

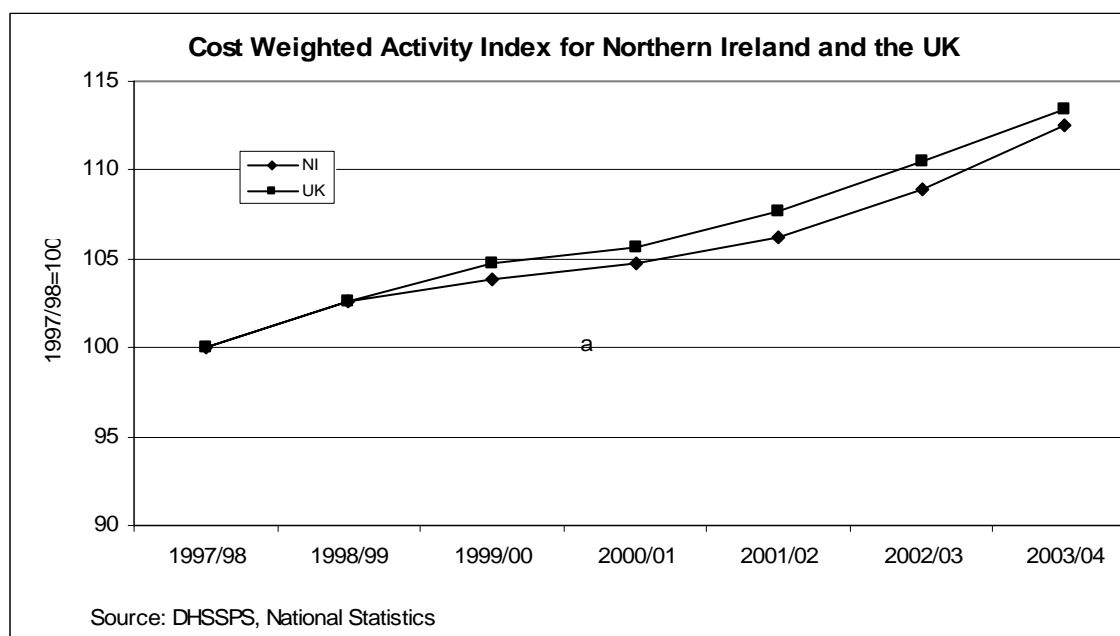
3.7 Efficiency and productivity

In common with most public services it is difficult to determine precisely the extent to which resources have been used efficiently in the health & social care sector. Although the inputs to the system are relatively easy to capture and measure (money, staff etc), the outputs present a more difficult task. For example, whilst population health measures such as age standardised mortality rates are often used as output indicators they are imperfect measures of health system performance as they reflect a range of determinants other than the effects of health and social care services, and often over individuals' entire lifetimes. Moreover, while such measures may capture one of the dimensions of health (in this case, death), other dimensions (quality of life) are just as important.

Unfortunately, health and social care systems do not routinely measure patients' and clients' quality of life, and, coupled with the attribution problem when using measures such as SMRs, traditionally, measures of efficiency have tended to rely on ratios of inputs (money) to outputs - usually measured in terms of activity (patients treated, operations performed etc).

Composite measures of health service activity (adding together different types of activity using share of expenditure as weights (cost weighted activity index - CWAI) divided by changes in real financial resources (the cost weighted efficiency index - CWEI) have been used by the English NHS to capture, in broad terms, the efficiency with which the NHS converts inputs into outputs. However, such measures are, as we note, imperfect (see Box 3.6).

Figure 3.57: The Cost Weighted Activity Index (CWAI) of Healthcare Services increased by 12.5% in Northern Ireland between 1997/98 and 2003/04 compared to 13.4% in England.

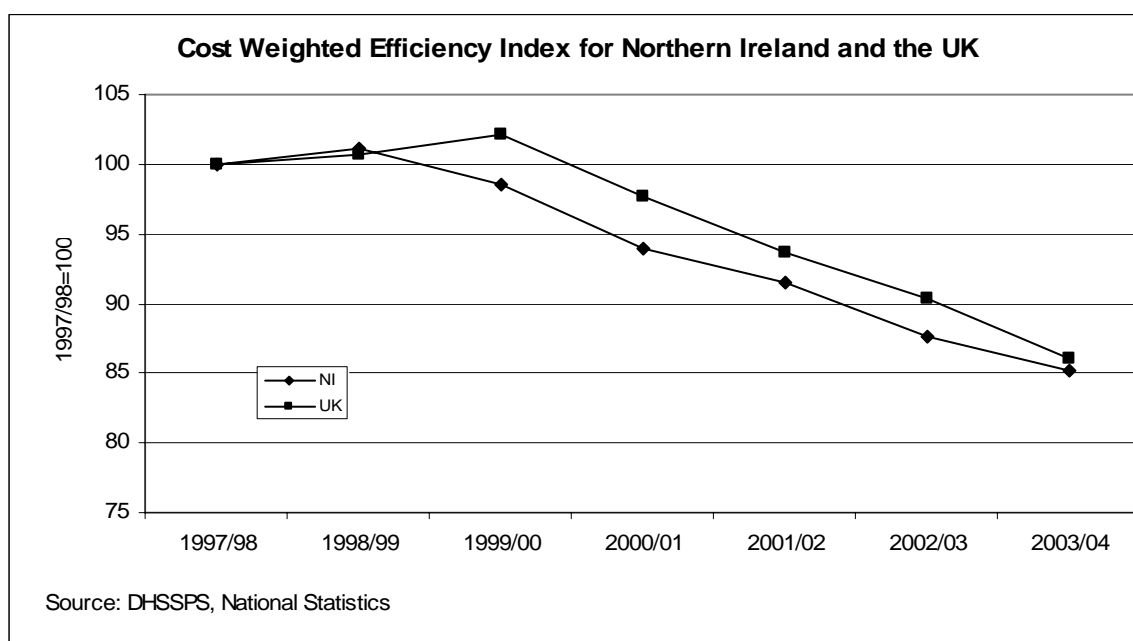


For illustrative purposes, figure 3.57 compares the increase in health service activity between Northern Ireland and the UK as a whole in terms of the CWAI. The CWAI includes hospital activity (e.g. inpatients, day cases), community activity (e.g. health visiting and district nursing) and family health services (e.g. GP consultations and

prescribing) weighted by their shares of total spending. It can be seen that on this measure, activity has risen at a slightly slower rate in Northern Ireland than England between 1997/98 and 2003/04. However, looking at the underlying data in more detail highlights the weaknesses of the indicator. In particular, the greatest contributions to the growth in activity in Northern Ireland come from inpatients and day case activity and GP prescribing activity⁷². In respect of the former, the main growth is mainly attributable to growth in day case activity, which, as these are on average less expensive than inpatient care, in the context of a constant weight suggests that growth is overstated. In addition, GP prescribing in Northern Ireland is not necessarily an area where more implies better.

In terms of efficiency, figure 3.58 shows that because health expenditure (in constant prices) increased at a faster rate than activity over this period, the efficiency index for both Northern Ireland and the UK as a whole followed a similar downward trend between 1999/00 and 2003/04. However, it should be highlighted that these charts are meant to be indicative of general trends and DHSSPS have significant reservations regarding their use.

Figure 3.58: The Costs Weighted Efficiency Index (CWEI) of Healthcare Services fell by almost 15% in the UK and Northern Ireland between 1997/98 and 2003/04.

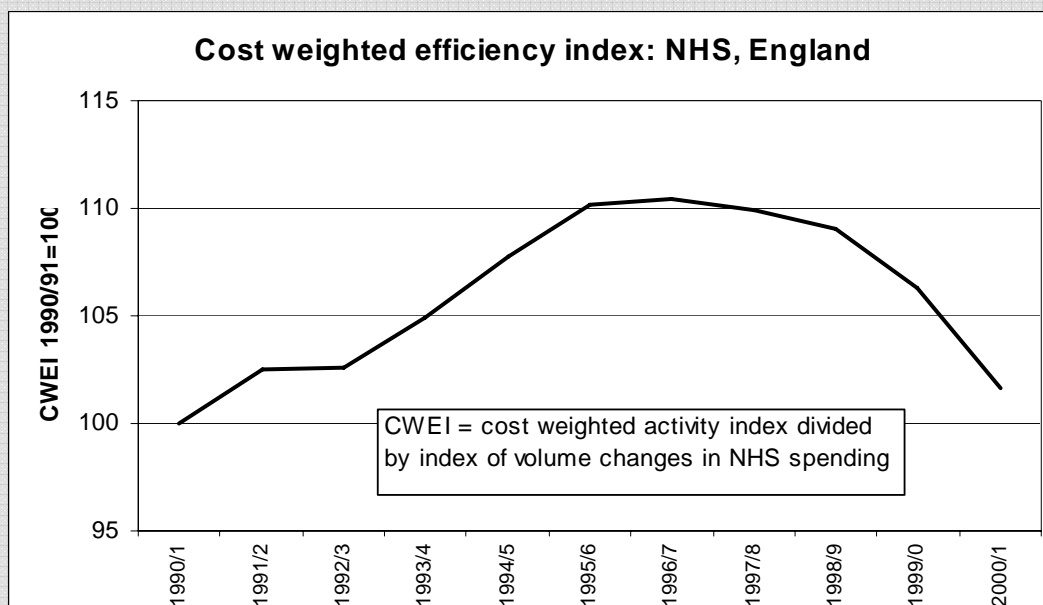


In response to problems with traditional measures of efficiency and productivity a review was commissioned by the ONS on the measurement of Government output. Although the review published its final report in January 2005 it is expected to be some time before useful results become available⁷³.

