

# The influence of improved adherence and persistence in Chronic Obstructive Pulmonary Disease (COPD) costs: systematic review of the literature

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## Introduction

The lack of adherence and persistence to COPD treatment, estimated between 20% and 60% of patients, contributes to poor clinical outcomes and disease progression that implies additional costs.<sup>1</sup>

## Objectives

The aim of this study is to estimate the variation on COPD costs that would result as a consequence of improving patients' adherence and persistence to treatment.

## Methods

### Phase 1. Systematic review of the literature

A systematic review of the literature, between 2002-2012, was performed in MedLine/PubMed, Cochrane Library, ISI WOK, MEDES, IBECS, CSIC, Google Scholar to identify articles on COPD direct cost and the influence of treatment adherence and persistence on these costs.

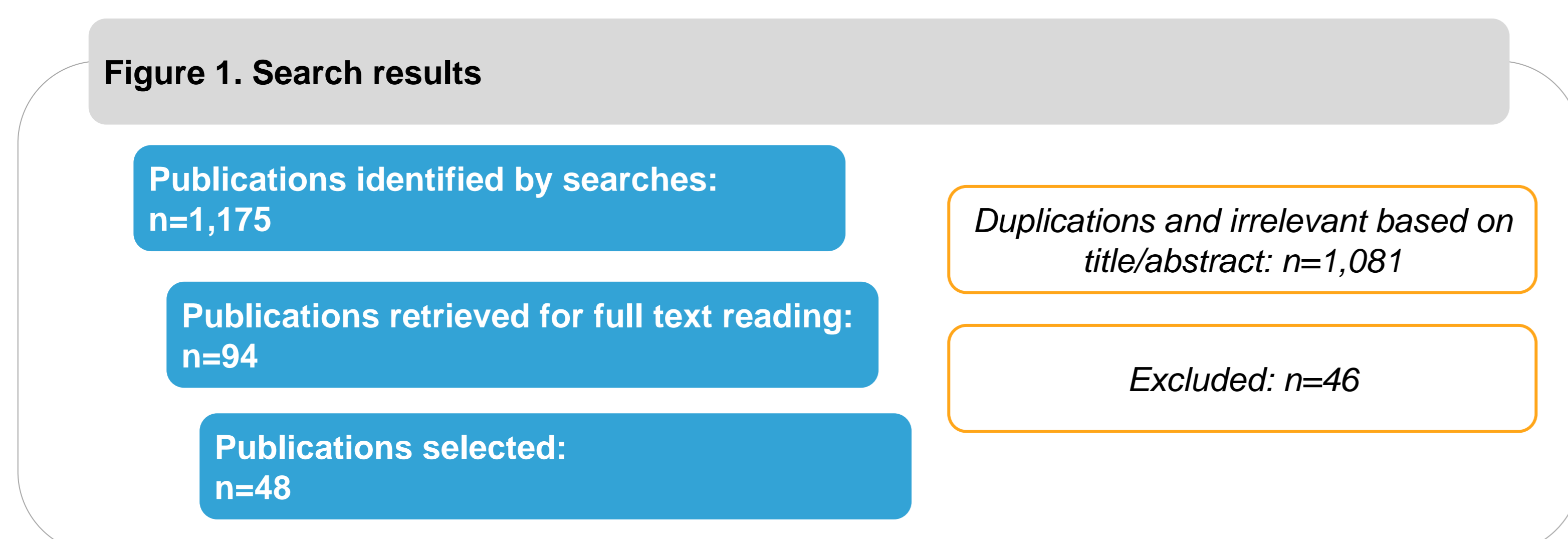
### Phase 2. COPD direct cost estimates from Spanish National Health System (NHS) perspective

Based on data identified in the systematic review, COPD annual direct costs per patient in Spain and potentially avoidable direct costs were estimated considering the improvement of therapeutic adherence and persistence in moderate and severe COPD patients, which is one of the recommendations of the Spanish NHS COPD Strategy.<sup>2</sup> Costs were updated to €, 2012.

## Results

### Phase 1. Systematic review of the literature

- A total of 48 articles were included (9 Spanish; 39 international).



- COPD treatment adherence and persistence and their influence on annual direct costs were analyzed in 3 articles (no Spanish publications identified).

