# Number-Needed-to-Treat and Cost-per-Responder Analysis of Dupilumab versus Mepolizumab in Chronic Rhinosinusitis with Nasal Polyps

CRSwNP

**Laurent Dreyfus[1], Jules Tavi[2], Jerome Msihid[2], Carla Trindade[3], Zhixiao Wang[4], Aakash Bipin Gandhi[5]**

[1]Aixial, Boulogne-Billancourt, Paris, France, [2]Sanofi, Gentilly, France, [3]Sanofi, Porto Salvo, Portugal, [4]Regeneron Pharmaceuticals, Inc., Sleepy Hollow, NY, USA, [5]Sanofi, Cambridge, MA, USA

## Background

- Dupilumab and mepolizumab are two of the biologics that are approved for the treatment of chronic rhinosinusitis with nasal polyps (CRSwNP), an inflammatory disease affecting the nasal and paranasal sinus mucosa[1].
- The efficacy of dupilumab and mepolizumab, compared to standard of care (SoC), was assessed in the LIBERTY NP SINUS 24/52 and SYNAPSE trials, respectively[2,3]. However, no head-to-head trials have been conducted comparing dupilumab vs. mepolizumab in patients with CRSwNP.
- Findings from a recent indirect treatment comparison (ITC) showed greater improvements in CRSwNP-related symptoms in patients treated with dupilumab than mepolizumab[4].
- The number needed to treat (NNT) and the cost per responder (CPR) are practical measures that are increasingly used to contextualise the clinical and economic benefits and support payer's decision-making[5].

## Objective

- **To compare the NNT to achieve one additional responder vs. SoC and the CPR of dupilumab vs. mepolizumab at Week-24 after treatment initiation (baseline) in patients with CRSwNP from the Portuguese healthcare perspective.**

## Conclusions

- **The NNT to achieve clinically meaningful improvement was relatively fewer in dupilumab than in mepolizumab.**
- **Compared to mepolizumab, achieving an equivalent number of additional responders (reduction in NPS and SNOT-22) at 24 weeks of treatment for CRSwNP was less costly with dupilumab.**
- **Overall, these findings indicate favorable treatment benefits and economic value for dupilumab compared to mepolizumab.**
- **Potential limitations of the study include the use of ITC rather than a randomized controlled trial for deriving efficacy outcomes and the use of list prices which may differ from the net prices.**

# METHODS & RESULTS

### NNT model

- An existing NNT model was adapted to analyse the Week-24 NNT vs. SoC for dupilumab and mepolizumab (**Figure 1**).
- The model was adapted based on efficacy and drug costs inputs from a Portuguese healthcare perspective (**Figure 1**).

