

# pharmerit

international

access through evidence

Using discrete event simulation to  
evaluate the cost-effectiveness  
of antipsychotics

# Outline

- Schizophrenia
- Reasons for modeling
- Modeling mechanism
- Progress hypothetical patient over time

# Schizophrenia

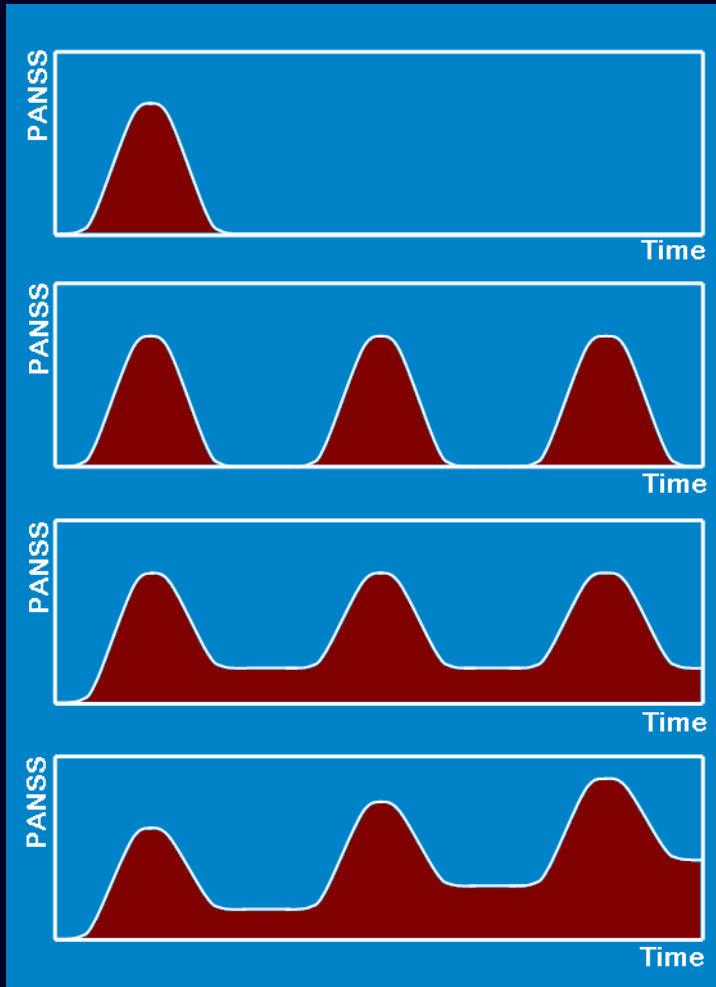
- **Chronic psychiatric disease**
- **Prevalence 2006 ~0.7%** (*Mental health care in Latvia, Statistical Yearbook 2006*)
- **The disease is characterized by:**
  - **Positive symptoms** (e.g. hallucinations, delusions)
  - **Negative symptoms** (e.g. restricted emotional experience and expression)
  - **Summarized in Positive And Negative Symptom Score (PANSS)**
- **Symptoms have a devastating effect on:**
  - **Ability to maintain (social) relationships**
  - **Employment prospects**
  - **Maintain wish to participate in normal daily activities**

# Schizophrenia (relapses)

**Patients have different propensities to relapse:**

- **Minority only experience one psychotic episode**
- **Most patients have recurrent relapses**
  - **Some recover fully between relapses**
  - **Most recover only partially, with residual symptoms and permanent loss of abilities/functioning**

