Prescribing Measures

and their application

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Seventh edition

March 2012

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Introduction

Prescribing and Primary Care Services is part of the Health and Social Care Information Centre (HSCIC) based in Leeds. In addition to work on the analysis of prescribing data, the unit advises the Department of Health, the Audit Commission, the Care Quality Commission and several other bodies on prescribing issues and policy.   The unit also works closely with the Department of Health on the development of primary care policy and initiatives.

The unit was known as the Prescribing Support Unit before it joined the HSCIC and this is why the much of the on-line material produced by the unit is to found at

www.ic.nhs.uk/psu

A number of publications and reports are available on the website.

If you have a general enquiry then please send an e-mail to

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Introduction

The introduction of PACT (Prescription Analysis and CosT) data, primary care drug budgets, and professional prescribing advisers brought in a whole new dictionary of words, abbreviations and acronyms. This language has become a part of general usage and an understanding is important for all of those who are involved in prescribing issues (e.g. GPs, non-medical prescribers, practice managers, pharmacists, analysts, managers and academics).

The purpose of this booklet is to provide a brief explanation of the principles underlying prescribing measures and their application. Where applicable, a brief history and relevant references are also included.

Traditionally, prescribing has been measured using the number of items prescribed and the cost of these drugs to compare drug utilisation between Strategic Health Authorities (SHAs), Primary Care Trusts (PCTs) and practices, and also to look at historic trends.

This booklet defines the measures currently used in reports and information systems produced by Prescription Services, a division of the NHS Business Services Authority (NHSBSA). It outlines new measures that are available, and discusses how these measures can be used to produce prescribing performance indicators. These indicators are important for the continued performance and financial management of the drugs bill.

We hope you find this booklet informative. If there are any additions you feel would be useful to include in the next edition we would be delighted to hear from you. Please e-mail any comments to enquiries@ic.nhs.uk

1. Traditional Prescribing Measures

1.1 Drug Costs

It is obviously important to measure the cost of prescribing in order to manage the drugs bill, and to provide forecasting models that will aid financial planning and risk management while allowing for the prioritisation of services and introduction of new drugs.

Costs of drugs are expressed in different "currencies" in different Prescription Services systems and reports. The differences usually reflect what is included in or excluded from the figure.

1.1.1 Net Ingredient Cost (NIC)

The net ingredient cost is the basic price of a drug i.e. the price listed in the Drug Tariff, British National Formulary or price lists. It is used in the ePACT system (an electronic system provided by Prescription Services which gives access to prescribing information), the PCA (Prescription Cost Analysis) publication which is available on the NHS Information Centre website, and other analyses reflecting the prescribing performance of practices and Primary Care Trusts (PCTs).

1.1.2 Actual Cost

Actual Cost is closer to the true price paid by the NHS. Community pharmacists are reimbursed for medicines they have dispensed on the basis of the NIC less a deduction related to the discount that they are assumed to have received from their suppliers. This discount value is determined by a survey of pharmaceutical wholesalers and can change from year to year. A container allowance (approximately three pence per item) is then added.

For the purposes of practice and PCT prescribing budgets and statements, an average discount percentage is used. It is important to note that a change in the discount rate can affect costs and should be kept in mind when looking at annual growth. It can be instructive to compare annual growth measured in Actual Cost with growth measured in NIC.

1.1.3 Other Measures of Cost

Prescription Services produce a report called the PMD (Prescribing Monitoring Document) which shows the actual cost of drugs at individual or organisation level where the prescriber is known. They also produce another expenditure report that shows the actual cost of drugs for all prescribers (identified and unidentified) and what might be called prescribing and dispensing overheads. These include the cost of lost batches, elements for which resources have been retained centrally and local charges. This report is called the IPPR (Itemised Prescription Pricing Report) and is used by the Department of Health to charge PCTs for their total drug expenditure. This cost could be termed the "real cost" but it excludes dispensing fees, even though these are now the responsibility of PCTs.

1.2   Items

A prescription item refers to a single item prescribed by a prescriber on a prescription form (known as an FP10). If a prescription form includes three medicines it is counted as three prescription items. The number of items is a measure of how often a prescriber has decided to write a prescription. It is often used when we wish to look at prescriber behaviour as every prescription is an opportunity to change treatment. For vaccinations and acute treatment (for example, a short course of antibiotics) the item is also a reasonable measure of the number of courses of treatment.

