

Better outcome predictions: the 'patients-like-me' method

Predicting the outcome of supervised exercise therapy for patients with intermittent claudication

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Introduction

- Supervised exercise therapy (SET) combined with lifestyle guidance is known to be highly effective for symptom relief in patients with intermittent claudication (IC).
- Currently, no validated tool exists to predict the outcome of individual patients with IC.

Aim

- To develop personalized prediction models for the expected walking distance over time for people with IC, using a neighbors-based prediction approach, to optimize therapy.

Methods

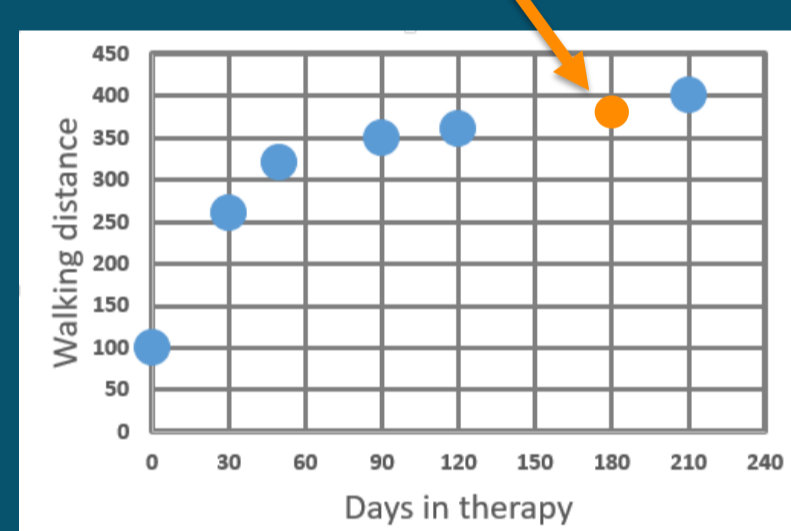
- Patient Like Me Algorithm: Sequential K-Nearest Neighbors Algorithm Extended with Predictive Mean Matching

Overview

1. Temporal split database



2. Estimate distal outcome (Using Brokenstick)



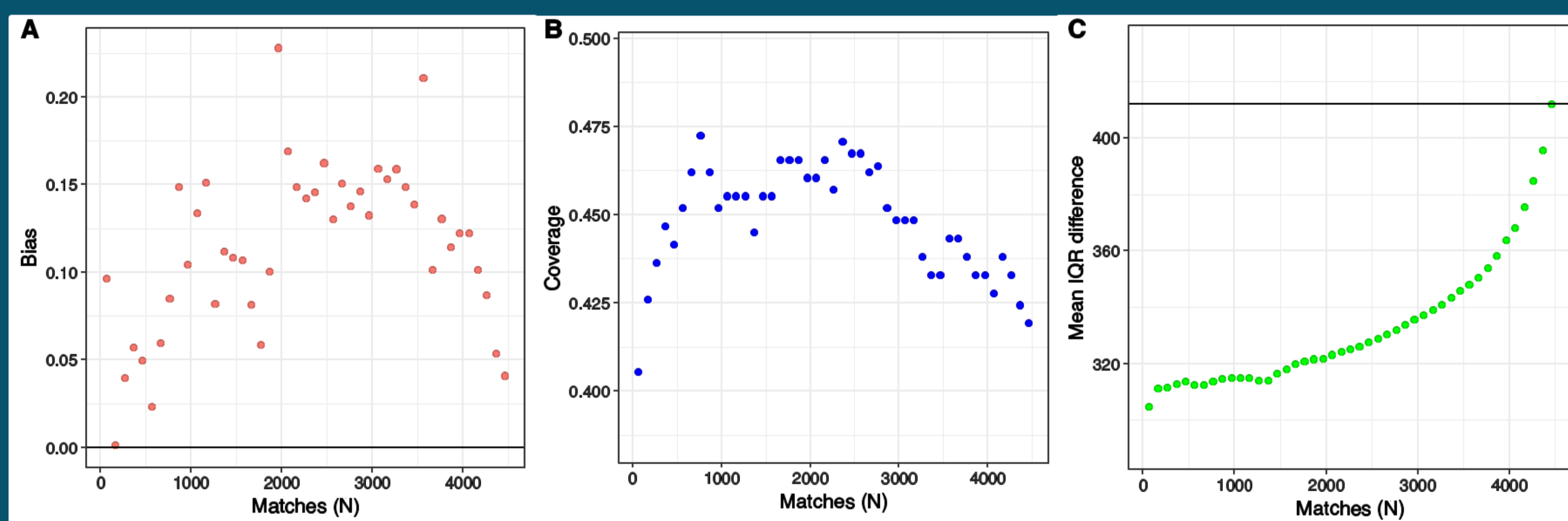
3. Predictive Mean Matching

$$\gamma = \beta_0 + \beta_1 \text{Age} + \beta_2 \text{Gender} + \beta_3 \text{FWD}$$

