A level playing field?

A discussion document for PCT's exploring the implications of how events get counted at acute trusts

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Aim

This document aims to explore the impact of differences in the way which acute hospitals count activity on the PBR cost borne by different PCT's.

It also gives a series of potential actions which could act to standardise the approach between PCT's and gives examples of various tools needed for this task.

The Data Dictionary

The NHS Data Dictionary is supposedly the reference point for all data definitions. Its role as a global reference source has however fallen behind the pace of change seen in the use of HRGs within a PBR environment.

Many definitions are vague and lack qualifying statements. For example, the data dictionary appears to allow a person who is an inpatient to attend an outpatient appointment. What the data dictionary omits to say is that such activities only apply to Mental Health and Learning Disability and are almost never allowable for an admission to an acute hospital. How many PCT's run a routine data check to see if this loophole is being exploited? Another example is that it is virtually impossible to use the data dictionary to define those activities which are a genuine inpatient admission with the classification of 'day case'.

In addition technical guidance relating to PBR given to finance departments may not be passed on to information departments for them to incorporate what amounts to qualifying statements to the definition given in the data dictionary. Likewise other DH documents will occasionally contain similar qualifying statements. The data dictionary is in urgent need for a radical update which includes all such qualifying statements in the context of the definition.

By default acute and PCT providers have been largely left to arrive at their own interpretation of the 'rules' leading to potential inconsistency in how the same treatment is both counted and costed.

Elective Activity

In an effort to correct this limitation the NHS in Wales commissioned a review of day case activity which concluded that 30% of all activity reported as a day case did not meet the true definition of a day case. A specification was given for around 60 OPCS primary procedure codes and one ICD 10 diagnosis which were excluded from 'inpatient' activity on the PEDW data base (the Welsh equivalent to HES) as they were considered to be 'outpatient' activities (1). This list is given in Table One at three digit level. Applying this list to 2004/05 HES data for England gave around 40% of reported 'day case' activity which could be regarded as outpatient procedures.

The key point to note is the huge volume of outpatient work which is reported as a 'day case' with potential for underlying inconsistency from one hospital to the next – a by-product of vague data definitions.

While various endoscopic procedures make up a large proportion of this activity base the argument is not whether they are a day case but that no one has specified their class and so one provider charges as an inpatient while another charges as an outpatient. In the longer term the HRG tariff aims to charge all procedures irrespective of setting at the same price, however, in the interim PCT's may experience real cost differences.

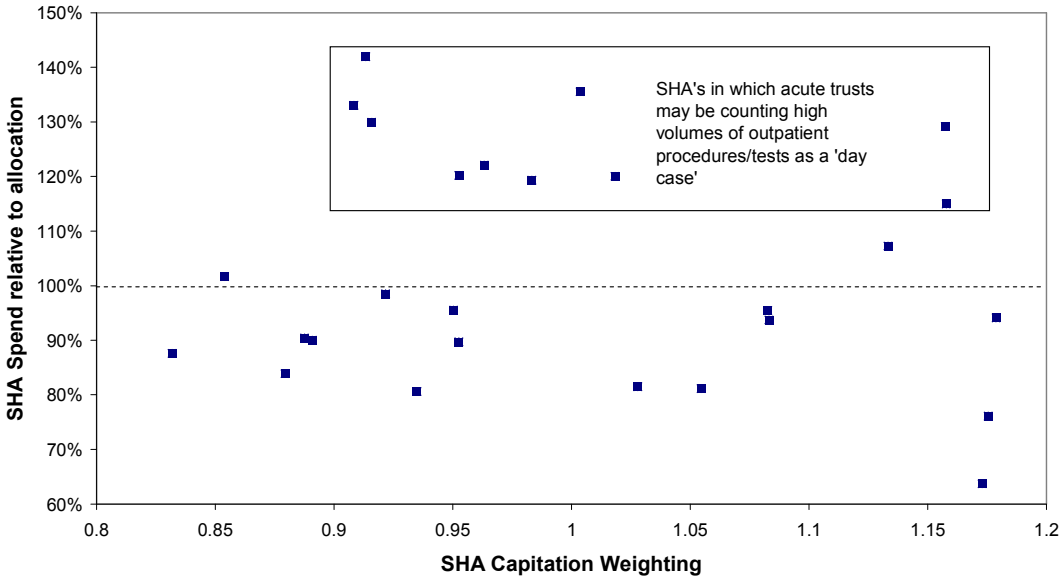
Table One: OPCS Procedure codes occurring as a single primary procedure which were considered to be outpatient procedures (1).