1.3   Volume

Historically, the number of items was used as a measure of volume. However, for areas of prescribing where there is a good deal of repeat prescribing, the number of items can be misleading because different practices use a different duration of supply, i.e. some will issue a prescription monthly, others for two months or three months and so will have different numbers of items for the same amount of medication. Even within a single practice there can be differences in the duration of prescriptions. Contraceptives and hormone replacement therapy are often prescribed for six months at a time while

hypnotics, which are recommended for short term use, may only be issued for a week or two.

Physical units (e.g. grams, litres), number of tablets, and number of items are sometimes used for quantifying drug usage. These units can be applied only when the use of one drug, or of specific products, is being evaluated.

Problems arise when the utilisation of drugs from a whole therapeutic area is being considered. If usage is given in terms of grams of active ingredients, drugs with low potency will have a larger fraction of the total than drugs with high potency.

Counting the number of tablets also has disadvantages because strengths of tablets vary, with the result that low strength preparations contribute relatively more than high strength preparations as the patient must take more of the lower strength to achieve the same effect. Also short-acting products will contribute more than long-acting preparations.

The following chapter discusses methods of measuring volume, which try to overcome these problems.

2. New Volume Measures

2.1 Defined Daily Doses (DDDs)

For many purposes it is clear that measuring the volume of prescribed drugs in terms of number of items is unsatisfactory. The main problem is that a single item can be of any quantity, e.g. a single tablet or hundreds of tablets, or for any duration, e.g. 6 months or 1 week. There is a need for a process to more reliably measure drug volume.

The system of Defined Daily Doses (DDDs), developed and maintained by the World Health Organisation (WHO), attempts to overcome these limitations. In this system each drug is given a value, within its recognised dosage range, that represents *the assumed average maintenance dose per day for a drug used for its main indication in adults*. It is emphasised that the DDD is a unit of measurement; it is **not** a recommended dose and may not be a real dose. Using this system the amount prescribed of an individual drug can be expressed in DDDs and, since the DDD of one drug is assumed to be functionally equivalent to the DDD of any other drug used for a similar purpose, the number of DDDs for two or more such drugs can be added together. It is also possible to add together the DDDs of all the drugs in the same broad therapeutic class or of all the drugs given to one or more patients. By extension, cost per DDD across groups of drugs (a measure of economy) may be compared between practices, Primary Care Trusts, and Strategic Health Authorities indicating where higher cost alternatives have been used.

> **Example**
> A GP prescribes thirty 20mg tablets of simvastatin. The DDD for simvastatin is 30mg. (Note that a 30mg tablet is not available. The DDD is a compromise between the commonly used strengths of 20mg and 40mg.)
> Therefore the number of DDDs is (30x20)/30 = 20.

Example

Section 10.1.1 of the British National Formulary (BNF) is non-steroidal anti-inflammatory drugs (NSAIDs). The following table shows the WHO DDDs for NSAIDs and shows how the total use of these drugs within a practice can be calculated.

2. New Volume Measures

BNF Name	DDD	Total Quantity Prescribed	Number of DDDs Prescribed (Total Quantity/DDD)
Diclofenac	100mg	50,000mg	50,000/100 = 500
Ibuprofen	1200mg	216,000mg	216,000/1200 = 180
Naproxen	500mg	48,000mg	48,000/500 = 96
Mefenamic acid	1000mg	10,000mg	10,000/1000 = 10

The total number of DDDs for NSAIDs prescribed in this period = 786.

There are particular therapeutic areas where the concept of a DDD is inappropriate.

♦ Skin preparations e.g. ointments and creams.

   The unit of issue is a tube. Patients use different quantities depending on the area to be covered and the quantity they apply per unit area, therefore it is not possible to produce a meaningful DDD.

♦ Vaccinations and other 'one-off' treatments.

   DDDs are defined as *the assumed average **maintenance dose** per day for its main indication in adults.* Vaccines are not used as maintenance doses.

♦ Combination preparations, mixtures and compounds.

   Where a product contains more than one drug it is difficult to determine for which component the DDD should be used although the WHO does occasionally define a DDD for a combination product.

♦ Contraceptive pills and hormone replacement therapy (HRT) regimes.

   For HRT and contraceptives it is not possible to have a DDD. Different preparations are given for varying time periods within the month, e.g. an HRT patch may be applied twice weekly and an HRT tablet taken daily, some products are taken continuously whilst others are taken for 3 weeks of each month. Other products contain mixtures of tablets and patches. Oral contraceptive prescribing is generally by packs rather than tablets.

2.2 Average Daily Quantities (ADQs)

DDDs have been defined by the WHO based on international prescribing habits. Work done by the PSU has demonstrated that prescribing in primary care in England can differ from the international standard. Reasons for variation include;

♦ different indications for drugs used in England, e.g. the DDD for quinine is based on the dose used for the treatment of malaria (1500mg) but in England the main indication is the treatment of leg cramps (300mg).

