and outcomes is complex and uncertain.

8. Even though the grade mix proportions in Table 5 are designed to overcome inappropriate working, the grade mix configurations may not suit your ward's context. For example, it may not be local policy to employ Level 3 or 4 health care assistants (grade C in Table 5). Reconfiguring the grade mix according to local policy, and adjusting the acuity-quality algorithm at the same time, takes considerable fieldwork and skill.

9. The acuity-quality method lends itself less well to forecasting the number of staff needed than other methods we've explored.

Timed-task/Activity Method

This method of estimating or evaluating the size and mix of nursing teams arose from a belief that acuity-quality staffing methods, for example, were inferior staffing predictors. The type and frequency of nursing interventions required by patients, on the other hand, are felt to be a better guide because the number of patient variables impinging on nursing time are more fully considered. If nurses are comfortable with constructing care plans for their patients then the timed-task/activity method simply adds nursing minutes to each intervention thereby generating the number of nursing hours needed. This method will suit wards in which care plans are systematically constructed, and for wards where patients' nursing needs can be confidently predicted; notably wards that admit from waiting lists.

In practice each patient's direct care nursing needs for the day are recorded on a locally developed check list of nursing interventions. The number of nursing interventions from which to chose for patient care varies from system to system. The one described in Table 6 below, for example on the face of it seems simple. However, Table 6 summarises approximately 450 nursing interventions. The full list of activities and times are not included in this report because of their bulk and also because many interventions and times are likely to be unique and context sensitive. However, contacting the author by e-mail <k.hurst@leeds.ac.uk> will ensure the full list is supplied.

Because each intervention is paired with a locally agreed time required for its completion, the patient's care plan and nursing time requirement is systematically built. This value attached to each intervention is generally the amount of time needed to carry out the care for one patient over a 24 hour period. As with the acuity-quality method, a ward 'overhead' has to be added to cater for the indirect care and other aspects of nurses' time. Similarly, breaks and time-out have to be considered. In short, there are four main activities:

1. The patient's care plan is completed or updated each day.
2. The total hours for all patients generated by all the care plans in the ward are aggregated.
3. All wards' nursing hours are collated enabling the manager to distribute nursing staff equitably.
4. Validity checks are done by experienced staff to ensure consistency in the selection and recording of nursing interventions. The validator also checks that the predicted nursing care is required by the patient over the ensuing 24 hours.

Nursing interventions making up the 13 main categories in Table 6 are subsumed under an activities of living classification to help nurses search for specific interventions. Two times are given: a one-off set-up time when the intervention is first implemented and a maintenance time that is activated each time the intervention is carried out.

Armed with the full list the nurse selects nursing interventions according to his or her patient's needs. As each intervention is selected the required time is summed and added to the nursing time for other patients in the ward. The total nursing time becomes the nursing hours required for the ward. The required nursing hours are converted into WTE after the overhead, breathing time and a time-out allowance are added to the required hours. Obviously, nursing care plans must be regularly updated so the required nursing hours always correspond to patients' nursing needs. Ideally, the method should be computerised.

Table 6. Broad Timed-task/Activity Nursing Interventions

Time in Minutes	Set Up	Maintain
1. Maintaining a safe environment	117	612
2. Physical and psychological comfort	199	571
3. Breathing	51	1592
4. Eating and drinking	35	485
5. Eliminating	95	388
6. Personal cleansing and dressing	240	253
7. Communicating	0	207
8. Controlling body temperature	33	114
9. Mobilising	16	122
10. Sleeping	0	16
11. Spiritual	0	30
12. Social care	41	20
13. Special needs and requests	40	140

Strengths and Weaknesses of the Timed-task/Activity Method

Strengths

1. Generates results that can be corroborated by other methods (see annotated bibliography on p.121).

2. Easily computerised so that the method becomes part of a nursing information system.

3. Commercial systems, such as GRASP, are readily available.

4. The base information is easily updated. Indeed, periodic reviews of nursing interventions and times are a good idea.

5. Adopting the system in other care settings is possible without destroying its integrity. However, protagonists warn users to check validity and reliability if grand care plans are transplanted into new nursing settings.

Weaknesses

1. The effort needed to maintain detailed care plans for each patient every shift adds considerably to the ward 'overhead'. One of the first rules of workforce planning is that it shouldn't add to the nurses' workload.

2. Commercial systems are the most expensive of all the methods described. Setting up and implementing the system is also time consuming and expensive. But like the acuity-quality method, these are largely capital rather than an a recurrent costs.

3. Reducing nursing care to a work study type list horrifies some nurses. However, the completed detailed list of required nursing interventions for an individual is no different to a thorough nursing care plan.

Regression Analysis Method

The annotated bibliography for this approach on p.128 shows that some authors were unable to find a method of demand-side nursing workforce planning that answered all their staffing questions. Consequently, they developed powerful regression analysis based predictions to estimate or monitor staffing levels. Broadly, regression methods predict the required number of nurses for a given level of activity. The predictor is called the independent variable and the outcome or level of staff is known as the dependent variable. Although the statistical analysis is challenging, once completed, all we need to know is the independent variable to predict the number of staff (dependent variable). Kaplan's 1975 study, for example, developed a nurse staffing model from an analysis of ward staffing and bed occupancies. Regression analysis showed that the number of nurses (dependent variable) increased as bed occupancy (independent variable) rose thus allowing staffing predictions. Other independent variables in the literature include the number of theatre sessions and day surgery cases. In short, once the base data are collected and analysed then the calculations are as straight forward as the NPOB method.

Strengths and Weaknesses of the Regression-based Method

1. Strengths

2. The regression method is useful for situations where predictions are possible, such as the number of planned admissions. This approach helps managers to forecast and prepare for extra demands.

3. It's a cheaper method because data are easier to collect and usually can be aggregated from other, same speciality wards. Moreover, independent variable data are usually inexpensive to update than, for example, acuity-quality data. The regression method, therefore, is especially useful to managers with limited resources, and who cannot afford to carry out a full dependency-activity-quality or a timed-task/activity study.

4. The outcomes of regression models have been well corroborated by other methods. Staffing formulas are judged valid, reliable and more usable than the detailed and expensive acuity-quality and timed-task/activity methods.

5. Staffing recommendations from regression analysis are relatively easily tested for accuracy by checking how well nursing time is used following enactment of staffing recommendations drawn from regression models.

6. Most care groups can be analysed in this way, therefore the ease of use across specialities is another strength.

7. Weaknesses

8. Since the number of variables that need to be considered in a ward setting are likely to be great then the knowledge and skills of a statistician will be needed to help you design and implement fieldwork that collects the most appropriate data for the regression analysis.

9. Transferring staffing formulas derived from regression coefficients from one setting to another isn't encouraged owing to unique variables (such as ward layout) in one setting. However, validity and reliability tests help in these situations.

10. Some independent variables are qualitative in nature while others are deemed subjective such as the ward manager's perceptions of ideal staffing. Sometimes, dummy or nominal data have to be assigned to these softer variables. Readers with statistical knowledge and skills know that regression analysis include data that are usually measured on interval or ratio scales.

11. Wards providing data for regression analysis are assumed to operate efficiently and effectively. That is, wards that supply establishment and bed occupancy data have managers who have varied staffing according to patient demand. Similarly, including data from wards with excess absenteeism or poor quality care can distort and invalidate the results.

12. Imposing regression statistical techniques on nursing teams has alienated some nurses. The main problem seems to be a lack of ownership and understanding by nurses at the receiving end.

13. It's unsafe to predict staffing levels outside the regression model's observed range. That is, if your data came from wards with no more than 25 beds then extrapolating to wards with 30 occupied beds might be error-prone because we can't be sure that linear relationships between independent and dependent variables exist beyond 25 beds.

Annotated Bibliography: Reviews of Nursing Workforce Planning Systems

The nursing workforce planning literature's breadth and depth means that authors periodically take stock of the nursing workforce planning systems and related notions. Readers will find most demand-side workforce planning methods constructively criticised in the texts in this section. Most reviewers are independent and disinterested; while others on the other hand, sometimes blatantly dismiss systems before recommending their own. Clearly, therefore, some reviews need to be considered carefully. Other authors treat competing methods more fairly by systematically ruling out approaches before implementing their method of choice. The range of reviewers is impressive; from Department of Health staff to academics and experts in commercial companies. The foci of the reviews is equally impressive. Some are theoretical while others are empirical. The reader is introduced to several frameworks for estimating and evaluating their nursing workforce. By far the commonest framework, however, is the top-down and bottom-up one. Finally, these materials are excellent for learning the esoteric language surrounding nursing workforce planning.

Arthur, T. and James, N. (1994)
Determining nurse staffing levels: a critical review of the literature,
Journal of Advanced Nursing, 19, pp.558-565.
Summary: Shows that there is no perfect nursing workforce planning system, but that robust ones can inform decision making. A range of methods is explored, broadly categorised as top-down and bottom-up.
Key words: critical review.

Audit Commission. (1991)
The Virtue of Patients: Making the Best Use of Nursing Resources,
London: HMSO.
Summary: Detailed examination of the managers' role in maintaining nursing efficiency and effectiveness. One section looks at nursing establishments and workload.
Key words: review.

Audit Commission. (1992)
Caring Systems,
London: HMSO.
Summary: Detailed examination of contemporary computerised nursing management systems. Nursing workload is well covered along with related issues such as care planning and rostering. Compares and contrasts nursing workload measures.
Key words: IM&T, review.

Audit Commission. (2002)
Acute Hospital Portfolio. Improving Performance Through Audit. Ward Staffing Management Tools. Practical Tips for Budget Setting,
Wetherby: Audit Commission Reports <www.audit-commission.gov.uk>.
Summary: A recent review of nursing workforce planning methods. Each methods' strengths, weaknesses and implications are covered.
Key words: review.

Aydelotte, M.K. (1973)
Nurse Staffing Methodology. A Review and Critique of Selected Literature. DHEW Publication (NIH) 73-433,
Washington: Department of Health, Education and Welfare.
Summary: Reviews contemporary North American nursing workload systems, some of which were later developed for use in the UK. Sets out the empirical basis for justifying nursing establishments and costs. Dated but the principles apply today.
Key words: review, quality.

Bagust, A. Prescott, J. and Smith, A. (1988)
Nurse Manpower Project: A Study of Alternative Methodologies,
Manchester: North West Regional Health Authority.
and
Bagust, A. Prescott, J. and Smith, A. (1988)
Numbering the nurses,
Health Service Journal, 98, 5108, pp.765-766.
Summary: Compares and contrasts professional judgement, dependency-acuity and linear regression methods. Favouring the latter, which is shown to overcome several shortcomings. Regression underlines the key variables in nursing workload and workforce planning. The method proved efficient and effective with high utility.
Key words: review, regression.

Barr, A. Moores, B. and Rhys-Hearn, C. (1973)
A review of the various methods of measuring the dependency of patients and nursing staff,
International Journal of Nursing Studies, 10, 3, pp.195-208.
Summary: An early stock take of contemporary nursing workforce planning methods. Strengths and weaknesses of various approaches are covered.
Key words: review.

Bosanquet, N. and Gerard K. (1985)
Discussion Paper 9. Nursing Manpower: Recent Trends and Policy Options,
University of York: Centre for Health Economics.
Summary: State-of-the-art-review of contemporary methods.
Key words: review.

Buchan, J. Ball, J. and O'May, F. (1996)
The Right Profile: A Review of Approaches to Determining Personnel Mix in Health Care,
Edinburgh University: Queen Margaret College.
Summary: Comprehensive review of contemporary workload measures and workforce planning methods.
Key words: review.

Carr-Hill, R.A. and Jenkins-Clarke, S. (1995)
The chimera of nursing workload management systems,
Health Informatics, 1, pp.22-25.
and

Carr-Hill, R.A. and Jenkins-Clarke, S. (1995)
Measurement systems in principle and practice: the example of nursing workload,
Journal of Nursing Administration, 22, pp.221-225.
Summary: Compares the outcomes of workload systems applied to three wards. Their reliability and validity are considered in detail. Differences between methods' outcomes in the same wards are examined. Specimen data are provided.
Key words: review.

Davies, J. (2002)
Workforce planning: strong-arm tactics,
Health Service Journal, 112, 5832, pp.24-27,
Summary: Conecntrates on the role of Workforce Development Confederations in demand sised workforce planning. Describes current vacancies in all occupational groups and sets out government targets.

Davies, M. (1996)
Skillmix Studies: A Critique of Available Methods,
Bedford Hospitals NHS Trust.
Summary: Describes and evaluates contemporary nursing workload and workforce planning methods. Focuses on the NISCM dependency-acuity method.
Key words: review, dependency-acuity.

Department of Health, Education and Welfare. (1978)
Methods for Studying Nurse Staffing in a Patient Unit,
Hyattsville: DHEW.
Summary: Detailed review of contemporary nursing workload and workforce planning methods.
Key words: review.

DoH Nursing Group. (1999)
Systems and Methodologies for Assessing Nursing Care and Costs in Nursing and Residential Homes,
London: DoH.
Summary: A review of contemporary patient dependency classification systems. Applies equally to some elderly care wards.
Key words: dependency, elderly, review.

DHSS. Operational Research Service (1982)
Nurse Manpower: Maintaining the Balance,
London: DHSS.
Summary: State-of-the-art review of contemporary demand-side nursing workforce planning methods.
Key words: review.

DHSS Operational Research Service. (1982)
Nurse Manpower Planning: Approaches and Techniques,
London: DHSS.
Summary: State-of-the-art review of (almost 400) contemporary nursing workforce planning methods. Divides methods into two categories: top-down formulas, such as nurses per

occupied bed, generated elsewhere but applied locally, and bottom-up methods that scrutinise patient and nursing activity data. Comments on the complex to simple range of methods.
Key words: review.

DHSS. (1984)
Nurse Manpower Project for the NHS Management Inquiry. 'A Comparison of Some Methods of Estimating the Requirements for Nurse Staffing.',
London: DHSS.
Summary: Considers seven contemporary nursing workforce planning methods, which range professional judgement to dependency-activity-quality approaches. Compares and contrasts these, using empirical data. Explores methods' reliability, particularly their consistency.
Key words: review.

DHSS. (1985)
Report No ORZ 1051: A Critique of Methods for Determining Nurse Staffing Levels,
London: DHSS.
Summary: Classifies and critiques contemporary nursing workforce planning methods, which are divided into top-down management and bottom-up patient/nurse-led methods.
Key words: review.

DHSS Operational Research Division. (1986)
Nurse Demand Methods - Whither Now?
London: HMSO.
Summary: Explores strengths and weaknesses of demand-side workforce planning methods. No recommendations are made but ample evidence allows the reader to judge and select methods.
Key words: review.

DHSS. (1988)
Options and Opportunities?
London: DHSS.
Summary: Explores strengths and weaknesses of demand-side workforce planning methods. No recommendations are made but ample evidence allows the reader to judge and select methods.
Key words: review.

Devine, C. McClean, S. and Reid, N. (1993)
Nurse manpower: a review of United Kingdom Methodologies,
Journal of Advanced Nursing, 18, pp.1883-1839.
Summary: State-of-the-art review of methods. Decides on two ways of categorising these methods: top-down and bottom-up, specifically the timed-task/activity and dependency-acuity methods. Reintroduces the nursing hours per patient approach. Commends its adoption owing to the method's simplicity.
Key words: review, nursing hours per patient method.

Dylak, P. (1991)
A Study of a Dependency-Based Nurse Manpower Planning System,
Manchester: Manchester Central Hospitals and Community Care NHS Trust.
Summary: A critique of contemporary workforce planning methods intended for local consumption. Dependency classification is criticised as unnecessarily complicated, preferring instead bed occupancy as the main variable. Instruments, data analysis methods and some results are provided.
Key words: dependency-acuity, review.

Edwardson, S.R. and Giovannetti, P.B. (1994)
Nursing workload measurement systems.
Critical Review of Nursing Research, 12, pp.95-123.
Summary: Explores nursing workload systems mainly from a theoretical perspective. Concludes that systems underpinned by robust variables, such as patient dependency, fair better.
Key words: review, dependency.

Fawcett, R. (1985)
Manpower planning: art or science?
Nursing Mirror, 160, 1, pp.20-22.
and
Fawcett, R. (1985)
Manpower planning: art or science?
Nursing Mirror, 160, 2, pp.29-31.
Summary: Classifies and describes contemporary nursing workload measuring methods. Focuses on Monitor/Criteria for Care. Specimen instruments and data are provided.
Key words: dependency-acuity-quality, review.

Gault, A.R. (1982)
The Aberdeen Formula as an illustration of the difficulty of determining nursing establishments,
International Journal of Nursing Studies, 19, pp.61-77.
Summary: A critique of the regression-based and timed-task/activity method of measuring nursing workload; using the Aberdeen formula as an illustration.
Key words: review, timed-task/activity.

Gibbs, I. McGaughan, M. and Griffiths, M. (1991)
Skill mix in nursing: a selective review of the literature,
Journal of Advanced Nursing, 16, pp. 242-249.
Summary: Systematic literature review into the cost and quality of nursing care and its relationship to skill mix and grade mix. A range of demand-side workforce planning issues are considered. No instruments are described but some data are given.
Key words: review, cost, quality, grade mix, skill mix.

Gray, A. (1987)
A mixed review,
Senior Nurse, 6, 2, pp.7-8.
Summary: A review of the DHSS (1986) Mix and Match report. Examines some useful techniques for exploring grade mix, nursing activity and costs. Specimen data are provided.
Key words: review, grade mix, costs.

Greenhalgh and Co. (1991)
Using Information in Managing the Nursing Resource - The Rainbow Pack,
Macclesfield: Greenhalgh Healthcare Consultants.
and
Greenhalgh and Co Ltd. (1991)
Nurse Management Systems. A Guide to Existing and Potential Products,
Macclesfield: Greenhalgh Healthcare Consultants.
Summary: Comprehensive, state-of-the-art review of many nursing workload measuring and workforce planning methods. Presents their strengths and weaknesses. Workload and grade mix are set in the context of quality; personnel and finances. Essentially the booklets are distance learning pack for ward managers. Information is dated but the principles apply.
Key words: activity, quality, grade mix, costs, review.

Hancock, C. (1980)
Finding the right level,
Nursing Mirror, 150, 2, pp.37-8.
Summary: Considers studies that establish staffing methods. Explains that acute wards have been well studied but Cinderella care groups, like paediatrics, have not been evaluated.
Key words: review.

Hansed, K. (2002)
Ward staffing: finding your form,
Health Service Journal, 112, 5830, pp.28-29.
Summary: Considers the workforce planning problems ward managers face and what needs to be done to solve them. Explores demand and supply side, and rotas.
Key words: review, rotas.

Harris, D.H. (1970)
Nursing: staffing requirements,
Hospitals, 44, pp.64-70.
Summary: Early examination of nursing workload methods and workforce planing. Outmoded but the principles apply.
Key words: review.

Hirsh, W. (1985)
Inside information,
Senior Nurse, 2, 2, pp.24-25.
and

Hirsh, W. (1986)
Planning with a purpose,
Senior Nurse, 4, 3, pp.18-20.
Summary: Examines the types of nursing workforce planning data (demand and supply side, but concentrates on the latter), how they are organised and how they can be used, manually and electronically to evaluate the workforce. Logically explains the issues in six steps.
Key words: review.

Hughes, M. (1999)
Nursing workload: an unquantifiable entity,
Journal of Nursing Management, 7, pp.317-322.
Summary: Comprehensively explores the literature that questions the validity, reliability and utility of nursing workload measures. Most contemporary nursing workload systems are included, which are allocated to three broad categories for review. Shows that different nursing workload methods used in the same settings can give different results. Other weaknesses are discussed. Concludes that large, computer based systems can show workload trends.
Key words: review.

Hurst, K. (1993)
Nursing Workforce Planning,
Harlow: Longman.
Summary: Describes, using plenty of worked examples, most contemporary nursing workload measures and workforce planning approaches. Data are outmoded but the principles apply.
Key words: professional judgement, nurses per occupied bed, dependency-activity-quality, timed-task/activity, time-out, grade mix.

Hutt, R. (1984)
Bringing facts to life,
Senior Nurse, 1, 32, pp.18-22.
Summary: Makes a connection between nurse education and demand side workforce planning.
Key words: review.

Illsley, V. and Goldstone, L. (1985)
Manpower planning: methods of planning,
Senior Nurse, 3, 6, pp.14-18.
Summary: Clearly and simply describes contemporary top-down and bottom-up workforce planning methods: nurses per occupied bed, regression-based, timed-task/activity, dependency-acuity and professional judgement.
Key words: review.

Jenkins-Clarke, S. (1992)
From lamps to laptops,
International Journal of Health Informatics, 2, 1, pp.11-14
and

Jenkins-Clarke, S. (1992)
Measuring Nursing Workload; a Cautionary Tale.
York University: Centre for Health Economics.
Summary: Extends the debate about the validity and reliability of commonly used nursing workload systems. Examines the benefits, weaknesses and implications of importing nursing and patient data compared with generating local data.
Key words: review.

Jenkins-Clarke, S. and Carr-Hill, R. (1991)
Nursing Workload Measures and Casemix: An Investigation of Reliability and Validity of Nursing Workload Measures.
York University: Centre for Health Economics.
and
Jenkins-Clarke, S. and Carr-Hill, R. (1992)
Marking time,
Health Service Journal, 102, 5297, pp.24-25).
Summary: Detailed, theoretical and empirical exploration of four commonly used workload measures' (FIP, SENS, Exelcare and Criteria for Care) psychometric properties. Several warnings are highlighted especially about importing data from other hospitals, and the cost of generating local data. Outcomes from the different workload measures varied remarkably but no trends emerged.
Key words: review.

JoNA. (1985) Consider this… [GRASP]
Journal of Nursing Administration, 15, 9, p.6, p.14.
Summary: Describes, compares and contrasts CASH (a dependency-activity workload measure) with GRASP (a timed-task/activity system). Outcomes were similar but GRASP takes longer to use.
Key words: dependency-activity, timed-task/activity, review.

Leenders, F. (1985)
Management: translating strategy.
Nursing Times, 81, 39, pp.43-45.
Summary: Compares and contrasts North American with UK nursing workforce planning methods. Broadly classifying methods as top-down management and bottom-up dependency-acuity. Cost and quality issues are considered. Specimen data and results are given.
Key words: review, dependency-acuity, cost, quality.

MacGuire, J. (1986)
Not on prescription,
Senior Nurse, 5, 4, pp.10-11.
Summary: Summarises the DHSS 1986 Mix and Match report. Concentrates on the report's main recommendations and argues the pro's and con's. Reflects on the NHS's unsystematic approach to workforce planning. Concludes that there isn't a best approach, but that a horses for courses approach is a sensible one. No instruments but some dependency and workload data are provided.
Key words: review.

Malin, H. (1986)

Nurse Demand Methods - Whither Now?
London: DHSS Operational Research Service.
Summary: Reflects on several years of nursing workforce planning research. Describes the complexity of the work and lack of consensus. Advocates the 'start simple' approach by using methods such as nurses per occupied bed.
Key words: review.

Mahmood, K. (1999)
Skillmix Review in Elderly Care: a Pragmatic Approach,
South West Regional Education and Development Group.
Summary: Detailed study of the actual and ideal skill mix in one hospital. Explores several peripheral issues and employs the NISCM dependency-acuity-quality nursing workload measure. Also reviews a range of alternative nursing workload measures, including their strengths and weaknesses.
Key words: review, dependency-acuity-quality, skill mix.

Meyer, D. (1978)
GRASP. Workload management system ensures stable nurse-patient ratios,
Hospitals, 52, 5, pp.81-85.
and
Meyer, D. (1980)
GRASP or a patient dependency category classification system: which do you chose?
Health Care Systems, Fall, no pages.
and
Meyer, D. (1982)
GRASP Too: Applications and Adaptations of the GRASP Nursing Workload Management System,
North Carolina: MCS.
and
Meyer, D. (1984)
Manpower planning: an American approach,
Nursing Times, 80, 34, pp.52-54.
Summary: Describes the GRASP timed-task/activity nursing workload measure and workforce planning system, including a useful précis of the 1978 GRASP how-to-do-it manual. GRASP is compared and contrasted with other systems; strengths and weaknesses of both are brought out. Specimen instruments and data are included. The system has been computerised in recent years.
Key words: timed-task/activity, review.

Mobbs, D. (circa 1986)
The relationship between district and region in the manpower planning process: a pilot study.
Health Service Manpower Review, no volume, issue nor date, pp,13-16.
Summary: Takes a global look at nursing workforce planning before deciding local workforce planning aims and objectives. Notes the variation in approaches used by hospitals and the proportion that have no system. Explores empirically the nature and purpose of top-down management approaches, and Region's influence. Argues the value of dedicated workforce planning departments.
Key words: review, top-down.

Moores, B. (1983)
1. Past initiatives,
Nursing Times, 79, 49, pp.24-26.
and
Moores, B. (1983)
2. Present developments,
Nursing Times, 79, 50, pp.34-35.
Summary: Reviews contemporary nursing workforce planning methods. Concentrates on the dependency-acuity method that sets the scene for a Nursing Times series (included in this bibliography). Specimen data are provided.
Key words: review, dependency-acuity.

National Audit Office (1985)
Report by the Comptroller and Auditor General. National Health Service: Control of Nursing Manpower,
London: HMSO.
Summary: Explores whether the NHS deploys the right number and mix of nurses, and does it efficiently and effectively. Suggests what nursing data are needed to evaluate the nursing workforce. Notes the lack of systematic approaches in hospitals.
Key words: review.

Needham, J. (1997)
Accuracy and workload measurement: a fact or fallacy,
Journal of Nursing Management, 5, 2, pp.83-87.
Summary: Defines workload before exploring validity and reliability of bottom-up, dependency-based methods. Top-down management methods are compared. Workload is discussed in quality terms.
Key words: review, quality.

Norman, S. Quinn, H. and Malin, H. (1988)
The Resource Management Initiative and Ward Nursing Management Information Systems,
London: DoH Nursing Division and Operational Research Services.
Summary: Examines nursing workload measures in a resource management context. The nature and value of contemporary workload methods are covered.
Key words: review.

Ramey, I.G. (1973)
Eleven steps to proper staffing,
Hospitals, 47, pp.98-104,
Summary: Dated but systematic review of demand and supply-side issues in a North American context.
Key words: review.

Rees, S. Bolton, J.P.G. and Mant, J.W.F. (1991)
How many nurses?
Senior Nurse, 11, 5, pp.31-35
Summary: Compares and contrasts FIP (dependency, timed-task/activity), Excelcare (computerised timed-task/activity) and the computerised McGratty (dependency-acuity) methods. Reliability, validity and utility are extensively discussed. Differences (classed as idiosyncratic (human) and methodological (system)) between the workload values of different methods, and their influence on nursing cost and quality are considered.
Key words: review.

Rhys-Hearn, C. (1972)
How many high care patients?
Nursing Times, 68, 16, pp.472-474.
and
Rhys-Hearn, C. (1972)
How many high care patients?
Nursing Times, 68, 17, pp.504-505.
and
Rhys-Hearn, C. (1974)
Evaluation of patients' nursing needs: prediction of staffing 1.
Nursing Times, Occasional Paper, 70, pp.69-72
and
Rhys-Hearn, C. (1974)
Evaluation of patients' nursing needs: prediction of staffing 2.
Nursing Times, Occasional Paper, 70, pp.73-76
and
Rhys-Hearn, C. (1974)
Evaluation of patients' nursing needs: prediction of staffing 3.
Nursing Times, Occasional Paper, 70, pp.77-80
and
Rhys-Hearn, C. (1974)
Evaluation of patients' nursing needs: prediction of staffing 4.
Nursing Times, Occasional Paper, 70, pp.81-84
and
Rhys-Hearn, C. (1977)
Nursing workload determination: development and trials of a package.
Medical Informatics, 2, 2, pp.91-99
and
Rhys-Hearn, C. (1979)
Staffing geriatric wards. Trials of a 'package' - 1,
Nursing Times, Occasional Papers, 75, 17, pp.45-48.
and
Rhys-Hearn, C. (1979)
Staffing geriatric wards. Trials of a 'package' - 2,
Nursing Times, Occasional Papers, 75, 18, p.52.
and

Rhys-Hearn, C. (1979)
Comparison of Rhys-hearn method of determining nursing staff requirements with the Aberdeen formula,
International Journal of Nursing Studies, 16, 1, pp.95-103.
and
Rhys-Hearn, C. (1979)
Evaluation of Nurse Activity, in: Alperovitch, A. de-Dombal, F.T. and Gremy, F. (eds)
Evaluation and Efficiency of Medical Action,
Amsterdam: North-Holland Publishing Company.
and
Rhys-Hearn, C. and Howard, J. (1980)
The Relationship of Nursing Needs, Resources and Standards in Geriatric Wards,
London: DHSS.
and
Rhys-Hearn, C. and Potts, D. (1978)
The effect of patients' individual characteristics upon activity times of nursing care.
International Journal of Nursing Studies, 15, 1, pp.23-30.
and
Rhys-Hearn, C. and Young, B. (1981)
Experience with the Rhys-Hearn geriatric workload package - a regional survey.
Nursing Times, Occasional Paper, 77, 4, pp.9-12.
Summary: A series of articles that applies the Rhys-Hearn dependency-activity method to various care settings, but elderly care features strongly. Case controlled trials and other research designs are used to test different establishments and grade mixes from a dependency, workload and quality perspectives. Instruments and ample specimen data are provided. Outcomes of the Rhys-Hearn method are compared with other approaches. The data and results are outmoded but the method's principles are relevant today.
Key words: dependency-activity, quality, elderly, review.

Rushworth, V.E.C. (1982)
Lies, damned lies and statistics,
Nursing Times, 78, 30, pp.1281-1282.
Summary: Demystifies supply and demand-side workforce planning. Bridges, using payroll and census data, demand and supply side approaches to workforce planning. Outmoded but the principles apply today.
Key words: review, actual staffing.

Rushworth, V. and Tackett, A. (1984)
Bottoms up?
Nursing Times, 80, 23, pp.16-18.
Summary: Describes the workforce planning systems considered during the Griffiths Management Inquiry; including professional judgement and dependency-acuity-quality. Clearly and simply shows each method's components, strengths and weaknesses. Conclusions are often supported empirically, and some not-often considered workforce planning issues like time-out are included.
Key words: review.

Schroeder, R.E. Rhodes, A.M. and Shields, R.E. (1984)
Nurse activity systems: CASH Vs GRASP: a determination of nurse staffing requirements,
Nursing Forum, 21, 2, pp.72-77.
Summary: Describes, compares and contrasts the CASH dependency-activity with the GRASP timed-task/activity nursing workload measure. Instruments and specimen data are provided. Both systems generated similar results but CASH was judge easier to use and less expensive.
Key words: review, timed-task/activity, dependency-acuity.

Scottish Integrated Workforce Planning Group. (2002)
Planning Together. Final Report of the SIWPG,
Edinburgh: Scottish Executive.
Summary: Detailed examination of NHS workforce demand and supply side. Concentrates on developing the workforce to meet future health care challenges. Structures and processes at national, regional and local level are described to help improve the efficiency and effectiveness of workforce planning.
Key words: review.

Slack, P. (1984)
How many nurses do we need?
Nursing Times, 81, 40, pp.19-20.
Summary: Reviews the nature and value of contemporary nursing workload measures including GRASP, PRN, Cheltenham, Criteria for Care, nursing hours per patient day. Underlines the important questions managers need to ask before selecting one or more approaches. The context is outmoded but the principles apply today.
Key words: review.

Snell, J. (2000)
Workforce Planning: Fleet of foot,
Health Service Journal, 110, 5692, pp.26-27.
and
Snell, J. (2000)
NHS Careers: Local counsel,
Health Service Journal, 110, 5718, pp.30-31.
Summary: Examines modern supply-side workforce planning issues; some of which influence demand side.
Key words: review.