### Direct costs

- Direct costs are heterogeneous depending on country, study design, population profile and resources use included.
- In Spain, the average direct cost per patient ranges between €301 and €4,226 depending on the publications.<sup>3,4</sup>

### Adherence and persistence with COPD treatment

- 97% of COPD patients take more than one medication, receiving multiple inhaled treatments with different devices of complex use.<sup>5,6</sup>
- Multiple inhaled treatments and devices of complex use contribute to poor adherence and persistence and to higher medical resources use and more exacerbations.<sup>6,7</sup>
- Treatment adherence implies a 9% decrease in average annual direct cost of a COPD patient, while non-adherence means an increase of 5%. Average direct costs decrease by 3% when treatment persistence is achieved. In case of non-persistence, direct costs increase by 13%.<sup>7</sup>

### Phase 2. COPD direct cost estimates from Spanish NHS perspective.

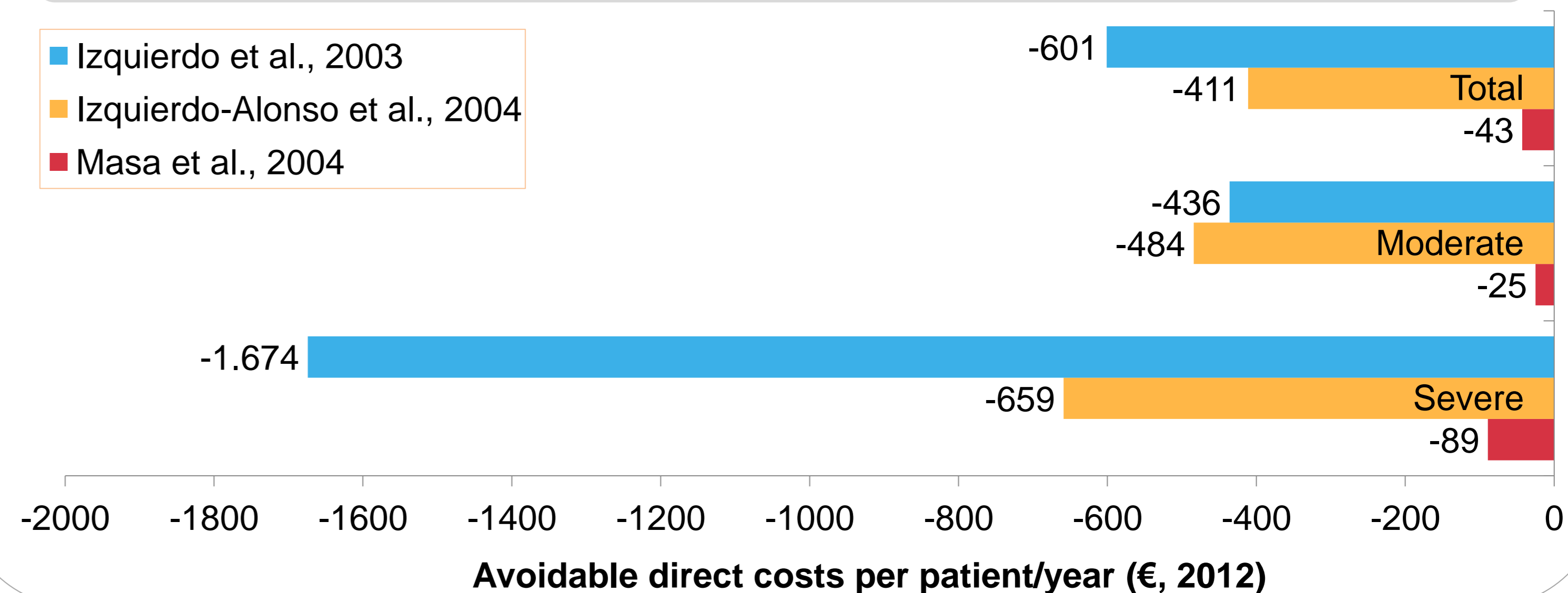
- In order to cover the range of COPD direct costs in Spain, 3 cost estimations were carried out based on data from Spanish sources selected from literature review: Izquierdo et al. <sup>3</sup>, Izquierdo-Alonso et al. <sup>5</sup> and Masa et al. <sup>4</sup> which present the higher, middle and lowest COPD direct costs, respectively.

