Cost Containment Measures for Pharmaceuticals Expenditure in the EU Countries: A Comparative Analysis

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Abstract: A vast majority of the EU countries are witnessing a rise in the share of public pharmaceutical spending in the total drugs expenditure. This urges governments to adopt cost containment measures through more stringent norms in their pharmaceutical policies. The aim of this paper is to review the existing pharmaceuticals cost-containment policies in the EU in order to illustrate the complexity of the drug policy decision making and to assess the effectiveness of the cost containment measures introduced so far in the 27 selected countries. The paper is focused on measures aimed at reducing the public expenditures on pharmaceutical products.

It is shown that cost containment policies for pharmaceutical expenditure are mostly targeted towards supply side measures, as they are proved to be more effective than demand side measures. However, price control policies do not guarantee expenditure control as long as they are not accompanied by control over volume. Rationalizing consumption volume should be targeted as well by giving more importance to demand side measures.

We argue that, given the structurally imperfect pharmaceutical market and the dominant position of the supply side, it is maybe unrealistic to expect cost containment measures to be very successful. With an aging European population demanding more health care and an enlarging EU, it is likely that the debate concerning pharmaceutical expenditure will become a never ending story. At the same time, substantial evidence shows that the effect of innovative drugs is worth the increased cost. Therefore, a change of perspective from the cost of medicines per se to the cost-benefit ratio of the pharmaceuticals might be the solution, almost ignored so far.

1. INTRODUCTION

Over the past decades, pharmaceutical expenditures have increased rapidly. The increase in total pharmaceutical expenditures (as shown in Fig. **1**) is driven by many factors, including changes in demographic and diseases patterns, the introduction of new and expensive drugs and the increase of me-too drugs [1].

Most EU member states have publicly funded healthcare systems and the proportion of pharmaceutical expenditure, as a portion of total health expenditure, is high (Fig. **2**). Also, a vast majority of the EU countries are witnessing a rise in the share of public pharmaceutical spending in the total drugs expenditure (Fig. **3**) thus urging governments to adopt cost containment measures through more stringent norms in their pharmaceutical policies. On average across countries, 60% of pharmaceutical expenditure is borne by public funds, the rest being met by out-of-pocket payments and private insurance [2]. However, there is a wide variation in public spending on pharmaceuticals, ranging from less than 40% in Italy or Poland to more than 80% in Ireland or the Netherlands (Fig. **3**).

Also in the new EU member states from Central and Eastern Europe a large share of total expenditures on pharmaceuticals is paid for by public means. Different measures have been introduced in an attempt to contain costs, but at the same time these countries have maintained their inherited concern with protecting vulnerable groups and those suffering from serious diseases [3].

A variety of controls and incentives are in use across different EU countries in order to better manage pharmaceutical expenditure. Initially, the emphasis was on supply side measures, but demand-side measures have attracted a lot of attention over the past 10 years.

However, despite the abundance of cost-containment policies, there have been few rigorous studies in Europe to analyze the economic and health impact of these strategies [3]. In assessing the effectiveness of different measures, one should remember that it is difficult to determine which of the approaches has been most successful, since they are most of the times applied in a combination of measures and in a specific context.

The aim of this paper is to review the existing pharmaceuticals cost-containment policies in the EU in order

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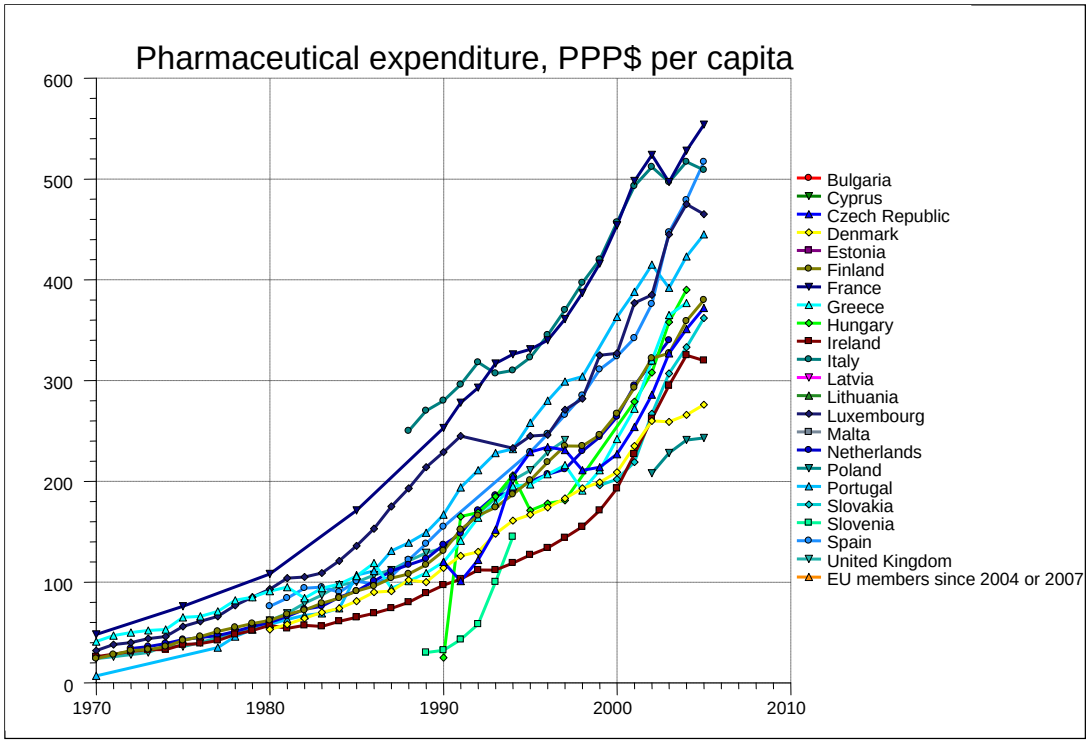

Fig. (1). Pharmaceutical expenditure per capita. Source: WHO/Europe, European Health for All database (HFA-DB).