Telford, W.A. (1979)
A method of determining nursing establishments,
Hospital Health Services Review, 5, 4. pp. 11-17.
and

Telford, W.A. (1983)
Determining Nursing Establishments: Telford Consultative Approach,
Birmingham: North Birmingham Health Authority.
Summary: Compares and contrasts the dependency-acuity and professional judgement methods. Questions the objective, scientific approach and recommends the simplicity of a three-step professional judgement method. Each step is described with examples. Instruments and specimen data are given. Honestly reports professional judgement method's weaknesses and how they can be overcome. A later report (South East Staffordshire Health Authority. circa 1990) report adds a quality of care measure to evaluate establishments.
Key words: professional judgement, review, quality.

Vaughan, R.G. and MacLeod, V. (1981)
Nurse staffing studies. No need to reinvent the wheel,
Journal of Nurse Administration, 10, pp.9-15.
Summary: Questions the need for hospital managers to develop bespoke nursing workload measures.
Key words: review.

Waite, R. (1986)
A network for safe staffing,
Nursing Times, 82, 9, pp.58-60.
and
Waite, R. (1986)
Nursing by numbers,
Nursing Times, 82, 8, pp.40-42.
and
Waite, R. and Hirsh, W. (1985)
Nursing Workload and Staffing Levels Summary Report
Sussex: Brighton Health Authority.
and
Waite, R. and Hirsh, W. (1986)
Not another dependency study,
Senior Nurse, 4, 1, pp.29-32.
and
Waite, R. and Hirsh, W. (1986)
Controlling workloads,
Senior Nurse, 4, 2, pp.14-17.
Summary: Describes Brighton's workforce planning method that considers dependency, occupancy, case mix and care safety in a nurse per patient context decided by professional judgement enhanced by regression analysis. Specimen instruments, computer screens and data are provided. Psychometric properties of workload measures are discussed and Brighton method's outcomes are compared with those generated by other nursing workload measures. One bottom line is that nursing workforce planning methods are too complicated. Another is that wide discrepancies exist between actual and recommended staffing levels, and that staffing levels do not always match workloads; that is, the inflexibility factor persists.
Key words: review, dependency, professional judgement, IM&T, nurses per occupied bed.

Wilson-Barnett, J. (1978)
A Review of Patient-Nurse Dependency Studies,
London: DHSS.
Summary: State-of-the-art review of patient dependency literature of its time. Many annotations are more detailed than presented in this review.
Key words: dependency, review.

Annotated Bibliography: Professional Judgement Method

The professional judgement method of estimating the most appropriate size and mix of nursing teams has stood the test of time. A distinct feature in many texts is the robust use of triangulation to strengthen the professional judgement method. Like the nurses per occupied bed approach, professional judgement is a simple to use springboard to more complex methods. Many authors in the texts below compare and contrast the professional judgement method with its counterparts.

Barr, A. (1983)
Nursing Hours Per Patient Day
Oxford: Oxford Regional Health Authority.
Summary: Explains a robust nursing hours per patient day, bed occupancy and professional judgement approach to calculating ward staffing. If nothing else, these are stepping stones to more sophisticated methods.
Key words: nursing hours per patient, nurses per occupied bed, professional judgement.

Bloore, J. (1984)
Manpower planning two: a system from Gloucestershire,
Nursing Times, 80, 34, pp.55-57.
Summary: Describes the Cheltenham nursing workload and workforce planning system. Compares and contrasts the Cheltenham timed-task/activity method with four other main methods: top-down, regression-based, professional judgement and dependency-acuity. Cheltenham's limitations are honestly reported within a carefully explained implementation programme.
Key words: timed-task/activity method, top-down, regression-based, professional judgement dependency-acuity.

Davies, A. Goldberg, B. and Wilkinson, I. (1984)
A methodology for manpower planning. Further applications of standardised assessments for the elderly,
Nursing Times, 80, 2, pp.44-46.
Summary: Takes the principles from dependency-activity-quality methods, enhanced using professional judgement, to create a workforce planning system for elderly mentally infirm wards.
Key words: elderly, dependency-activity-quality, professional judgement.

Hurst, K. (1993)
Nursing Workforce Planning,
Harlow: Longman.
Summary: Describes, using plenty of worked examples, most contemporary nursing workload measures and workforce planning approaches. Data are outmoded but the principles apply.
Key words: professional judgement, nurses per occupied bed, dependency-activity-quality, timed-task/activity, time-out, grade mix.

Illsley, V. and Goldstone, L. (1985)
Manpower planning: methods of planning,
Senior Nurse, 3, 6, pp.14-18.
Summary: Clearly and simply describes contemporary top-down and bottom-up workforce planning methods: nurses per occupied bed, regression-based, timed-task/activity, dependency-acuity and professional judgement methods.
Key words: review.

JDM Management Services (1994)
The Value of your NISCM Information,
Skipton: JDM Management Services.
and
JDM Management Services (1994)
Why Do You Need Nursing Information,
Skipton: JDM Management Services.
Summary: Describes the NISCM system's contribution to nursing information broadly and workload information specifically. Activity analysis and direct/indirect care are described in detail. A quality measure that monitors available nursing hours against nursing hours demanded can be made to run in parallel, which provides data when nursing care falls below safe levels.
Key words: dependency-acuity, professional judgement.
Morris, P. (1995)
Evaluation Report: Nurse Workload Project,
Coventry: South Warwickshire General Hospitals NHS Trust.
Summary: Comprehensive review of contemporary nursing workload measures. The reasons for selecting NISCM are discussed.
Key words: review, dependency-acuity, professional judgement.

Telford, W.A. (1979)
A method of determining nursing establishments,
Hospital Health Services Review, 5, 4. pp. 11-17.
and
Telford, W.A. (1983)
Determining Nursing Establishments: Telford Consultative Approach,
Birmingham: North Birmingham Health Authority.
Summary: Compares and contrasts the dependency-acuity and professional judgement methods. Questions the objective, scientific approach and recommends the simplicity of a three-step professional judgement method. Each step is described with examples. Instruments and specimen data are given. Honestly reports professional judgement method weaknesses and how they can be overcome. A later report (South East Staffordshire Health Authority circa 1990) adds a quality of care measure to evaluate establishments.
Key words: professional judgement, review, quality.

Waite, R. (1986)
A network for safe staffing,
Nursing Times, 82, 9, pp.58-60.
and

Waite, R. (1986)
Nursing by numbers,
Nursing Times, 82, 8, pp.40-42.
and
Waite, R. and Hirsh, W. (1985)
Nursing Workload and Staffing Levels Summary Report
Sussex: Brighton Health Authority.
and
Waite, R. and Hirsh, W. (1986)
Not another dependency study,
Senior Nurse, 4, 1, pp.29-32.
and
Waite, R. and Hirsh, W. (1986)
Controlling workloads,
Senior Nurse, 4, 2, pp.14-17.

Summary: Describes Brighton's workforce planning method that considers dependency, occupancy, case mix and care safety in a nurse per patient context decided by professional judgement enhanced by regression analysis. Specimen instruments, computer screens and data are provided. Psychometric properties of workload measures are discussed and Brighton method's outcomes are compared with those generated by other nursing workload measures. One bottom line is that nursing workforce planning methods are getting complicated. Another is that wide discrepancies exist between actual and recommended staffing levels, and that staffing levels do not always match workloads; that is, the inflexibility factor persists.

Key words: review, dependency, professional judgement, IM&T, nurses per occupied bed.

Annotated Bibliography: Time-out

Given that one in five nurses may be away from the team at any given period, time-out (leave and absence of all kinds) is an important variable when finally deciding the size of the nursing team.

Allen, C. (2001)
Human resources: lean on me.
Health Service Journal, 111, 5744, pp.32-3.
Summary: Provides valuable data and insight into 'time-out', which workforce planners include in their staffing calculations.
Key words: time-out.

Hurst, K. (1993)
Nursing Workforce Planning,
Harlow: Longman.
Summary: Describes, using plenty of worked examples, most contemporary nursing workload measures and workforce planning approaches. Data are outmoded but the principles apply.
Key words: professional judgement, nurses per occupied bed, dependency-activity-quality, timed-task/activity, time-out, grade mix.

MacKay, L. (1988)
No time to care,
Nursing Times, 84, 11, pp.33-34.
Summary: Looks at the relationship between under-staffing, excessive workload and time-out. Broader workforce planning issues are discussed.
Key words: time-out, actual staffing, acuity.

Presly, A.S. (1980)
An evaluation of the reduction in patient numbers in psycho-geriatric wards,
Health Bulletin, 38, 1, pp.32-36.
Summary: Detailed study of patient dependency, nursing activity, quality of care, actual staffing and time-out in a new elderly mentally infirm unit.
Key words: patient dependency, nursing activity, quality of care, actual staffing, time-out.

Rapson, C. and Halliday, J. (2002)
Safety in numbers,
Health Service Journal, 112, 5802, pp.24-25,
Summary: Describes the nature, value and application of the NISCM dependency-acuity nursing workload system. Addresses some unusual quality issues, such as untoward incidents, in the relation to under-staffing. Time-out is also considered. Argues strongly that workload and staffing methods are essential for modern workforce planning.
Key words: dependency-acuity, quality, time-out.

Seccombe, I. and Buchan, J. (1993)
High anxiety,
Health Service Journal, 103, 5373, pp.22-24.
Summary: Generates insights into time-out, especially sickness-absence data and how they can be used in workforce planning.
Key words: time-out.

Taunton, R.L. Kleinbeck, S.V.M. Stafford, R. et al. (1994)
Patient outcomes: are they linked to registered nurse absenteeism, separation or workload?
Journal of Nursing Administration, 24, suppl.48-55, erratum 24, 72.
Summary: Concludes that variables other than staffing levels and mix are responsible for good patient outcomes.
Key words: quality, time-out.

Annotated Bibliography: Payroll and Personnel Information

At first glance these articles/books/reports seem to concentrate on supply-side workforce planning. Closer inspection, on the other hand, shows how authors use payroll and personnel databases to inform demand-side workforce planning decisions.

Balk, E. (1982)
Manpower information, payroll and occupation codes,
Nursing Times, 78, 30, pp.1278-1281.
Summary: Specimen computer screens show how nominal roles can be used to help workforce planners. Information includes: starters and leavers, age, sex, retirement, head count and WTEs arranged by care group. Although the categories and information are dated they bridge demand and supply side issues.
Key words: payroll.

Berliner, H. (2002)
US Healthcare: United straights,
Health Service Journal, 112, 5811, p.32.
Summary: Looks at the North American nursing workforce from an unusual angle including: participation rates, shortfall, home and overseas recruitment, and retention.
Key words: actual establishment, payroll and personnel.

Deeming, C. (2002)
Data briefing: nurse vacancies,
Health Service Journal, 112, 5811, p.36.
Summary: Variables and supporting data that reflect or influence nursing shortages are examined quantitatively. Useful data such as vacancies, participation rates, nursing costs and agency/bank use are included in succinct article.
Key words: payroll/personnel, costs, actual staffing.

Naylor, S. and Horne, G. (1984)
Muddle in the Midlands,
Nursing Times, 80, 39, pp.48-51.
Summary: Describes the nature and purpose of the Naylor-Horn computerised nursing workforce modelling system, which manipulates the demand-side variables. Variables include joiners, leavers, age, source and destination. Specimen data are provided, which are dated but the principles apply.
Key words: payroll, IM&T.

Slack, P. (1983)
Snippet with a big future,
Nursing Times, 80, 11, pp.11-14.
Summary: Describes a modular PC-based system that uses personnel and payroll records to inform workforce planning.
Key words: payroll, IM&T.

Walker, G. (1983)
Management: Square pegs for square holes,
<u>Nursing Mirror</u>, 157, 24, pp.29-30.
Summary: Briefly reviews top-down and bottom-up workforce planning methods. Recommends the participation rate method that uses starters and leavers data as a spring board. Other variables like ages and nursing quality data are included.
Key words: payroll.

Annotated Bibliography: NPOB method

This literature epitomises the 'keep it simple' approach. Data for constructing NPOB formulas for determining the size and the mix of nursing teams are relatively easy to gather, manipulate and generate. However, as discussed above, the database can be expensive to maintain. The following literature includes: Barr; BGA; DHMS; RCCS and the Sheffield Northern General NPOB approaches. One advantage of the methods is that they are remarkably uniform across different care groups. However, probably more so than in other methods, data become quickly outmoded. Nevertheless, the principles will always be applicable. Many authors compare and contrast NPOB with other approaches. Some authors compare their actual staffing with NPOB outcomes. Articles with more recent data are excellent for bench marking. Generally, these texts are good for learning workforce planning's esoteric language.

Alberman, E. (1977)
Arrangements for special and intensive care of the new born,
British Medical Journal, 2, 6904, pp.1045-47.
Summary: A census of nurses per occupied (and other features) of intensive care units. Explores grade mix and staffing variations.
Key words: ITU, nurses per occupied bed.

Audit Commission. (2001)
Acute Hospital Portfolio. Review of National Findings, Ward Staffing 3,
Wetherby: Audit Commission Reports <www.audit-commission.gov.uk>.
Summary: Examines hospital nursing establishments, grade mix, cost and quality. Notes the variation in resources.
Key words: actual establishments.

Barnett, D. and McCann, P. (1988)
Staffing for intensive care or therapy,
Nursing Times, 84, 25, pp.46-48.
Summary: One of the few articles to explore staffing in specialist units. Notes the variations in nurses per occupied ITU beds. Describes a patient dependency system for ITUs. Also explains some unusual workforce planning variables such as support staff, in-unit laboratory facilities, etc. Instruments and data are provided. Ideal staffing and working conditions are covered.
Key words: nurses per occupied beds, ITUs, dependency.

Barr, A. (1983)
Nursing Hours Per Patient Day
Oxford: Oxford Regional Health Authority.
Summary: Explains a robust nursing hours per patient day, bed occupancy and professional judgement approach to calculating ward staffing. If nothing else, these are stepping stones to more sophisticated methods.
Key words: nursing hours per patient, nurses per occupied bed, professional judgement.

Berliner, H. (2002)
US Healthcare: United straights,
Health Service Journal, 112, 5811, p.32.
Summary: Looks at the North American nursing workforce from an unusual angle including: participation rates, shortfall, home and overseas recruitment, and retention.
Key words: actual establishment, payroll and personnel.

Bloore, J. (1984)
Manpower planning two: a system from Gloucestershire,
Nursing Times, 80, 34, pp.55-57.
Summary: Describes the Cheltenham nursing workload and workforce planning system. Compares and contrasts the Cheltenham timed-task/activity method with four other main methods: top-down, regression-based, professional judgement and dependency-acuity. Cheltenham's limitations are honestly reported within a carefully explained implementation programme.
Key words: timed-task/activity method, top-down, regression-based, professional judgement dependency-acuity.

Boam, T. (1977)
A question of balance: tactics and strategy of nurse manpower planning - 1,
Nursing Times, Occasional Papers, 73, 1, pp.1-4.
and
Boam, T. (1977)
A question of balance: tactics and strategy of nurse manpower planning - 2,
Nursing Times, Occasional Papers, 73, 2, pp.5-8.
Summary: Describes the RCCS, DHMS and BGA nurses per occupied bed methods. Explores the methods' weaknesses before explaining a workload-based approach. Although dated the principles apply today.
Key words: nurses per occupied bed, dependency, acuity.

Bowden, H. Pierce, G. and Shaw, V. (1989)
Finding the right level,
Nursing Times, 85, 23, pp.48-50.
Summary: Uses nurses per occupied method to set nursing establishments. The method is well explained and specimen data are provided.
Key words: nurses per occupied bed.

Brocklehurst, J. and Andrews, K. (1987)
Nurse staffing in geriatric wards,
Nursing Times, Occasional Paper, 83, 1, pp.48-51.
Summary: Best practice nurses per occupied bed data are provided, which were generated from detailed empirical studies. Establishment and grade mix formulas, and specimen data are provided.
Key words: nurses per occupied bed, elderly care.

Buchan, J. (2002)
Human resources: Rallying the troops,
Health Service Journal, 112, 5807, pp.24-25.
Summary: Looks at current workforce development policies. Focuses on the supply-side, but demand side issues such as skill mix are implicit.
Key words: actual staffing.

Carr, A. J. (1976)
Workload and staffing on night duty,
Nursing Times, Occasional Paper, 72, 30, pp.105-108.
Summary: One of the few articles that concentrates on appropriate numbers and mix of nurses on night duty. Nurses per occupied bed formulas are provided. The results are outmoded but the principles remain.
Key words: shifts, nurses per occupied bed.

Deeming, C. (2002)
Data briefing: nurse vacancies,
Health Service Journal, 112, 5811, p.36.
Summary: Variables and supporting data that reflect or influence nursing shortages are examined quantitatively. Useful data such as vacancies, participation rates, nursing costs and agency/bank time are included in a succinct article.
Key words: payroll/personnel, costs, actual staffing.

Devine, C. McClean, S. and Reid, N. (1993)
Nurse manpower: a review of United Kingdom methodologies,
Journal of Advanced Nursing, 18, pp.1883-1839.
Summary: State-of-the-art review of methods. Decides on two ways of categorising approaches: top-down and bottom-up, specifically the timed-task/activity and dependency-acuity methods. Reintroduces the nursing hours per patient method. Commends its adoption owing to its simplicity. Methods not methodologies are reviewed.
Key words: review, nursing hours per patient method.

Evans, S.K. Laundon, T. and Yamamoto, W.G. (1980)
Projecting staffing requirements for intensive care units,
Journal of Nursing Administration, 35, pp.36-42.
Summary: Describes a way of classifying ITU patients and provides a nurses per occupied bed formula.
Key words: ITUs, dependency, nurses per occupied bed.

Fuller, C. (1984)
Staffing a dialysis unit,
Nursing Times, 80, 38, pp.59-61.
Summary: One of the few articles that addresses staffing in specialist units. A modified nurses per occupied method, instruments and data are well described.
Key words: ITU, nurses per occupied bed.

Goldstone, L. (1981)
Nursing manpower requirements: a framework for rational discussion.
Health Service Manpower Review, pp.6-8.
Summary: Reviews all the main nursing workforce planning categories. Nurses per occupied bed and dependency-activity-quality methods are covered in detail. Other important variables are included such as indirect care and time-out. Specimen data and formulas are provided. Outmoded results but the principles apply still.
Key words: nurses per occupied bed, dependency-activity-quality.

Grant, N. (1979)
Time to Care. A Method of Calculating Nursing Workload Based on Individual Patient Care, London: Royal College of Nursing.
Summary: Nursing hours per patient method. Outmoded but principle are useful.
Key words: nursing hours per patient.

Gray, A. (1982)
Trends in the Characteristics and Deployment of Nursing Manpower in the NHS, Aberdeen University: HERU.
Summary: Longitudinal study that provides data on most nursing workforce variables. The nurses per occupied bed data are outmoded but the principles apply.
Key words: nurses per occupied bed.

Harrison, S. and Ayton, M. (1979)
Dependency of elderly people in homes and staffing ratios,
Health and Social Services Journal, 88, 4653, supplement pages 15-20.
and
Harrisson, S, and Ayton, M. (1980)
The dependency of elderly people in residential homes.
Nursing Times, Occasional Papers, 76, 43, pp.105-112.
and
Harrison, S.P. and Ayton, M. (1981)
The Care of Elderly People in Hospital and the Community: A Study of Resources and Nursing Needs,
Durham University: Department of Sociology and Social Policy.
and
Harrison, S. (1988)
Changing admission patterns of short-stay geriatric patients.
Nursing Times, Occasional Paper, 84, 4, pp.53-55.
Summary: A set of related papers that look at dependency, workload and nurses per occupied bed in elderly care settings. Notes discrepancies between sites and how elderly patient dependency increased. Outmoded but the principles apply.
Key words: dependency, activity, nurses per occupied bed, costs.

Harrison, J. Saunders, M.E. and Sims, A. (1977)
Some structural considerations in modular education for basic nursing students,
Journal of Advanced Nursing, 2, 4, pp.383-391.
Summary: Briefly examines the relationship between staffing ratios and the quality of student nurse education.
Key words: nurses per occupied bed.

Hawley, C.A. Stilwell, J.A. Robinson, J. and Bond, M. (1993)
Nurses Manage,
Aldershot: Averbury.
Summary: Detailed and systematic account of ward managers' responsibilities including nursing workload, establishments, grade mixes, rostering, nursing costs and quality. Draws on extensive empirical data from several acute wards. Outmoded but the principles apply.
Key words: actual staffing, dependency-acuity, quality, costs, rotas.

Hillingdon Area Health Authority. (1977)
Recruitment of Nursing Staff with Particular Reference to the Staffing of Regional Specialities,
Hillingdon: Area Health Authority
Summary: Notes the relationship between nursing workload, staffing, job satisfaction, recruitment and retention.
Key words: nurses per occupied bed.

Hurst, K. (1993)
Nursing Workforce Planning,
Harlow: Longman.
Summary: Describes, using plenty of worked examples, most contemporary nursing workload measures and workforce planning approaches. Data are outmoded but the principles apply.
Key words: professional judgement, nurses per occupied bed, dependency-activity-quality, timed-task/activity, time-out, grade mix.

Illsley, V. and Goldstone, L. (1985)
Manpower planning: methods of planning,
Senior Nurse, 3, 6, pp.14-18.
Summary: Clearly and simply describes contemporary top-down and bottom-up workforce planning methods: nurses per occupied bed, regression-based, timed-task/activity, dependency-acuity and professional judgement.
Key words: review.

Jones, J. Sanderson, C. and Black, N. (1993)
Does labour substitution occur in district general hospitals?
Health Trends, 25, 2, pp.68-72.
Summary: Explores nurses per occupied bed in a broader health context. The actual level of nurse staffing could not be attributed to occupancy nor dependency. Also contemplates grade mix and notes the absence of outcome patterns from rich dilute grade mixes. Concludes that these outcomes are historical and decries the absence of empirical workforce planning methods. Suggests that a dependency-activity-quality methods would help. Extensive data are provided for bench marking purposes.
Key words: actual staffing, nurses per occupied bed, dependency, grade mix.

Levendtam, A.K. and Bergbom Enberg, I. (1993)
The Zebra system - a new patient classification system,
Journal of Nursing Management, 1, pp.229-237.
Summary: Describes the Swedish Zebra patient dependency classification system. Instruments and specimen data are provided. The latter are based on nurses per occupied bed.
Key words: dependency, nurses per occupied bed.

Lockett, R.W. (1972)
Assessment of patients' dependency,
Nursing Times, Occasional Paper, 68, 15, pp.57-60.
Summary: Although set in a unit for learning difficulties, and somewhat outdated, the method of arriving at nurses per client can be extrapolated.
Key words: nurses per occupied bed.

MacDonald, F.G. (1972)
Coronary Care Units and the nurse,
Nursing Times, Occasional Paper, 68, 39, pp.113-116.
Summary: Empirically determined nurses per occupied ITU bed formula.
Key words: nurses per occupied bed, ITU.

MacKay, L. (1988)
No time to care,
Nursing Times, 84, 11, pp.33-34.
Summary: Looks at the relationship between under-staffing, excessive workload and time-out. Broader workforce planning issues are discussed.
Key words: time-out, actual staffing, acuity.

McGratty, P. (1985)
A daily forecast,
Nursing Times, 81, 36, p.45.
and
McGratty, P. (1985)
Confidence with practice,
Nursing Times, 81, 37, pp.38-40.
Summary: Describes the development and application of the AMI computerised NurSys dependency, nurses per patient method. Specimen instruments and results are given.
Key words: dependency, nurses per patient.

Mobbs, D. (circa 1986)
The relationship between district and region in the manpower planning process: a pilot study.
Health Service Manpower Review, no volume, issue nor date, pp.13-16.
Summary: Takes a global look at nursing workforce planning before deciding local workforce planning aims and objectives. Notes the variation in approaches used by hospitals and the proportion that have no system. Explores empirically the nature and purpose of top-down management approaches and the Regional Health Authority's influence. Argues the value of dedicated workforce planning departments.
Key words: review, top-down.

Moores, B. and Barr, L. (1982)
Nurse patient dependency revisited (somewhat apologetically).
Journal of Advanced Nursing, 7, pp.269-271.
Summary: Looks at the value of adding dependency into nursing workload measures. Questions the need for dependency data and suggests that occupancy alone may suffice.
Key words: dependency, nurses per occupied bed.

Moores, B. and Grant, G.W.B. (1977)
The 'Avoidance' syndrome in hospitals for the mentally handicapped,
International Journal of Nursing Studies, 14, 2, pp.91-95.
Summary: An early exploration of the relationship between dependency, nurse-patient ratios and quality of care.
Key words: dependency, nurses per occupied bed, quality.

Moores, B. and Moult, A. (1977)
Sources of variation in the pressure of work index in thirty hospital wards,
Journal of Advanced Nursing, 2, 3, pp.271-279.
and
Moores, B. and Moult, A. (1979)
Patterns of nurse activity,
Journal of Advanced Nursing, 4, 2, pp.137-149.
and
Moores, B. and Moult A, (1979)
The relationship between the level of nurse staffing and the patterns of patient care and staff activity,
Journal of Advanced Nursing, 4, 3, pp.299-306.
Summary: Detailed exploration about measuring and the value of nursing activity data. The relationship between available nursing hours and the pattern of nursing activity, especially their fluctuation, is discussed. The role of patient dependency is implicit. Detailed, outmoded data are provided, nevertheless the principles still apply.
Key words: activity, nurses per occupied bed, dependency.

Murray, F.A. (1974)
Nurses and their workload,
Health and Social Services Journal, 84, 4414, pp.2723-2724.
Summary: Compares the actual nurses per occupied bed with ones suggested by the patients' demand on nurses. Although outmoded data are provided, the principles remain relevant.
Key words: nurses per occupied bed.

North West Thames Regional Health Authority. (1975)
Patient Dependency in Barnet General Hospital,
North West Thames Regional Health Authority.
Summary: Evaluates local nursing establishments using the Rhys-Hearn dependency-activity and nurses per occupied bed methods.
Key words: dependency-activity, nurses per occupied bed.

Oxford Regional Hospital Board. (1967)
Report No. 9: Measurement of Nursing Care.
Oxford Regional Health Authority: Operational Research Unit.
and
Oxford Regional Hospital Board. (1967)
Nursing Dependency in the Medical Wards. An Analysis of Nursing Hours and Workload in the Radcliffe Infirmary.
Oxford Regional Health Authority: Operational Research Unit.
and
Oxford Regional Health Authority. (1983)
Nursing Hours Per Patient Day,
Oxford Regional Health Authority.
Summary: Describes the development and application of the Barr dependency classification. The later reports compare and contrasts nursing hours per patient with dependency-based workload estimates. Outmoded data but the principles apply.
Key words: dependency, nursing hours per patient.

Pinel, C. and Seriki, C. (1976)
Nursing establishments in geriatric hospitals,
Nursing Times, 77, 22, pp.850-853.
Summary: Examines the intra-ward and inter-ward nurses per occupied differences in elderly care wards. Nurse to patient ratios are given although they are dated.
Key words: nurses per occupied bed, elderly.

Poulton, K. (1985)
The dynamics of change,
Senior Nurse, 3, 5, pp.13-16.
Summary: Detailed examination of contemporary trends and distributions in the nursing workforce. Outmoded data but the analytical techniques apply today.
Key words: actual staffing.

Presly, A.S. (1980)
An evaluation of the reduction in patient numbers in psycho-geriatric wards,
Health Bulletin, 38, 1, pp.32-36.
Summary: Detailed study of patient dependency, nursing activity, quality of care, actual staffing and time out in a new elderly mentally infirm unit.
Key words: elderly care, patient dependency, nursing activity, quality of care, actual staffing, time-out.

Redshaw, M.E. Harris, A. and Ingram, J.C. (1993)
Nursing and medical staffing in neonatal units
Journal of Nursing Management, 1, pp.221-228.
Summary: Explores many neonatal patient and staffing variables including occupancy and nurses per occupied bed. Actual staffing was compared with staffing recommended by various formulas. Large inter-unit variations were found most notably grade mix.
Key words: ITU, nurses per occupied bed, grade mix.

Reid, E. and Candappa, H. (1986)
How to get value for money,
Nursing Times, 82, 10, pp.37-40.
Summary: Describes a broad-ranging, best value for money audit that included managers' perceptions of nurse establishments and grade mix. Good and poor management practices are considered. Outmoded data but the principles apply still apply.
Key words: actual staffing.

Reid, N. and Melaugh, M. (1988)
Nursing hours per patient: a method for monitoring and explaining staffing levels,
International Journal of Nursing Studies, 24, 1, pp.1-14.
Summary: Detailed empirical work is used to test the nature and value of an uncomplicated approach to estimating workload and presenting results. A good launch pad before sophisticated methods such the dependency-acuity method are tried.
Key words: nursing hours per patient.

Royal College of Nursing. (1976)
Standards of Care. A survey of the Thames Regions,
London: RCN.
Summary: A detailed, contemporary examination of actual staffing trends. Outmoded but principles and techniques apply today.
Key words: actual staffing.

Royal College of Nursing. (circa 1998)
RCN Assessment Tool for Nursing Older People,
Summary: Two-part, how-to-do-it manual for the RCN's elderly care dependency and nursing hours per patient workload instruments. The method has a built-in grade mix component. Data collection forms and specimen data are provided.
Key words: elderly, dependency, nursing hours per patient.

Rushworth, V.E.C. (1982)
Lies, damned lies and statistics,
Nursing Times, 78, 30, pp.1281-1282.
Summary: Demystifies supply and demand-side workforce planning. Bridges, using payroll and census data, demand and supply side approaches. Outmoded but the principles apply today.
Key words: review, actual staffing.

Senior, O.E. and Gratton, R.G. (1980)
Looking at Nurse Staffing Levels,
Sheffield: Trent Regional Health Authority.
and
Senior, O.E. and Taylor, I.D.S. (1978)
An Analysis of Nurse Staffing Levels in Hospitals in Trent Region,
Sheffield: Trent Regional Health Authority.
Summary: Describes the Trent Participation Rate method. Outmoded, but the techniques are applicable today.
Key words: actual staffing.

South East Thames Regional Health Authority. (1981)
Planning Guidelines and Policies,
Sussex: SETRHA.
Summary: Explains the development and application of a simple to use nurses per occupied bed ratio. Probably out of date but the principles apply.
Key words: nurses per occupied bed.

Standen, L.F.B. (1971)
Controlling bed availability,
Nursing Times, Occasional Papers, 67, 49, pp.193-194.
Summary: Determines the number of beds a hospital should open based on the number of nurses available. Barr's patient dependency classification is used to determine workload. Outmoded data but the principles apply.
Key words: nurses per occupied, dependency-acuity.

Waite, R. (1986)
A network for safe staffing,
Nursing Times, 82, 9, pp.58-60.
and
Waite, R. (1986)
Nursing by numbers,
Nursing Times, 82, 8, pp.40-42.
and
Waite, R. and Hirsh, W. (1985)
Nursing Workload and Staffing Levels Summary Report
Sussex: Brighton Health Authority.
and
Waite, R. and Hirsh, W. (1986)
Not another dependency study,
Senior Nurse, 4, 1, pp.29-32.
and
Waite, R. and Hirsh, W. (1986)
Controlling workloads,
Senior Nurse, 4, 2, pp.14-17.
Summary: Describes Brighton's workforce planning method that considers dependency, occupancy, case mix and care safety in a nurse per patient context decided by professional judgement enhanced by regression analysis. Specimen instruments, computer screens and data are provided. Psychometric properties of workload measures are discussed and Brighton method's outcomes are compared with those generated by other nursing workload measures. One bottom line is that nursing workforce planning methods are too complicated. Another is that wide discrepancies exist between actual and recommended staffing levels, and that staffing levels do not always match workloads; that is, the inflexibility factor persists.
Key words: review, dependency, professional judgement, IM&T, nurses per occupied bed.

Walker, C. (1984)
Staffing neonatal units,
Nursing Times, 80, 20, pp.32-33.
Summary: Reviews staffing in neonatal special care and intensive care units. Findings are dated but the principles apply today. Broader workforce planning issues are considered.
Key words: nurses per occupied bed, ITU.

