

# Dynamics of Smoking

## *Proposal for the Flash Talks for the course Modelling and Simulating Social Systems, Autumn Semester 2018*

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### Topic<sup>1</sup>

As the number of smokers decreased in the US over the past decades, the Framingham Heart Study studied a network of about 12,000 people and their health status. In the paper "The Collective Dynamics of Smoking in a Large Social Network" the results of this study regarding smoking are presented.

It is shown that in the examined network the individual smoking behavior is highly influenced by one's social environment, such as the person's partner, family, friends and work contacts. This means that for example "Smoking cessation by a spouse decreased a person's chances of smoking by 67%"<sup>2</sup>.

The study shows the spreading and decline of smoking behavior and the formation of groups of people that are either smokers or non-smokers.

### Our Goals

In order to investigate the dynamics of smoking behavior in a society on a theoretical level, we want to create a digital network of people that are influencing each other's smoking habits as family, friends, coworkers etc., as described in the Framingham Heart Study. The social system we want to create should work similarly to "Conway's Game of Life", by means of which we will try to break down the complexity of our system as much as possible without losing the main characteristics of our model.

As initial conditions for our project we want to use data about the tobacco consumption in Switzerland, where in 2012 32.4% of the men and 24.2% of the women in Switzerland were smokers<sup>3</sup>.

Our goal is to examine how our model of a society develops and if it matches the real development which was being described in the Framingham Heart Study. Furthermore, we want to evaluate whether our model is stable and whether it appears to have a fix point. Such a fixpoint could indicate that after a long time has passed, the whole society will consist of non-smokers (or smokers) or that we see formations of groups of smokers and groups of non-smokers as we have also seen in the results of the Framingham Heart Study.

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<sup>1</sup>The new england journal of medicine, Nicholas A. Christakis, M.D., Ph.D., M.P.H., and James H. Fowler, Ph.D., The Collective Dynamics of Smoking in a Large Social Network, 2008

<sup>2</sup>page 1 of the mentioned paper

<sup>3</sup>Bundesamt für Statistik, Tabak,  
<https://www.bfs.admin.ch/bfs/de/home/statistiken/gesundheit/determinanten/tabak.html>