♦ different prescribing habits in England, e.g. the DDD for dosulepin (dothiepin) is 150mg; this drug is a tricyclic antidepressants and the dose is probably influenced by the higher doses used in hospitals. In England GPs tend to use smaller doses of tricyclic antidepressants, and 75mg is the average dose prescribed [1].

To allow comparison of prescribing within England there is a need to have a system which more accurately reflects primary care prescribing. To meet this need Average Daily Quantities (ADQs) have been developed by an expert group convened by the PSU.

The following information is considered when defining an Average Daily Quantity;

1. the Defined Daily Dose (if one is available), as the World Health Organisation Advisory Group have much experience in this area and have access to a variety of data sources when defining values.

2. the Prescribed Daily Dose (the actual average dose) if available and when calculated on a large enough sample of items, should also be considered, as it reflects the actual usage by GPs. However, it may well be that the single value Prescribed Daily Dose hides a wide variation in prescribing practice, again stressing the nature of the Prescribed Daily Dose and the subsequent ADQs as being analytical units.

2. New Volume Measures

3. Prescription Services data, which gives the number of items prescribed by particular quantities of each drug preparation. This information source has the advantage of being based on every prescription dispensed in England but the disadvantage of not including the intended duration for the item or indication, making the calculation of an 'accurate' Prescribed Daily Dose impossible. However it is a useful indication of the strengths being prescribed.

4. BNF information regarding dosage, particularly for maintenance doses.

5. whenever possible, therapeutic equivalence between drugs of the same therapeutic type is sought. However, where there is a discrepancy between actual usage as suggested by data sources (2), (3), and (4) and equivalence data from clinical research, then the actual usage is given priority. The expert group stresses that these discrepancies should be kept to a minimum and that when they occur, they should be noted in any disseminated information regarding the ADQs.

6. following the first five principles, an ADQ is set only with the agreement of all members of the group.

ADQs are reviewed on a regular basis, thus reflecting any changes in drug utilisation and the introduction of new drugs.

Many ADQs are the same as the corresponding DDD as prescribing practice in England is often very similar to international usage. However there are some drugs where the values can be very different. In some cases this is because the DDD value is influenced by use of higher doses in a hospital setting while ADQs are designed to reflect use in primary care.

2. New Volume Measures

AVERAGE DAILY QUANTITIES ARE NOT RECOMMENDED DOSES

but are analytical units produced in order to compare more accurately the prescribing activity of primary care practitioners.

2. New Volume Measures

To date, ADQs have been developed for the following therapeutic areas:
<here>

BNF Sub-section 1.1.1	Antacids
BNF Section 1.2	Antispasmodics and other drugs altering drug mobility
BNF Section 1.3	Antisecretory drugs and mucosal protectants
BNF Section 1.4	Antidiarrhoeal drugs
BNF Section 1.5	Chronic Bowel Disorders
BNF Section 1.6	Laxatives
BNF Section 2.2	Diuretics
BNF Section 2.3	Anti-arrhythmic drugs
BNF Section 2.4	Beta-adrenoceptor blocking drugs
BNF Sub-section 2.5.1	Vasodilator antihypertensive drugs
BNF Sub-section 2.5.2	Centrally acting antihypertensive drugs – can't find these on website
BNF Sub-section 2.5.4	Alpha-adrenoceptor blocking drugs
BNF Sub-section 2.5.5	Drugs affecting the renin-angiotensin system
BNF Sub-section 2.6.2	Calcium channel blockers
BNF Sub-section 2.6.3	Potassium-channel activators
BNF Section 2.9	Antiplatelet drugs
BNF Section 2.12	Lipid regulating drugs
BNF Section 3.1	Bronchodilators
BNF Section 3.2	Inhaled corticosteroids
BNF Section 3.3	Cromoglicate and related therapy
BNF Sub-section 3.4.1	Antihistamines
BNF Sub-section 4.1.1	Hypnotics
BNF Sub-section 4.1.2	Anxiolytics
BNF Section 4.2	Drugs used in psychoses and related disorders
BNF Section 4.3	Antidepressant drugs
BNF Section 4.5	Drugs used in the treatment of obesity
BNF Section 4.6	Drugs used in nausea and vertigo
BNF Section 4.7	Analgesics
BNF Sub-section 4.7.4	Treatment of acute migraine
BNF Section 4.8	Antiepileptic Drugs
BNF Section 4.9	Drugs used in parkinsonism and related disorders
BNF Section 4.11	Drugs for dementia
BNF Section 5.1	Antibacterial drugs
BNF Section 5.2	Antifungal drugs
BNF Section 5.3	Antiviral drugs
BNF Sub-section 6.1.2	Oral antidiabetic drugs
BNF Section 6.2	Thyroid and antithyroid drugs
BNF Sub-section 6.6.2	Biphospohonates
BNF Sub-section 10.1.1	Non-steroidal anti-inflammatory drugs

In 2010/11 73 per cent of items prescribed in general practice (excluding dressings and appliances) had ADQ values.

