

Taming the Escalating Costs of Ireland's Community Drugs Schemes

Duncan Fortescue-Webb

CLINICAL POINTS

- The Community Drugs Schemes provide prescription drugs to patients through community pharmacies, and cost €1.9 billion in 2008.
- Minister Harney has recently implemented legislation to reduce the cost of the Community Drugs Schemes by reducing payments to drugs manufacturers, wholesalers and pharmacists; and requiring patient co-payments for all prescriptions dispensed.
- Future legislative reform is likely to include introduction of reference pricing, pharmacist-led substitution, renegotiation of prices with manufacturers, and disinvestment of ineffective drugs.
- Prescriber initiatives to reduce drugs expenditure can significantly ease the healthcare budget and forestall cutbacks to services.
- Generic prescribing continues to have an important role in improving patient safety and reducing drugs costs.
- Prescriber comparison of the prices of competing drugs and brands for the same indication can improve cost-effective prescribing.
- One third of prescriptions for the over 70s contain potentially inappropriate items. The most frequent include: PPIs at full therapeutic strength for over 8 weeks, NSAIDs for over 3 months, long-acting benzodiazepines for over 1 month, and duplicate drugs.
- Use of antibiotics to treat illnesses that are not likely to be bacterial is ineffective, causes adverse effects in one fifth of patients, and leads to antimicrobial resistance.

ABSTRACT

A reduced public budget has increased pressure to improve the efficiency of healthcare provision in Ireland. Legislative changes to reduce margins throughout the drugs supply chain and increase patient co-payments have recently been implemented. The background and implications of these changes are considered for manufacturers, wholesalers, pharmacists, patients and the public purse. Together, the changes are predicted to reduce the cost of providing drugs in the community in 2010 by nearly €270 million (11% of the projected €2.4 billion they would otherwise cost). However, underlying growth trends in drugs expenditure, particularly in the burgeoning high-tech drugs market, mean that although recent changes should contain the cost of drugs in 2010 at a level similar to 2009, annual growth of 12% is likely to resume thereafter unless additional reform is implemented. Slated future legislative changes that could be worth a further €200 million or more annually include: reference pricing, pharmacist-led substitution, renegotiation of manufacturer prices, and disinvestment of non-cost-effective drugs from public schemes. Finally, ways to improve prescriber habits are considered that could save an additional €100 million annually. These include periodic and critical reviews of patient prescriptions, more judicious use of antibiotics, generic prescribing, prescriber awareness of drug prices, and provision of prescribing software.

INTRODUCTION

Health accounted for 27% of Ireland's total public current expenditure in 2008 and, therefore, is of central importance in any strategy to ease the public budget¹. The Health Service Executive (HSE) provides most public healthcare and had a budget of over €14 billion in 2008². €1.9 billion of this was spent on prescription drugs supplied through pharmacies via the Community Drugs Schemes³. The cost of these schemes has been growing lately by about 12% each year^{3,4} (Figure 1), and quintupled during the last decade because of changing demographics, the introduction of expensive new therapies, and a bloated supply chain. The rate of increase is among the highest in Europe⁵ and the burden on public finances has come under increasing criticism. Mary Harney, Minister for Health and Children, recently implemented cost-containment measures to reduce payments to manufacturers, wholesalers and pharmacists, and to increase patient co-payments. This paper will examine the background and effects of these changes, the potential for further cost-control legislation, and the role of prescribers in the development of an efficient drugs supply system.

OVERVIEW OF DRUG DEVELOPMENT AND SUPPLY IN IRELAND

Drug research and manufacturing produces over half of Ireland's exports, employs about 24,500 people directly, and contributes over €1 billion in corporation tax⁶: it naturally also enjoys considerable political clout. To bring a new drug to market can take a research-based manufacturer upward of a decade and cost as much as €1 billion⁷. Once

chemical entities with promising biological activity are identified they must be assessed for safety, toxicity, pharmacokinetics, metabolism and efficacy via a series of in vitro, animal and human clinical trials. The vast majority of potential drugs fail. A twenty year patent is commonly granted to the originator company once a promising chemical entity has been identified. This patent typically lasts 8-12 years beyond the time required to bring the drug to market⁷ and gives the company exclusive rights to manufacture and supply the drug. When the patent expires, generic competitors may enter the market.