Activity	OPCS primary procedure (3digit level)
EEG & other tests	A84
Fine needle biopsy of breast & other	B37
Suture of eyelid	C17
Removal of foreign body from cornea	C48
Removal of foreign body from eye	C86
Plastic ear fitting	D03
Surgical arrest of nose bleed	E05
Packing of nose	E06
Suture of lip	F05
Simple dental extraction	F10
pH Manometry	G21
Diagnostic endoscopies	G16, G19, G45, G55, G65, G80, H22, H25
Diagnostic rigid sigmoidoscopy	H28
Bowel washout	H62
TOE/ECG/Stress Test	K66
Other open operations on vein	L93
Needle biopsy of prostate	M70
Fertility Investigation	N34
Episiotomy	P14
Colposcopy	P27
Destruction of lesion of cervix	Q02
Biopsy of cervix uteri	Q03
IVF	Q13
Cervical smears/ introduction of IUCD	Q12, Q55
Amniocentesis	R10
Other excision of skin	S06
Minor Warts /Curettage of lesion of skin	S08
Photo destruction of lesion	S09
Other destruction of lesion of skin	S11
Shave biopsy of skin	S14
Simple Removal of Sutures	S43
Removal of foreign body from skin	S45
Introduction of substance into skin	S52
Simple dressing to head and neck	S56
Exploration of other skin of other site	S57
Injection into Joint	W90
Subcutaneous injection	X30, X31, X37, X38
Other blood transfusion	X33
Intravenous Chemotherapy	X35
Simple blood withdrawal	X36
Renal Dialysis	X40
CAPD	X41
Plaster cast removal	X48
Other immobilisation	X49
Removal of foreign body from organ	Y29
Acupuncture	Y33

In England any such approach to categorise procedures received scant attention due to the 75% raw day case target. This target only fuelled the impetus for acute and PCT providers to classify more and more outpatient type work as a day case. Indeed a review of HES data for England shows that the growth in raw ‘day case’ activity between 1999/00 and 2004/05 was largely due to additional activity reported in the non-surgical specialties, i.e. those specialties where particular outpatient procedure can be re-classified as a day case. Fortunately common sense has now prevailed and the definition has been shifted to 75% of the activity within the Audit Commission basket of ‘surgical’ procedures.

However the legacy remains and PCT's are now left with the situation where there is extreme variability in the recording of 'day case' activities. Figure One illustrates the enormity of the problem even when the numbers are aggregated at SHA level. After adjusting for the effect of size it emerges that PCT's in Trent are paying for 200,000 more so-called 'day case' admissions per annum than their equivalents in North Central London. Why should PCT's in Trent and elsewhere have to pay for these additional elective admissions at the inpatient tariff rather than the outpatient price?

Figure One: Potential PbR spend on 'day case' activity[1]. Data is for 2004/05.



The move to combine day case & overnight activity into a single HRG tariff has complicated the issue exceedingly. To be fair some HRG which describe clearly defined major surgical procedures such as joint replacement, cataract surgery, hernia repair, etc are immune to such 'counting' problems; however, it is in the other HRG that serious problems lie.

In the absence of a national definition for activities which are not day case (as in Table One) such differences are easily implemented due to the ambiguity in the recording of what happens, its consequent impact on clinical coding and the flow of this into a HRG. Having decided that a procedure, test or similar attendance will be called a 'day case' the procedure/test is then given an ICD diagnosis and the nearest fit (sometimes not the best fit) to an OPCS procedure/test code. The HRG grouper then automatically assigns this to a HRG. Indeed it is also possible to have a 'day case' with no procedure such as in HRG S22 (planned procedures not carried out).

Detailed research appears to show that some 25% of HRG (encompassing 67% of the elective volume in England) are subject to local counting issues either due to regular day attenders being incorrectly reported as a 'day case' or to outpatient procedures/tests, injections, etc reported as a 'day case'.

