

demographic factors underlying the cost of GMS prescribing in Ireland are complex and inter-related. Alternative solutions to the question GMS coverage in the elderly may need to be found soon that prove fiscally and economically sustainable. The large gap in GMS prescribing costs between men and women in early adulthood requires further investigation.

#### PHP69

##### THE TRANSPARENCY OF NATIONAL HEALTH CARE COSTS IN THE 'EUROPEAN UNION FIVE (EU-5)'

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**OBJECTIVES:** Cost-effectiveness analyses play a key role in the reimbursement of health care technologies and require health care resource use (HRU) cost inputs. Inaccuracies in inputs can lead to potentially significant differences in results. Thus, the availability of HRU costs is vital for decision-making. This study's objective is to assess the transparency and ease of access to HRU costs in France, Germany, Italy, Spain and the UK. **METHODS:** A targeted search and contact with country-specific representatives highlighted existing national documentation. A cross-sectional selection of costs were searched for including GP and nurse costs; hospital bed and overhead costs; drug prices; follow-up/out-patient visit costs; and the availability of Diagnosis-Related Group (DRG) codes and tariffs. The transparency and availability of costs were assessed using the following criteria: the date, access restrictions and the need for assumptions to generate cost estimates. **RESULTS:** DRG tariffs were identified for all countries, but the availability of other data varied. Drug prices were obtainable online (such as the website MedicPrix, France), but others required paid registration (Giofil, Italy). The UK had the most accessible primary and secondary care HRU cost data through PSSRU. Italy was the least transparent however AIFA informed us a website reform will increase access to data in 2014. Where not explicit, HRU costs can be indirectly derived from total procedure codes (for example through ATIH, France). Spain and Italy's regional structure made sourcing national cost data challenging, resulting in wide ranges in input costs in published cost-effectiveness analyses. **CONCLUSIONS:** Whilst some nations provided transparent HRU cost data, others did not, causing inconsistent inputs across cost-effectiveness analyses. To minimise inconsistency we propose a hierarchy of evidence for use when sourcing costs: 1) Govt/health service official sources; 2) Official international websites (OECD/WHO); 3) Published economic studies; 4) Published non-economic studies; 5) National expert opinion; and 6) Unofficial websites/sources.

#### PHP70

##### A RETROSPECTIVE ANALYSIS OF DRUG REIMBURSEMENT DECISIONS IN IRELAND: A MULTI CRITERIA DECISION ANALYSIS APPROACH

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**OBJECTIVES:** Standard approaches to economic evaluations based on cost utility analysis are increasingly considered inadequate. While simple and intuitive, it is acknowledged that the QALY alone does not capture all aspects of health benefit. Multi Criteria Decision Analysis (MCDA) has been proposed as a way of incorporating multiple factors influencing the value of a health technology. The objective of this study was to analyse past reimbursement recommendations by the National Centre for Pharmacoeconomics (NCE) in Ireland in order to identify factors which have influenced decisions in the past. **METHODS:** Based on published literature, national guidelines and experience, a list of potentially influencing criteria was identified. Information on each criterion was extracted for each full pharmacoeconomic assessment conducted by the NCE. Logistic regression was used to estimate the impact each of these criteria has had on past recommendations. Model fit was assessed using the Deviance Information Criterion and the best fit model was chosen using backwards stepwise regression. **RESULTS:** Between 2006 and May 2013 the NCE conducted 54 full pharmacoeconomic assessments. Each of these was scored against 14 criteria, which can be grouped into clinical utility, consumer demand, economic incentives, societal perspective and efficiency/affordability. The model of choice identified criteria of each group which impact on reimbursement recommendations. **CONCLUSIONS:** This analysis shows that factors other than cost per QALY have impacted on past valuations of health technologies in Ireland. Since the analysis was carried out retrospectively, these factors have influenced decisions in an informal manner and do not necessarily represent the factors which should influence future reimbursement decisions. This approach contrasts with methods used elsewhere to estimate weights for the criteria. The results of this analysis provide a basis for the development of a MCDA approach to HTA in Ireland, which has the potential to improve consistent and transparent decision making.