Watts, J. Cochrane, D. and Conroy, M. (1993)
What about the workers?
Health Service Journal, 103, 5378, pp.27-29.
Summary: Describes Sheffield Northern General's approach to workforce planning, which includes supply and demand variables. The latter is largely nurses per occupied bed, explored using 'what-if?' spreadsheets. Grade mix and skill mix are considered. The method is expected to be refined as it is extended to other directorates in the hospital.
Key words: nurses per occupied bed, IM&T.

Yates, J. (1981)
Staff-patient ratios and hospital inquiries,
Nursing Times, 77, 50, pp.2143-2145.
Summary: Examines nurse-patient ratios in psychiatric hospitals. Variations and reasons are explored. Specimen data are provided. Although dated, the principles apply today.
Key words: nurses per occupied bed.

Annotated Bibliography: **Patient Dependency**

The extent to which patients are dependent on the nurse for part or all of their care is a major demand-side workforce planning variable. This section looks at the rationale behind patient dependency; its measuring approaches, psychometric issues and results. Instruments are provided and explanations are given about handling data. Dependency information from different contexts are considered although some data are anachronistic. Some texts go onto provide dependency-based staffing formula while other authors explore dependency data's other uses such as assessing a patient's readiness for discharge.

Astbury, C. (1986)
Recording patient dependency,
Nursing Times, 82, 21, pp.40-41.
Summary: Explains that the method and frequency of assessing patient dependency needs to be carefully considered. Shows that dependency varies intra and inter ward; the latter when wards are seemingly identical. Methods and results are given.
Key words: patient dependency.

Audit Commission. (1993)
Children First: a Study of Hospital Services,
London: HMSO.
Summary: Survey of seven hospitals and 31 paediatric ward staffing levels. Notes that few wards met the DoH recommended establishments and that dependency was a key nursing workload variable.
Key words: paediatric, dependency.

Bagust, A. (1990)
Dispel that old myth,
Health Service Journal, 100, 5208, pp.100-101.
Summary: Questions the validity of patient dependency as a variable in nursing workload and nursing costs. Provides specimen data.
Key words: patient dependency.

Barnett, D. and McCann, P. (1988)
Staffing for intensive care or therapy,
Nursing Times, 84, 25, pp.46-48.
Summary: One of the few articles to explore staffing in specialist units. Notes the variations in nurses per occupied ITU beds. Describes a patient dependency system for ITUs. Also explains some unusual workforce planning variables such as support staff, in-unit laboratory facilities, etc. Instruments and data are provided. Ideal staffing and working conditions are covered.
Key words: nurses per occupied beds, ITUs, dependency.

Barr, A. (1964)
Measuring Nursing Care,
Oxford: Oxford University Press.
and

Barr, A. (1967)
Measuring Nursing Care,
Oxford: Oxford University Press.
Summary: Barr's (1964) work is updated. Seminal work that established a valid and reliable patient dependency classification, nursing activity and acuity systems. Ample specimen data and results are provided.
Key words: dependency, activity, acuity.

Bryant, Y.M. and Heron, K. (1974)
Monitoring patient dependency Part 1.
Nursing Times, Occasional Paper, 70, 19, pp.1-4.
and
Bryant, Y.M. and Heron, K. (1974)
Monitoring patient dependency Part 2.
Nursing Times, Occasional Paper, 70, 20, pp.5-8.
Summary: Explains how patient dependency can be measured and monitored for the purposes of measuring nursing workload. Specimen forms, data and results are provided.
Key words: dependency.

Burger, H. Christie, J. and Smith, J. (1981)
How to combine patient classification and patient care planning.
Hospital Topics, Sept/Oct, pp.34-41.
Summary: Explores patient dependency systems' validity and reliability. Recommends ways of overcoming bias and other unforced errors.
Key words: dependency.

Butler, C. (1964)
Some Practical Results of Recording Nursing Care in Gynaecological Wards In: McLachan, G. (1964) Problems and Progress in Medical Care,
Oxford: Nuffield Provincial Hospital Trust.
Summary: An early study of patient dependency and its implications for nursing workload. Results are dated but the principles remain applicable.
Key words: dependency.

Cambell, T. Taylor, S. Callaghan, S. and Shuldham, C. (1997)
Casemix type as a predictor of nursing workload,
Journal of Nursing Management, 5, pp.237-245.
Summary: Casemix is used as a proxy for dependency and an indicator of nursing workload. Casemix groups were found wanting without the dependency variable.
Key words: dependency.

Clarke, E.L. and Diggs, W.W. (1971)
Quantifying patient care needs,
Hospitals, 45, 18, pp.96-100.
Summary: Reviews patient dependency methods of measuring nursing workload.
Key words: patient dependency.

David, J. and Pritchard, P. (1987)
Using Monitor,
Senior Nurse, 6, 4, pp.43-45.
Summary: Describes Monitor's nature, purpose and application to specific settings. Although the relationship between Monitor and patient dependency is covered, other workload issues are only briefly discussed (i.e., Criteria for Care). Specimen data and results are provided.
Key words: quality, dependency.

DoH (Department of Health) (1997)
A Bridge to the Future - Nursing Standards, Education and Workforce Planning in Paediatric Intensive Care,
Whetherby: DoH.
Summary: Provides a dependency-based formula for calculating nursing establishment and grade mix chaldern's wards.
Key words: paediatric, dependency.

DoH Nursing Group. (1999)
Systems and Methodologies for Assessing Nursing Care and Costs in Nursing and Residential Homes,
London: DoH.
Summary: A review of contemporary patient dependency classification systems. Applies equally to some elderly care wards.
Key words: dependency, elderly, review.

Dobson, M. (1970)
The coronary care unit: patterns,
Nursing Times, 66, 28, pp.869-871.
Summary: Patient dependency, nursing activity and nursing quality in the CCU. Examines the role of patients' emotions in their dependency scores.
Key words: dependency.

Dodd, K. Clarke, M.G. and Palmer, R.L. (1980)
Misplacement of the elderly in hospitals and residential homes: a survey and follow-up.
Health Trends, 12, 3, pp.74-76.
Summary: Examines elderly patient dependency and its influence on care location
Key words: elderly, dependency.

Donaldson, S.N. Wheeler, M.R. and Barr, A. (1977)
Demand for patient care,
British Medical Journal, 2, 6090, pp. 799-802.
Summary: Detailed empirical study of patient dependency and location of care. Shows that dependency can determine whether secondary or residential home is needed.
Key words: dependency.

Duberley, J. and Norman, S. (1990)
Nursing Workload Measurement and Nursing Data for Resource Management,
Leeds: NHS Executive, Financial Management Directorate, Resource Management Unit.
Summary: Describes a Financial Information Project (FIP) based system that estimates nursing workload from patient and nursing activity data.
Key words: dependency, timed-task/activity.

Edwardson, S.R. and Giovannetti, P.B. (1994)
Nursing workload measurement systems,
Critical Review of Nursing Research, 12, pp.95-123.
Summary: Explores nursing workload systems mainly from a theoretical perspective. Concludes that systems underpinned by robust variables, such as patient dependency, fair better.
Key words: review, dependency.

Evans, S.K. Laundon, T. and Yamamoto, W.G. (1980)
Projecting staffing requirements for intensive care units,
Journal of Nursing Administration, 35, pp.36-42.
Summary: Describes a way of classifying ITU patients and provides a nurses per occupied bed formula, which is influenced by dependency.
Key words: ITUs, dependency, nurses per occupied bed.

Fabray, C. and Greenhalgh, P. (1984)
Nursing time is money,
Nursing Times, 80, 46, pp.60-62.
Summary: Describes the FIP dependency, timed-task/activity method of measuring nursing workload, which was developed from the Cheltenham system. Specimen instruments and data are given. The relationship between workload and resources are extensively discussed.
Key words: dependency, timed-task/activity, cost.

Farrell, G. (undated)
Resource Utilisation Groups (RUGs),
NHS Information Authority.
Summary: Describes the RUGs patient dependency assessment instrument and how it can be applied to elderly and other care groups.
Key words: dependency, elderly.

Georgette, J.K. (1970)
Staffing by patient classification,
Nursing Clinics of North America, 5, 2, pp.329-339.
Summary: Explores the dependency-acuity approach to measuring workload and staffing. Outmoded but the principles are relevant today.
Key words: dependency-acuity.

Gibson, S. Buxton, M. Caine, N. et al. (1986)
Measuring patient dependency,
Nursing Times, 82, 5, pp.36-38.
Summary: Describes and applies a dependency score for ICUs. Shows differences between ICUs and acute wards. The importance of dependency data for staffing and costing ICUs is discussed.
Key words: dependency, ICU, acuity.

Giovannetti, P. (1978)
Patient classification in nursing; a description and analysis. HRA 78-22; HRP 050051.
Hyattsville: US Department of Health and Welfare.
and
Giovannetti, P. (1979)
Understanding patient classification,
Journal of Nursing Administration, 9, 2, pp.4-9.
and
Giovanneti, P. and Meyer, G. (1984)
Building confidence in patient classification systems,
Nursing Management, 15, 18, pp.31-34.
Summary: Explores the nature, value and application of dependency-based workload measurement. Discusses the relationship between establishments, grade mix and nursing quality.
Key words: dependency, quality.

Harrison, S. and Ayton, M. (1979)
Dependency of elderly people in homes and staffing ratios,
Health and Social Services Journal, 88, 4653, supplement pages 15-20.
and
Harrisson, S, and Ayton, M. (1980)
The dependency of elderly people in residential homes.
Nursing Times, Occasional Papers, 76, 43, pp.105-112.
and
Harrison, S.P. and Ayton, M. (1981)
The Care of Elderly People in Hospital and the Community: A Study of Resources and Nursing Needs,
Durham University: Department of Sociology and Social Policy.
and
Harrison, S. (1988)
Changing admission patterns of short-stay geriatric patients.
Nursing Times, Occasional Paper, 84, 4, pp.53-55.
Summary: A set of related papers that explore dependency, workload and nurses per occupied bed in elderly care settings. Notes discrepancies between sites and how elderly patient dependency was increasing over time. Outmoded but the principles apply.
Key words: dependency, activity, nurses per occupied bed, costs.

Higgins, R. Hurst, K and Wistow, G (1999)
Psychiatric Nursing Revisited,
London: Whurr.
Summary: Detailed, empirical evaluation of modern psychiatric nursing care. Patient dependency, nursing, workload and quality are explored. Principles apply to all care groups.
Key words: patient dependency, nursing workload and quality.

Iapichino, G. Radrizzani, D, Bertolini, G. et al (2001)
Daily classification of the level of care. A method to describe clinical course of illness, use of resources and quality of intensive care assistance,
Intensive Care Medicine, 27, 1, pp.131-136.
Summary: Describes a patient dependency system for ITUs.
Key words: dependency, ITU.

Intensive Care Society (ICS)
(2002)
Levels of Critical Care for Adult Patients. Standards and Guidelines,
London: ICS.
Summary: Places critically ill patients into 1 of 3 clinical categories.
Key words: dependency, ITU.

Jeevendrampillai, V. and Campbell, W. (1979)
A study of new long-stay patients in a psychiatric unit,
Nursing Times, 75, 15, pp.633-637.
Summary: Describes the construction, testing and application of a psychiatric patient dependency measure. Principles apply to other care groups.
Key words: dependency, psychiatry.

Jones, J. Sanderson, C. and Black, N. (1993)
Does labour substitution occur in district general hospitals?
Health Trends, 25, 2, pp.68-72.
Summary: Explores nurses per occupied bed in a broader health context. The actual level of nurse staffing could not be attributed to occupancy nor dependency. Also, contemplates grade mix and the absence of outcome patterns from rich and dilute grade mixes. Concludes that these outcomes are historical and decries the absence of empirical workforce planning methods. Suggests that a dependency-activity-quality methods would help. Extensive data are provided for bench marking purposes.
Key words: actual staffing, nurses per occupied bed, dependency, grade mix.

Levendtam, A.K. and Bergbom Enberg, I. (1993)
The Zebra system - a new patient classification system,
Journal of Nursing Management, 1, pp.229-237.
Summary: Describes the Swedish Zebra patient dependency classification system. Instruments and specimen data are provided. The latter are examined in relation to nurses per occupied bed.
Key words: dependency, nurses per occupied bed.

MacDonald, L. (1978)
Assessment of Mental Handicap: The Leavesden Project. In: Jaques, E. (1978) Health Services. Their Nature and Organisation, and the Role of Patients, Doctors, Nurses and Organisation, and the Complementary Professions,
London: Heinemann.
Summary: Although dated and set in the context of a learning difficulties unit, the study's approach to patient dependency measurement can be extrapolated.
Key words: patient dependency.

McGilloway, F.A. (1976)
Dependency and vulnerability in the nurse-patient situation,
Journal of Advanced Nursing, 1, 3, pp.229-236.
Summary: Explores patient dependency from an unusual angle that would be useful for testing the psychometric properties of patient dependency classifications.
Key words: patient dependency.

McGratty, P. (1985)
A daily forecast,
Nursing Times, 81, 36, p.45.
and
McGratty, P. (1985)
Confidence with practice,
Nursing Times, 81, 37, pp.38-40.
Summary: Describes the development and application of the AMI computerised NurSys dependency, nurses per patient method. Specimen instruments and results are given.
Key words: dependency, nurses per patient.

MacGuire, J. (1985)
The road to rehabilitation,
Senior Nurse, 2, 8, pp.18-19.
Summary: Explores the spin-offs from the KTC dependency-acuity nursing workload system, especially the nature and value of the system's dependency data.
Key words: patient dependency, dependency acuity.

MacGuire, J. (1986)
Where do we go from here?
Senior Nurse, 5, 5/6, pp.12-16.
Summary: Detailed, empirical study of elderly patient dependency and length of stay. Concludes that dependency is iatrogenic. Specimen data and results are provided.
Key words: elderly, dependency.
and

MacGuire, J. and Newberry, S. (1984)
A measure of need,
Senior Nurse, 1, 17, pp.14-8.
Summary: Describes the KTC elderly care dependency, nursing hours per patient-based system. Instruments and specimen data are provided. Concentrates on the instruments' psychometric properties especially sources of bias when rating dependency. Explains how these data can be used for workforce and discharge planning. Uses acuity data from other hospitals rather than locally generated ones.
Key words: dependency, acuity, elderly.

Magid, S. and Rhys-Hearn, C. (1981)
Characteristics of geriatric patients as related to nursing needs.
International Journal of Nursing Studies, 18, 2, pp.97-106.
Summary: Explores elderly patient dependency, how it can be measured and how dependency influences nursing workload.
Key words: dependency, activity, elderly.

Miller, E.A. (1976)
Staffing with the aid of dependency studies,
Nursing Times, Occasional Papers, 72, 32, pp.113-115.
and
Miller, A. (1984)
Nurse/patient dependency - a review of different approaches with particular reference to studies of the dependency of elderly patients,
Journal of Advanced Nursing, 9. pp.479-486.
and
Miller, A. (1984)
Does dependency count?
Senior Nurse, 1, 29, pp.10-11.
and
Miller, A. (1985)
Nurse/patient dependency - is it iatrogenic?
Journal of Advanced Nursing, 10, pp.63-69.
and
Miller, A. (1985).
A study of dependency of elderly patients in wards using a different methods of nursing care.
Age and Ageing, 14, pp.132-138.
Summary: Detailed examination of patient dependency's contribution to measuring nursing workload. Instruments, specimen data and results are provided. Some sections focus on elderly care units. Explains that dependency is partly iatrogenic and less sensitive to physical and mental state than previously thought. Consequently, dependency can only partly explain nursing workload. Recommends that quality of care takes precedence over dependency measures in nursing workforce planning.
Key words: dependency, workload, quality.

Milne, C. (1988)
Getting to grips with GRASP,
Nursing Standard, 10, 3, pp.22-23.
Summary: Describes GRASP's nature and purpose and application to one hospital. GRASP's dependency, care hours and quality components are covered. Specimen instruments are provided.
Key words: timed-task/activity, quality, dependency.

MDS (circa 2000)
UK Minimum Data Set (MDS) for Home Care Resident Assessment and Care Screening. Basic Assessment and Tracking Form,
<http://www.hcfa.gov/medicare/hsqb/mds20>.
Summary: Detailed elderly patient dependency assessment and monitoring system. Instruments and specimen data are provided.
Key words: dependency, elderly.

Mitchell, M. Godden, E. and Balk, T. (1977)
The Aberdeen Formula. A trial in SE Thames,
Nursing Times, 73, 22, pp.839-840.
Summary: Describes and applies the Aberdeen Formula and how it measures nursing workload. Detailed results are provided.
Key words: dependency, timed-task/activity, regression.

Moores, B. (1970)
The effect of length of stay on nursing workload,
International Journal of Nursing Studies, 7, 2, pp.81-88.
Summary: Explores the relationship of patient dependency to nursing workload in different contexts.
Key words: dependency, acuity.

Moores, B. and Grant, G.W.B. (1977)
The 'Avoidance' syndrome in hospitals for the mentally handicapped,
International Journal of Nursing Studies, 14, 2, pp.91-95.
Summary: An early exploration of the relationship between dependency, nurse-patient ratios and quality of care.
Key words: dependency, nurses per occupied bed, quality.

Moores, B. and Moult, A. (1977)
Sources of variation in the pressure of work index in thirty hospital wards,
Journal of Advanced Nursing, 2, 3, pp.271-279.
and
Moores, B. and Moult, A. (1979)
Patterns of nurse activity,
Journal of Advanced Nursing, 4, 2, pp.137-149.
and

Moores, B. and Moult A, (1979)
The relationship between the level of nurse staffing and the patterns of patient care and staff activity,
Journal of Advanced Nursing, 4, 3, pp.299-306.
Summary: Detailed exploration of how nursing activity is measured and the value of data. The relationship between available nursing hours and the pattern of nursing activity, especially their fluctuation, is discussed. The role of patient dependency is implicit. Detailed but outmoded data are provided, nevertheless the principles still apply.
Key words: activity, nurses per occupied bed, dependency.

Northern Ireland Health and Social Services Board Strategic Planning Team. (1976)
Development of Hospital Services in the Area of the Northern Ireland Health and Social Services Board, Volume 2.
Ballymena: Northern Ireland Health and Social Services Board.
Summary: Broad ranging study of health services part of which included a census of patient dependency. Instruments and ample data are provided.
Key words: dependency.

O'Brien, G. (1986)
The intuitive method of patient dependency,
Nursing Times, Occasional Paper, 82, 8, pp.57-61.
Summary: Describes the development and use of the Isle of Wight dependency method, which is judged to be as sensitive but not as demanding as activity-based approaches.
Key words: dependency-acuity.

Oxford Regional Hospital Board. (1967)
Report No. 9: Measurement of Nursing Care.
Oxford Regional Health Authority: Operational Research Unit.
and
Oxford Regional Hospital Board. (1967)
Nursing Dependency in the Medical Wards. An Analysis of Nursing Hours and Workload in the Radcliffe Infirmary.
Oxford Regional Health Authority: Operational Research Unit.
and
Oxford Regional Health Authority. (1983)
Nursing Hours Per Patient Day,
Oxford Regional Health Authority.
Summary: Describes the development and application of the Barr dependency classification. The later reports compares and contrasts nursing hours per patient with dependency-based workload estimates. Outmoded data but the principles apply.
Key words: dependency, nursing hours per patient.

Pardee, G. (1968)
Classifying patients to predict staff requirements,
American Journal of Nursing, 68, 3, pp.517-520.
Summary: An introduction to patient dependency measurement and data use.
Key words: dependency.

Pasker, P. and Ashley, J.S.A. (1971)
Interrelationship of different sectors of the total health and social services system.
Community Medicine, 126, 3302, pp.272-276.
Summary: Census study of patient dependency using the Barr classification. Shows the differences between hospital and home patient dependencies. Outmoded but the principles apply.
Key words: dependency.

Presly, A.S. (1980)
An evaluation of the reduction in patient numbers in psycho geriatric wards,
Health Bulletin, 38, 1, pp.32-36.
Summary: Detailed study of patient dependency, nursing activity, quality of care, actual staffing and time out in a new elderly mentally infirm unit.
Key words: elderly care, patient dependency, nursing activity, quality of care, actual staffing, time-out.

Roper, N. (1976)
An image for nursing in the 1970s
Nursing Times, Occasional Paper, 72, 17, pp.61-64.
Summary: Examines nursing activity over time. Includes patient dependency and grade mix issues. Outmoded but the principles still apply.
Key words: activity, dependency.

Royal College of Nursing. (undated)
Staffing Issues in Paediatric Nursing,
London: RCN.
Summary: Reviews paediatric patient dependency systems.
Key words: paediatric, dependency.

Royal College of Nursing. (circa 1998)
RCN Assessment Tool for Nursing Older People,
Summary: Two-part, how-to-do-it manual for the RCN's elderly care dependency and nursing hours per patient workload instruments. The method has a built-in grade mix component. Data collection forms and specimen data are provided.
Key words: elderly, dependency, nursing hours per patient.

Savage, B.J. and Widdowson, T.   (1974)
Psycho geriatrics - revising the use of nursing resources - 1,
Nursing Times, 70, 36, pp.1372-1374.
and
Savage, B.J. and Widdowson, T.   (1974)
Psycho geriatrics - revising the use of nursing resources -2,
Nursing Times, 70, 37, pp.1424-1427.
and

Savage, B. Widdowson, A. and Wright, A. (1979)
Improving the Care of the Elderly, in: Towell, D. and Harries, C. Innovation in Patient Care, London: Croom Helm.
Summary: An early dependency-activity study in elderly mentally infirm wards. Instruments and specimen data are provided. Outmoded but the principles still apply.
Key words: dependency-activity, elderly.

Stevens, J. and Goucher, J. (1985)
Measurement of patient dependency,
Nursing Times, 81, 44, pp.54-55.
Summary: Describes the Sandwell dependency-quality workforce planning method. Outmoded outcomes but the principles apply.
Key words: dependency, quality.

Stone, M. (1987)
The support worker. Multipurpose home care,
Nursing Times, 83, 10, pp.28-29.
Summary: Explains how the newly created health care assistant roles can work in elderly care units. Provides specimen dependency data and health care assistant job descriptions.
Key words: dependency, grade mix.

Stride, N.M. (1988)
An investigation of the dependence of severely disabled people in a hospital,
Journal of Advanced Nursing, 13, pp.557-564.
Summary: Considers iatrogenic effect of institutionalised care on patient dependency.
Key words: dependency.

UK Minimum Data Set. (circa 1998)
MDS for Home Resident Assessment and Care Screening: Basic Assessment and Tracking Form,
Birmingham University.
Summary: A detailed elderly care patient dependency assessment system.
Key words: dependency, elderly care.

Wade, B. and Snaith, P. (1981)
The assessment of patient's need for nursing care on geriatric wards,
International Journal of Nursing Studies, 18, 4, pp.261-271.
and
Wade, B.E. and Sayer, L. (1982)
Different Care Provision for the Elderly,
London School of Economics and Political Science.
Summary: Extensive studies in all elderly care settings that use the dependency component of the Rhys-Hearn dependency-activity method to estimate elderly patients' demand for nursing care. The instrument's validity and reliability are considered in detail.
Key words: elderly, dependency.

Waite, R. (1986)
A network for safe staffing,
Nursing Times, 82, 9, pp.58-60.
and
Waite, R. (1986)
Nursing by numbers,
Nursing Times, 82, 8, pp.40-42.
and
Waite, R. and Hirsh, W. (1985)
Nursing Workload and Staffing Levels Summary Report
Sussex: Brighton Health Authority.
and
Waite, R. and Hirsh, W. (1986)
Not another dependency study,
Senior Nurse, 4, 1, pp.29-32.
and
Waite, R. and Hirsh, W. (1986)
Controlling workloads,
Senior Nurse, 4, 2, pp.14-17.
Summary: Describes Brighton's workforce planning method that considers dependency, occupancy, case mix and care safety in a nurse per patient context decided by professional judgement enhanced by regression analysis. Specimen instruments, computer screens and data are provided. Psychometric properties of workload measures are discussed and Brighton method's outcomes are compared with those generated by other nursing workload measures. One bottom line is that nursing workforce planning methods are too complicated. Another is that wide discrepancies exist between actual and recommended staffing levels, and that staffing levels do not always match workloads; that is, the inflexibility factor persists.
Key words: review, dependency, professional judgement, IM&T, nurses per occupied bed.

Walton, M. Hockey, L. and Garraway, W.M. (1978)
How dependent are stroke patients?
Nursing Mirror, 147, 14, pp.57-58.
Summary: Summarises a longitudinal and multi-site study of patient dependency.
Key words: dependency, elderly.

Whitney, J.A. Killien, M.G. (1987)
Establishing predictive validity of a patient classification system,
Nursing Management, 18, pp.80-86.
Summary: Detailed examination of the psychometric properties of nursing workload measures. Concentrates on validity and reliability and how each can be improved when measuring patient dependency.
Key words: dependency.

Wilkin, D. and Jolley, D.J. (1978)
Mental and physical impairment in the elderly in hospital and residential care 1,
Nursing Times, Occasional Papers, 74, 29, pp.117-120.
Summary: Describes an activity of daily living-based dependency classification system for use in elderly care. Shows how similar dependency is in different elderly care settings. Staffing, on the other hand, doesn't reflect dependency.
Key words: dependency, elderly.

Wilkinson, I.M. and Graham-White, J. (1980)
Dependency ratings scales in psycho geriatric nursing,
Health Bulletin: 38, 1, pp.36-42.
Summary: Uses a bespoke patient dependency system with the Aberdeen time-task/activity formula. Outmoded nurse to patient ratios are provided, but the principles remain the same.
Key words: dependency, time-task/activity.

Wilson-Barnett, J. (1978)
A Review of Patient-Nurse Dependency Studies,
London: DHSS.
Summary: State-of-the-art review of patient dependency literature of its time. Many annotations are more detailed than presented in this review.
Key words: dependency, review.

Annotated Bibliography: Nursing Activity

This section lists and summarises texts that look at nursing activity as a component of workforce planning. The amount of direct (face-to-face) patient care has fallen over the last twenty years and has shifted toward indirect care, which these texts explore implicitly or explicitly. Inappropriate working by nurses is constantly raised. The methods of measuring nursing activity range from simple to complex. The latter texts sometimes include the instruments' psychometric properties.

Catterson, J. (1988)
How busy are you?
Nursing Times, 84, 45, pp.40-41.
Summary: Provides simple to use instruments for measuring nursing workload. Data help to equalise nursing workload or argue for more staff.
Key words: activity.

DHSS. (1988)
A Report on the Activities of Nursing Staff in Hospital Wards. Service Quality Study
London: DHSS: NHS Management Consultancy Services/Nursing Division.
Summary: Looks at the methods for measuring and exploring the relationship between nursing activity and nursing quality.
Key words: activity, quality.

Greenhalgh and Co. (1991)
Using Information in Managing the Nursing Resource - The Rainbow Pack,
Macclesfield: Greenhalgh Healthcare Consultants.
and
Greenhalgh and Co Ltd. (1991)
Nurse Management Systems. A Guide to Existing and Potential Products,
Macclesfield: Greenhalgh Healthcare Consultants.
Summary: Comprehensive, state-of-the-art review of many nursing workload measuring and workforce planning methods. Presents their strengths and weaknesses. Workload and grade mix are set in the context of quality; personnel and finances. These booklets are distance learning packs for ward managers. Information is dated but the principles apply.
Key words: activity, quality, grade mix, costs, review.

Hamm-Vida, D. (1990)
Costs of non-nursing tasks,
Nursing Management, 21, 4, pp.23-4,
Summary: Looks at the cost implications of associated (generally non-nursing) work.
Key words: nursing activity and cost effectiveness.

Harrison, S. and Ayton, M. (1979)
Dependency of elderly people in homes and staffing ratios,
Health and Social Services Journal, 88, 4653, supplement pages 15-20.
and

Harrisson, S, and Ayton, M. (1980)
The dependency of elderly people in residential homes.
Nursing Times, Occasional Papers, 76, 43, pp.105-112.
and
Harrison, S.P. and Ayton, M. (1981)
The Care of Elderly People in Hospital and the Community: A Study of Resources and Nursing Needs,
Durham University: Department of Sociology and Social Policy.
and
Harrison, S. (1988)
Changing admission patterns of short-stay geriatric patients.
Nursing Times, Occasional Paper, 84, 4, pp.53-55.
Summary: A set of related papers that look at the relationship between dependency, workload and nurses per occupied bed in elderly care settings. Notes discrepancies between sites and how elderly patient dependency is increasing over time. Outmoded but the principles apply.
Key words: dependency, activity, nurses per occupied bed, costs.

Hicks, C. (1985)
Who cleans up after?
Nursing Times, 81, 2, pp.18-19.
Summary: Looks at the nursing activity implications of contracting-out cleaning services. Notes the likely nursing shift from direct patient care to associated work.
Key words: activity.

Hulton, A. Kerstell, J. R. and Svanborg, A. (1969)
A method to calculate nursing load.
Scandinavian Journal of Rehabilitation Medicine, 1, 117-125.
Summary: Concentrates on validity and reliability issues when collecting nursing activity data for nursing acuity purposes. Outmoded but the principles apply.
Key words: activity.

Hunt, J. (1990)
The activity balance,
Nursing Standard, 4, 42, p.47.
Summary: Concludes that activity sampling as a measure of nursing workload is flawed owing to the multitasking, holistic nature of nursing.
Key words: activity.

Hurst, K. (1992)
Changes in nursing practice 1984-1992,
Nursing Times, 88, 12, p.54.
Summary: Shows the shift from direct (face-to-face) care towards indirect (e.g., paper work) care and associated (hotel-type) work and the implications for the nursing workforce.
Key words: activity.

Jones, B.T. and Buchanan, M. (1989)
Relieving the bottlenecks in ward activity monitoring through IT,
Information Technology in Nursing, 1, 2, pp.27-31.
Summary: Describes in detail a computerised method that reduces labour-intensive nursing activity sampling. Provides activity categories and explains how the data might be stored and analysed using a personal computer.
Key words: IM&T, nursing activity.

MacLeod, M. (1985)
The professional ancillary,
Nursing Times, 81. 47, pp.24-27.
Summary: Examines the amount of nursing time spent on non-nursing work. Calculates the savings if ward grade mix reflected nursing activity. Instruments and specimen data are provided.
Key words: grade mix, activity.

Magid, S. and Rhys-Hearn, C. (1981)
Characteristics of geriatric patients as related to nursing needs.
International Journal of Nursing Studies, 18, 2, pp.97-106.
Summary: Explores elderly patient dependency, how it can be measured and how dependency influences nursing workload.
Key words: dependency, activity, elderly.

Moores, B. and Moult, A. (1977)
Sources of variation in the pressure of work index in thirty hospital wards,
Journal of Advanced Nursing, 2, 3, pp.271-279.
and
Moores, B. and Moult, A. (1979)
Patterns of nurse activity,
Journal of Advanced Nursing, 4, 2, pp.137-149.
and
Moores, B. and Moult A, (1979)
The relationship between the level of nurse staffing and the patterns of patient care and staff activity,
Journal of Advanced Nursing, 4, 3, pp.299-306.
Summary: Detailed exploration of nursing activity measurement and the value of the data. The relationship between available nursing hours and the pattern of nursing activity, especially their fluctuation, are discussed. The role of patient dependency is implicit. Detailed but outmoded data are provided, nevertheless the principles still apply.
Key words: activity, nurses per occupied bed, dependency.

Morse, T. (1997)
An Evaluation of Activity Analysis Data Collection,
Coventry: South Warwickshire General Hospitals NHS Trust.
Summary: Comprehensive analysis of the nature and value of nursing activity analysis.
Key words: activity.

New, P.K. Nite, G. and Gallaghan, J. (1959)
Too many nurses may be worse than too few,
The Modern Hospital, October, pp.104-106.
Summary: An early article that explores staff saturation. Outmoded but the principles apply.
Key words: activity.