[1] Specialty average prices were calculated using national data and were applied to specialty level activity data at SHA level.

Emergency Activity

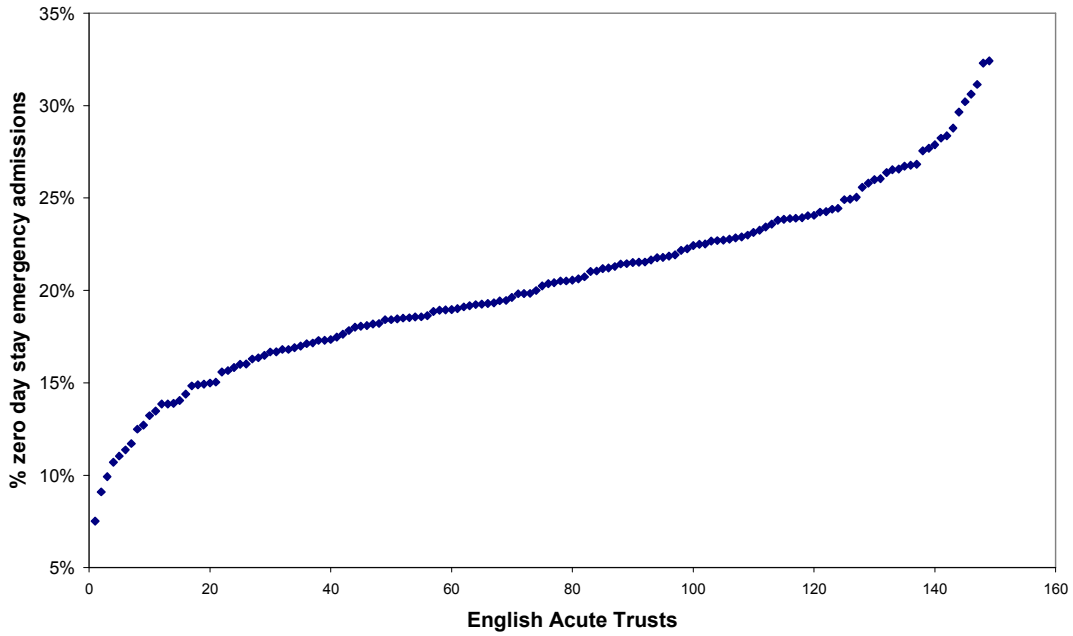
At first glance it would appear that emergency admissions escape such problems, however, the A&E four hour target and the trend toward assessment units has led to high growth in the volume of zero day stay 'emergency' admissions. In fact in recent years it is the zero day stay emergency admissions which account for almost all of the apparent growth in the volume of total emergency admissions.

Analysis of the national trend in emergency admissions shows that the growth is made up of step changes in reporting at individual provider hospitals, i.e. the process of recording an emergency admission is changed such that there is a step increase in apparent volume and the magnitude of this step increase is almost exclusively zero day stay activity. This zero day stay activity largely occurs in assessment units and in terms of real cost may be closer to what would otherwise be called an 'immediate' outpatient assessment or an A&E attendance.

The current short stay emergency tariff appears to grossly over-remunerate this work because the short stay tariff covers both 0 and 1 day stays and does not cover all HRG.

Once again the key point is that there is high variability between acute trusts in how these otherwise outpatient/A&E activities are reported. Figure Two illustrates the extent of this problem where on a like for like basis the PCT's utilising the two acute providers at the top and bottom end of the range could be paying for an incredible 25% differential in the volume of so-called 'emergency' admissions.

Figure Two: Range in the proportion of total emergency volume which is reported as a zero day stay for English acute hospitals. Data is for 2004/05 and excludes mental health and specialist hospitals.



Such activities have a significant effect on the perceived length of stay (LOS) efficiency of acute trusts. For example, at the one acute hospital the real average LOS for COPD admissions (as defined by ICD-10 codes J40 to J44) was shifted from 8.7 days to 7.8 days following the opening of a medical assessment unit. In this instance the hospital in question had 240% higher volumes of zero day stay emergency admissions than neighbouring hospitals. These were sufficient to explain the apparent 10% improvement in LOS efficiency.

Wider Implications

There are wider implications of these discrepancies in recording to the national average price for particular HRG and the apparent Reference Cost Index for acute trusts. These will now be discussed in turn.