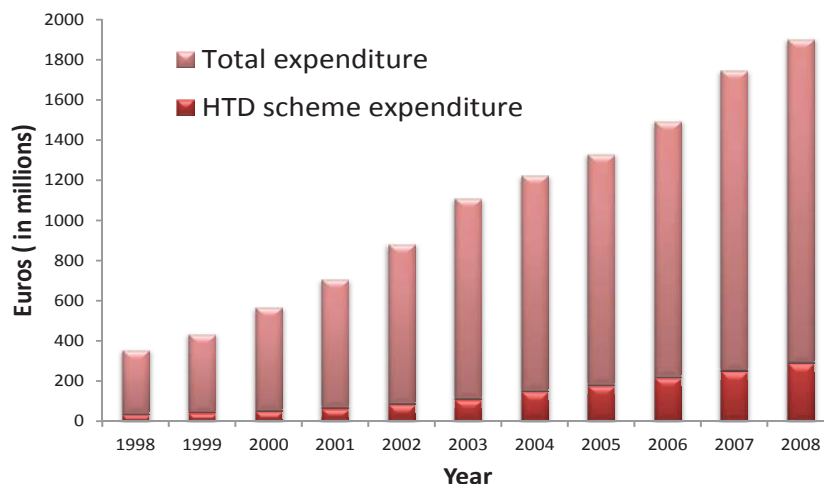
Every drug has an International Nonproprietary Name (INN) granted by the World Health Organisation (WHO). The INN reflects the therapeutic mechanism of the drug and is used to refer unambiguously to a specific chemical entity (e.g. omeprazole). In addition, the originator company chooses one or more brand names under which to market the drug (e.g. Losec). When the patent expires other manufacturers may also market the same drug under generic brands (e.g. BySec, Lopraz, Losamel, Ucid) or the INN. These generic manufacturers incur relatively low development and regulatory costs, and typically sell the drugs at a lower price than the originator company.

Once a drug has been approved for sale in Ireland, the HSE negotiates an ex-factory price with the manufacturer based on the average price in nine European countries⁸. The manufacturer sells the drug to wholesalers, who add a mark-up and sell it on to pharmacists and hospitals. Pharmacists then dispense the drug, adding any applicable mark-up and fees. A prescription that specifies a brand of drug cannot be dispensed as another brand, but a generic prescription (where only the INN is used) can be dispensed as any available brand. About 85% of all community prescription drugs are paid for by the HSE through the

Community Drugs Schemes⁹; the remainder is paid for by patients.

There are four major Community Drugs Schemes in Ireland providing prescription drugs through pharmacies. The largest Community Drugs Scheme is the means-tested General Medical Scheme (GMS)

Minister Harney has sought ways to control drugs costs while still encouraging future drug innovation and ensuring continuity of supply to patients. To achieve this she has recently undertaken extensive renegotiation of the agreements that govern costs throughout the drugs supply chain.



▲ Figure 1. Expenditure under the Community Drugs Schemes, 1998-2008

which provides drugs to medical card holders for 50c an item. The Long-Term Illness scheme (LTI) provides drugs to treat any of fifteen chronic conditions (e.g. cystic fibrosis, epilepsy, diabetes) for 50c an item. Together, the GMS and LTI cover approximately one third of the population and account for two thirds of expenditure³ (Figure 2). The Drugs Payments Scheme (DPS) is available to all residents and limits the drugs cost to a €120 co-payment per family per month. Finally, the High Tech Drugs scheme (HTD) provides certain high-price drugs such as chemotherapy adjuncts and biologic agents that would otherwise be provided primarily in hospitals, with patient co-payment dependant on eligibility under the GMS, LTI or DPS schemes. The HTD is the most rapidly expanding scheme, with costs increasing between 2004 and 2008 by 18% a year (Figure 1) (HTD historic cost data from M Barry; personal communication, 16 February 2010)^{10,11,12}.

