Improving ROI
via
Churn Reduction & Smart Outreach

Shaul Tayeb

Problem Overview & Business Goal

Objective: Predict likelihood of member churn

Goal: Prioritize outreach to high-risk members

Constraints: Marginal cost per outreach - need to choose top-n users

Data Sources & Labels

- **WellCo.** data in July 2025
- **Population of interest**: diabetes mellitus, essential hypertension and documented dietary counseling and surveillance.
- **Web activity**: URL visits with timestamps
- **App usage:** Event types and frequency
- **Claims:** Medical ICD-10 codes
- **Member metadata:** Signup date, churn flag, outreach flag

- **Label:** Churn = member inactive for X=30 days (provided)

Features Extracted to Model Churn

Goal: Capture behavioral engagement + health context

- **Digital Engagement:**
  - Total user interactions, indicating engagement levels.
  - Time from sign-up to most recent activity helps capture user "freshness".
  - Tracks how often users visited health-related web content, signaling intent or interest.

- **Healthcare Utilization:**
  Number of distinct medical claims submitted by the member.

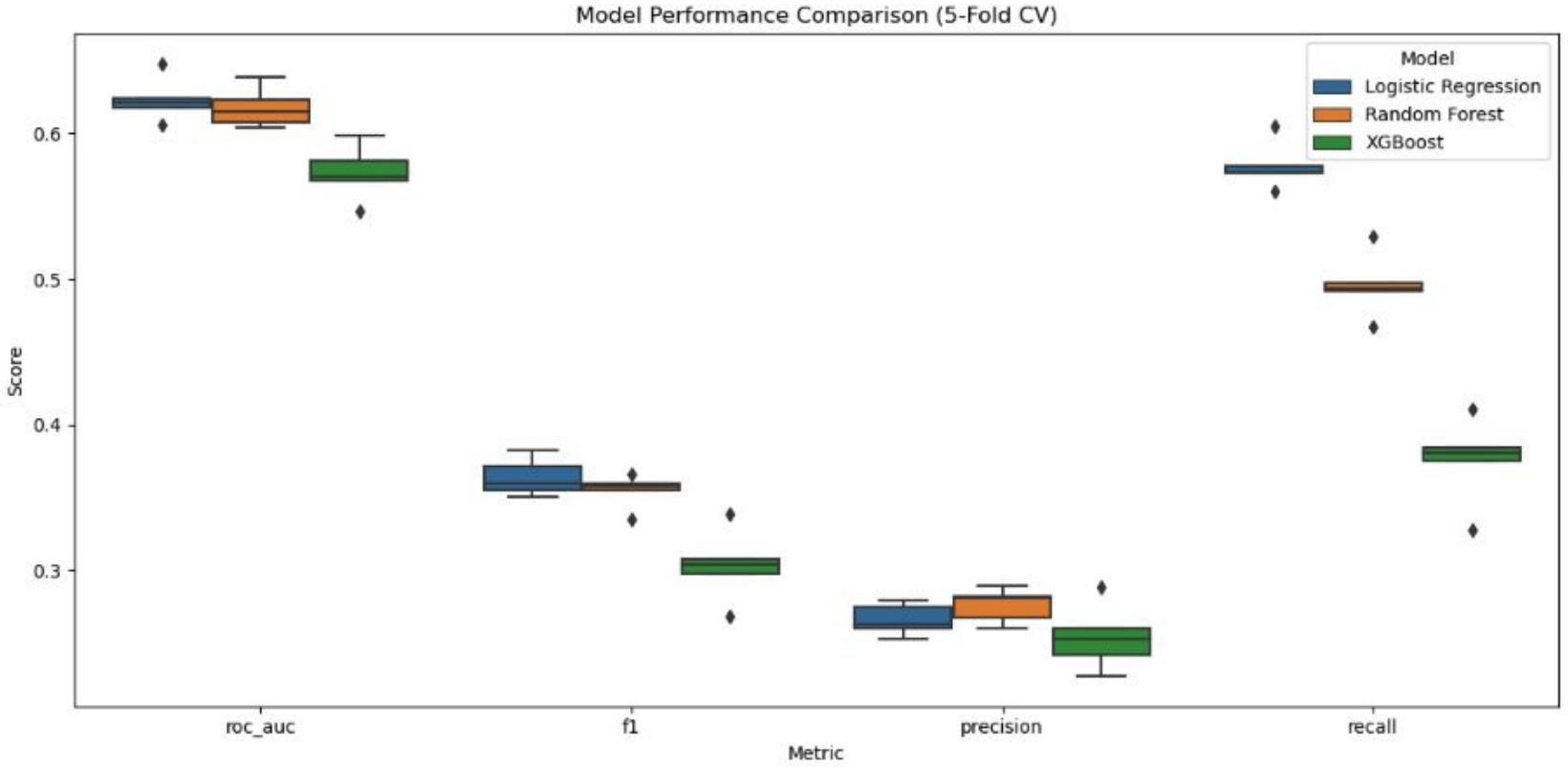
- **Behavior Patterns:**
  Frequency of app use normalized by membership length - helps distinguish casual vs. engaged users

