

# **Cost effective prescribing of proton pump inhibitors (PPI's) in the GMS scheme**

Bernadette McGowan, Kathleen Bennett, Lesley Tilson, Michael Barry

## **Correspondence to:**

Dr. Michael Barry - Director  
National Centre for Pharmacoeconomics  
St. James's Hospital  
Dublin 8  
Telephone: 01 4103427  
Email: [mbarry@stjames.ie](mailto:mbarry@stjames.ie)  
[info@ncpe.ie](mailto:info@ncpe.ie)

## **Abstract**

Total expenditure under the Community Drugs Schemes in Ireland on the proton pump inhibitors (PPI's) used for the management of patients with dyspepsia was approximately €64 million in 2002, an 8-fold increase since 1995. As PPI maintenance therapy accounts for the majority of this expenditure we determined potential cost savings to the GMS scheme should the prescribing of these drugs for maintenance therapy follow published clinical and cost effectiveness guidelines. Substitution, in accordance with therapeutic indication, of the PPI with the greatest individual cost i.e. omeprazole (Losec Mups) with any of the alternative agents particularly the generic omeprazole preparations Ulcid & Lopraz, rabeprazole (Pariet) and pantoprazole (Protium) would be expected to produce cost savings in excess of €5 million per annum. These savings may be further enhanced by increasing the step down from healing to maintenance doses of these drugs.

## **Introduction**

It is estimated that 10% of the population seek their general practitioner's advice for dyspeptic symptoms each year.<sup>(1)</sup> Total expenditure under the Community Drugs Schemes on the proton pump inhibitors (PPI's) which are used for the management of patients with dyspepsia has increased from approximately €3 million in 1995 to €64 million in 2002 (figure 1).<sup>(2)</sup> The PPI's, which include omeprazole (e.g. Losec Mups), lansoprazole (Zoton), pantoprazole (Protium), rabeprazole (Pariet) and esomeprazole (Nexium), are the most expensive drug group reimbursed under the Community Drugs Schemes accounting for over 10% of total drug expenditure. Using the General Medical Services (GMS) prescribing data and current clinical and cost effectiveness guidelines on the use of proton pump inhibitors in the treatment of dyspepsia we investigate current prescribing trends for this group of drugs and determine whether cost savings could be made by changes in prescribing practice.

## **Methods**

Data from the GMS Scheme was used to conduct a detailed analysis of PPI prescribing (ATC code A02BC) over a 12-month period commencing November 2002. As maintenance therapy with PPI's accounts for the majority of expenditure e.g. over 80% of costs associated with omeprazole under the GMS scheme during the study period, we included data from all patients who received uninterrupted PPI therapy for at least 3-months. We also determined the dose of each PPI used for maintenance therapy. The potential cost savings to the GMS scheme was estimated should prescribing of these drugs follow published clinical guidelines (NICE guidance) taking into consideration the doses used and the appropriate clinical indications for maintenance therapy. The statistical software package JMP-In® (SAS Institute) was used for data analysis. To estimate potential cost savings each omeprazole (Losec Mups) dose dispensed under the GMS scheme was substituted with alternative PPI's. For omeprazole (Losec Mups) 10mg and 20mg doses the change in expenditure following substitution was corrected for the percentage of prescriptions of the substituted PPI according to current GMS prescribing trends e.g. it was assumed that 72% of lansoprazole would be substituted at the higher 30mg dose. The 40mg omeprazole (Losec Mups) dose was substituted by the higher alternative PPI doses thereby avoiding overestimation of the potential savings. For the

generic omeprazole preparations which are available in 20mg strength only, we substituted the generic 20mg for Losec Mups 10mg and 20mg and substituted two of the generic 20mg for Losec Mups 40mg to determine cost savings.

## **Results**

Omeprazole was the product with the highest ingredient cost (€30.14 million) under the Community Drugs Schemes in 2002. Trends in GMS expenditure on all the PPI's for the period November 2002 to October 2003 is seen in figure 2. For patients on maintenance omeprazole 83% of total expenditure (82% of all prescriptions) was for the 20mg daily dose with the 10mg dose accounting for 11% of expenditure and 6% of total expenditure for the 40mg daily dosage. Our analysis demonstrates that maintenance therapy with other PPI's frequently occurs at the higher dose level e.g. 72% of all lansoprazole maintenance therapy was at the 30mg/day dose (Table 1). Total estimated cost savings were greatest for the generic omeprazole preparation Lopraz, rabeprazole (Pariet), Ulcid (another generic omeprazole product), pantoprazole (Protium) and Lansoprazole (Zoton) when substituted for Losec Mups. Substitution with the generic omeprazole product (Losamel) or Esomeprazole (Nexium) resulted in the lowest cost savings. The potential savings following the substitution of omeprazole (Losec Mups) with alternative PPI's is summarised in Table 1.

