A mathematical approach to medical complexity

When birds fly close to a few nearest neighbours, the flock produces a wonderful, changing array of patterns. Health is a complex interaction of individual characteristics, treatment characteristics and organisational characteristics. Complexity science studies such systems to understand them and to discover if the emergent behaviour we see can be directed or controlled. Tailoring treatments to patients has potential to improve patients' quality of life and reduce resource consumption. The power of mathematics is used to drive efficient and provably robust machine learning, which has the capacity to predict outcomes in the case of complex interactions, such as in healthcare. The ability to predict outcomes for patients will enable the tailoring of their treatments to their individual needs.