



# Assessment of Effectiveness of Tendering Procedure in Pharmaceuticals: The Cyprus Experience

Alexandrou Panayiotopoulou E<sup>1\*</sup>, George Charalambous<sup>2</sup>, Daphni Kaitelidou<sup>3</sup> and Eleni Jelastopulu<sup>4</sup>

<sup>1</sup>Frederick University, Pharmaceutical Services, Ministry of Health, Cyprus

<sup>2</sup>General Hospital of Athens "Hippocrates", Greece

<sup>3</sup>Department of Nursing, National and Kapodistrian University of Athens, Greece

<sup>4</sup>Department of Public Health, University of Patras, Greece

## Abstract

**Objective:** National pricing and reimbursement policies should provide an efficient pricing and reimbursement pharmaceutical systems. The health system in Cyprus, before June 2019, consisted of a public and private sector. Cyprus has just introduced a National Health System. The establishment of the new health system should require the appropriate reimbursement policies since lower prices can be achieved through robust reimbursement systems. Cyprus has had considerable success implementing tendering procedure for over three decades. This study aims to assess the effectiveness of the tendering procedure with the comparison of the tender price and the official wholesale price of pharmaceutical products from 267 therapeutic subgroups at ATC 4 level, from the private and public sectors.

**Methods:** Pharmaceutical products were identified and categorized based on strength, pharmaceutical form, therapeutic subgroup and chemical substance as procured by the public sector during 2017. Subsequently, comparison of the total expenditures was carried out between the lowest wholesale price and the tender price of the identified pharmaceutical products from the private and public sectors respectively. Included in the analysis were 2237 pharmaceutical products from the private sector and 709 from the public sector covering 267 therapeutic subgroups.

**Findings:** The tender prices which were secured by the Ministry of Health were lower than the lowest wholesale prices for the same products in the price list of 2017.

**Conclusion:** Tenders could be seen as an additional tool for the new reimbursement system to select cost-effective choices. For Cyprus authorities, tendering could be an option in setting a reimbursement policy.

**Keywords:** Tendering; Pharmaceuticals; Reimbursement; Wholesale price; Cyprus

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### \*Correspondence:

Alexandrou Panayiotopoulou E,  
Frederick University, Pharmaceutical  
Services, Ministry of Health, Nicosia,  
Cyprus,  
E-mail: hpanayiotopoulou@hotmail.com

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## Introduction

Cyprus is a member state of the European Union (EU) with an estimated population of 864,200 [1]. In 2017 the national income Purchasing Power Parity (PPP) per capita in Cyprus was \$33,609 and the life expectancy at birth for males and females is about 78.2 and 83.6 years, respectively [1]. Cypriots enjoy levels of health that are comparable to other member states of the Organization of Economic Co-operation and Development (OECD) [2]. In 2017, the total expenditure on health as a percentage of gross domestic product was 6.7%, which is lower than the OECD average [3]. The country has just introduced a National Health System with universal health insurance coverage.

The health system before June 2019 consisted of a public and private sector. It was estimated that the public sector covered about 80% of the population [4]. However, it is remarkable that in 2017, 42.6% and 57.4% of pharmaceutical expenditure was publicly and privately funded, respectively. Low-income individuals ( $\leq$  €15,400/year), chronically-ill patients, and civil servants were eligible for public-sector coverage [5,6]. Pharmaceuticals for the public sector, before the introduction of the new health system, were procured centrally by the Ministry of Health through tendering procedures to achieve additional discounts on the whole sale prices as they were noted in the official pharmaceutical price list. Cyprus has had considerable success implementing tendering procedures for over three decades, especially for off-patent and generic products through the open invitation

procedure. All tender outcomes were made publicly available, including the tender price and the total contract value. Tendering procedures, conformed to the national institutional framework in force on public procurement, are governed by the principles of transparency, non-discrimination, mutual recognition and equal treatment [7]. The tendering agreement was legally binding and the price that had been agreed by Ministry of Health and a vendor could not be adjusted.