## **Discussion:**

Maintenance therapy with PPI's is indicated for a number of conditions including duodenal ulceration, non-steroidal anti-inflammatory drug (NSAID) induced ulceration and gastro oesophageal reflux disease (GORD). Guidance for the use of PPI's in the treatment of dyspepsia was issued following a review by the UK's National Institute for Clinical Excellence (NICE) in July 2000.<sup>(3)</sup> This guidance indicates that patients with severe GORD should be treated with a healing dose of a PPI until symptoms have been controlled. Once this has been achieved the dose should be reduced to the lowest dose that controls symptoms. A regular maintenance low dose of most PPI's will prevent GORD symptoms in 70-80% of patients and should be used in preference to the higher healing dose. All of the five available PPI's are licensed for this indication. Analysis of the GMS database indicates that with the exception of omeprazole and esomeprazole the majority of patients on long-term PPI therapy receive the higher maintenance dose e.g. lansoprazole 30mg per day accounted for 72% of all prescriptions, pantoprazole 40mg

daily 66%, rabeprazole 20mg daily 81%, omeprazole (Losec Mups) 20mg daily 82% and esomeprazole 40mg daily accounted for 48% of all prescriptions issued for maintenance therapy.

For patients with a documented NSAID induced ulcer who must unavoidably continue with NSAID therapy a PPI is indicated. After the ulcer has been healed the PPI dose should be reduced to the lower maintenance dose when possible. Three of the PPI's are indicated for the treatment of NSAID induced ulceration i.e. omeprazole, lansoprazole and pantoprazole. A similar strategy is used for the treatment of duodenal ulceration with maintenance therapy using the lower PPI dose where possible. Of course, patients with peptic ulcer disease should be assessed for *Helicobacter pylori* and receive eradication therapy if positive. Two of the PPI's i.e. omeprazole and lansoprazole are licensed for maintenance therapy in patients with duodenal ulceration. The NICE guidelines suggest that patients with non-ulcer dyspepsia should not be routinely treated with PPI's. Should symptoms appear acid related an antacid or the lowest dose of an acid suppressor e.g. H<sub>2</sub> receptor antagonist to control symptoms should be prescribed. Patients presenting in general practice with mild symptoms of dyspepsia may be treated on either a "step-up" or a "step-down" basis. Neither group should normally be treated with PPI's on a long-term basis without a confirmed clinical diagnosis being made.<sup>(3)</sup>

Omeprazole has been the number one drug in terms of ingredient cost to be reimbursed under the GMS scheme each year since 1995. Despite the fact that the majority of prescriptions for maintenance PPI's such as lansoprazole, pantoprazole and rabeprazole are at the higher dose, prescribing these drugs in preference to omeprazole (Losec Mups) for maintenance therapy still results in cost savings. This is a consequence of the pricing differences between the agents e.g. lansoprazole (Zoton) 30mg/day × 28 days = €42.70, pantoprazole (Protium) 40mg/day × 28 days = €39.30, rabeprazole (Pariet) 20mg/day × 28 days = €2.42 whereas omeprazole (Losec Mups) 20mg/day × 28 days = €19.61.

The NICE guidelines on PPI prescribing suggest the least expensive appropriate PPI should be used. As all the available PPI's are indicated for the treatment of GORD then the prescribing of the generic omeprazole Lopraz, rabeprazole (Pariet), Ulcid (a generic omeprazole product) and pantoprazole (Protium) would be expected to result in greater savings when prescribed for this indication. Similarly for long-term co-administration

with NSAID the PPI's of choice according to NICE guidance would be generic omeprazole preparations Lopraz & Ulcid and pantoprazole (Protium). For maintenance therapy in patients with duodenal ulceration our data suggests the generic omeprazole preparations Lopraz & Lopraz to be the PPI's of choice.