O'Byrne, J. (1992)
Does fewer mean better?
Nursing Standard, 6, 39, pp.20-21.
Summary: One of the few studies to examine unoccupied time in different nursing team contexts.
Key words: activity.

Presly, A.S. (1980)
An evaluation of the reduction in patient numbers in psycho-geriatric wards,
Health Bulletin, 38, 1, pp.32-36.
Summary: Detailed study of patient dependency, nursing activity, quality of care, actual staffing and time-out in a new elderly mentally infirm unit.
Key words: patient dependency, nursing activity, quality of care, actual staffing, time-out.

Roper, N. (1976)
An image for nursing in the 1970s
Nursing Times, Occasional Paper, 72, 17, pp.61-64.
Summary: Examines nursing activity over time. Includes patient dependency and grade mix issues. Outmoded but the principles still apply.
Key words: activity, dependency.

Scottish Home and Health Department. (1967)
Report No. 3. Nurses' Work in Hospitals in the North Eastern Region,
Edinburgh: SHHD.
and
Scottish Home and Health Department. (1969)
Report No. 9. Nursing Workload per Patient as a Basis for Staffing,
Edinburgh: SHHD.
Summary: Early, extensive study into nurses' workload using activity analysis. Outmoded data but principles apply. The forerunner of the Aberdeen timed-task/activity, regression system.
Key words: activity, timed-task/activity, regression.

Stilwell, J.A. and Hawley, C. (1993)
Nursing dependency and the costs of nursing care,
Journal of Nursing Management, 1, 1, pp.25-30.
Summary: Examines how nursing activity, such as direct care, and dependency can influence daily nursing costs. Also gives a clear account of how nursing activity can be measured.
Key words: nursing activity, costs.

Taylor, S. (1990)
Divide and conquer,
Nursing Times, 86, 19, pp.47-49.
Summary: Looks at the increasing amount of time ward sisters spend in non-nursing work, and how nursing assistants can reverse these changes. Instruments and specimen data are provided.
Key words: activity, grade mix.

Taylor, S. Senn, S. and Potton, R. (1976)
Report no. 75/23. Nursing Dependency. Patients at Leybourne Grange Hospital for the Mentally Handicapped,
South East Thames Regional Health Authority.
and
Taylor, S. Senn, S. and Potton, R. (1978)
Patient-nurse dependency,
Nursing Times, 74, 18, pp.755-758.
Summary: Develops a dependency-acuity method of measuring nursing workload based on the Norwich elderly care method. Highlights nursing activity, especially the falling amount of direct care. Dated and specific to one clinical speciality but the principles can be applied today and applied more broadly.
Key words: activity, dependency-acuity.

Welsh Hospital Board. (1970)
An Examination of the Workload of Nursing Staff at the Gynaecological Ward of H.M. Stanley Hospital,
Cardiff: Welsh Hospital Board.
Summary: Uses non-participant and participant observation to describe nursing activity and workload. Outmoded data are provided but the principles apply today.
Key words: activity.

Wiseman, J. (1988)
Cutting overheads,
Nursing Times, 84, 24, pp.32-33.
Summary: Explores indirect care and associated work, a less-frequently studied aspect of workforce planning. Grade mix implications are considered.
Key words: activity, grade mix.

Annotated Bibliography: Dependency-activity Method

This literature explains nursing acuity - a standardised nursing workload value. How acuities are converted into staffing establishments is well covered. However, some texts describe patient and nursing activity without converting data into acuities - hence the distinction between 'dependency-activity' and 'dependency-acuity'. Systems included in this section are the: Birmingham; Cheltenham; Criteria for Care; KTC; NISCM; Norwich-Senior; SENS; Isle of Wight; and Wessex methods. Some texts critically review and compare methods, while others use large, empirically determined data sets. Unfortunately, data more than a few years old are out of date and should not be applied to wards today. The more recent data, on the other hand, are excellent for bench marking.

Adams, I.M. (1970)
Nursing workload,
Nursing Times Occasional Paper, 66, pp.95-97.
Summary: An early attempt at measuring mental health nursing workload using patient dependency and nursing activity. Instruments and specimen data are provided.
Key words: psychiatry, dependency-activity.

Adams, G. and McIlraith, F. (1963)
Geriatric Nursing. A Study of the Work of Geriatric Ward Staff,
Oxford: Nuffield Hospitals Provincial Hospital Trust.
Summary: An early study of nursing workload in elderly care wards using patient dependency and nursing activity. Specimen instruments, establishments and grade mix outcomes are given.
Key words: dependency-activity, elderly care.

Asset Management Consultants. (1986)
SENS. South East Thames Nursing System,
South East Thames Regional Health Authority.
Summary: Describes the SENS dependency-acuity nursing workload system, and how data can be collected from model wards and extrapolated.
Key words: dependency-acuity.

Auld, M.G. (1976)
How Many Nurses? A Method of Estimating the Requisite Nursing Establishment of a Hospital,
London: RCN.
Summary: Provides method, specimen data and outcomes from a dependency-activity nursing workload system. The results are dated but the principles remain relevant.
Key words: dependency-activity.

Ball, J and Goldstone, L. (1984)
Criteria for Care,
Nursing Times, 80, 36, pp.55-58.
Summary: How to do Criteria for Care.
Key words: dependency-acuity.

Ball, J. and Hurst, K. (1990)
Signs for the times,
Health Service Journal, 100, 5190, pp.632-634.
Summary: Explains the Criteria for Care method. Specimen data and explanations are given.
Key words: dependency-acuity.

Barr, A. (1964)
Measuring Nursing Care,
Oxford: Oxford University Press.
and
Barr, A. (1967)
Measuring Nursing Care,
Oxford: Oxford University Press.
Summary: Updates Barr's (1964) work. Seminal work that established a valid and reliable patient dependency classification, nursing activity analysis and acuities. Ample specimen data and results are provided.
Key words: dependency, activity, acuity.

Birmingham Hospital Management Services Division. (1973)
Review of Nurse Staffing Levels in Burton General Hospital,
Birmingham: Hospital Management Committee.
Summary: A dependency-acuity based nursing workload system. Specimen data and results are provided. Although dated the principles still apply.
Key words: dependency, acuity.

Blee, A.C. (1993)
The right staff in the right place: a review of manpower, leading to skill-mix, activity matched to outcome.
Journal of Nursing Management, 1, pp.89-94.
Summary: Isle of Wight Health Authority's approach to reviewing and planning the nursing workforce. Skill mix changes led to a potential 10% savings. The evaluation performance indicator, activity analysis, quality of care and 'what-if?' based. Specimen data and results are provided.
Key words: activity, quality.

Bloore, J. (1984)
Manpower planning two: a system from Gloucestershire,
Nursing Times, 80, 34, pp.55-57.
Summary: Describes the Cheltenham nursing workload and workforce planning system. Compares and contrasts the Cheltenham timed-task/activity method with four other main methods: top-down, regression-based, professional judgement and dependency-acuity. Cheltenham's limitations are honestly reported within a carefully explained implementation programme.
Key words: timed-task/activity method, top-down, regression-based, professional judgement dependency-acuity.

Boam, T. (1977)
A question of balance: tactics and strategy of nurse manpower planning - 1,
Nursing Times, Occasional Papers, 73, 1, pp.1-4.
and
Boam, T. (1977)
A question of balance: tactics and strategy of nurse manpower planning - 2,
Nursing Times, Occasional Papers, 73, 2, pp.5-8.
Summary: Describes the RCCS, DHMS and BGA nurses per occupied bed methods. Explores the weaknesses of the methods before explaining a workload-based approach. Although dated the principles apply today.
Key words: nurses per occupied bed, dependency, acuity.

Brinham, R.O.J. (1972)
Looking at ward activity,
Nursing Times, 68, 37, pp.1154-1155.
Summary: Takes an unusual approach to the dependency-activity method of assessing workload and determining staffing levels. Specimen data and results are provided.
Key words: dependency-activity.

Charles, S.T. and Gillott, M. (1977)
Equating ward staff with workloads,
Nursing Times Occasional Paper, 73, 8, pp.29-32.
Summary: Examines nursing establishments generated by dependency and workload. Also looks at shifts and duty rotas.
Key words: dependency-acuity, rotas.

Cheltenham and District Health Authority (1982)
A Total Care Nursing Dependency Study at Cheltenham General Hospital,
Cheltenham: Cheltenham District Health Authority.
and
Cheltenham and District Health Authority (1984)
A Step-by-step Guide to Undertake a nurse-dependency study in a Hospital for Elderly Patients, 2nd Ed.,
Cheltenham: Cheltenham District Health Authority.
Summary: Describes in detail the Cheltenham dependency-acuity nursing workload system. The later report concentrates on elderly care.
Key words: dependency-acuity, elderly.

Coles, J. and Jenkins, L. (1992)
Computerised nursing workload systems,
Senior Nurse, 12, 4, pp.5-7.
Summary: Explores a symbiotic relationship between computerised nursing information systems and dependency-activity nursing workload. Specimen data are given but no outcomes.
Key words: IM&T, dependency-activity.

Davidson, J.H. (1975)
Patient care in a district general hospital
Nursing Mirror, 141, 4, pp.55-56.
Summary: Examines patient dependency and nursing activity in general and elderly care wards. Instruments and specimen data are provided. The latter are outdated but the principles apply.
Key words: dependency, activity.

Davies, M. (1996)
Skillmix Studies: A Critique of Available Methods,
Bedford Hospitals NHS Trust.
Summary: Describes and evaluates contemporary nursing workload and workforce planning methods. Focuses on the NISCM dependency-acuity method.
Key words: review, dependency-acuity.

DeGroot, H.A. (1989)
Patient classification system evaluation. Part 1: Essential system elements,
Journal of Nursing Administration, 19, 6, pp.30-35.
and
DeGroot, H.A. (1989)
Patient classification system evaluation. Part 2: System selection and implementation,
Journal of Nursing Administration, 19, 7, pp.24-30.
Summary: Description of a computerised dependency-activity method of measuring nursing workload.
Key words: IM&T, dependency-activity.

DoH (Department of Health) (1988)
Service Quality Study,
London: DoH.
Summary: Detailed empirical study of patient dependency, nursing activity and nursing workload in 106 wards using Criteria for Care. Although outmoded, ample date are provided. Principles still apply.
Key words: dependency-activity.

Donnelly, P. (1986)
Staffing a children's unit,
Nursing Times, 82, 39, pp.35-36.
Summary: Describes Criteria for Care and how it was applied to paediatric wards. Key data are provided for bench marking.
Key words: paediatric, dependency-acuity.

Dylak P. (1991)
A Study of a Dependency-Based Nurse Manpower Planning System,
Manchester: Manchester Central Hospitals and Community Care NHS Trust.
Summary: A critique of contemporary workforce planning methods intended for local consumption. Dependency classification is criticised as unnecessarily complicated, preferring instead bed occupancy as the main variable. Instruments, data analysis methods and some results are provided.
Key words: dependency-acuity, review.

Finnerty, R. and Whitbread, A.W. (1971)
Local Government Operational Research Unit Report No. C.97. How Much Nursing is Nursing? A Study on the Structure of the Nursing Establishment of St. Mary's Hospital, London.
London: Royal Institute of Public Administration Local Government Research Unit.
Summary: Examines dependency-based nursing workload and designs a nursing workforce to meet present and anticipated demand. Considers several other workforce planning variables such as retention.
Key words: dependency, activity.

Gibson, S. Buxton, M. Caine, N. et al. (1986)
Measuring patient dependency,
Nursing Times, 82, 5, pp.36-38.
Summary: Describes and applies a dependency score for ICUs. Shows differences between ICUs and acute wards. The importance of dependency data for staffing and costing ICUs is discussed.
Key words: dependency, ICU, acuity.

Goddard, H.A. (1953)
The Work of Nurses in General Hospital Wards. Report of a Job Analysis,
London: Nuffield Hospital Provincial Hospital Trusts.
Summary: Perhaps the earliest of nursing workload studies in the UK that formed the basis of many studies that followed.
Key words: dependency, activity.

Harrison, S. and Ayton, M. (1979)
Dependency of elderly people in homes and staffing ratios,
Health and Social Services Journal, 88, 4653, supplement pages 15-20.
and
Harrison, S.P. and Ayton, M. (1981)
The Care of Elderly People in Hospital and the Community: A Study of Resources and Nursing Needs,
Durham University: Department of Sociology and Social Policy.
and
Harrison, S. (1988)
Changing admission patterns of short-stay geriatric patients.
Nursing Times, Occasional Paper, 84, 4, pp.53-55.
Summary: A set of related papers that look at dependency, workload and nurses per occupied bed in elderly care settings. Notes the discrepancies between sites. Outmoded but the principles apply.
Key words: dependency, activity, nurses per occupied bed.

Hassell, D. (1971)
Patient dependency related to nurse staffing in a MS hospital,
Nursing Times, Occasional Paper, 67, 20, pp.77-80.
and

Hassell, D. (1971)
Patient dependency related to nurse staffing in a MS hospital,
Nursing Times, Occasional Paper, 67, 21, pp.83-84.
Summary: Although based in units for the learning disabled, and outmoded, the principles between client dependency and nursing workload are relevant today and to other care groups. Psychometric properties of instruments are covered.
Key words: dependency-activity-workload.

Hawley, C.A. Stilwell, J.A. Robinson, J. and Bond, M. (1993)
Nurses Manage,
Aldershot: Averbury.
Summary: Detailed and systematic account of ward managers' responsibilities including nursing workload, establishments, grade mixes, rostering, nursing costs and quality. Draws on extensive empirical data from several acute wards. Outmoded but the principles apply.
Key words: actual staffing, dependency-acuity, quality, costs, rotas.

Henwood, M. (1992)
Twilight zone,
Health Service Journal, 102, 5327, pp.28-30.
Summary: Looks at a five-group elderly patient dependency classification system across different sectors. Instrument and specimen data are provided.
Key words: dependency, elderly.

Higgins, R. Hurst, K and Wistow, G (1999)
Psychiatric Nursing Revisited,
London: Whurr.
Summary: Detailed, empirical evaluation of modern psychiatric nursing care. Patient dependency, nursing, workload and quality are explored. Principles apply to all care groups.
Key words: patient dependency, nursing workload and quality.

Illsley, V. and Goldstone, L. (1985)
Manpower planning: methods of planning,
Senior Nurse, 3, 6, pp.14-18.
Summary: Clearly and simply describes contemporary top-down and bottom-up workforce planning methods: nurses per occupied bed, regression-based, timed-task/activity, dependency-acuity and professional judgement.
Key words: review.

JDM Management Services (1994)
The Value of your NISCM Information,
Skipton: JDM Management Services.
and

JDM Management Services (1994)
Why Do You Need Nursing Information,
Skipton: JDM Management Services.
Summary: Describes the NISCM system's contribution to nursing information broadly and workload information specifically. Activity analysis and direct/indirect care are described in detail. A quality measure that monitors available nursing hours against nursing hours demanded can be made to run in parallel, which provides data when nursing care falls below safe levels.
Key words: dependency-acuity, professional judgement.

Jelinek, R.C. (1966)
A new approach to the analysis of nursing activities,
Hospitals, 40, pp.89-91.
Summary: Early days of dependency-activity nursing workload measures. Outmoded data but the principles apply.
Key words: dependency-activity.

JoNA. (1985) Consider this… [GRASP]
Journal of Nursing Administration, 15, 9, p.6, p.14.
Summary: Describes, compares and contrasts CASH (a dependency-activity workload measure) with GRASP (a timed-task/activity system). Outcomes were similar but GRASP was found to be more time consuming.
Key words: dependency-activity, timed-task/activity, review.
Kovner, C.T. Jones, C.B. and Gergen, P.J. (2000)
Nurse staffing in acute care hospitals, 1990-1996.
Policy, Politics and Nursing Practice, 1, pp.194-204.
Summary: Examines static nurse staffing, rising acuities and outcomes over time. Concludes that current staffing has not kept pace.
Key words: dependency, acuity.

Leenders, F. (1985)
Management: translating strategy.
Nursing Times, 81, 39, pp.43-45.
Summary: Compares and contrasts North American with UK nursing workforce planning methods. Broadly classifying methods as top-down management and bottom-up dependency-acuity, cost and quality issues are considered. Specimen data and results are given.
Key words: review, dependency-acuity, cost, quality.

MacGuire, J. (1985)
The road to rehabilitation,
Senior Nurse, 2, 8, pp.18-19.
Summary: Explores the spin-offs from the KTC dependency-acuity nursing workload system, especially the nature and value of the system's dependency data.
Key words: patient dependency, dependency acuity.

MacGuire, J. and Newberry, S. (1984)
A measure of need,
Senior Nurse, 1, 17, pp.14-8.
Summary: Describes the KTC elderly care dependency, nursing hours per patient-based system. Instruments and specimen data are provided. Concentrates on the instruments' psychometric properties especially sources of bias when rating dependency. Explains how these data can be used for workforce planning and discharge planning. Uses acuity data from other hospitals, not locally generated ones.
Key words: dependency, acuity, elderly.

MacKay, L. (1988)
No time to care,
Nursing Times, 84, 11, pp.33-34.
Summary: Looks at the relationship between under-staffing, excessive workload and time-out. Broader workforce planning issues are discussed.
Key words: time-out, actual staffing, acuity.

Manchester University Institute of Science and Technology Department of Management Sciences. (1973)
Development of a Model of a Regional Burns Unit,
Manchester University: UMIST.
Summary: Looks at patient dependency and nursing workload in the context of a burns unit.
Key words: dependency, activity.

Miller, E.A. (1976)
Staffing with the aid of dependency studies,
Nursing Times, Occasional Papers, 72, 32, pp.113-115.
and
Miller, A. (1984)
Nurse/patient dependency - a review of different approaches with particular reference to studies of the dependency of elderly patients,
Journal of Advanced Nursing, 9. pp.479-486.
and
Miller, A.   (1984)
Does dependency count?
Senior Nurse, 1, 29, pp.10-11.
and
Miller, A. (1985)
Nurse/patient dependency - is it iatrogenic?
Journal of Advanced Nursing, 10, pp.63-69.
and

Miller, A. (1985).
A study of dependency of elderly patients in wards using a different methods of nursing care.
Age and Ageing, 14, pp.132-138.
Summary: Detailed examination of patient dependency's contribution to measuring nursing workload. Instruments, specimen data and results are provided. Some sections focus on elderly care units. Explains that dependency is partly iatrogenic and less sensitive to physical and mental state than previously thought. Consequently, dependency can only partly explain nursing workload. Recommends that quality of care takes precedence over dependency measures in nursing workforce planning.
Key words: dependency, workload, quality.

Moores, B. (1970)
The effect of length of stay on nursing workload,
International Journal of Nursing Studies, 7, 2, pp.81-88.
Summary: Explores the relationship of patient dependency to nursing workload in different contexts.
Key words: dependency, acuity.

Moores, B. (1983)
1. Past initiatives,
Nursing Times, 79, 49, pp.24-26.
and
Moores, B. (1983)
2. Present developments,
Nursing Times, 79, 50, pp.34-35.
Summary: Reviews contemporary nursing workforce planning methods. Concentrates on the dependency-acuity method in preparation for a Nursing Times series. Specimen data are provided.
Key words: review, dependency-acuity.

Moores, B. and Moult, A. (1977)
Sources of variation in the pressure of work index in thirty hospital wards,
Journal of Advanced Nursing, 2, 3, pp.271-279.
Summary: Examines, empirically, the relationship between the demand for and supply of nursing care. The fluctuations in nursing workload and nursing hours available to meet demand are explored in detail.
Key words: dependency, nurses per occupied bed, acuity.

Morris, P. (1995)
Evaluation Report: Nurse Workload Project,
Coventry: South Warwickshire General Hospitals NHS Trust.
Summary: Comprehensive review of contemporary nursing workload measures. The reasons for selecting NISCM are discussed.
Key words: review, dependency-acuity, professional judgement.

Mulligan, B. (1973)
Measurement of Patient-Nurse Dependency and the Workload Index,
London: King's Fund.
Summary: An early dependency-activity study that generated nursing time ratios for three dependency categories. Outmoded but the principles apply.
Key words: dependency-acuity.

NHS Executive. (1990)
Resource Management: the Leading Edge,
Leeds: NHS Executive.
Summary: Includes a short section on Criteria for Care-based nursing workload measurement and results. Discusses these in a resource management context.
Key words: dependency-acuity.

North East Thames Regional Health Authority. (1978)
The Study of Nursing Care in Four Geriatric Hospitals,
North East Thames Regional Health Authority.
Summary: Examines elderly care nursing workload using extensive dependency and activity sampling. Although outmoded, the activity percentages provide benchmarks.
Key words: dependency, activity.

North West Thames Regional Health Authority. (1975)
Patient Dependency in Barnet General Hospital,
North West Thames Regional Health Authority.
Summary: Evaluates local nursing establishments using the Rhys-Hearn dependency-activity and nurses per occupied bed methods.
Key words: dependency-activity, nurses per occupied bed.

Norwich, H.S. (1980)
A study of nursing care in geriatric hospitals,
Nursing Times, 76, 7, pp.292-295.
Summary: Evaluates local elderly care ward nursing establishments using dependency-activity studies. Outmoded data but the principles apply.
Key words: dependency-activity.

Norwich, H.S. and Senior, O.E. (1971)
Determining nursing establishments,
Nursing Times, Occasional Paper, 67, 5, pp.17-20.
Summary: Describes a nursing workforce planning method based on dependency and acuity. Outmoded but the principles apply.
Key words: dependency-acuity.

NISCM (1988)
JDM Management Services,
Skipton, North Yorkshire .
Summary: Manuals and software for the NISCM dependency-acuity nursing workload and workforce planning system.
Key words: dependency-acuity, professional judgement.

O'Brien, G. (1986)
The intuitive method of patient dependency,
Nursing Times, Occasional Paper, 82, 8, pp.57-61.
Summary: Describes the development and use of the Isle of Wight dependency method, which is judged to be as sensitive but not as demanding as activity-based approaches.
Key words: dependency, acuity.

Pace, A.J. and Grimshaw, E. (1978)
Regional nurse staffing: a system for recording the utilisation of nursing staff,
Nursing Times, Occasional Papers, 74, 25, pp.101-104.
and
Pace, A.J. and Grimshaw, E. (1978)
Regional nurse staffing 2: a system for recording the utilisation of nursing staff,
Nursing Times, Occasional Papers, 74, 26, pp.105-108.
Summary: Describes the uncomplicated Wessex system of measuring nursing workload. Outmoded data but the principles apply.
Key words: dependency-acuity.

Poulton, K. (1984)
A measure of independence,
Nursing Times, 80, 34, pp.32-35.
Summary: Describes an empirically determined dependency classification instrument suitable for elderly care wards.
Key words: dependency, elderly.

Proctor, S. and Hunt, M. (1994)
Using the Delphi technique to develop a professional definition of nursing for analysing nursing workload,
Journal of Advanced Nursing, 19, pp.1003-1014.
Summary: Makes a significant contribution to what constitutes dependency and nursing activity measures using professional judgement. Instruments are given. Concludes that nursing workload is context bound and existing measures may need tailoring to the setting to which they're applied.
Key words: dependency-acuity.

Quinn, H. (1990)
Monitoring workloads,
Information Technology in Nursing, 2, 4, pp.70-71.
Summary: Defines nursing workload and explains its nature and purpose. Explores methods of measuring nursing workload. Argues that selecting and applying an appropriate measure is a key step. Important nursing workload variables are examined.
Key words: dependency-acuity.

Rapson, C. and Halliday, J. (2002)
Safety in numbers,
Health Service Journal, 112, 5802, pp.24-25,
Summary: Describes the nature, value and application of the NISCM dependency-acuity nursing workload system. Addresses some unusual quality issues, such as untoward incidents, in the relation to under-staffing. Time-out is also considered. Argues strongly that workload and staffing methods are essential for modern workforce planning.
Key words: dependency-acuity, quality, time-out.

Rhys-Hearn, C. (1972)
How many high care patients?
Nursing Times, 68, 16, pp.472-474.
and
Rhys-Hearn, C. (1972)
How many high care patients?
Nursing Times, 68, 17, pp.504-505.
and
Rhys-Hearn, C. (1974)
Evaluation of patients' nursing needs: prediction of staffing 1.
Nursing Times, Occasional Paper, 70, pp.69-72
and
Rhys-Hearn, C. (1974)
Evaluation of patients' nursing needs: prediction of staffing 2.
Nursing Times, Occasional Paper, 70, pp.73-76
and
Rhys-Hearn, C. (1974)
Evaluation of patients' nursing needs: prediction of staffing 3.
Nursing Times, Occasional Paper, 70, pp.77-80
and
Rhys-Hearn, C. (1974)
Evaluation of patients' nursing needs: prediction of staffing 4.
Nursing Times, Occasional Paper, 70, pp.81-84
and
Rhys-Hearn, C. (1977)
Nursing workload determination: development and trials of a package.
Medical Informatics, 2, 2, pp.91-99
and
Rhys-Hearn, C. (1979)
Staffing geriatric wards. Trials of a 'package' - 1,
Nursing Times, Occasional Papers, 75, 17, pp.45-48.
and
Rhys-Hearn, C. (1979)
Staffing geriatric wards. Trials of a 'package' - 2,
Nursing Times, Occasional Papers, 75, 18, p.52.
and

Rhys-Hearn, C.   (1979)
Comparison of Rhys-Hearn method of determining nursing staff requirements with the Aberdeen formula,
International Journal of Nursing Studies, 16, 1, pp.95-103.
and
Rhys-Hearn, C. (1979)
Evaluation of Nurse Activity, in: Alperovitch, A. de-Dombal, F.T. and Gremy, F. (eds)
Evaluation and Efficiency of Medical Action,
Amsterdam: North-Holland Publishing Company.
and
Rhys-Hearn, C. and Howard, J. (1980)
The Relationship of Nursing Needs, Resources and Standards in Geriatric Wards,
London: DHSS.
and
Rhys-Hearn, C. and Potts, D. (1978)
The effect of patients' individual characteristics upon activity times of nursing care.
International Journal of Nursing Studies, 15, 1, pp.23-30.
and
Rhys-Hearn, C. and Young, B. (1981)
Experience with the Rhys-Hearn geriatric workload package - a regional survey.
Nursing Times, Occasional Paper, 77, 4, pp.9-12.
Summary: A series of articles that applies the Rhys-Hearn dependency-activity method to various care settings, but elderly care features strongly. Case controlled trials and other research designs are used to test different establishments and grade mixes from a dependency, workload and quality perspective. Instruments and ample specimen data are provided. Rhys-Hearn outcomes are compared with other approaches. The data and results are outmoded but the method's principles are relevant today.
Key words: elderly care, dependency-activity, quality, elderly, review.

Rothwell, S. (1986)
Costing flexible working patterns,
Nursing Times, 82, 28, pp.43-45.
Summary: Explores nursing workload and grade mix from a cost-effectiveness perspective
Specimen data and results are given
Key words: acuity, grade mix, cost, quality.

Savage, B.J. and Widdowson, T.   (1974)
Psycho geriatrics - revising the use of nursing resources - 1,
Nursing Times, 70, 36, pp.1372-1374.
and
Savage, B.J. and Widdowson, T.   (1974)
Psycho geriatrics - revising the use of nursing resources -2,
Nursing Times, 70, 37, pp.1424-1427.
and

Savage, B. Widdowson, A. and Wright, A.   (1979)
Improving the Care of the Elderly, in: Towell, D. and Harries, C. Innovation in Patient Care, London: Croom Helm.
Summary: An early dependency-activity study in elderly mentally infirm wards. Instruments and specimen data are provided. Outmoded but the principles still apply.
Key words: dependency-activity, elderly.

Schroeder, R.E. Rhodes, A.M. and Shields, R.E. (1984)
Nurse activity systems: CASH Vs GRASP: a determination of nurse staffing requirements, Nursing Forum, 21, 2, pp.72-77.
Summary: Describes, compares and contrasts the CASH dependency-activity with the GRASP timed-task/activity nursing workload measure. Instruments and specimen data are provided. Both systems generated similar results but CASH was judge easier to use and less expensive.
Key words: review, timed-task/activity, dependency-acuity.

Senior, O.E. (1978)
Nurse-patient dependency,
Management Services, pp.1424-1427.
and
Senior, O. (1979)
Dependency and Establishments,
London: RCN.
Summary: Describes a dependency-activity workload measure. Outmoded data but the principles remain applicable.
Key words: dependency-activity.

South East Thames Regional Health Authority. (1987)
Nursing Collaborative Study,
Sussex: SETRHA.
Summary: Critical review of dependency-acuity and timed-task/activity nursing workload measures.
Key words: dependency-acuity, timed-task/activity.

Standen, L.F.B. (1971)
Controlling bed availability,
Nursing Times, Occasional Papers, 67, 49, pp.193-194.
Summary: Determines the number of beds a hospital should open based on the number of nurses available. Barr's patient dependency classification is used to determine workload. Outmoded but the principles apply.
Key words: nurses per occupied, dependency-acuity.

Stilwell, J.A. and Hawley, C. (1993)
Nursing dependency and the costs of nursing care,
Journal of Nursing Management, 1, 1, pp.113-117.
Summary: Explores dependency from an unusual angle. Shows that costs rise with patient dependency, and that nursing work overlaps occur. Warns that care is needed when dependency-acuity data are used to determine the size and mix of nursing teams. Examines also some related issue such as the unpredictability of nursing workload and matching the latter with rotas.
Key words: dependency-acuity, rotas.

Storey, C. and Bell, A. (1984)
Assessing workload by a nursing study,
Nursing Times, 80, 34, pp.57-60.
and
Storey, C. and Bell, A. (1985)
A useful pair of hands,
Nursing Times, 81, 13, pp.40-42.
Summary: Looks at nurse activity and grade mix within the context of the Cheltenham dependency-acuity system. Instruments and specimen data are provided. Core data and outcomes are outmoded but the principles apply today.
Key words: dependency-acuity.

Sullivan, M.T. and Boyle, M.A. (1971)
Establishment setting and control in small hospitals,
Nursing Times, Occasional Papers, 67, 28, pp.109-111.
Summary: Application of dependency-acuity nursing workload measures to one setting. Outmoded results but the principles apply today.
Key words: dependency-acuity.

Taylor, S. Senn, S. and Potton, R. (1976)
Report no. 75/23. Nursing Dependency. Patients at Leybourne Grange Hospital for the Mentally Handicapped,
South East Thames Regional Health Authority.
and
Taylor, S. Senn, S. and Potton, R. (1978)
Patient-nurse dependency,
Nursing Times, 74, 18, pp.755-758.
Summary: Develops a dependency-acuity method of measuring nursing workload based on the Norwich elderly care method. Highlights nursing activity, especially the falling amount of direct care. Dated and specific to one clinical speciality but the principles can be applied today and more broadly.
Key words: activity, dependency-acuity.

Walker, D.D. (1983)
The cost of nursing care in hospitals,
Journal of Nursing Administration, 13, 3, pp.13-18.
Summary: Uses a Criteria for Care type dependency-acuity method to generate insight into nursing cost variations.
Key words: dependency-acuity, costs.

Wolf, H. and Young, J.P. (1965)
Staffing the nursing unit. Part 1.
Nursing Research, 14, 3, pp.237-243.
and
Wolf, H. and Young, J.P. (1965)
Staffing the nursing unit. Part 2.
Nursing Research, 14, 3, pp.299-303.
Summary: Very early days of developing a dependency-activity nursing workload measure. Outmoded data but the principles remain the same.
Key words: dependency-activity.

Annotated Bibliography: Quality of Care

The implications of under-staffing and inappropriate mix for quality of care can't be ignored. This section looks at not only quality implications but also how quality of care in a nursing workforce planning context can be assessed and evaluated. Consequently, links between quality of nursing care and nursing workload are strongly made. The following measures are included: Monitor; Quality Pointers; QualPaCS; Sandwell and the South East Staffordshire audit. Independent authors comment on quality measures' validity, reliability and user-friendliness.

