



Cláudia Furtado, Inês Teixeira

Medicine and Health Products Observatory / Medicine and Health Products Economics Department

National Institute of Pharmacy and Medicines

## BACKGROUND

Cardiovascular diseases are the major cause of death in Portugal, as well as in the majority of developed countries. Moreover are also one of the main causes of morbidity, disability and years of potential life lost in the Portuguese population<sup>1</sup>. If these diseases are detected precociously and adequately controlled, there is a high potential for minimizing the cardiovascular morbidity and mortality in this country.

## OBJECTIVES

- ⇒ Analyse Portuguese cardiovascular drug utilization patterns at national and regional level and compare it with other European countries;
- ⇒ Evaluate both NHS and patient's expenditure as well as daily treatment cost evolution;
- ⇒ Analyse the correlation between drug utilization and the morbidity and mortality trends in Portugal.

## METHODS

Cross-sectional descriptive study with an analytical component. Drug utilization data refers to Cardiovascular Drugs prescribed and dispensed in ambulatory to population covered by the National Health Service (NHS), from 1<sup>st</sup> January 2000 to 31<sup>st</sup> December 2004. In accordance with the WHO ATC classification index<sup>2</sup> they have the following codes: B01A, B02BA, C01, C02, C03, C04, C07, C08, C09 e C10. Utilization and expenditure indicators employed in the study are those recommended by EURO-MED-STAT<sup>3</sup>.

Utilization data was expressed in Defined Daily Dose (DDD), which correspond to the average maintenance dose in adults for the drug's main indication. In order to express consumption independently of the size of a region's population, DDD per 1000 inhabitants per day (DID) was used.

$$DID = \frac{\text{Nr. of packages sold in a year (mg)} \times 1000 \text{ inhabitants}}{DDD \text{ (mg)} \times 365 \text{ days} \times \text{population}}$$

Expenditure was expressed in Retail Prices (RP), which includes the NHS reimbursement and the user copayment. The daily treatment cost (DTC) was also calculated using the formula:  $DTC = RP/DDD$ , which gives the average cost of each active substance or drug class.

### Analyses of the correlation between Cardiovascular drugs utilization with factors known to affect the utilization

Pearson's correlation (with a level of significance of 0.05) was used to determine whether there was an association between drug's utilization, age structure, and morbidity and mortality levels.

## RESULTS

### Trends in Drug Utilization

Increased 33,4% in DDD per 1000 inhab. day (2000-2004)

- ✓ In 2004, Antihypertensive Drugs were the most frequently prescribed followed by Lipid Lowering Drugs.
- ✓ Angiotensin Converting Enzyme Inhibitors (ACEI) is the drug class most prescribed, and Lisinopril is the ACEI most prescribed followed by Enalapril and Ramipril;
- ✓ Statins and Angiotensin Receptor Blockers (ARB) accounted for most of the rising Cardiovascular drug utilization rates. Statins had a marked increase specially due to Simvastatin.
- ✓ Diuretics is the drug class that most decreased in this period, followed by Digitalics.
- ✓ In relation to Platelet Aggregation Inhibitors, Ticlopidine was the most used active substance (6,5 DID) and Acetylsalicylic acid had in 2004 a utilization of 4 DID.

### Trends in Drug Expenditure

- ✓ The utilization pattern had a high impact in the cardiovascular drug expenditure, which increased 52% in this period, amounting to over 638 million euros in 2004.
- ✓ Over the study period Statins and ARB, plain or in combination formulations, accounted for 40% and 30% of the expenditure growth, respectively.
- ✓ Although the increase in ACEI utilization, its expenditure has not increased, especially due to the effect of generic utilization.
- ✓ Platelet Aggregation Inhibitors showed a marked increase between 2003 and 2004 due to reimbursement of Clopidogrel.

### Regional Analyse

- ✓ These results also reveal high asymmetries on drug utilization at regional level. For instance Antihypertensive and Lipid Lowering Drugs were less used in the north of Portugal and in Algarve.
- ✓ In relation to morbidity and mortality rates there was not a statistical significant correlation between these indicators and the utilization's trend at the national level ( $p > 0.05$ ).

### Comparison of Antihypertensive Drug utilization Pattern in Portugal with other European Countries

- ⇒ Compared with the other four countries, Portugal had the highest percentage of ACEIs, in isolation or associated with diuretics, and was among those with the lowest proportion of diuretics and beta blockers;
- ⇒ Denmark had the highest proportion of diuretics, more than double the percentage consumed in Portugal.

