

EFFICIENCY (COST/EFFICACY) OF BIOLOGIC AGENTS FOR THE TREATMENT OF MODERATE TO SEVERE PSORIASIS

Ferrándiz C¹, Blasco AJ², Lázaro P², García A³, Liso J⁴.

¹Dermatology Service. Germans Trias i Pujol University Hospital. Barcelona. Spain. ²Advanced Techniques in Health Services Research (TAISS). Madrid. Spain. ³Dermatology Service. La Princesa University Hospital. Madrid. Spain. ⁴Specialized Pharmacy Service. Badajoz University Hospital. Badajoz. Spain.

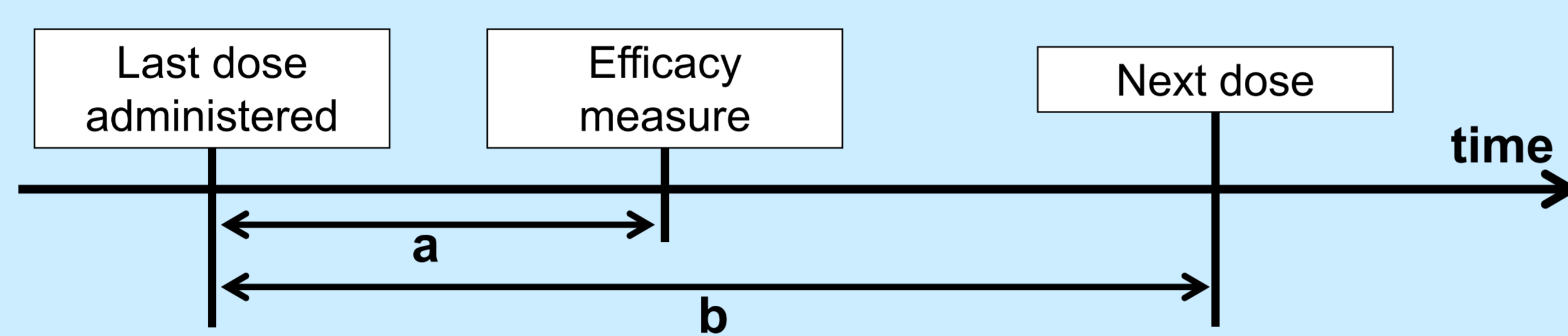
Objective:

To estimate the efficiency, in terms of incremental cost-efficacy ratios (ICER), of biologics licensed in Spain, in 2009 (adalimumab, etanercept, infliximab and ustekinumab) for the management of moderate to severe psoriasis.

Methods:

Economic evaluation model: Decision tree for each treatment (dose and duration) of the biologics compared. Information about efficacy and dosage was obtained from published randomized controlled trials (RCTs) comparing the treatment to be evaluated with placebo. **Time horizon:** Duration of the RCTs (minimum:10 weeks; maximum: 24 weeks). **Perspective:** Payer (Spanish Health Care System) only considering drug costs (laboratory sales price, in 2009 €). For infliximab, which requires a weight-dependent dosing, the weight of the study participants was standardized by age and sex to the Spanish population with correction for increased weight in individuals with psoriasis. **Incremental cost:** Treatment cost, assuming that the cost of placebo is zero. When costs accruals were considered, the "unit of cost" of the last dose was calculated as a proportion in which the numerator is the time between the last dose administered and the moment in which the efficacy is measured, and the denominator is the time between the last dose administered and the moment in which the next dose should be administered (according to the summary of products characteristics) (Figure 1). **Incremental efficacy:** Proportion of patients considered responders according to the Psoriasis Area Severity Index (PASI) 75 criterion (improvement of 75% from baseline PASI) in the biologic group minus the proportion who respond in the placebo group. When more than one trial per treatment was available, a meta-analysis was undertaken assuming a random effect model (DerSimonian-Laird method). **Efficiency:** Incremental cost-efficacy ratios (ICER) with respect to placebo. **Uncertainty:** Deterministic sensitivity analysis, building scenarios with 95% confidence intervals for costs and efficacy.