Copies of ADQ values are available from the PSU website, www.ic.nhs.uk/psu.

3. Patient Denominators

The volume and cost of prescribing within an organisation is influenced by the size and nature of the population served. Practices and PCTs have therefore often been compared using the measures items per patient, and cost per patient. Practices range from having a handful of patients to over forty thousand. Even Primary Care Trusts range from under 100,000 patients to over one million patients. The wide range in the population served means that it is pointless to analyse prescribing of practices or PCTs without taking the size of the population into account. Practices and, to a lesser extent, PCTS also vary in the age and gender profile of their patients. While the mean proportion of patients aged 65 and over is 16 per cent, one tenth of practices have than 7 per cent or less of such patients and one tenth have 23 per cent or more. <DN I've calculated these from the practice populations supplied to NHS comparators – do we need to state a source?>

General practitioners have received reports containing data about their prescribing for many years, and these have always included comparisons with local and national averages. In an attempt to make the comparisons more valid, a weighting factor, called the prescribing unit (PU), was introduced in England in 1983 to take account of the greater need of elderly patients for medication. In 1993 a more sophisticated weighting system called ASTRO-PUs [2] was adopted which took account of sex and temporary resident status, and used a greater number of age bands. The weightings were first revised in 1997 [3] and again in 2009. In 1995 a system of weighted prescribing units within specific therapeutic groups (STAR-PUs) was developed [4].

3.1 Prescribing Units (PUs)

PUs were adopted to take account of the greater need of elderly patients for medication in reporting prescribing performance at both the practice and primary care organisational level. Rather than compare the cost of prescribing or the number of items prescribed per patient, comparisons by PU would weight the result according to the number of elderly patients in the practice or PCT. A large difference in cost per PU between two practices could not then be explained by one practice having a higher proportion of elderly in their population.

3. Patient Denominators

Patients aged 65 and over are counted as 3 prescribing units and patients under 65 and temporary residents are counted as 1. Note that the number of temporary residents is no longer collected.

Example 1 – Dr. Sample

Total List Size	2,184
No. of Patients 65 and Over	355
No. of Temporary Residents	6

No. of Prescribing Units (PUs)   **(2,184 – 355) + (3 x 355) + 6 = 2,900**

3. Patient Denominators

Prescribing units can be used to calculate differences in the prescribing by one practice from the average for the Primary Care Trust (PCT).

To compare a practice's expenditure with the PCT total spend, for example, the total spend within the PCT is divided by the total number of PUs within the PCT and then multiplied by the number of practice PUs.

Example 2 - Dr Sample spent a total of £15,164 in one quarter. How does this compare with the PCT average?
The total spend in PCT   = £3,200,000
Number of PUs in PCT   =   1,250,000
Number of PUs in Dr. Sample's practice   =   2,900

Therefore, average cost per PU in PCT = £3,200,000/1,250,000 = £2.56
Predicted spend would be   £2.56 x 2,900   = £7,424
Thus Dr Sample's spend was 104% above the PCT equivalent,
      (£15,164 - £7,424) x 100 / £7,424.

3.2 Age, Sex and Temporary Resident Originated Prescribing Units (ASTRO-PUs)

Derived by the Prescribing Research Unit (PRU) in 1993 [2], ASTRO-PUs were designed to weight individual practice populations for age, sex and temporary residents. The ASTRO-PU values you will usually see are based on cost although there are also weights based on the number of items.

ASTRO-PUs have been used by the Department of Health and others in prescribing allocation methodology and as the appropriate denominator when comparing the costs of prescribing between practices or between PCTs.

Prescribing habits change over time; new drugs are introduced, older drugs may become less popular, new indications are licensed for existing drugs and more patients may be treated for existing indications as better evidence for efficacy is demonstrated e.g. the use of statins for primary and secondary prevention of coronary heart disease. For these reasons the ASTRO-PU values need to be reviewed regularly. Following work carried out by the PSU [3] the weights were revised in 1997 and, to avoid confusion, the units based on

3. Patient Denominators

these values are sometimes known as ASTRO(97)-PUs. In 2009 new weights were adopted and these are known as ASTRO(09)-PUs. The weights are shown below. Temporary resident data is now not collected as practices are re-imbursed by a different method and so there is no weighting for temporary residents. The name has not been changed to ASO-PUs as people are familiar with the term ASTRO-PU.