RECENT LEGISLATIVE CHANGES AFFECTING THE COMMUNITY DRUGS SCHEMES

In order to conserve scarce resources for home support and acute hospital activities, Minister Harney implemented several measures in 2009 and 2010 to reduce public costs throughout the drugs supply chain. The groups targeted to achieve this reduction include manufacturers, wholesalers, pharmacists and patients.

Since 2006, under the IPHA/HSE Agreement, when a drug's patent expires and a generic competitor enters the market, the price is reduced immediately by 20% and then by another 15% of the original price 22 months later¹³. The Irish Pharmaceutical Healthcare Association (IPHA) of research-based manufacturers have now agreed to reduce prices of nearly 300 off-patent drugs by a further 40% from February 2010¹⁴, leaving these drugs at least 61% below their previous on-

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patent price. Prior to February 2010, original branded drugs typically cost 10% more than their generic competitors¹⁵. Now, however, Ireland is in a unique situation with many well known proprietary brands of drugs from IPHA manufacturers costing about 30% less than equivalents from competing generic manufacturers.

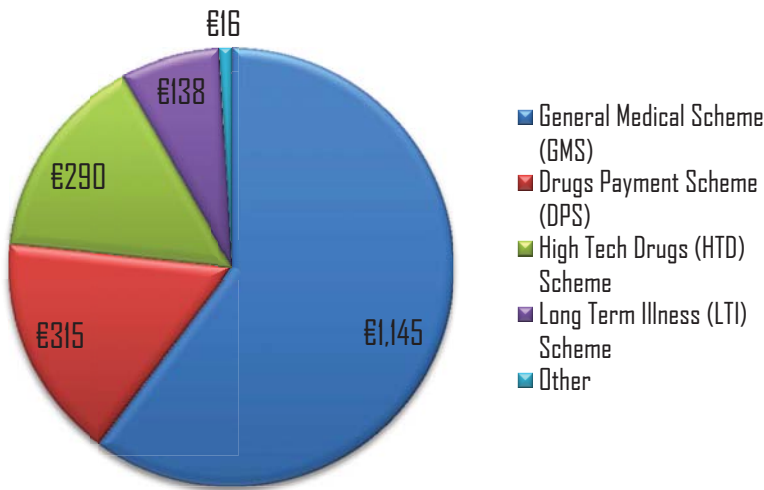
In addition, IPHA manufacturers are required from February 2010 to pay the HSE a rebate of 4% of the ex-factory price for all other drugs sold under any of the Community

dispensing fee structures under the GMS, LTI and DPS (to cover miscellaneous costs such as spoilage and repackaging) have been replaced with a more generous single sliding scale: €5 for the first 1667 items dispensed by a pharmacy per month, €4.50 for the next 833, and €3.50 for any remaining items¹⁸. The standard patient care fee of €60.52 per month paid to pharmacists under the HTD scheme is unaffected. These changes in payments to wholesalers and pharmacists should save €141 million per year.

EFFECTS OF RECENT LEGISLATIVE CHANGES

Minister Harney's recent legislative changes will promote efficient healthcare and bring long term cost benefits. However, the disruption as the drugs market adjusts to these changes is likely to bring many indirect consequences which will erode the cost savings.

Minister Harney's recent changes will reduce revenues of IPHA drug manufacturers through the implementation of the 40% price reduction on 300 off-patent drugs and the 4% rebate for all other drugs. However, these manufacturers have secured two significant concessions by agreeing to reduce prices six months before their existing contracts were due to expire in September 2010. Firstly, renegotiation of prices for on-patent drugs (which account for about 75% of drug expenditure¹⁹) has been deferred 18 months until February 2012, protecting the largest part of the manufacturers' revenues from any further reduction. Secondly, the 40% price reduction will not automatically apply to drugs whose patents expire after January 2010²⁰. Several blockbuster drugs will come off patent in 2011 including: atorvastatin (Lipitor) which cost €94 million in 2008, clopidogrel (Plavix) which cost €24 million, and olanzapine (Zyprexa) which cost €23 million³. Revenues from these drugs will therefore remain relatively high even once the patents expire and generic competitors can enter the market. These two concessions mean IPHA manufacturers will be able to maintain revenues from their most lucrative drugs for longer, offsetting the price reductions for their off-patent drugs and the increased rebate, and thereby diminishing the true savings to the Community Drugs Schemes.