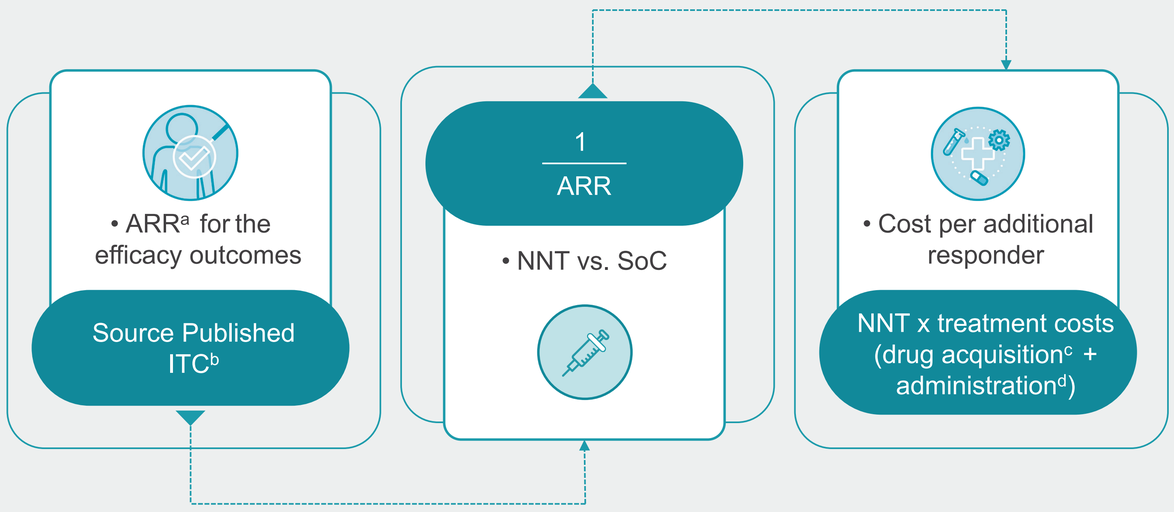
### Efficacy outcomes and data sources

- The response rates considered included a reduction from baseline (RFB) in the nasal polyp score (NPS) by ≥ 1; a reduction in the NPS by ≥ 2; and a reduction in the sino-nasal outcome test (SNOT-22) score by ≥ 8.9 (clinically meaningful improvement) [6,7].
- Response rates at Week-24 for dupilumab and SoC were extracted from a *post-hoc* analysis of a sub population of patients (SYNAPSE-like: ≥ 1 prior surgery, non-smoker, or former smoker >6 months, and overall symptoms' visual analogue scale > 7 at baseline) in the LIBERTY NP SINUS trials.
- Response rates for mepolizumab were derived from a recently published ITC comparing the same sub population of SYNAPSE-like patients in the LIBERTY NP SINUS trials vs. mepolizumab treated patients from the SYNAPSE trial[4].
- The response rates for NPS ≥ 2 and SNOT-22 ≥ 8.9 were based on the relative efficacy data at week 52 (due to unavailability of data at Week-24).

### Treatment costs and data sources

- The CPR was computed by multiplying treatment costs (drug acquisition costs and administration costs) by the NNT to obtain the corresponding 24-week CPR for dupilumab and mepolizumab.
- The drug acquisition costs for dupilumab (given every 2 weeks, 559.73 € per dose) and mepolizumab (given every 4 weeks, 872.53 € per dose) were sourced from the Portuguese government public hospital contract website[8].
- Administration costs included only nurse consultation charges (16€) for training the patient/caregiver in the home administration of dupilumab or mepolizumab[9].

