

GPs knowledge of pharmaceutical prices

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1. Introduction

This paper reports on a survey into the extent to which GPs regard considering cost in prescribing decisions as important, and on their awareness of the relative prices of different products within therapeutic categories. There is growing evidence of increasing price competition in the supply of medicines within a number of therapeutic categories¹. However if GPs are not aware of the differences in price or of the importance of getting value for money from prescribing expenditure then this competition will not lead to savings for the NHS, or more cost-effective care for patients, or better returns for companies that are more price competitive.

2. The UK prescribing environment

The previous government introduced fundholding which operated from 1991-1999 (and is still operating in Northern Ireland). This gave GP practices the option of taking over budget responsibility for a range of prescribing and community services as well as the purchasing of some non-emergency hospital services. Although non-fundholders were also given prescribing budgets they had far fewer incentives to save money on prescribing than fundholders who were able to switch savings into other activities. A number of studies were carried out to see if fundholders did make prescribing savings. A review of these studies² indicated that fundholders were able to save money on prescribing, but that after a couple of years, growth in their prescribing expenditure reverted back to the trend growth of the non-fundholders. Thus permanent savings were made but these largely comprised one-off shifts in behaviour, notably greater use of generics and reductions in the number of items prescribed.

One can conclude that:

- GPs do respond to budgets, and the response is greater when (as in the case of fundholding) “a change in prescribing behaviour produces tangible benefits to both the practice and the GP”³
- whilst there may have been shifts by fundholders to lower cost branded products, there is little mention of this in the literature. This suggests that it was not a major priority for fundholding GPs as compared to non-fundholding GPs.

The current government has abolished fundholding on grounds of equity and (in England) is introducing primary care groups with commissioning responsibilities and integrated primary and secondary care budgets. Together these will give GPs budget responsibility both for pharmaceutical expenditure and for overall NHS expenditure on their patients. Primary care groups differ from fundholders in that all GPs will become members of a PCG and they will not have a choice as to which PCG they must belong to.

Two related questions arise. Firstly how strong will the budget pressures be on GPs to save money when most of the benefits do not accrue to the GP practice making a saving but to the 50 or so other GPs in the PCG?³ Secondly, are GPs likely to move beyond cost containment strategies that rely on generics to greater exploitation of price differences between branded products within therapy areas. Our analysis of new survey data seeks to cast some light on both of these questions.

3. Previous studies of GP price awareness

A series of three studies have addressed similar issues to us. In the most recent study, Silcock et al⁴ sent a postal questionnaire to 1000 randomly selected GPs in England and Scotland in February 1995 and received 627 replies. It found that at least 70% of responding GPs thought cost should be taken into account when prescribing, that prescribing costs could be reduced without affecting patient care, and that providing more information on costs

ⁱ Office of Health Economics

ⁱⁱ Novartis Pharmaceuticals UK

would lower the cost of prescribing. However, only 54% said that budgets had changed their prescribing habits. Fundholders were significantly more supportive of these statements than non-fundholders. The GPs were also asked about the prices of 31 medicines. Doctors were urged not to estimate the prices of drugs they did not use. Accuracy was defined as being within 25% of the actual price. Overall 33% of the price estimates were accurate, 20% were underestimates and 47% were overestimates. For very cheap drugs (i.e. less than £1 per pack), only 15% of estimates were accurate, whereas for expensive drugs (i.e. greater than £10 per pack) 49% of estimates were accurate. Fundholders had a significantly better knowledge of the prices of very cheap and cheap (£1 - £10) drug prices than non-fundholders.

In the Ryan et al study carried out in April 1990⁵ 400 randomly selected English GPs were asked the prices of 21 drugs. Again doctors were urged not to estimate the prices of drugs they did not use. 244 replied. The authors found that doctors tended to overestimate the prices of inexpensive drugs and underestimate the prices of expensive ones. Overall 29% of the estimates were accurate (i.e. within 25%). The study used the same drugs and same approach as the same authors' earlier study of 400 Scottish GPs⁶ in 1986. In that study 33% of the price estimates GPs made were accurate.

What is remarkable about these three studies is the degree of consistency of price accuracy over a 9 year period. In 1986 before the introduction of information for GPs on the costs of their prescribing (PACT in England and Wales), and before budget holding, GPs had the same accuracy score (33%) as in 1995, 4 years after the introduction of fundholding and of target prescribing budgets for non-fundholders.

4. Methods

Our analysis is based on a study sponsored by the ABPI which comprised face-to-face interviews with 200 GPs, carried out by members of NOP Healthcare's IQCS- (Market Research Society approved) specialist medical interviewing field force between 1st -14th September 1998. The 200 GPs were taken from a quota based nationally representative random sample, based on 5 geographical regions, Scotland, Northern/Yorkshire/North West, W. Midlands/Trent/Anglia and Oxford, South West/Wales, and Thames. Each respondent was selected from a different practice. None had taken part in this type of survey for NOP within the last 12 months. A demographic breakdown of the sample is set out in Appendix 1 together with comparable national data. χ^2 tests show that it is geographically representative and also is representative of relative list sizes, but not representative in terms of sex (82% male v 70% nationally). It has too many single handed practitioners (22% v 9% nationally), too few fundholders (43% v. 54% nationally) and too few dispensing doctors (6% v 16% nationally). We have analysed the results for these subgroups and where appropriate these are reported.

The survey questions were added to other NOP questions for other clients so that each GP would be interviewed for about 1 hour. We have no knowledge of the other questions that were asked. We also do not know how many GPs refused to participate when the 200 interview candidates were identified. However, problems of self-selection should be lower than with a postal survey. Face-to-face interviews should also obtain better responses from interviewees than postal surveys. In particular it eliminates any possibility of a GP looking up prices before responding to the relative price questions.

The order of questions was as follows:

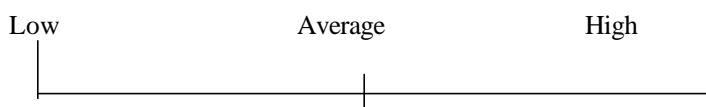
- (i) questions about the awareness of, usage and future prescribing intentions for individual named drugs (by brand or generic name) in the following five therapeutic areas:
 - lipid lowering statins (LLS)
 - proton pump inhibitors (PPI)
 - hormone replacement therapies (HRT)
 - calcium antagonists (CIA)
 - antidepressants (SSRI)

The 5 therapy areas were chosen because there are at least 3 products competing in each of these classes, because they are, for most GP practices, areas of significant prescribing expenditure.

