Adherence, Hypertension, Claims data, EventFlow & CoCo

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Adherence

• Morbidity
• Mortality
• Costs
  – $13.35 billion in hospitalization costs annually due to medication non-adherence (Sullivan et al 1990)
Adherence Measurement

• The medication possession ratio (MPR):

\[ \frac{\sum \text{days supplied}}{\text{length of observation period}} = 83\% \]

The Data

• 900,000 Individuals
• 16 million prescription claims
• 5 Drug classes:
  – Angiotension-Converting Enzyme-Inhibitors (ACE)
  – Angiotension II Receptor Blockers (ARB)
  – Calcium Channel Blockers (CCB)
  – Beta blockers (Beta)
  – Diuretics

The Research Questions

• Can we use visualization to understand adherence patterns
  – Can we derive new metrics/visualizations/knowledge
  – Can we make better prescription decisions

Hypertension Treatment
Hypertension Treatment
The Research Questions

• Can we use visualization to understand adherence patterns
  – Can we derive new metrics/visualizations/knowledge
  – Can we make better prescription decisions
• What are the effects of our modeling decisions
• Can we understand different subgroups better

Hypertension Treatment
Gaps & Overlaps

Remove Gaps/Overlaps
Event Type: [ ] Direct
☐ Gaps < 0 [ ] days
☐ Overlaps < 0 [ ] days

Remove Gaps/Overlaps
Event Type: [ ] Direct
☑ Gaps < 14 [ ] days
☐ Overlaps < 0 [ ] days

Remove Gaps/Overlaps
Event Type: [ ] Direct
☑ Gaps < 14 [ ] days
☑ Overlaps < 14 [ ] days

Gaps & Overlaps
Understanding Adherence and Prescription Patterns Using Large-Scale Claims Data

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Case study

PATTERNS AND MODELING DECISIONS

Event Flow
Diuretics Only - Gaps

0 days
Diuretics Only - Gaps

0 days
15 days
7 days
30 days

Drilling Down with CoCo

- Adherent vs. non-adherent

- Ace-Inhibitors vs Diuretics
Summary

- All of the standard data cleaning considerations apply and are necessary
- CoCo can quickly compare two cohorts and give an overall feel the differences between the two groups

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