▲ Figure 2. Expenditure by Community Drugs Scheme (in millions of Euros), 2008

Drugs Schemes. Previously a 3.53% rebate applied under only the GMS. Together, the 40% price reduction and the increased rebate are expected to save €94 million per year¹⁴.

Legislative changes to wholesale and pharmacist mark-ups and fees were implemented in July 2009 to contribute to cost reduction. The wholesale mark-up has been reduced from 17.66% to 10%, which brings the price paid for delivery of drugs to pharmacies back towards the European average of 8%¹⁶. Previously about half of the wholesale mark-up was being passed from wholesalers to pharmacists as discounts¹⁷. The pharmacist mark-up applicable under the DPS and LTI schemes has also been reduced from 50% to 20%. Furthermore, the previous standard

Finally, the maximum patient co-payment under the DPS has been increased by 20% to €120 per family per month from January 2010. Patient co-payments of 50c per item (capped at €10 per family per month) have also been introduced under the GMS and LTI schemes from April 2010. These co-payments should save €52 million per year¹.

Without intervention, the 12% per year growth trend of the Community Drugs Schemes would have brought their cost to about €2.4 billion in 2010. Altogether, the above measures recently introduced by Minister Harney are predicted to reduce the 2010 Community Drugs Schemes cost by €270 million (about 11%), minimising any cost increase over 2009.

However, non-IPHA generic manufacturers declined to match the IPHA 40% price reduction and 4% rebate. Their prices are now less competitive compared to IPHA manufacturers', and they risk losing significant market share. Many generic manufacturers may find that it is no longer profitable to operate within the Irish market and may cease operations in Ireland entirely, with adverse implications for employment and long-term competition. Additionally, the 2006 IPHA/HSE Agreement triggers a phased 35% price reduction when a drug comes off-patent only if a generic competitor enters the market. If fewer generic manufacturers operate in Ireland it is likely there will be a longer delay between patent expiration and generic entry, allowing IPHA manufacturers to maintain market dominance and high prices for their drugs that come off-patent.

The recent changes are also expected to bring wholesaler and pharmacist dispensing revenues down by about 30%¹⁷, encouraging competition and efficiency. Between 2004 and 2010, the number of pharmacies in Ireland increased by 28% to 1705^{21,22}. This boom is unsustainable in the face of such severe revenue cuts and the general economic downturn. Already many pharmacies are running at a loss, several have closed, and the Independent Pharmacy Ownership Scheme (which had minority holdings in nearly 150 pharmacies) has gone into liquidation²³. There is a risk that patient access to services will be hindered if pharmacies in rural or deprived areas close. A further problem is that the Community Drugs Schemes provide a perverse incentive to pharmacists and wholesalers to fill generic prescriptions with the most expensive available drug in order to maximise their mark-up. With many pharmacies and wholesalers in financial difficulty it is likely some will resort to preferentially supplying more expensive brands, inflating the costs of the Community Drugs Schemes. Parallel imports, where pharmacists and wholesalers source

drugs more cheaply from wholesalers abroad, allow greater profit margins and are likely to increase, bringing the hazard that counterfeit drugs may more easily enter the supply chain.

Changes to patient co-payments are intended both to raise revenue and to discourage unnecessary drug use by influencing prescriber and patient habits. However, the system of patient co-payments has two major flaws. Firstly, increased patient co-payments will cause some price-sensitive patients to reduce their consumption of drugs that have significant clinical merit for chronic conditions such as cardiovascular disease²⁴. Reduced consumption will hinder disease management programmes, increase acute hospital admissions, and add to HSE running costs. Secondly, although the co-payments may ease the Community Drugs Schemes budget, they merely shift the costs onto patients. Therefore the overall proportion of the nation's wealth that is spent on drugs is not reduced, and so no net resources are freed for use elsewhere. Future reform should aim to reduce total drug expenditure across both public and private sectors.