- (ii) 2 general questions about
- the overall importance of price on their general prescribing over time
 - the relative importance of price in prescribing particular drug groups.
- (iii) questions about their perception of the prices of individual products by specific form and dosage in relation to the costs of other products within their therapy classes.

GPs were asked to respond to the general and relative price questions using a 10cm long visual analogue scale as set out in Figure 1 below. In the case of the relative price questions, this was designed to achieve a higher response rate than asking doctors about specific prices. The two general questions were measured using a 10 point scale (i.e. GP responses were assigned a value of one of 0, 1,..., 10), the relative price questions were measured using a 100 point scale (i.e. GP responses were assigned a value of one of 0, 0.1, ...9.9, 10.)

Figure 1: Visual analogue scale used in the questionnaire



5. Results

5.1 Awareness and usage

GPs were shown cards for each of the five therapy areas listing all of the drugs included in the survey and asked:

- which, if any, of the following products are you aware of?
- which, if any, of these products have you ever used?
- which, if any, of these products do you currently use?
- approximately how many prescriptions for each of the products currently used have you written in the last 4 weeks?
- is your current usage of each of these products increasing, decreasing or steady?

Usage as defined should pick up repeat prescriptions. We have further validated the sample by comparing the mix of prescriptions against IMS market volume data for the UK as a whole. This is set out in Table 1 below. It shows that usage of these products by the sample of doctors is representative of national patterns of use.

Table 1: Comparison of NOP survey and IMS prescribing usage data

CCBs	ADALAT	ISTIN	MOTENS	TILDIEM	TOTAL RX			
NOP	30.4%	37.4%	11.3%	20.9%	100.0%			
IMS MDI	29.0%	49.6%	4.6%	16.7%	100.0%			
Statins	LESCOL	LIPITOR	LIPOBAY	LIPOSTAT	ZOCOR	TOTAL RX		
NOP	6.6%	23.7%	9.6%	11.9%	48.2%	100.0%		
IMS MDI	6.6%	18.1%	8.3%	15.2%	51.8%	100.0%		
PPIs	LOSEC	PROTIUM	ZOTON	TOTAL RX				
NOP	56.4%	11.8%	31.7%	100.0%				
IMS MDI	59.1%	3.0%	37.9%	100.0%				
SSRIs	CIPRAMIL	DUTONIN	EFEXOR	FAVERIN	LUSTRAL	PROZAC	SEROXAT	TOTAL RX
NOP	7.0%	1.8%	11.4%	1.0%	15.2%	37.6%	26.0%	100.0%
IMS MDI	6.1%	1.6%	7.9%	0.0%	12.6%	38.4%	33.4%	100.0%
HRT	ESTRADERM	KLIOFEM	NUVELLE	PREMARIN	PREMIQUE	PREMPAK-C	TOTAL RX	
NOP	16.8%	9.3%	7.3%	22.6%	11.1%	32.9%	100.0%	
IMS MDI	16.3%	9.4%	5.3%	28.2%	14.2%	26.6%	100.0%	

The current usage information can also be analysed to measure the extent to which GPs routinely use more than one product in a therapy class. For each of the 5 classes, we set out in Table 2 below the proportion of GPs using 3 or more products from the sample in each of the therapy classes in the last 4 weeks.

Table 2. Numbers of Products used by GPs

Therapy category	No of products in the sample	% of GPs using 3 or more products*
Lipid lowering statins (LLS)	5	58%
Proton pump inhibitors (PPIs)	3	47%
HRT	6	84.5%
Calcium antagonists (CIA)	4	73%
SSRIs	7	85%

* from the sample in the previous 4 week period

This suggests that most GPs regularly use a number of products within a therapeutic area. Even in the case of PPIs, where there were only 3 products in the sample, the modal GP had used all three products within the last 4 weeks.

5.2 Overall importance of price over time

GPs were asked “to show the overall importance of price in terms of its general impact on your prescribing over time.” The results are set out in Table 3 below with the results for fundholders and non-fundholders, dispensing and non-dispensing doctors, shown separately.

Table 3 – Importance of Price over time

	Total	D	ND	F	NFH
Early 1980's	2.2	1.3	2.2	1.8	2.4
Late 1980's	3.2	2.4	3.2	2.9	3.4
Early 1990's	5.2	4.6	5.2	5.4	5.1
Present Day	7.4	6.0	7.5	7.6	7.2
In the Future	8.1	6.8	8.2	8.4	7.9

D = dispensing doctors FH = fundholders ND = non dispensing doctors NFH = non-fundholders

The overall trend showed a significant increase in the importance of price over time, significant at the 1% level.

The results for particular subgroups were analysed using ANOVA and contrast tests, and for the regions, a pairwise comparison. The analysis showed that:

- non-dispensing GPs attached higher importance than dispensing GPs to price throughout the 5 periods, but only the last two responses were significantly higher – those relating to the importance of price in the present day and the future;
- fundholders thought price was more important than non-fundholders in the last three time periods but less important in the earlier two time periods. Only the difference in respect of the first time period, the early 1980s, was the difference significant.

The results for the other groups had less obvious policy relevance.

5.3 Relative importance of price in particular drug groups

GPs were asked “to indicate your perception of the relative importance of price on your prescribing of each of the (five) drug groups. Table 4 shows the average score and also the average cost per day of therapy of the drugs listed in the survey. This average is crude, i.e. not sales value or volume weighted. Results are shown separately by fundholding status, dispensing status, and by age group.

Table 4 – Relative Importance of Price in different therapy areas

Cost/day Therapy area	GPs Importance score								
	Rank*	Total	FH	NFH	D	ND	Date of Qualification		
							< 75	75-84	> 85
£16.20 LLS	3	6.5	6.5	6.5	4.8	6.6	6.2	6.7	6.7
£29.90 PPI	1	7.1	7.4	6.7	5.3	7.1	6.5	7.4	7.5
£6.00 HRT	5	5.9	6.2	5.7	5.0	6.0	6.0	5.8	6.1
£11.80 CIA	4	5.8	6.3	5.4	4.4	5.9	5.4	6.1	6.0
£20.90 SSRIs	2	6.4	6.9	6.0	5.3	6.5	6.4	6.4	6.3

* by actual price

Our expectation was that there would be a relationship between the average unit cost of therapy and the importance of price in prescribing in that therapy area. However, the results show no clear link between cost per day of therapy and importance of price. Regression analysis showed an R-squared of 0.855, with an x-coefficient of 0.053. Only the fundholding group ranked the importance of pricing in the therapy areas in the same order as the average cost of prescribing in those areas. These results may have occurred for one of several reasons:

- (i) it maybe that GPs interpreted the question as being about the importance of price in making choices within each therapy class, rather than in relation to the expense of a therapy category. This may depend on their perception of differences in price within each category, rather than the overall cost;
- (ii) importance may depend on a GP's relative expenditure on each of the drug groups rather than simply on average cost;
- (iii) much prescribing in these areas is likely to be repeat prescribing. GPs may see price as only important in the dynamic (new patient) sector of the market. Hence the ratio of new to repeat prescribing is a key driver of the importance of price.
- (iv) GPs don't understand prices.