Age (Years)	Cost-based ASTRO(09)-PUs	
	Male	Female
0-4	1.0	0.8
5-14	1.1	1.0
15-24	1.4	2.0
25-34	1.8	2.8
35-44	2.9	4.0
45-54	4.9	6.1
55-64	9.2	9.6
65-74	15.9	14.5
>75	21.1	18.5

Example 3
Dr Doolittle's and Dr Lector's practices both have populations of 10,000 patients. Dr Doolittle's practice is made up predominately of students and Dr Lector's practice is in an inner city area.

| Age	Dr. Doolittle's Practice Patient Numbers		Male ASTRO(09)-PUs	Female ASTRO(09)-PUs
	Male	Female		
0-4	50	30	50 x 1.0 = 50	30 x 0.8 = 24
5-14	250	240	250 x 1.1 = 0	0 x 1.0 = 0
15-24	1,900	2,100	1900 x 1.4 = 2,600	2100 x 2.0 = 4,200
25-34	800	780	800 x 1.8 = 1,440	780 x 2.8 = 2,184
35-44	950	1,150	950 x 2.9 = 2,775	1150 x 4.0 = 4,600
45-54	500	600	500 x 4.9 = 2,450	600 x 6.1 = 3,660
55-64	180	240	175 x 9.2 = 1,610	240 x 9.6 = 2,304
65-74	80	100	80 x 15.9 = 1,272	100 x 14.5 = 1,450
>75	20	30	20 x 21.1 = 422	30 x 18.5 = 555
			Male ASTRO -PUs = 12980	**Female ASTRO -PUs = 19217**
No. of Patients	4730	5270	**Total No. of ASTRO -PUs = 32,197**	

3. Patient Denominators

Similarly for Dr. Lector's practice:

Age	Dr. Lector's Practice Patient Numbers		Male ASTRO -PUs	Female ASTRO -PUs
	Male	Female		
0-4	350	330	350	264
5-14	300	300	420	360
15-24	600	600	1020	1260
25-34	600	600	1200	1440
35-44	1000	1000	2800	3200
45-54	900	1000	3960	5400
55-64	500	600	3800	4320
65-74	300	500	3030	4800
>75	170	350	2006	3710
			Male ASTRO -PUs = 18586	Female ASTRO -PUs = 24754
No. of Patients	4720	5280	Total No. of ASTRO -PUs = 43,340	

Thus Dr Doolittle has 32,197 ASTRO–PUs while Dr Lector has 43,340, although they have the same number of patients. We would therefore expect Dr Lector's prescribing to be higher, all other things being equal (which is rarely the case!).

The following graph shows the difference in NIC/patient and NIC/ASTRO-PU (re-scaled) for individual practices within a health authority. This demonstrates how misleading NIC per patient can be. If the age and structure of the populations is taken into consideration by using NIC per ASTRO-PU, the costs for some practices are somewhat higher and would draw more attention than their NIC per patient. NIC per patient clearly hides the high cost of the arrowed practice!
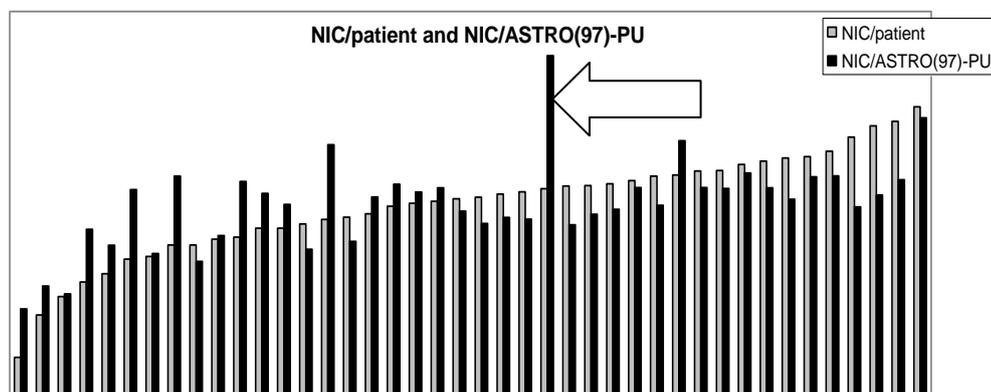
3.3   Specific Therapeutic group Age-sex Related Prescribing Units (STAR-PUs)

