university of groningen

PERSONALISED EPISODE IDENTIFICATION IN SCHIZOPHRENIA SPECTRUM DISORDER USING HEALTHCARE CONSUMPTION TRAJECTORIES

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1. Background

Various illnesses follow a recurring pattern of episodes.

In schizophrenia literature, there is no clear consensus about what constitutes the definition of relapse (Olivares et al. 2013), which is the onset of a subsequent episode.

The most common factors in the definition of relapse are hospitalisation (54%), and symptom scales such as the Positive and Negative Symptom Scale (PANSS) (20%) and the Clinical Global Impression (CGI) (18%).

2. Objective

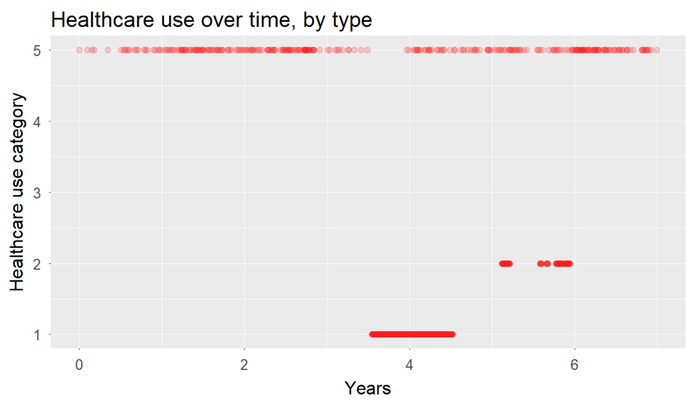
We aim to determine episodes from a personalised perspective, robust against policy changes, using healthcare data.

We use an iterative method based on control charts and Exponentially Weighted Moving Average filters to determine structural changes in the trend of a healthcare variable as a definition of the “in-episode” state.

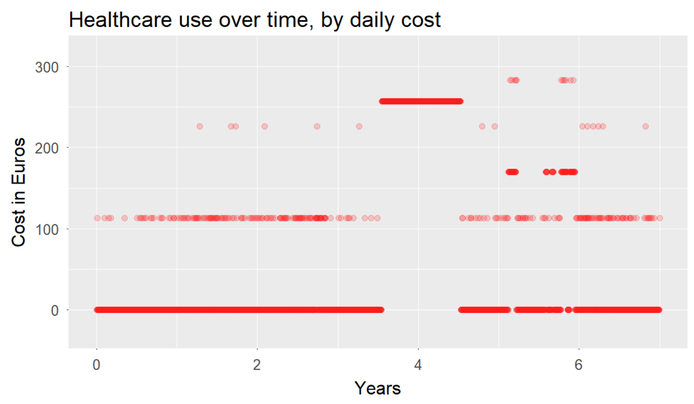
We use a population of schizophrenia patients from the Northern Netherlands to demonstrate the use of the method.

3. Methods & Example

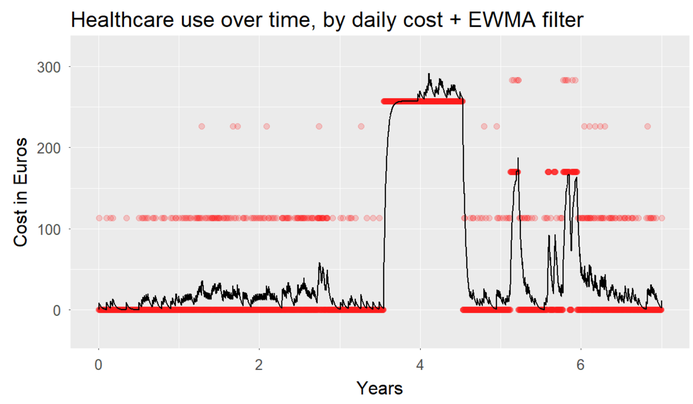
a) Healthcare use (single patient)