On the basis of the responses to the relative price questions discussed below we are inclined to dismiss (iv). Our view is that the question needed to be worded differently, i.e. (i), but that (ii) and (iii) may also play a role.

We did look at differences between sub-groups of the sample, again using ANOVA and contrast tests, and for the regions, a pairwise comparison. The analysis showed that:

- fundholders rated price as more important in all therapy areas, but only in the case of three groups, PPIs, CIAs and SSRIs, was the difference was significant;
- non-dispensing GPs rated price as more important in all therapy areas, and in four groups, statins, PPIs, CIAs and SSRIs, the difference was significant;
- there were no significant differences between male and female GP respondents, or between list size or size of practice;
- there were significant regional differences between the north of England GPs who rated price least important in 4 of the five groups, and GPs in the south west and Wales who rated price most important in all five areas.

5.4 Knowledge of relative prices of products within therapy classes

For each of the five therapy classes GPs were asked to “show their perception of the price of each product in relation to the cost of other products within its therapy class, in terms of the cost of 28 days treatment.” The results as measured on a 100 point scale and compared to the prices of 28 days of treatment are set out in several forms:

- Appendix 2 shows plots of perceived relative price on relative price for each therapy area. The results for the SSRIs show a poor knowledge of the relative price of one product (it had a low level of usage and a high level of don't knows among respondents) and so results are shown including and excluding this product;
- Appendix 3 contains box plots for each therapy area of the median, minimum, maximum, and interquartile range of each product in ascending order of actual price.

Knowledge of the size of differences in relative prices as well as of the order of prices is important if GPs are trading off price differences as compared to some other distinction between products in a therapy class. However, given the difficulty of reading across from the visual analogue scale to absolute price differences, ranking seemed to the most powerful analytical tool. Rank correlations of the order of the overall sample averages for each product in each therapy area as between actual cost and perceived cost are set out in Table 5 below, together with correlations for key sub groups. In Table 5A rankings are presented that have been calculated by averaging across all GPs the rankings given to each product by each GP in the sample (i.e. what were the rankings using the averages of the rankings of the products by each GP).

Table 5 Rank correlation between actual price and perceived price (* p<0.05, + p<.10)

		LLS	PPI	HRT	CIAS	SSRI
Overall		1.00 *	1.00 *	0.83 *	0.80 +	0.86 *
Fundholder	Yes	1.00 *	1.00 *	0.83 *	0.80 +	0.86 *
	No	1.00 *	1.00 *	0.83 *	0.80 +	0.86 *
			*			
GP Type	Singleton	1.00 *	1.00 *	0.77 +	0.60	0.86 *
	Partner	1.00 *	1.00 *	0.94 *	0.80 +	0.86 *
	Group	1.00 *	1.00 *	0.77 +	0.80 +	0.80 +
	Health Centre	1.00 *	0.80	0.60	0.60	0.40
Year Qualified	Pre 1975	1.00 *	1.00 *	0.83 *	0.80 +	0.86 *
	1975-84	1.00 *	1.00 *	0.83 *	0.80 +	0.74
	1985+	1.00 *	0.80	0.77 +	1.00 *	0.63
Practice	Dispensing	0.60	0.80	0.77 +	0.80 +	0.80 +
	Non-dispensing	1.00 *	1.00 *	0.83 *	0.80 +	0.86 *
Region	Scotland	0.90 *	1.00 *	0.83 *	0.60	0.91 *
	N&Yorks/NW	0.70	1.00 *	0.83 *	0.80 +	0.86 *
	WMids/Trent/A&O	1.00 *	1.00 *	0.77 +	0.60	0.91 *
	South West/Wales	1.00 *	1.00 *	0.77 +	0.80 +	0.80 +
	Thames	1.00 *	1.00 *	0.77 +	1.00 *	0.74

Table 5a Rank correlation between actual price and perceived price based on individual GP rankings.

		LLS	PPI	HRT	CIAS	SSRI
Overall		0.90 *	1.00 *	0.83 *	0.80 +	0.80 +
Fundholder	Yes	1.00 *	1.00 *	0.83 *	0.80 +	0.86 *
	No	0.90 *	1.00 *	0.83 *	0.80 +	0.69

The overall results set out in Table 5 show significant correlation for the statins, PPIs, HRT and the SSRIs. The results for the CIAs are significant at the 10% level. The correlations in Table 5A from averaging individual GP rankings are slightly weaker but still significant. For individual sub groups:

- there is no difference between fundholders and non-fundholders;
- those working in health centres have a poorer understanding of relative prices;
- dispensing GPs have a poorer understanding of relative prices than non-dispensing GPs;
- there are no identifiable patterns in differences by region or by age of GP.

However, the sample score averages may conceal some offsetting differences in scoring by different GPs. Accordingly, we analysed the sample responses to identify the numbers of errors that GPs made in the ranking of products. Appendix 4 sets out analysis of the numbers of ranking errors made by GPs in each therapy area using two different approaches

- (i) using ranking order, i.e. how many errors did individual GPs make in their overall ranking of the order of all sample products in a therapy area;
- (ii) using pairwise comparisons of products, how many errors did individual GPs make, treating equal rankings as non-errors. We also show in Appendix 4 the results treating equal rankings as errors.

In approach (i), we defined 1 error as when only one product was out of order (i.e. where a GP had given it the same score as another product), 2 errors as where two products were out of order (e.g. the correct order was 123 but the GP put 213) and so on. The maximum possible errors that can be made in a therapy area is thus equal to the number of products in that area. The results are summarised in Table 6.