Aydelotte, M.K. (1973)
Nurse Staffing Methodology. A Review and Critique of Selected Literature. DHEW Publication (NIH) 73-433.
Washington: Department of Health, Education and Welfare.
Summary: Reviews contemporary North American nursing workload systems, some of which were developed for use in the UK. Sets out the empirical basis for justifying nursing establishments and costs.
Key words: review, quality.

Bagust, A. Oakley, J. and Slack, R. (1992)
Ward Nursing Quality and Grade mix. Report of a Paired Ward Experiment Undertaken in the North West Region, York University: Health Economics Consortium.
Summary: Detailed report on the method and results of the Quality Pointers and Teamwork project, and their application to measuring nursing workload. Instruments and specimen results are provided. The main thrust of the report is an experiment in which the quality of nursing care and workload are compared under different grade mixes.
Key words: regression, quality.

Bagust, A. Burrows, J. and Oakley, J. (1992)
Quality or quantity, Health Service Journal, 105, 5314, pp.23-25.
Summary: Empirically determines a relationship between grade mix and the quality of patient care. Shift-based specimen data and recommendations are provided.
Key words: grade mix, quality, regression.

Ball, J. and Oreschnick, R. (1986)
Balanced formula,
Senior Nurse, 5, 5/6, pp.30-32.
Summary: Clearly and simply describes the Monitor/Criteria for Care dependency, acuity and quality method. Formulas, specimen data and ward case studies are given.
Key words: dependency-acuity, nursing quality.

Barnett, D. and Wainwright, P. (1987)
A measure of quality,
Senior Nurse, 6, 3, pp.8-9.
and

Barnett, D. and Wainwright, P. (1987)
Between two tools,
Senior Nurse, 6, 4, pp.40-42.
Summary: Explores the psychometric properties of Monitor and QualPaCS. Both instruments have strengths and weaknesses, but QualPaCS emerges as the more robust. These articles are written in a quality assurance rather than a workforce planning context.
Key words: quality.

Blee, A.C. (1993)
The right staff in the right place: a review of manpower, leading to skill-mix, activity matched to outcome.
Journal of Nursing Management, 1, pp.89-94.
Summary: Isle of Wight Health Authority's approach to reviewing and planning the nursing workforce. Skill mix changes led to a potential 10% savings. The evaluation performance indicator, activity analysis, quality of care and 'what-if?' based. Specimen data and results are provided.
Key words: activity, quality.

Blegan, M.A. Goode, C.J. and Reed, L. (1998)
Nurse staffing and patient outcomes.
Nursing Research, 47, pp.43-50.
Summary: Examines the implications of dilute grade mixes for nursing outcomes.
Key words: quality.

Bosanquet, N. (1985)
Where have all the nurses gone?
Nursing Times, 81, 43, pp.16-17.
Summary: Looks at the cost and quality of nursing care.
Key words: quality, cost.

Brittle, J. and Marsh, J. (1986)
Monitor: Definition or measurement?
Nursing Times, 82, 45, pp.36-37.
Summary: Tests and reports Monitor's psychometric properties. Concludes that Monitor has weaknesses and limitations that workforce planners need to consider when educating auditors to prevent invalid and unreliable results. N.B. Goldstone responds in on pp.38-39 in the same journal.
Key words: quality.

Carr-Hill, R.A. Dixon, P. Griffiths, M. et al. (1992)
Skillmix and the Effectiveness of Nursing Care
York University: Centre for Health Economics.
and
Carr-Hill, R.A. Dixon, P. Griffiths, M. et al. (1995)
The impact of nursing grade on the quality and outcome of nursing care.
Health Economics, 4, pp.57-72.
Summary: Detailed, empirical study of rich and dilute nursing grade mix - especially the quality implications. QualPaCS was the measure of nursing quality.
Key words: grade mix, quality, cost.

Czaplinski, C. and Diers, D. (1998)
The effect of staff nursing on length of stay and mortality.
Medical Care, 36, pp.1626-1638.
Summary: Examines the relationship between nursing numbers, mix and selected patient outcomes.
Key words: quality.

David, J. and Pritchard, P. (1987)
Using Monitor,
Senior Nurse, 6, 4, pp.43-45.
Summary: Describes Monitor's nature, purpose and application to specific settings. Although the relationship between Monitor and patient dependency is covered, other workload issues are only briefly discussed (i.e., Criteria for Care). Specimen data and results are provided.
Key words: quality, dependency.

DHSS. (1988)
A Report on the Activities of Nursing Staff in Hospital Wards. Service Quality Study
London: DHSS: NHS Management Consultancy Services/Nursing Division.
Summary: Looks at the methods for measuring and exploring the relationship between nursing activity and nursing quality.
Key words: activity, quality.

Dimmock, S. (1983)
Splitting and sharing jobs,
Nursing Times, 79, 40, p.60.
Summary: Examines cost, quality and grade mix from a permanent and temporary staff perspective.
Key words: grade mix, quality.

Donnelly, P. (1986)
Spotlight on children: It's the quality that counts,
Nursing Times, 82, 26, pp.59-61.
Summary: Describes the Monitor quality of care component of workforce planning and how it was applied to paediatric wards. Specimen instruments and data are provided.
Key words: paediatric, quality.

Donovan, M. and Lewis, G. (1987)
Increasing productivity and decreasing costs: the value of RNs.
Journal of Nursing Administration, 17, 9, pp.16-18.
Summary: Examines the cost and quality implications of rich and dilute grade mixes.
Keywords: grade mix, cost, quality.

Flood, S.D. and Diers, D. (1988)
Nurse staffing, patient outcome and cost.
Nursing Management, 19, pp.34-43.
Summary: Concludes that richer grade mixes improve patient outcomes.
Key words: quality.

Forster, J.F. (1978)
The dollars and sense of an all-RN staff,
Nursing Administration Quarterly, 3, pp.41-47.
Summary: Examines the cost and quality of nursing care in relation to different grade mixes.
Key words: cost, quality, grade mix.

Galvin, J.A. and Goldstone, L. (1985)
Junior Monitor,
Loughton: Gale Publications.
Summary: The Monitor pack for children's nursing.
Key words: quality.

Gibbs, I. McGaughan, M. and Griffiths, M. (1991)
Skill mix in nursing: a selective review of the literature,
Journal of Advanced Nursing, 16, pp. 242-249.
Summary: Systematic literature review into the cost and quality of nursing care and its relationship to skill mix and grade mix. A range of demand-side workforce planning issues are considered. No instruments are described but some data are given.
Key words: review, cost, quality, grade mix, skill mix.

Giovannetti, P. (1978)
Patient classification in nursing; a description and analysis. HRA 78-22; HRP 050051.
Hyattsville: US Department of Health and Welfare.
and
Giovannetti, P. (1979)
Understanding patient classification,
Journal of Nursing Administration, 9, 2, pp.4-9.
and
Giovanneti, P. and Meyer, G. (1984)
Building confidence in patient classification systems,
Nursing Management, 15, 18, pp.31-34.
Summary: Explores nature, value and application of dependency-based workload measurement. Discusses the relationship between establishments, grade mix and nursing quality.
Key words: dependency, quality.

Goldstone, L. (1986)
A pointer to quality,
Nursing Times, 82, 45, pp.38-39.
Summary: Goldstone replies to Brittle and Marsh criticism of Monitor on pp.36-37 in the same journal.
Key words: quality.

Goldstone, L. Ball, J. and Collier, M. (1983)
Monitor,
Loughton: Gale Publications.
and

Goldstone, L. and Maselino-Okai, C.V (1984)
Senior Monitor,
Summary: The full instruments and instructions on how to use them.
Key words: quality.

Greenhalgh and Co. (1991)
Using Information in Managing the Nursing Resource - The Rainbow Pack,
Macclesfield: Greenhalgh Healthcare Consultants.
and
Greenhalgh and Co Ltd. (1991)
Nurse Management Systems. A Guide to Existing and Potential Products,
Macclesfield: Greenhalgh Healthcare Consultants.
Summary: Comprehensive, state-of-the-art review of many nursing workload measuring and workforce planning methods. Presents their strengths and weaknesses. Workload and grade mix are set in the context of quality; personnel and finances. These booklets are distance learning packs for ward managers. Information is dated but the principles apply.
Key words: activity, quality, grade mix, costs, review.

Hawley, C.A. Stilwell, J.A. Robinson, J. and Bond, M. (1993)
Nurses Manage,
Aldershot: Averbury.
Summary: Detailed and systematic account of ward managers' responsibilities including nursing workload, establishments, grade mixes, rostering, nursing costs and quality. Draws on extensive empirical data from several acute wards. Outmoded but the principles apply.
Key words: actual staffing, dependency-acuity, quality, costs, rotas.

Higgins, R. Hurst, K and Wistow, G. (1999)
Psychiatric Nursing Revisited,
London: Whurr.
Summary: Detailed, empirical evaluation of modern psychiatric nursing care. Patient dependency, nursing, workload and quality are explored. Principles apply to all care groups.
Key words: patient dependency, nursing workload and quality.

Hurst, K. and Howard, D. (1988)
Measure for measure,
Nursing Times, 84, 22, pp.30-32.
Summary: Describes a nursing quality audit that can be used in conjunction with a dependency-activity nursing workload measure. Outmoded data but the principles apply.
Key words: quality, psychiatry.

Jacques, C.A. (1983)
A practical view,
Nursing Times, 79, 38, pp.27-28.
Summary: Explores the cost and quality of nursing care in the context of regular part-time and temporary staff.
Key words: cost, quality, rotas.

Jones, W.J. (1977)
Management by crisis or by objectives?
Nursing Times, 73, 11, pp.388-390.
Summary: Looks at the relationships between the nursing establishments and ward managers' ability to use patient-centred care. Quality of care was felt to be suffering owing to nursing workload and under-staffing.
Key words: quality.

Leenders, F. (1985)
Management: translating strategy.
Nursing Times, 81, 39, pp.43-45.
Summary: Compares and contrasts North American with UK nursing workforce planning methods. Broadly classifying methods as top-down management and bottom-up dependency-acuity, cost and quality issues are considered. Specimen data and results are given.
Key words: review, dependency-acuity, cost, quality.

McElroy, A. Rodgers, D. and Smith, M. (1996)
Fix the skill mix,
Nursing Management, 2, pp.14-15.
Summary: Examines the relationship between nursing, grade mix, skill mix, demand and supply-side workforce planning. The ratio of nurses and nursing assistants are examined in the context of care quality.
Key words: grade mix, skill mix, quality.

McKenna, H.P. (1995)
Nursing skill mix substitutions and the quality of care: an exploration of assumptions from the research literature.
Journal of Advanced Nursing, 21, pp.452-459.
Summary: Systematic literature review that explores three assumptions about the relationship between grade mix and skill mix richness and the quality of care. The cost-effectiveness of rich and dilute grade mix and skill mix are considered.
Key words: grade mix, quality, cost.

Miller, E.A. (1976)
Staffing with the aid of dependency studies,
Nursing Times, Occasional Papers, 72, 32, pp.113-115.
and
Miller, A. (1984)
Nurse/patient dependency - a review of different approaches with particular reference to studies of the dependency of elderly patients,
Journal of Advanced Nursing, 9. pp.479-486.
and
Miller, A.   (1984)
Does dependency count?
Senior Nurse, 1, 29, pp.10-11.
and

Miller, A. (1985)

Nurse/patient dependency - is it iatrogenic?
Journal of Advanced Nursing, 10, pp.63-69.
and
Miller, A. (1985).
A study of dependency of elderly patients in wards using a different methods of nursing care.
Age and Ageing, 14, pp.132-138.
Summary: Detailed examination of patient dependency's contribution to measuring nursing workload. Instruments, specimen data and results are provided. Some sections focus on elderly care units. Explains that dependency is partly iatrogenic and less sensitive to physical and mental state than previously thought. Consequently, dependency can only partly explain nursing workload. Recommends that quality of care takes precedence over dependency measures in nursing workforce planning.
Key words: dependency, workload, quality.

Milne, C. (1988)
Getting to grips with GRASP,
Nursing Standard, 10, 3, pp.22-23.
Summary: Describes GRASP, its nature and purpose and application to one hospital. GRASP's dependency, care hours and quality components are covered. Specimen instruments are provided.
Key words: timed-task/activity, quality, dependency.

Moores, B. and Grant, G.W.B. (1977)
The 'Avoidance' syndrome in hospitals for the mentally handicapped,
International Journal of Nursing Studies, 14, 2, pp.91-95.
Summary: An early exploration of the relationship between dependency, nurse-patient ratios and quality of care.
Key words: dependency, nurses per occupied bed, quality, learning disability.

Needham, J. (1997)
Accuracy and workload measurement: a fact or fallacy,
Journal of Nursing Management, 5, 2, pp.83-87.
Summary: Defines workload before exploring validity and reliability of bottom-up, dependency-based methods. Top-down management methods are compared. Workload is discussed in quality terms.
Key words: review, quality.

Needeleman, J. Buerhaus, P. Mattke, S. et al (2002)
Nurse staffing levels and quality of care in hospitals,
New England Journal of Medicine, 346, 22, pp.1715-1722.
Summary: Large-scale, empirical study involving medical and surgical nursing staff and patients in 799 hospitals. There were significant relationships between the number and proportion of registered nurses and positive patient outcomes such as rescuing medical patients from life-threatening conditions like cardiac arrest and shock. Different but equally positive outcomes were recorded in surgical wards. In short, richer grade mixes led to better care.
Key words: quality.

Osinski, E.G. and Powals, J.G. (1980)
The cost of an all-RN staffed primary nursing,
Supervisor Nurse, 11, pp.16-21.
Summary: Explores the cost and quality of qualified-nursing assistant combinations.
Key words: grade mix, cost, quality.

Presly, A.S. (1980)
An evaluation of the reduction in patient numbers in psycho geriatric wards,
Health Bulletin, 38, 1, pp.32-36.
Summary: Detailed study of patient dependency, nursing activity, quality of care, actual staffing and time out in a new elderly mentally infirm unit.
Key words: elderly care, patient dependency, nursing activity, quality of care, actual staffing, time-out.

Pearson, A. Hocking, S. Mott, S. and Riggs, A. (1992)
Skills mix in Australian nursing homes,
Journal of Advanced Nursing, 17, pp.767-776.
Summary: Looks at the cost and quality of different grade mix combinations. Patient dependency also features along with many other workforce planning issues. Principles are relevant in elderly care wards too.
Key words: cost, quality, grade mix, elderly.

Rapson, C. and Halliday, J. (2002)
Safety in numbers,
Health Service Journal, 112, 5802, pp.24-25,
Summary: Describes the nature, value and application of the NISCM dependency-acuity nursing workload system. Addresses some unusual quality issues, such as untoward incidents, in the relation to under-staffing. Time-out is also considered. Argues strongly that workload and staffing methods are essential for modern workforce planning.
Key words: dependency-acuity, quality, time-out.

Redfern, S.J. and Norman, I.J. (1990)
Measuring the quality of nursing care: a consideration of approaches,
Journal of Advanced Nursing, 15, pp.1260-71.
Summary: Empirically determines the nature and value of nursing quality audits, which feature strongly in many dependency-acuity-quality nursing workload measures. The validity and reliability of quality measures are explored in detail.
Key words: quality, dependency-activity-quality.

Rhys-Hearn, C. (1972)
How many high care patients?
Nursing Times, 68, 16, pp.472-474.
and
Rhys-Hearn, C. (1972)
How many high care patients?
Nursing Times, 68, 17, pp.504-505.
and
Rhys-Hearn, C. (1974)
Evaluation of patients' nursing needs: prediction of staffing 1.
Nursing Times, Occasional Paper, 70, pp.69-72
and
Rhys-Hearn, C. (1974)
Evaluation of patients' nursing needs: prediction of staffing 2.
Nursing Times, Occasional Paper, 70, pp.73-76
and
Rhys-Hearn, C. (1974)
Evaluation of patients' nursing needs: prediction of staffing 3.
Nursing Times, Occasional Paper, 70, pp.77-80
and
Rhys-Hearn, C. (1974)
Evaluation of patients' nursing needs: prediction of staffing 4.
Nursing Times, Occasional Paper, 70, pp.81-84
and
Rhys-Hearn, C. (1977)
Nursing workload determination: development and trials of a package.
Medical Informatics, 2, 2, pp.91-99
and
Rhys-Hearn, C. (1979)
Staffing geriatric wards. Trials of a 'package' - 1,
Nursing Times, Occasional Papers, 75, 17, pp.45-48.
and
Rhys-Hearn, C. (1979)
Staffing geriatric wards. Trials of a 'package' - 2,
Nursing Times, Occasional Papers, 75, 18, p.52.
and
Rhys-Hearn, C.   (1979)
Comparison of Rhys-Hearn method of determining nursing staff requirements with the Aberdeen formula,
International Journal of Nursing Studies, 16, 1, pp.95-103.
and
Rhys-Hearn, C. (1979)
Evaluation of Nurse Activity, in: Alperovitch, A. de-Dombal, F.T. and Gremy, F. (eds)
Evaluation and Efficiency of Medical Action,
Amsterdam: North-Holland Publishing Company.
and

Rhys-Hearn, C. and Howard, J. (1980)
The Relationship of Nursing Needs, Resources and Standards in Geriatric Wards,
London: DHSS.
and
Rhys-Hearn, C. and Potts, D. (1978)
The effect of patients' individual characteristics upon activity times of nursing care.
International Journal of Nursing Studies, 15, 1, pp.23-30.
and
Rhys-Hearn, C. and Young, B. (1981)
Experience with the Rhys-Hearn geriatric workload package - a regional survey.
Nursing Times, Occasional Paper, 77, 4, pp.9-12.
Summary: A series of articles that applies the Rhys-Hearn dependency-activity method to various care settings, but elderly care features strongly. Case controlled trials and other research designs are used to test different establishments and grade mixes from a dependency, workload and quality perspectives. Instruments and ample specimen data are provided. Rhys-Hearn outcomes are compared with other approaches. The data and results are outmoded but the method's principles are relevant today.
Key words: dependency-activity, quality, elderly, review.

Rothwell, S. (1986)
Costing flexible working patterns,
Nursing Times, 82, 28, pp.43-45.
Summary: Explores nursing workload and grade mix from a cost-effectiveness perspective Specimen data and results are given.
Key words: acuity, grade mix, cost, quality.

Royal College of Nursing. (1992)
Cost effective Care
London: RCN.
Summary: Briefly explores cost and quality implications of grade mix..
Key words: grade mix, cost, quality.

South East Staffordshire Health Authority. (circa 1990)
Quality Assurance Ward Audit
Tamworth: Tamworth General Hospital.
Summary: Produced by Telford, originator of the professional judgement method of workforce planning. The audit can be used as a parallel measure of quality of care, which can be used to evaluate staffing levels and nursing standards.
Key words: quality.

Stevens, J. and Goucher, J. (1985)
Measurement of patient dependency,
Nursing Times, 81, 44, pp.54-55.
Summary: Describes the Sandwell dependency-quality workforce planning method. Outmoded outcomes but the principles apply.
Key words: dependency, quality.

Taunton, R.L. Kleinbeck, S.V.M. Stafford, R. et al. (1994)
Patient outcomes: are they linked to registered nurse absenteeism, separation or workload?
Journal of Nursing Administration, 24, suppl.48-55, erratum 24, 72.
Summary: Concludes that variables other than staffing levels and mix are responsible for good patient outcomes.
Key words: quality, time-out.

Telford, W.A. (1979)
A method of determining nursing establishments,
Hospital Health Services Review, 5, 4. pp. 11-17.
and
Telford, W.A. (1983)
Determining Nursing Establishments: Telford Consultative Approach,
Birmingham: North Birmingham Health Authority.
Summary: Compares and contrasts the dependency-acuity and professional judgement methods. Questions the objective, scientific approach and recommends the simplicity of a three-step professional judgement method. Each step is described with examples. Instruments and specimen data are given. Honestly reports professional judgement method weaknesses and how they can be overcome. A later report (South East Staffordshire Health Authority circa 1990) adds a quality of care measure to evaluate establishments.
Key words: professional judgement, review, quality.

Tomalin, D.A. Redfern, S.J. and Norman, I.J. (1992)
Monitor and Senior Monitor: problems of administration and some proposed solutions,
Journal of Advanced Nursing, 17, pp.72-82.
Summary: Describes the quality of care component of some dependency-activity-quality methods, and concentrates on their reliability, validity and utility.
Key words: quality.

Wandelt, M. and Ager, J. (1974)
Quality Patient Care Scale (QualPaCS),
New York: Appleton-Century-Crofts.
Summary: A well-established, robust measure of nursing quality that can be used in parallel with nursing workload measures to add insight into actual and recommended establishments and grade mix.
Key words: quality.

Wiles, A. (1992)
Quality Patient Care Scale, in: Pearson, A. (ed.) (1992) Nursing Quality Measurement.
Quality Assurance Methods for Peer Review,
Chichester: Wiley.
Summary: Describes one team's experience with QualPaCS; a nursing quality measure that can be used in parallel with dependency-activity measures to evaluate workload.
Key words: quality.

Williams, M.A. and Murphy, L.M. (1979)
Subjective and objective measures of staffing adequacy,
Journal of Nursing Administration, 9, 1, pp.21-29.
Summary: Explores, mainly, the quality of care implications of under-staffing.
Key words: quality.

York Health Economics Consortium (1993)
Quality Pointers Questionnaire for General Surgical and General Medical Wards,
York: York University.
Summary: Describes the efficient and effective Quality Pointers nursing quality measures that
can be used in parallel with measures of nursing workload.
Key words: quality.

Annotated Bibliography: Dependency-activity-quality Method

A logical extension to the acuity method was to add a method of measuring the quality of nursing care. These quality of care assured data are meant to reinforce information about the adequacy (or otherwise) of existing nursing establishments. Methods include: Birmingham; East Dyfed; and Monitor/Criteria for Care. This section is rich in texts that include instruments and large data sets gathered empirically (although much of the latter is outmoded). Other texts describe detailed case studies. Also, there are distance learning texts on how-to-do-it. Finally, a small section looks at instruments' psychometric properties.

Adams, R. and Duchene, P. (1985)
Computerisation of patient acuity and nursing care planning,
Journal of Nursing Administration, 15, 4, pp.11-17.
Summary: Describes a computerised Monitor/Criteria for Care nursing workload and care planning system.
Key words: dependency-activity-quality, IM&T.

Ball, J. (1987)
A quality environment,
Senior Nurse, 6, 1, pp.22-23.
Summary: Shows how Monitor/Criteria for Care can be used to evaluate actual nursing establishments within a quality of care context. Specimen formulas, data and results are provided.
Key words: dependency-activity-quality.

Ball, J. Hurst, K. Booth, M. and Franklin, R. (1989)
'… But Who Will Make the Beds?' A Research Based Strategy for Ward Nursing Skills and Resources for the 1990's,
Leeds: University of Leeds, Nuffield Institute.
Summary: Detailed empirical evaluation of nursing establishments and grade mix using Monitor and Criteria for Care nursing workload and nursing quality method. Most central and many peripheral workforce planning issues are addressed in a nursing efficiency and effectiveness context.
Key words: dependency-acuity, nursing quality.

Ball, J. and Oreschnick, R. (1986)
Balanced formula,
Senior Nurse, 5, 5/6, pp.30-32.
Summary: Clearly and simply describes the Monitor/Criteria for Care dependency, acuity and quality method. Formulas and specimen data from ward case studies are given.
Key words: dependency-acuity, nursing quality.

Birmingham University Health Services Research Centre. (1980)
Report 14. Nursing Studies. Assessment of Nursing Needs Leading to Optimal Staffing Patterns.
Birmingham University Health Services Research Centre.
Summary: Describes the development and implementation of a dependency, acuity and nursing quality based workforce planning system.
Key words: dependency, acuity, quality.

Davies, A. Goldberg, B. and Wilkinson, I. (1984)
A methodology for manpower planning. Further applications of standardised assessments for the elderly,
Nursing Times, Occasional Papers, 80, 2, pp.44-46.
Summary: Takes the principles from dependency-activity-quality methods, enhanced using professional judgement, to create a workforce planning system for elderly mentally infirm wards.
Key words: elderly, dependency-activity-quality, professional judgement.

Fawcett, R. (1985)
Manpower planning: art or science?
Nursing Mirror, 160, 1, pp.20-22.
and
Fawcett, R. (1985)
Manpower planning: art or science?
Nursing Mirror, 160, 2, pp.29-31.
Summary: Classifies and describes contemporary nursing workload measuring methods. Focuses on Monitor/Criteria for Care. Specimen instruments and data are provided.
Key words: dependency-acuity-quality, review.

Gillet, J. and Flux, R. (1987)
Acting on information,
Nursing Times, 83, 15, pp.29-30.
Summary: A case study of the Monitor/Criteria for Care dependency-acuity-quality method, and how data were used to change ward policy and practice.
Key words: dependency, acuity, quality.

Goldberg, B. Davies, A. and Johnson, P. (1984)
Scaling the heights,
Nursing Mirror, 158, 15, pp.35-38.
Summary: Describes the East Dyfed MDSX dependency-activity-quality method of nursing workforce planning. Instruments and specimen data are provided (in an Elderly Mentally Infirm context). Nursing standards take priority closely followed by patient dependency as means of determining nurse staffing. Formula are regression-based.
Key words: regression, dependency-activity-quality.

Goldstone, L. (1981)
Nursing manpower requirements: a framework for rational discussion.
Health Service Manpower Review, pp.6-8.
Summary: Reviews all the main categories of nursing workforce planning. Nurses per occupied bed and dependency-activity-quality methods are covered in detail. Other, important variables are included such as indirect care and time-out. Specimen data and formulas are provided. Outmoded results but the principles apply still.
Key words: nurses per occupied bed, dependency-activity-quality.

Goldstone, L. and Ball, J. (1984)
The quality of nursing services,
Nursing Times, 80, 35, pp.56-58.
and
Goldstone, L. and Ball, J. (1984)
Criteria for Care,
Nursing Times, 80, 36, pp.55-58.
Summary: Describes in detail, with worked examples, the Monitor/Criteria for Care dependency-activity-quality nursing workload and workforce planning method. Underlines the link between quality and nursing workload. Summarises the nature, value, utility and psychometric properties of M/CforC. Specimen data and results are given
Key words: dependency-activity-quality.

Hilton, I. and Dawson, J. (1988)
Monitor evaluated,
Senior Nurse, 8, 5, pp.10-11.
and
Hilton, I. and Dawson, J. (1988)
Monitor and Criteria for Care: the Portsmouth experience,
Senior Nurse, 8, 6, pp.26-28.
Summary: Reports the experiences of one team who applied Monitor/Criteria for Care in acute hospital wards. Ample specimen data are used to show how staffing was evaluated. Monitor/Criteria for Care's strengths and weaknesses are carefully explored.
Key words: dependency-acuity-quality.

Hurst, K. (1992)
Learning workforce planning from the school of hard knocks. Part 1: theory and practice of patient dependency measurement nursing activity analysis,
International Journal of Health Informatics, 2, 1, pp.17-19.
and
Hurst, K. (1992)
Learning workforce planning from the school of hard knocks. Part 2: nursing role, nursing grade mix and nursing quality,
International Journal of Health Informatics, 2, 2, pp.15-17.
Summary: Explains the theory and practice of Monitor/Criteria for Care method of measuring nursing workload and quality. A warts and all stance is taken.
Key words: dependency-activity-quality.

Hurst, K. (1993)
Nursing Workforce Planning,
Harlow: Longman.
Summary: Describes, with plenty of worked examples, most contemporary nursing workload measures and workforce planning approaches. Data are outmoded but the principles apply.
Key words: professional judgement, nurses per occupied bed, dependency-activity-quality, timed-task/activity, time-out, grade mix.

Hurst, K. and Quinn, H. (1992)
Nursing Establishments and Skill Mix in Northern Ireland. Making the Best Use of Nursing Resources in the Province,
Leeds University: Nuffield Institute for Health and the Northern Ireland DHSS.
and
Hurst, K. (1995)
Nursing Establishments and Skill Mix in Northern Ireland. Making the Best Use of Mental Health Nursing Resources in the Province,
Leeds University: Nuffield Institute for Health and the Northern Ireland DHSS.
and
Hurst, K. (1995)
Nursing Establishments and Skill Mix in Northern Ireland. Making the Best Use of Learning Disabilities Nursing Resources in the Province,
Leeds University: Nuffield Institute for Health and the Northern Ireland DHSS.
Summary: Detailed, empirical studies using Monitor/Criteria for Care in several hospitals. Ample specimen data, formulas and results are provided. Outmoded but the principles apply.
Key words: dependency-activity-quality.

Hurst, K. and Ball, J. (1990)
A tailor-made workforce for 2000,
Nursing Standard, 4, 35, pp. 35-36.
Summary: Extends the Monitor/Criteria for Care to determining the number and mix of nurses. Specimen data and results are provided.
Key words: dependency-activity-quality.

Jelinek, R. Hausman, R. and Hegyvary, S. (1977)
Publication Number (HRA) 77-70. Monitoring the Quality of Nursing Care Part 3: Professional Review of Nursing. An Empirical Investigation,
Washington: US Dept of Health, Education and Welfare.
Summary: Describes the Rush-Medicus system of nursing workload and quality measure from which Monitor and Criteria for Care were derived.
Key words: dependency-acuity-quality.

Mahmood, K. (1999)
Skillmix Review in Elderly Care: a Pragmatic Approach,
South West Regional Education and Development Group.
Summary: Detailed study of the actual and ideal skill mix in one hospital. Explores several peripheral issues and employs the NISCM dependency-acuity-quality nursing workload measure. Also reviews a range of alternative nursing workload measures, including their strengths and weaknesses.
Key words: review, dependency-acuity-quality, skill mix.

North Western Regional Health Authority. (1981)
Report of the Nurse Staffing Levels Project 1978-1981,
Manchester: NWRHA.
Summary: Describes a bespoke dependency-acuity-quality system that was a forerunner to Monitor and Criteria for Care.
Key words: dependency-acuity-quality.

Nuffield Institute for Health (2002)
Patient Dependency, Nursing Activity and Nursing Quality Database,
Leeds: Nuffield Institute for Health <k.hurst@leeds.ac.uk>.
Summary: Yearly updates to a twenty-five year database of patient dependency, nursing activity, nursing quality, job descriptions and actual staffing data.
Key words: dependency-activity-quality.

Open Learning for Nurses. (1990)
Measurement in Nursing. Section 7: Manpower Planning in Nursing,
London: Barnett College.
Summary: Distance learning text that takes the reader through the Monitor and Criteria for Care approach to measuring workload and determining establishments. Dependency and acuity data are outmoded but the principles are the same.
Key words: dependency-acuity-quality.

Owens, M. and Hurst, K. (1991)
Auditing mental health units,
International Journal of Health Care Quality Assurance, 4, 1, pp.30-32.
Summary: Translates the Monitor and Criteria for Care dependency-acuity-quality method for use in psychiatric settings. Instruments and specimen data are provided.
Key words: dependency-acuity-quality, psychiatry.

Redfern, S.J. and Norman, I.J. (1990)
Measuring the quality of nursing care: a consideration of approaches,
Journal of Advanced Nursing, 15, pp.1260-71.
Summary: Empirically determines the nature and value of nursing quality audits, which feature strongly in many dependency-acuity-quality nursing workload measures. The validity and reliability of these quality measures are explored in detail.
Key words: quality, dependency-activity-quality.

TMS/Nuffield Institute for Health. (1997)
Bedcost: Nursing Workforce Planning and Analysis Tool,
Wolverhampton: TMS.
Summary: User guide to a commercially available stand-alone program that is based on the Monitor/Criteria for Care method. Ample specimen computer screens are provided.
Key words: dependency-activity-quality, IM&T.

Vousden, M. (1989)
Resource Management: Freeman's choice,
Nursing Times, 85, 11, pp.28-30.
Summary: Connects Monitor/Criteria for Care and Resource Management. Examines in particular staff perceptions during and after implementation.
Key words: dependency-activity-quality, IM&T.