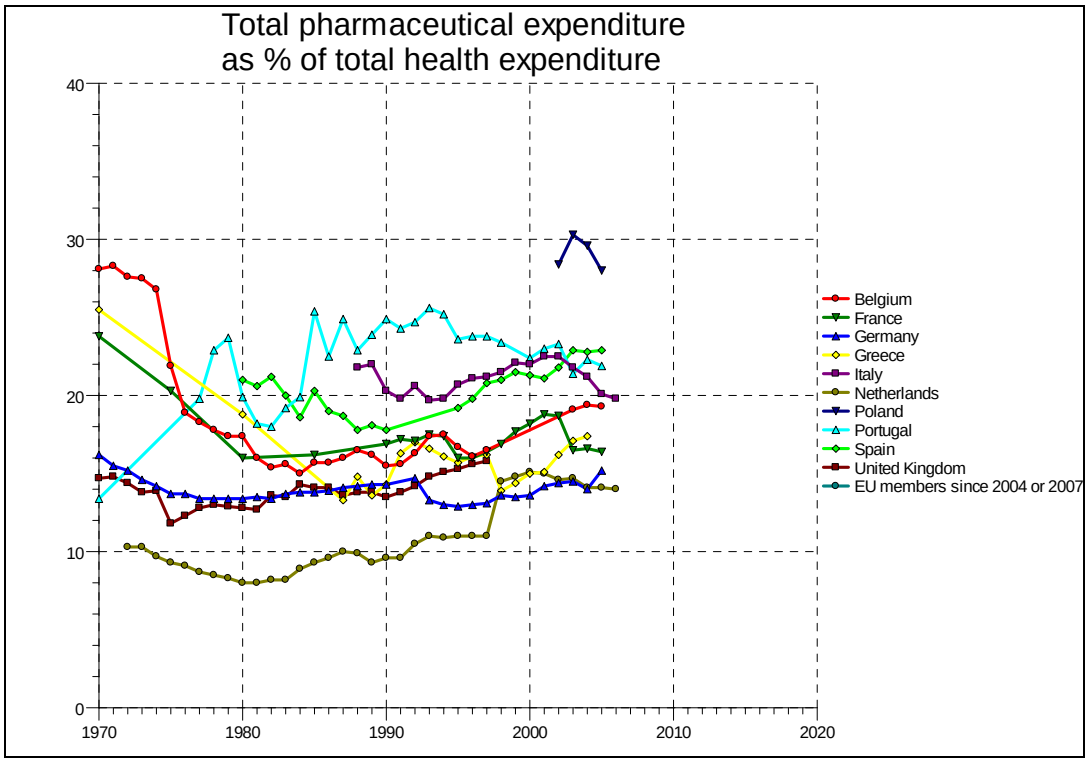

Fig. (2). Total pharmaceutical expenditure as % of total health expenditure. Source: WHO/Europe, European Health for All database (HFA-DB).

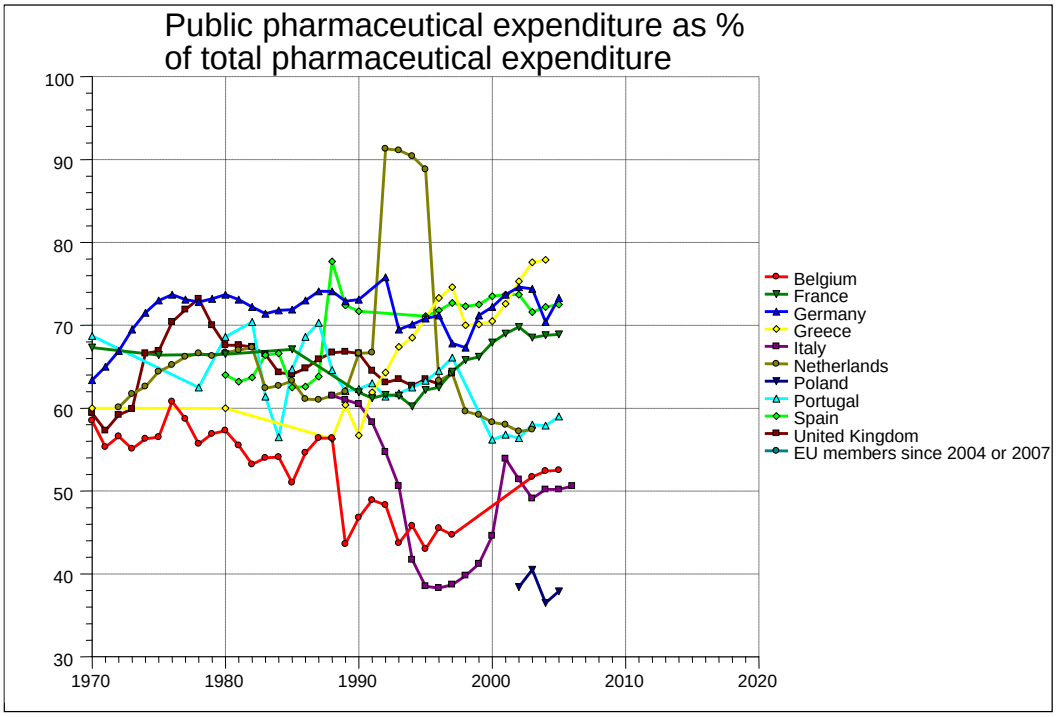

Fig. (3). Public pharmaceutical expenditure as % of total pharmaceutical expenditure. Source: WHO/Europe, European Health for All database (HFA-DB).

to illustrate the complexity of the drug policy decision making and to assess the effectiveness of the cost containment measures introduced so far in the 27 selected countries. The paper will be focused on measures aimed at reducing the public expenditures on pharmaceutical products.