National Average Price

Prior to the 2005/06 financial year procedures were paid at the separate overnight and day case tariff. However in a move designed to increase perceived lower efficiency in some Trusts the HRG tariff for 05/06 onward is a single price covering both overnight and day case treatments for the same HRG. Under payment by results (PbR) this has two effects:

1. The national average price for particular HRGs is depressed by the inclusion of potentially large volumes of lower value 'outpatient-type' procedures counted at some hospitals.
2. Those organisations who adopt this practice make large windfall gains since they are paid for a relatively inexpensive outpatient procedure/test at the price of genuine inpatient treatment (overnight plus day case average price).

The evidence suggests that particular providers may be given an unfair financial advantage while purchasers using these organisations may likewise be receiving poor value for money. Calculations show that for a single HRG an acute Trust (in an extreme case) can make a windfall gain of up to £1M per annum!

Reference Cost Index

The inpatient reference cost index is the cost of running the inpatient activities of a hospital divided by the total inpatient activity. The apparent reference cost is open to bias if a particular organisation counts a large portion of A&E or outpatient activities as an 'inpatient' activity. In this instance the higher cost inpatient activities are diluted with lower cost A&E and outpatient activities to give the appearance of a favourable reference cost index.

Figure Three: Elective and non-elective reference costs for English acute trusts after adjusting for the market forces factor. Data is for 2005/06.

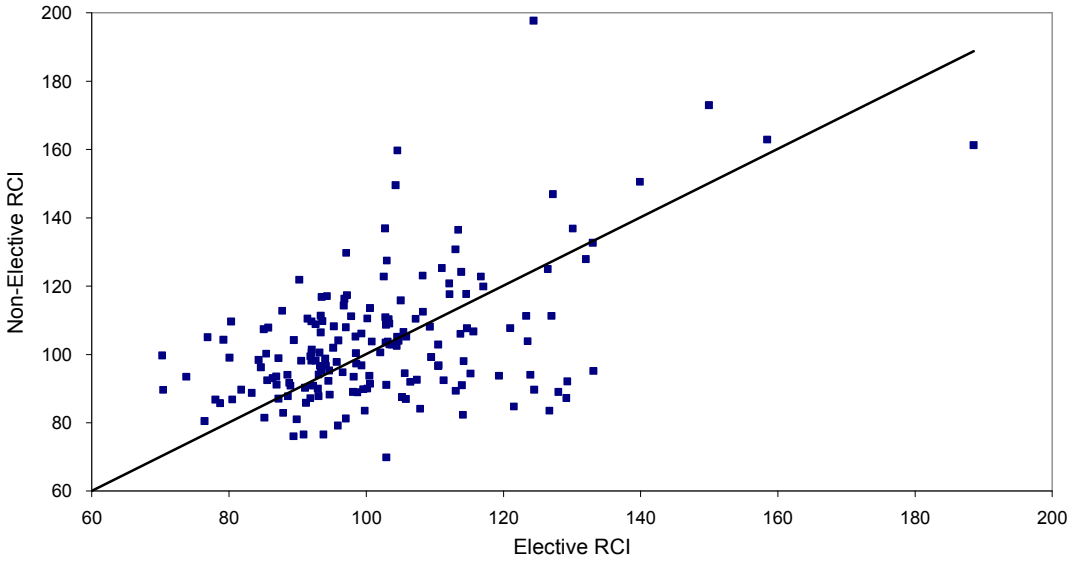


Figure Three shows the wide variation between elective and non-elective reference costs at different acute trusts. We need to ask a fundamental question. Given that both elective and

non-elective activities are occurring within the same organisation with the same set of supporting service activities, i.e. pathology, sterile services, linen, cleaning, heating, etc and with the same nursing, medical & management staff why is there such huge variation in the two dimensions? Logic suggests that the data should be far closer to the 1:1 relationship than is the case. Is it possible that the way things get counted is contributing to the huge range seen in the reference costs?

Some 35 acute trusts have an elective reference cost index below 90% of national average, another 32 are below 90% for non-elective admissions and 32 are below 90% for other (mainly maternity) admissions. Eleven Trusts are below 90% for both elective and non-elective admissions while 7 are below 90% for elective, non-elective and other admissions. PCT's will need to discern if these organisations have a low reference cost index due to counting issues rather than genuine efficiency.

