

# MAIN FACTORS ASSOCIATED TO COSTS OF TYPE 2 DIABETES MELLITUS CARE IN SPAIN: A SYSTEMATIC REVIEW OF THE 2001-2011 LITERATURE

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## Introduction

Type 2 diabetes mellitus (T2DM) is one of the major health problems worldwide. It is estimated that there are 246 million people affected and it is estimated that in 2025 T2DM may reach 380 million cases<sup>1</sup>. In Spain, T2DM prevalence varies between 6% and 12%<sup>2</sup>. Chronic micro and macro vascular complications are common and responsible for a significant proportion of costs due to the use of health resources<sup>3</sup>. The costs related to treatment and prevention of diabetes become one of the main budget impacts that the public health system should assume.

## Objetives

- To identify the driven factors of care costs of T2DM patients as reported in the literature in Spain.
- To describe the position of Spain with respect to other European countries in terms of T2DM cost factors.

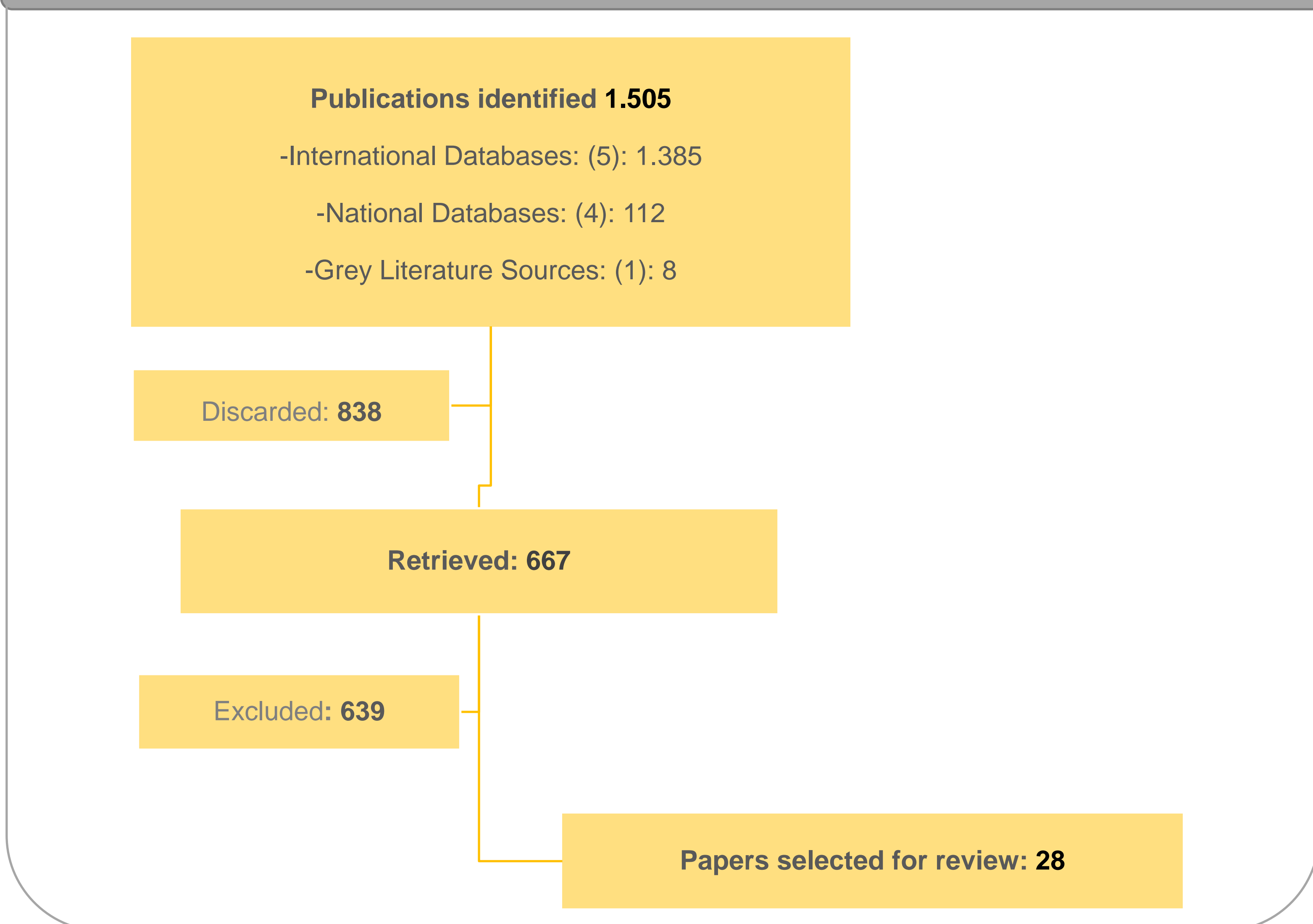