2. METHODOLOGY

In order to answer the research question concerning EU pharmaceutical expenditures, official data from OECD and WHO statistics on pharmaceutical expenditures are used. We further use the computerized Pubmed system to identify studies regarding cost containment policies published in health care management and economics journals between 1997 and 2008 in European Union countries. The following key words were used: pharmaceuticals cost containment, pharmaceuticals reimbursement system, reference pricing, pharmaceuticals price control, pharmaceuticals profit control, generic substitution, co-payments for pharmaceuticals, followed by the name of every EU country. Further, a manual search was performed and some articles published in Health Policy and Pharmacoeconomics journals were added. While many studies were published on the topic of pharmaceuticals cost containment in "old" member states of EU, few articles have been found regarding the pharmaceuticals policies in the new member states and their impact. However, many changes took place in the last years in the new member states, due to the fact that these countries had to upgrade their legislation to comply with EU regulation on intellectual property rights and regulatory prices of pharmaceutical while applying the cost containment measures as well [4].

For each of the selected countries, the evolution of pharmaceuticals expenditures in the last 10 years was analyzed and an overview of the cost containment policies during the last 10 years will be presented. This is followed by a comparative analysis of the cost containment policy tools that countries have used to contain pharmaceutical expenditures. For the purpose of this study, the cost containment strategies will be analyzed from two different points of view: supply-side cost containment measures and demand-side cost containment measures.

The drug market can be divided into three types: the over-the-counter (OTC) submarket, the hospital submarket and the prescription submarket [5]. The focus of this paper will be on prescription market, due to the fact that this market represents in most EU countries 75-85% of total pharmaceuticals expenditures and that this prescriptions are reimbursed by public funds.

3. COMPARATIVE ANALYSIS

The pharmaceutical market is characterized by market imperfections in both the supply (generally related to patent protection and the process of regulatory approval) and the demand side (where the demand is influenced at four

Table 1. Supply Side Coercive Measures

Country	Positive List	Negative List	Price Control	Profit Control	Individual or Global Budgets	Delay in Approval Procedures for Market Authorization
Austria	√		√	√	No	√
Belgium	√		√	√	√	√
Bulgaria	√		√	No	√	N/A
Cyprus	√		No	N/A	N/A	N/A
Czech Republic	√		√	N/A	N/A	N/A
Denmark	√		√	N/A	No	√
Estonia	√		√	N/A	N/A	N/A
Finland	No	√	√	N/A	N/A	√
France	√		√	√	√	√
Germany	√	√	√	No	National budgets	N/A
Greece	Recent abolition of the list		√ (also for OTCs)	N/A	N/A	√
Hungary	√		√	N/A	N/A	N/A
Ireland	√		√	N/A	√	N/A
Italy	√		√	N/A	√	√
Latvia	√		√.	N/A	√	N/A
Lithuania	√	√	√	N/A	√	√
Luxembourg	√		N/A	N/A	N/A	N/A
Malta	√		No			
Netherlands	√		√	No	Hospital budgets	√
Poland	√		√	No	N/A	√
Portugal	√	√	√	√	No	√
Romania	√		√	No	√	N/A
Slovakia	√		√	N/A	N/A	√
Slovenia	√		√	N/A	N/A	N/A
Spain	√	√	√	√	√	√
Sweden	√	√	√	No	√	√
United Kingdom		√	√	√	√	√

Source : [18], [14], [8], [31], [40], [35], [41], [42], [43], [21], [13], [4], [15], [44], [27], [9], [34], [32], [45], [23], [46], [39], [36], [47], [22], [10], [48].

different levels: physicians, pharmacists, patients and payment mechanism).

Tables **1**-**3** present a summary of the cost containment policies and show that in many countries, pharmaceuticals markets are heavily regulated, governments are trying to protect population health and to guarantee access to safe and effective medicines, while constraining pharmaceuticals expenditures [6].

When summarizing the available information regarding the cost-containment strategies, unbalanced information was found (Tables **1** and **2** *vs* Table **3**): the majority of countries continue to give a greater importance to the supply side measures, targeting price or profit regulation, than to demand side measures.

3.1. Supply Side Measures

Supply-side cost containment measures are primarily targeted either directly or indirectly at regulating the prices of pharmaceuticals.

3.1.1. Positive List/Negative List

The aim of the positive list is to reduce the number of reimbursed drugs. A positive list contains the drugs that will receive different levels of reimbursement, while the drugs on the negative list must be paid entirely by the patient [7]. Except for Finland and the UK, who have negative lists, the other EU countries, have a positive list. Germany, Portugal, Spain, Sweden and Lithuania have both a positive and a negative list. The UK has 2 negative lists-one black and one grey. The black list contains the medicines that GPs are not

Table 2. Supply Side Non-Coercive Measures

Country	Reference Pricing Schemes	Fostering the Use of Generic Drugs	Substitution by Pharmacists	Economic Evaluation	Monitoring of Prescription Patterns
Austria		No	No	√	√
Belgium	Reference pricing for generic equivalents; Removal of less effective products from reimbursement	√	In exceptional circumstances	√	√
Bulgaria	Reference pricing based on the maximum value per unit of active substance	√	√	√	No
Cyprus	N/A	No	N/A	N/A	N/A
Czech Republic	Reimbursement is set for 1 DDD of the active substance At least one product in the therapeutic group is fully reimbursed	N/A	No	N/A	N/A
Denmark	Narrow reference groups Lowest priced generic equivalent available on the market	√	√	√	√
Estonia	Since January 2005 RP= the ADD price of the second cheapest drug	√	No mandatory generic substitution;	N/A	N/A
Finland	Reimbursement categories classified according to the severity of the illness and the necessity of the drug treatment	√	Yes, if the price lies within a €2-3 price corridor set by the lowest-priced generic.	√, through FinOHTA	√
France	Narrow reference groups	Prices of generics 40% lower than those of original		Cost-effectiveness is not a criterion for assessing ASMR	Clinical practice guidelines mandatory
Germany	Reference prices set by Reference Price Institute Broad reference group	√	√	√	Guidelines/Monitoring
Greece	The lowest reference pricing system among the 15 European Union member states.	Price of a generic cannot exceed 80% of the price of its equivalent original	Not permitted	The establishment of HTA agency postponed to future decisions	No prescribing guideline or prescribing management
Hungary	Therapeutic reference pricing from September 2003	The branded generics generally just 10-20% cheaper than the originals	No incentives for generic prescriptions for physicians or for pharmacists.		
Ireland		√	No	Use of economic evidence in reimbursement decisions	Guidelines/monitoring-limited impact
Italy	The reference price as the weighted average price of similar products, whose price is not higher than the maximum price of generics	Generic market negligible (less than 1%)	√	Studies are left to company's discretion and not yet systematicall submitted.	Guidelines /monitoring
Latvia	Reimbursement is provided for treatment of chronic and severe illnesses, with 4 reimbursement categories applied for this purpose: 100%, 90%, 75% and 50%.	The cheapest product included in the positive list is issued by the pharmacist if the doctor has used the INN	√		Prescribing of certain products only under special conditions according to approved treatment guidelines