#### PHP71

##### MEDICAL CARDS DURING RECESSION: HOW MANY, FOR WHOM AND HOW MUCH?

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**OBJECTIVES:** To model the age, gender and regional pattern of GMS coverage rates as they are key determinants of public spending on GMS medicines. **METHODS:** We used PCRS (Primary Care Reimbursement Service) and CSO (Central Statistics Office) databases to estimate GMS coverage rates by age, gender and region in 2010 and 2011. Assuming log-normally distributed incomes we used CSO SILC data to estimate GMS coverage semi-elasticities in 2010. We estimated how much GMS male and female coverage rates in 7 adult age categories and 8 Irish regions in 2010 responded to changing average income levels, income inequality and income thresholds. We tracked how well our predicted GMS coverage rates fitted actual rates in 2011. We simulated the 2011 GMS medicines cost burden of a ceteris paribus repeat of the 2010 changes in income and income-inequality. **RESULTS:** Our modelled coverage rates have high goodness of fit compared to conventional econometric estimates. Coverage income-semi-elasticity ranges from .7 to 2.3, is highest for elderly age cohorts and in the South-East and South-West regions and

is similar for males and females. Growing inequality generally increases GMS coverage but pushes some persons aged over 70 above the qualifying income threshold. Repeating 2010 average income in 2011 would increase the 2011 GMS medicines cost by around €110m; repeating the 2010 inequality changes would increase it by a further €105m, ceteris paribus. **CONCLUSIONS:** Fiscal cutbacks during recession induce countervailing increases in the medical card population and the public cost of its medicines. These are the first systematic and detailed estimates – by age, gender and region – of whose medical access is affected and how much the offsetting public cost will increase.

#### PHP72

##### THE BURDEN OF DISEASE ATTRIBUTABLE TO PHYSICAL INACTIVITY IN THE AUSTRIAN REGION OF BURGENLAND

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**OBJECTIVES:** About 52.6% or 125,434 people of the population in Burgenland is physical inactive. As a risk factor for several chronic diseases like cardiovascular diseases, type 2 diabetes, osteoporosis, depression, back-pain, hypertension, breast cancer and colorectal carcinoma physical inactivity can potentially be a substantial public health burden. Furthermore, it is one of the greatest risk factors for global mortality. Hence, the aim of the analysis was to estimate the direct health-care costs saved, the number of diseases and premature death saved each year attributable to a health promotion program focusing on walking ("3,000 steps" more). **METHODS:** The evaluation of the health-economic impact was performed using a cost-of-illness analysis. We have used relative risk (RR) estimates from the literature to evaluate the effects of physical inactivity on the above mentioned diseases. Afterwards, the population-attributable fraction (PAF) for each illness to estimate the risk factor on the given disease was computed. Direct medical costs were considered from the health care system perspective. Costs were calculated bottom-up for the year 2012. We have calculated effects of a reduction in inactivity level by 10,000 physical inactive people in Burgenland. **RESULTS:** Results show that physical inactivity causes 27,542 cases of illness as well as 50 premature deaths in population of Burgenland, leading to a total cost-of-illness of 58.9 million Euro (6.3% of total health expenditure). Reducing the inactive group by 10,000 people, 2,221 cases of illness and cases of death will be reduced by four. Moreover the cost of illness could be reduced by 6.40 million Euro each year of which 5.03 million Euro are directly related to diminish physical inactivity. **CONCLUSIONS:** Physical inactivity represents an important public health burden in Austria. Even modest reductions in inactivity levels could result in substantial cost savings.