ASTRO-PUs are derived from data on the total of all drug costs. It is therefore not appropriate to use NIC per ASTRO-PU when considering a single therapeutic group e.g. NIC per ASTRO-PU for ulcer-healing drugs. There are differences in the age and sex of patients for whom drugs in specific therapeutic groups are usually prescribed. To make such comparisons STAR-PUs [4] have been developed using a similar methodology to the ASTRO-PU but based on costs within the therapeutic groups. These were revised in 1997 and again in 2001 when it was decided that some, but not all, needed to be revised. In 2009 several of the weightings were revised while some, including chapter level STAR-PUs, were considered to be no longer appropriate and were therefore withdrawn.

STAR-PU values are available for BNF sections to match most of the groups for which ADQs have been developed (see list on page 12). They are available from the PSU website at www.ic.nhs.uk/psu.

3.4   ASTRO-PU Weightings for Patients in Homes

It was suggested by Brian Crompton [6] and others that patients in nursing homes and residential homes need higher weightings within the ASTRO-PU system because of their greater need compared with patients of the same age living in their own homes. The PSU carried out a study in collaboration with over 120 practices from 32 Health Authorities in April, May and June of 1997 looking at the needs of patients in nursing and residential homes [7,8].

The ASTRO-PU weightings for patients in residential homes were recommended as being twice the value of the corresponding patients in their own homes. For patients in nursing homes, the recommended ASTRO-PU value is three times that for corresponding patients in their own homes.

To allow for this in budget allocations for practices it is recommended that PCTs do the following:

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For residential homes: calculate the number of ASTRO-PUs for the patients in the home and then double it before adding it to the remaining ASTRO-PUs for the practice.

For nursing homes: calculate the number of ASTRO-PUs for the patients in the home and then triple it before adding it to the remaining ASTRO-PUs for the practice.

The new classification of care homes may make it difficult to separate nursing and residential care in which case we would recommend using a weighting of 2.5. These weightings are not used by the Department of Health in calculating PCT allocations as the requisite data is not available centrally.

4. Applications of Measures of Prescribing

4.1   Comparators and Indicators

It is useful to distinguish between comparators and indicators. A comparator simply compares the way in which different prescribers use certain preparations, usually age/sex standardised in some way. An indicator is similar but carries the implication that it has been validated by a group of experts and that we can say in which direction we would wish to see prescribing move, even if we cannot specify a value which represents "good practice".

4.2   Prescribing Comparators available from Prescription Services

The Prescription Services Toolkit, available via NHSnet, provides a wide range of comparators which mainly fall into two categories:

♦ Volume Comparators
♦ Cost Comparators

The Volume Comparators are measured as ADQs per cost-based STAR-PU (these STAR-PUs are the ones developed to match the ADQ groups). Ideally we would use ADQ-based STAR-PUs but developing these proved very difficult as the database we use does not hold the data in the form of ADQs.

The Cost Comparators are overall expenditure (NIC per ASTRO-PU) and four measures of enteral nutrition (NIC per PU).

There is also information available on the savings which could be made by increasing generic prescribing (Potential Generics Savings) and on use of drugs which are usually both expensive and initiated in hospitals (Specialist Drugs).

4.3   National Comparators

Graphs of growth for overall cost and for ten major BNF sections are available on the PSU website (www.ic.nhs.uk/psu). We also produce a table showing growth for the top 30 BNF sections so far in the current financial year. These allow PCTs to compare themselves with national trends.

4.4 Prescribing Indicators

Prescribing indicators are measurements that are used to show how prescribing performance for a Primary Care Trust or a practice might compare with other organisations, national averages or themselves over time. Prescribing indicators should not be seen as definitive or be used in isolation but rather as a starting point for reviewing progress.

4.4.1 Prescribing Indicators available from Prescription Services

The Prescription Services Toolkit (available over the NHSnet system) includes several prescribing indicators. These have been derived from two sources. Some are based on the Audit Commission Report [5]. Others were developed by the Prescribing Indicators Group (PIG) set up by the Department of Health in 1997.

The Prescribing Indicators Group also developed criteria which can be used to assess the validity of prescribing indicators, or to assist in the development of local indicators. Indicators need to be simple in concept and based on justifiable criteria.

The criteria developed by PIG recommend that indicators should be:

♦ **based on clinical evidence or professional consensus**

♦ **accepted as relevant and useful**

   Prescribing indicators should be acceptable to those to whose behaviour and practices they may be applied.