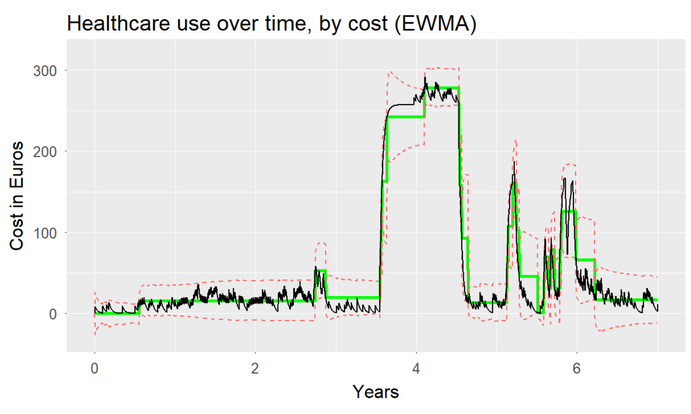
b) Healthcare use -> daily cost (€)



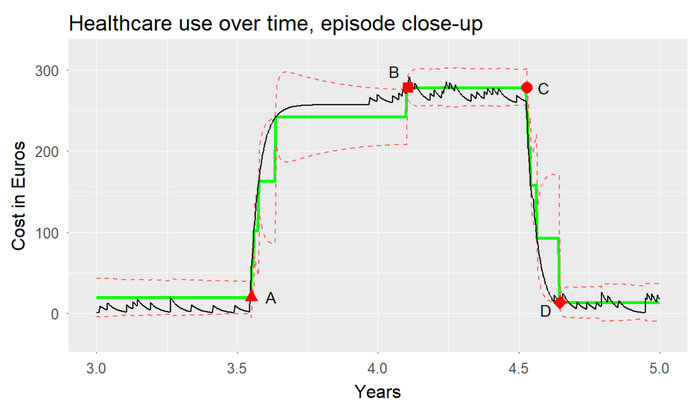
c) Daily cost -> EWMA filter



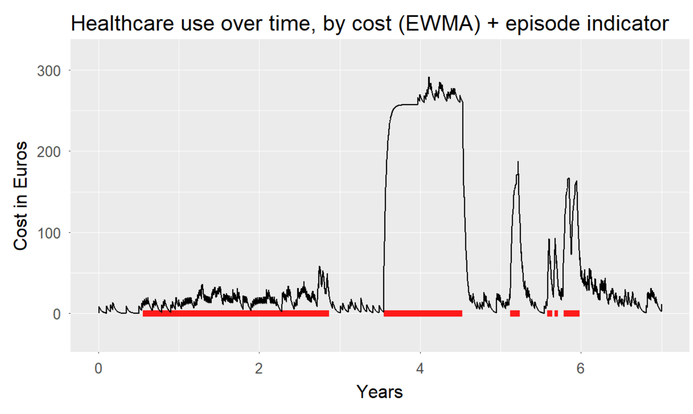
d) Daily cost signal + control chart



e) Structural changes in trend direction



f) Underlined episodes (A-C definition)



4. Results

For baseline choices of parameters we find:

- In our population of 13,155 patients, 0.61 episodes per year and 150 days per episode on average.
- In a subset of 4,809 patients without hospitalisations, 0.51 episodes per year and 147 days per episode on average.
- We observe a statistically significant association between the “in-episode” state and Global Assessment of Functioning (GAF) scores. This was for N = 11,509 patients that have one or more completed GAF, with on average 4.9 GAF measurements per patient.

5. Conclusion

The new method defines episodes based on an individual’s variation using control charts.

The method is suitable for time series with a sufficient resolution, and can be used on variables such as cost or symptom scales.

This method is robust to policy changes such as deinstitutionalisation.

Patients without hospitalisation have episodes of similar length compared to patients with hospitalisation, but less frequently and with smaller structural changes in healthcare use.

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