⁷² Collectively they account for 78% of the growth in weighted activity excluding dental services for which data is not available over the entire period.

⁷³ Atkinson Review Final report: Measurement of Government Output and Productivity for the National Accounts, 2005

Box 3.6: Problems with traditional measures of health care productivity and efficiency



The reason for the falling trend in the above graph is straightforward: As the traditional productivity measure is a ratio of outputs (activity) to inputs (money), and as there have been relatively large increases in NHS spending since 1997/8 without similar increase in outputs, the ratio of outputs to inputs must fall. With spending rising even faster since 2000/01, this downward trend is likely to have continued in subsequent years.

Although the reason for the trend is straightforward, its interpretation is less so. There are essentially four reasons underlying the downward trend in efficiency:

Extra spending has in part been:

- **absorbed by higher costs (rather than higher outputs).**

In other words, productivity has actually fallen in some areas

- **invested in services and activities which may take some years to be reflected in increased outputs.**

Spending on preventative services such as smoking cessation classes or dietary advice, may not yield their full measurable results sometime after the year in which the spending on these services took place.

- **increasingly channelled into activities not captured by the productivity measure.**

The cost weighted efficiency measure, for example, does not record clinics held in GP surgeries, which may often act as a substitute for activities usually carried out in hospitals.

- **used to increase the (unmeasured) *quality* rather than the (measured) *volume* of outputs.**

Devoting more time to each patient improves the quality of care (and costs), but is not captured by current productivity measures.

It may seem somewhat paradoxical, but it is not always in the patient's interests for the NHS to always do more activity - even if this improves measured productivity. It is not, for example, necessarily desirable for the NHS to continually increase the number of admissions to its casualty departments; prevention is better. And as some drugs (and some operations and other interventions) are only of very limited benefit to patients it makes little sense for the NHS to strive to provide more.

For the NHS, improving productivity is not just about producing more of everything for each extra pound, it is about doing the right things in the right way as efficiently as possible.

Due to the weaknesses of the overall macro indicators, significant weight is often given to micro indicators of performance such as waiting lists and times, cancellation rates, GP referral rates, day case rates etc. However, each of these indicators needs to be considered in context. For example, high waiting lists may reflect high levels of demand rather than inefficient delivery, whilst a very high rate of bed occupancy may exacerbate the risk of hospital acquired Infections.

Here, using currently available data, we examine the efficiency of various sectors of the health and social care system in Northern Ireland, wherever possible and appropriate, making comparisons with other regions of the UK. As already noted, largely for historical reasons, there is a bias towards the acute health care sector in terms of the measures available to provide indicators of efficiency and productivity. In considering the effectiveness of acute service provision in Northern Ireland, the 2002 Needs and Effectiveness Evaluation (NEE) presented evidence that unit costs were higher and productivity was lower in Northern Ireland than England, with part of the explanation for this being attributable to higher lengths of stay. However, little were made of these findings and it was also stated that Northern Ireland performed better in terms of other indicators of performance (such as readmission rates) but with little in the form of supporting data.

A key statement from the NEE was that, *“Productivity in the hospital sector has increased by almost 100% over the last 10 years”*. This was based on growth in throughput (that is, day case and inpatient activity per available bed) - which increased by 97% in Northern Ireland between 1991/92 and 2000/01 compared to 71% in England. It is worth noting however, that despite this greater increase in throughput, by 2000/01 productivity in Northern Ireland was still 19% lower than in England. In addition, subsequent growth in throughput has averaged only 2.5% per year in Northern Ireland compared to 3.0% in England.

These calculations include renal dialysis treatments not included in GB data as referred to in Section 3.3.1. Excluding these treatments the growth in Northern Ireland throughput between 1991/92 and 2000/01 falls to 83% whilst 2003/04 throughput is 26% below the level in England.

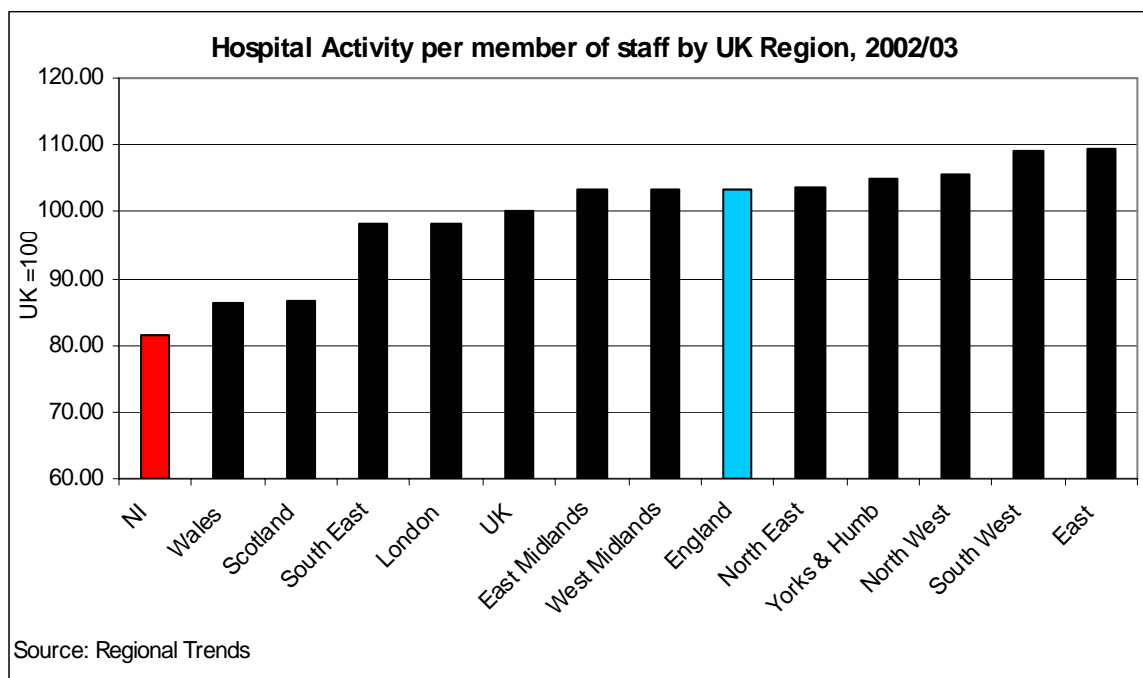
3.7.1 Hospital activity and labour inputs

Throughput is one measure of the utilisation of a key resource - beds. However, there are other ways of looking at the efficiency with which a system uses the resources at its disposal.

For example, although Northern Ireland has higher levels of hospital activity than the UK average (see section 3.2.2), it also has significantly higher levels of staffing, and figure 3.59 shows that Northern Ireland, Wales and Scotland have significantly *lower* level of labour productivity than English regions, with hospital activity per staff member in the Northern Ireland health care sector approximately 19% lower than the UK average (and 16% below on unadjusted basis)⁷⁴.

⁷⁴ Unweighted activity is simply the summation of the number of inpatients, outpatients, day cases and A&E attendances. Weighted activity is the sum of each activity weighted by the respective unit cost for England. Inpatients have a weighting of 20.9 compared to 7.1 for day cases and 1 each for outpatients and A&E.

Figure 3.59: Hospital activity (weighted) per member of staff in Northern Ireland is the lowest of the UK regions, 2002/03



Although it was not possible to split staff between activities, figures 3.60-3.63 below compare levels of inpatients, outpatients, day cases and A&E attendances with the total number of HCHS staff for each UK region as a broad indicator of labour productivity. It can be seen for inpatients, outpatients and day cases that HCHS labour productivity in Northern Ireland is significantly below the UK average. Whilst labour productivity in Northern Ireland is higher in terms of A&E attendances, the significant variation with other forms of activity raises questions as to whether the level of activity reflects actual need or that it might be better for treatment to be provided in an alternative form.