**Table 1. Annual direct cost per patient with COPD in Spain, according publication and COPD severity.**

Annual direct cost per patient (€, 2012)	Izquierdo (2003) <sup>3</sup>	Izquierdo Alonso et al. (2004) <sup>5</sup>	Masa et al. (2004) <sup>4</sup>
Total COPD patients	4,226	2,890	301
Moderate COPD patients	3,051	3,400	175
Severe COPD patients	11,697	4,631	628

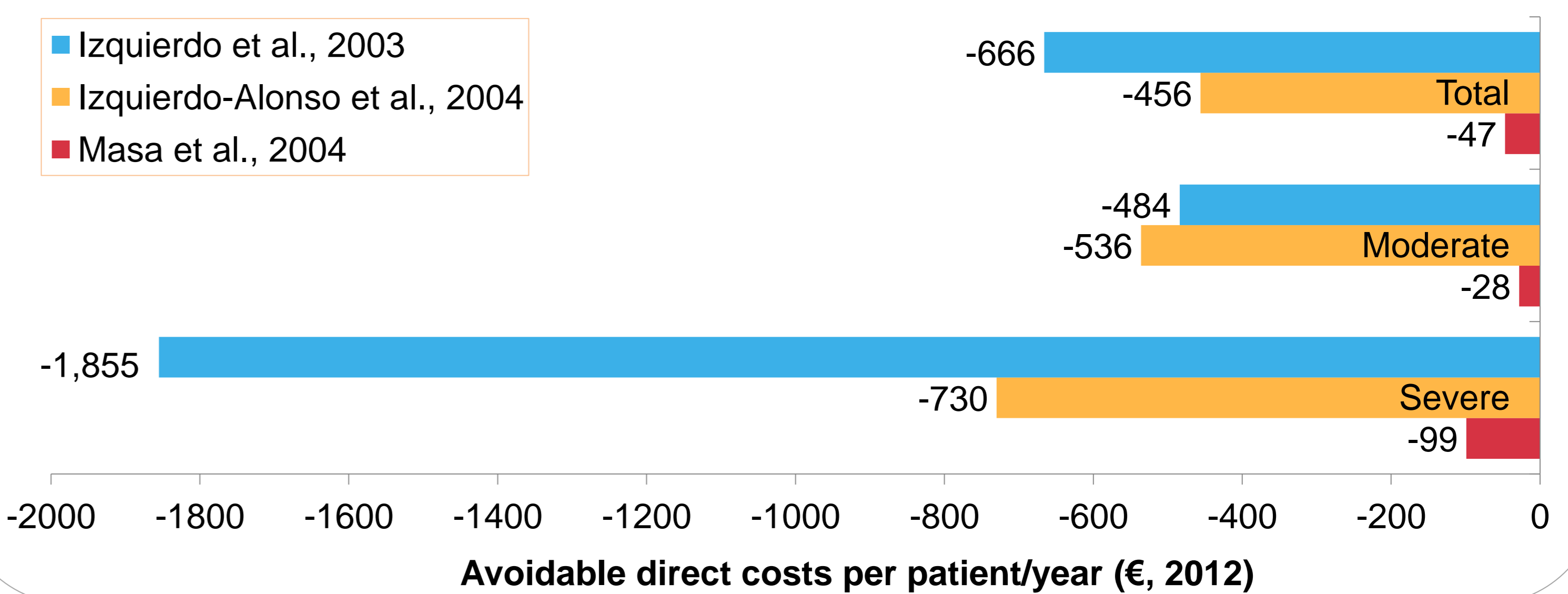
- Improving treatment adherence could further avoid €43 to €601 per patient/year (depending on the selected publication), reaching €89 to €1,674 in severe patients (Figure 2).

**Figure 2. Estimation of the avoidable COPD direct cost per patient/year depending on adherence or non-adherence, disease severity and selected publication.**



- Improving treatment persistence could save between €47 and €666 per patient/year (depending on the selected publication), rising up to €99-€1,855 in severe COPD patients (Figure 3).

**Figure 3. Estimation of the avoidable COPD direct cost per patient/year depending on persistence or non-persistence, disease severity and selected publication.**



## Conclusions

Available studies on influence of adherence and persistence on COPD costs are scarce making difficult to draw definitive and consistent conclusions.

Nevertheless, improving therapeutic adherence and persistence are crucial to optimize outcomes and reduce COPD costs in the Spanish NHS.

## Bibliography

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