Visualization of Drug Prescription Patterns

Project suggestion for CMSC 734 - Spring 2015

Client: Catherine Plaisant plaisir@cs.umd.edu

Domain experts ready to advice and test prototypes with their data:
Margret Bjarnadottir – for heart failure medicines
Susan X (from School of Pharmacy in Baltimore) – for pediatric psychiatric care
NEED:

a specialized visualization tool for
- characterize the different patterns
- novel overview for large # of patients
EVENTFLOW will serve as inspiration, but...

we know of limitations
and can do probably better for this specialized application

No need to build on top of EventFlow code – but you are welcome to if you want...
Eventflow with 4 drugs
What may be involved?

pre-processing e.g

Merge intervals and remove gaps

Preprocess to mark time of important changes
  Keep only 1\textsuperscript{st}, 10\textsuperscript{th}, last prescription
  Find MEANINGFUL CHANGES: e.g. Switches between drugs, dosage changes
  Differentiate between Small, medium and large (episodes or gaps)

Etc.

+ show effect on detail view of sample records
What may be involved?

Alternate representations of the data?

Convert to show episodes of:
  no drug, 1 drug only, 2, 3, 4 drugs at once (any one)
Or
  No drug, only A, only B, only C, A+B, A+C etc, A+B+C

SHOW distribution and stats (# and duration of episodes)
What may be involved?

New pattern visualization?

e.g. Summarize 1 month is one cell 1 pixel row per parent > can show lot of parents on 1 screen. Ordering them by similarity of start patterns would help, or (me of start of a drug
What may be involved?

New pattern visualization?

e.g. Summarize 1 month is one cell

1 pixel row per patient
  can show lot of patients on 1 screen.

Sorting by?
Many opportunities

- Start with 2 then 3 different drugs, but can we go to 4 or more?
- Deal with dose changes?
- Show switch between drug names within same class, or switch generic>brand and brand>generic

- Add 1 outcome event then link pattern with outcome

- Metrics to characterize the rhythm(s) of the prescription

- Analytics to remove anomalies (e.g.: find all prescriptions that are not 30 or 60 days, and allow users to remove them) > interactive visual data cleaning