## Methods

A systematic review of literature focused on costs of diabetes was conducted. Electronic data bases, including Medline, ISI Wok, Scopus, Cochrane Library, DARE, CSIC-IME, IBECS, MEDES and Medibooks were searched to identify articles published between January 2001 and December 2011. The reference list of key papers as well as the grey literature were hand searched. Literature search criteria included original, national and international studies published in English or Spanish, addressing the costs and resources used in T2DM care. Data was extracted to analyze the influence in costs of hypoglycemia, vascular complications, pharmacological interventions and treatment compliance. All costs were updated to €, 2011.

## Results

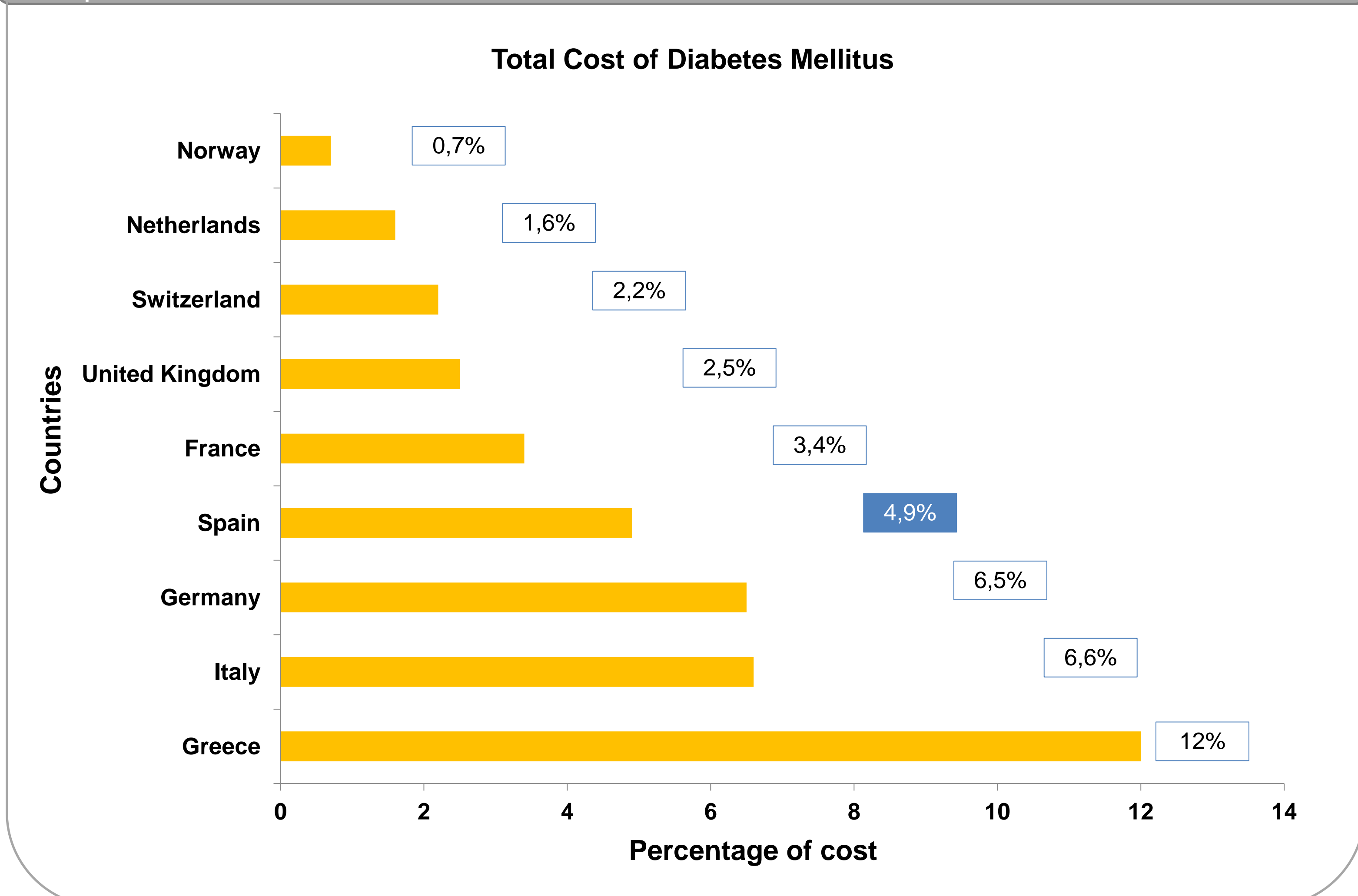
More than a thousand relevant titles were initially identified and 667 abstracts of potential interest were retrieved. After excluding articles not fulfilling the inclusion criteria, a total of 28 articles were reviewed (Figure 1).