♦ **based on reliable, accurate and comparable data**

   Within the NHS most prescribing indicator data will be derived from PACT. Patients may also consume medication that is not dispensed on a prescription e.g. aspirin 75mg purchased over the counter.

♦ **able to demonstrate changes in prescribing behaviour**

   Changes in prescribing behaviour of drugs that are for short courses e.g. antibiotics, will be demonstrated earlier than changes in prescribing of

drugs used for chronic conditions and which are subject to repeat prescribing e.g. ulcer healing treatment.

♦ **appropriately weighted to allow comparisons between practices or organisations, and to allow for changes over time.**

Variables within a population need to be controlled to make relevant comparisons e.g. age and sex profiles. Appropriate units of measurement should be used.

♦ **able to discriminate between more and less desirable prescribing behaviour.**

Prescribing indicators should not be misleading.

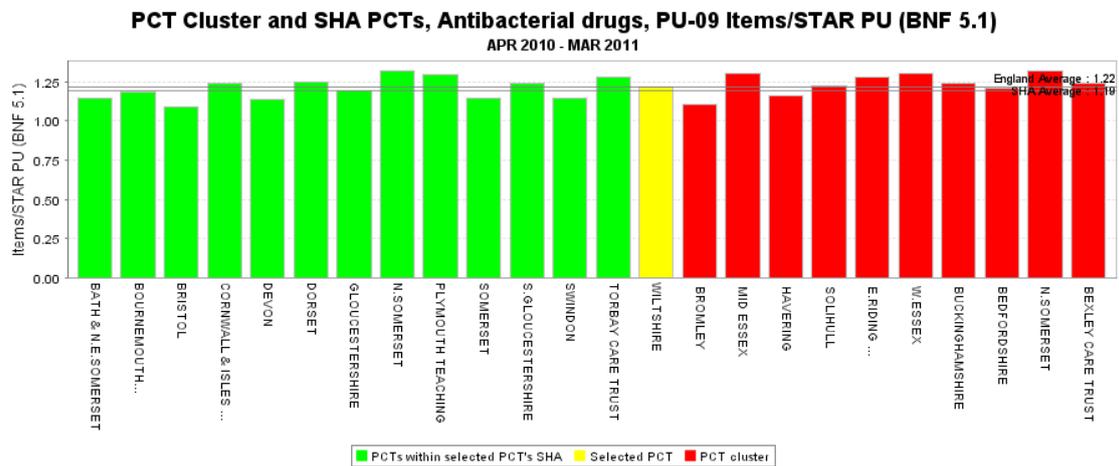The Prescribing Indicators available within the Toolkit are:

1. **Antibacterial drugs - Items per STAR-PU.**
2. **Antibacterial drugs – NIC/Items.**
3. **Benzodiazepines (Capsules and Tablets)- ADQs per STAR-PU**.
4. **Inhaled corticosteroids - ADQs per STAR-PU.**
5. **Inhaled corticosteroids - NIC per ADQ.**
6. **Oral NSAID preparations - ADQs per STAR-PU.**
7. **Oral NSAID preparations - NIC per ADQ.**
8. **Percentage of items prescribed by generic name**
9. **Proton Pump Inhibitors ADQ per STAR-PU.**
10. **Ulcer healing drugs - NIC per ADQ.**
11. **Ulcer healing drugs - ADQs per STAR-PU.**

Example

Below is a screen from the Toolkit system. It shows the use of antibacterial drugs measured as the number of items per antibacterial STAR-PU displayed as a bar chart. Here the selected PCT (the yellow bar) is compared with other PCTs in its Strategic Health Authority (shown in green) and 10 PCTs from around the country judged to be similar (shown in red). This similarity is assessed by Prescription Services using a number of factors. See section 4.4.2 for details.

Note that a PCT can appear both as a PCT in the same SHA and also as a comparable PCT, for example North Somerset in the example. The graph also shows the average for England and the average for the SHA as horizontal lines.

PCT Cluster and SHA PCTs, Antibacterial drugs, PU-09 Items/STAR PU (BNF 5.1)
APR 2010 - MAR 2011

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It is generally accepted that prescribing of antibiotics should be considered carefully so as to reduce the potential for the development of drug resistant microbes but, as with many prescribing indicators, it is difficult, if not impossible to say what the 'correct' level of use should be.

For most indicators or comparators in the Toolkit system you can obtain a list of the data (and can ask for the data for all PCTs to be displayed in this way), details on the drugs included and the weightings used for the population by selecting the appropriate option from the drop-down menu. Clearing the tick box marked PU 09 allows you to access the previous set of weights (from 2001).