Figure 1. Unit of cost calculation. Unit of cost = a/b



Results:

Summary of the characteristics of the RCTs included

Study	Year	Setting	Duration (weeks)	Drug	Dosage	N (patients)
Gordon et al.	2008	USA, Canada	12	Adalimumab	80 mg + 40 mg/2 weeks	45
				Placebo		52
Saurat et al.	2008	Europe, Canada	12, 16	Adalimumab	80 mg + 40 mg/2 weeks	108
				Placebo		53
Menter et al.	2008	USA, Canada	12, 16	Adalimumab	80 mg + 40 mg/2 weeks	814
				Placebo		398
Leonardi et al.	2003	USA	12	Etanercept	2 x 25 mg/week	162
				Placebo	2 x 50 mg/week	164
Papp et al.	2005	USA, Europe, Canada	12	Etanercept	2 x 25 mg/week	196
				Placebo	2 x 50 mg/week	194
Gottlieb et al.	2003	USA	12, 24	Etanercept	2 x 25 mg/week	57
				Placebo		55
van de Kerkhof et al.	2008	Europe	12	Etanercept	50 mg/week*	96
				Placebo		46
Tyring et al.	2006	USA	12	Etanercept	2 x 50 mg/week	311
				Placebo		306
Reich et al.	2005	Europe, Canada	10, 24	Infliximab	5 mg/Kg**	301
				Placebo		77
Menter et al.	2007	USA, Europe, Canada	10	Infliximab	5 mg/Kg***	314
				Placebo		208
Chaudhari et al.	2001	USA	10	Infliximab	5 mg/Kg***	11
				Placebo		11
Gottlieb et al.	2004	USA	10	Infliximab	5 mg/Kg***	99
				Placebo		51
Leonardi et al.	2008	USA, Canada, Belgium	12	Ustekinumab	45 mg [†]	255
				Placebo	90 mg [†]	256
Papp et al.	2008	USA, Europe, Canada	12	Ustekinumab	45 mg [†]	409
				Placebo	90 mg [†]	411

*Equivalent to 2 x 25 mg/week. **Administered at weeks 0, 2, 6, 14 and 22. ***Administered at weeks 0, 2, and 6. [†]Administered at weeks 0 and 4.

Cost of the biologics, units administered and "unit of cost" when considering cost accruals

Drug	Dosage	Unit	Price (euros)	Weeks	Units	
					Administered	"Cost"
Adalimumab	80 mg + 40 mg/2 weeks	Prefilled pen, 40 mg	514,15	12	8	7,5
					16	9,5
Etanercept	2 x 25 mg/week	Syringe, 25 mg	118,40	12	24	24
	2 x 50 mg/week	Syringe, 50 mg	236,80	12	24	24
Infliximab	5 mg/Kg*	Vial, 100 mg	536,28	10	15-12**	12,5-10**
					24	21,25-17**
Ustekinumab	45 mg***	Vial, 45 mg	3.052,26	12	2	1,67
	90 mg***				4	3,33

* Administered at weeks 0, 2, 6, 14 and 22. ** In the most favorable scenario. ***Administered at weeks 0 and 4.