## CONCLUSIONS

- ⇒ On the health gains perspective, the significant rise in cardiovascular drug utilization reveals a potentially favourable evolution due to the increase of patients undergoing drug treatment, despite a lower usage in some drug classes in comparison with other European countries.
- ⇒ There is a lower usage of diuretics, beta-blockers and platelet aggregation inhibitors, in particular of acetylsalicylic acid. These patterns are not in accordance with the majority of national and international guidelines related with cardiovascular diseases.
- ⇒ For instance in antihypertensive treatment it is recommended the use of diuretics as first line agents. Considering that these drugs have the least daily treatment cost, it would be expectable not only a high market share but also a rise in its utilization. Both situations are inexistent in Portugal.
- ⇒ This study reveals a lack of adherence to national and international guidelines, therefore it should be given more attention to its implementation in order to improve health gains in Portugal.

Table 1 - Evolution of Cardiovascular Drugs Utilization and Expenditure

	2000	2001	2002	2003	2004	Δ 2000-04 (%)
Utilization (DID)	310,30	328,95	342,49	370,98	413,94	33,4%
Expenditure (RRP)	420.118.488	467.296.913	515.361.932	552.358.845	638.459.999	52,0%
Expenditure (Government)	307.761.978	340.192.712	371.521.943	391.559.272	444.114.199	44,3%

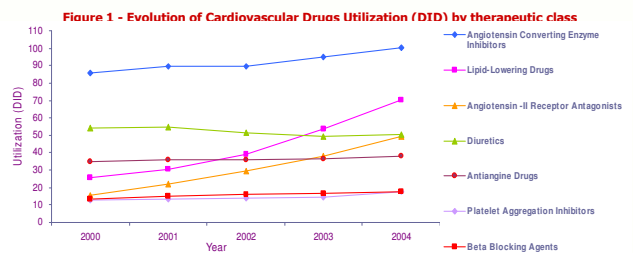


Figure 2 - Evolution of Cardiovascular Drugs expenditure (RRP) by therapeutic class

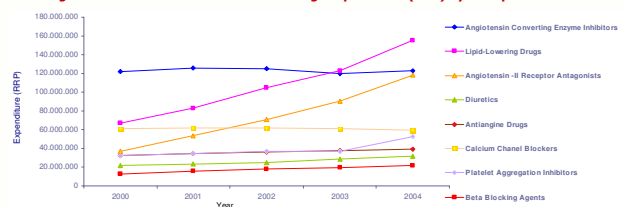


Fig. 4 - Distribution of antihypertensive's utilization in Portugal

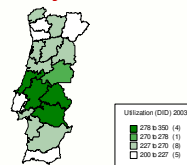


Fig. 4 - Distribution of statin's utilization in Portugal

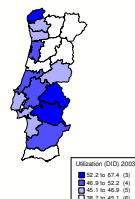
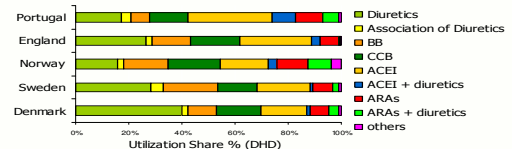


Figure 3 - Pattern of Cardiovascular Drugs Utilization between Countries<sup>4,5</sup> by therapeutic class



## REFERENCES

- 1 - Programa Nacional de Prevenção e Controlo das Doenças Cardiovasculares. Despacho nº 16415/2003 (2ª série)- Diário da República nº 193 de 22 de Agosto
- 2 - World Health Organization Collaborating Centre for Drug Statistics Methodology: Anatomical Therapeutic Chemical (ATC) classification index including defined daily doses (DDD) for plain substances (2004). Available at <http://www.who.cc.no/atcddd/>
- 3 - EURO-MED-STAT. The Library of European Union Pharmaceutical Indicators, 2005. Available at <http://www.euromedstat.cnr.it>
- 4 - Nordic Medico statistical Committee. Medicines Consumption in the Nordic Countries 1999-2003. Nordic Medico statistical Committee 2004. Disponível em <http://www.nord-nos.dk/Medicinebook/medicines%20consumption.pdf>
- 5 - Health and Social Care Information Centre. Prescription Cost Analysis: England 2004. Department of Health 2005. Disponível em <http://www.dh.gov.uk/assetRoot/04/10/76/26/04107626.pdf>