Figure 1. Systematic review process.



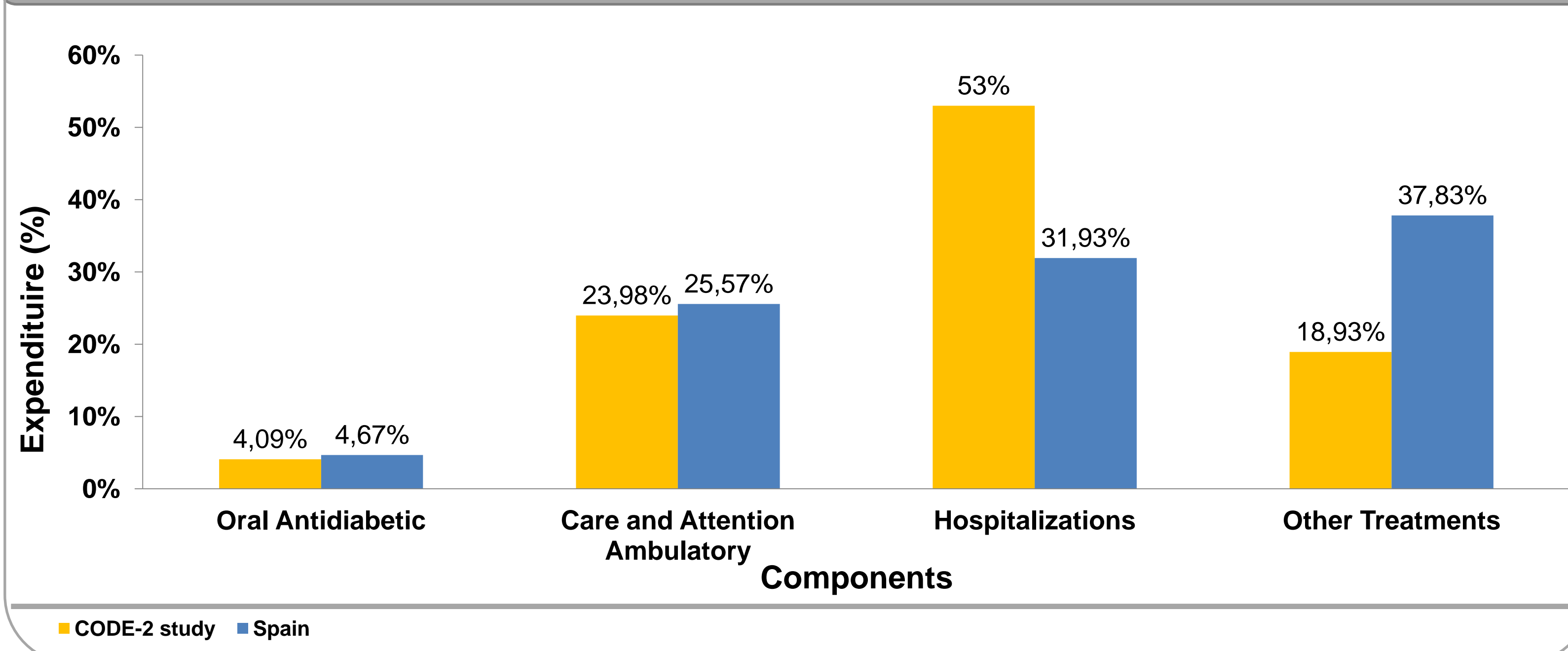
- In Europe, the total direct medical costs of T2DM were estimated at €42 billions per year while in Spain were calculated in €2.800 million per year.
- Spain occupied the 4th place after Greece, Italy and Germany in relation to the percentage of the total health expenditure directed towards T2DM care (Figure 2).
- In Spain, the total cost per patient/year ranged between €851.23 and €4882.80 depending on the costs included in the analysis in the studies considered.

Figure 2. Proportion of the total healthcare expenditure directed towards T2DM care in nine European countries



- In Europe, hospital admissions and ambulatory visits were the main T2DM direct costs drivers, representing the 76.98% of the total costs.
- In Spain drugs not related to glycemic control and hospital admissions were the main drivers of direct costs representing 37.83% and 31.93% of the total cost of T2DM management, respectively (Figure 3).