Altogether, Minister Harney's recent reforms are intended to reduce the projected €2.4 billion cost of the Community Drugs Schemes in 2010 by €270 million. Assuming that market adjustments do not erode these savings significantly, this will be sufficient to restrain overall drug expenditure near 2009 levels during 2010. However, unless long-term strategies are developed to improve both price competition within the drugs market and prescribing habits, underlying growth trends of 12% per year will then resume. An emerging issue is the HTD scheme, which cost €290 million and accounted for 15% of the Community Drugs Schemes expenditure in 2008. Recent reforms fail to address the cost of the scheme beyond imposing a 4% rebate on the ex-factory price of these drugs, worth €14 million in 2010^{3,18}. The cost of the

HTD scheme has been increasing by 18% per year between 2004 and 2008, far more than the 11% increase of the other schemes (Figure 1). If this growth rate continues unchecked, the HTD scheme expenditure will approach €900 million in 2015.

Long-term control of the costs of the Community Drugs Schemes without compromising patient care requires ongoing reform from both legislators and prescribers. Several strategies to further reduce drug expenditure are available. Future legislative reform offers the chance to address some of the current shortcomings in current drugs market legislation as well as to implement entirely new initiatives. Educational efforts to improve the cost-effectiveness of prescribing while improving patient care could begin immediately but are likely to be relatively slow to show results.

FUTURE LEGISLATIVE CHANGES TO THE COMMUNITY DRUGS SCHEMES

Four major changes expected for the Community Drugs Schemes are reference pricing, pharmacist-led drug substitution, renegotiation of drug prices with manufacturers, and disinvestment of selected drugs.

Introduction of a reference pricing system has been proposed for 2011¹¹. Under this system, a maximum reimbursement price would be agreed for groups of interchangeable drugs with the same active ingredient. For example, whether omeprazole is dispensed as the original brand, Losec, or as one of many available generic versions, the HSE will only reimburse at the stated reference price based on the cheapest alternative. If the patient insists on a more expensive branded product without medical justification, he must pay the price difference from his own pocket²⁵. Reference pricing is an effective way to legislate for reduced drug expenditure without compromising prescriber autonomy or patient care²⁶, and is already in place in eighteen European countries.

CONCLUSION

Public budget cuts provide an impetus to legislators and prescribers to overhaul the provision of healthcare. Efforts to improve the efficiency of the drugs supply in Ireland can both save public money and improve patient care. Recent changes to the Community Drugs Schemes are a generally promising first step, but the need remains for further legislation and improved prescriber habits. Future policy debate is likely to be dominated by how to encourage price competition within the drugs market and how to address the rapidly growing costs of novel biologic products. Ireland can afford to maintain one of the best healthcare systems in the world; what we can no longer afford is to run the system inefficiently.

