Precision Medicine Enabled Benefits Management for Diabetes and Weight Loss Management

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Abstract

Glucagon-like peptide-1 receptor agonists (GLP-1 RAs) are highly effective for type 2 diabetes and weight loss management but come with significant cost challenges for health plans. Alternative lower cost therapies have shown efficacy in diverse patient populations but the lack of precision clinical guidelines makes weight management benefit design difficult. As GLP1-RA utilization rises, precision approaches to benefits management are increasingly needed.

We leveraged precision real-world evidence (RWE) to compare weight loss therapies against in-class alternatives across over 1,620 patient subpopulations. Our analysis identified scenarios where GLPs were cost-effective and others where lower-cost therapies provided similar clinical benefit.

This subpopulation-driven model allows payers to optimize GLP access where clinical and economic value align while promoting alternatives when appropriate. Precision RWE offers a scalable pathway to balance innovation, access, and affordability in the management of chronic metabolic diseases.

Methodology

Study Design
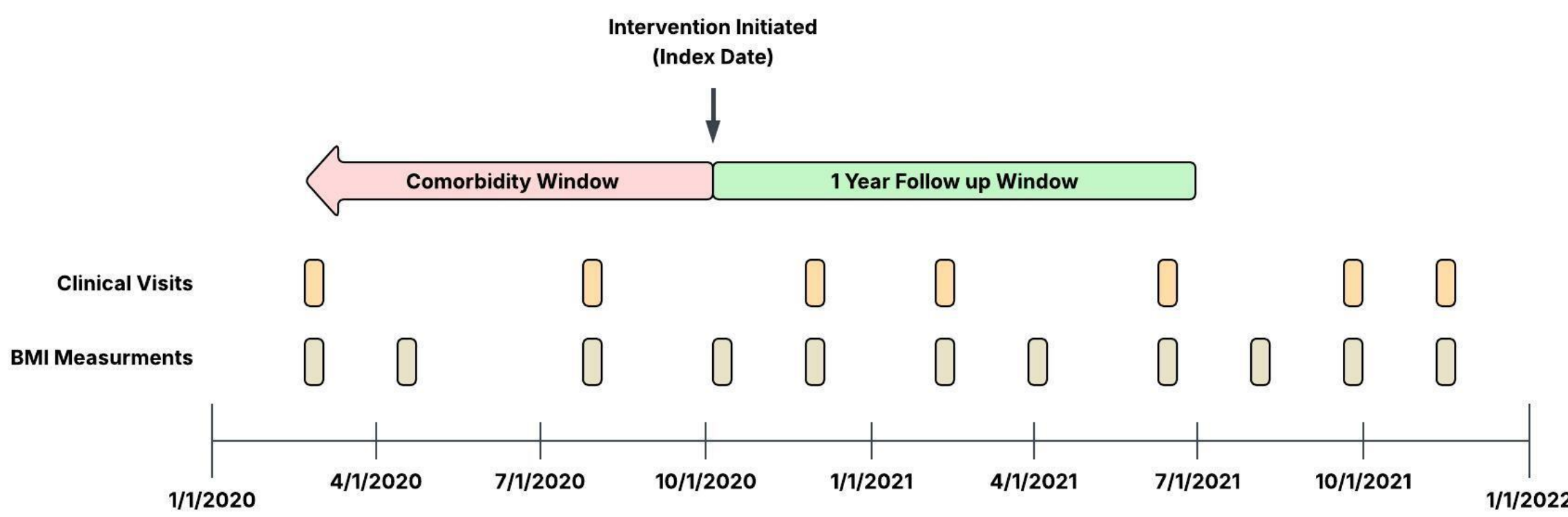
Patient Subpopulations Evaluated

Age	Sex	Baseline BMI	Baseline HbA1C	Treatments
All Ages	All	All	All	All
Above 45	Male only	BMI 25-30	HbA1C <6.5	GLP-1RA
Below 45	Female only	BMI 30-35	HbA1C 6.5-8.0	Orlistat
		BMI 35-40	HbA1C >8.0	Naltrexone-Bupropion
		BMI >40		Phentermine / Topiramate
				Behavior change
				Weight Loss Surgery
				SGLT2 Inhibitors
				DPP-4 Inhibitors

