



# **UNTANGLING BELIEF NETWORKS: HOW DATA SCIENCE COULD BE THE KEY TO CHANGING HEALTH BEHAVIOUR**

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## KEY TAKEAWAYS:

- Understanding motivational drivers of behaviour, such as beliefs, is key for changing health behaviour.
- Motivation is complex and can interact with cognitive, social and environmental factors.
- Network analysis can help us understand interrelated beliefs, attitudes and feelings and their effect on behaviour. Additionally, it can provide a data-driven way to prioritise behavioural interventions.

## MENTAL HEALTH CONDITIONS CAN AFFECT ANYONE, ANYWHERE

**Our mental wellbeing can affect how we think, feel and act. It can influence how we respond to stress and difficult emotions, how we relate and interact with others and also how we reason and make decisions. Despite all this, many of us do not reach out for support for our mental health. Why?**

Access is certainly one barrier that can make seeking support challenging as anyone who has tried to receive treatment on the NHS will know. In fact, around 23% of people with mental health conditions wait more than 12 weeks to start treatment, with over 43% of people reporting that the wait between initial referral and second appointment caused their mental health to worsen<sup>1</sup>. However, this is certainly not the whole story.

## Beliefs about mental health and support services influence whether people seek help

As behavioural health researchers, our aim is to try and get to the bottom of what exactly is stopping people from behaving in a way that would support their health, so that we can help our clients in changing this behaviour. For example, by understanding exactly what drives or prevents help-seeking behaviour, we can design tailored interventions that aim to encourage individuals to seek support for their mental health, and therefore improve their experience of living with a mental health condition.

Whilst environmental barriers, such as the long appointment waiting times mentioned or costs associated with support services, are important, often little can be done to overcome these. Therefore, it is critical to explore other factors, such as people's beliefs and attitudes, that may be key in motivating them to behave in a way that does or does not support their health.

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# UNDERSTANDING BELIEF IS ESSENTIAL FOR BEHAVIOUR CHANGE

We often use psychological theories and frameworks to identify what exactly underpins health behaviour.

These models explore how cognitive, social and environmental factors can affect health behaviour, although many overlook the role of motivation (and more specifically belief). Other models, such as the Health Belief Model<sup>2</sup>, do consider how people's beliefs about their health and health condition influence their health-related behaviours. However, they don't provide a strategy to **change** these beliefs and behaviours.

Models like the COM-B model of behaviour change<sup>3</sup> do provide tailored interventions to change beliefs and therefore behaviour. But what it doesn't do is help us understand how different beliefs are connected or help us prioritise what will be most important to change when designing our intervention.

**For this, we need to look at network analysis of belief systems.**

## Mapping out belief systems: using a network analysis to identify beliefs that are most influential on help-seeking behaviour

Belief systems describe the relationships between various attitudes, opinions and beliefs, and can help us understand:

- How people specifically draw on different beliefs or attitudes when performing a behaviour
- How beliefs interact with other factors, such as those in our social environment, to influence behaviour; and, crucially
- What is most influential or central belief to target when designing behaviour change interventions.<sup>4</sup>

Let's take our mental health support example. Network analysis can help us to visually map people's beliefs and attitudes<sup>5</sup> about mental health conditions, which offers insights into how they work together to influence help-seeking behaviour. Then, statistical analysis can help to evaluate which beliefs or attitudes are the most influential.

**Network analysis can help us to visually map people's beliefs and attitudes<sup>5</sup> about mental health**



We conducted a survey to explore people's attitudes towards mental health support services, and identified a number of beliefs that affect whether people seek support for their mental health. In the diagram below (Figure 1), each belief or attitude about mental health is represented by a circle, or 'node'. For example, the belief that having a mental health problem can result in serious consequences is represented by the node 'CONSEQ'.

Each node or belief can have a correlational relationship (when one variable may change as another variable changes) with another node and these connections are represented by lines or 'edges'. The **green** line represents a positive relationship, where as one variable increases or decreases, the other variable does the same. The **orange** line represents a negative relationship, where as one variable increases or decreases, the other variable does the opposite.