Figure 2. Efficacy of biologics vs. placebo

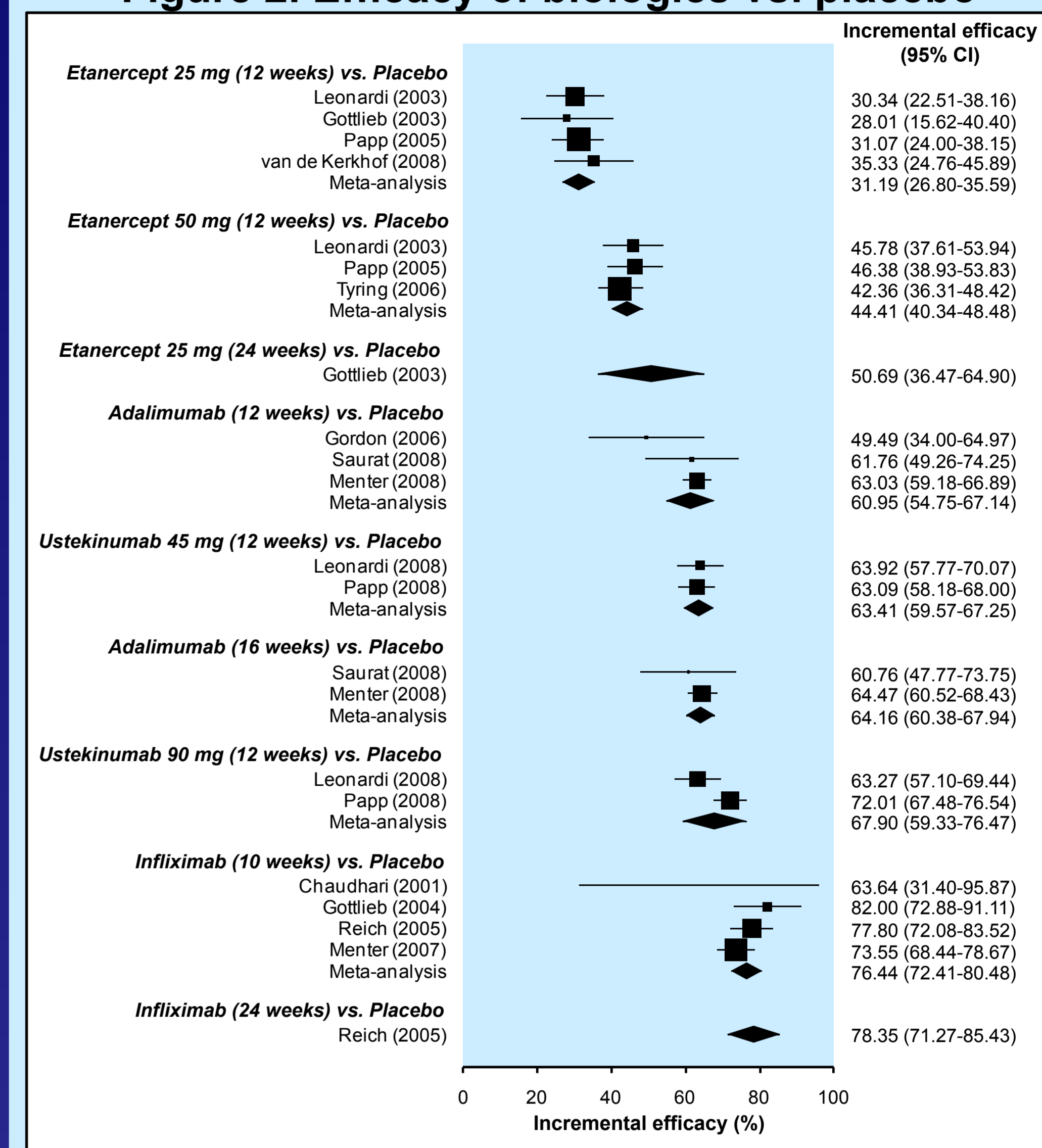


Figure 3. Efficiency of biologics vs. placebo, considering units administered (ICER: cost/PASI-75 responder gained)