In the private sector, almost all costs were paid out-of-pocket, with a small part reimbursed by voluntary health insurance [8]. Prices in the private sector are set by the Ministry of Health, based on the recommendations of the Drugs Price Committee; the Committee applies on the External Reference Pricing Scheme (ERP) to obtain the official price, i.e. the wholesale price for the Cyprus pharmaceutical market [9].

Pharmaceutical policies aim to enable the availability of safe, affordable and effective medicines. Given the rising costs of new medicines and restricted national budgets, all countries strive to achieve a balance between ensuring affordable health care and enabling the use of innovative medicines [10,11]. National pricing and reimbursement policies should provide an effective, transparent, stable, predictable and sustainable pricing and reimbursement system for pharmaceuticals [12,13]. The establishment of the new health system in Cyprus should require the adoption of appropriate reimbursement policies since lower prices can be achieved through the right reimbursement strategies. For competent authorities, tendering could be an option as a reimbursement policy. This study aims to assess the effectiveness of the tendering procedure with the comparison of the tender price and the official wholesale price of pharmaceutical products from 267 therapeutic subgroups at ATC 4 level, from the private and public sectors.

## Methods

### Data collection

The following data sources were used in the conduct of this study:

- 1) List of pharmaceutical products in the public sector in 2017, as it is available from the official website of the Pharmaceutical Services of the Ministry of Health Cyprus.
- 2) The quantities sold in the private sector and the quantities procured by the public sector, as they have been recorded by the Pharmaceutical Services, Ministry of Health Cyprus, during 2017.
- 3) The wholesale prices of the private sector, as they have been published in the pharmaceutical price list 2017, from the official website of the Pharmaceutical Services of the Ministry of Health Cyprus.
- 4) The prices of procured products of the public sector, as they have been published from the official Gazette of the Republic of Cyprus or from the official Journal of the European Union in accordance with the contract budget.
- 5) Tendering documents of the public sector, as they have been published in the official Gazette of the Republic of Cyprus or in the official Journal of the European Union in accordance with the contract budget.

### Methodology

Pharmaceutical products were identified and categorized based on strength, pharmaceutical form, and therapeutic subgroup at ATC4

level and chemical substance at ATC5 level as procured by the public sector during 2017.

The following calculations were carried out in sequence:

- 1) The quantities of the above identified pharmaceutical products as procured by the public sector.
- 2) The quantities of the above identified medicinal products as sold in the private sector (in case of generics, this is the sum of all quantities of all pharmaceutical products that were sold within the same therapeutic subgroup at ATC4 level or chemical substance at ATC5 level accordingly).
- 3) The sum of the above quantities from the private and public sector and the total expenditure using the lowest wholesale price of the identified pharmaceutical products.
- 4) The sum of the above quantities from the private and public sector and the total expenditure using the public tender price.

The analysis focused mainly on 10 therapeutic categories as follows:

- A-Alimentary tract and metabolism
- B-Blood and blood forming organs
- C-Cardiovascular system
- J-Anti infective for systemic use
- L-Antineoplastic and immunomodulating agents
- M-Musculoskeletal system
- N-Nervous system
- R-Respiratory
- H-Systematic hormonal preparations, excluding sex hormones and insulin's
- V-Variou

Included in the analysis were 2,237 pharmaceutical products from the private sector and 709 from the public sector covering 267 therapeutic subgroups at ATC 4 level. However, out of the 267 ATC 4 subgroups, only 40 concerned tenders of equivalent therapeutic groups in the public sector. The remaining 227 groups were analyzed at ATC5 level (molecular level). Table 1 shows the expenditures using the lowest wholesale price and tender price in accordance with the ATC category and the number of products in the two sectors.

## Results

The total expenditure which was calculated using the lowest wholesale price, in the private and public sector together amounted to €183,401,847.33, whilst the total expenditure which was calculated with the tender price, in the private and public sector together amounted to €90,393,781.52. The total savings amounted to €93,008,065.81 with an overall decrease in price 50.71%. It seems that the tender prices which were secured by the Ministry of Health were lower than the lowest wholesale prices for the same products in the price list of 2017. Figure 1 illustrates the comparison of total expenditure with the lowest wholesale price, the tender price and the savings achieved.

