Research & Literature Review

# Overview

Due to the variety of fields interacting within the project, understanding the relevant background to each of these areas is the key to creating a representative model. Specifically, investigating how social networks and personal health interact provide a good starting point in creating an agent-based model. This section will consider relevant and similar works to both justify and allow the project to expand upon the existing knowledgebase.

# Social Networks

As described previously, social networks, whilst always existing, have become a popular topic in recent years. In particular, applying an analytical approach to them has led to a formalisation. At the lowest level, networks are represented using mathematical graph theory [**ref NetMark**]. This means that individual entities within the network are shown as nodes, whilst relations between these entities are edges. Importantly, these edges can be either directed or undirected, which can change their meaning depending on context – for example, directed edges could be used to show how one node likes another [**ref USN 14**]. By extension, a bidirectional edge represents some mutual relationship between the nodes.

Building on this basic set of terms, a number of structural definitions emerge that begin to underpin the theoretical to the practical. The strength of ties, a tie being

* Stucture
  + Betweeness
  + Strong & Weak ties
  + Triadic closure
* Homophily
* Influence
  + Different approaches
  + Different complexities
* Connectivity
* Small-world phenomenon

# Smoking Cessation

* Current smoking situation
  + Quit rates
  + Smoking uptake
  + Costs
* Smoking cessation
  + Rates
  + Factors
  + Results of it

# Agent-Based Modelling

* Basic runover of what it is and does
  + Repast paper for key defs etc
* Examples of how it is used
  + Emergency paper
  + Computing paper
  + IEEE paper
* Repast Simphony
  + Environment for this
  + etc

# Similar Work

* Framingham Heart Study
  + Shows social behaviour has impact
* Also study on Malaysian people (?)
  + More specific to smoking
* Smoking combo paper – covers a number of areas in depth, with potential to combine
* Epidemiology paper
* Social circle paper