#### PHP73

##### THE IMPACT OF THE BLIND BID PROCEDURE IN HUNGARY

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**OBJECTIVES:** The modified reference price procedure, which was introduced in October 2011, caused significant savings in the Health Insurance Fund's Pharmaceutical budget. In our analysis we aim to give an insight into the effects of this measure on the drug consumption and on the sales of the pharmaceutical companies as well as measure the generated savings and losses on the side of the industry. In the course of the analysis we examine the change in the demand of the related drugs and in their composition, from the aspect of industry, financier and patients. We explore which are the price strategies of the companies and are they managed to increase the sales or decrease the losses with them. The proper knowledge of the effects of blind bid will support the decision making of the concerned market actors as well as the further rulemaking. **METHODS:** A retrospective data analysis was conducted on the official NHIFA (national Health Insurance Fund) monthly data-base between October 2011 and March 2013. **RESULTS:** In the blind bid procedure 90 companies, 169 active substances and more than 2100 product were involved. The relevant products market share is almost 30% of the total Hungarian Pharmaceutical budget, which is almost 1 billion € annually. As we found, the blind bid process has a significant saving effect for the financier. The cumulative savings on the 18 months period reached 113 millions € for the financier. It means 24% reduction on the average reimbursement level, whilst the average manufacturer price decreased 16% and a minimal 3% savings was realized on the co-payment side. **CONCLUSIONS:** Huge savings were realized with this new reference pricing method, where the financier realized the most of the savings.

#### PHP74

##### COST-EFFECTIVENESS OF AN INTERFACE GERIATRIC INTERVENTION: ACUTE MEDICAL UNIT COMPREHENSIVE GERIATRIC ASSESSMENT INTERVENTION STUDY (AMIGOS)

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**OBJECTIVES:** Older people (>70) with high risk of future health problems discharged from acute medical units (AMU) within 72 hours, in Nottingham and Leicester, England, were included in an RCT of an interface geriatric intervention (IGI) comprising geriatrician assessment and further specialist management. The objective was to assess cost-effectiveness of IGI compared to standard care. **METHODS:** In the trial-based economic evaluation, 417 participants (IGI: 205) were analysed at 90-day follow-up. Health (inpatient, day-case, outpatient), social care and IGI resource-use data were collected and combined with unit costs to estimate total cost. Quality-adjusted life years (QALY), based on EQ-5D valuations at baseline and follow-up, were obtained for 254 (60.9%) participants. Multiple imputation by chained equations was applied to deal with missing QALY values. Cost and QALYs were adjusted by baseline characteristics using regression methods, and probabilistic incremental cost-effectiveness ratios (ICER) were constructed. Sub-group analysis was carried

out for patients who had not been hospitalized within six months prior to index AMU admission. **RESULTS:** In the whole group, total cost for IGI was higher (£207.4, 95%CI: £94.8-£331.2) with no QALY gain (-0.001, 95%CI: -0.009-0.007); IGI was dominated by standard care (3%-probability of ICER<£30,000/QALY). In the sub-group of 209 patients (IGI: 106) without a hospital stay in the previous six months, total cost for IGI was lower (-£274.2, 95%CI: -£480.4--£46.3) with non-significant QALY gain (0.001, 95%CI: -0.011-0.013), and 49%-probability of IGI being dominant (90%-probability of ICER<£30,000/QALY). In the whole group (sub-group), inpatient cost was lower by £212 (£778), and social care cost was higher (lower) by £220 (£141), comparing IGI to standard care. **CONCLUSIONS:** The IGI for high-risk older people discharged from AMU was not cost-effective for all patients, but was cost-effective in patients without a hospital stay in the previous six months. This suggests targeting the intervention is required.

#### PHP75

##### ANALYSIS OF TOTAL TREATMENT COSTS OF ORGANOPHOSPHOROUS POISONING IN A TERTIARY CARE HOSPITAL

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**OBJECTIVES:** To establish the correlation of log mean cost with respect to APACHE II score, pre-hospitalization and length of hospital stay, and to determine the intra-group variance of log mean treatment costs in different parameters. **METHODS:** Categorical data was presented as frequencies with percentages and was analyzed by Chi-square test, log regression and Pearson correlation. A logarithmic transformation was used for total cost to convert into normal distribution. Geometric mean and Geometric SD was used to summarize total cost. One way ANOVA was used to compare the mean of log (total cost) across various categorical variables. Multiple linear regression was used to find the factors associated with total cost of hospitalization of OPP. Correlations was used for measuring the strength of linear relationship between total cost and APACHE II score. **RESULTS:** A significant variance in log mean treatment costs was observed in different parameters like pseudocholinesterase levels, type of poison consumed, anticholinergics administered and incidence of intermediate syndrome. A high mean cost was observed in patients with a pseudocholinesterase level of less than 2000 and those who consumed WHO class Ib pesticide. A cost difference of INR 25,000 was noted in patients who developed intermediate syndrome. The APACHE II score, pre-hospitalization period and length of hospital stay had significant correlation with log cost. Among the variables, length of hospitalization had strong correlation with log cost ( $r=0.673$ ,  $p<0.001$ ). For every one-unit increase in pre-hospitalization period, APACHE II score and length of hospital stay, the log cost increases by INR 1.01, 1.27 and 1.5 respectively. **CONCLUSIONS:** High costs of treatment coupled with a proportionately great loss of man-days, make OPP an extremely important area for pharmaco-economic evaluation and for framing appropriate policies for remedial measures. Hence studies evaluating treatment regimens with respect to costs and outcome are highly desirable.