4.4.2 Establishing "clusters" for PCTs

PCTs often complain that they are unlike the other PCTs within their SHA and prefer to be compared with PCTs elsewhere in the country which they regard as being more similar. To find other PCTs with which to compare a given PCT (what are sometimes called "clusters") Prescription Services use the following variables.

- ♦ ASTRO-PUs (cost based) per patient
- ♦ The Income index (part of the Index of Multiple Deprivation) produced for the Communities and Local Government department to enable local government to compare themselves with other areas.
- ♦ the Health Deprivation and Disability index (part of the Index of Multiple Deprivation)

The first variable is a measure of demographic need for prescribing; the second is a measure of deprivation and the third is a measure of health and disability. The "distance" between PCTs as measured on these variables is calculated after standardising each of them so that the scale of measurement does not have an effect. The ten "nearest" PCTs are then used as the members of the "cluster".

More detail is given in the Help information associated with the Toolkit.

4.4.3 Quality, Innovation, Productivity and Prevention

The Quality, Innovation, Productivity and Prevention (QIPP) initiative seeks to improve the quality and productivity of care delivered by the NHS. One result of this initiative is a set of prescribing comparators incorporating the QIPP principles. These include some which measure the proportion of preferred products (either lower cost or greater safety) and others which measure use standardised by weighted populations. These are available to practice level to PCTs and at PCT level to the general public on the BSA website.

4.5   Prescribing Indicators National Group (PING)

A Prescribing Indicator National Group (PING) with membership from various parts of the NHS, Department of Health and academia used to meet to examine the development and maintenance of a core set of prescribing indicators. The mission statement for PING was

- To establish the criteria for the development of prescribing related indicators that can be applied throughout the NHS

- To produce a set of prescribing indicators that can be used by the NHS in conjunction with other indicators to support and monitor Primary Care organisations and their GP practices in the care of patients.

- Be responsible for the production and review of the prescribing indicators in the various indicator sets issued by the Department of Health including the Toolkit indicators from Prescription Services.

Although the group has not met for some years they developed a set of principles which should underlie comparators and indicators which are described in the next section.

4.5.1 Indicators of Prescribing Quality

Indicators of prescribing quality, such as the Quality and Outcome Framework indicators, differ from those available from the Toolkit in that they use data extracted from GP clinical systems and so can use additional data such as diagnosis, age and sex of the patient and link these directly to the prescribing information. Suggested indicators need to be simple in concept and based on justifiable criteria. The criteria used by PING recommend that these indicators should be;

1. **Be based on scientific evidence supplemented in a systematic way by expert opinion.**
   Due to the nature of trial evidence, no findings are applicable to all individuals all the time. Therefore expert opinion is important.

2. **Cover a range of process and outcome measures.**
   Outcomes are difficult to measure in primary care and therefore outcome indicators are difficult to develop. Process indicators have many advantages and should not be regarded as second best. However, process indicators, where possible, should be linked by evidence/expert opinion to outcomes.

3. **Represent areas where change is largely within the control of the clinician.**

    If this is not true then we have to ask what is the purpose of the indicator.

4. **Represent areas of practice that are regarded as important by clinicians and consistent with national health policy initiatives.**

5. **Represent areas of practice where the most important case mix and risk adjustment factors are known and data about them can be collected.**

    Where possible, relevant factors should be incorporated to provide appropriately weighted indicators.

6. **Be based on clinical data that**
    ♦ should be recorded by clinicians as part of the process of clinical care.
    ♦ should be electronically recorded in clinical records using current clinical terminologies and codes.
    ♦ can be extracted in a timely manner.
    ♦ are sensitive to changes in quality of care.
    ♦ can be easily checked for validity and reliability.

These criteria can be used as a guide when developing local indicators.

5. Other Measures produced by the PSU

5.1 Low Income Scheme Index (LISI)

The Low Income Scheme Index (LISI) is a measure of deprivation based on claims for exemption from the prescription charge on the grounds of low income [9]. The index is calculated and distributed by Prescription Services in collaboration with the Prescribing Support Unit. The figures are collected as part of a 5% sample of prescriptions processed by Prescription Services. Prescriptions issued to dispensing patients were not part of this sample until October 2000 and so the coverage was much less complete for doctors with large numbers of dispensing patients. However dispensing practices were included in from 2001 onwards. A PCT can obtain the values for its own practices from the electronic system epact.net. Toolkit includes the PCT level values for all PCTs.

Note that Prescription Services have revised their view of the accuracy of estimates derived from their sample of exemption information and will not be updating the LISI scores until they have a better way of producing such estimates.

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