Tools to aid PCT's

Having discerned that there may be a fundamental issue we now need to address the problem with workable solutions.

Table One represents a good starting point to challenge the activities reported by acute trusts. Table One is not an exhaustive reference source since there are a range of additional OPCS procedures which can be both inpatient and outpatient. For example, some types of laser iridotomy are outpatient as are some types of nasopharingoscopy.

Another useful tool is to look at the share of the national day case volume held by a particular organisation. For inpatient activities the expected share can be calculated based on their relative volume of non-zero day stay activity (elective + emergency). For example, in 2003/04 two PCT's acting as providers with less than a 0.1% share of national volume held a 7% share of the national volume of day case foot procedures in HRG H12. To achieve this remarkable feat these provider PCT's were probably miscoding a large volume of outpatient podiatry – which will have fed into the national average price for that HRG!

Another acute hospital (2003/04 data) with around 0.6% share of national volume based on its relative size had a 9.5% share of the national volume of HRG B32 (Non surgical Ophthalmology with los <2 days). This same hospital had a 3.6% share of B15, 3.5% share of B26 and a 5.5% share of B29. Their share for all other Ophthalmology HRGs was much closer to the 0.6% value expected from their relative size. There appears to have been the potential for charging local PCT's for up to 2,000 outpatient procedures per annum as 'inpatient' admissions.

Another approach is to look at the percentage day case for each HRG at a local level and compare this to the relevant national HES value. This can be done at both OPCS and HRG level. After adjusting for genuine surgical day case rates any activity above the national average where a 'minor' procedure is implicated can be re-valued at the appropriate outpatient price.

For each HRG there is a national average case-mix for the composite OPCS or ICD codes making up the HRG. Hence if a particular provider has a HRG case mix which is skewed to a particular 'minor' procedure then it is highly likely that they are coding some form of outpatient activity as an 'inpatient'. Such a tool is not currently available and would require significant input from the National Case Mix Team. If desperately needed for a limited range of HRG a PCT can obtain an approximate answer using HES data.

Another useful test is to define those HRG where day case activity is highly unlikely to occur. These HRG describe events which are complex surgical or medical events. Some 340 HRG can be identified where activity reported as a DC can be questioned.

For zero day stay emergency admissions the definitive reference source is the base HES data for the current HRG prices. Hence 2006/06 prices are based on 2004/05 data. For each HRG the reference point is the national average of zero day stays in that HRG. Table Two gives an example for the HRG in chapter A. For example, if a local acute hospital had 40% of emergency admissions for HRG A11 (muscular disorders) as a zero day stay the PCT would be justified in proposing that 9% be paid at the short stay tariff and the remaining 31% be paid at the A&E or outpatient first attendance tariff, i.e. as an urgent (but unscheduled) outpatient assessment..

In practice there is considerable small number fluctuation in the local percentage values and for this reason the deviations need to be netted off after converting to price.

Table Two: National average zero day stay emergency admissions in 2004/05.