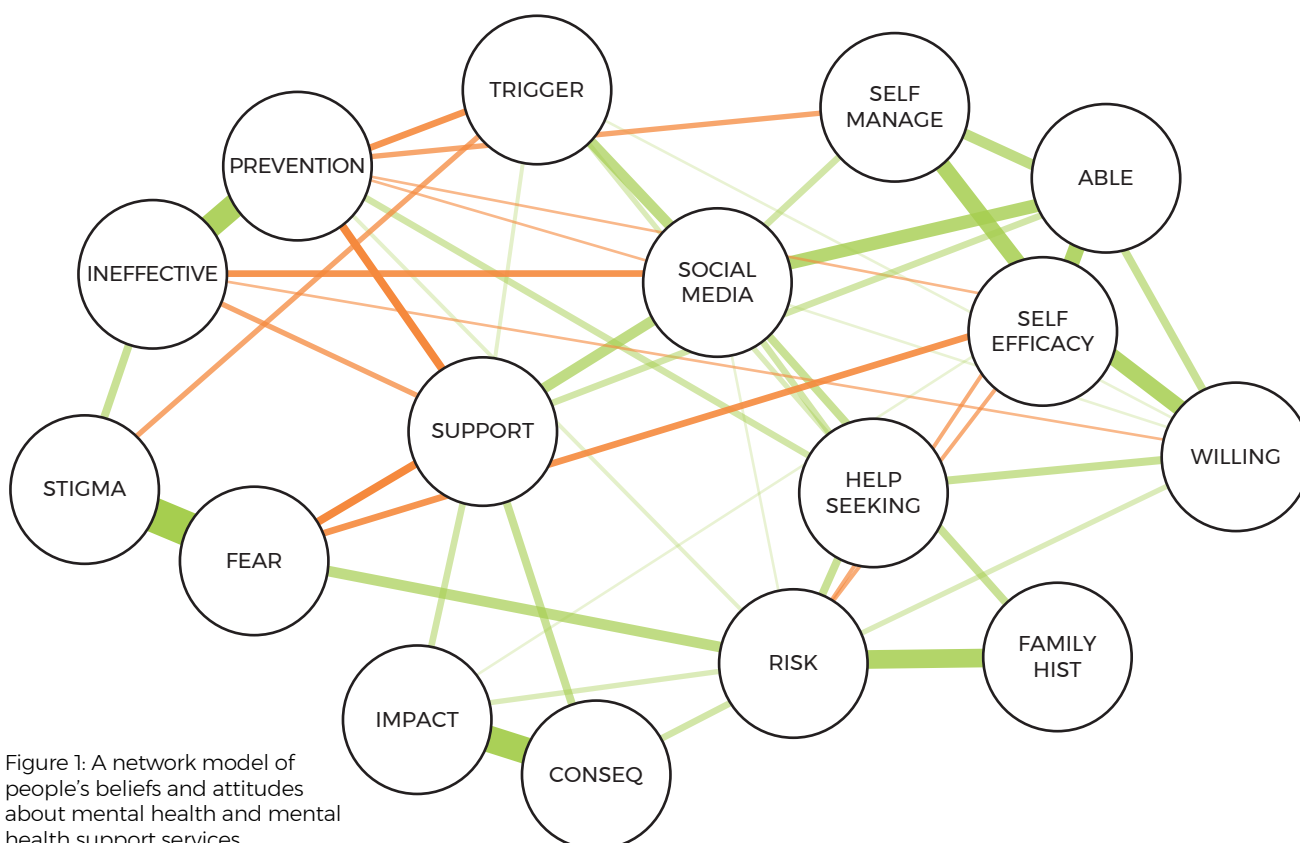


Figure 1: A network model of people's beliefs and attitudes about mental health and mental health support services

**Abbreviations:**

**RISK** - I am concerned about my risk of experiencing a mental health problem;

**FAMILY HIST** - I am more likely to experience a mental health problem due to my family history of mental health problems;

**CONSEQ** - Having a mental health problem can result in serious consequence;

**IMPACT** - Having a mental health problem can impact several different areas of life (such as family, career and social life);

**FEAR** - I am afraid to talk to others about my mental health;

**STIGMA** - I would not want anyone to know if I were receiving support for my mental health;

**INEFFECTIVE** - I do not believe mental health services are effective in supporting mental health and improving quality of life;

**PREVENTION** - I do not believe receiving mental health support prevents a mental health condition from worsening;

**SOCIAL MEDIA** - When people talk openly on social media about mental health and reaching out for support, it makes me think about seeking support;

**TRIGGER** - When significant changes occur in my life, it makes me think about seeking support;

**SUPPORT** - Support and encouragement from my family and friends makes me feel more comfortable about seeking support;

**ABLE** - I am able to seek mental health support if I begin to experience symptoms of mental illness or my symptoms worsen;

**SELF-MANAGE** - I am able to administer and manage treatments on my own if diagnosed with a mental illness;

**WILLING** - I am willing to open up to a professional about a mental health problem;

**SELF-EFFICACY** - I am capable of making the necessary changes to improve my mental health;

**HELP-SEEKING (BEHAVIOUR)** - Frequency of mental health support service use in the last three months.



## THREE THINGS WE LEARNED FROM OUR ANALYSIS

1. There is a strong positive relationship between STIGMA and FEAR, meaning that the more people are afraid to talk to others about their mental health, the more likely they would be to not want anyone to know if they were receiving support for their mental health.
2. There is a strong positive relationship between INEFFECTIVE and PREVENTION, where individuals who do not believe mental health services are effective in improving quality of life also are likely to not believe that receiving mental health support prevents a condition from worsening.
3. SOCIAL MEDIA, SUPPORT and SELF-EFFICACY are highly connected beliefs, meaning that these beliefs may be some of the most influential on the network and therefore help-seeking behaviour.

## WHY IS MOTIVATION SO IMPORTANT IN HEALTH BEHAVIOUR?

When working with clients, we identify what produces behaviour and therefore what needs to change in order for a behavioural intervention to be effective. Whilst it is critical that people have the appropriate knowledge and skills to carry out a behaviour and an environment that supports the behaviour, it is also essential that individuals have the **motivation** to behave in a way that supports their health.

At Redline Strategic, understanding motivational drivers of behaviour is key for many of the projects we work on. Identifying beliefs that influence our motivation can be simple, however understanding which beliefs are most integral, how different beliefs interact or how beliefs can be affected by environmental factors, can be complex.

Network analysis allows us to identify patterns and trends in the relationships between the entities in a network, i.e., beliefs and attitudes, and to understand how these relationships influence the behaviour. Network modelling provides us with an effective tool to understand the interrelated motivations and beliefs that drive behaviour and can help us take a data-driven approach to the prioritisation of behavioural interventions.



# REFERENCES

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