The results of an analysis by ATC categories are summarized in Table 2 and Figure 2 illustrates the level of savings that can be

**Table 1:** Expenditures using the lowest wholesale price and the tender price in accordance with the ATC category and the number of products in the private and public sector.

ATC Category	Number of ATC 4 groups	Number of products in the private sector	Number of products in the public sector	Expenditure with Lowest Wholesale price	Expenditure with Tender price
A	32	129	51	€24,302,618.65	€7,551,048.18
B	19	154	82	€21,252,996.97	€10,194,201.08
C	36	419	96	€7,159,660.10	€7,500,852.43
H	7	34	22	€2,520,898.55	€1,623,160.12
J	60	431	133	€19,612,512.12	€11,055,512.75
L	31	321	145	€47,494,945.08	€37,962,649.11
M	13	38	16	€4,752,150.15	€1,515,464.32
N	38	497	120	€15,653,365.02	€7,060,735.05
R	29	207	40	€9,970,434.91	€5,716,880.46
V	2	7	4	€682,265.78	€213,278.02
Total amount	267	2237	709	€183,401,847.33	€90,393,781.52

**Table 2:** Expenditures using the lowest wholesale price, the tender price and costs savings in accordance with the ATC category and the number of products in the private and public sector.

ATC Category	Number of ATC 4 groups	Number of products in the private sector	Number of products in the public sector	Expenditure with Lowest Wholesale price	Expenditure with Tender price	Cost Savings	% decrease in prices
A	32	129	51	€24,302,618.65	€7,551,048.18	€16,751,570.47	68.93%
B	19	154	82	€21,252,996.97	€10,194,201.08	€11,058,795.89	52.03%
C	36	419	96	€7,159,660.10	€7,500,852.43	€29,658,807.67	79.81%
H	7	34	22	€2,520,898.55	€1,623,160.12	€897,738.43	35.61%
J	60	431	133	€19,612,512.12	€11,055,512.75	€8,556,999.37	43.63%
L	31	321	145	€47,494,945.08	€37,962,649.11	€9,532,295.97	20.07%
M	13	38	16	€4,752,150.15	€1,515,464.32	€3,236,685.83	68.11%
N	38	497	120	€15,653,365.02	€7,060,735.05	€8,592,629.97	54.89%
R	29	207	40	€9,970,434.91	€5,716,880.46	€4,253,554.45	42.66%
V	2	7	4	€682,265.78	€213,278.02	€468,987.76	68.74%
Total amount	267	2237	709	€183,401,847.33	€90,393,781.52	€93,008,065.81	50.71%

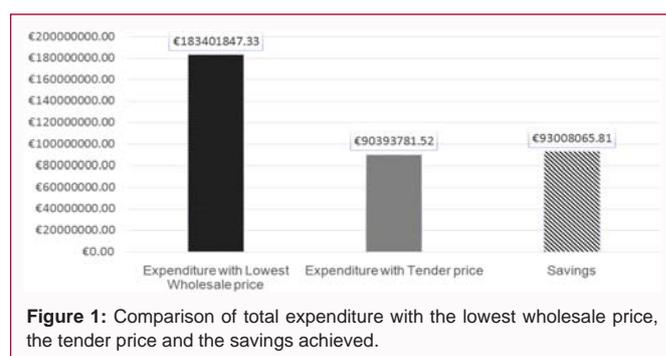
achieved.

ATC C category shows the highest decrease in prices, up to 79.81%, with €29,658,807.67 savings achieved, using the tender price instead of the lowest wholesale price. ATC A follows with a decrease of 68.93% and savings up to €16,751,570.47.

The therapeutic category ATC L shows the lowest decrease in prices, up to 20.07% with €9,532,295.97 savings achieved, despite the fact that the total expenditure using either the wholesale price or the tender price showed the maximum cost of all of the above ATC categories.