Table 6: GP error rates in ranking products correctly

	Therapy area				
No.of errors	LLSs	PPIs	HRT	CIAs	SSRIs*
0	5%	25%	4%	8%	0%
1-2	17%	61%	8%	41%	5%
3	21%	14%	21%	27%	14%
4	35%	-	33%	24%	21%
5	22%	-	22%	-	43%
6	-	-	12%	-	17%
Total	100%	100%	100%	100%	100%
No of GPs	164	188	162	158	123

* excluding Duntonin

In approach (ii) the number of errors were calculated by looking at the number of the pairwise errors. For example if the correct order was 123 but the GP put 213, then only 1 error out of three comparisons are made (1v2 is wrong, but 1v3 and 2v3 are correct.) The results are summarised in Table 7.

Table 7: Error rates*

Therapy Area	No. of products	No. of pairwise comparisons	cumulative % of errors				
			0	1	2	3	4
LLS	5	10	19%	28%	37%	62%	79%
PPI	3	3	44%	82%	96%	100%	-
HRT	6	15	9%	15%	34%	59%	84%
CIA	4	6	24%	56%	75%	93%	96%
SSRI	6#	15	7%	11%	23%	31%	45%

* Assuming equal = no error; # Excluding Duntonin

We compared these results with rankings obtained by Ryan et al in their 1992 paper⁶. They tested for rankings in 6 therapy areas. Two therapy areas had only 2 competing products in the sample, in two there were 3 products and in two there were 4 products. The results for the 3 and 4 product groups are set out in Table 7 below. We have also assumed that the authors did not count +/- 25% error rates as correct, as in the case of their price comparisons, but counted the ranking by stated price.

Table 8 Error rates from Ryan et al study⁶

Therapy area	No. of products	No. of pairwise comparisons	%age making 0 errors	1 errors	2 errors
Angina prophylactics	3	3	69%	100%	100%
Analgesics	3	3	27%	95%	96%
NSAIDs	4	6	13%	62%	83%
Penicillins	4	6	30%	74%	89%

These results suggest that the accuracy of GPs in our sample is broadly comparable with that of the GPs in the 1992 Ryan et al study. We have not examined whether the relative price differences were larger in the Ryan et al study, which included generics as well as branded products.

It is important, however, when looking at the rankings to remember that most GPs are getting most pairwise comparisons right. We can measure this by calculating from the data presented in Appendix 4 the proportion of comparisons that GPs on average get right in each therapy area – as opposed to the error rates presented above. These results are set out in Table 9.

Table 9: Percentage of correct pairwise comparisons by therapy class, based on GPs with complete responses across products in each area

Therapy area	SSRI w/o Dutonin	PPI	CIA	HRT	LLS	All Therapy Areas
Total	1845	564	954	2430	1640	7433
Correct	999	345	596	1713	921	4574
% correct stating a price	54%	61%	62%	70%	56%	62%

These results suggest that whilst the average results do conceal error rates amongst individual GPs, most GPs are getting most comparisons correct.

5.5 Impact of price changes and of price perceptions on prescribing behaviour

We plan to use the data to look at two further issues:

- firstly, how long does it take GPs to recognise that price changes have occurred. In the case of the PPIs, price changes had occurred within two months of the sample being questioned. Zoton had dropped in price as compared to Protium and then Losec had dropped in price to be close to Zoton and Protium. We plan to analyse the data using the 94 GPs who prescribe all 3 products to see if there are two groups, those whose price perceptions reflect current relative prices and those whose perceptions are some months out of date. Price change patterns in these two products are set out in Appendix 5;
- secondly to link current prescribing patterns and intention to prescribe more or less in the future to perception of price. For example, are GPs who think the price of Losec is close to that of Zoton and Protium (i.e. who were aware of recent price changes) more likely to be using and planning to use Losec than those who think it is still priced significantly above these two drugs?

6. Discussion of results

The sample was geographically representative and its use of the products included in the survey was representative of the national use of these products. The main results show that:

- price is considered by GPs to have become an increasingly important influence on prescribing for all GPs;
- price is significantly more important to fundholders as compared to non-fundholders, and for non-dispensing as compared to dispensing GPs, in, respectively, 3 and 4 of the 5 therapy groups considered;
- most GPs regularly use several products within these five therapy classes;
- there are regional differences in GP perception of the importance of price. The north of England GPs rated price least important in 4 of the five therapy groups, and GPs in the south west and Wales rated price most important in all five areas. The differences between the two groups of GPs were significant in three therapy areas;
- GPs are aware that there are price differences between products within these five therapy classes. Ability, on average, to identify the correct order of prices was high, with no differences in ranking ability between fundholders and non-fundholders. Dispensing doctors were less able to rank than non-dispensing doctors. However, although sample averages were reasonably accurate, and GPs on average got nearly 2/3 of price comparisons correct, individual error rates were as high as those found in the earlier Ryan et al study. Again, there was no significant difference in individual accuracy rates between fundholding and non-fundholding GPs.

We make three points in interpreting these results in the context of the UK prescribing environment and the findings of the other research we have discussed.

Firstly, given the greater perception by fundholding GPs of the importance of price in prescribing, and the evidence of one –off savings from fundholder prescribing studies, the ending of fundholding may well reduce the pressures perceived by GPs to contain prescribing costs. Much will depend on whether PCGs are seen by GPs as creating fundholding type incentives and pressures for all their GP members or whether they dilute the pressures on individual practices.

Secondly, fundholders do not have a significantly better knowledge of relative brand prices than non-fundholding GPs. This makes sense in the context of:

- evidence from fundholding studies that fundholding GPs did not use switches to lower cost branded products as major cost saving strategies;
- evidence from the Silcock et al study⁴ that although GP fundholders had a significantly better knowledge of cheap and very cheap drugs (categories which presumably include most generics) they were not significantly better than non-fundholders at pricing “expensive” products (>£10).

Thirdly there appears to be an important paradox in our findings. There is evidence of increasing price competition between branded products, which – if companies have good market research information and are rational (both of which we would expect) – should be evidence of growing price awareness on the part of GPs and growing GP willingness to switch patients on the basis of price. Yet, the evidence from the fundholder v. non-fundholder comparisons discussed above, together with the fact that although average scores for perception of relative product prices were accurate, individual GP accuracy rates were not noticeably improved from the Ryan et al study undertaken nearly a decade ago, suggest that this may not be the case. It may be, of course, that price awareness is high enough to drive price competition between brands, and that companies are increasingly responding to this.

