

# Comparative Effectiveness of Asthma Monoclonal Antibody Therapy in Adults: An EHR-based, Propensity-Score-Matched Retrospective Cohort Study

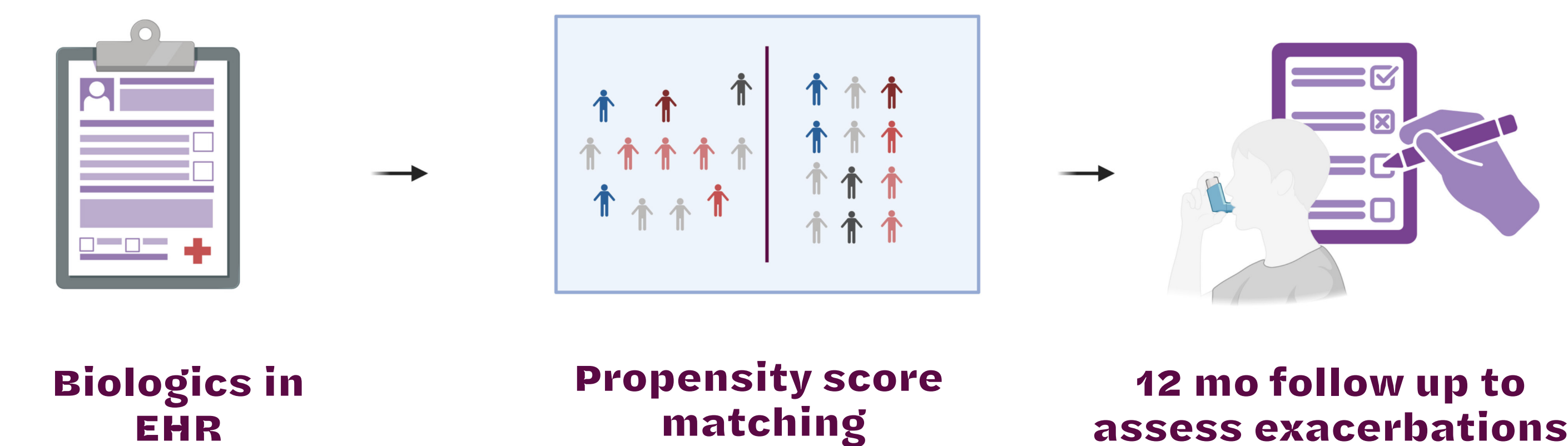
Lizbeth F. Gómez<sup>1,2</sup>; Kimberly Lactaoen<sup>1</sup>; Alana Schreibman<sup>1</sup>; Patrick K. Gleeson<sup>2</sup>; Gary E. Weissman<sup>1,2</sup>

<sup>1</sup>Palliative and Advanced Illness Research Center; <sup>2</sup>Division of Pulmonary, Allergy, and Critical Care, Department of Medicine, University of Pennsylvania, Philadelphia, PA

## Introduction

- Biologics demonstrably improve asthma control by targeting key inflammatory pathways.
- However, the comparative effectiveness of biologics among adults is understudied. [1]
- Real-world comparative effectiveness of biologics **can inform treatment selection** and provide clinicians **evidence-based recommendations** for when patients are eligible for multiple biologics. [2]