### Discussion

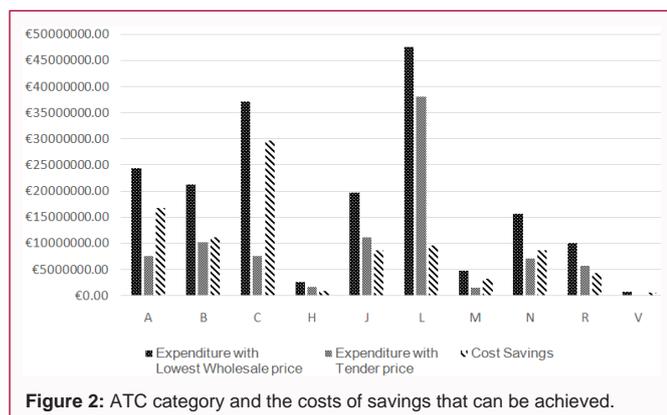
This study assesses the effectiveness of the tendering procedure with the comparison of the tender price and the official wholesale price of pharmaceutical products of 267 therapeutic subgroups at ATC 4 level, from the private and public sectors. It can be seen that the categories ATC C and A show the highest decrease in prices, 79.81% and 68.93% respectively, when using the tender price instead of the lowest wholesale price. These two categories are made up in their majority with off patent and generic products; this results in price competition and a consequent decline in prices in an open invitation procedure [14,15]. The public sector tendering system in Cyprus used to achieve substantial price reductions for multi-source



**Figure 1:** Comparison of total expenditure with the lowest wholesale price, the tender price and the savings achieved.

drugs, or drugs that are manufactured by multiple firms (e.g. off patent and generic drugs). Large number of competitors could be a predictor of intense price competition [16]. The result revealed that the price difference between the official wholesale price and the tender price was significant, highlighting the fact that the tender price brings the winning bid closer to the marginal cost of production [17]. The tender prices, for most of the categories, (6 out of 10), are 50% to 80% lower than the lowest wholesale prices, in the private sector.

However, the therapeutic category ATC L shows the lowest decrease in prices, which is at 20.07%. This could be explained by the fact that the ATC L group is mainly consisted of patented products



where the negotiator procedure was implemented achieving minor deduction from the wholesale price; this leads to a monopolistic environment with limited negotiation power [18]. For single-source drugs, such as on-patent drugs at ATC L and ATC H, with no or only few therapeutic substitutes, it seems from the discount rating 20% and 35% respectively, that the public sector prices were lower than those in the private sector. This result is logical in the absence of competition for these products [19,20]. The Ministry of Health did not proceed with further price discounts on the basis of willingness-to-pay or other pharmacoeconomic criteria since these techniques are not allowed by the national law.

In Cyprus, the public sector tender system, before the introduction of the National Health System, was divided mainly in two tendering procedures: 1) the open invitation procedure, where the suppliers were invited to submit their tenders which were subsequently evaluated and awards were made for the entire public sector based on the lowest price offer within the required terms and specifications, and 2) the negotiation procedure, whereby the renderers were invited to a process of negotiation based on an ex-ante fixed volume. The open invitation procedure was predominantly meant for drugs whose patents have expired, and therefore there was a potential for competition for off patent and generic products. About 75% of public sector drugs were tendered through an open invitation procedure that applies at molecule level ATC 5, although in some cases tenders were at the therapeutic level ATC 4 when it was applicable. Generics are usually less costly than their originator products, owing to much lower research and development costs for manufacturers, who profit from patent expirations of already established pharmaceuticals [21,22]. The negotiation procedure was applied to the patent protected innovative medicines [23]. This channel was mostly reserved for on patent pharmaceutical products without alternative competitor at molecular or therapeutic class level, such as oncology drug sat ATC L, and accounted for about €50 million in sales. The tenders, for both of the procedures, awarded the right to a single vendor to supply the public sector for the particular therapeutic subgroup ATC 4 or chemical substance ATC 5 that was being tendered, for a period of two years, in most of the cases. The government procured the entire quantity of drugs in installments, and the vendor was reimbursed upon delivery of the pharmaceutical products. The procured pharmaceutical products were distributed to public pharmacies [24]. The tendering system in Cyprus was operated within the context of a clear legal framework with precise provisions about process and timelines.