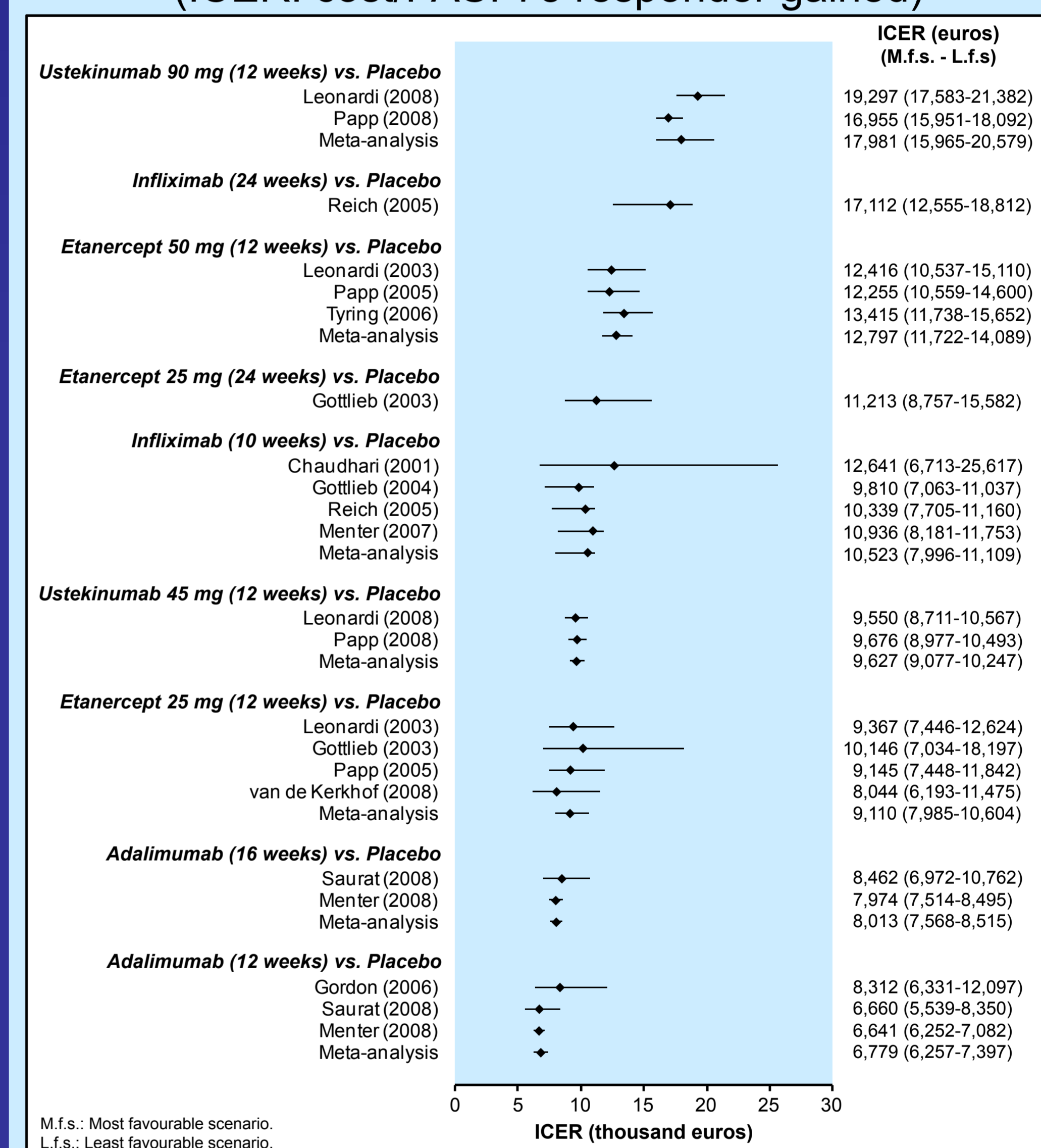
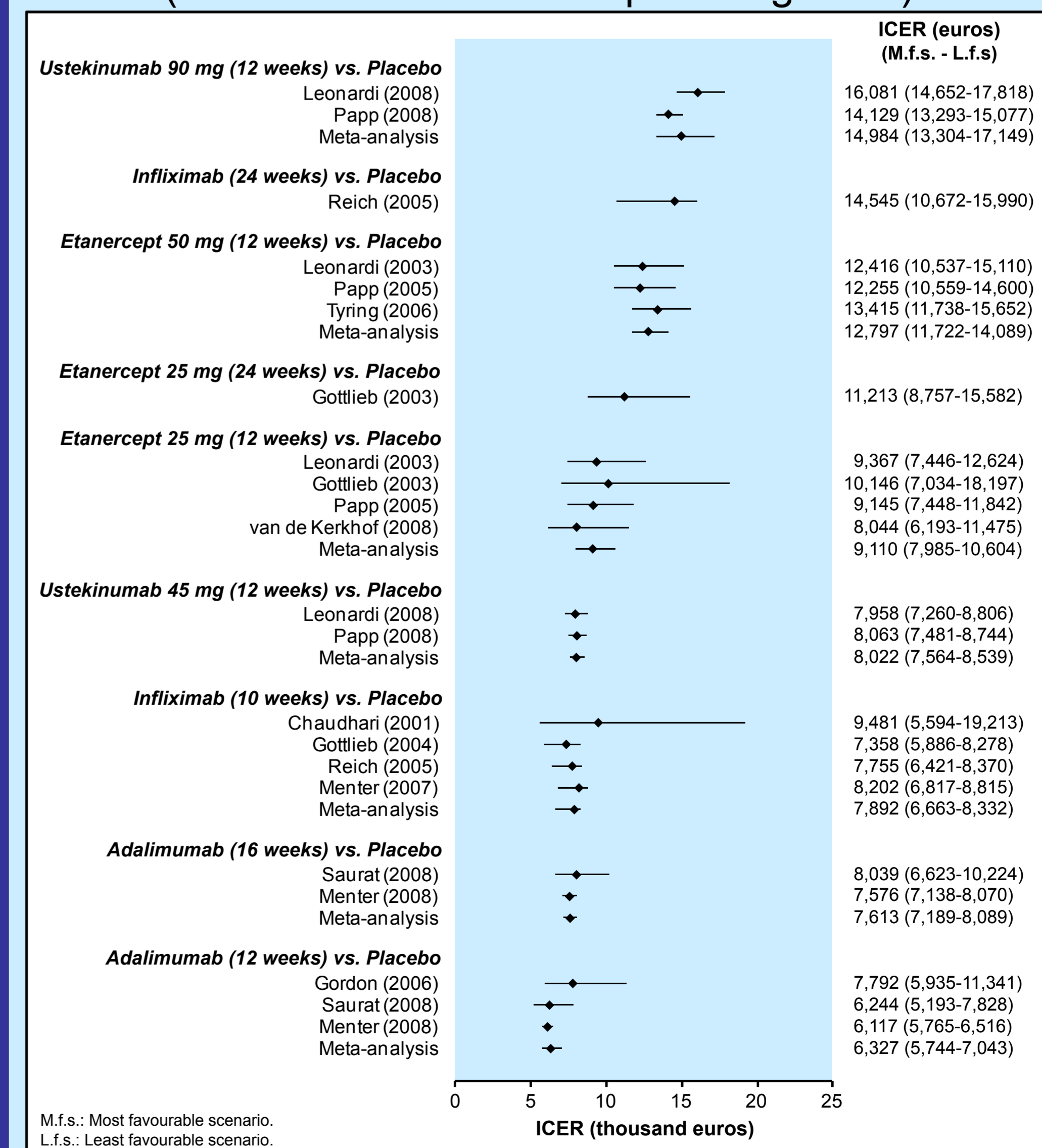


Figure 4. Efficiency of biologics vs. placebo, considering costs accruals (ICER: cost/PASI-75 responder gained)



Conclusion:

Among the biologics licensed in Spain in 2009, the most efficient according to its' ICER is adalimumab. The economic benefit shown by adalimumab is methodologically robust, given that it is the more efficient biologic in comparison to placebo, not only in the base case, but also in the most and least favourable scenarios considered.

Study funded by Abbott Laboratories without restrictions.