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# Stochastic modeling of patients recruitment in clinical trials

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## Abstract

Patients' recruitment is a topic of paramount interest in most medical studies. Clinical trials are usually provided with the purpose to prove some useful properties of the treatment. The proof of concept is based on statistical considerations and the number of patients to include (*NSS*) is a key point of the methodology (too large number of patients is detrimental to the ethic – and the cost - of the trial and too small number can lead to the lack of statistical power in the analysis and impossibility to make reliable conclusions). Much attention has been focused on the calculation of the *NSS*. However, the process of patients recruitment and modelling of its dynamics has been very little investigating and is almost not exploited. Rojavin [**1**] summaries the situation saying "*Patient recruitment and retention remains until now more of an art rather than a science"*.

The main question of interest is to predict the date of the end of the trial with a satisfactory precision. The usual method is deterministic but this approach is not satisfactory because of the huge variability of the recruitment process. Thus, it is an imperative task to develop stochastic models for patients' recruitment which will lead to the two mains applications: first, the opportunity to evaluate the main characteristics of a clinical trial (duration, cost) and to develop tools for decision-making process at any stage of clinical trial. Here we present the results in on the sensitivity of the so-called Poisson-Gamma model introduced in and the extended model in which takes into account the drop-outs.

## Biography

Nicolas Savy is associated Professor in the University Paul Sabatier of Toulouse in the Team Statistics and Probability of the Toulouse Mathematics Institute. His research focuses on two ways: first theoretical problems in probability theory especially stochastic calculus, anticipative stochastic integration, Lévy processes and problems applied to medical researches especially stochastic modeling in clinical trials, survival data analysis and mediation analysis.