Figure 3.60: The number of inpatients treated per HCHS staff member in Northern Ireland is 21% lower than the UK average.

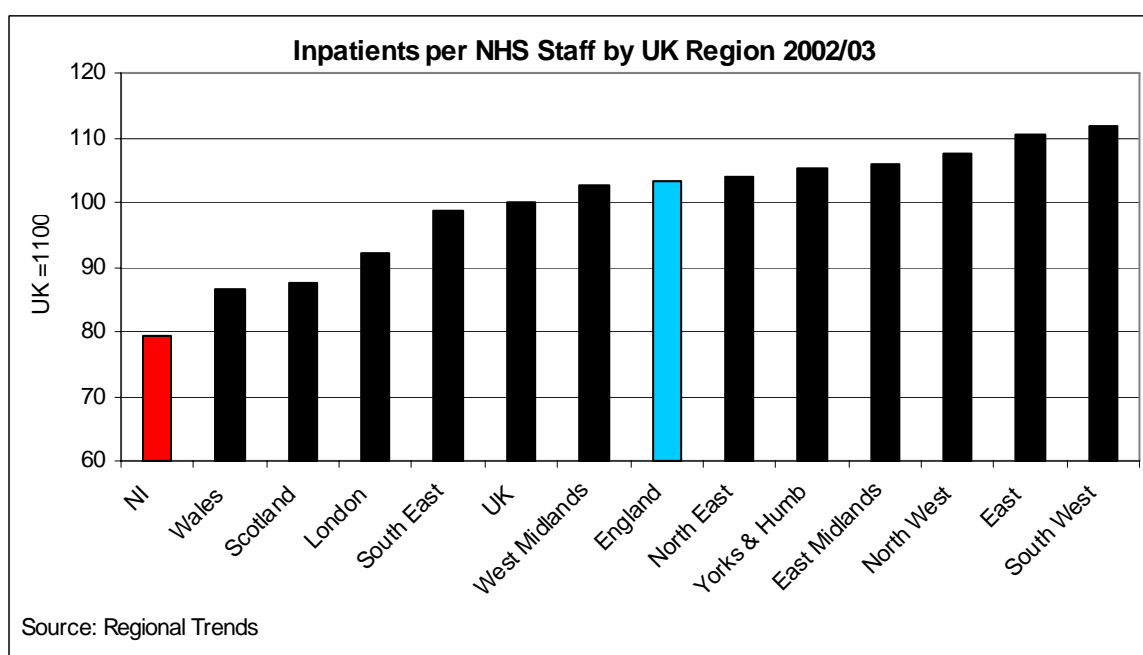


Figure 3.61: The number of day cases per HCHS staff member is 11% lower than the UK average.

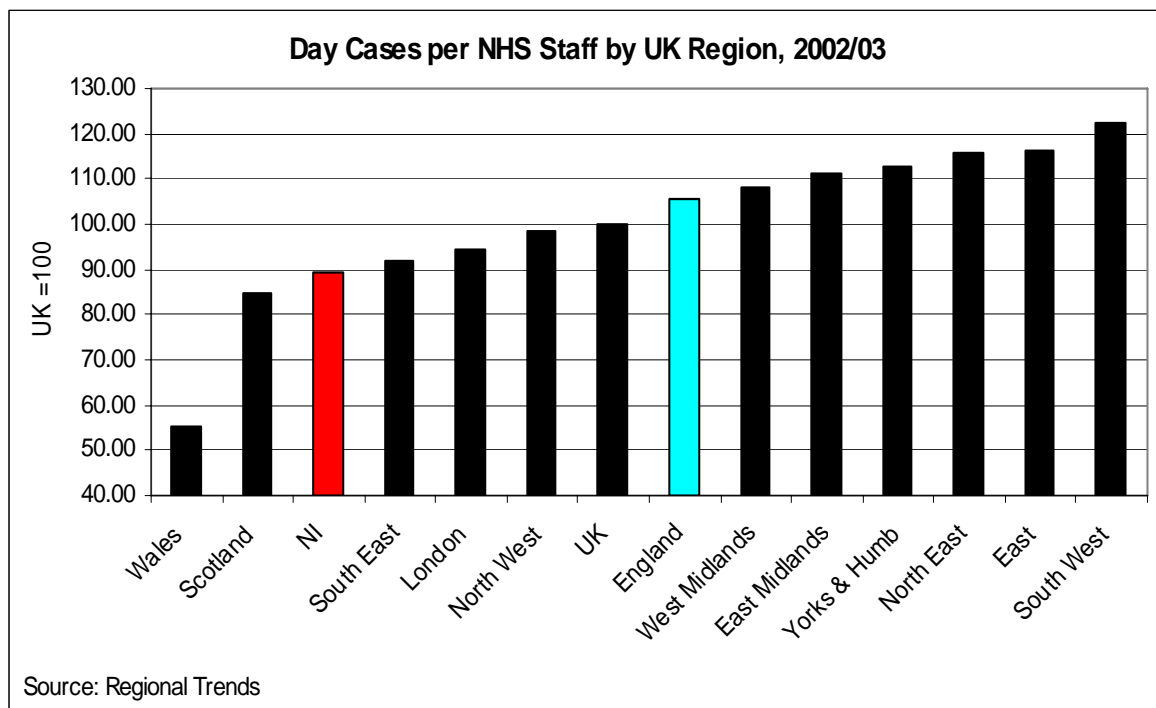


Figure 3.62: The number of outpatients treated per HCHS staff member is the lowest of all UK regions