### Figure 1. NNT model structure

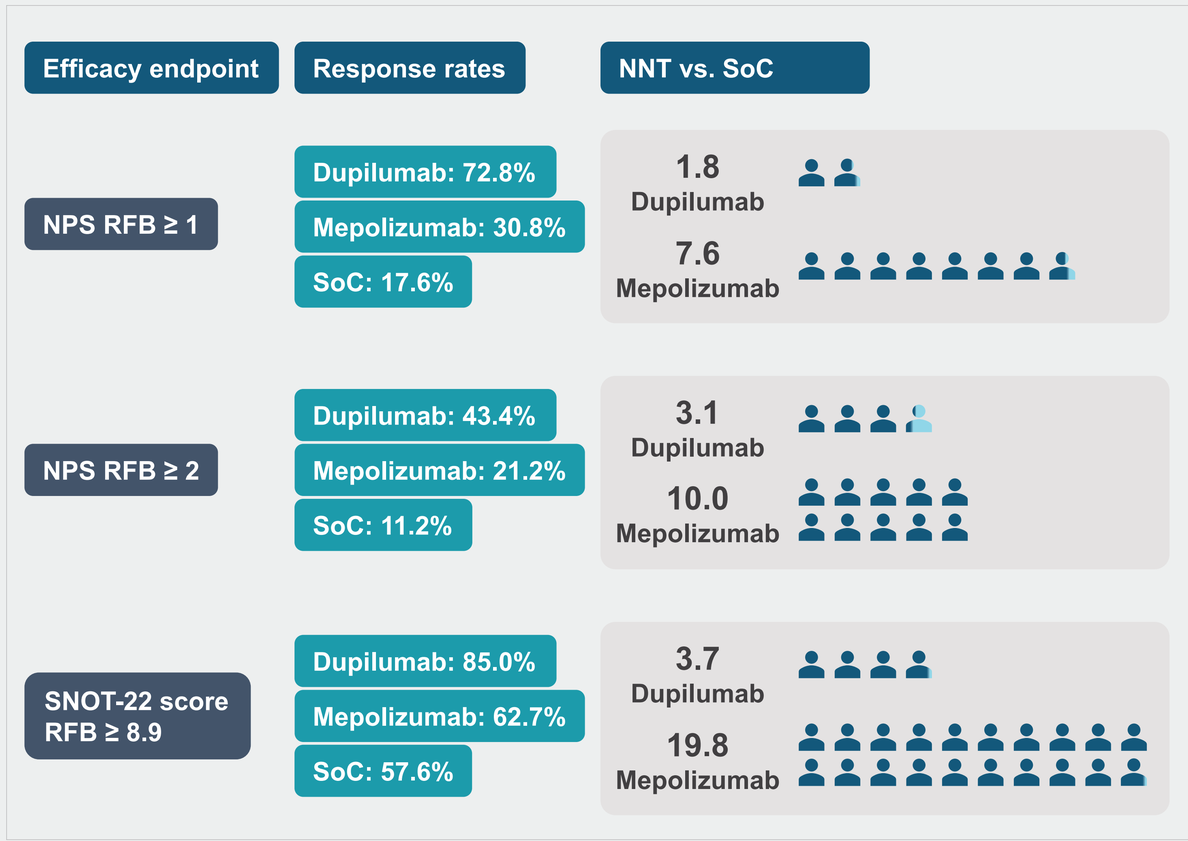



[a]Difference in response rates vs. SoC; [b]A post-hoc study with SYNAPSE-like patients from the LIBERTY NP SINUS 24/52 trials was included in the ITC; [c]Source: government public hospital contract website. [d]Nurse consultation charges.
ARR, absolute risk reduction; ITC, indirect treatment comparison; NNT, number needed to treat; SoC, standard of care.

## Results

- The NNT to achieve one additional responder was lower for dupilumab vs. SoC than that for mepolizumab vs. SoC across all the three efficacy outcomes (**Figure 2**).

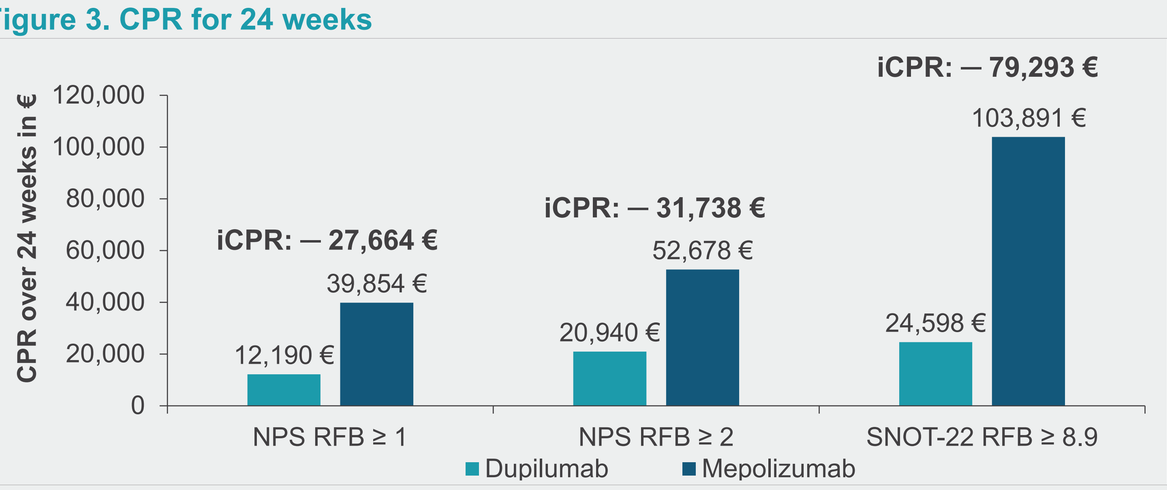
### Figure 2. NNT at Week-24 for dupilumab and mepolizumab vs. SoC




RFB, reduction from baseline; NNT, number needed to treat; NPS, nasal polyp score; SoC, standard of care; SNOT-22, sino-nasal outcome test.

- The CPR for all the efficacy endpoints was lower for dupilumab vs. mepolizumab with an incremental CPR ranging from −27,664 € to −79,293 € (**Figure 3)** across the three efficacy endpoints.

### Figure 3. CPR for 24 weeks




RFB, reduction from baseline; CPR, cost per additional responder; iCPR, incremental CPR; NPS, nasal polyp score; SNOT-22, sino-nasal outcome test.

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**CONFLICTS OF INTEREST**

**LD** – Aixial, employee, paid consultant for Sanofi.
**JT, JM, ABG and CT** – Sanofi – employees, may hold stocks and/or stock options in the company;
**ZW** – Regeneron Pharmaceuticals Inc. – employee, may hold stocks and/or stock options in the company.



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