

HEALTH TECHNOLOGY ASSESSMENT OF DUPILUMAB IN SEVERE BRONCHIAL ASTHMA IN THE RUSSIAN FEDERATION

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OBJECTIVES

Health economics evaluation of dupilumab, the new biological agent, is very important for reimbursement status decision.

Asthma remains in the top ten chronic diseases associated with the greatest economic burden. Ineffective treatment of asthma imposes significant limitations on professional performance and physical activity, causes early deaths, and involves growing expenses worldwide (1). Particular attention should be paid to patients with severe asthma. Although such patients account for only 5-10% of the total number of asthma sufferers, both adults and children, their management takes approximately 50% of all asthma-related medical costs (2, 3, 4). Definition of the health economics parameters of dupilumab, a new biological medicine for patients with severe asthma, is essential for state reimbursement-related decisions.

METHODS

The study included a comparative analysis of the direct and indirect costs of the use of dupilumab (Dupixent®, Sanofi Winthrop Industrie, France, solution for subcutaneous injection, 200 mg and 300 mg) and omalizumab (Xolair®, Vetter Pharma-Fertigung GmbH & Co KG, solution for subcutaneous injection, 150 mg) based on data obtained from indirect comparison of their efficacy in severe asthma. The analysis used a dupilumab price calculated as the average (50/50%) of the prices of the two strengths, 200 mg and 300 mg, according to data obtained from the indirect comparison. The dose of omalizumab depends on the patient’s body weight at baseline and blood IgE concentration. A patient’s body weight was set at 80 kg, which corresponds to the value used in the Russian pharmacoeconomic study of omalizumab. After that, the weighted average cost of one omalizumab dose was calculated using data from the Russian Severe Asthma Registry(5). The costs of pharmacotherapy, hospitalizations due to exacerbations and outpatient treatment were determined; the GDP lost due to temporary disability was calculated. The cost-effectiveness and 3-year budget impact were determined using data from the Russian Register; a sensitivity analysis of the obtained results was conducted.

RESULTS

Population: adult patients with allergic asthma and IgE >100 IU/mL (the target population size calculation is presented in **fig. 1, 2**).

As **fig. 3** shows, the expected cost of dupilumab therapy in the target group of 191 patients was US\$ 2.70 million per year, the direct medical costs were US\$ 0.16 million, and the indirect costs amounted to US\$ 0.71 million, with the sum totaling US\$ 3.57 million. At the same time, the respective costs with omalizumab were US\$ 2.97 million, US\$ 0.22 million, and US\$ 1.25 million. The total cost is US\$ 4.44 million (24.3% higher than with dupilumab). The indirect costs of omalizumab therapy were higher than with dupilumab due to a greater number of severe asthma exacerbations (1.7 times higher). The cost-effectiveness ratio was US\$ 3,400 for dupilumab and US\$ 6,600 for omalizumab. According to the results of the budget impact analysis, dupilumab helps decrease direct costs (including those of pharmacotherapy) by 11%. The saved money is enough to additionally provide treatment to 53 patients. The sensitivity analysis confirmed the obtained results.

Fig. 1. Distribution of patients in the Russian Severe Asthma Registry by IgE level (5) (for subsequent calculation of the target population size).