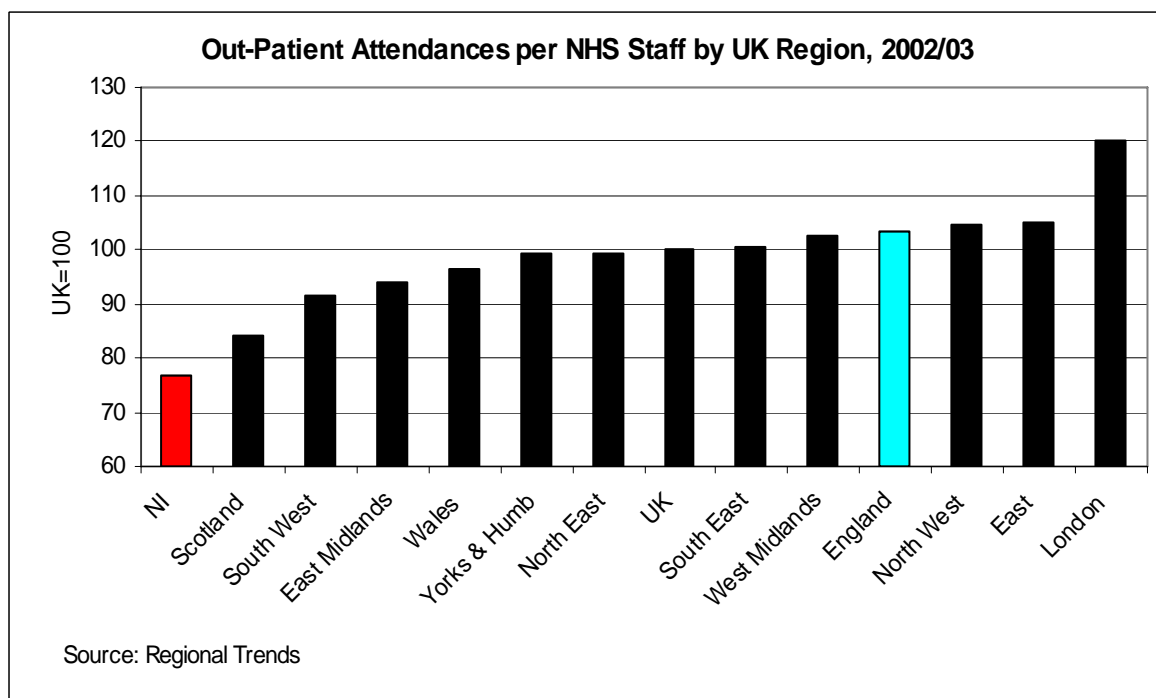
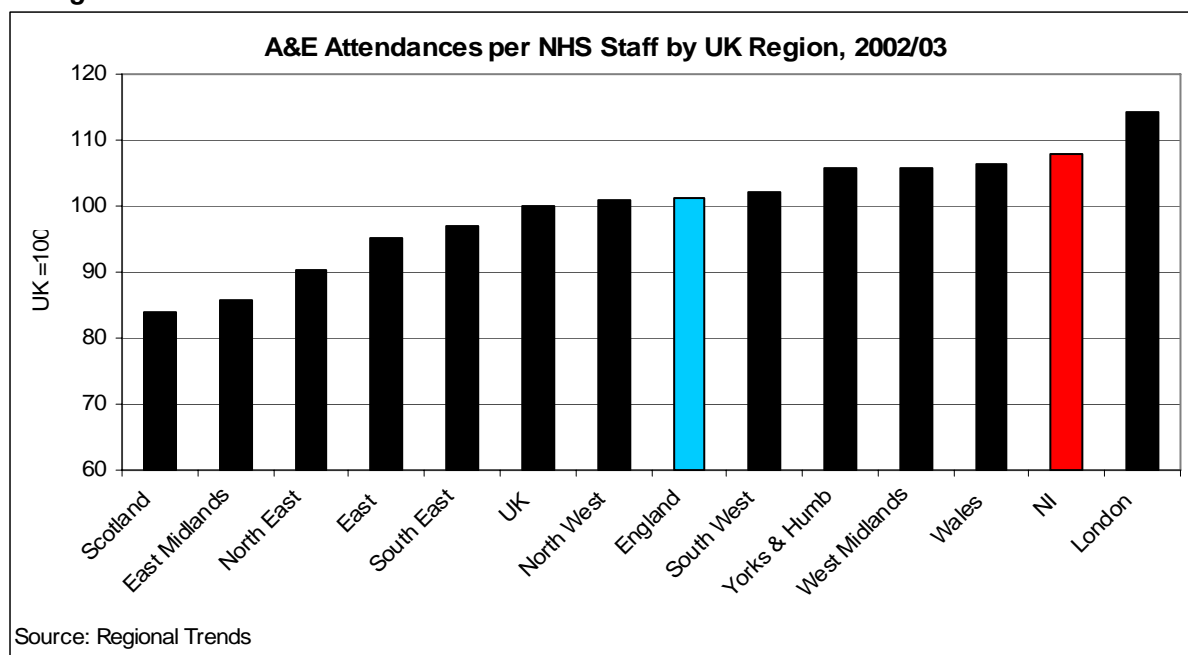
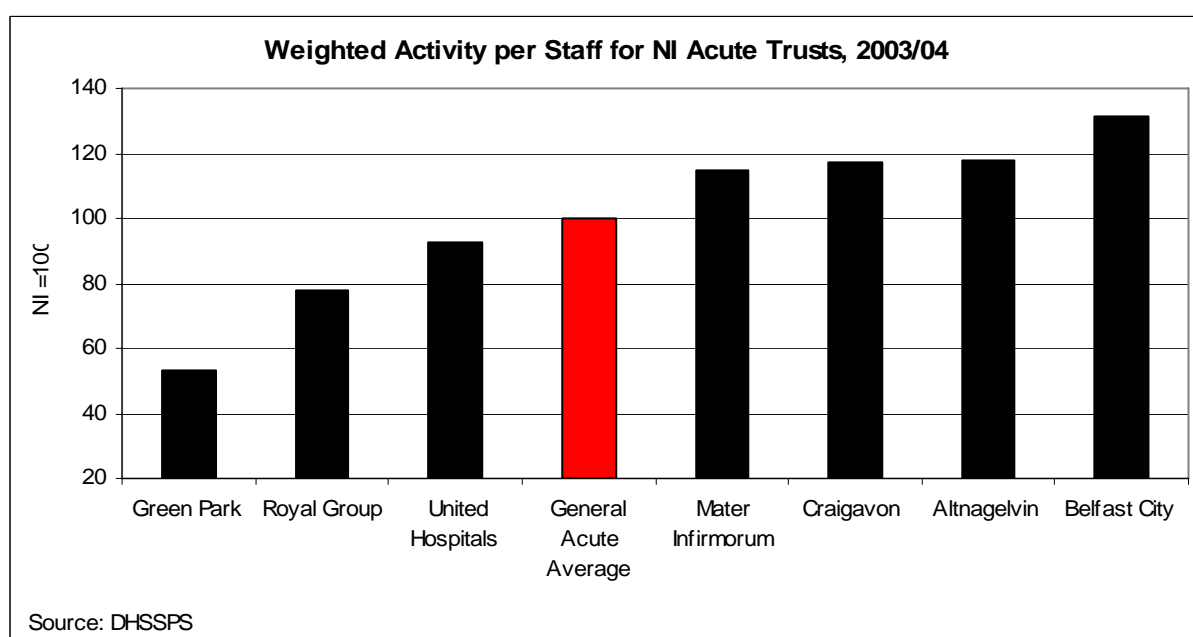


Figure 3.63: The number of A&E attendances per HCHS staff member is 8% higher than the UK average



There are also significant variations in the level of activity per staff member between Northern Ireland hospitals. Figure 3.64 compares the weighted level of activity for General Acute Hospitals in Northern Ireland. It can be seen that weighted activity per staff is 31% higher in the Belfast City Trust than the average for Northern Ireland whilst in the Green Park Trust labour productivity is 47% below the average. However, these comparisons need to be treated with care given differences in case mix with the Royal and Greenpark Trusts carrying out the main regional medical specialties.

Figure 3.64: There are significant variations in the level of weighted hospital activity per staff for Northern Ireland general acute trusts, 2003/04

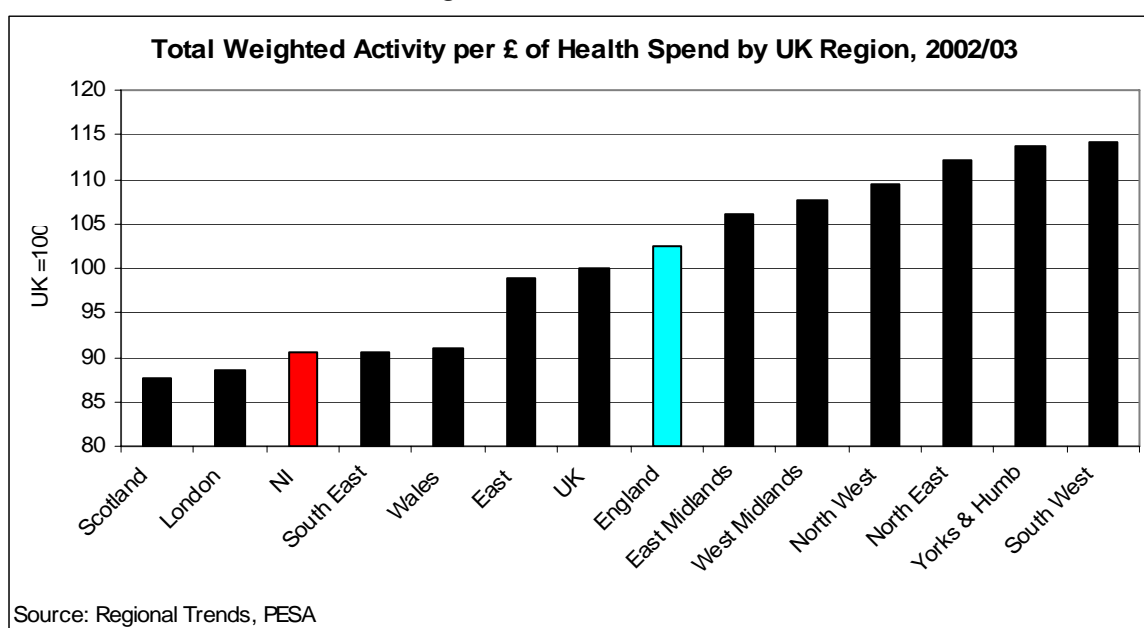


3.7.2 Hospital activity and total financial inputs

Whilst labour is a significant input into the provision of health care services, it is not the only one. In addition, variations in labour input mix across the different regions of the UK (which have not been taken into account above) can affect regions' relative positions.

A more general measure of inputs is the total financial resources devoted to health care. Figure 3.65, for example, shows that hospital activity per health care pound in Northern Ireland is 9% lower than the UK average (7% unadjusted for the different unit cost of activities). If Northern Ireland were to achieve the same level of efficiency as England, this would allow, for example, an additional 45,000 inpatients to be treated each year - equivalent to the entire inpatient waiting list⁷⁵.

Figure 3.65: Hospital Activity (weighted) per £ identifiable Health spend is 9% lower in Northern Ireland than the UK average, 2002/03



3.7.3 Unit costs of hospital activity

At a more micro level, it is also possible to examine the unit costs (also termed reference costs) of individual defined groupings of like hospital procedures that are considered to consume like resources- health care resource groups (HRGs).