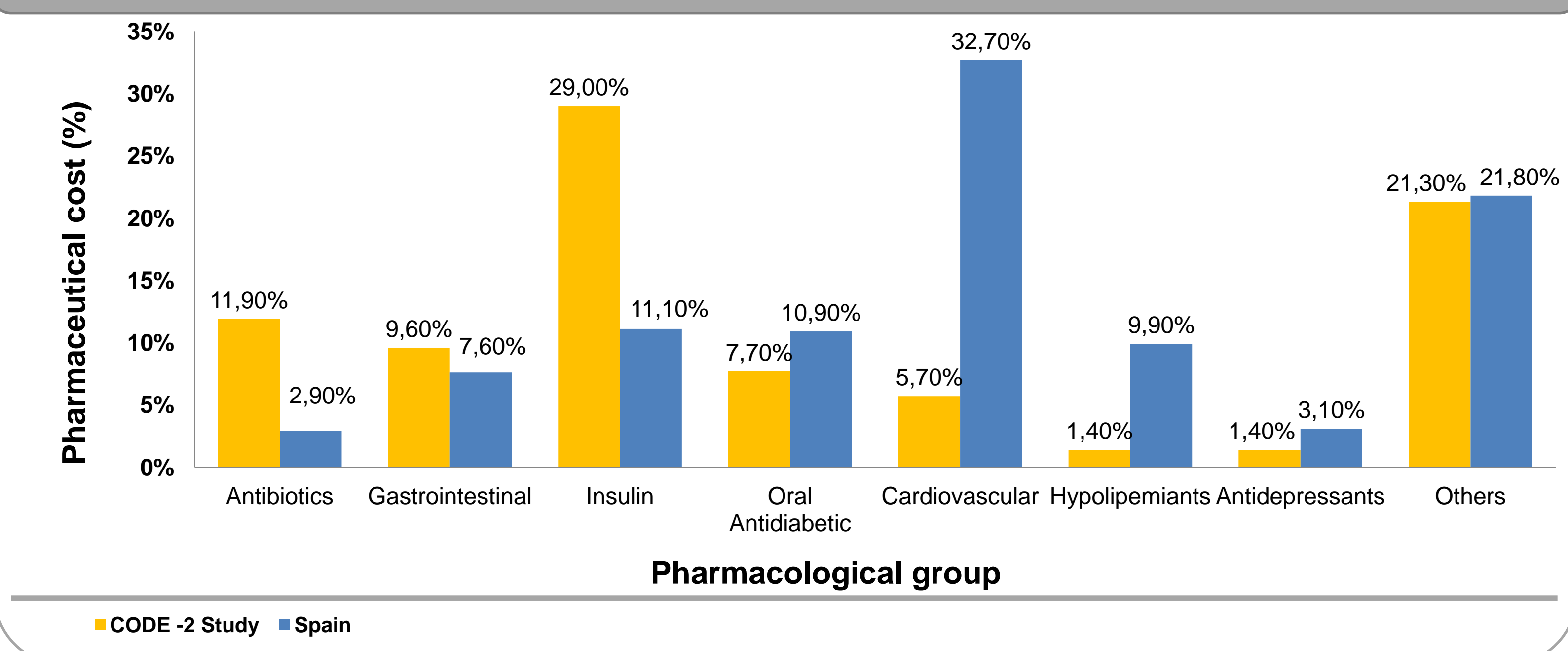
Figure 3. Main drivers of T2DM care costs in Europe (CODE-2 study) and Spain expressed as the percentage of the total health expenditure.



## PHARMACOLOGICAL INTERVENTIONS

- In Spain, the higher pharmacological cost associated to T2DM treatment corresponded to cardiovascular drugs, followed by insulin, oral hypoglycemic drugs, gastrointestinal drugs, antidepressants and antibiotics (figure 4).

Figure 4. Distribution of the cost of pharmacological treatment for T2DM patients in Spain and Europe (CODE-2 study).