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Appendix 1 Match of sample with national GMS profile

General Practitioners

Location

	1997		Sample	
	No	%	No	%
Scotland	3,625	11	18	9
Northern & Yorkshire/North West	7,113	22	51	26
West Midlands/Trent/Anglia & Oxford	8,585	26	47	24
South & West/Wales	5,708	18	33	17
North Thames and South Thames	7,446	23	51	26
Total	32,477		200	

Chi-square =3.38 < 9.49

Sex

	1997		Sample	
	No	%	No	%
Males	20,221	70%	163	82
Females	8,467	30%	37	19
	28,688		200	

Chi-square =11.7 > 3.84

Type of practice

	1997		Sample	
	No	%	No	%
Single handed	3,017	9	43	22
Partnership	30,501	91	97	49
Group practice	n/a		48	24
Health Centre	n/a		18	9

Dispensing

	1997		Sample	
	No	%	No	%
Yes	4,255	16	11	6
No	22,844	84	189	95
			200	

Chi-square =15.7 > 3.84

Fundholder

	1998		Sample	
	No	%	No	%
Yes	14,722	54	86	43
No	12,670	46	114	57

Chi-square =9.7 > 3.84

Number of patients on respondents personal list

	1997		Sample	
	No	%	No	%
Under 1875	10,885	38%	61	30
1875-2250	9,224	32%	65	33
Over 2250	8,579	30%	69	35
not stated			5	3
			195	

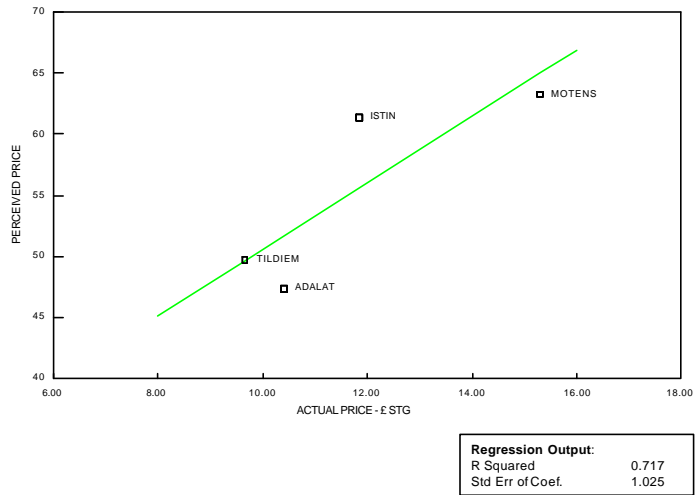
Chi-square =4.33 < 5.99

Date of Qualification

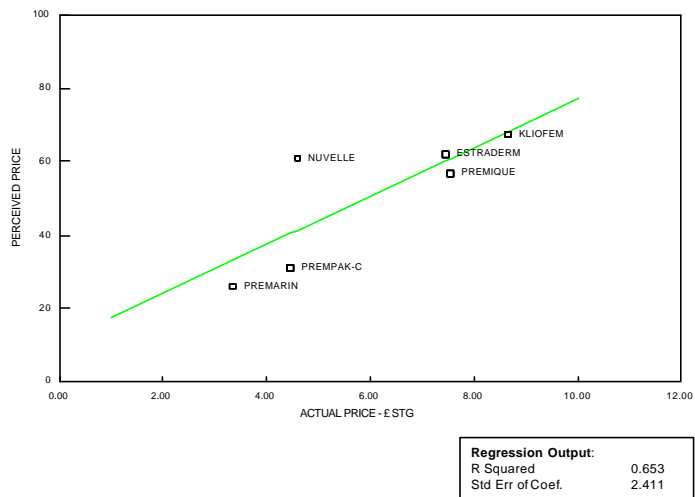
	1997		Sample	
	No	%	No	%
Pre 1975	n/a	n/a	91	46
1975-1984	n/a	n/a	79	39
1985+	n/a	n/a	30	15

Appendix 2

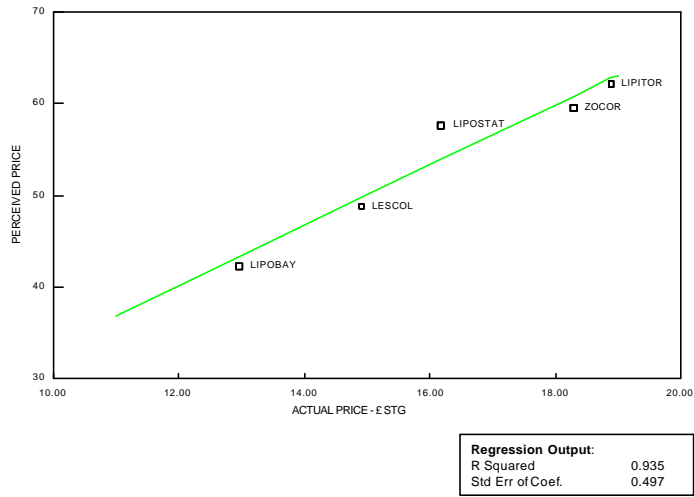
Calcium Ion Antagonists - Actual vs Perceived Prices



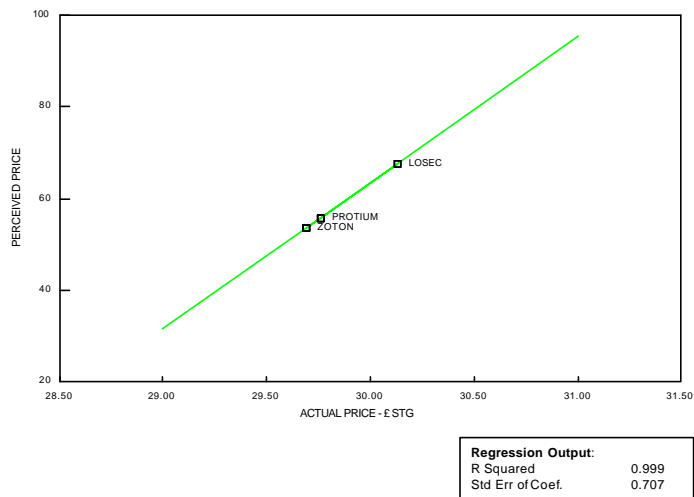
Hormone Replacement Therapies - Actual vs Perceived Prices



