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. 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.

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 especially due to Simvastatin.
  - Diuretics is the drug class that most decreased in this period, followed by Digitalis.
  - In relation to Platelet Aggregation Inhibitors, Ticlopidine was the most used active substance (5.5 DDD) and Acetylsalicilc 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 438 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 utilisation.
  - 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 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-blocking agents;
- 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 acetylsalicilc 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 inexist 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.

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

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.

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 utilisation with factors known to affect the utilisation
Pearson’s correlation (with a level of significance of 0.05) was used to determine whether there was an association between drug’s utilisation, age structure, and morbidity and mortality levels.

REFERENCES
2. World Health Organization. Collaborating Centre for Drug Statistics Methodology; Anatomical Therapeutic Chemical (ATC) classification index including defined daily doses (DDD) for plain substances (2000). Available at http://www.who.int/atcddd/