Such data allows for comparison both at the level of trusts across Northern Ireland and with England. Figure 3.66 shows that the average cost per procedure (aggregated up from individual procedures into elective inpatients, non-elective cases and day cases) in the acute sector in Northern Ireland for 2002/03⁷⁶ was 6%

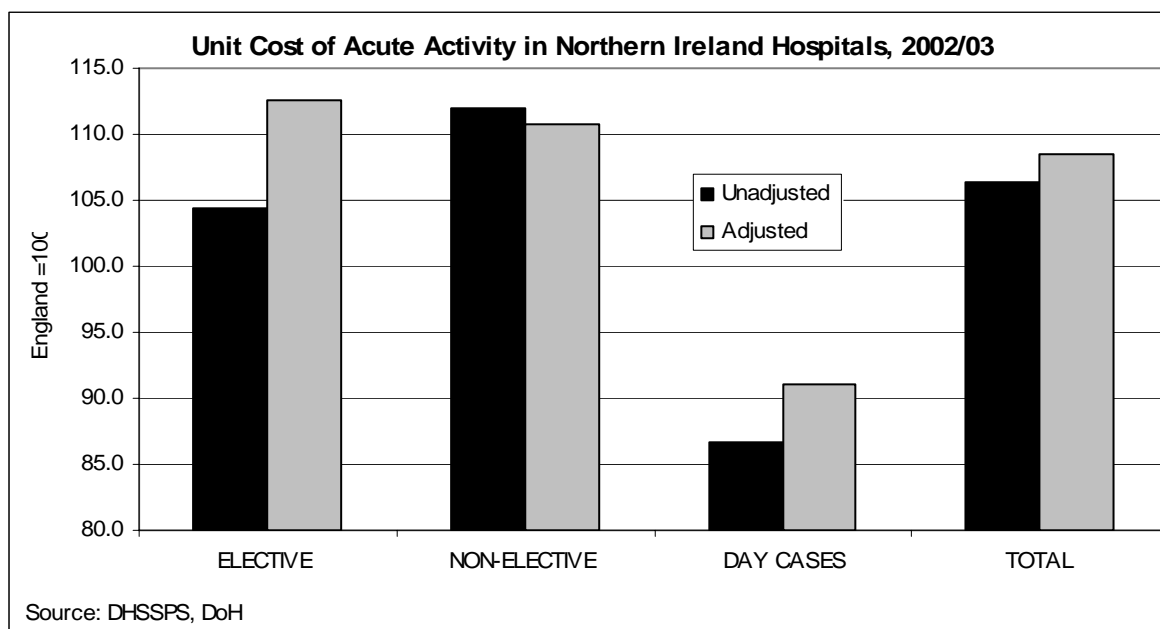
⁷⁵ Based on 9.4% of weighted activity divided by the weighting for inpatient activity (20.9)

⁷⁶ The unit cost data covers approximately £450m of the £708m acute budget in 2002/03. It is estimated that approximately £66m of the £450m could be saved if Northern Ireland matched the performance of England in terms of the HRGs where unit costs are currently lower in England. Whilst DHSSPS consider that only £25m could be saved this is on the basis that Northern Ireland matches England even in those areas where costs are currently higher ie unit costs would be allowed to fall which is clearly illogical.

higher than in England. However, given that the case mix in England tends to be distributed towards more expensive procedures, adjusting for case-mix results in unit costs being 9% higher in Northern Ireland compared with England⁷⁷.

There are significant variations within this overall figure. Day case unit costs are 9% lower than in England, while elective inpatient costs are 13% higher, with non-elective costs being similar. As the length of stay for elective procedures in Northern Ireland is 7% lower than in England (although later it will be shown that for all inpatient activity the length of stay is higher in Northern Ireland), this would indicate that per diem unit costs in Northern Ireland are even higher than this. In addition, in England unit costs are also adjusted when making comparisons between Trusts by a market forces factor to reflect differences in the underlying cost base of different areas. The lower level of costs in Northern Ireland would imply that unit costs are even further from the English than the figures above would suggest⁷⁸. DHSSPS have indicated that a significant element of the difference in unit costs is due to maternity provision which, the Department state, is of a higher standard in Northern Ireland than England.

Figure 3.66: 2002/03 Unit Costs in Northern Ireland Acute Sector (England =100)

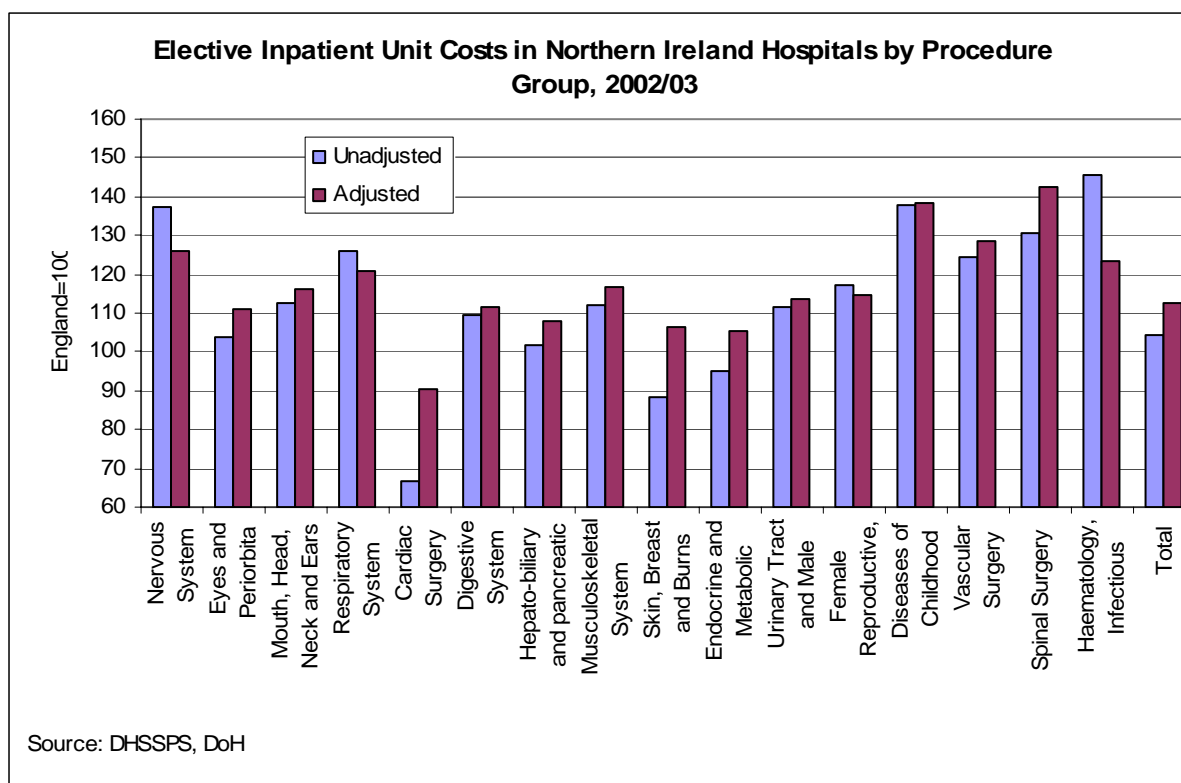


At a more disaggregated level, figure 3.67 shows average unit costs for Northern Ireland relative to the English average (=100) across groups of procedures. For nearly all groups, Northern Ireland has higher unit costs for elective procedures than England (with the exception of cardiac surgery, where unit costs are 9% lower). In contrast, spinal surgery costs are 42% higher in Northern Ireland than England.

⁷⁷ Adjusting for case mix involved weighting English unit cost data per procedure by the Northern Ireland distribution of FCE's between procedures.

⁷⁸ DHSSPS have indicated that some of the difference in unit costs is due to methodology rather than efficiency for example in respect of funding for older Specialist Registrar posts for junior doctors and the non exclusion of discrete coronary care units from NI HRGs.