Generic prescribing is widely considered as a method of optimising cost effectiveness.<sup>(4)</sup> This may not always be the case in relation to the prescribing of PPI's in Ireland. Whilst the price of the generic omeprazole product losamel at 20mg x 30days = €41.46 (€1.38/tablet) is 22% lower than Losec Mups it is more expensive than the recommended maintenance dose of Lansoprazole (Zoton), pantoprazole (Protium) and rabeprazole (Pariet). The recent introduction of two additional generic omeprazole products Ulcid and Lopraz should enhance cost effective prescribing as they are priced much lower than losamel e.g. Ulcid 20mg x 28 days = €29.85 (€1.06/tablet). Therefore in this therapeutic setting generic prescribing would be expected to facilitate cost effective prescribing but the choice of generic product is of significance. The introduction of a reference price (the maximum price reimbursed by the GMS Payments Board) at the level of these generic products and the ability of the pharmacist to dispense the less expensive generic equivalent (generic substitution) is one method of realising the cost savings outlined above.

There is considerable interest in prescribing at the interface between hospitals and general practitioners and the associated transfer of costs.<sup>(5)</sup> Under the current agreement on the supply terms, conditions and prices of medicines supplied to the health services in Ireland, hospitals have the right to negotiate favourable drug prices with individual manufacturers. This results in the price of some PPI's in certain hospitals being a fraction (e.g. as low as 15%) of the cost of the drug in the community. Therefore the most cost effective PPI's in the community may not be the most cost effective in the hospital setting. This could be expected to have a significant economic impact as it has been shown that hospital initiated prescriptions are responsible for a significant proportion both in volume and cost of general practitioner prescribing.<sup>(6)</sup> Hospital initiated prescriptions have been demonstrated to be more expensive than those initiated in the community. This was mainly attributable to repeat prescriptions with a greater volume prescribed and a higher median ingredient cost.<sup>(6)</sup> The differential pricing of PPI's (and other medicines) in the hospital and community setting and the potential economic

impact merits further consideration particularly when reviewing PPI's for inclusion in hospital drug formularies.

### **Conclusion**

The PPI's were the most expensive drug group reimbursed under the GMS scheme in 2002 accounting for over 10% of total expenditure. During the 12 month study period we estimated that the total number of PPI prescriptions across the Community Drugs Schemes exceeded 1.6 million ( 1.13 million under the GMS scheme ) with associated expenditure of over € 67.9 million. Our study suggests that significant cost savings could be made by a change in prescribing practice for maintenance therapy with these drugs. Substitution in accordance with therapeutic indication, of the number one selling drug omeprazole (Losec Mups) with any of the alternative agents, particularly the generic omeprazole products Ulcid & Lopraz, rabeprazole (Pariet) and pantoprazole (Protium) would be expected to reduce drug expenditure in this therapeutic area. The estimated savings presented here may be further enhanced by increasing the step down from healing to maintenance doses of these drugs.

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## References

1. Jones R.

Clinical economics review: gastrointestinal disease in primary care.

Aliment Pharmacol Ther. 1996;10:233-239.

2. General Medical Services Payments Board.

Report for the year ending 31<sup>st</sup> December 2002.

3. Guidance on the use of proton pump inhibitors in the treatment of dyspepsia.

Technology appraisal guidance – No 7. July 2000.

National Institute for Clinical Excellence (NICE) [www.nice.org.uk](http://www.nice.org.uk)

4. Tilson L, McGowan B, Ryan M, Barry M.

Generic drug utilisation on the General Medical Services (GMS) Scheme in 2001.

Ir. Med. J. 2003;96(6):176-179.

5. Crump BJ, Panton R, Drummond M, et al.

Transferring the costs of expensive treatments from secondary to primary care.

BMJ 1995;310:509-512

6. Feely J, Chan R, McManus J, O'Shea B.

The influence of hospital based prescribers on prescribing in general practice.

Pharmacoeconomics 1999;16(2):175-181.



Figure 1. Proton Pump Inhibitor (PPI) expenditure under the Community Drugs Schemes (GMS & DPS/DCS) 1995-2002.