(Table 2) contd…..

Country	Reference Pricing Schemes	Fostering the Use of Generic Drugs	Substitution by Pharmacists	Economic Evaluation	Monitoring of Prescription Patterns
Lithuania	Cluster system in reference pricing: drugs containing an identical molecule clustered together; the average of the lowest 2 of the cluster				
Luxembourg	N/A	No	N/A	N/A	N/A
Malta	Pink card /Yellow card	N/A	N/A	N/A	N/A
Netherlands	Therapeutic reference pricing Broad reference group Reference pricing for therapeutically interchangeable drugs	√	√	√	√
Poland	Low reference price Reimbursement limit=usually the price of the cheapest generic in the given class	√	√	HTA agency established in September 2005, however, no fourth hurdle	√
Portugal	Narrow reference groups Reference pricing implemented in 2003, set at the highest price of generics	√	√	√	√
Romania	Reference price=the lowest-priced product within a cluster of medicines with the same active substance. From 2005- the introduction of the reference price as a manner of reimbursement	√	√	From March 2008, the MoH requires HE data for the drugs introduces on reimbursement lists. The use of this data is unclear	From June 2008- therapeutic protocols
Slovakia	Generic reference pricing and the reselection of the reference product every three months In selected therapeutic areas patent protected pharmaceuticals are reimbursed based upon the cheapest product in their ATC group	Generic price erosion is facilitated by the internal reference pricing and the fast track option for reimbursement of generics with 10% price discount.	Generic substitution not legally mandated No financial incentives for physicians or pharmacists to undertake generic substitution.	Pharmacists are obliged to inform patients of the availability of an alternative product with lower co-payment	Computer-based prescribing software, but not mandated or incentivised; Several guidelines, but not mandatory in outpatient care;
Slovenia				Legal basis for pharmaco-economic criteria	
Spain	National reference pricing Andalucia reference pricing	√	With doctors' agreement		Guidelines/monitoring-limited impact
Sweden	Reimbursement system on the basis of costeffectiveness and clinical superiority compared to other medicines in the same class	√	√ Reference price at pharmacy buying level	Major emphasis is laid on cost-effectiveness and rational use of drugs.	Practice guidelines
United Kingdom		√	No	Guidance on cost-effectiveness by NICE influences prescribing	Practice guidelines in force

Source : [18], [14], [8], [31], [40], [35], [41], [42], [43], [21], [13], [4], [15], [44], [27], [9], [34], [32], [45], [23], [46], [39], [36], [47], [22], [10], [48].

allowed to prescribe in NHS, while on the grey list are dugs that can be prescribed only for specific indications or patients groups. In Greece, the introduction of the positive list proved to have small and short time containment effect. However, it is difficult to assess the effectiveness of this measure, since it was accompanied by a recalculation of prices of all pharmaceutical products according to the lowest price in Europe (EU-15) [8]. Overall, the positive list can have a cost-containment effect due to the pharmaceuticals companies' behavior, who are willing to lower the price in order to secure their revenues by an increase in volume [6].

Table 3. Demand Side Measures

Country	Copayment	Educational for Health	Financial Incentives for Physicians	Non-Financial Incentives for Physicians
Austria	Flat fee per script item		No	√
Belgium	Lower co-payment for generics (20% instead of 25%)	Information campaign regarding the use of generic medicines	N/A	√
Bulgaria	Co-payments for prescribed outpatient drugs	N/A		
Cyprus	Patients entitled to reduced-fee services are reimbursed at 50%, private patients are not reimbursed	Computerized database available to all physicians	N/A	N/A
Czech Republic	Co-payment for prescribed drugs in cases where prices of pharmaceuticals exceed the reference reimbursement level.	N/A	N/A	N/A
Denmark	Adults: mix of flat fee and tiered percentages. Basic co-payment: DKr 510; For chronic illnesses, there is an additional threshold of DKr 3,600 beyond which all drugs are 100% reimbursed.	N/A	N/A	√
Estonia	Co-payment for pharmaceuticals listed for the most severe diseases; 25% co-payment for pharmaceuticals for less severe (mostly chronic) diseases Since January 2003: supplementary benefit for people who spend more than €383 (EEK 6000) per calendar year on pharmaceuticals included in the EHIF positive list to a maximum additional benefit per person per calendar year of €1278	N/A	N/A	N/A
Finland	User charges around 33% in 2003 Co-payment of €3 per medicine per purchase. Additional refund: if a patient pays more than the annual limit of €616.72 (in 2006), Kela covers all costs with a co-payment of €1.50 per medicine per purchase	ROHTO disseminates relevant information on drugs and rational prescribing	N/A	N/A
France	0%, 35%, 65% set by the body that decides on reimbursement; co-payment levels are set on the basis of medical necessity and product innovation. Considerable exemptions apply, esp. for patients suffering from chronic diseases	N/A	√	N/A
Germany	Fixed co-payments based on pack size	√	√	
Greece	Reimbursement is based on a three-tiered system of co-payment (25, 10 and 0%- for serious diseases).	N/A	N/A	N/A
Hungary	The subsidy can be 0%, 50%, 70%, 90% or 100% of the agreed consumer price, or a fixed amount.	N/A	N/A	N/A
Ireland	Depends on scheme: None, Deductible per month	N/A	N/A	N/A
Italy	None other than patients paying excess over reference price. Co-payments on drugs were abolished in 2001, but many regions reintroduced them in 2002.	Information campaign regarding the use of generic medicines	N/A	√
Latvia	Reimbursed according to the degree of severity (i.e. 100%, 90%, 75% and 50% reimbursement).	N/A	N/A	N/A
Lithuania	N/A	N/A	N/A	N/A
Luxembourg	N/A	N/A	N/A	N/A
Malta	No co-payment in The Government Health Services (GHS)			
Netherlands	Flat co-payment + deductible			√