On the other hand, for the Cyprus private sector, the pricing

policy relies on the External Reference Pricing Scheme (ERP). The calculation to set the official wholesale price is based on the wholesale prices in a basket of ten countries. Specifically it is calculated from the average of four values; the cheapest price from the group of three high price countries (Austria, Germany and Denmark) the two cheaper prices from the group of four medium price countries (Belgium, Spain, Italy and Sweden) and the cheapest price from the group of low price countries (France, Greece and Portugal) [8]. A 3% mark-up is added to the EPR price to cover the cost of importing pharmaceuticals.

The concept of therapeutic class level tendering seems to improve the efficiency and potentially increase savings. Grouping either all versions of the same chemical molecules at ATC-5 level or all molecules in a tightly defined therapeutic subgroup at ATC-4 level and requesting offers across the molecule or the therapeutic subgroup seems to be an effective approach. The latter can be achieved in cases where there is wide evidence on the inter-changeability amongst the options available e.g. PPIs, statins, ACE-I inhibitors, beta-blockers, and CA-channel antagonists [25]. It can be seen that tenders for pharmaceuticals can drive prices down significantly and, if sustained over successive tender cycles, can result in substantial savings, whilst at the same time they can optimize prescribing in therapeutic areas, where significant options exist [12]. However, some of the stakeholders may be affected either because of greater logistics spending and discount elimination i.e. pharmacists, or because of the requirement to explain to patients any change in the drug prescribed i.e. pharmacists and physician [26,27]. There may also be some confusion among patients when changes, in pharmaceutical form, are observed (e.g. color, shape etc.) to the preferred medicine after subsequent tenders [28]. In order to ensure that the patient's compliance is not affected, pharmacies need to play a key role in advising patients of such changes to their drug regimens.

## Conclusion

This case study supports the view that Cyprus Health System should capture the lessons learned through these years of practice and use the tendering system, which has delivered significant benefits over time, in the new health system and potentially increase savings. The Ministry of Health in Cyprus has accumulated considerable experience in the use and administration of tenders through the open invitation procedure for off patent and generic products. Stimulating competition intuitively leads to price reduction which, in turn, should lead to greater savings to health systems. This is particularly important for a young health system in order to monitor the pharmaceutical expenditure for the generic and off patent products. Furthermore, it should be considered that there is in place a well settle down system with a precise regulatory and legislative framework fully compatible with EU legislation. This expertise needs to be preserved and be used for both in- and out-patient drugs. Tenders could be seen as an additional tool for the new reimbursement system to select cost-effective choices even if this means restricting formulary choices. The concept of therapeutic class level tendering, should be enhanced as it seems to improve the efficiency and potentially increase savings. The Cyprus competent authorities should identify potential targets in pharmaceutical policies for the implementation of the new National Health System, especially when competition is limited and when a tender approach might deliver better results for health insurance than alternative reimbursement methods.