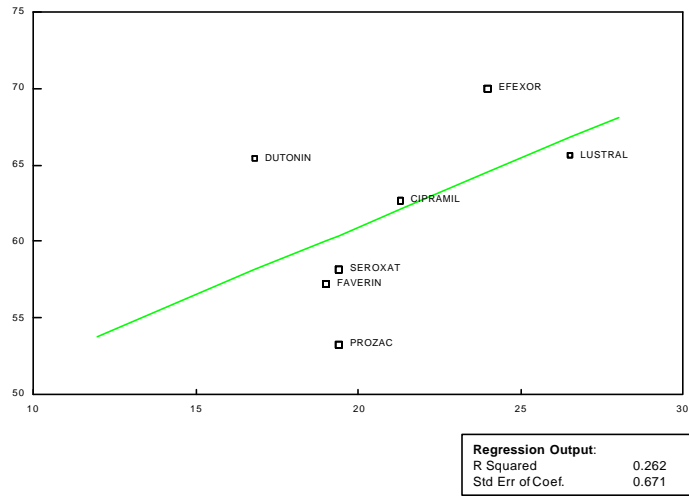
Lipid Lowering Statins - Actual vs Perceived Prices



Proton Pump Inhibitors - Actual vs Perceived Prices

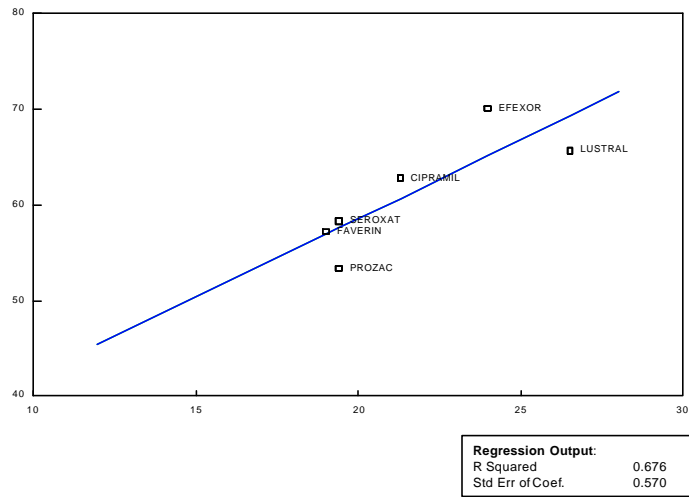


SSRIs & Similar Products - Actual vs Perceived Prices



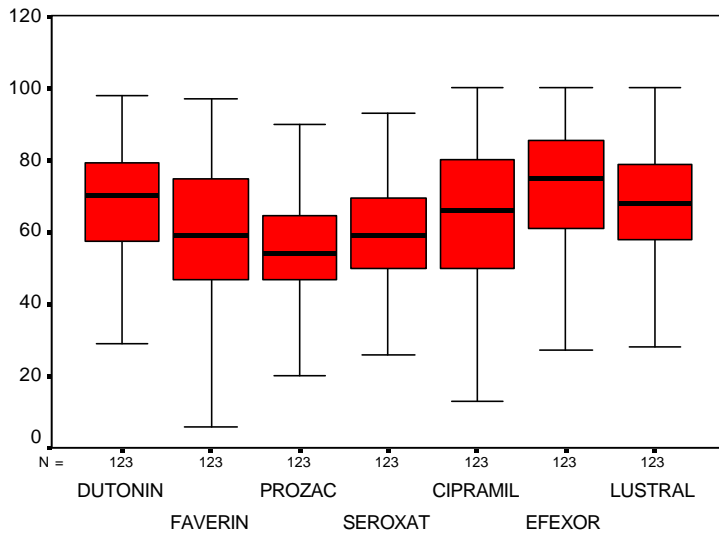
SSRIs & Similar Products - Actual vs Perceived Prices

Excludes DUTONIN which had 29% of GPs Unable to State / Don't Know Price

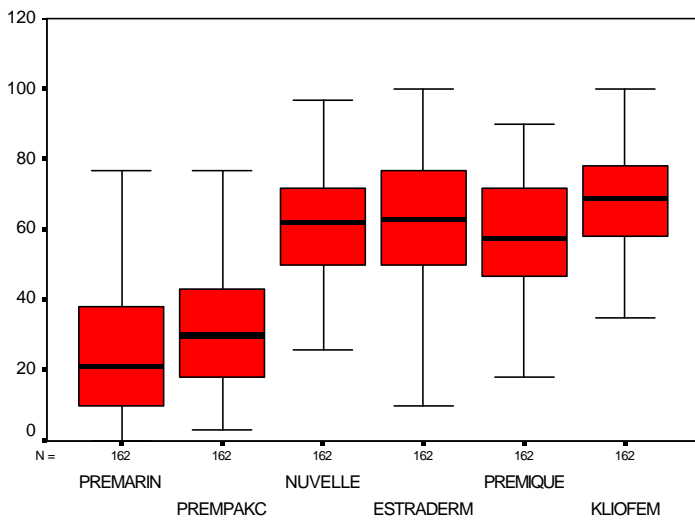


Appendix 3 : Box-plot for each therapeutic class

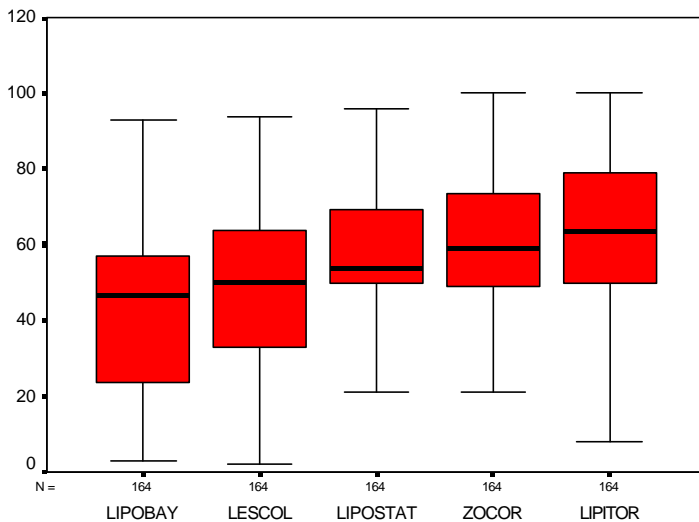
ANTIDEPRESSANTS (SSRI)