(Table 3) contd…..

Country	Copayment	Educational for Health	Financial Incentives for Physicians	Non-Financial Incentives for Physicians
Portugal	4 reimbursement categories for brand or generic drugs(A, B, C, D):5%, 31%, 63% 80%; For pensioners the reimbursement levels for branded products are 15% lower: 0%, 16%, 47%,65% and for generic drugs are 0%, 21%, 53% and 70% Pharmaceuticals used by some highly vulnerable groups of patients are fully paid for by the NHS.	Information campaign regarding the use of generic medicines		√
Romania	Patients have to pay 10% or 50% of the reference price. Patients suffering from one or more of 31 diseases, such as cancer, TB, diabetes, HIV/AIDS do not pay any co-payment. Lower co-payments for generics (10% *vs* 50%)	No	No	No
Slovakia	The average co-payment rate of all partially reimbursed pharmaceuticals must not exceed 20%. In practice, the average co-payment rate is currently about 13%	N/A	N/A	N/A
Spain	Three co-payment rates: 40% of retail price applies to the active population and its dependents; reduced rate of 10% of retail price for drugs in therapeutic categories for certain chronic conditions (eg insulin, anti-cancer preparations, human growth hormones, opportunistic infections in AIDS)	Information campaign regarding the use of generic medicines		
Sweden	When the total cost exceeds 900 SEK, a reimbursement is granted as follows: 50% of the portion over SEK 900 but under SEK 1,700, and furthermore, 75% of the portion over SEK 1,700 but under SEK 3,300, 90% of the portion over SEK 3,300 but under SEK 4,300 and, 100% of the total cost exceeding SEK 4,300.			√
United Kingdom	Flat fee per prescription item: UK£6.20 as of 1 April 2002	Information campaign regarding the use of generics		√

Source: [18], [14], [8], [31], [40], [35], [41], [42], [43], [21], [13], [4], [15], [44], [27], [9], [34], [32], [45], [23], [46], [39], [36], [47], [22], [10], [48].

3.1.2. Price Controls and Reference Pricing Schemes

Total pharmaceutical expenditure is a function of the quantity of drugs consumed, multiplied by the price. Studies have shown that there is a trend for countries with high drug consumption to have lower prices and for countries with low consumption to have higher prices [5].

Price control sets a maximum amount at which a medicine can be sold, while reference prices are ceilings established by the payer that fully or partially cover the drugs to the reference price [5]. The patient pays the difference between the reference price and the pharmacy price. Thus, the goal of this measure is to limit the third-party expenditure on prescription drugs, not the overall expenditure on medicines.

Although evidence shows that a strict direct price regulation scheme seems less effective in controlling overall expenditure, since the savings are usually counteracted by large increase in volume [3], most EU countries have different systems to control prices. In our assessment, Cyprus and Malta were found to have no price regulation [9], while the rest of the EU countries developed price control mechanisms at least for the innovative drugs or for the ones proposed for reimbursement. In Greece, the prices of OTC are also regulated, using the same criteria as for prescription only medicines [10].

Various systems of price control can be found across the EU. In most countries, the maximum price of medicines is determined in comparison with the neighboring countries. In Bulgaria, the prices cannot be higher than the retail prices found in nine countries (Austria, Hungary, Poland, Portugal, Romania, Slovakia, Spain, the Czech Republic and the Russian Federation). In Denmark, the reimbursement price is calculated according to Average European Price rule comprising 11 EU countries plus Norway. Finland maintains its focus on keeping its prices in the lower half of European Prices and uses international price information from countries belonging to the EU before May 2004 (EU15) as well as Norway and Iceland. In France, prices should not exceed those in the UK and German markets and must be in line with those in Italy and Spain. Ireland calculates its prices as an average of Denmark, France, Germany, Netherlands and UK. Italy uses an average European Price (all EU prices). Portugal cannot have prices higher than the average of Spain, France, Italy and Greece. Recently, in Romania, prices have been set as the lowest price from a basket of 12 countries: Czech Republic, Bulgaria, Hungary, Poland, Slovakia, Austria, Belgium, Italy, Lithuania, Spain, Greece and Germany [11].

However, not always these types of policies have the expected effect. In 1998, the Greek government introduced a recalculation of the prices of all pharmaceutical products according to the lowest price in Europe (EU-15). The

measures proved to be ineffective since after a short-term reduction, pharmaceutical expenditure continued to increase at rates similar to those before the introduction of price control mechanisms. Moreover, the action was found to violate the principles of free trade and fair competition and was considered unconstitutional by the Greek Court, who gave priority to the economic and entrepreneurial freedom and emphasized that the system of calculating prices could jeopardize the health of population by obstructing the import and circulation of medicines [8].