Model Performance

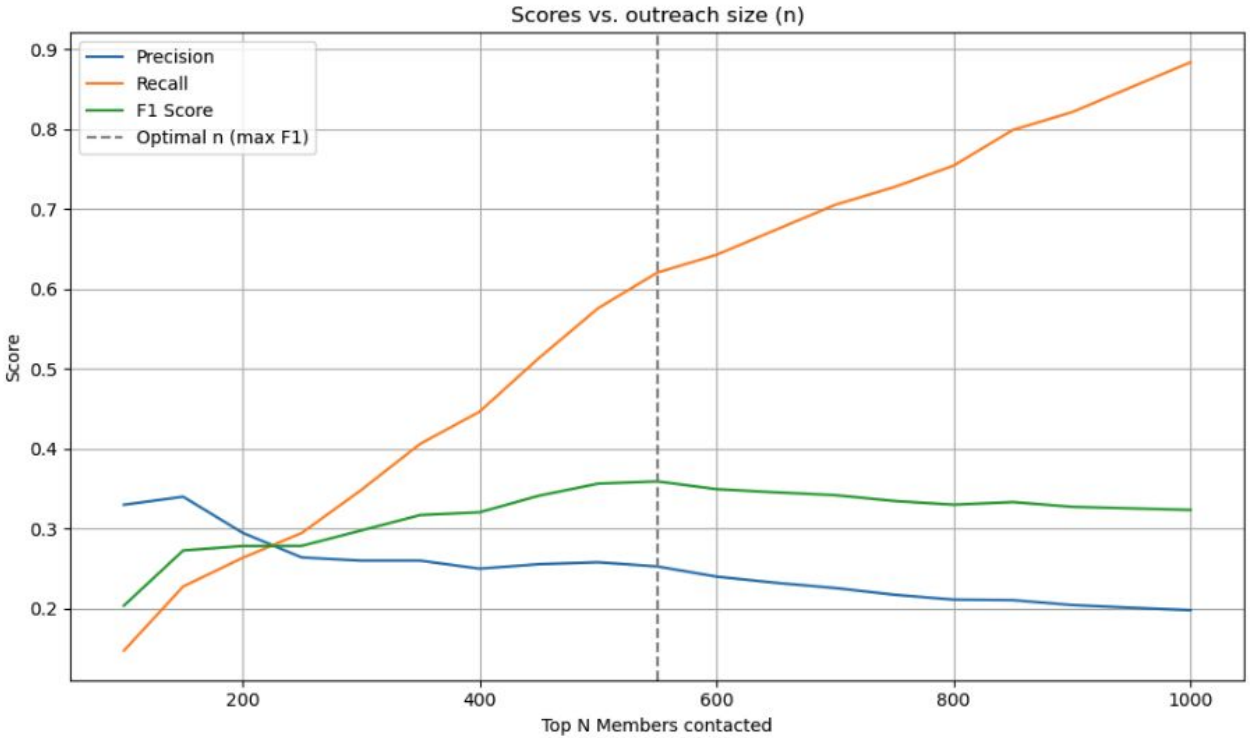
- Best model: **Logistic Regression** (compared to RandomForest and XgBoost)

- **AUC = 0.62 (**Better than random (0.5), but shows there is a signal)

Model Comparison



Outreach Strategy




```
The optimal outreach size (n) for maximum F1 score: 550
```

Next Steps

- Add more features
- More granular features (e.g. session duration, recent trends)
- Time-aware models (e.g. survival analysis)
- Explainability
- Experiment: Monitor churn post-outreach for impact evaluation