Annotated Bibliography: Grade mix and Skillmix

Owing to the influence on nursing costs, texts that examined the shape as well as the size of the health care workforce took off in the early eighties. Consequently, this section explores appropriate and inappropriate grade mix (within nursing) and skill mix (between nurses and other health care professionals) and how appropriate mixes can be determined. Many of the nursing workload and nursing workforce planning methods described elsewhere are mentioned in these texts. Extended and expanded nursing roles, health care assistants, NVQs and nursing cadets are discussed explicitly. Also, there are some good review articles and reports.

All Wales Nurse Manpower Planning Committee. (1987)
Third Report: Nursing Staff Mix,
Cardiff: Welsh Office.
Summary: Looks at the factors that influence nursing grade mix.
Key words: grade mix.

Anderson, L. (1997)
The introduction of generic workers into the ward team: an exploratory study,
Journal of Nursing Management, 5, pp.69-75.
Summary: Explores grade mix and multiskilling. GRASP is used to evaluate these workforce planning issues.
Key words: timed-task, multiskilling.

Audit Commission. (2001)
National Report. Brief Encounters. Getting the Best from Temporary Staff,
Wetherby: Audit Commission Reports <www.audit-commission.gov.uk>.
Summary: Detailed, empirical study of bank and agency nurses. Their efficiency and effectiveness is considered in a cost and quality context.
Key words: grade mix.

Bagust, A. Burrows, J. and Oakley, J. (1992)
Quality or quantity,
Health Service Journal, 105, 5314, pp.23-25.
Summary: Empirically determines a relationship between grade mix and the quality of patient care. Shift-based specimen data are provided and recommendations are shift based.
Key words: grade mix, quality, regression.

Beardshaw, A. and Robinson, R. (1990)
New for Old?
London: King's Fund Institute.
Summary: Looks at nursing grade mix from an unusual perspective, the aim of which is to help managers and practitioners shape the nursing workforce to meet future health care challenges.
Key words: grade mix.

Bloom, J. Alexander, J.A. and Nichols, B.A. (1997)
Nurse staffing patterns and hospital efficiency in the United States.
Social Science and Medicine, 44, 2, pp.147-155.
Summary: Considers in detail the relationship between nursing grade mix, efficiency and effectiveness.
Key words: grade mix.

British Medical Journal. (2002)
Discussion Paper 9. The Future Healthcare Workforce,
London: BMJ.
Summary: Explores skills mix in the light of the demand for and supply of health care professionals. Expanded and extended nursing roles, especially their nature, purpose and implications are discussed at length. Workload, efficiency and effectiveness are also discussed.
Key words: skill mix.

Buchan, J. (1991)
Using agency nurses in the NHS,
Nursing Standard, 5/6, 20, p.29.
Summary: Briefly examines the nature and value of agency nurses in a grade mix and skill mix context.
Key words: grade mix, skill mix.

Buchan, J. (2002)
Magnet Hospitals: Attraction of opposites,
Health Service Journal, 112, 5812, pp.22-24.
Summary: Describes North American magnet hospitals before exploring their nature and value in the UK.
Key: skill mix.

Buchan, J. and Ball, J. (1991)
Caring Costs. Nursing Costs and Benefits: A Review for the Royal College of Nursing,
Brighton: Institute of Manpower Studies.
Summary: Explores skill mix in a cost and quality context.
Key words: skill mix.

Carr-Hill, R.A. Dixon, P. Griffiths, M. et al. (1992)
Skillmix and the Effectiveness of Nursing Care
York University: Centre for Health Economics.
and
Carr-Hill, R.A. Dixon, P. Griffiths, M. et al. (1995)
The impact of nursing grade on the quality and outcome of nursing care.
Health Economics, 4, pp.57-72.
Summary: Detailed, empirical study of rich and dilute nursing grade mix - especially the quality implications. QualPaCS was the nursing quality measure.
Key words: grade mix, quality, cost.

Coombs, J. and Sutton, C. (1994)
Support workers: cast in a supporting role.
Health Service Journal, 104, 5413, p.21.
Summary: Outlines the nature and value of flexible nursing assistants. Contributes to the 'wasted qualified nursing effort' debate. Provides specimen data.
Key words: grade mix.

Dash, P. and Jones, A. (1991)
Stretched to the limit,
Health Service Journal, 101, 5274, pp.21-23.
Summary: Looks at the skill mix implications of the New Deal for [junior] Doctors [hours]. These issues were recently resurrected with the recent introduction of the EU working time directive.
Key words: skill mix.

Denton, F.T. Gofri, A. Spencer, B.G. and Stoddart, G.L. (1983)
Potential savings from the adoption of nurse practitioners in the Canadian health care system, Socio-economic Planning Sciences, 17, 4, pp.199-209.
Summary: Explores skill mix and grade mix from and cost-benefit standpoint.
Key words: grade mix.

DoH (2002).
NHS Hospital and Community Health Services Non-Medical Staff in England: 1991-2001.
London: DoH <www.doh.gov.uk/public/nhsworkforce.htm>.
Summary: Shows trends in workforce numbers, mix, ages and location.
Key words: skill mix, grade mix.

DHSS (Department of Health and Social Security). (1977)
The Extended Role of the Clinical Nurses HC (77) 22,
London: DHSS.
Summary: An early consideration of extended nursing roles.
Key words: skill mix.

DHSS. (1986)
Mix and Match: A Review of Nursing Skill Mix,
London: HMSO.
Summary: Thorough, empirical study of nursing grade mix and skill mix. Outcomes are dated but the principles apply today.
Key words: grade mix and skill mix.

DHSS Nursing Division. (1987)
Review of Nursing Skillmix,
London: HMSO.
Summary: Develops points made in the Mix and Match report published one year earlier based on the professions' response to Mix and Match. The professions' suspicion of health care assistants' efficiency and effectiveness was a main issue.
Key words: grade mix, skill mix.

DHSS. (1987)
The Role and Preparation of Support Workers to Nurses, Midwives and Health Visitors, and the Implications for Manpower and Service Planning,
London: HMSO.
Summary: A detailed job-description based study of support workers and their contribution to patient care. Nursing efficiency and effectiveness is also covered. Parts are dated but the principles are important.
Key words: grade mix, skill mix.

Dewar B.J. and MacLeod-Clark, J. (1992)
The role of the paid non-professional nursing helper: a review of the literature,
Journal of Advanced Nursing, 17, pp.113-120.
Summary: Extensive review of the literature on health care assistants. Concentrates on professionals' attitudes towards HCAs. Role descriptions are discussed in the context of different organisations. Nurses' role erosion is examined.
Key words: skill mix.

Dickson, N. and Cole, A. (1987)
Nurse's little helper,
Nursing Times, 83, 10, pp.24-26.
Summary: Early, theoretical examination of the health care assistant as a replacement of Project 2000 students.
Key words: skill mix.

Dimmock, S. (1983)
Splitting and sharing jobs,
Nursing Times, 79, 40, p.60.
Summary: Examines cost, quality and grade mix from a permanent and temporary staff perspective.
Key words: grade mix, quality.

Donovan, M. and Lewis, G. (1987)
Increasing productivity and decreasing costs: the value of RNs.
Journal of Nursing Administration, 17, 9, pp.16-18.
Summary: Examines the cost and quality implications of rich and dilute grade mixes.
Keywords: grade mix, cost, quality.

Farrell, J. (2000)
Skillmix: careers without tiers,
Health Service Journal, 110, 5710, p.30.
Summary: Takes extended nursing role to its extreme by describing successful nurse-run clinics and treatment sessions. Explores the implications of such developments.
Key words: skill mix.

Fisher, J. (1983)
The slip backwards,
<u>Nursing Times</u>, 79, 38, p.28.
Summary: Examines the cost and quality of nursing care from permanent and temporary staff perspectives.
Key words: rotas, grade mix.

Flack, M. and Johnston, M. (1987)
A helping handbook,
<u>Senior Nurse</u>, 6, 2, pp.10-11.
Summary: Justifies the nursing assistant's role and outlines their development using formal education.
Key words: grade mix.

Forster, J.F. (1978)
The dollars and sense of an all-RN staff,
<u>Nursing Administration Quarterly</u>, 3, pp.41-47.
Summary: Examines the cost and quality of nursing care in relation to different grade mixes.
Key words: cost, quality, grade mix.

Francis, B. and Humphreys, J. (1998)
Regulating non-nursing health care workers,
<u>Nursing Standard</u>, 12, 47, pp.35-37.
Summary: Explores the nursing assistant's role primarily from an education perspective. Considers the way a polarised qualified and unqualified nursing workforce is emerging.
Key words: grade mix.

Gaze, H. (1990)
Helping hands: a glimpse into the future,
<u>Nursing Times</u>, 86, 16, pp.28-30.
Summary: Summarises theoretical and practical issues from the empirical and anecdotal literature on the pro's and con's of health care assistants.
Key words: grade mix.

Gibbs, I. McGaughan, M. and Griffiths, M. (1991)
Skill mix in nursing: a selective review of the literature,
<u>Journal of Advanced Nursing</u>, 16, pp. 242-249.
Summary: Systematic literature review into the cost and quality of nursing care and its relationship to skill mix and grade mix. A range of demand-side workforce planning issues are considered. No instruments are described but some data are given.
Key words: review, cost, quality, grade mix, skill mix.

Gill, P. (1996)
The importance of workforce planning in the NHS in the 1990s.
<u>Health Manpower Management</u>, 22, 2, pp.21-25.
Summary: Broad discussion of workforce planning demand and supply side issues. Skillmix and reprofiling are discussed regarding the policy pressures facing NHS managers.
Key words: skill mix.

Gray, A. (1987)
A mixed review,
Senior Nurse, 6, 2, pp.7-8.
Summary: A review of the DHSS (1986) Mix and Match report. Examines some useful techniques for exploring grade mix, nursing activity and costs. Specimen data are provided.
Key words: review, grade mix, costs.

Greenhalgh and Co. (1991)
Using Information in Managing the Nursing Resource - The Rainbow Pack,
Macclesfield: Greenhalgh Healthcare Consultants.
and
Greenhalgh and Co Ltd. (1991)
Nurse Management Systems. A Guide to Existing and Potential Products,
Macclesfield: Greenhalgh Healthcare Consultants.
Summary: Comprehensive, state-of-the-art review of many nursing workload measuring and workforce planning methods. Presents their strengths and weaknesses. Workload and grade mix are set in the context of quality, personnel and finances. The booklets are distance learning packs for ward managers. Information is dated but the principles apply.
Key words: activity, quality, grade mix, costs, review.

Halloran, E.J. (1983)
RN staffing: more care less cost,
Nursing Management, 14, 9, pp.18-22.
Summary: Explores the relationship between grade mix and nursing efficiency and effectiveness.
Key words: grade mix, costs.

Hardie, M. (1987)
The support worker. A special kind of person,
Nursing Times, 83,10, pp.26-27.
Summary: Historical account of the transition from nursing auxiliaries to health care assistants Key words: grade mix.

Harper, L. (1986)
Skillmix: all mixed up,
Nursing Times, 82, 48, pp.28-31.
Summary: Reflects on the Mix and Match and report, notably the relationship between cost and quality of patient care. Explores the strengths and weaknesses of rich and dilute nursing teams. Using an experimental approach, compares and contrasts the difference in dependency, activity, quality and job satisfaction data from an all-qualified nursing care of the elderly team with a traditional nursing team. Instruments are described and preliminary data are given. Analysis was incomplete at the time of publication, but no obvious trends were emerging.
Key words: grade mix.

Hart, E. (1991)
Ghost in the machine,
Health Service Journal, 101, 5281, pp.20-21.
Summary: Debates grade mix from a cure or care perspective. Managerial and political elements emerge. Concludes that the planning and implementation of health care assistants is more complex than imagined.
Key words: grade mix.

Helt, E. and Jellineck, R.C. (1988)
In the wake of cost cutting, nursing productivity and quality improves,
Nursing Management, 19, 6, pp.36-48.
Summary: Reports some surprising outcomes from grade mix changes in North American Hospitals.
Key words: grade mix.

Hibbs, P.J. (1992)
Management: Skillmix in hospital,
Senior Nurse, 12, 5, pp.14-17.
Summary: Empirically explores the relationship between grade mix and quality of care. Instruments are briefly described and specimen data are provided.
Key words: grade mix, quality.

Hinshaw, A.S. Schofield, R. and Altwood, J.R. (1981)
Staff, patients and cost outcomes of all registered nurse staffing,
Journal of Nursing Administration, 11, pp.30-36.
Summary: Examines the upsides and downsides of rich grade mixes.
Key words: grade mix.

Hurst, K. (1993)
Nursing Workforce Planning,
Harlow: Longman.
Summary: Describes, using plenty of worked examples, most contemporary nursing workload measures and workforce planning approaches. Data are outmoded but the principles apply.
Key words: professional judgement, nurses per occupied bed, dependency-activity-quality, timed-task/activity, time-out, grade mix.

Hurst, K. (1995)
Nursing Establishments and Skill Mix in Northern Ireland. Making the Best Use of Nursing Resources in the Province,
Leeds University: Nuffield Institute for Health and the Northern Ireland DHSS.
and
Hurst, K. (1995)
Nursing Establishments and Skill Mix in Northern Ireland. Making the Best Use of Mental Health Nursing Resources in the Province,
Leeds University: Nuffield Institute for Health and the Northern Ireland DHSS.
and

Hurst, K. (1995)
Nursing Establishments and Skill Mix in Northern Ireland. Making the Best Use of Learning Disabilities Nursing Resources in the Province,
Leeds University: Nuffield Institute for Health and the Northern Ireland DHSS.
Summary: Detailed, empirical studies using Monitor/Criteria for Care in several hospitals. Ample specimen data, formulas and results are provided. Outmoded but the principles apply.
Key words: dependency-activity-quality.

Jarrold, K. (1986)
Cost-effective quality,
Nursing Times, 82, 50, pp.38-39.
Summary: Examines the efficiency and effectiveness of grade mixes and questions the move towards diluting the nursing workforce.
Key words: grade mix.

Jones, K. (1985)
One step ahead,
Nursing Times, pp.36-39.
Summary: Describes the mid-Staffordhsire supply-side model. Specimen data and results are given. Although dated, the role student nurse data play in workforce planning is discussed, which may have application today when health care assistants and nursing cadets are considered.
Key words: grade mix.

Jones, K. Redman, R.W. Vanden Bosch, T.M. et al. (1999)
Evaluating a multifunctional worker role: stakeholder analysis.
Outcomes Management for Nursing Practice, 3, 3, pp.128-135.
Summary: Examines skill mix from a re-engineering perspective. Anticipated and actual outcomes from job satisfaction to nursing quality in an North American hospital are considered.
Key words: skill mix.

Jones, J. Sanderson, C. and Black, N. (1993)
Does labour substitution occur in district general hospitals?
Health Trends, 25, 2, pp.68-72.
Summary: Explores nurses per occupied bed in a broader health context. The actual level of nurse staffing could not be attributed to occupancy nor dependency. Also, contemplates grade mix and notes no outcome patterns from rich or dilute grade mixes. Concludes that these outcomes are historical and decries the absence of empirical workforce planning methods. Suggests that a dependency-activity-quality methods would help. Extensive data are provided for bench marking purposes.
Key words: actual staffing, nurses per occupied bed, dependency, grade mix.

King, S. (2000)
Research: staffing levels. Safe staffing levels for children's wards,
Paediatric Nursing, 12, 2, pp.28-31.
Summary: Considers DoH guidelines on paediatric ward safe staffing levels; notably the RSCN mix. Highlights the reasons why staffing recommendations may be inadequate. Several variables (environmental hazards, dependency and shift systems) are discussed.
Key words: paediatric, grade mix.

Kyle, S.P. (1975)
A survey of the availability of part-time staff in relation to lists in the operating theatre,
NATN News, 12, 2, p.12.
Summary: Explores the role of part-time qualified staff in the operating theatre. Considers their value and what can be done to recruit and retain these staff.
Key words: grade mix, rotas.

McElroy, A. Rodgers, D. and Smith, M. (1996)
Fix the skill mix,
Nursing Management, 2, pp.14-15.
Summary: Examines the relationship between nursing, grade mix, skill mix, demand and supply-side workforce planning. The ratio of nurses to nursing assistants are examined in the context of care quality.
Key words: grade mix, skill mix, quality.

McKenna, H.P. (1995)
Nursing skill mix substitutions and the quality of care: an exploration of assumptions from the research literature.
Journal of Advanced Nursing, 21, pp.452-459.
Summary: Systematic literature review that explores three assumptions about the relationship between grade mix and skill mix richness and the quality of care. The cost-effectiveness of rich and dilute grade mix and skill mix are considered.
Key words: grade mix, quality, cost.

McKeown, M. (1994)
Skillmix reviews: the need to be aware,
Nursing Standard, 8, 32, pp.37-39.
Summary: Explores nursing workload and grade mix in the light of Project 2000. Discusses nursing students' contribution to nursing care in the wards and the implications for nursing efficiency and effectiveness.
Key words: grade mix.

MacLeod, M. (1985)
The professional ancillary,
Nursing Times, 81. 47, pp.24-27.
Summary: Examines the amount of nursing time spent on non-nursing work. Calculates the savings if ward grade mix reflected nursing activity. Instruments and specimen data are provided.
Key words: grade mix, activity.

Malby, R. (1990)
Vocational support,
Nursing Times, 86, 16, pp.31-33.
Summary: Describes one health authority's approach to determining the number and preparation of health care assistants in preparation for Project 2000. Important supply-side and job satisfaction issues are included.
Key words: grade mix.

Malin, H. and Wright-Warren, P. (1987)
Mix and Match,
Senior Nurse, 6, 3, p.5.
Summary: Summarises the first major review of skill mix in the UK (DHSS 1986). This articles replies to the report's critics.
Key words: skill mix.

Mahmood, K. (1999)
Skillmix Review in Elderly Care: a Pragmatic Approach,
South West Regional Education and Development Group.
Summary: Detailed study of the actual and ideal; skill mix in one hospital. Explores several peripheral issues and employs the NISCM dependency-acuity-quality nursing workload measure. Also reviews a range of alternative nursing workload measures, including their strengths and weaknesses.
Key words: review, dependency-acuity-quality, skill mix.

Management Advisory Service (MAS). (1990)
Identifying an Ideal Nursing Skillmix and Developing Associated Job Descriptions,
Cheltenham: MAS.
Summary: Uses the MAS job profile for determining skill mix. Detailed protocols, flowcharts, and instruments are provided. This report was prepared for the nursing regrading exercise in the 90s; they are outdated but the principles apply.
Key words: skill mix.

NHS Training Authority. (1988)
Support Workers/Helpers. Their Role Selection and Training,
Bristol: NHSTA.
Summary: Begins developing competencies for health care assistants, which eventually led to the NVQ education programme for health care assistants.
Key words: grade mix.

NHS Workforce Taskforce and HR Directorate DoH. (2002)
HR in the NHS Plan,
London: DoH <www.doh.gov.uk>.
Summary: Sets out HR best practice in the context of the NHS plan. Concentrates on the supply side; however, multiskilling and skill mix are briefly considered.
Key words: multiskilling, skill mix.

Needham, J. (1996)
Balancing skill mix - future paediatric health care provision,
Journal of Nursing Administration, 4, pp.127-131.
Summary: Examines the relationship between nursing grade mix/skill mix , nursing efficiency and effectiveness.
Key words: grade mix.

Nichols, L.M. (1992)
Estimating the cost of under-using Advanced Practice Nurses,
Nursing Economics, 10, 5, pp.348-351.
Summary: Looks at the efficiency and effectiveness of nurses with extended roles.
Key words: skill mix.

Oakley, P. and Coulstock, J. (1990)
Skills mix to match costs,
Health Service Journal, 100, pp.768-770.
Summary: Defines skill mix and explains its relevance to modern health care.
Key words: skill mix.

Osinski, E.G. and Powals, J.G. (1980)
The cost of an all-RN staffed primary nursing,
Supervisor Nurse, 11, pp.16-21.
Summary: Explores the cost and quality of qualified-nursing assistant combinations.
Key words: grade mix, cost, quality.

Poirier-Elliot, E. (1994)
Cost-effectiveness of non-physician, health care professionals,
Nurse Practitioner, 9, 10, pp.54-56.
Summary: Examines nurses' extending roles in an economic and skill mix context.
Key words: cost, skill mix.

Pearson, A. Hocking, S. Mott, S. and Riggs, A. (1992)
Skills mix in Australian nursing homes,
Journal of Advanced Nursing, 17, pp.767-776.
Summary: Looks at the cost and quality of different grade mix combinations. Patient dependency also features along with many other workforce planning issues. Principles are relevant in elderly care wards too.
Key words: cost, quality, grade mix, elderly care.

Reid, N.G. (1985)
The effective training of nurses: manpower implications,
International Journal of Nursing Studies, 22, 2, pp.89-98.
Summary: Examines in detail learners' contribution to meeting nursing workloads.
Key words: grade mix.

Redshaw, M.E. Harris, A. and Ingram, J.C. (1993)
Nursing and medical staffing in neonatal units
Journal of Nursing Management, 1, pp.221-228.
Summary: Explores many neonatal patient and staffing variables including occupancy and nurses per occupied bed. Actual staffing was compared with staffing recommended by various formulas. Large inter-unit variations were found most notably grade mix.
Key words: ITU, nurses per occupied bed, grade mix.

Richardson, G. (1999)
Identifying, evaluating and implementing cost-effective skill mix,
Journal of Advanced Nursing, 7, pp.265-270.
Summary: Looks at skill mix from a cost-benefit and other economic perspectives. Questions skills substitution. Discusses some supply-side workforce variables that complicate the skill mix considerations.
Key words: skill mix.

Richardson, G. (1999)
Identifying, evaluating and implementing cost-effective skill mix,
Journal of Advanced Nursing, 7, pp.265-270.
and
Richardson, G. and Maynard, A. (1995)
Discussion Paper 3: Fewer Doctors? More Nurses? A Review of the Knowledge Base of Doctor-Nurse Substitution,
York University: Centre for Health Economics.
and
Richardson, G. Maynard, A. Cullum, N. et al. (1998)
Skillmix changes: substitution or service development?
Health Policy, 45, pp.119-132.
Summary: Looks at skill mix from a cost-benefit and other economic perspectives. Questions the cost-effectiveness of skills substitution from doctors to nurses. Discusses some supply-side workforce variables that complicate skill mix. Includes a systematic review of the skills-substitution literature.
Key words: skill mix.

Roberts, I.L. (1994)
The health care assistant: professional support or budget necessity?
International Journal of Health Care Quality Assurance, 7, 6, pp.20-25.
and
Roberts, I. (1995)
Healthcare assistants: professional supporter or budget necessity?
Health Manpower Management, 21, 5, pp.20-25.
Summary: Explores nursing assistants from a quality and professionals' standpoint. Specimen job descriptions are provided. The role of NVQs are considered.
Key words: grade mix.

Robinson, J. Stilwell, J. Hawley, C. et al. (1989)
The Role of the Support Worker in the Ward Health Care Team,
University of Warwick: Nursing Policy Studies Centre.
Summary: Detailed examination of skill mix, grade mix; especially nursing assistants.
Key words: grade mix.

Rogers, J. and Langan, J. (2000)
Careering down a radical path,
Health Service Journal, 110, 5692, pp.28-29.
Summary: Follows up the Future Healthcare Workforce Reports by concentrating on nursing assistant and health practitioner role. Brief job descriptions are included.
Key words: multiskilling, grade mix.

Rothwell, S. (1986)
Costing flexible working patterns,
Nursing Times, 82, 28, pp.43-45.
Summary: Explores nursing workload and grade mix from a cost-effectiveness perspective
Specimen data and results are given
Key words: acuity, grade mix, cost, quality.

Royal College of Nursing. (1979)
The Extended Clinical Role of the Nurse,
London: RCN.
Summary: RCN briefing paper.
Key words: skill mix.

Royal College of Nursing. (1979)
Overseas Nurses. Training for a Caring Profession?
London: RCN.
Summary: Some of the issues discussed in this report are relevant to today's overseas recruitment drive.
Key words: grade mix.

Royal College of Nursing. (1992)
Skillmix and Reprofiling: A Guide for RCN Members
London: RCN.
Summary: Encourages ward nurses to contribute to hospital reprofiling exercises. Reminds readers about the consequences of diluting grade mix such as job dissatisfaction and lower quality. Contains a useful checklist for evaluating skill mix exercises.
Key words: grade mix, skill mix, multiskilling.

Royal College of Nursing. (1992)
Cost effective Care
London: RCN.
Summary: Briefly explores cost and quality implications of grade mix..
Key words: grade mix, cost, quality.

Salvage, J. (1989)
Shifting the boundaries,
Nursing Times, 85, 10, p.24.
Summary: Short account of extended nursing roles.
Key words: skill mix.

Sidewells, J. (1983)
Using staff to good purpose.
Nursing Times, 79, 38, pp.24-26
Summary: Explores the cost and quality of grade mix. Bank and agency staffing are considered.
Key words: grade mix.

Simons, W.   (1987)
The model auxiliary,
Senior Nurse, 6, 2, pp.9-10.
Summary: Justifies the nursing assistant's role. Specimen job descriptions are provided.
Key words: grade mix.

Slack, P. (1986)
Skillmix: Plan of action,
Nursing Times, 82, 48, pp.32-33.
Summary: Examines the DHSS 1986 Skillmix report's impact on influencing nursing workforce planning. Notes managers' reticence about taking a grip of the topic. Some of the issues are relevant today particularly the reasons why some of the report's recommendations failed to take off.
Key words: skill mix.

Spisso, J. O'Callaghan, C. McKennan, M. et al. (1990)
Improved quality of care and reduction of house staff workload using trainee nurse practitioners,
The Journal of Trauma, 30, 6, pp.660-665.
Summary: Skillmix innovations that rely on nurses' extended roles.
Key words: skill mix.

Stone, M. (1987)
The support worker. Multipurpose home care,
Nursing Times, 83, 10, pp.28-29.
Summary: Explains how the newly created health care assistant roles can work in elderly care units. Provides specimen dependency data and health care assistant job descriptions.
Key words: dependency, grade mix.

Taylor, S. (1990)
Divide and conquer,
Nursing Times, 86, 19, pp.47-49.
Summary: Looks at the increasing amount of time ward sisters spend in non-nursing work, and how nursing assistants can reverse these changes. Instruments and specimen data are provided.
Key words: activity, grade mix.

Unison. (1994)
Unison Guidelines: Skillmix in the Health Service,
London: Unison.
Summary: Examines the nursing workforce from a demand and supply perspective. The cost and quality implications of skill mix are compared.
Key words: skill mix.

Venters, A. and Nichol, H. (1985)
Opting for optimum numbers,
Nursing Mirror, 161, 9, pp.42-44.
Summary: Describes the importance of grade mix to staffing equations.
Key words: grade mix.

Vousden, M. (1987)
No experience necessary,
Nursing Times, 83, 31, pp.16-17.
Summary: Good background to the nursing cadet schemes reappearing in the NHS. Explores issues that are equally relevant today such as downskilling.
Key words: grade mix.

Wanless, D. (2002)
Securing Our Future Health: Taking a Long-term View,
London: HM Treasury Public Enquiry Unit.
Summary: Section 5 of the Report examines the future nursing workforce and considers the best size and mix. Broader skill mix issues are explored.
Key words: skill mix.

Wiseman, J. (1988)
Cutting overheads,
Nursing Times, 84, 24, pp.32-33.
Summary: Explores indirect care and associated work, a less-frequently studied aspect of workforce planning. Grade mix implications are considered.
Key words: activity, grade mix.

Wright, S.G. (1995)
Clinical scope of professional practice. The role of the nurse: extended or expanded,
Nursing Standard, 9, 33, pp.25-27.
Summary: Looks at skill mix from an extended role stance. The benefits and disadvantages to extended/expanded roles are explored.
Key words: skill mix.

Annotated Bibliography: Timed-task/Activity Method

Like texts in the acuity-quality and professional judgement methods, articles/books/reports in this section describe one of the most enduring demand-side workforce planning methods that use care plans and associated times to determine the numbers of nursing hours needed to look after inpatients. Methods include: Aberdeen; AIM; Cheltenham; FIP; GRASP; Ninewells; and SETRHA. The GRASP method, however, is the most discussed and the most enduring approach in the batch.

Anderson, L. (1997)
The role and resources required for the introduction of ward assistants using the GRASP systems workload method: a quantitative study,
Journal of Nursing Management, 5, pp.11-17.
and
Anderson, L. (1997)
The introduction of generic workers into the ward team: an exploratory study,
Journal of Nursing Management, 5, pp.69-75.
Summary: Explores grade mix and multiskilling. GRASP is used to evaluate these workforce planning issues.
Key words: timed-task, multiskilling.

Bell, A. and Storey, C. (1984)
Assessing workload by a nursing study,
Nursing Times, 80, 34, pp.57-59.
Summary: Concentrates on the Cheltenham timed-task/activity method. Times for tasks were obtained using a professional judgement, activity analysis and quality of care combination. Implementing the system is described in 14 stages. Specimen forms, data and results are given.
Key words: timed-task/activity.

Bloore, J. (1984)
Manpower planning two: a system from Gloucestershire,
Nursing Times, 80, 34, pp.55-57.
Summary: Describes the Cheltenham nursing workload and workforce planning system. Compares and contrasts the Cheltenham timed-task/activity method with four other main methods: top-down, regression-based, professional judgement and dependency-acuity. Cheltenham's limitations are honestly reported within a carefully explained implementation programme.
Key words: timed-task/activity method, top-down, regression-based, professional judgement dependency-acuity.

Botter, M.L. (2000)
The use of information generated by a patient classification system,
Journal of Nursing Administration, 30, 11, pp.544-551.
Summary: Explores, qualitatively, the wider use of information generated by computerised patient classification timed-task/activity systems.
Key words: timed-task/activity, IM&T.

Cameron, J. (1979)
The Aberdeen Formula. Revision of nursing workload per patient as a basis for staffing,
Nursing Times Occasional Paper, 75, 49, pp.131-132.
Summary: Updates the Aberdeen Formula's timed-task/activity, regression-based nursing workload system. The main changes acknowledge the growing numbers of old and very old inpatients.
Key words: timed-task/activity, regression.

Cheltenham and District Health Authority (1986)
FIP: Interim Report: Development of a Ward Nursing Management System for Acute Hospital Services,
Cheltenham: Cheltenham District Health Authority.
Summary: Describes the evolution and application of the FIP timed-task/activity care plan approach to nursing workload measurement.
Keywords: timed-task/activity.

Clayton, T. (1980)
In a nutshell … GRASP, the measurement tool.
Health Care Systems, Dimensions, Fall, no page numbers.
Summary: Describes GRASP's principles.
Keywords: timed-task/activity.

Clayton, T. and St.Germain, D. (1981)
A four-year experience with GRASP,
Dimensions, Health Care Systems, November/December, no page numbers given.
Summary: Briefly describes GRASP and details its implementation and evaluation in hospitals over four years. GRASP's flexibility is explained along with warnings about monitoring data quality.
Key words: timed-task/activity.

Crompton, H.M. Mitchell, H. and McCameron, J. (1976)
The Aberdeen Formula,
Nursing Times, Occasional Paper, 72, 34, pp.121-124.
and
Crompton, H.M. Mitchell, H. and McCameron, J. (1976)
The Aberdeen Formula,
Nursing Times, Occasional Paper, 72, 35, pp.125-126.
Summary: Describes the Aberdeen Formula method of workforce planning before providing specimen data and results. Data are outmoded but the principles apply.
Key words: timed-task/activity, regression.

Diggs, W.A. (1980)
New methodology affords 'Grasp' on minimum nursing staff,
Health Care Systems, Fall, no pages.
Summary: Describes the background to and development of GRASP. Components are thoroughly described. Data are provided but no instruments.
Key words: timed-task/activity.

Duberley, J. and Norman, S. (1990)
Nursing Workload Measurement and Nursing Data for Resource Management,
Leeds: NHS Executive, Financial Management Directorate, Resource Management Unit.
Summary: Describes a Financial Information Project (FIP) based system that estimates nursing workload from patient and nursing activity data.
Key words: dependency, timed-task/activity.