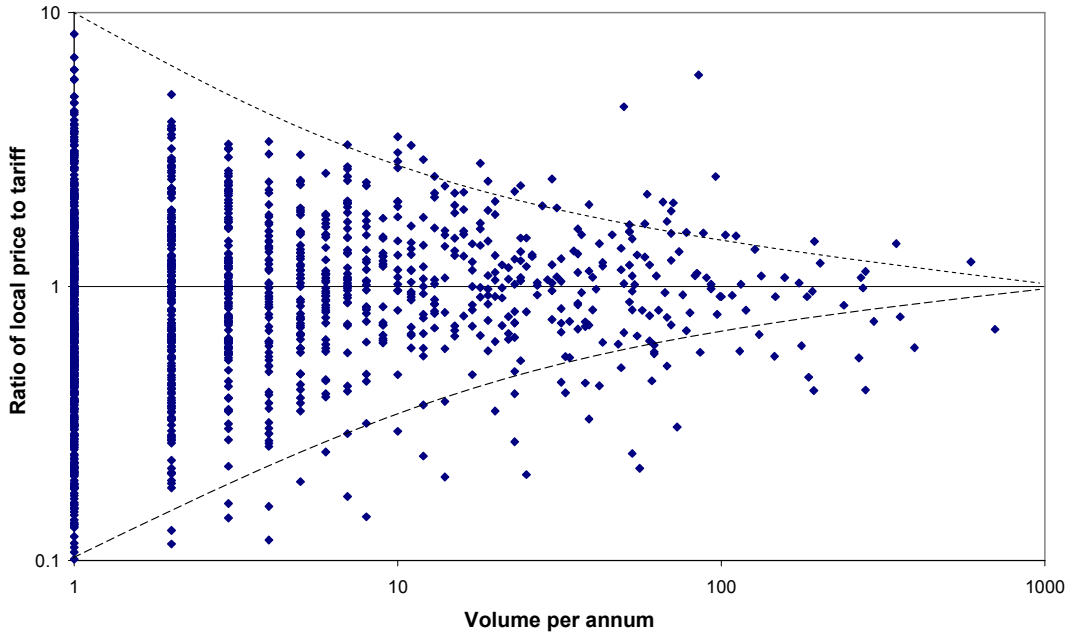
HRG	HRG Description	% zero day stay
A01	Intracranial Procedures Except Trauma - Category 1	4%
A02	Intracranial Procedures Except Trauma - Category 2	2%
A03	Intracranial Procedures Except Trauma - Category 3	1%
A04	Intracranial Procedures Except Trauma - Category 4	0%
A05	Intracranial Procedures for Trauma w cc	1%
A06	Intracranial Procedures for Trauma w/o cc	1%
A07	Intermediate Pain Procedures	60%
A08	Percutaneous Image Controlled Pain Procedures	17%
A09	Peripheral Nerve Disorder w cc	12%
A10	Peripheral Nerve Disorder w/o cc	30%
A11	Muscular Disorders	9%
A12	Disorder of Balance aetiology unknown w cc	11%
A13	Disorder of Balance aetiology unknown w/o cc	27%
A14	Brain Tumours or Cerebral Cysts >69 or w cc	3%
A15	Brain Tumours or Cerebral Cysts <70 w/o cc	9%
A16	Cerebral Degenerations >69 or w cc	7%
A17	Cerebral Degenerations <70 w/o cc	28%
A18	Multiple Sclerosis or other CNS Demyelinating Conditions	12%
A19	Haemorrhagic Cerebrovascular Disorders	13%
A20	Transient Ischaemic Attack >69 or w cc	14%
A21	Transient Ischaemic Attack <70 w/o cc	24%
A22	Non-Transient Stroke or Cerebrovascular Accident >69 or w cc	3%
A23	Non-Transient Stroke or Cerebrovascular Accident <70 w/o cc	5%
A24	Cranial Nerve Disorders	27%
A25	Nervous System Infections	5%
A26	Encephalopathy	22%
A27	Headache or Migraine >69 or w cc	19%
A28	Headache or Migraine <70 w/o cc	33%
A29	Epilepsy >69 or w cc	11%
A30	Epilepsy <70 w/o cc	24%
A31	Head Injury with Brain Injury	20%
A32	Head Injury without Significant Brain Injury w cc	7%
A33	Head Injury without Significant Brain Injury w/o cc	17%
A34	Miscellaneous Disorders of Nervous System	14%
A37	Motor Neuron Disease	7%
A38	Alzheimers Disease	6%
A98	Neoplasms, etc	22%
A99	Complex Elderly with a Nervous System Primary Diagnosis	3%

Another very useful test is to look at the monthly time trend for zero day stay elective or emergency activity assigned to a particular HRG. Changes in counting will show up as a step change. The organisational issues behind this step change can then be investigated. Experience shows that the bulk of such steps are due to counting rather than coding issues. A step increase in the count leads to a step increase in costs which carries on into the indefinite future!