# Schizophrenia (PANSS)



1. One episode only, no impairment (16%)

2. Several episodes, with minimal impairment (32%)

3. Impairment after the first episode, with subsequent exacerbation and no return to normality (9%)

4. Impairment increasing with each of several episodes and no return to normality (43%)

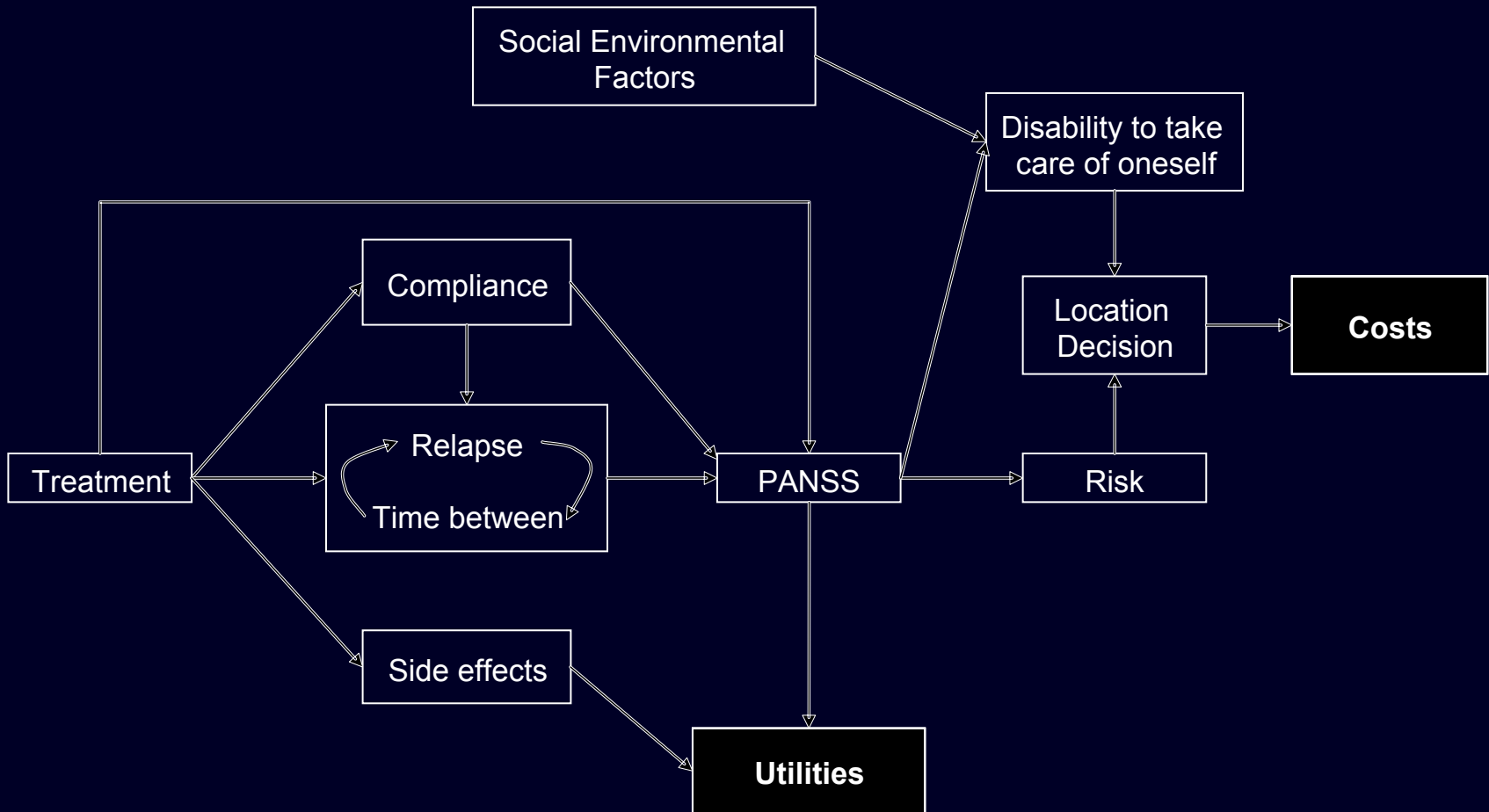
Source: Travis

# Reasons for modeling

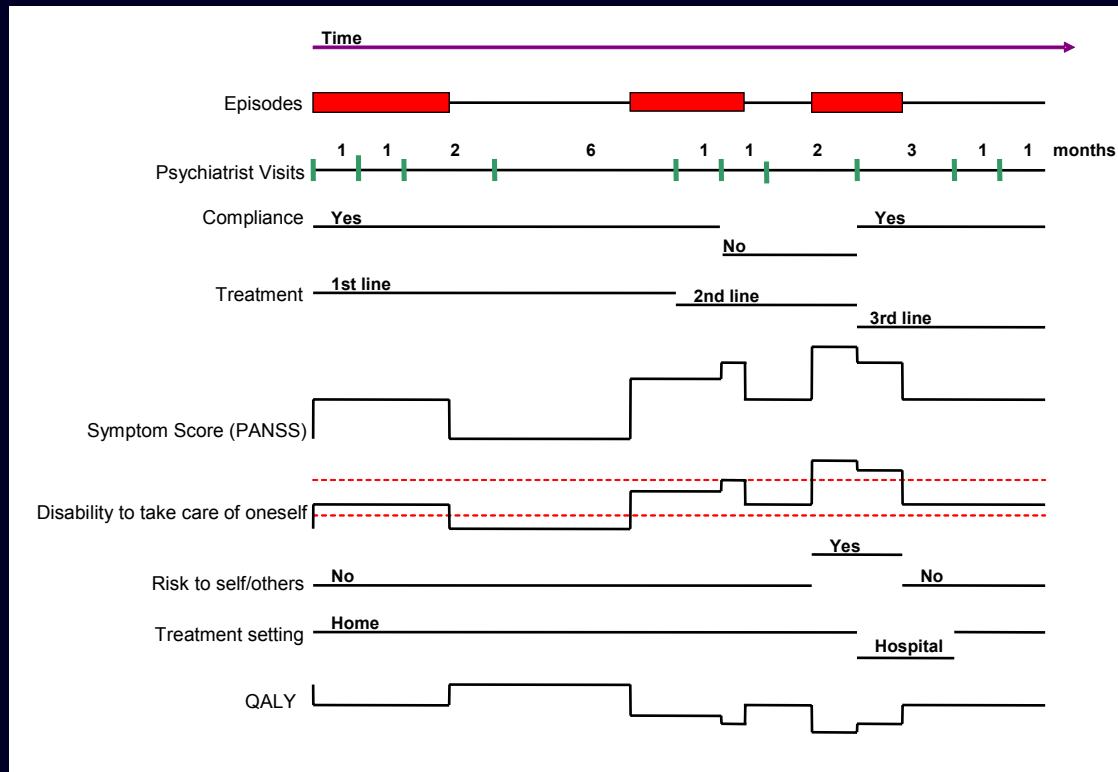
- **To bring together knowledge**
- **When knowledge comes from different sources**
- **When extraopolating**
  - **In time**
  - **In patient groups**
  - **Countries**
- **To answer what-if questions**
- **To identify what we do not know**
- **A clinical trial is also a model**

*(Karnon et al. 1998.; Brennan et al. 2000)*

# Modeling mechanism



# Hypothetical patient over time



The model simulates the occurrence of events (visit, relapse) and changes in relevant attributes in the life of the patient.

# Conclusion

- Two different treatment scenario's can be defined
- The model simulates disease progression under the two scenario's in a large heterogeneous cohort of schizophrenia patients
- The model outcomes enables incremental cost-effectiveness analyses and 'value-of-information' analyses.
- The model allows for univariate and multivariate sensitivity analysis
- The model is flexible for adjustments to
  - specific country setting
  - new scientific evidence
  - new treatment options