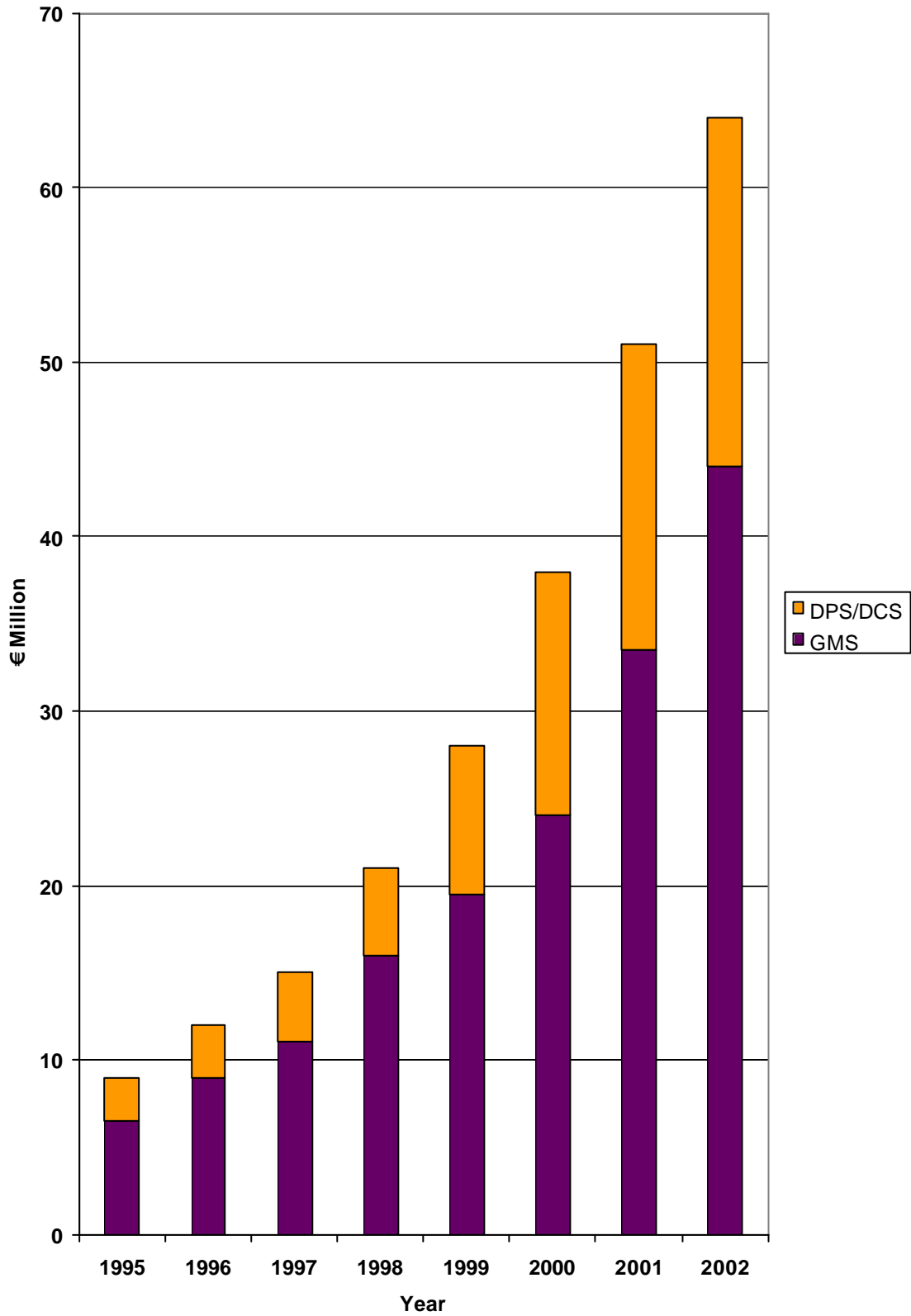
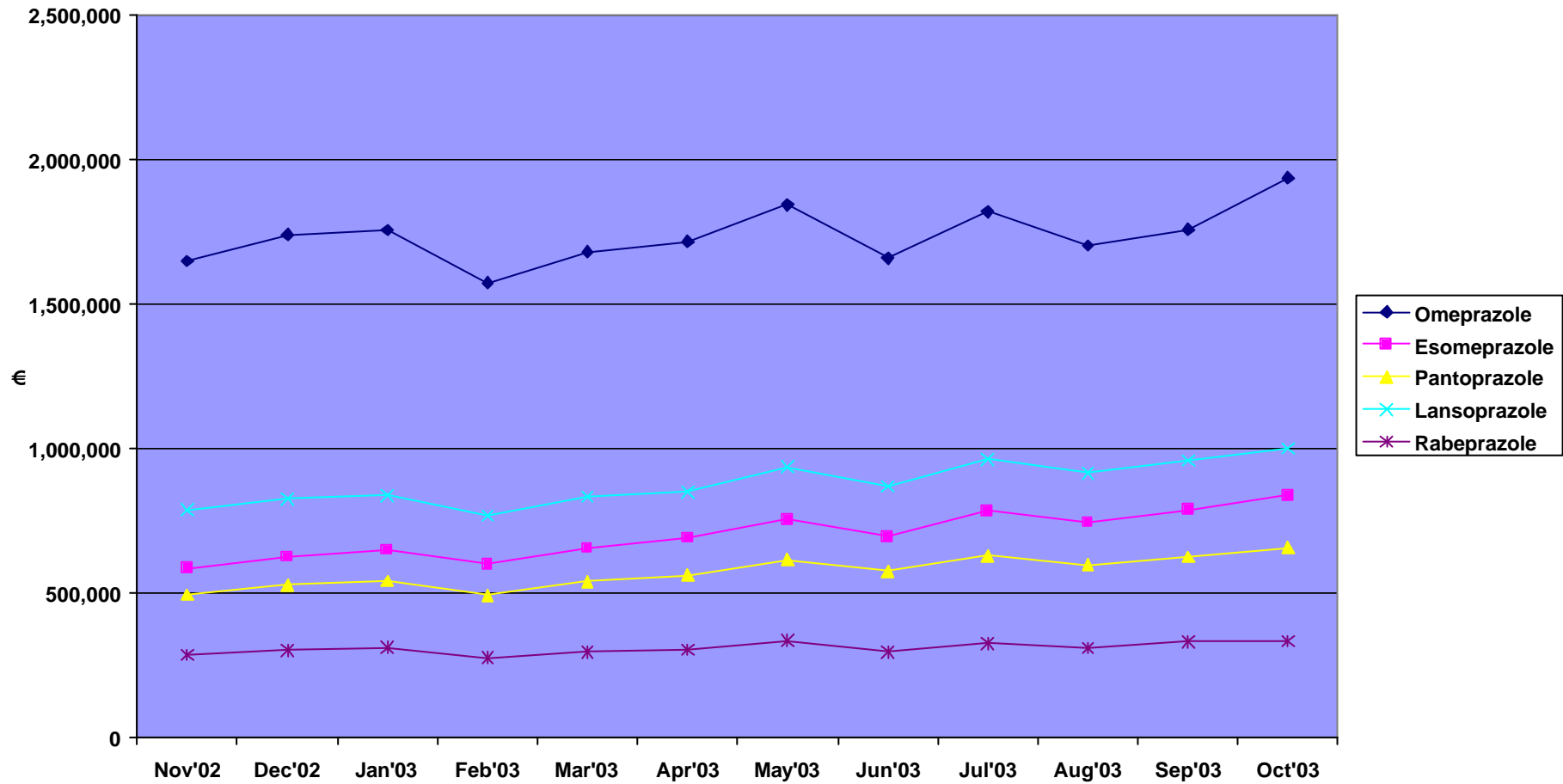


