Recommending the Appropriate Medication: A Pilot Study on Patients with Rheumatoid Arthritis

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IHiS Because IT's in Healthcare

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Introduction

Goal
To develop a similarity analytic-driven decision-making tool that supports medication prescription in Rheumatoid Arthritis (RA).

Clinical Need
Current RA drug prescription guidelines are based largely on clinical trials, which focus on a minority of patients who fulfil inclusion criteria for these trials. There is a need to determine response to treatment for the large majority of patients who do not fulfill criteria for clinical trials, which is addressed by this project.

Identifying Relevant Data Sources

Local RA Patient Data

Patient Demographics
Age, gender, race, etc

Laboratory Results
Lab results to measure patient outcome

Pharmaceutical Data
Drug medication history

Electronic Medical Records
Notes on patient outcome

International RA guidelines

The European League against Rheumatism

American College of Rheumatology

Data Driven Methodology

1. Joined Data Sources
Normalize all data into a flat file

2. Classification Model
Decision tree

3. Model Evaluation
12 % more effective

4. Dashboard Development
Build decision support tool for doctors

Model Evaluation

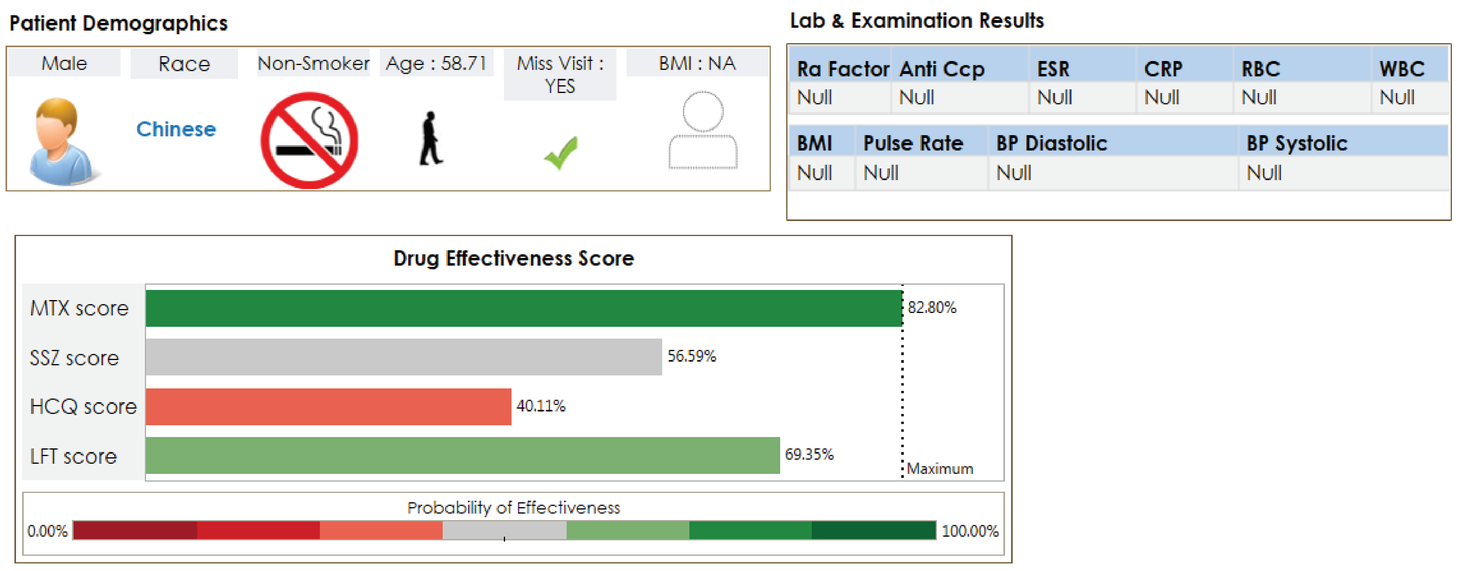
Methotrexate (MTX) group

Non-MTX group

12% more effective

MTX-effective group has higher effective rate than non-MTX-effective group

Personalized Patient Treatment

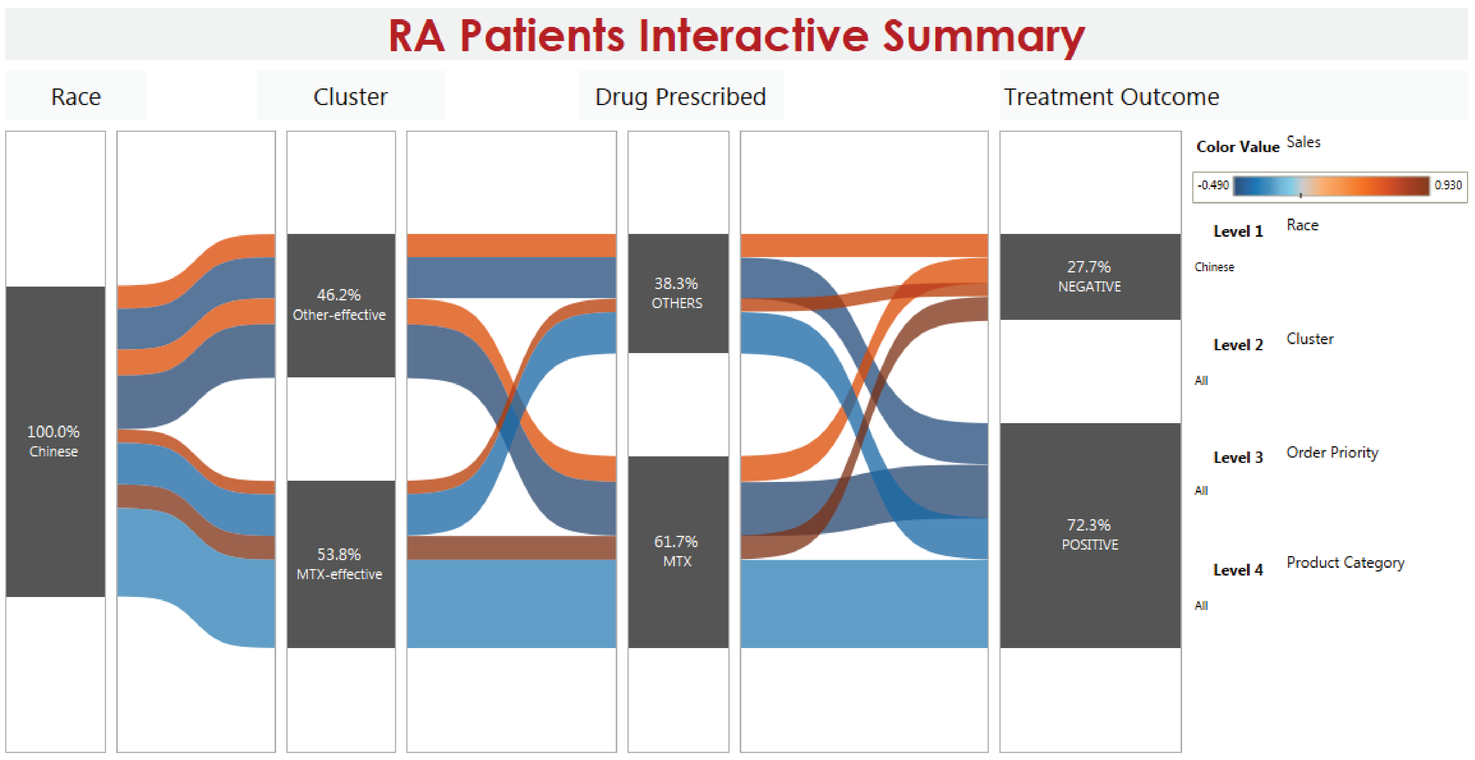


Personalized Treatment

For whom:

Purpose: This dashboard presents the drug effectiveness **score** of each medication for RA. The score is generated from the decision tree model when demographics and lab results of index patient are provided.

RA Patients Interactive Summary



Interactive Summary

For whom:

Purpose: This dashboard allows doctors to select or change parameters of interest and **visualize** the treatment outcome of the selected drug.