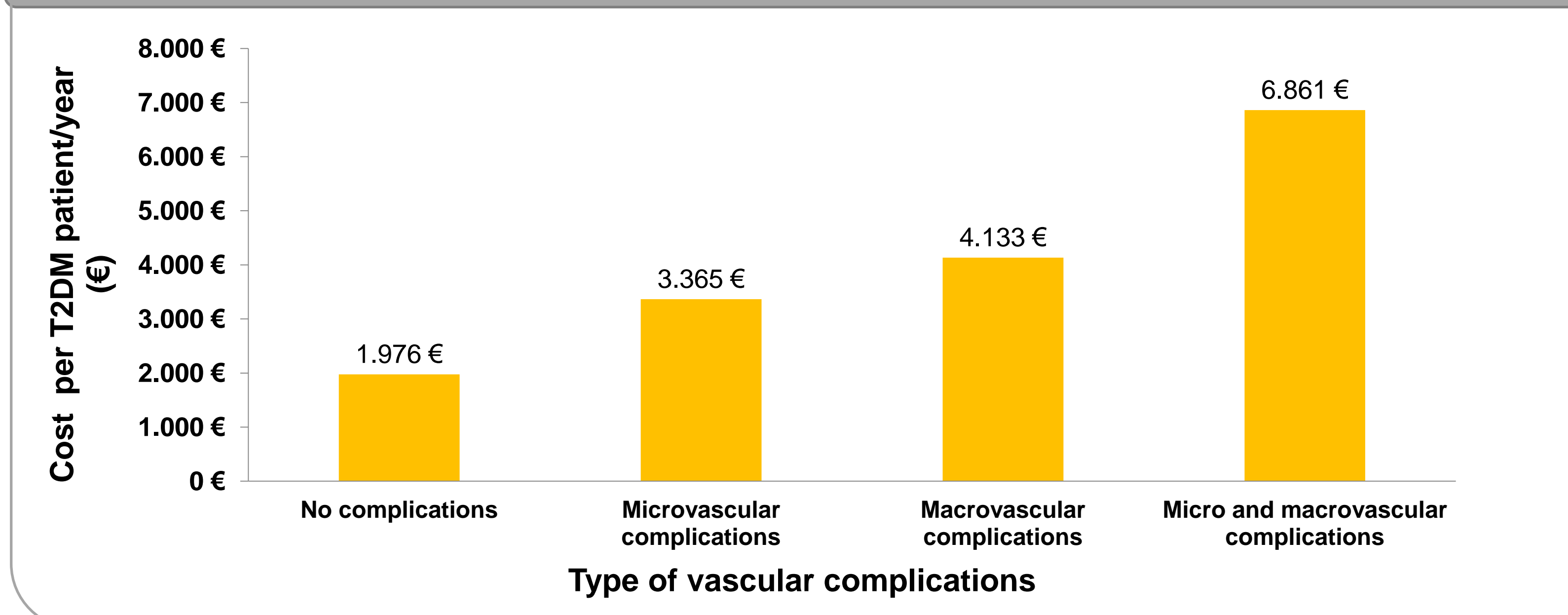


- In Europe, T2DM patients who do not reach the target level of glucose control have an annual drug cost 29.7% higher than patients who do reach the target level (€484.83 vs. €373.53 respectively).
- In Europe, a 59.9% increase in the average annual cost per patient associated with the management of the disease was observed when the objective of glycemic control was not achieved.
- Further, the clinical management of obesity increases by 30% the direct cost of T2DM patients care.

## VASCULAR COMPLICATIONS

- T2DM patients with macro and microvascular complications represent, at least, 64.5% of the cost associated with the use of health care resources.
- Patients with macro vascular complications increase at least 2 times the cost associated with the use of health care resources while patients with one or more micro vascular complications increase it at least 1.7 times (Figure 5).

Figure 5. Effect of complications on the T2DM average cost patient per year.



- The incremental increase in hospitalizations' cost for patients with only micro vascular or macro vascular complications is 100% and 200%, respectively, compared to patients with no complications.
- In Spain, patients with uncomplicated T2DM represent 13.7% of the direct costs.

## TREATMENT COMPLIANCE

- The magnitude of the reduction of T2DM costs depends on the adherence of patients to oral antidiabetic treatment.
- An increase of 10% in oral antidiabetic treatment adherence supposes a 6.6% reduction in the number of hospitalizations per patient/month.
- An increase of 10% in oral antidiabetic treatment compliance represents a reduction by 2%(p< 0.001) in total health care cost and 4%(p<0.01) in costs associated with T2DM management.

## Conclusions

A comparatively high percentage of health expenditure is devoted to T2DM care in Spain. Main factors directly associated with T2DM management costs were T2DM related complications, poor glycemc control, obesity and poor treatment adherence. Strategies aimed to improve these factors would have a major impact on costs reduction.

## References:

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3. Estrategia en diabetes del Sistema Nacional de Salud. Ministerio de Sanidad y Consumo, España 2007.