

# Leveraging Patient-Reported Outcome Methods to Test Hypotheses Prior to Initiating Comparative Effectiveness Studies

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## Objectives

- Although payers are asking for comparative effectiveness data, risk of conducting these studies is significant.
- One possible intermediate step is to leverage a validated instrument, the Treatment Satisfaction Questionnaire for Medication Version 1.4 (TSQM), to identify domains for separation and calculate sample size required for superiority in a comparative study.

## Methods

- We used data from iGuard.org, a consumer medication monitoring service totaling over 1 million members, whereby patients are randomly invited to complete the TSQM on an on-going basis.
- TSQM is a 14-item reliable and valid instrument providing scores on four scales—effectiveness, side effects, convenience and global satisfaction.
- For this study, we analyzed all responses from patients using lisinopril and metoprolol, two drugs used to treat high blood pressure.
- For sample size evaluation, adjusted means (LsMean) and standard errors (SE) were generated for each treatment using an analysis of covariance (ANCOVA) model controlling for age, gender, self-reported severity of disease, and use of other hypertensive, diabetes and heart failure medications.
- Analysis were conducted using SAS Version 9 and nQuery Advisor Version 7.

## Results

- 625 patients, 363 (58.1%) on lisinopril and 262 (41.9%) on metoprolol completed the TSQM between March and November 2008.
- TSQM domains had good internal consistency with Cronbach's alpha values over 0.85.
- There were significant differences between the two treatments on age, self-reported severity, use of diabetes medications and heart failure medications (Table 1).
- Figure 1 shows the adjusted mean (LsMean) and 95% confidence intervals (CI) for lisinopril and metoprolol for each of the TSQM domains.
- Given the observed difference in means and the standard deviation (SD) of the TSQM scores, Figure 2 describes the sample size required for a comparative effectiveness study to detect a statistically significant difference at a two-sided alpha of 0.05 with 80% power.

Table 1. Patient Baseline Characteristics

Patient Characteristics	Lisinopril N (%)	Metoprolol N (%)	P-value
N	363	262	<0.0001
Gender			
Female	227 (62.5%)	156 (59.5%)	0.4486
Male	136 (37.5%)	106 (40.5%)	
Self-reported severity			
Mild	141 (43.7%)	77 (31.6%)	0.0044
Moderate	155 (47.9%)	132 (54.1%)	
Severe	27 (8.4%)	35 (14.3%)	
Diabetes medications	89 (24.5%)	35 (13.4%)	0.0006
Heart Failure medications	45 (12.4%)	58 (22.1%)	0.0012
Other antihypertensive medications	213 (58.7%)	162 (61.8%)	0.4270