Figure 3.67: Elective Inpatient unit costs are higher in Northern Ireland than England for most procedure groups, 2002/03

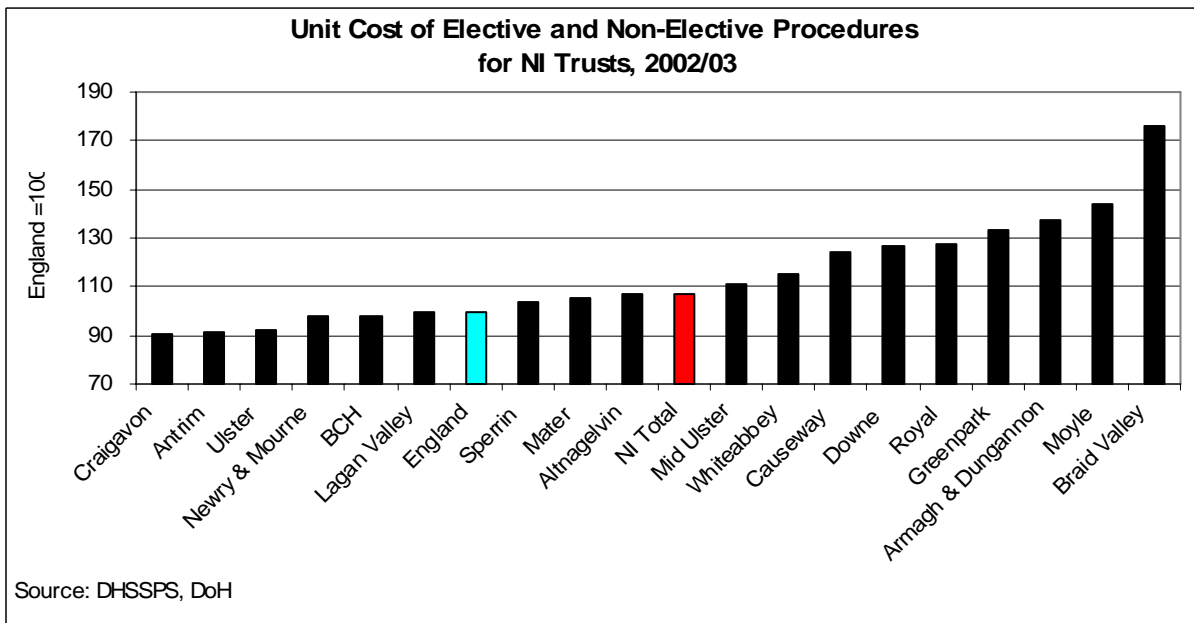


Within Northern Ireland there are also significant variations between trusts - but this appears to be mostly related to trust size. Figure 3.68 shows that there are a number of hospitals in Northern Ireland where the average unit cost of procedures is comparable to the average for England.

However, there are also trusts which have costs substantially higher than the Northern Ireland average. These tend to carry out only small amounts of acute activity. This corresponds to the view of some of the people we met who suggested that the continued provision of services in hospital below a certain scale was inefficient. However, given their relatively small scale, removing the three smallest Trusts⁷⁹ from the analysis only marginally reduces Northern Ireland's overall unit cost. In contrast, if the Royal Group of Hospitals and Greenpark Hospital Trust were excluded, this would be sufficient to remove the cost difference with England. DHSSPS have argued that these findings reflect those found elsewhere: that small and large hospitals tend to have higher unit costs. However, this begs the question of the appropriate size - both in efficiency and clinical terms - for Northern Ireland hospitals and the opportunity costs currently born as a result of maintaining the current configuration of hospitals.

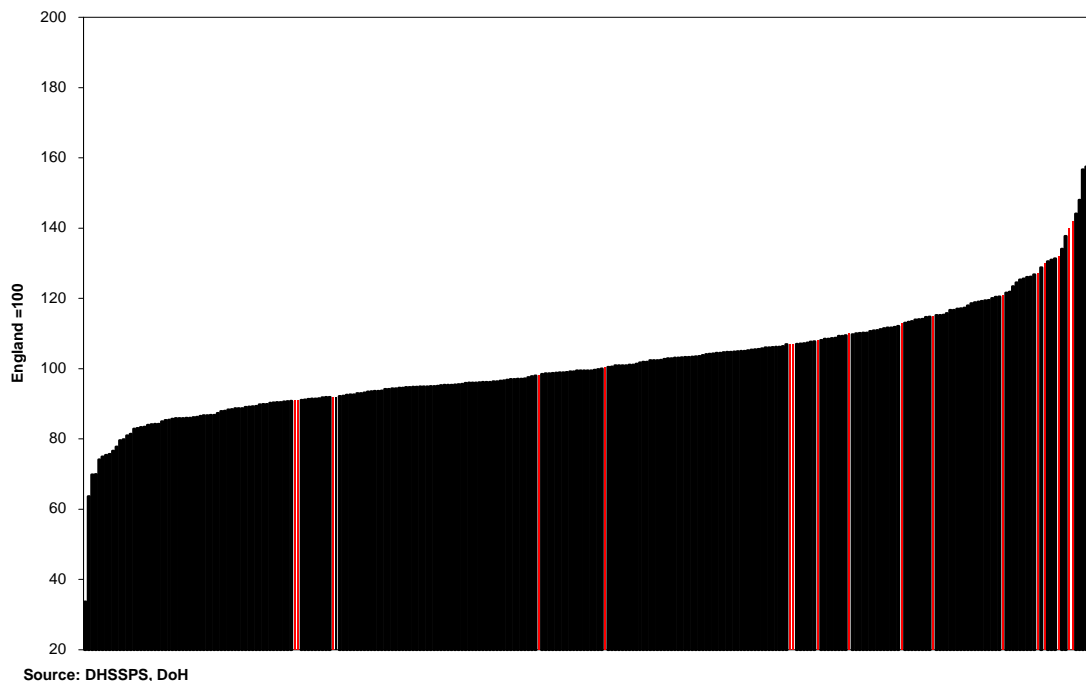
⁷⁹ Armagh & Dungannon, Braid and Moyle

Figure 3.68: The Unit Cost of Elective and Non-Elective Procedures for most Northern Ireland Acute Hospital Trusts is above the average for England, 2002/03



It is important to recognise that there is also significant variation in the unit cost of procedures for NHS trusts in England. Figure 3.69 highlights the performance of Northern Ireland acute trusts against the range of trusts in England. It can be seen that whilst a minority of Northern Ireland hospitals are below the English average, a majority are above - some in the top 10%.

Figure 3.69: Unit cost of procedures for Northern Ireland trusts compared to NHS Trusts in England, 2002/03



This section has shown that there are in general lower level of productivity and efficiency in hospitals in Northern Ireland than England although performance appears to be better than in Scotland and Wales. Section 3.83 will show that in recent years the level of activity has not risen to the same extent as staff in the

HCHS sector throughout the UK countries. There is therefore clear scope for efficiency gains if the performance in England could be matched particularly if reforms in England, such as payment by results, return productivity to the levels seen in the late 1990's. Whilst policy makers in Northern Ireland may decide that the required adjustments to the system here are not appropriate, for example reduced level of service for rural communities, the opportunity cost of such decisions need to be recognised.

Recommendation 13: Investigate ways to reduce unit cost variations through incentive mechanisms such as tariff-based activity payment/budget setting systems

Recommendation 14: Further investigation is needed to explore possible reasons for high unit costs at the Royal and Green Park Trusts.

3.7.3 Theatre Usage

A key resource within hospitals is operating theatres. A recent report from the Northern Ireland Audit Office⁸⁰ indicated that there was significant unused capacity in the system given that theatres were only intended for use (that is, available) 63% of the available time. DHSSPS have argued that because of the need to have theatres dedicated to particular specialties a better indicator is the proportion of *planned* hours that were used, and that on this measure the 2002 Healthcare Commission Acute Hospital Portfolio illustrated that the mean across Northern Ireland was 74% compared to 73% across English and Welsh trusts.

In addition, whilst the overall cancellation rate of 6.4% was within the benchmark target of 10%, there were significant variations between individual specialties. In particular, the cancellation rate for cardiac surgery was 36% whilst that for plastic surgery was 9% (2001/02 data)⁸¹.

Over the past two years there has been general progress in this area, with a 6% increase in intended theatre sessions and a fall in the cancellation rate to 5% (although this still means that theatres are only used for 68% of the time). There has been progress too in reducing the cardiac surgery cancellation rate - now down to 24%. However, this appears to have been achieved largely by cutting the number of intended sessions by more than half⁸². In addition, cancellation rates for plastic surgery have increased to 32% whilst those for thoracic surgery have increased from 3% to 16% over the period.

3.7.4 Day case work

Where appropriate in terms of medical technology and patients' health status, many operations once requiring overnight stays in hospital as an inpatient are now carried out as day cases. This is not only a more efficient use of scarce hospital resources,

⁸⁰ *The Use of Operating Theatres in the Northern Ireland Health and Personal Social Services*, NIAO, 2003

⁸¹ A higher cancellation rate is to be expected for cardiac surgery due to the dependence on patients' fitness for surgery.

⁸² DHSSPS have indicated that this was due to changes in cardiac procedure casemix, with less invasive procedures now available and only the more complicated cases resulting in operations.

but better for patients. As a result, rates of day case work have generally been increasing in all health care systems.

A 2001/02 DHSPSS commissioned report into value for money aspects of day case work in Northern Ireland⁸³ found that compared with England, a higher proportion of day case activity in Northern Ireland was *inappropriate* in terms of, for example, minor procedures that should be carried out in treatment rooms or outpatient departments. At the same time, too many patients were being treated as in-patients when treatment as a day case would have been more appropriate. Out of eighteen procedures investigated, there were only five for which Northern Ireland hospitals had the same or higher rates than in England and Wales. In addition, whilst the level of throughput per staff member was higher in Northern Ireland, at 6.5%, the rate of non-attendance was significantly higher.