10 years after the Greek experience, Romania introduced the lowest reference price out of 12 EU countries, one of them being Greece. As in the Greek case, the Romanian Association of International Medicines Manufacturers sued the Ministry of Health, claiming that, by imposing unrealistic calculation formulas and an exchange rate much below the real one, the current regulation will trigger the establishment in Romania of certain prices which are much lower than the minimum European price, with harsh consequences on the business operators and with creation of perfect conditions for parallel trade. As a direct consequence, Romanian patients are in danger of being deprived of the medicines necessary for the relevant medical care, since this measure encourages medicine distributors to purchase medicines from the Romanian market and re-sell them at a higher price on the European markets. The law suit is still ongoing and the effect of the Government regulation on pharmaceuticals in Romania is yet to be seen.

The other group of countries consists of those where the price regulation process is based on an agreement between the country's health authorities and the pharmaceutical industry. These negotiations take place in Bulgaria, Lithuania, Latvia, France, Spain and Sweden.

Price-volume agreements are in place in Austria, France and in Sweden for innovative drugs. This policy aims at bringing efficient medicines to the population at a reasonable price, while the companies secure their position on the market.

In the last years, many European countries, such as Belgium, Italy, Romania, Lithuania, applied a percentage price cut.

In the UK, the price of all new brand medicines is regulated through the Pharmaceutical Price Regulation Scheme (PPRS). The system proved to have an effect on lowering expenditures and in the same time encouraging investments in research and development, as the permitted rate of return on capital is 17-21% and as an incentive, the companies may retain additional profit when this is due to innovation [6].

As shown in Table **2**, different versions of *internal reference pricing schemes* are applied across EU. With the exception of Netherlands and Hungary, who apply therapeutic reference pricing schemes, the other EU countries apply an active substance reference pricing. Germany was the first one to introduce the reference pricing and this policy was followed by a reduction on public expenditure on medicines [5]. However, according to Lopez-Casasnovas & Puig-Junoy [12], the use of reference pricing does not always achieve the cost-containment aim and does not result in important long-term savings. At European level, studies show that this policy often fails to have a cost-containment effect because the pharmaceutical companies lower their prices to coincide with the reference price [6].

In Hungary, the introduction of therapeutic reference pricing in 2003 had limited impact on the growth of pharmaceutical expenditure, since public pharmaceutical expenditure grew by 16.7% in 2003-2005, compared to 16.5% between 1994 and 2002, although the introduction of therapeutic reference pricing was accompanied by a 15% price cut over a 3-month period. Moreover, clinical heterogeneity within the referenced group can induce potential medical adverse events, as patients might change their treatment to less efficacious drugs or with more side-effects and, consequently, could increase the cost of non-pharmaceutical medical expenses [13].

Overall, evidence from EU level shows that price controls certainly can have an impact on either slowing price increases or lowering drug prices [3]. To what extent pharmaceuticals prices can be regulated or what is the reasonable price is still an ongoing debate, as shown by the various methods used in the EU countries.

3.1.3. Profit Controls

Profit controls are exercised in the UK through the PPRS which is in fact an agreement with the industry on profit control by which price controls may be implemented only if profits are considered too high [14]. Other countries have recently introduced some measures for profit control. Austria practices a rebate on excess sale, while in Belgium a payback scheme is in place, whereby companies return 65% of any excess on the agreed upon budget. France has a payback clause if agreed-upon budget is exceeded, while in Spain the payback clause intensified [15].

In Portugal, in 1997, by a voluntary agreement between the Government and the pharmaceutical industry, the later agreed to pay back to the NHS 64.3% of any excess between 4% and 11% above the 1996 expenditure. However, by the middle of the first year of this initiative, growth in expenditure on pharmaceuticals was already up by 16%. The measure is reinforced again in February 2006, when another protocol for 2006-2009 was signed with the Association of Pharmaceutical Companies, by which ceilings for expenditure are stipulated, involving also the return of excess spending if limits are exceeded [16].

3.1.4. Individual or Global Budgets

Individual budgets, usually for GPs are implemented in Belgium, Italy, Latvia, Portugal and Romania while Bulgaria and Germany have global budgets. In Germany, prescribing budgets were abolished and national budgets are now in place. In Netherlands local budgets are given to the hospitals, while in UK the budgets are given to Primary Care Groups (PCGs). Romania is known as the only country which, for many years, had budgets for pharmacies. Due to the scarce resources, the limits of these budgets were usually reached before the end of the month and many times patients queue at the beginning of the month in front of GPs offices and pharmacies in order to secure their prescriptions. In October 2008, this controversial method was finaly abolished [17].

Wheynes, Baines & Tolley [18] studied the cost containment effect of introducing fixed budgets and concluded that they reduce pharmaceutical costs and the volume of medicines prescribed and increase the rate of generic prescribing and the use of computerized prescribing management. The study of Granlund, Rudholm & Wikstrom [19] showed that when two Sweden health centers were given a fixed budget, the number of prescriptions declined relatively to the control group. However, the study contradicted the UK study from 1997 [18] by showing that in the Sweden case, there were no systematic differences regarding either price or quantity per prescription between health centers using fixed and open-ended budgets for pharmaceutical products [19].

3.1.5. Delay in Formulary Approval Procedure

The delay of price approval after granting of marketing authorization or for obtaining the reimbursement status can be considered an important impediment in patient access to medicines [14], but in the same time a potential measure for cost-containment. For products approved by the EMEA, this time ranged between 0 days in UK and 340 days in Greece [10], while for the generic medicines, this time varied between 0 days in Denmark and 180 days in Austria, Belgium, Hungary, Poland, Luxembourg, Slovenia and Slovakia [20].

Prior to the implementation of the EU Transparency Directive, Slovakia's pricing and reimbursement process was one of the slowest in Europe, with a 500-day average delay, while at present, decisions on the reimbursement of drugs sold in retail pharmacies are mostly made within the proposed timelines by the Transparency Directive [21]. In Greece, the average delay between marketing authorization and accessibility to patients was 500 days in 2004 but 335 days in 2006 [10]. The delay was so important, that the reimbursement list from March 2004 included only drugs priced before July 2002.