*1,620 permutations evaluated

Results

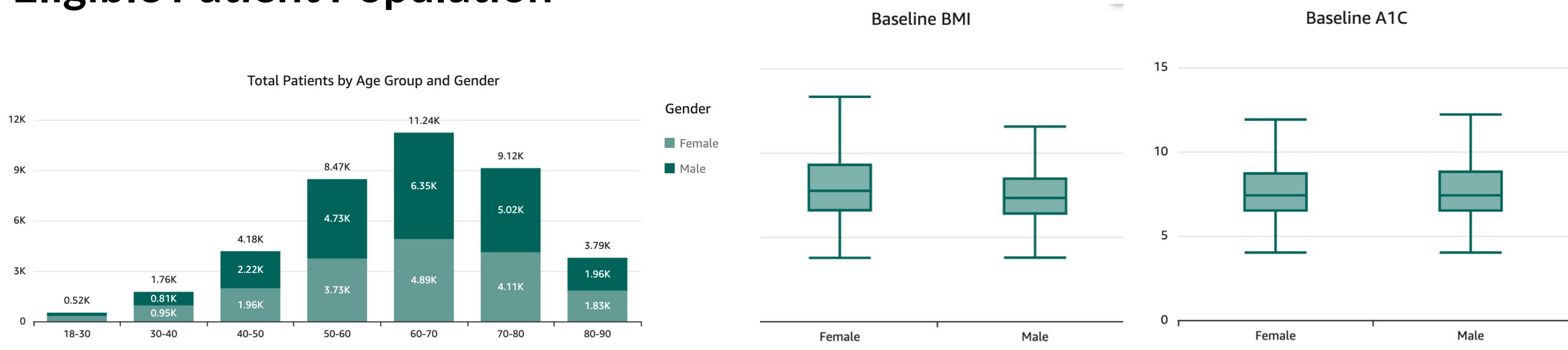### Eligible Patient Population

Figure 2 – We identified 2.2M patients in a national EHR and claims dataset with longitudinal history and a recorded BMI > 25 between 2015 and 2025.

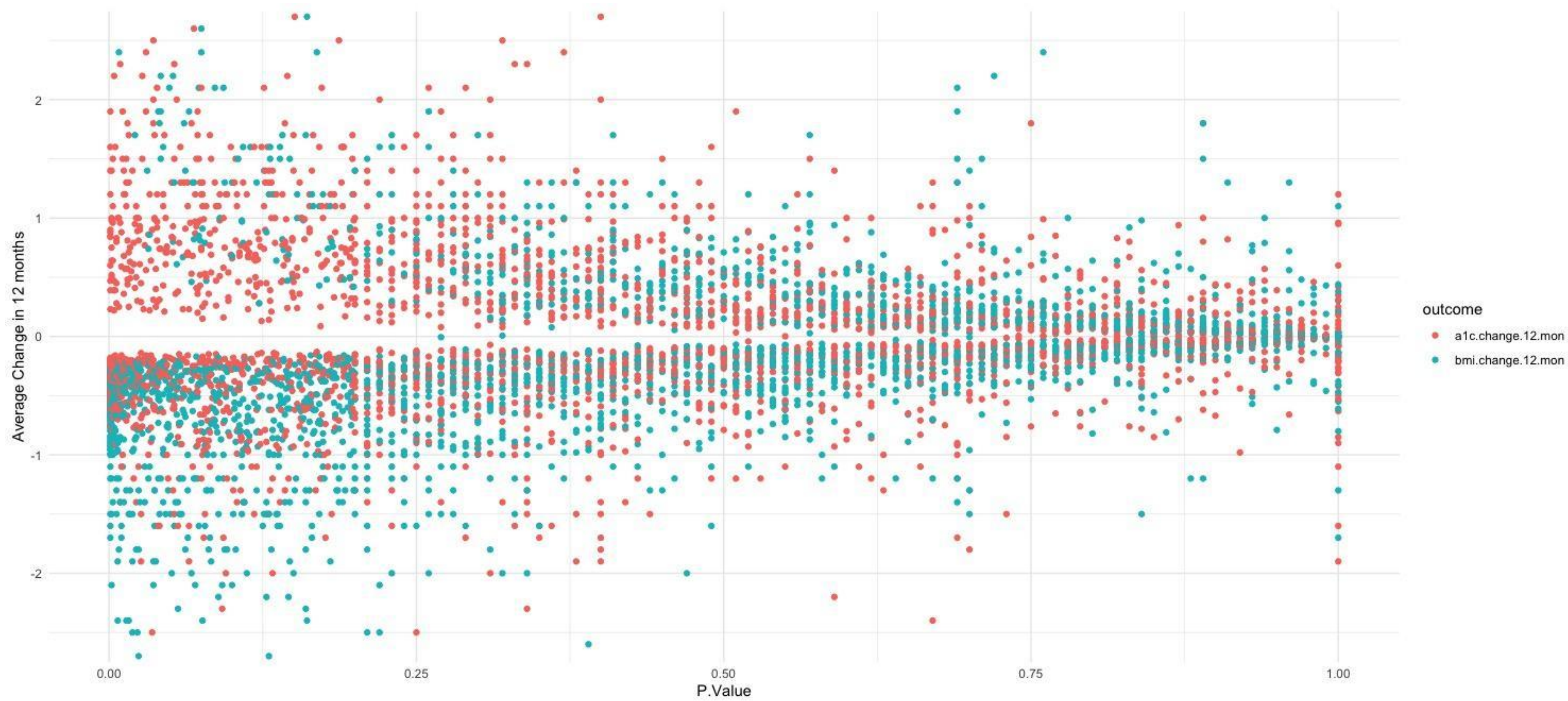### GLP1-RA Therapy Not Uniformly Effective in All Subpopulations