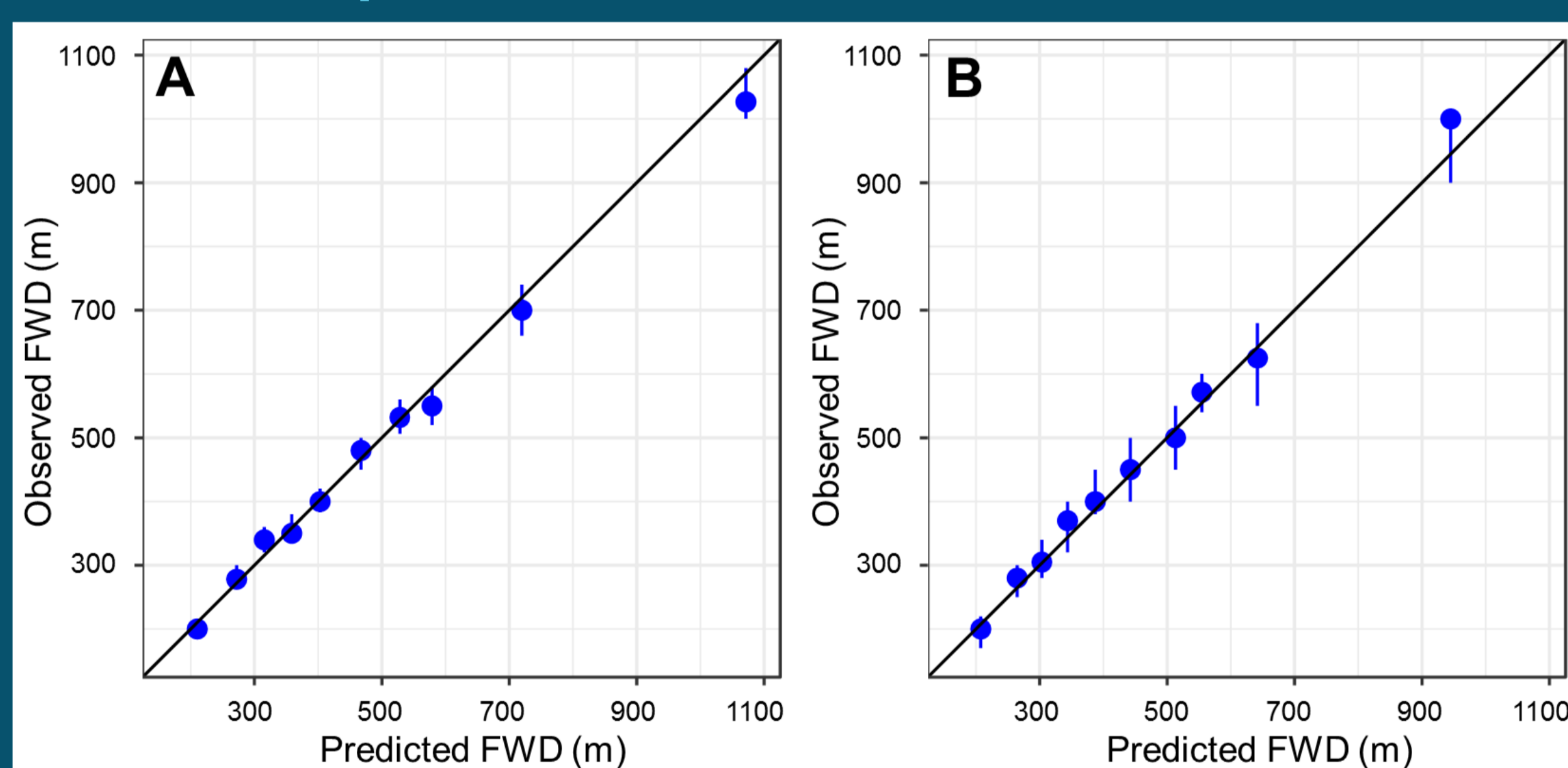
4. Generalized Additive Model Location Scale & Shape