The Polish system often discriminated in favor of local companies: registration of original products generally took twice as long as the registration of products by local producers [22].

3.1.6. Fostering the Use of Generic Drugs

Simoens & De Coster [23] carried out an exercise to demonstrate the potential savings from generic substitution if brand medicines for top 10 active substances in different countries are replaced by generics. They showed that generic substitution would reduce pharmaceutical expenditures by 21% to 48%. A recent study [24] assessed the impact of generic substitution on patients' and society's expenditures and proved that in Sweden the introduction of generic substitution shifted the trend from an increase into a decrease in patient and society expenditures on drugs.

The positive impact of generic substitution on efficiency is known a priori, however, it is still underused by the governments [25].

The generic market is dominant in most of the countries from CEE. However, even in these countries, the generic substitution decreased its cost-containment effect, giving the upgrade of the quality standards (Good Manufacturing Practices) in the pharmaceutical industry that lead in higher retail prices for generics [26]. The evidence from the countries where the generic substitution was successful shows the importance of strategies that facilitate the entry into the market of the generic drugs combined with strategies influencing the demand.

A price difference of at least 20% between the brand and the generics is practiced in most of the countries with a successful generic market. In Hungary, the savings from generic prescriptions were limited, as the generics were just 10% under the brand names. In Greece, generic substitution is not permitted, while in Italy generic market came to existence only after the introduction of an effective reference price system [27].

Although successful, the Slovakian generic policy is still limited due to the lack of incentives for pharmacists and patients. Traditionally, Slovak physicians continue to prescribe more generics than original brand names, despite the lack of financial incentives [21], but this practice is not generalized across Europe. In many other countries "because physicians do not gain from any cost savings, they have little incentives to invest in the information about availability of generics and their effectiveness and prices" [28]. In Romania, locally produced drugs cover 40% of the market in terms of value, but over 80% in terms of volume, which suggests that local low-cost drugs are popular and widespread [29]. Nevertheless, the prescription by International-Non-Proprietary Name was introduced only in the late 2005, after long debates between doctors and the Ministry of Health and was abolished in 2008, forcing again the patients to cover important co-payments, since the physicians continue to prescribe the brand expensive medicine, and the reference price is set at the price of the cheapest generic medicine. Starting April 2009, the generic substitution was again enforced, together with a mandatory price difference of 35% between brand and generics drugs [11].

In order to be successful, this policy needs both supply-side measures (pricing and reimbursement) and demand-side measures (incentives for physicians, pharmacists, patients) [23]. However, can generic substitution be considered the magic solution for cost containment? Studies about benefits and costs of newer drugs [30] came to the conclusion that allowing people to use only generic drugs would increase total treatment costs, instead of reducing them, and would lead to worse outcomes. Moreover, the results from the same study show that the replacement of older by newer drugs results in reductions in mortality, morbidity, and total medical expenditure, especially in inpatient expenditure.

3.1.7. Economic Evaluation

Numerous countries in EU use more and more economic evaluation when taking the decision regarding pricing and reimbursement. In Sweden, major emphasis is laid on cost-effectiveness and rational use of drugs. Ireland and the Netherlands use economic evidence in reimbursement decisions [15]. In Denmark and Sweden, the cost effectiveness studies are a requirement for price premium [31]. In Portugal, the Government issued in 1999 the official guidelines for carrying cost-effectiveness studies. Since then, the utilization of efficiency criteria in reimbursement decisions decisively increased [16]. In Slovenia, a legal basis

is provided for pharmacoeconomic criteria, which are becoming more and more important [32].

However, the studies conducted across Europe use different methodologies. Finland and the Netherlands refer to cost-effectiveness and patients' quality of life criteria, while other countries like Austria, Belgium, Denmark, Ireland, Italy and Portugal take into account a variety of economic criteria [10].

NICE guidelines are the most known and used and they are proved to influence prescribing. Nevertheless, according to Mossialos & Oliver [6], NICE recommendations are one of the reasons for increased pharmaceuticals expenditures in UK, since the issue of affordability is not considered in NICE's decisions. However, the notorious case of Herceptin opened the room for discussions on the best way to decide on health care priorities [33].

In other parts of the EU, the use of economic evaluation is still at its infancy.

In Finland, a study was carried out in 2005 regarding the quality of studies performed by the pharmaceutical companies. The results were not very satisfactory, since among the 22 evaluations assessed, two thirds were of poor quality and could not be taken into account for pricing decisions; half of the evaluations used cost-minimization analyses; half used cost-utility or cost effectiveness analyses [34]. In Italy, there are not yet guidelines on how to conduct economic evaluation studies. The studies are used mainly by the companies to get a higher price and are not viewed by government as a tool to improve allocation of resources [35]. In Greece, the establishment of HTA agency was postponed to future decisions [10].

The Polish HTA agency was established in September 2005, however, there are some concerns that "in the near future there will be no fourth hurdle but rather a continuing reimbursement hurdle for containment of drug expenditure" [22].

From March 2008, the Romanian Ministry of Public Health passed a Government Ordinance [36] by which health economics data are required for the drugs introduced on the reimbursement lists. The use of this data is still unclear, since there is no Romanian guideline on how to conduct pharmacoeconomics studies and the studies submitted by the companies were mainly conducted in Western Europe.

Nevertheless, although no common criteria are invoked in all countries and some of the new EU member countries even seem to ignore the well known issue of transferability of health economics results from one country to another, the willingness to introduce pharmacoeconomics criteria in decision making process proves an initiative towards a greater consistency in the application of cost-effectiveness at EU level.