Figure 3 – Despite access to millions of patients overall many subpopulations did not demonstrate effective weight loss or improved A1C after controlling for all observable confounders. The populations with a p > 0.05 or a mean-difference with an increase in BMI/A1c are suspect for other interventions to improve outcomes or cost.

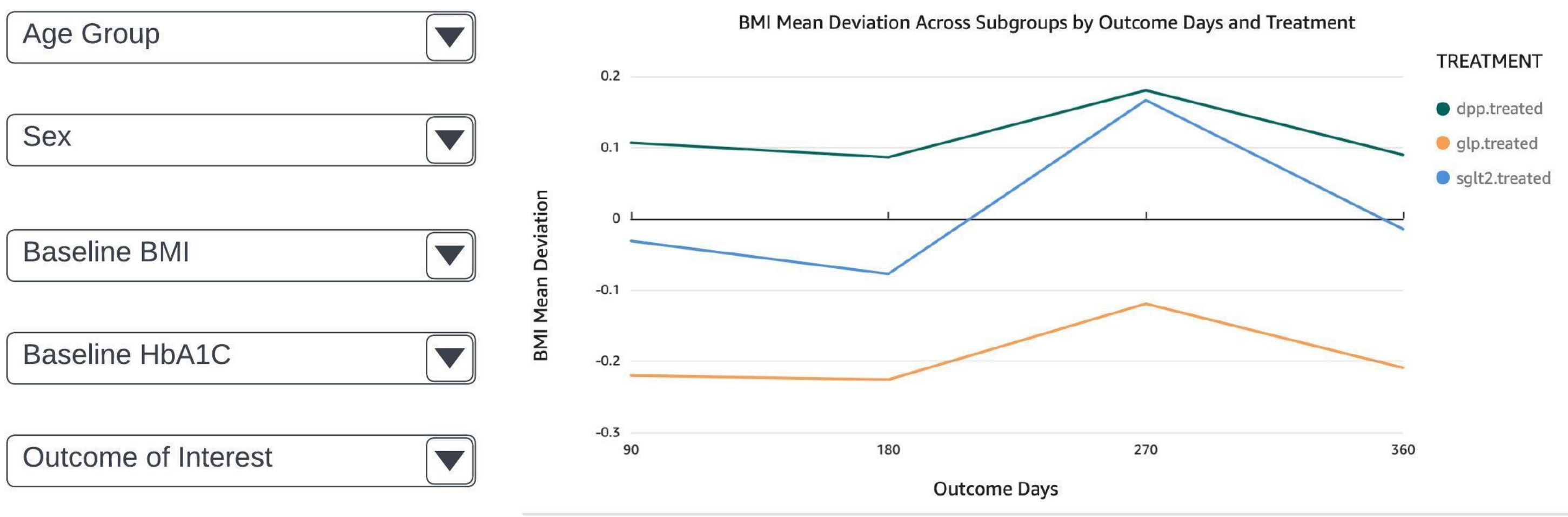### Navigation via Population Baseline to Select Optimal Treatment