5. Test Validation

Leave-one-out cross-validation

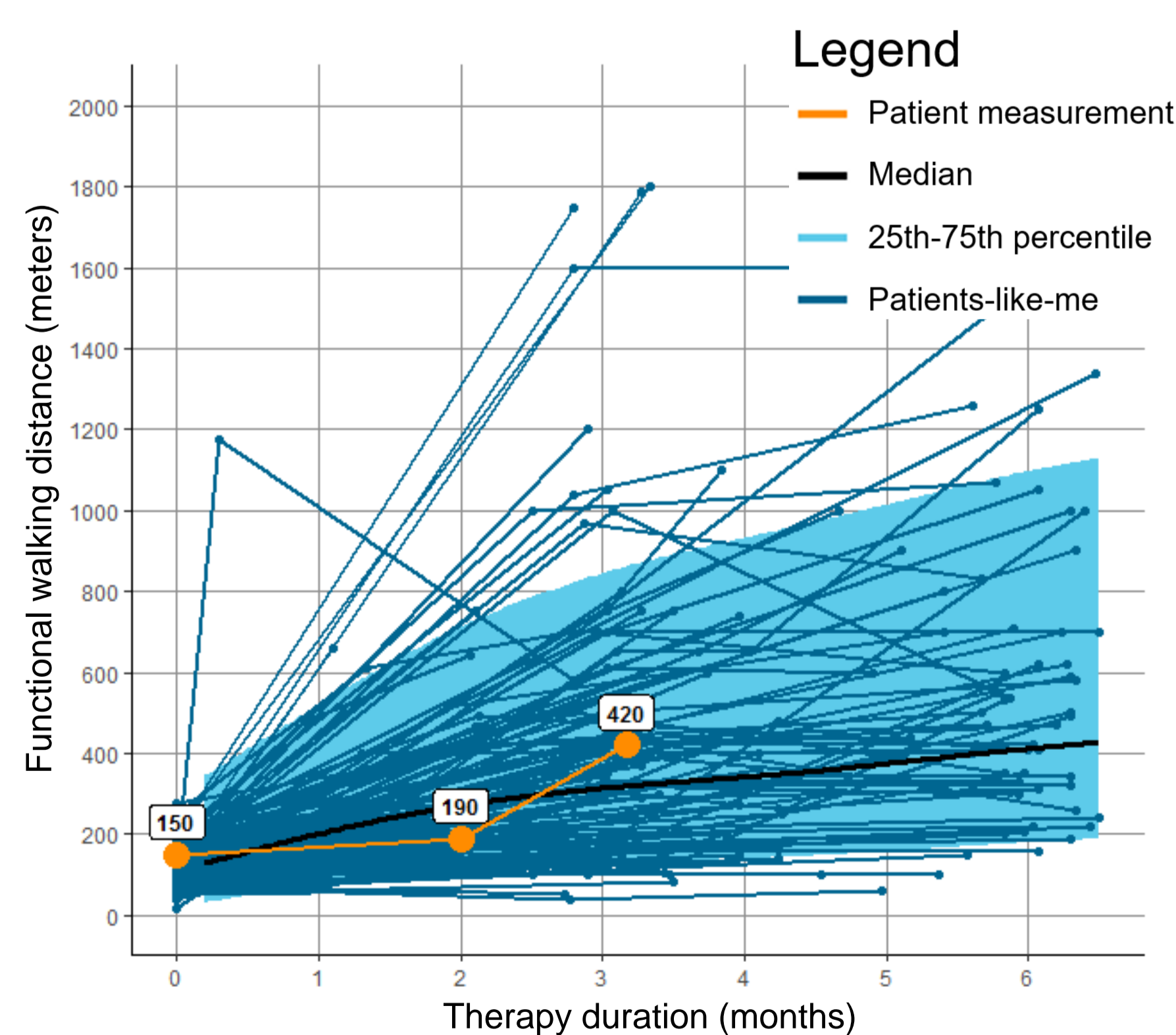


Calibration plot



Results

- Final database: 3799 patients with 15330 walking distance measurements.
- Optimal number of matches: 160
- Bias: -0.04 standard deviations (ideal = 0)
- Coverage: 48.7% (ideal = 50%)
- Precision: 311 meters (20% improvement)



Conclusion

- We successfully developed neighbors-based predictions for walking distance after SET for patients with IC.
- These predictions may assist in patient-centered information regarding prognosis and progress during therapy. This can optimize shared decision making between therapists and patients.
- The prediction tool will be implemented through the successful network of Chronic CareNet.

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