## Methods



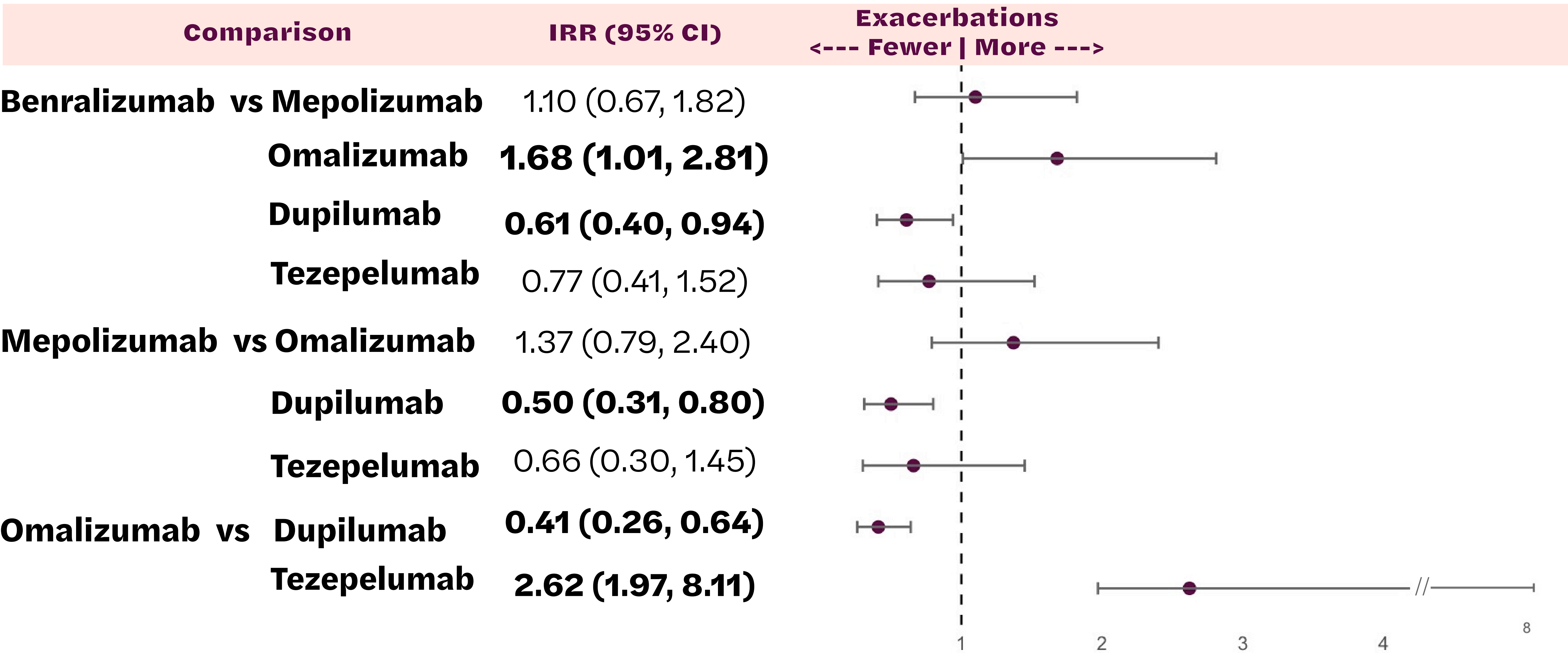
- Electronic Health Record (EHR)-based retrospective cohort from Penn Medicine encounters for adults with a primary asthma ICD-10 diagnosis between January 1, 2017, and February 29, 2024.
- Encounters were limited to patients that were ever prescribed **Omalizumab, Mepolizumab, Benralizumab, Dupilumab, or Tezepelumab**.
- We computed **propensity scores** using logistic regression (models adjusted for sex, race, smoking, baseline treatment, allergic comorbidities, and Elixhauser comorbidity score).
- Negative binomial regression models with a 2:1 nearest neighbor matching were fit. We estimated the total number of **asthma-related exacerbations during 12 months following first biologic prescription**.

In propensity score matched analyses, Omalizumab and Mepolizumab were associated with fewer exacerbations than Dupilumab. Tezepelumab outperformed Omalizumab.



## Results

**Figure 1: Pairwise Comparisons of Biologics for Asthma. Incidence Rate Ratios (95 % CI).**



## References

1. Bacharier LB. Asthma guidelines: Where to next? Annals of Allergy, Asthma & Immunology.
2. Couillard S, Jackson DJ, Pavord ID, Wechsler ME. Choosing the Right Biologic for the Right Patient With Severe Asthma Chest. 2024:S0012-3692(24)05139-0.

## Discussion

- We included **1,149 patients** (median age **54 years**, **67.8% female**) and **22% had at least 1 exacerbation**.
- **Dupilumab (32.6%) was the most prescribed biologic**, followed by Omalizumab (28.4%), Mepolizumab (17.3%), Benralizumab (16.5%), and Tezepelumab (5.1%).
- **Mepolizumab and Benralizumab** were associated with **significantly fewer exacerbations than Dupilumab** (IRR = 0.50; 95% CI: 0.31, 0.80), and (IRR = 0.61; 95% CI: 0.40, 0.94).
- **Omalizumab and Mepolizumab were associated with fewer exacerbations** when compared to Dupilumab and Tezepelumab outperformed Omalizumab.
- We found **clinically relevant differences** in effectiveness of prescribed biologics among adults.
- In future steps, prospective comparative effectiveness trials are needed to guide optimal treatment for adults with moderate-to-severe asthma.