Eaves, D. (1989)
Computerise your ward,
Nursing Times, 23, 85, pp.43-44.
Summary: Uses a computer-based timed-task/activity method to measuring nursing workload.
Key words: IM&T, timed-task/activity.

Fabray, C. and Greenhalgh, P. (1984)
Nursing time is money,
Nursing Times, 80, 46, pp.60-62.
Summary: Describes the FIP dependency, timed-task/activity method of measuring nursing workload, which was developed from the Cheltenham system. Specimen instruments and data are given. The relationship between workload and resources are extensively discussed.
Key words: dependency, timed-task/activity, cost.

Gault, A.R. (1982)
The Aberdeen Formula as an illustration of the difficulty of determining nursing establishments,
International Journal of Nursing Studies, 19, pp.61-77.
Summary: A critique of the regression-based and timed-task/activity method of measuring nursing workload; using the Aberdeen formula as an illustration.
Key words: review, timed-task/activity.

GRASP UK (undated)
The GRASP System. The Workload Solutions to Your Staffing Puzzles,
Sheffield: GRASP UK.
Summary: How-to-do-it manual including an explanation of hardware and software requirements. Specimen data collection forms, data reports are provided. A menu of costs is included to help managers estimate the set-up and running costs.
Key words: timed-task/activity.

Henney, C.R. and Bosworth, R.N. (1979)
Nurse Allocation by Computer, in Barber, B. et al (eds) Proceedings of the Medical Informatics Conference, Berlin, 1979.
Berlin: Springer Verlag.
and
Henney, C.R. and Bosworth, R.N. (1980)
A computer-based system for the automatic production of nursing workload,
Nursing Times, 76, 28, pp.1212-1217.
Summary: Computerised measure of nursing workload using the Ninewells Index corroborated using the Aberdeen Formula method. Comments on fluctuating nursing workload and the importance of regular monitoring.
Key words: IM&T, timed-task/activity.

Hurst, K. (1993)
Nursing Workforce Planning,
Harlow: Longman.
Summary: Describes, using plenty of worked examples, most contemporary nursing workload measures and workforce planning approaches. Data are outmoded but the principles apply.
Key words: professional judgement, nurses per occupied bed, dependency-activity-quality, timed-task/activity, time-out, grade mix.

Illsley, V. and Goldstone, L. (1985)
Manpower planning: methods of planning,
Senior Nurse, 3, 6, pp.14-18.
Summary: Clearly and simply describes contemporary top-down and bottom-up workforce planning methods: nurses per occupied bed, regression-based, timed-task/activity, dependency-acuity and professional judgement.
Key words: review.

JoNA. (1985) Consider this… [GRASP]
Journal of Nursing Administration, 15, 9, p.6, p.14.
Summary: Describes, compares and contrasts CASH (a dependency-activity workload measure) with GRASP (a timed-task/activity system). Outcomes were similar but GRASP took longer to operate.
Key words: dependency-activity, timed-task/activity, review.

Kinley, J. and Cronenwett, L.R. (1987)
Multiple shift patient classification: Is it necessary?
Journal of Nursing Administration, 17, 2, pp.22-25.
Summary: Describes a variation of the GRASP timed-task/activity workload measure called AIM. Argues that repeated patient classification during a shift isn't necessary thereby reducing computer time but without loss of data quality.
Key words: timed-task/activity.

Latiff, H.A. (1981)
The Study to Explore Methods of Determining the Number of Nurses Required to Staff Specific Wards and to Assess their Relevance to the Brunei Hospital Nursing Service,
Unpublished Dissertation,
Dundee College of Technology.
Summary: Applies the Aberdeen Formula timed-task/activity, regression method of determining nursing workload and staffing levels. Found that the method could be used in Brunei.
Key words: timed-task/activity, regression.

McIlwaine, J. (1981)
The Aberdeen Formula psychiatric X-factor - fact or fiction?
Nursing Times, Occasional Papers, 77, 18, pp.69-71.
Summary: Adapts the Aberdeen Formula for psychiatry contexts. Shows how an additional 'X factor' is necessary to cater for mentally ill patients' special needs.
Key words: timed-task/activity, regression analysis, psychiatry.

Mackley, B. (1984)
The misappliance of science,
Nursing Times, 80, 40, pp.51-52.
and
Mackley, B. Heslop, T. and McAllister, D. (1979)
The Aberdeen formula: evaluation on a larger scale (1),
Nursing Times, Occasional Papers, 75, 7, pp.29-32.
and
Mackley, B. Heslop, T. and McAllister, D. (1979)
The Aberdeen formula: evaluation on a larger scale (2),
Nursing Times, Occasional Papers, 75, 8, pp.33-36.
and
Mackley, B. Heslop, T. and McAllister, D. (1979)
The Aberdeen formula: evaluation on a larger scale (3),
Nursing Times, Occasional Papers, 75, 9, pp.37-39.
Summary: Explains clearly and simply the nature, value and application of the Aberdeen Formula timed-task/activity method of measuring nursing workload. Also explores the dilemma managers faced with the plethora of workforce planning methods. Replies to criticisms made about the Aberdeen Formula. The data provided are outmoded but the principles apply.
Key words: timed-task/activity, regression.

Meyer, D. (1978)
GRASP. Workload management system ensures stable nurse-patient ratios,
Hospitals, 52, 5, pp.81-85.
and
Meyer, D. (1980)
GRASP or a patient dependency category classification system: which do you chose?
Health Care Systems, Fall, no pages.
and
Meyer, D. (1982)
GRASP Too: Applications and Adaptations of the GRASP Nursing Workload Management System,
North Carolina: MCS.
and
Meyer, D. (1984)
Manpower planning: an American approach,
Nursing Times, 80, 34, pp.52-54.
Summary: Describes the GRASP timed-task/activity nursing workload measure and workforce planning system, including a useful précis of the 1978 GRASP how-to-do-it manual. GRASP is compared and contrasted with other systems; strengths and weaknesses of both are brought out. Specimen instruments and data are included. The system has been computerised in recent years.
Key words: timed-task/activity, review.

Milne, C. (1988)
Getting to grips with GRASP,
Nursing Standard, 10, 3, pp.22-23.
Summary: Describes GRASP, its nature and purpose and application to one hospital. GRASP's dependency, care hours and quality components are covered. Specimen instruments are provided.
Key words: timed-task/activity, quality, dependency.

Mitchell, M. Godden, E. and Balk, T. (1977)
The Aberdeen Formula. A trial in SE Thames,
Nursing Times, 73, 22, pp.839-840.
Summary: Describes and applies the Aberdeen Formula approach to measuring nursing workload and workforce planning. Detailed results are provided.
Key words: dependency, timed-task/activity, regression.

Poland, M. English, N. Thornton, N. et al. (1970)
PETO: A system for assessing and meeting patient care needs,
American Journal of Nursing, 70, 7, pp.1479-1482.
Summary: This is the P part of GRASP, which the Grace Reynolds team adapted to form the GRASP timed-task/activity measure of nursing workload.
Key words: timed-task/activity.

Schroeder, R.E. Rhodes, A.M. and Shields, R.E. (1984)
Nurse activity systems: CASH Vs GRASP: a determination of nurse staffing requirements,
Nursing Forum, 21, 2, pp.72-77.
Summary: Describes, compares and contrasts the CASH dependency-activity with the GRASP timed-task/activity nursing workload measure. Instruments and specimen data are provided. Both systems generated similar results but CASH was judge easier to use and less expensive.
Key words: review, timed-task/activity, dependency-acuity.

Scottish Home and Health Department. (1967)
Report No. 3. Nurses' Work in Hospitals in the North Eastern Region,
Edinburgh: SHHD.
and
Scottish Home and Health Department. (1969)
Report No. 9. Nursing Workload per Patient as a Basis for Staffing,
Edinburgh: SHHD.
Summary: Early, extensive study in to nurses' workload using activity analysis. Outmoded data but principles apply. These articles were forerunners of the Aberdeen timed-task/activity, regression system.
Key words: activity, timed-task/activity, regression.

Shaiman, J. and Hagen, B. (1994)
The relationship between length of stay and required nursing care hours,
Journal of Nursing Administration, 24, 7/8, pp.52-58.
Summary: An application of the GRASP timed-task/activity method.
Key words: timed-task/activity.

South East Thames Regional Health Authority. (1987)
Nursing Collaborative Study,
Sussex: SETRHA.
Summary: Critical review of dependency-acuity and timed-task/activity nursing workload measures.
Key words: dependency-acuity, timed-task/activity.

Stephens, G.M. Davies, A. and Goldberg, C.B. (1978)
An evaluation of the Aberdeen Formula for calculating nurse establishments in hospital wards,
Camarthen: Dyfed Health Authority.
Summary: Tailors the Aberdeen timed-task/activity workforce planning system for use in Wales. Outmoded core data and outcomes but the principles apply today.
Key words: timed-task/activity, regression.

Wilkinson, I.M. and Graham-White, J. (1980)
Dependency ratings scales in psycho geriatric nursing,
Health Bulletin: 38, 1, pp.36-42.
and
Wilkinson, I.M. and Graham-White, J. (1980)
Psycho geriatric dependency rating scales (PGDRS). A method of use by nurses.
British Journal of Psychiatry, 137, pp.558-565.
Summary: Uses a bespoke patient dependency system with the Aberdeen time-task/activity formula. The instrument's psychometric properties are considered in detail. Although outmoded nurse to patient ratios are provided, the principles remain the same.
Key words: dependency, time-task/activity.

Wilson, L. (1983)
GRASP - for high quality patient care,
Health Care, September, pp.21-24.
Summary: Describes the GRASP timed-task/activity measure of nursing workload and how it was successfully implemented in one unit. The potential pitfalls are explained and how to overcome them.
Key words: timed-task/activity.

Annotated Bibliography: Regression-based Method

Linear regression analysis is used to generate staffing formulas in these articles/books/reports. Texts in this section show how the independent and dependent variables were determined, or in the shorter pieces how they were used to calculate nursing establishments. Specific methods include: Aberdeen Formula; Brighton; Kaplan; Teamwork and MDSX.

Bagust, A. Oakley, J. and Slack, R. (1992)
Ward Nursing Quality and Grade mix. Report of a Paired Ward Experiment Undertaken in the North West Region,
York University: Health Economics Consortium.
Summary: Detailed report on the method and results of Quality Pointers and Teamwork project, and their application to measuring nursing workload. Instruments and specimen results are provided. The main thrust of the report is an experiment in which the quality of nursing care and workload are compared under different grade mixes.
Key words: regression, quality.

Bagust, A. Burrows, J. and Oakley, J. (1992)
Quality or quantity, Health Service Journal, 105, 5314, pp.23-25.
Summary: Empirically determines a relationship between grade mix and the quality of patient care. Shift-based specimen data are provided and recommendations are shift based.
Key words: grade mix, quality, regression.

Bagust, A. Prescott, J. and Smith, A. (1988)
Numbering the nurses,
Health Service Journal, 98, 5108, pp.765-766.
Summary: Compares and contrasts professional judgement, dependency-acuity and linear regression methods. The authors favour the latter, which is shown to overcome several shortcomings. Regression underlines the key variables in nursing workload and workforce planning. The method proved efficient and effective with high utility.
Key words: review, regression.

Bagust, A. and Slack, R. (1991)
Report No 50: Ward Nursing Quality - Report of the Development of Indicator Assessment for the North Western Regional Health Authority.
York University: York Health Economics Consortium.
Summary: Describes the Teamwork method of workforce planning.
Key words: regression.

Bloore, J. (1984)
Manpower planning two: a system from Gloucestershire,
Nursing Times, 80, 34, pp.55-57.
Summary: Describes the Cheltenham nursing workload and workforce planning system. Compares and contrasts the Cheltenham timed-task/activity method with four other main methods: top-down, regression-based, professional judgement and dependency-acuity. Cheltenham's limitations are honestly reported within a carefully explained implementation programme.
Key words: timed-task/activity method, top-down, regression-based, professional judgement dependency-acuity.

Cameron, J. (1979)
The Aberdeen Formula. Revision of nursing workload per patient as a basis for staffing,
Nursing Times Occasional Paper, 75, 49, pp.131-132.
Summary: Updates the Aberdeen Formula's timed-task/activity, regression-based nursing workload system. The main changes to the system is that the growing numbers of old and very old inpatients are acknowledged.
Key words: timed-task/activity, regression.

Crompton, H.M. Mitchell, H. and McCameron, J. (1976)
The Aberdeen Formula,
Nursing Times, Occasional Paper, 72, 34, pp.121-124.
and
Crompton, H.M. Mitchell, H. and McCameron, J. (1976)
The Aberdeen Formula,
Nursing Times, Occasional Paper, 72, 35, pp.125-126.
Summary: Describes the Aberdeen Formula method of workforce planning before providing specimen data and results. Data are outmoded but the principles apply.
Key words: timed-task/activity, regression.

Goldberg, B. Davies, A. and Johnson, P. (1984)
Scaling the heights,
Nursing Mirror, 158, 15, pp.35-38.
Summary: Describes the East Dyfed MDSX dependency-activity-quality method of nursing workforce planning. Instruments and specimen data are provided (in an Elderly Mentally Infirm context). Nursing standards take priority closely followed by patient dependency as means of determining nurse staffing. Formula are regression-based.
Key words: regression, dependency-activity-quality, elderly care.

Illsley, V. and Goldstone, L. (1985)
Manpower planning: methods of planning,
Senior Nurse, 3, 6, pp.14-18.
Summary: Clearly and simply describes contemporary top-down and bottom-up workforce planning methods: nurses per occupied bed, regression-based, timed-task/activity, dependency-acuity and professional judgement.
Key words: review.

Kaplan, R.S. (1975)
Approaches and techniques. Analysis and control of nurse staffing,
Health Services Research, Fall, pp.278-296.
Summary: An early, detailed explanation of the regression analysis method of nursing workforce planning. Variables (patient days, nursing hours worked, grade and care group) and formulas are provided. The limitations are well covered. Suggests that dependency data are a stronger predictor than occupancy.
Key words: regression.

McIlwaine, J. (1981)
The Aberdeen Formula psychiatric X-factor - fact or fiction?
Nursing Times, Occasional Papers, 77, 18, pp.69-71.
Summary: Adapts the Aberdeen Formula for psychiatry contexts. Shows how an additional 'X factor' is necessary to cater for mentally ill patients' special needs.
Key words: timed-task/activity, regression analysis.

Mackley, B. (1984)
The misappliance of science,
Nursing Times, 80, 40, pp.51-52.
and
Mackley, B. Heslop, T. and McAllister, D. (1979)
The Aberdeen formula: evaluation on a larger scale (1),
Nursing Times, Occasional Papers, 75, 7, pp.29-32.
and
Mackley, B. Heslop, T. and McAllister, D. (1979)
The Aberdeen formula: evaluation on a larger scale (2),
Nursing Times, Occasional Papers, 75, 8, pp.33-36.
and

Mackley, B. Heslop, T. and McAllister, D. (1979)
The Aberdeen formula: evaluation on a larger scale (3),
Nursing Times, Occasional Papers, 75, 9, pp.37-39.
Summary: Explains clearly and simply the nature, value and application of the Aberdeen Formula timed-task/activity method of measuring nursing workload. Also explores the dilemma managers faced with the plethora of workforce planning methods. Replies to criticisms made about the Aberdeen Formula. The data provided are outmoded but the principles apply.
Key words: timed-task/activity, regression.

Mitchell, M. Godden, E. and Balk, T. (1977)
The Aberdeen Formula. A trial in SE Thames,
Nursing Times, 73, 22, pp.839-840.
Summary: Describes and applies the Aberdeen Formula approach to measuring nursing workload and workforce planning. Detailed results are provided.
Key words: dependency, timed-task/activity, regression.

North Western Regional Health Authority. (1990)
Teamwork,
Manchester: NWRHA.
Summary: Estimates the number of nurses using straight forward linear relationships between nursing hours, occupancy and patient movement. Includes implementation guidance.
Key words: regression.

Stephens, G.M. Davies, A. and Goldberg, C.B. (1978)
An evaluation of the Aberdeen Formula for calculating nurse establishments in hospital wards,
Camarthen: Dyfed Health Authority.
Summary: Tailors the Aberdeen timed-task/activity workforce planning system for use in Wales. Outmoded core data and outcomes but the principles apply today.
Key words: timed-task/activity, regression.

Other Annotated Bibliographic Categories

Sifting the full 500 item Harvard list of nursing workforce planning texts located valuable articles, reports and books that do not sit easily in any of the five main workforce planning methods. Consequently, these are simply categorised and listed below.

Multiskilling

Like grade mix and skill mix, multiskilling (aka cross-training and generic working) caught workforce planners' imagination after Patient-focused Care (PFC) and Hospital Process Reengineering (BPR) hit the headlines in the early to mid-nineties. Encouragingly, some authors use well-known nursing workload measures to investigate PFC and BPR, which adds a new dimension to workforce planning methods. Texts include both working-up and working-down issues.

Anderson, L. (1997)
The role and resources required for the introduction of ward assistants using the GRASP systems workload method: a quantitative study,
Journal of Nursing Management, 5, pp.11-17.
Summary: GRASP is used to evaluate the nature and purpose of multiskilling the ward team.
Key words: timed-task/activity, multiskilling.

Anderson, L. (1997)
The introduction of generic workers into the ward team: an exploratory study,
Journal of Nursing Management, 5, pp.69-75.
Summary: Explores grade mix and multiskilling. GRASP is used to evaluate these workforce planning issues.
Key words: timed-task, multiskilling.

Brider, P. (1992)
The move to patient focused care.
American Journal of Nursing, 92, 9, pp.26-33.
Summary: Takes stock of patient-focused care issues, including multiskilling, in North American Hospitals.
Key words: multiskilling.

Brooks, I. (1996)
Using ritual to reduce barriers between subcultures,
Journal of Management in Medicine, 10, 3, pp.23-30.
Summary: Critically examines multiskilling and what can be done to enhance implementation.
Key words: multiskilling.

Buchan, J. (1991)
Focusing on the Patient? An Overview of Developments in Patient Focused Hospitals.
Edinburgh: Queen Margaret College.
Summary: One of the last and comprehensive reviews of patient-focused care in the UK before business process re-engineering took over. Implicitly and explicitly considers multiskilling.

Key words: multiskilling.

Burchell, H. and Jenner, E.A. (1996)
The role of the nurse in patient focused care; models of competence and implications for training,
International Journal of Nursing Studies, 33, 1, pp.67-75.
Summary: Looks at multiskilling the health care workforce, its implications for nursing and especially education and training issues.
Key words: multiskilling.

Carlisle, D. (1992)
Patients first … nurses last,
Nursing Times, 88, 12, pp.16-18.
Summary: Describes multiskilling within a patient-focused care context and related issues.
Key words: multiskilling.

Chant, A.D.B. (1998)
A confusion of roles,
Journal of the Royal Society of Medicine, 91, pp.263-265.
Summary: Explains multiskilling in a workforce planning context. Focuses on nurses 'working-up' as junior doctors. Considers the efficiency and effectiveness implications of this form of multiskilling.
Key words: multiskilling.

Conrane Consulting, NAHAT, Manchester University, et al. (1996)
The Future Healthcare Workforce,
Manchester: Manchester University.
and
Conrane Consulting, HSMU, Bournemouth University (1999)
The Future Healthcare Workforce: Second Report,
University of Bournemouth.
Summary: Extends and develops the multiskilling and multiprofessional education debate from the original patient-focused projects. The shape and size of the NHS workforce needed to meet future health care is discussed in detail. Ample data and examples are provided.
Key words: multiskilling.

DoH (2000)
A Health Service of All the Talents,
London: DoH.
Summary: Examines many demand and supply workforce planning issues. Draws on the Future Health Workforce report (see Conrane Consulting et al). Examines multiskilling and multiprofessional education to provide a workforce capable of meeting future health care demands. Concentrates on the medical workforce but nursing isn't ignored.
Key words: multiskilling.

Garside, P. (1993)
Patient Focused Care. A Review of Seven Sites in England,
Leeds: NHS Management Executive.
Summary: An early, comprehensive, empirical evaluation of patient-focused care. Several sections discuss multiskilling the NHS workforce.
Key words: multiskilling.

Hancock, C. (1992)
Nurses and skill mix,
Senior Nurse, 12, 5, pp.9-12.
Summary: Reports the RCN's continued interest in skill mix projects. Refreshes the upsides and downsides of skill mix changes by drawing on patient-focused care project outcomes such as multiskilling. Recognises absent but important empirical data.
Key words: multiskilling.

Health Care Advisory Board. (1992)
Executive Report to the CEO. The Merits of Patient-Focused Care,
Washington: The Advisory Board Company.
and
Health Care Advisory Board. (1995)
Patient-Focused Care Questions and Answers,
Washington: The Advisory Board Company.
Summary: North American Review of patient-focused care hospitals. The nature and value of cross training (multiskilling) is implicitly and explicitly covered from a management, cost and quality perspective.
Key words: multiskilling.

Health Service Journal Management Guide. (1994)
Starting point: Policy in action, resources.
Health Service Journal Supplement, 104, 5408, pp.1-12.
Summary: Describes patient-focused care hospitals, especially management issues. Multiskilling is implicitly and explicitly discussed.
Key words: multiskilling.

Health Service Report. (1997)
Roles and rewards for ward based staff at Ealing Hospital,
Health Service Report, Spring, pp.10-14.
Summary: Discussed some personnel issues of a multiskilled workforce.
Key words: multiskilling.

Heymann, T.D. and Culling, W. (1995)
The Patient Focused Approach: a Better Way to Run a Hospital,
Kingston Hospital NHS Trust: Department of Medicine.
Summary: Examines all aspects of patient-focused care hospitals including multiskilling.
Key words: multiskilling.

Hurst, K. (1995)
Progress with Patient-Focused Care in the UK,
Leeds: NHS Executive, Nuffield Institute for Health.
and
Hurst, K. (1996)
The managerial and clinical implications of patient-focused care,
Journal of Management in Medicine, 10, 3, pp.59-77.
and
Hurst, K. (1997)
Multiskilled health carers: nature, purpose and implications,
Health Manpower Management, 23, 6, pp.197-211.
and
Hurst, K. (1999)
Educational implications of multiskilled health carers,
Medical Teacher, 21, 2, pp.170-173.
Summary: A comprehensive review (from the literature and empirically) of patient-focused care hospitals. One chapter concentrates on the nature and value of multiskilling. The journal publications are not only useful précis but also focus managerial, clinical and educational issues.
Key words: multiskilling.

Jenner, E. (1998)
A case study analysis of nurses' roles, education and training needs associated with patient-focused care,
Journal of Advanced Nursing, 27, 5, pp.1087-1085.
Summary: Qualitative evaluation of patient-focused care. Multiskilling (cross training) is examined theoretically and practically, using evidence from one case study. The size and mix of ward nursing teams are considered in a multiskilling context.
Key words: multiskilling.

Morgan G. (1993)
Clinical management: the implication of patient-focused care,
Nursing Standard, 7, 52, pp.37-39.
Summary: Looks at multiskilling in one patient-focused care hospital pilot site.
Keywords: multiskilling.

Morris-Thompson, P. (1999)
Nursing and re-engineering,
Nursing Standard, 13, 7, pp.33-34.
Summary: Describes re-engineering at the Leicester Royal Infirmary, and especially the new inpatient care teams, in which nurses with extended roles play a large part. Offers new insights into multiskilling.
Key words: multiskilling.

NHS Estates. (1993)
Health Facilities Note. Design for Patient-Focused Care,
London: NHS Estates.
Summary: Examines multiskilling in a patient-focused care unit context.
Key words: multiskilling.

NHS Workforce Taskforce and HR Directorate DoH. (2002)
HR in the NHS Plan,
London: DoH <www.doh.gov.uk>.
Summary: Sets out HR best practice in the context of the NHS plan. Concentrates on the supply side; however, multiskilling and skill mix are briefly considered.
Key words: multiskilling, skill mix.

Rogers, J. and Langan, J. (2000)
Careering down a radical path,
Health Service Journal, 110, 5692, pp.28-29.
Summary: Follows up the Future Healthcare Workforce Reports by concentrating on nursing assistant and health practitioner role. Brief job descriptions are included.
Key words: multiskilling, grade mix.

Royal College of Nursing. (1992)
Skillmix and Reprofiling: A Guide for RCN Members
London: RCN.
Summary: Encourages ward nurses to contribute to hospital reprofiling exercises. Reminds readers about the consequences of diluting grade mix such as job dissatisfaction and lower quality. Contains a useful checklist for evaluating skill mix exercises.
Key words: grade mix, skill mix, multiskilling.

Royal College of Nursing. (1992)
Task Focused Hospital or Patient-Focused Care?
London: RCN.
Summary: Examines the implications of multiskilling on nurses and nursing.
Key words: multiskilling.

Elderly Care

Care of the elderly seemed to raise special issues for nursing workforce planners so a separate section listing articles/books/reports that address this speciality has been included. The citations show that a small group of workforce planners, such as Rhys-Hearn, have dedicated their work to elderly care.

Adams, G. and McIlraith, F. (1963)
Geriatric Nursing. A Study of the Work of Geriatric Ward Staff,
Oxford: Nuffield Hospitals Provincial Hospital Trust.
Summary: An early study of nursing workload in elderly care wards using patient dependency and nursing activity. Specimen instruments, establishments and grade mix outcomes are given. Key words: dependency- activity, elderly care.

Bokhoree, L. (1982)
Staffing a geriatric unit at morning peak hours,
Nursing Times, Occasional Papers, 78, 26, pp.101-102.
and
Bokhoree, L. (1983)
Staffing a geriatric unit: a progress report,
Nursing Times, Occasional Papers, 79, 11, pp.52-53.
Summary: Improves the equity of nursing workload across shifts by redistributing nursing hours to peak times. Specimen duty rotas are provided.
Key words: elderly care, rotas.

Brocklehurst, J. and Andrews, K. (1987)
Nurse staffing in geriatric wards,
Nursing Times, Occasional Paper, 83, 1, pp.48-51.
Summary: The appropriate number of nurses per occupied to achieve good quality care are provided, which were generated from detailed empirical studies. Establishment and grade mix formulas, and specimen data are provided.
Key words: nurses per occupied bed, elderly care.

Cheltenham and District Health Authority (1982)
A Total Care Nursing Dependency Study at Cheltenham General Hospital,
Cheltenham: Cheltenham District Health Authority.
and
Cheltenham and District Health Authority (1984)
A Step-by-step Guide to Undertake a nurse-dependency study in a Hospital for Elderly Patients, 2nd Ed.,
Cheltenham: Cheltenham District Health Authority.
Summary: Describes in detail the Cheltenham dependency-acuity nursing workload system. The later report concentrates on elderly care.
Key words: dependency-acuity, elderly.

Davies, A. Goldberg, B. and Wilkinson, I. (1984)
A methodology for manpower planning. Further applications of standardised assessments for the elderly,
Nursing Times, Occasional Papers, 80, 2, pp.44-46.
Summary: Takes the principles from dependency-activity-quality methods, enhanced using professional judgement to create a workforce planning system for elderly mentally infirm wards.
Key words: elderly, dependency-activity-quality, professional judgement.

DoH Nursing Group. (1999)
Systems and Methodologies for Assessing Nursing Care and Costs in Nursing and Residential Homes,
London: DoH.
Summary: A review of contemporary patient dependency classification systems. Contents apply equally to some elderly care wards.
Key words: dependency, elderly, review.

Dodd, K. Clarke, M.G. and Palmer, R.L. (1980)
Misplacement of the elderly in hospitals and residential homes: a survey and follow-up.
Health Trends, 12, 3, pp.74-76.
Summary: Examines elderly patient dependency and its influence on care location
Key words: elderly, dependency.

Farrell, G. (undated)
Resource Utilisation Groups (RUGs),
NHS Information Authority.
Summary: Describes the RUGs patient dependency assessment instrument and how it can be applied to elderly and other care groups.
Key words: dependency, elderly.

Henwood, M. (1992)
Twilight zone,
Health Service Journal, 102, 5327, pp.28-30.
Summary: Looks at a five-group elderly patient dependency classification system across different sectors. Instrument and specimen data are provided.
Key words: dependency, elderly.

Huddleston, J. (1983)
The dawn shift,
Nursing Times, Occasional Paper, 79, 32, pp.68-69.
Summary: Shows how nursing efficiency and effectiveness can be improved by adjusting rotas to included a dawn shift on elderly care wards.
Key words: shifts, elderly care.

MacGuire, J. (1986)
Where do we go from here?
Senior Nurse, 5, 5/6, pp.12-16.
Summary: Detailed, empirical study of elderly patient dependency and length of stay. Concludes that dependency is iatrogenic. Specimen data and results are provided.
Key words: elderly, dependency.

MacGuire, J. and Newberry, S. (1984)
A measure of need,
Senior Nurse, 1, 17, pp.14-8.
Summary: Describes the KTC elderly care dependency, nursing hours per patient-based system. Instruments and specimen data are provided. Concentrates on the instruments' psychometric properties especially sources of bias when rating dependency. Explains how these data can be used for workforce planning and discharge planning. Uses acuity data from other hospitals rather than locally generated ones.
Key words: dependency, acuity, elderly.

Magid, S. and Rhys-Hearn, C. (1981)
Characteristics of geriatric patients as related to nursing needs.
International Journal of Nursing Studies, 18, 2, pp.97-106.
Summary: Explores elderly patient dependency, how it can be measured and how dependency influences nursing workload.
Key words: dependency, activity, elderly.

MDS (circa 2000)
UK Minimum Data Set (MDS) for Home Care Resident Assessment and Care Screening.
Basic Assessment and Tracking Form,
<http://www.hcfa.gov/medicare/hsqb/mds20>.
Summary: Detailed elderly patient dependency assessment and monitoring system. Instruments and specimen data are provided.
Key words: dependency, elderly.

Pearson, A. Hocking, S. Mott, S. and Riggs, A. (1992)
Skills mix in Australian nursing homes,
Journal of Advanced Nursing, 17, pp.767-776.
Summary: Looks at the cost and quality of different grade mix combinations. Patient dependency also features along with many other workforce planning issues. Principles are relevant in elderly care wards too.
Key words: cost, quality, grade mix, elderly.

Pinel, C. and Seriki, C. (1976)
Nursing establishments in geriatric hospitals,
Nursing Times, 77, 22, pp.850-853.
Summary: Examines the intra-ward and inter-ward nurses per occupied differences in elderly care wards. Nurse to patient ratios are given although they are dated.
Key words: nurses per occupied bed, elderly.

Poulton, K. (1984)
A measure of independence,
Nursing Times, 80, 34, pp.32-35.
Summary: Describes an empirically determined dependency classification instrument suitable for elderly care wards.
Key words: dependency, elderly.