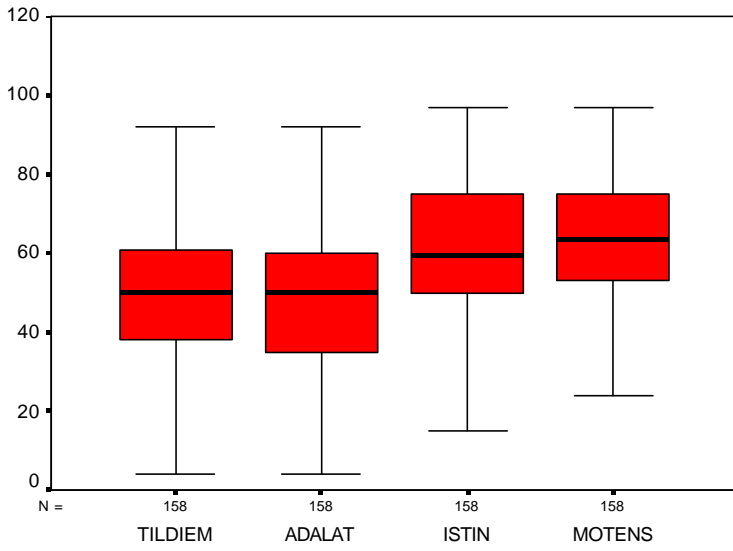
HORMONE REPLACEMENT THERAPY (HRT)



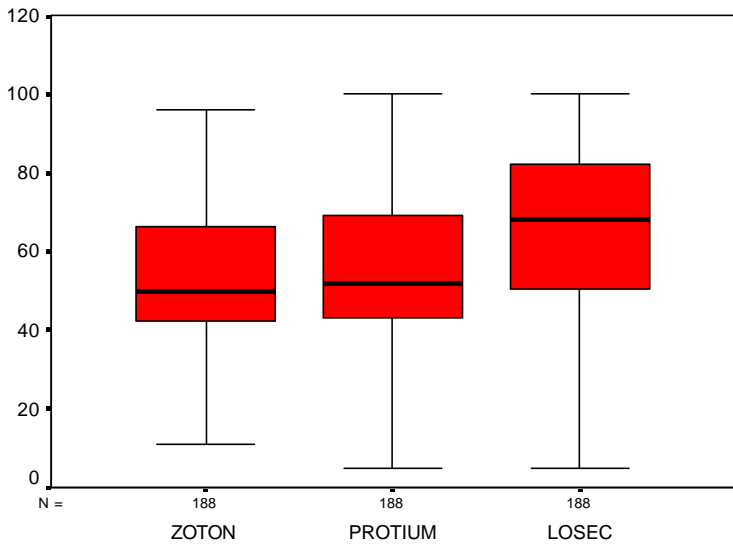
LIPID-LOWERING STATIN



CALCIUM ANTAGONISTS (CIAS)



PROTON PUMP INHIBITORS (PPI)



Appendix 4

Method 1 (based on ranking order)

	No. of errors	No. of GPs (%)					
		FH		NON-FH		ALL	
LLS	0	7	(10)	2	(2)	9	(5)
	1	4	(5)	2	(2)	6	(3)
	2	11	(15)	10	(10)	21	(12)
	3	16	(22)	18	(19)	34	(20)
	4	22	(31)	36	(38)	58	(35)
	5	10	(14)	26	(27)	36	(21)
		70	(100)	94	(100)	164	(100)
PPI	0	25	(31)	22	(20)	47	(25)
	1	11	(13)	13	(12)	24	(12)
	2	34	(42)	57	(52)	91	(48)
	3	10	(12)	16	(14)	26	(13)
			80	(100)	108	(100)	188
HRT	0	5	(7)	1	(1)	6	(3)
	1	2	(2)	1	(1)	3	(1)
	2	6	(8)	4	(4)	10	(6)
	3	13	(18)	21	(23)	34	(20)
	4	26	(36)	27	(29)	53	(32)
	5	12	(16)	24	(26)	36	(22)
	6	7	(9)	13	(14)	20	(12)
		71	(100)	91	(100)	162	(100)
CIAS	0	5	(7)	8	(8)	13	(8)
	1	7	(10)	5	(5)	12	(7)
	2	28	(40)	24	(26)	52	(32)
	3	15	(21)	27	(30)	42	(26)
	4	14	(20)	25	(28)	39	(24)
		69	(100)	89	(100)	158	(100)
SSRIs	0	0	(0)	0	(0)	0	(0)
	1	0	(0)	0	(0)	0	(0)
	2	3	(5)	3	(4)	6	(4)
	3	8	(14)	9	(13)	17	(13)
	4	13	(23)	13	(19)	26	(21)
	5	23	(41)	30	(44)	53	(43)
	6	8	(14)	13	(19)	21	(17)
		55	(100)	68	(100)	123	(100)

Method 3 (based on pairwise (equal rank = error)

	No. of errors	No. of GPs (%)					
		FH		NON-FH		ALL	
LLS	0	7	(10)	2	(2)	9	(5)
	1	9	(12)	6	(6)	15	(9)
	2	6	(8)	9	(9)	15	(9)
	3	14	(20)	17	(18)	31	(18)
	4	14	(20)	16	(17)	30	(18)
	5	5	(7)	9	(9)	14	(8)
	6	6	(8)	9	(9)	15	(9)
	7	4	(5)	6	(6)	10	(6)
	8	0	(0)	7	(7)	7	(4)
	9	4	(5)	1	(1)	5	(3)
10	1	(1)	12	(12)	13	(7)	
		70	(100)	94	(100)	164	(100)
PPI	0	25	(31)	22	(20)	47	(25)
	1	36	(45)	53	(49)	89	(47)
	2	8	(10)	18	(16)	26	(13)
	3	11	(13)	15	(13)	26	(13)
		80	(100)	108	(100)	188	(100)
HRT	0	5	(7)	1	(1)	6	(3)
	1	5	(7)	2	(2)	7	(4)
	2	6	(8)	12	(13)	18	(11)
	3	19	(26)	13	(14)	32	(19)
	4	19	(26)	24	(26)	43	(26)
	5	6	(8)	18	(19)	24	(14)
	6	5	(7)	6	(6)	11	(6)
	7	3	(4)	5	(5)	8	(4)
	8	1	(1)	1	(1)	2	(1)
	9	0	(0)	1	(1)	1	(0)
	10	0	(0)	0	(0)	0	(0)
	11	0	(0)	1	(1)	1	(0)
	12	0	(0)	1	(1)	1	(0)
	13	2	(2)	0	(0)	2	(1)
	14	0	(0)	0	(0)	0	(0)
15	0	(0)	6	(6)	6	(3)	
		71	(100)	91	(100)	162	(100)
CIAS	0	6	(8)	8	(8)	14	(8)
	1	24	(34)	20	(22)	44	(27)
	2	18	(25)	24	(26)	42	(26)
	3	14	(20)	20	(22)	34	(21)
	4	3	(4)	6	(6)	9	(5)
	5	2	(2)	2	(2)	4	(2)
6	3	(4)	9	(10)	12	(7)	
		70	(100)	89	(100)	159	(100)
SSRIs	0	0	(0)	0	(0)	0	(0)
	1	1	(1)	0	(0)	1	(0)
	2	2	(3)	4	(5)	6	(4)
	3	3	(5)	3	(4)	6	(4)
	4	7	(12)	5	(7)	12	(9)
	5	10	(18)	5	(7)	15	(12)
	6	6	(10)	12	(17)	18	(14)
	7	9	(16)	9	(13)	18	(14)
	8	7	(12)	7	(10)	14	(11)
	9	5	(9)	12	(17)	17	(13)
	10	2	(3)	4	(5)	6	(4)
	11	0	(0)	0	(0)	0	(0)
	12	3	(5)	1	(1)	4	(3)
	13	0	(0)	0	(0)	0	(0)
	14	0	(0)	5	(7)	5	(4)
15	0	(0)	1	(1)	1	(0)	
		55	(100)	68	(100)	123	(100)