#### PHP76

##### COST OF INTENSIVE CARE STAY IN TURKEY: IN THE VIEW OF PAYER AND HEALTH CARE PROVIDER

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**OBJECTIVES:** The demand for intensive care units has risen in the recent years as the increasing aged population in all countries and in Turkey. The aim of the study is to calculate the average cost of intensive care stay (ICS) and to compare the cost with the reimbursement amount depending on a public hospital data in Turkey. **METHODS:** The records of ICSed patients from a public hospital in Ankara were evaluated retrospectively between November 2011 and January 2012. The hospital cost and reimbursement amount were calculated depending on the data. **RESULTS:** A total of 104 patients stayed in the given time line. Four patients excluded due to the missing data in files. The average cost of pharmaceuticals, medical devices, laboratory, health care and total cost per patient were calculated as 1209.16 TL± 492.46, 137.48 TL± 41.08, 422.35 TL± 108.70, 873.10 TL± 247.82 and 2992.43 TL± 994.06, respectively. The average reimbursement amount per patient was calculated as 2846.59 TL± 842.60. The average profit or deficit of the hospital were calculated for the 1st,2nd,3rd,4th,5th,6th,7th,8th,9-15th,16-29th and 30-51st days as 34.90 TL± 49.69, -75.48 TL± 671.39, -23.25 TL± 315.41, 382.80 TL± 368.58, 283.09 TL± 628.57, -266.13 TL± 612.81, 312.45 TL± 416.11, 118.99 TL± 729.00, -916.58 TL± 1430.94, -1500.57 TL± 3217.87 and -2054.55 TL± 3204.79, respectively. The profit and deficit trend line was calculated with the number of ICS days as  $y = -51,889x^2 + 446,98x - 631,73$  ( $y$ =profit or deficit,  $x$ =hospital stay days). **CONCLUSIONS:** It was concluded that the average daily cost of ICS increased depending on the length of stay. The patients in critical state who needed more ICS days may have caused this. On the other hand, it was observed that the fixed daily reimbursement amount is inadequate for prolonged ICS. As a result this leads to the deficits of the hospitals in the prolonged ICS.

#### PHP77

##### REVIEW OF THE USE OF RESOURCE USE INSTRUMENTS BASED ON PATIENT RECALL IN RELATION TO OTHER METHODS OF COST ESTIMATION

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**OBJECTIVES:** Instruments for resource use measurement based on patient-recall (e.g. questionnaires, logs and diaries) are used extensively in trial-based economic evaluations; sometimes on their own and sometimes alongside other methods for estimating costs. The aims were to assess: 1) how resource use instruments are used in practice; 2) which items of resource use are based most frequently on patient-recall; and 3) how estimates compare if more than one method of

data collection is used for the same resource items. **METHODS:** Articles citing 38 trial-based resource use instruments catalogued in the MRC-funded Database of Instruments for Resource Use Measurement ([www.DIRUM.org](http://www.DIRUM.org)) were identified using Google Scholar, ISI Web of Science and Scopus, and screened according to resource use measure usage. Data were extracted on: the method of administration, resources measured, rates of return and the nature of the other methods of resource use measurement. **RESULTS:** A total of 146/1503 citations met the screening criteria. Nearly all (143/146) used resource use instruments derived from Beecham and Knapp's Client Service Receipt Inventory. Most instruments relied on patient- or proxy-recall (126/146) generally administered during researcher interviews. Primary and secondary care usage were the most widely asked items (136/146) with 75 using no supplementary supporting data such as from hospital notes. Twelve studies compared one or more method of data collection for the same resource items with 8 indicating good agreement between medical records and patient/carer recall, 1 indicating the greater reliability of case notes and 3 were not evaluable. **CONCLUSIONS:** Resource use instruments based on patient recall are valuable complements to other methods and essential for certain items (e.g. out of pocket costs, non-medical costs). However, there remains inappropriate use in circumstances where more objective measures are available.