In terms of more recent performance, figure 3.70 shows that day cases account for 66% of elective day and inpatient activity in Northern Ireland compared to 65% for the UK as a whole - although there does not appear to be significant variation across UK regions, with the exception of Wales.

Figure 3.70: Northern Ireland has the sixth highest day case rate of UK Regions, 2002/03

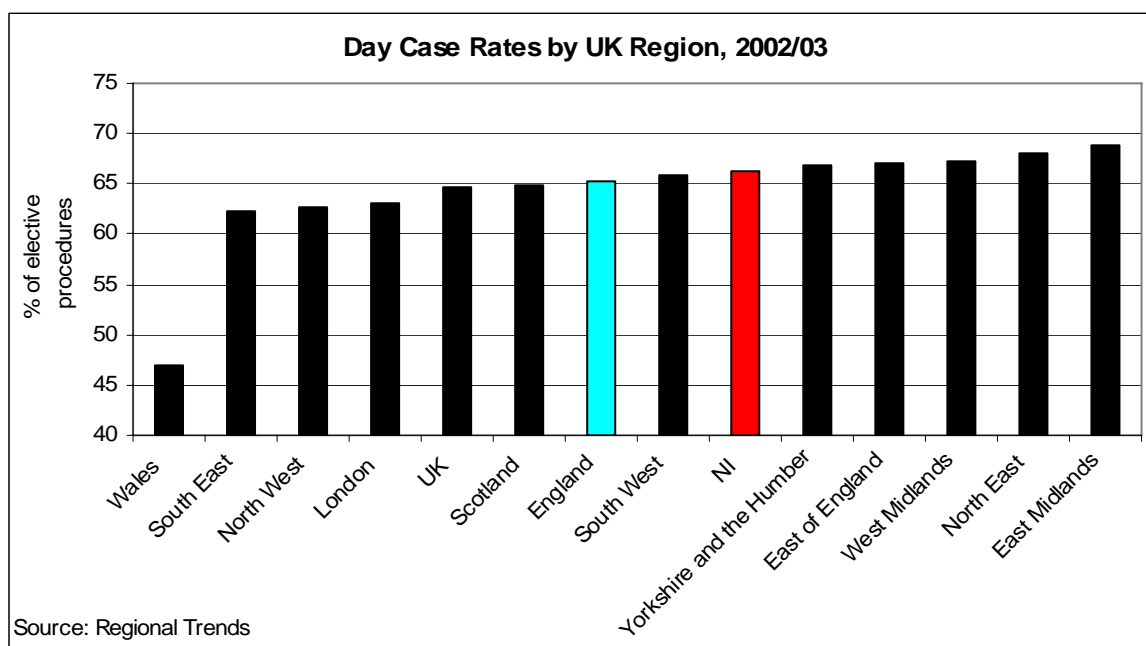
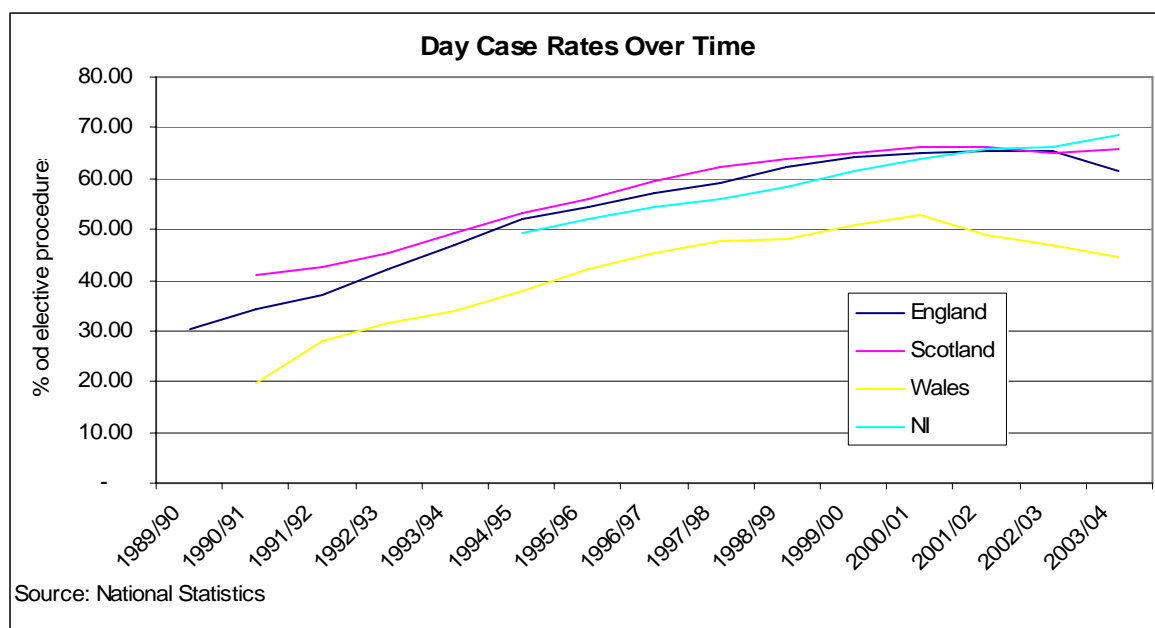


Figure 3.71 shows that there has been a significant increase in the day case rate across the UK in the past decade.

⁸³ *Day Surgery in Northern Ireland*, Regional Summary of Acute Hospital Portfolio, DHSSPS (October 2003)

Figure 3.71: Northern Ireland, England and Scotland have experienced broadly similar upward trends in day case rates.



However, day case rates in Scotland and England appear to have reached a plateau in recent years, although the fall in the English day case rate in 2003/04 was due to a substantial increase in elective inpatient activity⁸⁴. In Northern Ireland, which previously had lower day case rates than in England and Scotland, the upward trend has continued although this has been due to a fall in elective inpatient activity. Wales is the clear outlier in terms of day case rates although it is not clear whether this reflects differences in activity or data collection.

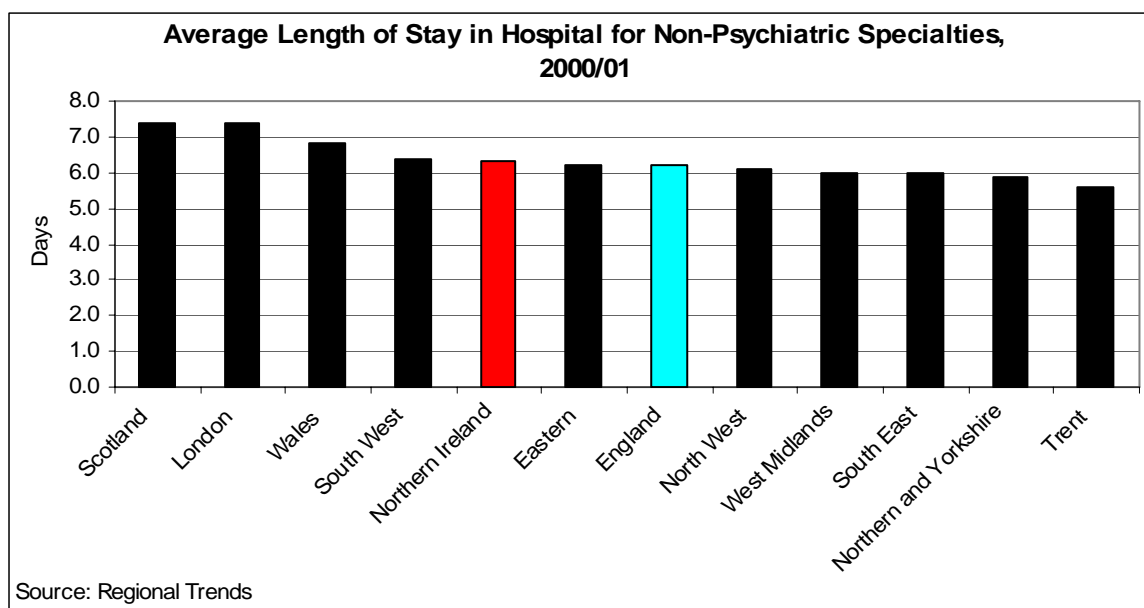
3.7.5 Length of Stay

Reductions in length of stay have been a long term trend across all health care systems and have been one of the main sources of improvement in efficiency and productivity. Length of stay is clearly important in terms of efficiency as the longer a person stays in hospital, the greater the cost.