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REFERENCES

1. Health Estimates for 2010. Department of Health and Children. 9 December 2009. Available from: www.dohc.ie/press/releases/2009/20091209.html
2. Annual Report and Financial Statements 2008. Health services Executive. May 2009. Available from: www.hse.ie/eng/services/Publications/corporate/arafs08.pdf
3. Statistical analysis of claims and payments 2008. Primary Care Reimbursement Service. Available from: www.hse.ie/eng/staff/PCRS/PCRS_Publications/FSA2008.pdf
4. Barry M, Boland R, Bradley C, Devlin J, Hughes C, Logan P, et al. Economies in Drug Usage in the Irish Healthcare Setting. 2009. Available from: www.dohc.ie/publications/pdf/economies_drug_usage.pdf?direct=1
5. Pharmaceuticals: Europe Industry Guide. Datamonitor. April 2009. Available from: www.bioportfolio.com/cgi-bin/acatalog/Pharmaceuticals-Europe-Industry-Guide.html
6. Why Ireland should be your location of choice. Pharmaceutical Ireland. 2009. Available from: [www.pharmaceuticalireland.ie/Sectors/PCI/PCI.nsf/vPages/News_and_events-ireland-as-a-location-of-choice-03-12-2009/\\$file/Ireland%20as%20a%20location%20of%20choice.pdf](http://www.pharmaceuticalireland.ie/Sectors/PCI/PCI.nsf/vPages/News_and_events-ireland-as-a-location-of-choice-03-12-2009/$file/Ireland%20as%20a%20location%20of%20choice.pdf)
7. Research and Development. Irish Pharmaceutical Healthcare Association. Available from: www.ipha.ie/alist/medicines-innovation.aspx
8. Coughlan JJ, Fortescue-Webb D, Heaney R, Judge G, Tilson L, Barry M. ISPOR Global Health Care Systems Road Map. June 2009. Available from: www.ispor.org/HTARoadMaps/Ireland.asp
9. Barry M, Molloy D, Usher C, Tilson L. Drug expenditure in Ireland 1997 – 2007. IMJ November 2008. IMJ 101(10):299-302. Available from: www.imj.ie/Issue_detail.aspx?issueid=+&pid=3860&type= Papers
10. Barry M, Tilson L. Recent developments in pricing and reimbursement of medicines in Ireland. Expert Rev. Pharmacoeconomics Outcomes Res. 2007 7(6), 605 – 611 Available from: www.expert-reviews.com/doi/abs/10.1586/14737167.7.6.605
11. Pricing and Reimbursement of Medicines – February 2010. Department of Health and Children. February 2010. Available from: www.dohc.ie/fact_sheets/pr_medicines_201002.pdf?direct=1
12. Your Guide to the Long-Term Illness Scheme. Health Service Executive. 21 October 2009. Available from: www.hse.ie/eng/services/Find_a_Service/entitlements/Long_Term_Illness
13. 2006 IPHA/HSE Agreement. Available from: www.ipha.ie/GetAttachment.aspx?id=76a31074-9c28-4917-af35-b3546572a415
14. Harney M. Written Answers, 11 February 2010. Available from: www.kildarestreet.com/wrans/?id=2010-02-11.614.0
15. Wall M. Switch to generic drugs saves €15m, not €200m. Irish Times. 14 April 2009. Available from: www.irishtimes.com/newspaper/health/2009/0414/1224244622790.html
16. A fair price for wholesalers means lower medicine prices. Health Service Executive. 25 February 2008. Available from: www.hse.ie/eng/services/news/2008_Archive/Feb_2008/A_Fair_Price_for_Wholesale_Services_Means_Lower_Medicine_Prices.html
17. Minister Harney announces reductions in payments to community pharmacists to reduce rapid rise in State expenditure on drugs and medicines. Department of Health and Children. 18 June 2009. Available from: www.dohc.ie/press/releases/2009/20090618.html
18. Health Professionals (Reduction of Payments to Community Pharmacy Contractors) Regulations 2009. Department of Health and Children. 1 July 2009. Available from: www.dohc.ie/legislation/statutory_instruments/pdf/si20090246.pdf?direct=1
19. Generic drug utilisation in Ireland 2008. National Centre for Pharmacoeconomics. April 2009. Available from: www.ncpe.ie/u_docs/doc_163.pdf
20. Donnellan E. Prescription for big savings. Irish Times. 2 February 2010. Available from: www.irishtimes.com/newspaper/health/2010/0202/1224263572987.html