Figure 2: Total monthly expenditure on PPIs in the GMS nationwide between Nov'02 and Oct'03



**Table 1.**

Estimated annual savings following the substitution of omeprazole (Losec Mups) with alternative proton pump inhibitors during maintenance therapy according to current prescribing practices in the GMS scheme.

<b>Drug (Trade Name)</b>	<b>Strength mg</b>	<b>Percentage of prescriptions dispensed at given strength</b>	<b>Estimated savings when substituted for omeprazole (Losec Mups) corrected for % prescriptions at higher and lower doses</b>
Generic Omeprazole (Losamel)	20mg	100%	€3,135,971
Esomeprazole (Nexium)	20mg 40mg	52% 48%	€3,355,926
Lansoprazole (Zoton)	15mg 30mg	28% 72%	€4,233,020
Pantoprazole (Protium)	20mg 40mg	34% 66%	€5,728,656
Generic Omeprazole (Ulcid)	20mg	100%	€6,419,600
Rabeprazole (Pariet)	10mg 20mg	19% 81%	€6,829,631
Generic Omeprazole (Lopraz)	20mg	100%	€6,843,294

Note: Not all PPI's are indicated for maintenance therapy of peptic ulcer disease or NSAID induced ulceration. All are indicated for maintenance therapy of GORD.