#### PHP78

##### BEYOND PATENT EXPIRY: DEVELOPMENT OF A MODEL FOR PRICING GENERIC DRUGS IN SOUTH AFRICA

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**OBJECTIVES:** Generic drugs provide a safe, effective and affordable alternative to medicines whose patent protection has expired. Generics have to meet the same quality standards as the innovator drugs; the only substantive difference is the price. Generic manufacturers compete 'on a knife-edge' of narrow margins of profitability. The generic pharmaceutical industry is risky and complex, success depends on the number of other generic drug manufacturers on the market, which affects the profit margins and volumes that each company could realize. The objective of the current study was to develop a model that explains the effect of generic drug entry on price competition after patent expiration in the pharmaceutical industry. **METHODS:** Innovators and their generics selected from all the chemical entities whose patents expired from 1999 through 2009. Data were obtained from IMS Health (Market Segmentation Report) and National Department of Health (Database of Medicine Prices) for the patents' expiration dates, prices, sales volume, therapeutic group, schedule, and dosage forms of drugs in the sample. **RESULTS:** A year after patent expiration, the innovators' products retained an average of 59% of the market share; the generic-to-innovator price ratio was at an average of 65%. By the end of the first year after patent expiration, an average of 2 generics was registered per innovators' product. **CONCLUSIONS:** Generic entry is commercially driven; it is influenced by the market size of the innovator product prior to the expiry of the patent protection. Generic penetration is slow, only intensifies after 5 years since the loss of patent protection. The price erosion of the innovator product is strongly influenced by generic penetration. The cost of drugs in South Africa is not coming down fast enough.

#### PHP79

##### HOSPITAL RESOURCE USE IN CHRONIC DISEASE COMBINATIONS: IS IT ENOUGH TO JUST ADD THEM UP?

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**OBJECTIVES:** Economic evaluations often ignore the possibility of non-linear health care costs when chronic diseases occur in combination. This paper aims to quantify the comparative effect of single and multiple chronic diseases on hospital resource use. **METHODS:** Using records of all admissions to public hospitals in the state of Victoria, Australia in 2010-2011 we estimate multiple regression models of hospital length of stay (and total annual discharges) for combinations of 11 chronic diseases. For length of stay we run separate models for same-day and overnight stays, adjusting for observed and unobserved characteristics of patients. **RESULTS:** A higher chronic disease count decreases the odds of a same-day hospitalization (day-case) exponentially while some disease combinations increased these odds. Having ischemic heart disease (IHD) & dementia doubled the odds of a day-case compared to a patient with dementia only. Among overnight stays, having a mental disease had the highest single disease effect on length of stay (LOS) – increasing LOS by 3-4 days. Some disease combinations had non-additive effects (i.e. their combined effect was greater/less than the sum of their single disease effects) on LOS while others were additive. The interaction effect in a depression-renal failure combination added 3 days to its single disease effects, while in cancer-osteoporosis it was -2 days. Disease combinations that produced a positive interaction effect were usually unrelated diseases. We found disease count to be positively correlated with number of admissions. Having a combination of diseases was generally found to have a less-than-additive effect on the number of admissions. **CONCLUSIONS:** Patients with chronic diseases have a resource use pattern that includes longer lengths of stays and more admissions. Combinations of unrelated diseases are particularly correlated with longer lengths of stay therefore it is the disease and combination type that is associated with higher lengths of stay and admitted episodes.

#### PHP80

##### PHARMACEUTICAL EXPENDITURE, CLINICAL OUTCOMES AND EXPENDITURES ON OTHER HEALTH SERVICES

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