The 2002 NEE recognised that the average length of stay in Northern Ireland hospitals was slightly longer than in comparative regions although this was in part explained by differences in measurement and policy. Figure 3.72 shows that although the average length of stay is higher in Northern Ireland than in England, it is lower than in Scotland and Wales.

⁸⁴ The increase in elective inpatient activity of 37.1% recorded for 2003/04 is higher than that which would be reasonably expected. It has however not been possible to obtain a definitive explanation for the increase.

Figure 3.72: Average Length of Stay in Hospital for Non-Psychiatric Specialties (Mean Days), 2000-01



More recently, figure 3.73 compares the average length of stay in Northern Ireland with England for a range of specialties. Whilst the average length of stay of stay in Northern Ireland is 6% greater than in England it can be seen that there are significant variations between specialties. For example, for general medicine and general surgery, which together account for over a third of the deaths and discharges, Northern Ireland has a lower length of stay than England. In addition, geriatric medicine, in which the average length of stay is 32.3 days in Northern Ireland compared to 21.9 days in England, accounts for almost all the variation between the countries⁸⁵.

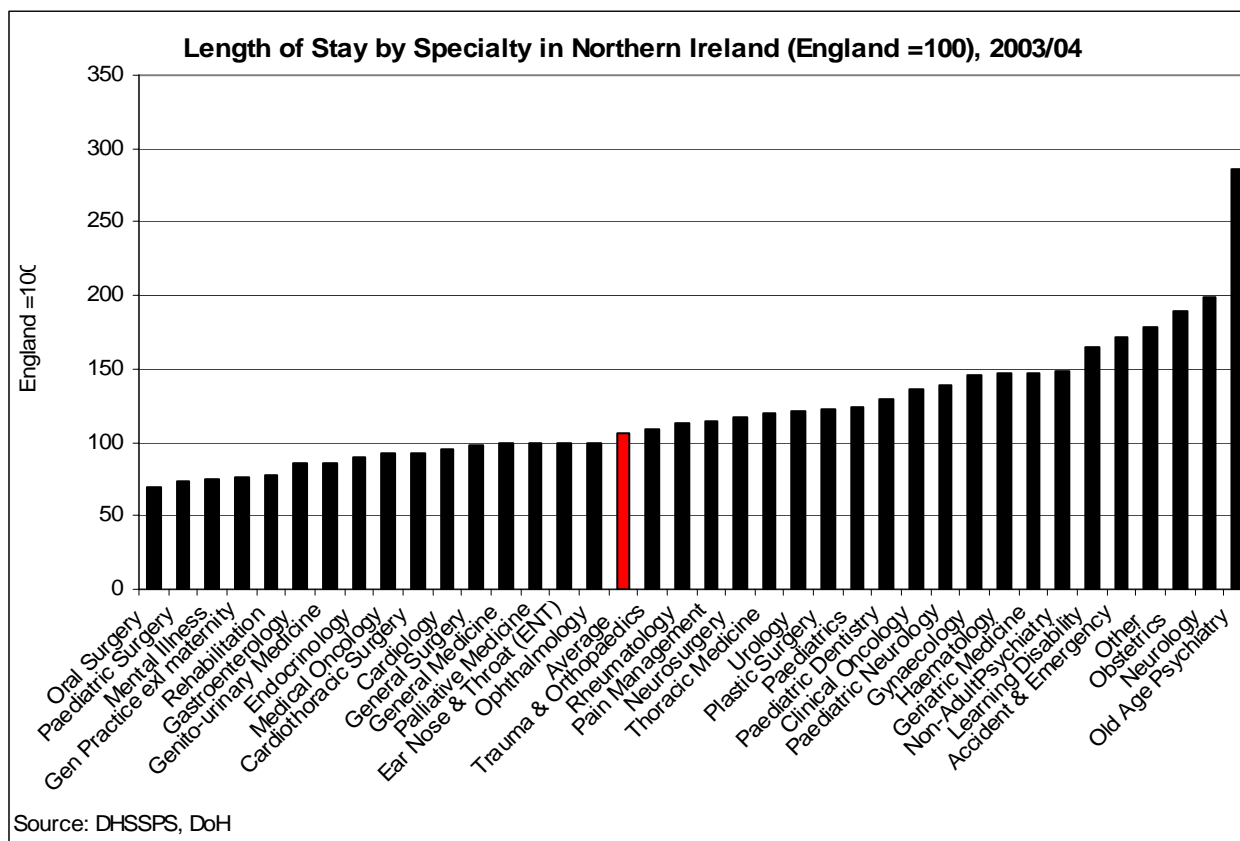
Overall, the average length of stay for treatment in Northern Ireland hospitals has fallen from 9.4 days in 1995/96 to 7.8 days in 2003/04. However, most of the decline occurred between 1995/96 and 1998/99, since when the average length of stay has remained broadly stable Whilst the average length of stay has fallen for all Programmes of Care over the past decade, figure 3.74 shows that the largest falls have been in Mental Health and Learning Disability.

A key factor determining length of stay is bed management. This issue was considered as part of the 2002 Acute Hospital Portfolio analysis⁸⁶. It was found that a higher proportion of beds in Northern Ireland than England were occupied by patients who should have been in a different type of bed representing an inefficient use of resources as well as reducing quality of care.

⁸⁵ If the Geriatric Medicine Inpatient specialty in NI Trusts had the same level of length of stay as in England, this would reduce the average length of stay to 7.7, slightly above the 7.6 figure for England.

⁸⁶ Acute Hospital Portfolio Year 3 Draft Regional Report, DHSSPS

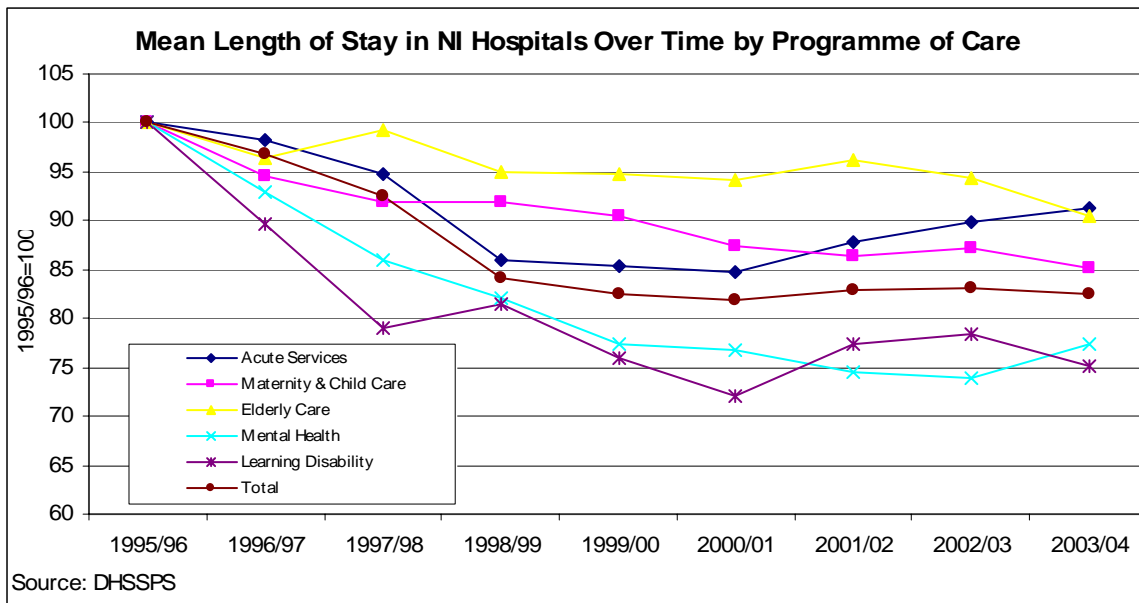
Figure 3.73: Mean Length of Stay by Specialty in Northern Ireland (England=100), 2003/04



Overall, there is scope for reductions in the average length of stay in Northern Ireland. If the average length of stay in England from figure 3.73 was matched in Northern Ireland this would potentially free up bed capacity to treat an additional 18,000 inpatients or perhaps more appropriately 700 more Geriatric medicine patients given that this appears to be the main cause of the differential⁸⁷. It should be noted that the 2005/06 Priorities for Action contains a target that the average length of stay for patients should be reduced by 5% in 2005/06 and a further 5% in 2006/07 compared to 2004/05 levels.

⁸⁷ Calculated as current number of NI deaths and discharges minus NI occupied beds divided by length of stay in England.

Figure 3.74: Length of Stay in Northern Ireland Trusts has fallen across all by Programmes of Care.



Recommendation 15: Investigate scope for further reductions in length of stay and avoidance of admission to hospital

Recommendation 16: Aim in medium term to use outcome-based productivity measures.