

# Modelling Social Contagion in Health

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## Background

Research over the past several years in the social sciences has provided evidence for the possibility of a phenomena known as *social contagion*, where the social connections an individual possesses influences aspects of their health and behaviour in such a way that it appears as if the health or behaviour in question is “spreading” from person to person. For instance, recent experiments suggest that an individual’s emotional state can be affected by exposure to the emotional expressions of social contacts [1]. Associations have also been found between social norms and weight perception [2].

Many studies have attempted to quantitatively model social contagion [3] but have often come under statistical criticisms, commonly due to the possibility of causal confounding [4]. In previous work, we developed a model that improved upon the criticisms to examine the possibility of depression (and lack of) spreading over adolescent friendship networks [5]. Subsequent model enhancements allowed us to explore both the possible spread of mood in general [6] and weight change [7].

## Project objectives

In this project, the student will undertake statistical modelling with the aim of enhancing the established model and applying the model to other noteworthy health aspects across multiple datasets. These refinements will allow for further applications of the model to health behaviours of telling importance to public health, as well as an investigation into the generalisability of the model when faced with different populations.

## Project deliverables

The core aim of this project is to develop and apply the model to analysing the possibility of social contagion of smoking uptake and cessation in two different datasets containing information on health aspects, behaviours and friendship networks: the National Longitudinal Study of Adolescent to Adult Health (Add Health) [8], and the California’s Smokers Study [9].

By identifying the social processes that may drive smoking uptake and cessation behaviours, the project will aid efforts to inform intervention policy that has the potential to bring about highly significant public health benefits.

## Extension to Ph.D. project

The broad research question has significant potential to be extended into a Ph.D. project. Extensions include:

- (1) the application of the model to further health aspects such as suicidal ideation;
- (2) theoretical generalisations of the model; for example, developing a justified form of the model that can be applied to datasets lacking social network information.

Proposed tasks can be discussed with the student and the ordering of research items within the project can be adapted to their interests.

Additionally, there is the prospect of collaboration with an enlarged research team, including Frances Griffiths (Warwick Medical School) and Thomas House (The University of Manchester).

Note that aspects surrounding the formal supervision of the Ph.D. project would require further discussion between the student and interested academic and industrial partners. Spectra Analytics are happy to be associated as external partners to any possible Ph.D. project, but can only give minor involvement and supervision in comparison to the highly involved supervision Rob Eyre will give on this MSc project on behalf of Spectra Analytics.

## References

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