One final test is to look at the local HRG price and compare this to the national average (2). One would anticipate that if a large volume of outpatient type activities were being counted as 'inpatient' then the local price should be depressed below the national average. An example of this approach is given in Figure Four where the relative cost is on the Y-axis and the annual volume for each HRG is given on the X-axis. As can be seen such an approach reveals that there is considerable ambiguity in the local price. This ambiguity arises as a consequence of the fact that the volume of activity for most HRG is small and this creates unavoidable errors in the apportionment of costs and overheads due to what is known as sampling error, i.e. at a local level the cost per patient is a sample of the larger national cost distribution implied for each HRG. These errors interact with all other HRG. The dotted lines have been added in an attempt to delineate the region outside of which the variance is extreme. Figure three also explains why it is so difficult to derive a stable national average price in many HRG.

On this basis the local PCT's could investigate the basis for counting in12 HRG with an annual volume greater than 100 where the local cost is lower than expected. There is little point questioning HRG with a volume lower than 100 per annum simply because the financial effect is far smaller and it becomes increasingly difficult to discern the true cause of the deviation since one or two atypical patients can act to skew the local price.

Figure Four: Comparison of local elective HRG costs to the national tariff for an acute provider. In this example data is from 2002/03.



In this example the acute trust should go back and check the cluster of very high prices seen in some of the low volume HRG since the local price was effectively contributing to an elevation in the national average price for these HRG – the sort of check which should be done before submitting the data.

It is also interesting to note that in this example one of the HRG with a very low local price was for cataract surgery. The low price arose from an error in the allocation of overhead costs which may partly explain some of the higher prices elsewhere.

This particular method could be more widely applied by investigating particular acute Trusts with a very low apparent inpatient reference cost index. It is difficult to imagine how any acute provider could have genuine inpatient costs which are 10% to 15% below the national average – the implied efficiency gap across all specialties is simply too good to be true.

Do we need rules or principles?

The approach which seems to be favoured at the moment is for guidelines based on principles. This approach has certain merits although the key principle appears to have never been explicitly stated.

This principle is one regarding consistency to the national average. Because of the way in which the national tariff works there is the un-stated assumption that all Trusts are near to the national average in terms of data reporting and practice. Hence the principle should be directly stated that any trust which sufficiently deviates from the national average can be questioned regarding its practice and counting. Hence deviation from the norm giving rise to a material financial effect in the tests outlined above is sufficient justification for action on behalf of a PCT.

Having discussed various pragmatic solutions there is still a fundamental need for a reference source which specifies in greater detail how acute trusts can count activity and under what basis a PCT is justified in requesting that the acute provider (many of whom are now foundation trusts) be forced to change the way it counts. This is needed in order to correct the potential anomalies in both the HRG price and reference cost index which such activities may be contributing.

An approach similar to Table One has many merits since it unambiguously defines which procedures shall be regarded as outpatient procedures and prevents the dilution of genuine inpatient activities. Table one needs further refinement at the 4 digit level and is probably just the tip of the iceberg since up to 150 elective HRG appear to be susceptible to such anomalies; occurring at individual providers.

In conclusion, there appears to be sufficient evidence to suggest that the way acute trusts count activities as an ‘inpatient’ admission is sufficient to cause appreciable differences in the cost base of particular PCT’s. The NHS Data Dictionary needs to be updated in such a way that the PBR implication of how things get counted is clearly reflected in the individual definitions. Any document released as part of PBR or by the DH should be checked for any implications to the Data Dictionary. In the interim PCT’s need to run a variety of tests to determine which HRG at particular acute trusts are leading to inappropriate local costs. Indeed there appears to be a wider role for the Audit Commission as an impartial scrutinizer of how providers count ‘inpatient’ activity.

Acknowledgements

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References

1. NHS WALES (2002) Specification for the historic revision of day case activity records currently held on the PEDW/APC national database. Version 8.2, May.
2. Jones R (2004) Financial risk in healthcare provision and contracts. Crystal Ball User Conference. http://www.crystalball.com/cbuc/2004/papers/CBUC04-Jones.pdf

Healthcare Analysis & Forecasting has developed the following tools & models:

- Statistical tests to detect counting anomalies at acute trusts.
- Geo-demographic methods for estimating the expected volume of each HRG given the local age profile, IMD, ethnicity and student population in the catchment area of an acute Trust or in any other defined geographic area such as a PCT.
- Actuarial methods for characterising financial risk due to the natural variation in demand, hence, the size of risk pools, contingency allowances, etc.
- Pattern recognition methods for forecasting year end out-turn from mid-year activity and cost along with associated confidence intervals.