Method 2 (based on pairwise (equal = no error))

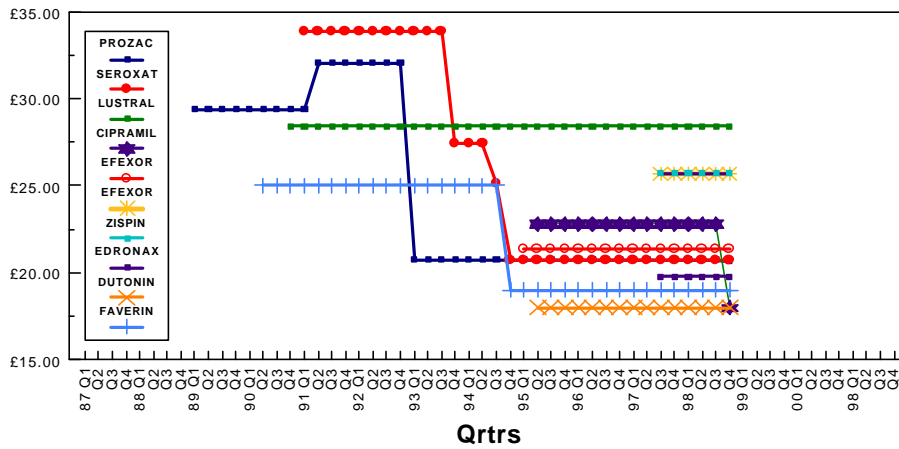
	No. of errors	No. of GPs (%)					
		FH		NON-FH		ALL	
LLS	0	16	(22)	16	(17)	32	(19)
	1	6	(8)	9	(9)	15	(9)
	2	8	(11)	7	(7)	15	(9)
	3	17	(24)	24	(25)	41	(25)
	4	12	(17)	16	(17)	28	(17)
	5	3	(4)	8	(8)	11	(6)
	6	4	(5)	5	(5)	9	(5)
	7	1	(1)	4	(4)	5	(3)
	8	1	(1)	3	(3)	4	(2)
	9	2	(2)	1	(1)	3	(1)
	10	0	(0)	1	(1)	1	(0)
		70	(100)	94	(100)	164	(100)
PPI	0	40	(50)	44	(40)	84	(44)
	1	26	(32)	47	(43)	73	(38)
	2	10	(12)	13	(12)	23	(12)
	3	4	(5)	4	(3)	8	(4)
		80	(100)	108	(100)	188	(100)
HRT	0	8	(11)	7	(7)	15	(9)
	1	4	(5)	6	(6)	10	(6)
	2	13	(18)	18	(19)	31	(19)
	3	20	(28)	22	(24)	42	(25)
	4	19	(26)	23	(25)	42	(25)
	5	4	(5)	11	(12)	15	(9)
	6	1	(1)	0	(0)	1	(0)
	7	2	(2)	3	(3)	5	(3)
	8	0	(0)	0	(0)	0	(0)
	9	0	(0)	1	(1)	1	(0)
	10	0	(0)	0	(0)	0	(0)
	11	0	(0)	0	(0)	0	(0)
	12	0	(0)	0	(0)	0	(0)
	13	0	(0)	0	(0)	0	(0)
	14	0	(0)	0	(0)	0	(0)
	15	0	(0)	0	(0)	0	(0)
		71	(100)	91	(100)	162	(100)
CIAS	0	16	(22)	23	(25)	39	(24)
	1	24	(34)	26	(29)	50	(31)
	2	13	(18)	18	(20)	31	(19)
	3	9	(12)	19	(21)	28	(17)
	4	4	(5)	1	(1)	5	(3)
	5	4	(5)	1	(1)	5	(3)
	6	0	(0)	1	(1)	1	(0)
		70	(100)	89	(100)	159	(100)
SSRIs	0	1	(1)	8	(11)	9	(7)
	1	3	(5)	3	(4)	6	(4)
	2	7	(12)	8	(11)	15	(12)
	3	5	(9)	7	(10)	12	(9)
	4	11	(20)	7	(10)	18	(14)
	5	15	(27)	11	(16)	26	(21)
	6	4	(7)	11	(16)	15	(12)
	7	4	(7)	8	(11)	12	(9)
	8	2	(3)	4	(5)	6	(4)
	9	3	(5)	0	(0)	3	(2)
	10	0	(0)	0	(0)	0	(0)
	11	0	(0)	0	(0)	0	(0)
	12	0	(0)	1	(1)	1	(0)
	13	0	(0)	0	(0)	0	(0)
	14	0	(0)	0	(0)	0	(0)
15	0	(0)	0	(0)	0	(0)	
		55	(100)	68	(100)	123	(100)

Appendix 5

Competition - Prices

Price Reductions Patent Protected Products - SSRI's & Similar

Price per Standard Pack



UK Prices of Proton Pump Inhibitors 1989 to 1998

Price per Standard Pack