Figure 4 – To select the most effective therapy for a given patient the baseline and demographic characteristics can be inputted and real-world outcomes across therapies are shown.
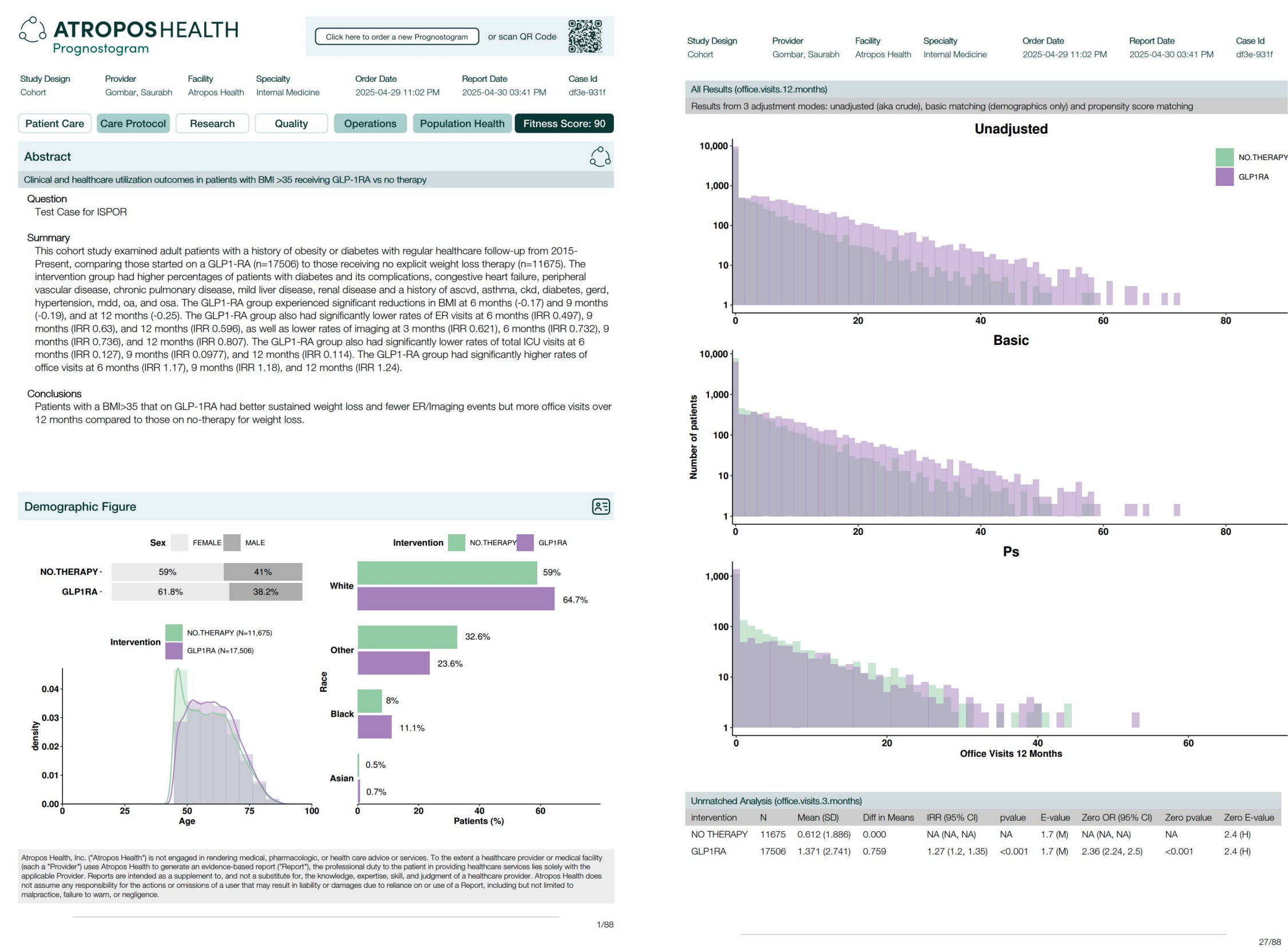
Single Study Example

Figure 5 – Each sub-population analyzed produced a full real-world evidence report breaking down the cohort comorbidities and outcomes after controlling for observable confounders utilizing high dimensionality PSM.

Conclusions

By evaluating thousands of clinically distinct subpopulations, we identified that a substantial proportion of patient cohorts experienced equal or better outcomes with lower-cost alternatives to GLP therapies. These results underscore the importance of a precision-based approach to benefits management—one that aligns the right therapy to the right patient. Leveraging real-world evidence at the subgroup level enables more effective treatment selection, enhances clinical outcomes, and reduces unnecessary drug spend. Precision medicine offers a scalable path forward for value-based care in chronic disease management.

References

1. Hu, Ying, et al. "Cost-effectiveness analysis of 4 GLP-1RAs in the treatment of obesity in a US setting." *Annals of translational medicine* 10.3 (2022): 152.
2. Paddu, Nina U., et al. "Weight maintenance on cost-effective antiobesity medications after 1 year of GLP-1 receptor agonist therapy: a real-world study." *Obesity* 32.12 (2024): 2255-2263.
3. Moore, Peyton W., et al. "GLP-1 agonists for weight loss: pharmacology and clinical implications." *Advances in therapy* 40.3 (2023): 723-742.