## References

1. Demographic report. Nicosia: Statistical Services of Cyprus. Ministry of Finance Cyprus; 2017.
2. Pharmaceutical Spending Indicator. Paris: Organisation for Economic Co Operation and Development (OECD); 2018.
3. Health and Hospital Statistics. Nicosia: Statistical Services of Cyprus. Ministry of Finance Cyprus; 2017.
4. Medical Care in Cyprus since 2013. Nicosia: Ministry of Health Cyprus; 2018.
5. The Medical Foundations and Services (fees and control) Laws 1978 and 2000 (Act 143/2013). Nicosia: Cylaw; 2017.
6. Strategic Plan 2018-2020. Nicosia: Ministry of Health Cyprus; 2018.
7. Regulating Procurement Procedures and Related Issues Law? Nicosia: Treasury of the Republic of Cyprus; 2017.
8. The drugs for human use (quality, control, supply ad prices) Laws 2001-2017 (Act 64/2018). Nicosia: Cylaw; 2018.
9. Kanavos PG, Wouters OJ. Transitioning to a national health system in Cyprus: a stakeholder analysis of pharmaceutical policy reform. *Bull World Health Organ.* 2014;93(9):606-13.
10. Belloni A, Morgan D, Paris V. Pharmaceutical expenditure and policies: Past trends and future challenges. *OECD Health Working Papers.* 2016;87.
11. Lee IH, Bloor K, Hewitt C, Maynard A. International experience in controlling pharmaceutical expenditure: Influencing patients and providers and regulating industry- a systematic review. *J Heal Serv Res Policy.* 2015;20(1):52-9.
12. Vogler S, Paris V, Ferrario A, Wirtz VJ, de Joncheere K, Schneider P, et al. How can pricing and reimbursement policies improve affordable access to medicines? Lessons learned from European Countries. *Appl Health Econ Health Policy.* 2017;15(3):307-321.
13. Achour L, Chachoua L, Dabbous M, Hanna E, Toumi M. European collaboration for innovative high cost medicines. *Value Heal.* 2018;21(S2):S94.
14. Hafezalkotob A, Mahmoudi R, Hajisami E, Wee HM. Wholesale-retail pricing strategies under market risk and uncertain demand in supply chain using evolutionary game theory. *Kybernetes.* 2018;47(6):1178-201.
15. Vogler S, Zimmermann N, Habl C, Piessnegger J, Bucsics A. Discounts and rebates granted to public payers for medicines in European countries. *South Med Rev.* 2012;5(1):38-46.
16. Godman B, Hassali MA. Strategies for pricing of pharmaceuticals and generics in developing countries. *Generics Biosimilars Initiat J;* 2017;6(2):58-60.
17. Morgan SG, Vogler S, Wagner AK. Payers' experiences with confidential pharmaceutical price discounts: A survey of public and statutory health systems in North America, Europe, and Australasia. *Health Policy.* 2017;121(4):354-62.
18. Godman B, Bucsics A, Vella Bonanno P, Oortwijn W, Rothe CC, Ferrario A, et al. Barriers for access to new medicines: Searching for the balance between rising costs and limited budgets. *Front Public Heal.* 2018;5(6):328.
19. Siskou O, Terpos E, Galanis P, Vasilakopoulos T, Tsigiotis P, Batsis I, et al. PCN113- Evaluation the economic impact of novel agents for treating multiple myeloma. *Value Heal.* 2018;21(S3):S33.
20. Ades F, Zardavas D, Senterre C, De Azambuja E, Eniu A, Popescu R, et al. Hurdles and delays in access to anti-cancer drugs in Europe. *Ecancer Med Sci.* 2014;8:482.
21. Ouellette LL. How many patents does it take to make a drug? Follow-on pharmaceutical patents and university licensing. *Mich Telecomm Tech L Rev.* 2010;17(1):299.
22. Bodenheimer T, Fernandez A. High and rising health care costs. Part 4: Can costs be controlled while preserving quality? *Ann Intern Med.* 2005;143(1):26-31.
23. Naci H, Mossialos E. Accelerated access to new drugs and technologies. *BMJ.* 2017;359:J5387.
24. Pharmaceutical committee. Nicosia: Pharmaceutical Services, Ministry of Health Cyprus. 2016.
25. Maniadakis N, Kourlaba G, Shen J, Holtorf A. Comprehensive taxonomy and worldwide trends in pharmaceutical policies in relation to country income status. *BMC Heal Serv Res.* 2017;17(1):371.
26. Yfantopoulos JN, Chantzaras A. Drug Policy in Greece. *Value Health Reg Issues.* 2018;16:66-73.
27. Kanavos P, Schurer W, Vogler S. The pharmaceutical distribution chain in the European Union: structure and impact on pharmaceutical prices. Brussels: European Commission; 2011:1-120.
28. Guhl D, Blankart KE, Stargardt T. Service quality and perceived customer value in community pharmacies. *Heal Serv Manag Res.* 2019;32(1):36-48.