21. Data taken from the Retail Pharmacy Business Register of The Pharmaceutical Society of Ireland. February 16 2010. Available from: public.pharmaceuticalsociety.ie
22. Statistical Analysis of Claims and Payments 2005. Primary Reimbursement Service. Available from: www.hse.ie/eng/Staff/PCRS/PCRS_Publications/Primary_Care_Reimbursement_Service_Financial_and_Statistical_Analysis_2005.pdf
23. Noonan L. Pharmacy ownership scheme collapses. Irish Independent. 5 February 2010. Available from: www.independent.ie/business/irish/pharmacy-ownership-scheme-collapses-2049465.html
24. Goldman DP, Joyce GF, Yuhui Zeng. Prescription Drug Cost Sharing: Associations with Medication and Medical Utilization and Spending and Health. JAMA 2007;298:61-69. Available from: jama.ama-assn.org/cgi/content/full/298/1/61
25. Culliton G. Pricing ourselves out of the market? Irish Medical Times. 31 July 2009. Available from: www.imt.ie/opinion/2009/07/pricing_ourselves_out_of_the_m.html
26. Aaserud M, Austvoll-Dahlgren A, Kösters JP, Oxman AD, Ramsay C, Sturm H. Pharmaceutical policies: effects of reference pricing, other pricing, and purchasing policies. Cochrane Database of Systematic Reviews 2006, Issue 2. Art. No.: CD005979. Available from: www.cochrane.org/reviews/en/aboo05979.html
27. Generic Prescribing. National Medicines Information Centre. Volume 15 Number 1. 2009. Available from: www.stjames.ie/GPsHealthcareProfessionals/Newsletters/NMICBulletins/Generic%20bulletin%20NMIC%20v15No1%20web%20with%20refs.pdf
28. Konijn P. Pharmaceutical products – comparative price levels in 33 European countries in 2005. Statistics in Focus, Economy and Finance. 45/2007. 2 February 2007. Available from: ec.europa.eu/cache/ITY_OFFPUB/KS-SF-07-045/EN/KS-SF-07-045-EN.PDF
29. The role of oral nutritional supplements in primary care. National Medicines Information Centre. 2004; 10;2. Available from: www.stjames.ie/GPsHealthcareProfessionals/Newsletters/NMICBulletins/NMICBulletins2004/The%20Role%20of%20Oral%20Nutritional%20Supplements%20in%20Primary%20Care%20Vol.10%20No.2%202004.pdf
30. Drugs worth €46 million inappropriately prescribed to elderly. Centre for Ageing Research and Development in Ireland. 18 September 2009. Available from: www.cardi.ie/?q=news/drugsworth%2%82%AC46millioninappropriatelyprescribedtoelderly
31. Policy Group on Healthcare-Associated Infection. Antibiotic Use And The Implications For Healthcare-Associated Infection. Royal College of Physicians of Ireland. 22 September 2009. Available from: www.rcpi.ie/News/Documents/AntibioticUseandImplicationsforHCAI.pdf
32. Mitchell S. HSE's Bitter Pill to Swallow. Sunday Business Post. 22 November 2009. Available from: archives.tcm.ie/businesspost/2009/11/22/story45786.asp
33. Cunney R. Antibiotic Use and Antibiotic Resistance in Ireland. HSPC. November 2008. Available from: www.hpsc.ie/hpsc/A-Z/Microbiology/AntimicrobialResistance/EuropeanSurveillanceofAntimicrobialConsumptionESAC/EuropeanAntibioticAwarenessDay/File,340,2008,en.pdf
34. McGowan B, Bergin C, Bennett K, Barry M. Utilisation of Antibiotic Therapy in Community Practice. Ir Med J October 2008 273-6. Available from: www.imj.ie/UserControls/WritePDF/ISSUE342/Original_Paper_Utilisation_of_Antibiotic.pdf
35. Prescriptions Dispensed in the Community Statistics for 1998 to 2008: England. The NHS Information Centre, Prescribing Support Unit. 29 July 2009. Available from: http://www.ic.nhs.uk/webfiles/publications/presdisp98-08/Prescriptions_Dispensed_in_the_Community_1998_2008_England_a.pdf
36. Gisbert JP, Pajares JM. Esomeprazole-based therapy in Helicobacter pylori eradication: a meta-analysis. Digestive and Liver Disease. April 2004 Volume 36, Issue 4, pp. 253-259. Available from: www.ncbi.nlm.nih.gov/pubmed/15115337
37. Harris G. 2 New Fronts in Heartburn Market Battle. New York Times. 20 August 2003. Available from: www.nytimes.com/2003/08/20/business/2-new-fronts-in-heartburn-market-battle.html?pagewanted=1