Rhys-Hearn, C. (1972)
How many high care patients?
Nursing Times, 68, 16, pp.472-474.
and
Rhys-Hearn, C. (1972)
How many high care patients?
Nursing Times, 68, 17, pp.504-505.
and
Rhys-Hearn, C. (1974)
Evaluation of patients' nursing needs: prediction of staffing 1.
Nursing Times, Occasional Paper, 70, pp.69-72
and
Rhys-Hearn, C. (1974)
Evaluation of patients' nursing needs: prediction of staffing 2.
Nursing Times, Occasional Paper, 70, pp.73-76
and
Rhys-Hearn, C. (1974)
Evaluation of patients' nursing needs: prediction of staffing 3.
Nursing Times, Occasional Paper, 70, pp.77-80
and
Rhys-Hearn, C. (1974)
Evaluation of patients' nursing needs: prediction of staffing 4.
Nursing Times, Occasional Paper, 70, pp.81-84
and
Rhys-Hearn, C. (1977)
Nursing workload determination: development and trials of a package.
Medical Informatics, 2, 2, pp.91-99
and
Rhys-Hearn, C. (1979)
Staffing geriatric wards. Trials of a 'package' - 1,
Nursing Times, Occasional Papers, 75, 17, pp.45-48.
and
Rhys-Hearn, C. (1979)
Staffing geriatric wards. Trials of a 'package' - 2,
Nursing Times, Occasional Papers, 75, 18, p.52.
and
Rhys-Hearn, C.   (1979)
Comparison of Rhys-Hearn method of determining nursing staff requirements with the Aberdeen formula,
International Journal of Nursing Studies, 16, 1, pp.95-103.
and

Rhys-Hearn, C. (1979)
Evaluation of Nurse Activity, in: Alperovitch, A. de-Dombal, F.T. and Gremy, F. (eds)
Evaluation and Efficiency of Medical Action,
Amsterdam: North-Holland Publishing Company.
and
Rhys-Hearn, C. and Howard, J. (1980)
The Relationship of Nursing Needs, Resources and Standards in Geriatric Wards,
London: DHSS.
and
Rhys-Hearn, C. and Potts, D. (1978)
The effect of patients' individual characteristics upon activity times of nursing care.
International Journal of Nursing Studies, 15, 1, pp.23-30.
and
Rhys-Hearn, C. and Young, B. (1981)
Experience with the Rhys-Hearn geriatric workload package - a regional survey.
Nursing Times, Occasional Paper, 77, 4, pp.9-12.
Summary: A series of articles that applies the Rhys-Hearn dependency-activity method to various care settings, but elderly care features strongly. Case controlled trials and other research designs are used to test different establishments and grade mixes from a dependency, workload and quality perspective. Instruments and ample specimen data are provided. Outcomes of Rhys-Hearn are compared with other approaches. The data and results are outmoded but the method's principles are relevant today.
Key words: dependency-activity, quality, elderly, review.

Royal College of Nursing. (circa 1998)
RCN Assessment Tool for Nursing Older People,
Summary: Two-part, how-to-do-it manual for the RCN's elderly care dependency and nursing hours per patient workload instruments. The method has a built-in grade mix component. Data collection forms and specimen data are provided.
Key words: elderly, dependency, nursing hours per patient.

Savage, B.J. and Widdowson, T. (1974)
Psycho geriatrics - revising the use of nursing resources - 1,
Nursing Times, 70, 36, pp.1372-1374.
and
Savage, B.J. and Widdowson, T. (1974)
Psycho geriatrics - revising the use of nursing resources -2,
Nursing Times, 70, 37, pp.1424-1427.
and
Savage, B. Widdowson, A. and Wright, A. (1979)
Improving the Care of the Elderly, in: Towell, D. and Harries, C. Innovation in Patient Care,
London: Croom Helm.
Summary: An early dependency-activity study in elderly mentally infirm wards. Instruments and specimen data are provided. Outmoded but the principles still apply.
Key words: dependency-activity, elderly.

Smith, B.J. and Irvino, R.E. (1971)
Nursing workload in a geriatric unit,
Gerontological Clinician, 13, pp.161-170.
Summary: Explores the similarities and differences between nursing workload in elderly care and other secondary care settings.
Key words: elderly.

UK Minimum Data Set. (circa 1998)
MDS for Home Resident Assessment and Care Screening: Basic Assessment and Tracking Form,
Birmingham University.
Summary: A detailed elderly care patient dependency assessment system.
Key words: dependency, elderly care.

Wade, B. and Snaith, P. (1981)
The assessment of patient's need for nursing care on geriatric wards,
International Journal of Nursing Studies, 18, 4, pp.261-271.
and
Wade, B.E. and Sayer, L. (1982)
Different Care Provision for the Elderly,
London School of Economics and Political Science.
Summary: Extensive studies in all elderly care settings using the Rhys-Hearn dependency-activity method to estimate elderly patients' demand for nursing care. The instrument's validity and reliability are considered in detail.
Key words: elderly, dependency.

Walton, M. Hockey, L. and Garraway, W.M. (1978)
How dependent are stroke patients?
Nursing Mirror, 147, 14, pp.57-58.
Summary: Summarises a longitudinal and multi-site study of patient dependency.
Key words: dependency, elderly.

Wilkin, D. and Jolley, D.J. (1978)
Mental and physical impairment in the elderly in hospital and residential care 1,
Nursing Times, Occasional Papers, 74, 29, pp.117-120.
Summary: Describes an activity of daily living-based dependency classification system for use in elderly care. Shows how similar dependency is in different elderly care settings. Staffing, on the other hand, doesn't reflect dependency.
Key words: dependency, elderly.

ITU

Like elderly care, critical care units bring extra-special problems for nursing workforce planners. Again, a separate short annotated bibliography has been generated to help specialists in this area. Owing to the nature of ITUs, unique dependency measures are sometimes described. However, the staffing calculation method is usually nurses per occupied bed. Actual and recommended staffing are discussed, while some texts look at broader, unusual workforce planning issues.

Alberman, E. (1977)
Arrangements for special and intensive care of the new born,
British Medical Journal, 2, 6904, pp.1045-47.
Summary: A census of nurses per occupied (and other, related features) of intensive care units. Explores grade mix and staffing variations.
Key words: ITU, nurses per occupied bed.

Barnett, D. and McCann, P. (1988)
Staffing for intensive care or therapy,
Nursing Times, 84, 25, pp.46-48.
Summary: Notes the variations in nurses per occupied ITU bed. Describes a patient dependency system for ITUs. Also explains some unusual workforce planning variables such as support staff, in-unit laboratory facilities, etc. Instruments and data are provided. Ideal staffing and working conditions are covered.
Key words: nurses per occupied beds, ITUs, dependency.

Evans, S.K. Laundon, T. and Yamamoto, W.G. (1980)
Projecting staffing requirements for intensive care units,
Journal of Nursing Administration, 35, pp.36-42.
Summary: Describes a way of classifying ITU patients and provides a nurses per occupied bed formula, which is influenced by dependency.
Key words: ITUs, dependency, nurses per occupied bed.

Fuller, C. (1984)
Staffing a dialysis unit,
Nursing Times, 80, 38, pp.59-61.
Summary: A modified nurses per occupied method, instruments and data are well described.
Key words: ITU, nurses per occupied bed.

Gibson, S. Buxton, M. Caine, N. et al. (1986)
Measuring patient dependency,
Nursing Times, 82, 5, pp.36-38.
Summary: Describes and applies a dependency score for ICUs. Explains the differences between ICUs and acute wards. The importance of dependency data for staffing and costing ICUs is discussed.
Key words: dependency, ICU, acuity.

Iapichino, G. Radrizzani, D, Bertolini, G. et al (2001)
Daily classification of the level of care. A method to describe clinical course of illness, use of resources and quality of intensive care assistance,
Intensive Care Medicine, 27, 1, pp.131-136.
Summary: Describes a patient dependency classification system for ITUs.
Key words: dependency, ITU.

Intensive Care Society (ICS) (2002)
Levels of Critical Care for Adult Patients. Standards and Guidelines,
London: ICS.
Summary: Places critically ill patients into 1 of 3 clinical categories.
Key words: dependency, ITU.

MacDonald, F.G. (1972)
Coronary Care Units and the nurse,
Nursing Times, Occasional Paper, 68, 39, pp.113-116.
Summary: Empirically determined nurses per occupied bed formula.
Key words: nurses per occupied bed, ITU.

Redshaw, M.E. Harris, A. and Ingram, J.C. (1993)
Nursing and medical staffing in neonatal units
Journal of Nursing Management, 1, pp.221-228.
Summary: Explores many neonatal patient and staffing variables including occupancy and nurses per occupied bed. Actual staffing was compared with staffing recommended by various formulas. Large inter-unit variations were found most notably grade mix.
Key words: ITU, nurses per occupied bed, grade mix.

Telfer, A. (1984)
Choosing the right number,
Nursing Mirror, 158, 23, pp.11-12.
Summary: Uses the nurse per occupied bed approach to not only bench mark ITUs but also to devise a formula for recommending ideal establishments Attempts to address dependency and nursing workload.
Key words: nurses per occupied bed.

Walker, C. (1984)
Staffing neonatal units,
Nursing Times, 80, 20, pp.32-33.
Summary: Reviews staffing in neonatal special care and intensive care units. Findings are dated but the principles apply today. Broader workforce planning issues are considered.
Key words: nurses per occupied bed, ITU.

Paediatric Nursing

As with critical and elderly care, children's nursing raises special issues that deserve a separate section in this annotated bibliography. Methods include dependency-based; Monitor/Criteria for Care; and the RSCN grade mix approach.

Audit Commission. (1993)
Children First: a Study of Hospital Services,
London: HMSO.
Summary: Survey of paediatric ward staffing levels. Seven hospitals and 31 wards are included. Notes that few met the DoH recommended establishments and that dependency was a key nursing workload variable.
Key words: paediatrics, dependency.

DoH (Department of Health) (1997)
A Bridge to the Future - Nursing Standards, Education and Workforce Planning in Paediatric Intensive Care,
Whetherby: DoH.
Summary: Provides a dependency-based formula for calculating nursing establishment and grade mix chaldern's wards.
Key words: paediatric, dependency.

Donnelly, P. (1986)
Staffing a children's unit,
Nursing Times, 82, 39, pp.35-36.
and
Donnelly, P. (1986)
Spotlight on children: It's the quality that counts,
Nursing Times, 82, 26, pp.59-61.
Summary: Describes Criteria for Care and how it was applied to paediatric wards. Key data are provided for bench marking. Monitor, a quality of care component is applied to paediatric wards to explore the adequacy of staffing levels. Specimen instruments and data are provided.
Key words: paediatric, quality, dependency-acuity.

King, S. (2000)
Research: staffing levels. Safe staffing levels for children's wards,
Paediatric Nursing, 12, 2, pp.28-31.
Summary: Considers DoH guidelines on paediatric ward safe staffing levels; notably the RSCN mix. Highlights the reasons why staffing recommendations may be inadequate. Several variables (environmental hazards, dependency and shift systems) are discussed.
Key words: paediatric, grade mix.

Royal College of Nursing. (undated)
Staffing Issues in Paediatric Nursing,
London: RCN.
Summary: Reviews paediatric patient dependency systems.
Key words: paediatrics, dependency.

Information Management and Technology

These texts concentrate on hardware and (to a greater extent) software designed to help nursing workforce planners. Generic, but mostly specific, software are described. Most are dated although their underlying frameworks still apply.

Adams, R. and Duchene, P. (1985)
Computerisation of patient acuity and nursing care planning,
Journal of Nursing Administration, 15, 4, pp.11-17.
Summary: Describes a computerised Monitor/Criteria for Care nursing workload and care planning system.
Key words: dependency-activity-quality, IM&T.

Audit Commission. (1992)
Caring Systems,
London: HMSO.
Summary: Detailed examination of contemporary computerised nursing management systems. Nursing workload is well covered along with related issues such as care planning and rostering. Compares and contrasts nursing workload measures.
Key words: IM&T, review.

Bach, B. (1988)
Counting the cost of care,
Nursing Times, 84, 10, pp.63-64.
Summary: Brief description of three workload measures that could be used to build a ward-based computerised nursing information system.
Key words: IM&T.

Botter, M.L. (2000)
The use of information generated by a patient classification system,
Journal of Nursing Administration, 30, 11, pp.544-551.
Summary: Explores, qualitatively, the wider use of information generated by computerised patient classification timed-task/activity systems.
Key words: timed-task/activity, IM&T.

Coles, J. and Jenkins, L. (1992)
Computerised nursing workload systems,
Senior Nurse, 12, 4, pp.5-7.
Summary: Explores a symbiotic relationship between computerised nursing information systems and dependency-activity nursing workload. Specimen data are given but no outcomes.
Key words: IM&T, dependency-activity.

DeGroot, H.A. (1989)
Patient classification system evaluation. Part 1: Essential system elements,
Journal of Nursing Administration, 19, 6, pp.30-35.
and

DeGroot, H.A. (1989)
Patient classification system evaluation. Part 2: System selection and implementation,
Journal of Nursing Administration, 19, 7, pp.24-30.
Summary: Description of a computerised dependency-activity method of measuring nursing workload.
Key words: IM&T, dependency-activity.

Eaves, D. (1989)
Computerise your ward,
Nursing Times, 23, 85, pp.43-44.
Summary: Uses a computer-based timed-task/activity method to measuring nursing workload.
Key words: IM&T, timed-task/activity.

Goldberg, B. and Davies, A. (1984)
A methodology for nurse workload measurement,
Management Services, 28, 5, pp.8-13.
Summary: Raises the cost issue of implementing a nursing workload systems especially the demands on nursing time, computer hardware and software.
Key words: IM&T.

Henney, C.R. and Bosworth, R.N. (1979)
Nurse Allocation by Computer, in Barber, B. et al (eds) Proceedings of the Medical Informatics Conference, Berlin, 1979.
Berlin: Springer Verlag.
and
Henney, C.R. and Bosworth, R.N. (1980)
A computer-based system for the automatic production of nursing workload,
Nursing Times, 76, 28, pp.1212-1217.
Summary: Computerised measure of nursing workload using the Ninewells Index corroborated using the Aberdeen Formula method. Comments on fluctuating nursing workload and the importance of regular monitoring..
Key words: IM&T, timed-task/activity.

Jones, B.T. and Buchanan, M. (1989)
Relieving the bottlenecks in ward activity monitoring through IT,
Information Technology in Nursing, 1, 2, pp.27-31.
Summary: Describes in detail a computerised method to diminish labour-intensive nursing activity sampling. Provides activity categories and explains how the data might be stored and analysed using a personal computer.
Key words: IM&T, nursing activity.

Naylor, S. and Horne, G. (1984)
Muddle in the Midlands,
Nursing Times, 80, 39, pp.48-51.
Summary: Describes the nature and purpose of the Naylor-Horn computerised nursing workforce modelling system, which manipulates several demand-side variables including joiners, leavers, age, source and destination. Specimen data are provided, which are dated but the principles apply.
Key words: payroll, IM&T.

Slack, P. (1983)
Snippet with a big future
Nursing Times, 80, 11, pp.11-14.
Summary: Describes a modular PC-based system that uses personnel and payroll records to inform workforce planning.
Key words: payroll, IM&T.

Stoneham, G. (1992)
Implementing a nurse information system,
Nursing Standard, 6, 36, pp.25-27.
Summary: Describes nursing information systems and the options open to managers and workforce planners.
Key words: IM&T.

TMS/Nuffield Institute for Health. (1997)
Bedcost: Nursing Workforce Planning and Analysis Tool,
Wolverhampton: TMS.
Summary: User guide to a commercially available stand-alone program that employs the Monitor/Criteria for Care method. Ample specimen computer screens are provided.
Key words: dependency-activity-quality, IM&T.

Vousden, M. (1989)
Resource Management: Freeman's choice,
Nursing Times, 85, 11, pp.28-30.
Summary: Connects Monitor/Criteria for Care and Resource Management. Examines in particular staff perceptions during and after implementation.
Key words: dependency-activity-quality, IM&T.

Waite, R. (1986)
A network for safe staffing,
Nursing Times, 82, 9, pp.58-60.
and
Waite, R. (1986)
Nursing by numbers,
Nursing Times, 82, 8, pp.40-42.
and
Waite, R. and Hirsh, W. (1985)
Nursing Workload and Staffing Levels Summary Report
Sussex: Brighton Health Authority.
and
Waite, R. and Hirsh, W. (1986)
Not another dependency study,
Senior Nurse, 4, 1, pp.29-32.
and

Waite, R. and Hirsh, W. (1986)
Controlling workloads,
<u>Senior Nurse</u>, 4, 2, pp.14-17.
Summary: Describes Brighton's workforce planning method that uses a dependency, occupancy, case mix, care safety in a nurse per patient context decided by professional judgement enhanced by regression analysis. Specimen instruments, computer screens and data are provided. Psychometric properties of workload measures are discussed and the method's outcomes are compared with those generated by other nursing workload measures. One bottom line is that nursing workforce planning methods are getting too complicated. Another is that wide discrepancies exist between actual and recommended staffing levels, and that staffing levels do not always match workloads; that is, the inflexibility factor persists.
Key words: review, dependency, professional judgement, IM&T, nurses per occupied bed.

Watts, J. Cochrane, D. and Conroy, M. (1993)
What about the workers?
<u>Health Service Journal</u>, 103, 5378, pp.27-29.
Summary: Describes Sheffield Northern General's approach to workforce planning, which includes supply and demand variables. The latter is largely nurses per occupied bed that are explored using 'what-if?' spreadsheets. Grade mix and skill mix are considered. The method is expected to be refined as it is extended to other directorates in the hospital.
Key words: nurses per occupied bed, IM&T.

Wilson, J. (1992)
Data systems can boost nursing care. Nurse management information in resource management,
<u>Professional Nurse</u>, February, pp.325-328.
Summary: Describes the nature, purpose, strengths and weaknesses of nurse management information systems in a ward-based nursing workload/planning context.
Key words: IM&T.

Shifts and Duty Rotas

A surprisingly large number of articles take the outcomes from estimating the size and mix of nursing teams to the next level - how best to deploy nurses. Although a less relevant topic, readers will gain useful insight into workforce planning. Rotas are explored mainly from rostering, shifts, overlaps, part-time and full-time working.

Applin, L. (1984)
Shifting the system,
Nursing Times, 80,18, pp.50-51.
Summary: Explains a new (of its time) shift system that increased nursing efficiency and effectiveness.
Key words: shifts, rotas.

Audit Commission. (1991)
The Virtue of Patients: Making the Best Use of Nursing Resources,
London: HMSO.
Summary: Detailed examination of the managers' role in maintaining nursing efficiency and effectiveness. One section looks at nursing establishments and workload.
Key words: nursing workload and workforce planning.

Barr, A. (1984)
Hospital nursing establishments and costs,
Hospital Health Services Review, pp.31-37
Summary: Explores daily variations in nursing workload and relatively static duty rotas.
Key words: acuity, rotas.

Blanchflower, S.(1986)
Alternative rota systems.
Nursing Times Occasional Paper, 82, 4, pp.55-58.
Summary: Explores the cost-effectiveness of nursing rotas, especially overlap in a nursing workload context. Specimen data and results are given.
Key words: rotas.

Bokhoree, L. (1982)
Staffing a geriatric unit at morning peak hours,
Nursing Times, Occasional Papers, 78, 26, pp.101-102.
and
Bokhoree, L. (1983)
Staffing a geriatric unit: a progress report,
Nursing Times, Occasional Papers, 79, 11, pp.52-53.
Summary: Improves the equity of nursing workload across shifts by redistributing nursing hours to favour peak times. Specimen duty rotas are provided.
Key words: elderly care, rotas.

Carr, A. J. (1976)
Workload and staffing on night duty,
Nursing Times, Occasional Paper, 72, 30, pp.105-108.
Summary: One of the few articles that concentrates on appropriate numbers and mix of nurses on night duty, based on nursing activity and workload. Nurses per occupied bed formulas are provided. The results are outmoded but the principles remain.
Key words: shifts, nurses per occupied bed.

Charles, S.T. and Gillott, M. (1977)
Equating ward staff with workloads,
Nursing Times Occasional Paper, 73, 8, pp.29-32.
Summary: Examines nursing workload generated by dependency and workload as a basis for demand-side workforce planning. Also looks at shifts and duty rotas.
Key words: dependency-acuity, rotas.

Corby, S. (1991)
When two halves make total sense,
Health Service Journal, 101, 5261, pp.20-21.
Summary: Looks at gender, grade mix and the efficiency and effectiveness of part-time workers.
Key words: Rotas.

Eaves, D. (1985)
Where the 12 hour shift works.
Nursing Times, 81, 14, pp.34-36.
and
Eaves, D. (1985)
Where the 12 hour shift works.
Nursing Times, 81, 15, pp.34-35.
Summary: Detailed study of long shifts. Many variables, including job satisfaction and nursing costs, are covered. Specimen rotas are provided.
Key words: rotas, costs.

Enis, J. (1982)
From Budget to the Bedside: Decision Making in the Allocation of Nurses,
Oxford: Oxford Regional Health Authority.
Summary: Explores the consequences of daily nursing workload variations when duty rotas are static.
Key words: rotas.

Fisher, J. (1983)
The slip backwards,
Nursing Times, 79, 38, p.28.
Summary: Examines the cost and quality of nursing care from permanent and temporary staff perspectives.
Key words: rotas, grade mix.

Hansed, K. (2002)
Ward staffing: finding your form,
Health Service Journal, 112, 5830, pp.28-29.
Summary: Considers the workforce planning problems ward managers face and what needs to be done to solve them. Explores demand and supply side, and rotas.
Key words: review, rotas.

Hawley, C.A. and Stilwell, J.A. (1993)
The myth of the midday overlap,
Journal of Nursing Management, 1, pp.56-67.
Summary: Detailed empirical study that explores the efficiency and effectiveness of shift overlaps in a workload context.
Key words: rotas.

Hawley, C.A. Stilwell, J.A. Robinson, J. and Bond, M. (1993)
Nurses Manage,
Aldershot: Averbury.
Summary: Detailed and systematic account of ward managers' responsibilities including nursing workload, establishments, grade mixes, rostering, nursing costs and quality. Draws on extensive empirical data from several acute wards. Outmoded but the principles apply.
Key words: actual staffing, dependency-acuity, quality, costs, rotas.

Huddleston, J. (1983)
The dawn shift,
Nursing Times, Occasional Paper, 79, 32, pp.68-69.
Summary: Shows how nursing efficiency and effectiveness can be improved by adjusting rotas to included a dawn shift on elderly care wards.
Key words: shifts, elderly care.

Jacques, C.A. (1983)
A practical view,
Nursing Times, 79, 38, pp.27-28.
Summary: Explores the cost and quality of nursing care in the context of regular part-time and temporary staff.
Key words: cost, quality, rotas.

Kyle, S.P. (1975)
A survey of the availability of part-time staff in relation to lists in the operating theatre,
NATN News, 12, 2, p.12.
Summary: Explores the role of part-time qualified staff in the operating theatre. Considers their value and what can be done to recruit and retain these staff.
Key words: grade mix, rotas.

Marsh, J. (1985)
Management: overlap - fact or fancy,
Nursing Times, 81, 35, pp.32-34.
Summary: Looks at ways of improving shift systems, especially overlaps. Considers shifts in a nursing workforce planning context. Specimen rotas are provided.
Key words: rotas.

Stark, V. (1986)
Management: the flexible solution,
Nursing Times, 82, 40, pp.44-45.
Summary: Looks carefully at the relationship between rostering and nursing workload. Specimen data are provided. Outmoded results but the principles apply today.
Key words: rotas.

Stilwell, J.A. and Hawley, C. (1993)
Nursing dependency and the costs of nursing care,
Journal of Nursing Management, 1, 1, pp.113-117.
Summary: Explores dependency from an unusual angle. Shows that costs rise with patient dependency, and that overlaps occur. Consequently, warns that care is needed when dependency-acuity data are used to determine the size and mix of nursing teams. Examines also some related issue such as the unpredictability of nursing workload and matching the latter with rotas.
Key words: dependency-acuity, rotas.

Wake, P. (1986)
Management: Shifting the system,
Nursing Times, 82, 26, pp.34-45.
Summary: Considers enhancing nursing efficiency and effectiveness by revisiting duty rotas.
Key words: rotas.

Wiseman, J. (1984)
Towards a unified approach,
Nursing Times, 80, 37, pp.55-58.
Summary: Describes Mersey's simplified dependency-activity nursing workload measuring method. Instruments, formula and specimen data are provided. Raises important issues about rotas. Quality issues are explored theoretically.
Key words: dependency-activity, rotas.

Costs and Nursing Workforce Planning

These articles/book/reports look at the economics of demand side nursing workforce planning, such as cost-benefit analysis, as well as nurse staffing costs generally. Specimen data are provided, which in some cases are outmoded. If readers agree that the cost of nursing structures, processes and outcomes is important then they might be surprised how few publications there are in this domain.

Bosanquet, N. (1985)
Where have all the nurses gone?
Nursing Times, 81, 43, pp.16-17.
Summary: Looks at the cost and quality of nursing care.
Key words: quality, cost.

Carr-Hill, R.A. Dixon, P. Griffiths, M. et al. (1992)
Skillmix and the Effectiveness of Nursing Care
York University: Centre for Health Economics.
and
Carr-Hill, R.A. Dixon, P. Griffiths, M. et al. (1995)
The impact of nursing grade on the quality and outcome of nursing care.
Health Economics, 4, pp.57-72.
Summary: Detailed, empirical study of rich and dilute nursing grade mix - especially the quality implications. QualPaCS was the measure of nursing quality.
Key words: grade mix, quality, cost.

Deeming, C. (2002)
Data briefing: nurse vacancies,
Health Service Journal, 112, 5811, p.36.
Summary: Variables and supporting data that reflect or influence nursing shortages are examined quantitatively. Useful data such as vacancies, participation rates, nursing costs and agency/bank use are included in succinct article.
Key words: payroll/personnel, costs, actual staffing.

Dimmock, S. (1983)
Splitting and sharing jobs,
Nursing Times, 79, 40, p.60.
Summary: Examines cost, quality and grade mix from a permanent and temporary staff perspective.
Key words: grade mix, quality.

Donovan, M. and Lewis, G. (1987)
Increasing productivity and decreasing costs: the value of RNs.
Journal of Nursing Administration, 17, 9, pp.16-18.
Summary: Examines the cost and quality implications of rich and dilute grade mixes.
Keywords: grade mix, cost, quality.

Eaves, D. (1985)
Where the 12 hour shift works.
<u>Nursing Times</u>, 81, 14, pp.34-36.
and
Eaves, D. (1985)
Where the 12 hour shift works.
<u>Nursing Times</u>, 81, 15, pp.34-35.
Summary: Detailed study of long shifts. Many variables, including job satisfaction and nursing costs, are covered. Specimen rotas are provided.
Key words: rotas, costs.

Fabray, C. and Greenhalgh, P. (1984)
Nursing time is money,
<u>Nursing Times</u>, 80, 46, pp.60-62.
Summary: Describes the FIP dependency, timed-task/activity method of measuring nursing workload, which was developed from the Cheltenham system. Specimen instruments and data are given. The relationship between workload and resources are extensively discussed.
Key words: dependency, timed-task/activity, cost.

Forster, J.F. (1978)
The dollars and sense of an all-RN staff,
<u>Nursing Administration Quarterly</u>, 3, pp.41-47.
Summary: Examines the cost and quality of nursing care in relation to different grade mixes.
Key words: cost, quality, grade mix.

Gibbs, I. McGaughan, M. and Griffiths, M. (1991)
Skill mix in nursing: a selective review of the literature,
<u>Journal of Advanced Nursing</u>, 16, pp. 242-249.
Summary: Systematic literature review into the cost and quality of nursing care and its relationship to skill mix and grade mix. A range of demand-side workforce planning issues are considered. No instruments are described but some data are given.
Key words: review, cost, quality, grade mix, skill mix.

Gray, A. (1987)
A mixed review,
<u>Senior Nurse</u>, 6, 2, pp.7-8.
Summary: A review of the DHSS (1986) Mix and Match report. Examines some useful techniques for exploring grade mix, nursing activity and costs. Specimen data are provided.
Key words: review, grade mix, costs.

Greenhalgh and Co. (1991)
<u>Using Information in Managing the Nursing Resource - The Rainbow Pack</u>,
Macclesfield: Greenhalgh Healthcare Consultants.
and

Greenhalgh and Co Ltd. (1991)
Nurse Management Systems. A Guide to Existing and Potential Products,
Macclesfield: Greenhalgh Healthcare Consultants.
Summary: Comprehensive, state-of-the-art review of many nursing workload measuring and workforce planning methods. Presents their strengths and weaknesses. Workload and grade mix are set in the context of quality, personnel and finances. The booklets are distance learning packs for ward managers. Information is dated but the principles apply.
Key words: activity, quality, grade mix, costs, review.

Halloran, E.J. (1983)
RN staffing: more care less cost,
Nursing Management, 14, 9, pp.18-22.
Summary: Explores the relationship between grade mix and nursing efficiency and effectiveness.
Key words: grade mix, costs.

Hamm-Vida, D. (1990)
Costs of non-nursing tasks,
Nursing Management, 21, 4, pp.23-4,
Summary: Looks at the cost implications of associated (generally non-nursing work).
Key words: nursing activity and cost effectiveness.

Harrison, S. and Ayton, M. (1979)
Dependency of elderly people in homes and staffing ratios,
Health and Social Services Journal, 88, 4653, supplement pages 15-20.
and
Harrisson, S, and Ayton, M. (1980)
The dependency of elderly people in residential homes.
Nursing Times, Occasional Papers, 76, 43, pp.105-112.
and
Harrison, S.P. and Ayton, M. (1981)
The Care of Elderly People in Hospital and the Community: A Study of Resources and Nursing Needs,
Durham University: Department of Sociology and Social Policy.
and
Harrison, S. (1988)
Changing admission patterns of short-stay geriatric patients.
Nursing Times, Occasional Paper, 84, 4, pp.53-55.
Summary: A set of related papers that look at the relationship between dependency, workload and nurses per occupied bed in elderly care settings. Notes discrepancies between sites and how elderly patient dependency was increasing over time. Outmoded but the principles apply.
Key words: dependency, activity, nurses per occupied bed, costs.

Hawley, C.A. Stilwell, J.A. Robinson, J. and Bond, M. (1993)
Nurses Manage,
Aldershot: Averbury.
Summary: Detailed and systematic account of ward managers' responsibilities including nursing workload, establishments, grade mixes, rostering, nursing costs and quality. Draws on extensive empirical data from several acute wards. Outmoded but the principles apply.
Key words: actual staffing, dependency-acuity, quality, costs, rotas.

Jacques, C.A. (1983)
A practical view,
Nursing Times, 79, 38, pp.27-28.
Summary: Explores the cost and quality of nursing care in the context of regular part-time and temporary staff.
Key words: cost, quality, rotas.

Leenders, F. (1985)
Management: translating strategy.
Nursing Times, 81, 39, pp.43-45.
Summary: Compares and contrasts North American with UK nursing workforce planning methods. Broadly classifying methods as top-down management and bottom-up dependency-acuity, cost and quality issues are considered. Specimen data and results are given.
Key words: review, dependency-acuity, cost, quality.

McKenna, H.P. (1995)
Nursing skill mix substitutions and the quality of care: an exploration of assumptions from the research literature.
Journal of Advanced Nursing, 21, pp.452-459.
Summary: Systematic literature review that explores three assumptions about the relationship between grade mix and skill mix richness and the quality of care. The cost-effectiveness of rich and dilute grade mix and skill mix are considered.
Key words: grade mix, quality, cost.

Osinski, E.G. and Powals, J.G. (1980)
The cost of an all-RN staffed primary nursing,
Supervisor Nurse, 11, pp.16-21.
Summary: Explores the cost and quality of qualified-nursing assistant combinations.
Key words: grade mix, cost, quality.

Pearson, A. Hocking, S. Mott, S. and Riggs, A. (1992)
Skills mix in Australian nursing homes,
Journal of Advanced Nursing, 17, pp.767-776.
Summary: Looks at the cost and quality of different grade mix combinations. Patient dependency also features along with many other workforce planning issues. Principles are relevant in elderly care wards too.
Key words: cost, quality, grade mix, elderly.

Poirier-Elliot, E. (1994)
Cost-effectiveness of non-physician, health care professionals,
<u>Nurse Practitioner</u>, 9, 10, pp.54-56.
Summary: Examines nurses' extending roles in an economic and skill mix context.
Key words: cost, skill mix.

Rothwell, S. (1986)
Costing flexible working patterns,
<u>Nursing Times</u>, 82, 28, pp.43-45.
Summary: Explores nursing workload and grade mix from a cost-effectiveness perspective
Specimen data and results are given.
Key words: acuity, grade mix, cost, quality.

Royal College of Nursing. (1992)
<u>Cost effective Care</u>
London: RCN.
Summary: Briefly explores cost and quality implications of grade mix.
Key words: grade mix, cost, quality.

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Summary: Examines how nursing activity, such as direct care, and dependency can influence daily nursing costs. Also gives a clear account of how nursing activity can be measured.
Key words: nursing activity, costs.

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Key words: dependency-acuity, costs.