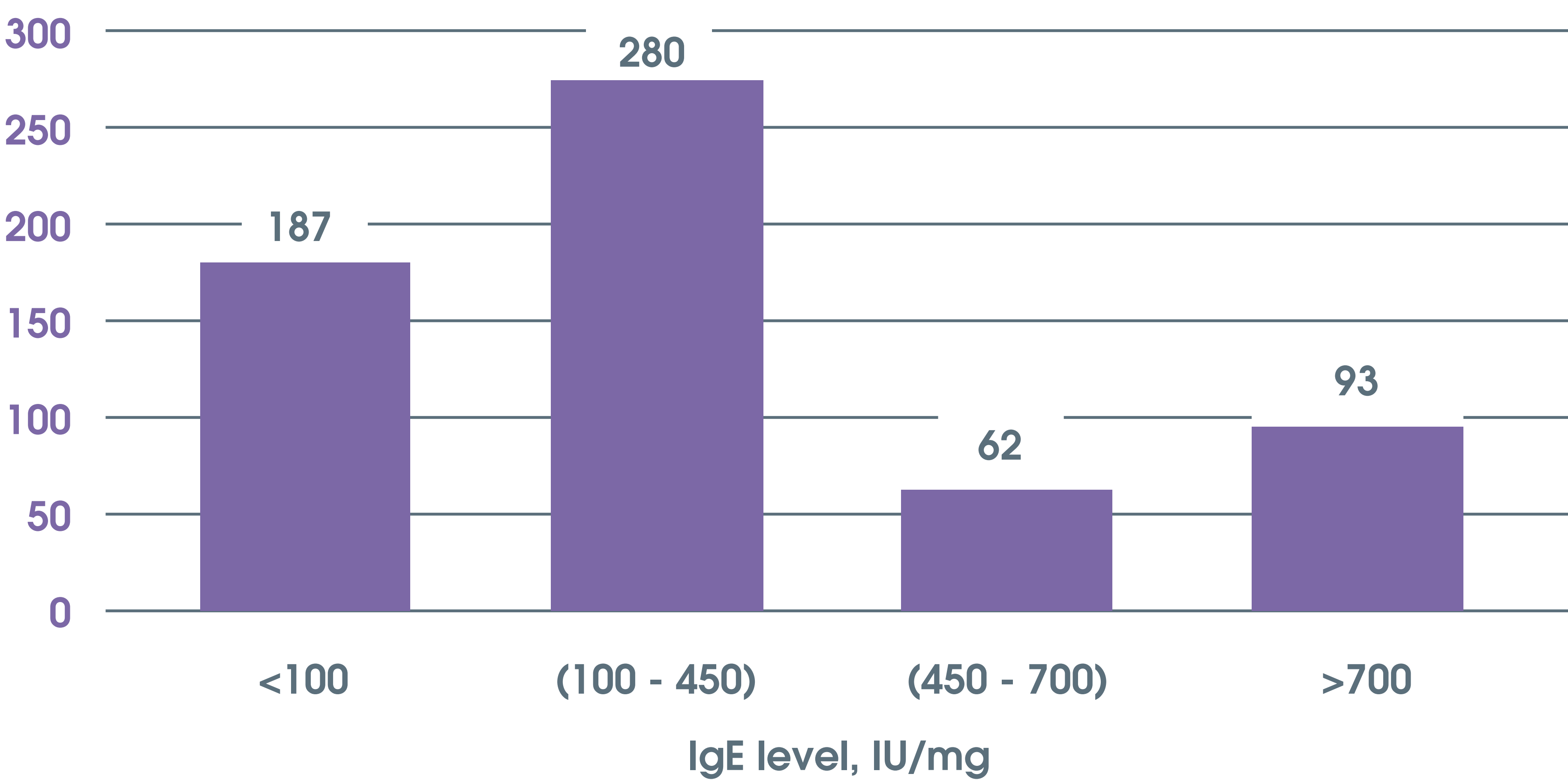
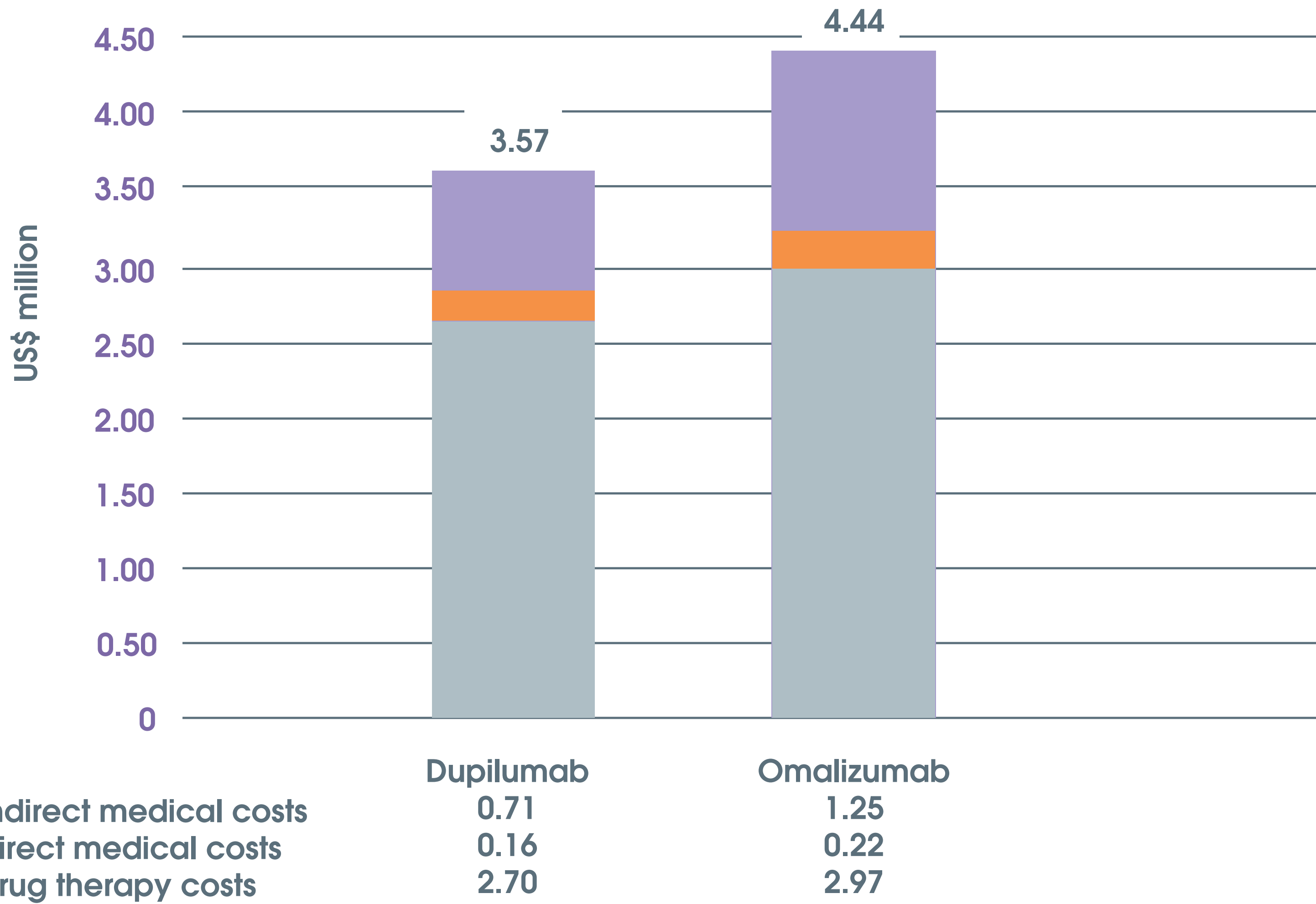


Fig. 2. Algorithm of the target population size calculation for the budget impact analysis.



Fig. 3. Results of the direct and indirect costs analysis for 3-year treatment of the entire population (191 patients) with dupilumab or omalizumab.



CONCLUSION

The reported pharmacoeconomic study demonstrated the advantages of dupilumab over omalizumab due to cost-effectiveness and budget impact analysis. Therefore, dupilumab can be recommended for state reimbursement for patients with severe asthma.

References:

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