3.1.8. Drug Use Review

Prescribing policies are introduced in various countries, especially as an adjuvant tool for monitoring the prescribing budgets. In some countries, the prescribing pattern is monitored more as a way of preventing abuse: Portugal published a list of doctors with the highest prescription spending [25], while in Romania a list with the name of over-prescribing physicians is published on the Romanian National Health Insurance Fund (NHIF) website.

3.2. Demand-Side Measures

Demand side policies can be seen as a four tiered structure of demand where the physician prescribes, the pharmacist dispenses, the patient consumes and a third party pays. The physicians are the key decision makers on the demand-side and many interventions are targeted at assuring best prescribing patterns. The importance of their role is reflected in the fact that, although within the demand side policies the most efficient in containing costs was proved to be generic prescribing or substitution [23], academic detailing - education of prescribers by trained health care professionals, in order to change prescribing of drugs so that it becomes consistent with medical and cost-effectiveness evidence - is the most professionally acceptable [3].

3.2.1. Co-Payment

From an economic point of view, co-payments are effective when price elasticity is higher - as in the pharmaceutical field - and less effective for other health services like hospital care [37]. Co-payments are the most used cost-control measures on the demand side but their level differs across EU. Malta is the only country without co-payments for medicines in the public sector.

Italy was one of the last countries in the European Union to introduce patient charges for drugs and they were abolished from January 2000. Their abolition caused a 12% increase in drug expenditure. Currently, the regions are free to apply co-payments [27].

Austria and UK apply a flat fee, while in the Netherlands patients pay the difference between the reference price and the price of the dispensed medicine.

Belgium, Portugal and Romania have a lower co-payment level for generics compared to the brand medicines.

In Estonia, the reimbursement system is disease specific, while in Latvia it is according to the degree of severity of the disease.

Some countries such as Greece, France or Romania, have a 3 tiered system of co-payment. The majority of EU countries has in place a 100% reimbursement scheme for highly vulnerable groups or for those suffering from very serious diseases. However, there are situations where the concern for vulnerable groups costs more than the public system can afford to pay for. In Romania, for instance, very expensive biological drugs and medicines for rare indication are on the top 10 drugs (as value of expenditures) 100 % reimbursed from the NHIF budget [38].

4. DISCUSSION

Reference pricing, delays in approval, restriction on prescribing and reimbursement systems are some of the methods that are frequently employed by EU governments in their efforts to control pharmaceutical costs.

We believe that international comparisons may contribute to a better understanding of the type of interventions that proved to be effective. However, for this paper only articles published in English language were collected. Moreover, due to the continuous development of

pharmaceutical regulations, some information provided might be no longer valid.

Nevertheless, based on our analysis, at the EU level, the dominant pattern of regulation seems to consist in a combination of positive lists, price control and reference pricing, prescription budgets and generic substitution. While the majority of the effective measures in containing costs are on the supply side, from the demand side, only co-payments are used in a systematic way at EU level.

While in all EU countries except Greece, generic substitution is not prohibited, it is however, in many countries, left to the physicians' decision. Influencing their behavior is therefore a key cost containment point. As many authors [1, 25] emphasized before, we believe that it is very important to increase costawareness on the demand side of the market for suitable alternative products, this way allowing the competition to generate lower prices.

Some researchers [25] argued that the policy-diffusion process in the pharmaceutical sector is not based on real policy-learning process, but is rather a result of a penguin-effect based on imitation of the others countries' policies. However, one may wonder whether this process is not rather an inherent attempt to harmonization under the impact of EU pharmaceutical policy. Many similarities exist between the new member states and the old EU countries when pharmaceuticals policies are concerned. With few exceptions, where some complicated local instruments were developed (such as therapeutic reference pricing in Hungary), the countries that joined EU in the last two enlargements have experimented the same measures that have been previously tried in the old EU member states. However, applying the methods that work in a rich and stable economy to the local Central and Eastern Europe context with limited resources for health, lack of technical assistance and political instability, may not bring the same results.

Since the emphasis is still on regulating costs, one may wonder whether a single price control system for the EU would be a viable alternative to the multiplicity of national price control mechanisms. While for the pharmaceutical industry it would mean a less complex European pharmaceutical market, from the regulators perspective, it is unlikely that there will be a single EU pharmaceutical price or reimbursement list in the near future, since the EU countries have different willingness to pay [1].

CONCLUSION

The possible alternatives for cost containment discussed in this paper have both positive and negative effects and they can affect the distribution of cost between patients and the health care systems. Although the goal is to contain costs, the health care decision makers must take into consideration also the impact of pharmaceuticals policies on the access to drugs for population.

Upon reviewing the cost containment policies in EU countries, our study shows that when the cost containment for pharmaceutical expenditure is targeted, the emphasis is still mostly on supply side measures, as they are proved to be more effective compared to demand side measures. However, price control policies do not guarantee expenditure control as long as they are not accompanied by control over volume [25]. Rationalizing consumption volume should be targeted as well by giving a bigger importance to the demand side measures.

Few measures are known a priori to be effective. Generic substitution together with the reference pricing is one of them. Other measures such as positive lists, prescribing budgets and reference pricing proved to be effective in some countries and only on short-term [25].

Is this due to the sometimes too frequent change in strategies that some Governments apply in their attempt to achieve their goals, or is this due to the pharmaceutical industry capacity to develop perverse surviving mechanisms to secure their position?

Given the structurally imperfect pharmaceutical market and the dominant position of the supply side, it is maybe unrealistic to expect an important success of the cost containment measures. New innovative drugs are prepared to be brought on the market. Recently, the Innovative Medicines Initiative was launched by the European Commission and the EMEA established an Advanced Therapies Committee to start its activities from 2009. With an aging European population demanding more health care and an enlarging EU, it is likely that the debate concerning the pharmaceutical expenditure will become a never ending story.

At the same time, substantial evidence shows that the effect of innovative drugs is worth the increased cost [39]. Therefore, a change of perspective from the cost of medicines per se to the cost-benefit ratio of the pharmaceuticals might be the solution.

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