Figure 1. Least Square Means by Treatment

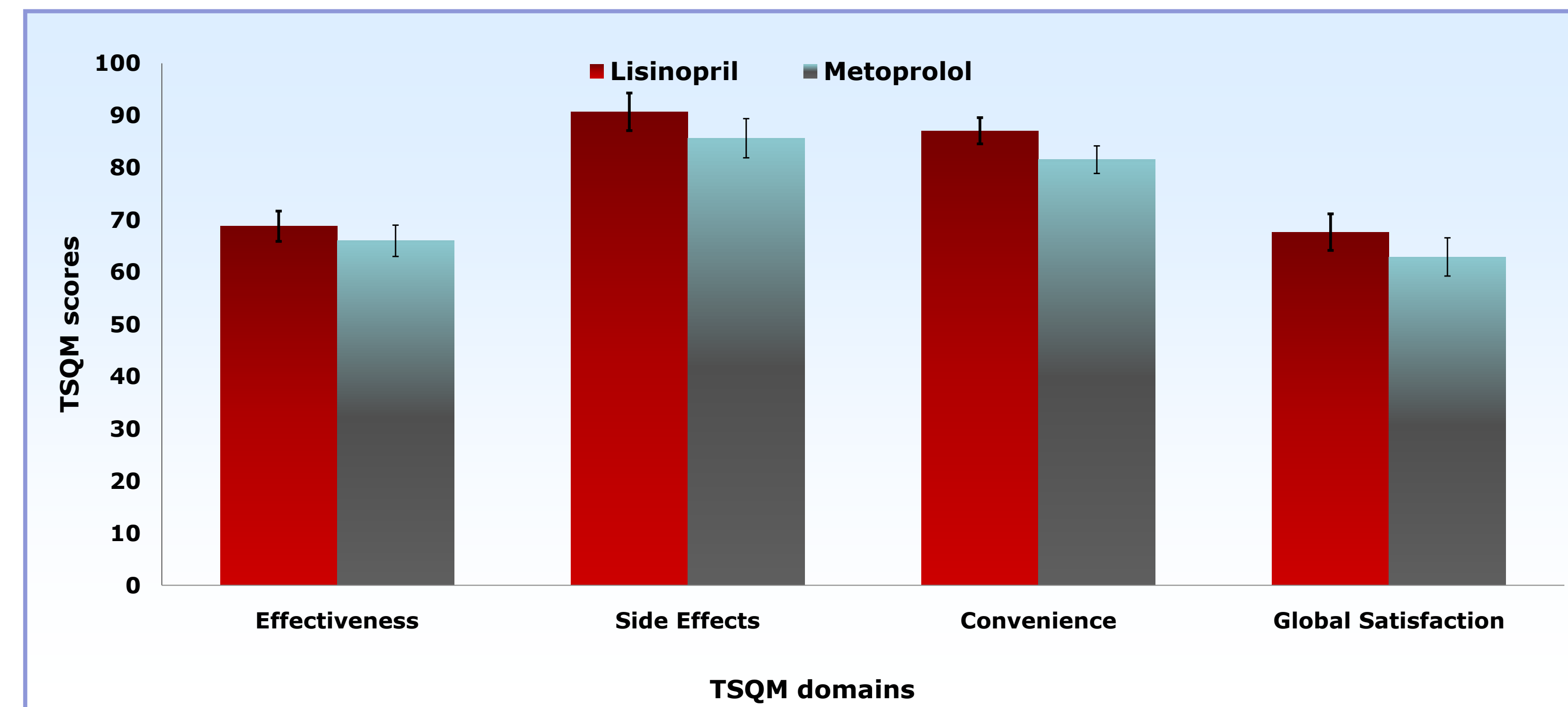
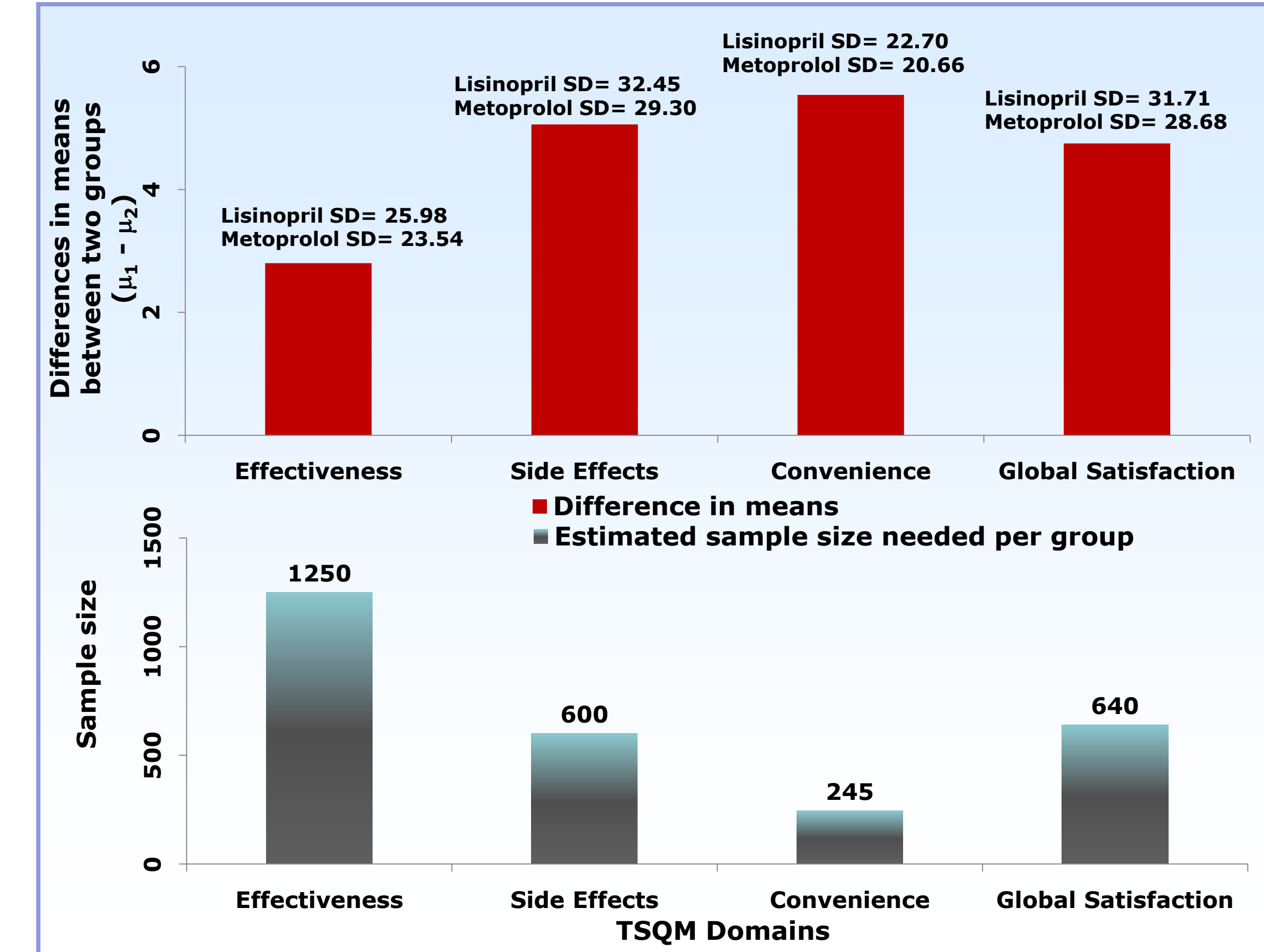


Figure 2. Sample Size Determination



## Conclusions

- In comparing treatment satisfaction between lisinopril and metoprolol among all four domains of the TSQM, detecting statistically significant differences would require a sample size ranging from 490 (Convenience domain) to 2500 (Effectiveness domain).
- This study demonstrates a quick and inexpensive model for obtaining feedback on comparative effectiveness study designs.
- By conducting a patient-reported feasibility survey prior to fielding a prospective comparative effectiveness study, researchers can increase their chances of a successful study.