SIMUL8 Healthcare

Supporting Vulnerable Communities' Health Needs Before they "Fall through the Cracks"

With unmanaged chronic conditions and a poor socio-economic environment, many vulnerable communities are left without proper healthcare or human services support

Many individuals in these communities will utilize a combination of health and human services throughout their lives, but effective planning and coordination is not always undertaken, particularly as individuals transition between service providers, non-profits, governmental programs, and employers. At the same time, these vulnerable populations tend to have more complex needs and often consume the most resources in the long run if they are not well managed.

Only 20% of children with mental health problems, for example, will receive appropriate treatment according to estimates from the Mental Health Commission of Canada.

Importance of ***early*** intervention

With more than two thirds of adults living with a mental health problem reporting that symptoms first appeared during their youth, establishing the foundation for healthy emotional and social development is vital to ensuring the mental well-being of all Canadians as they progress from childhood to adulthood (Mental Health Commission of Canada, 2014).

Early intervention and ***effective coordination*** between social services, healthcare providers, and a case manager is needed to support the child through adolescence and into adult services. This helps them to lead healthy lives and prevents them from consuming more resources at a higher total cost.

Predicting the ***needs*** of those with multiple Chronic Conditions

SIMUL8 Corporation has been working with the NHS in England to predict the needs of people living with multiple chronic diseases to ***understand how*** a capitated payment could be created to cover costs and incentivize healthcare and social service coordination.

The way this works is to segment the population into groups with broadly similar needs. In the case of chronic disease, people were identified through risk stratification tools and grouped according to the number of conditions they had (see Figure 1).

Figure 1: Risk Groups

Using cohort data over a three year period provided an understanding of how people in each group move into and out of crisis over time.

Using cohort data over a three year period provided an understanding of how people in each group move:

The simulation contained two elements:

1. ***The first was a disease model*** which simulates individuals transitioning between the identified risk groups and also takes into account an individual's life expectancy. The transitions are defined by the rates that each group are likely to develop another condition and therefore change risk group.

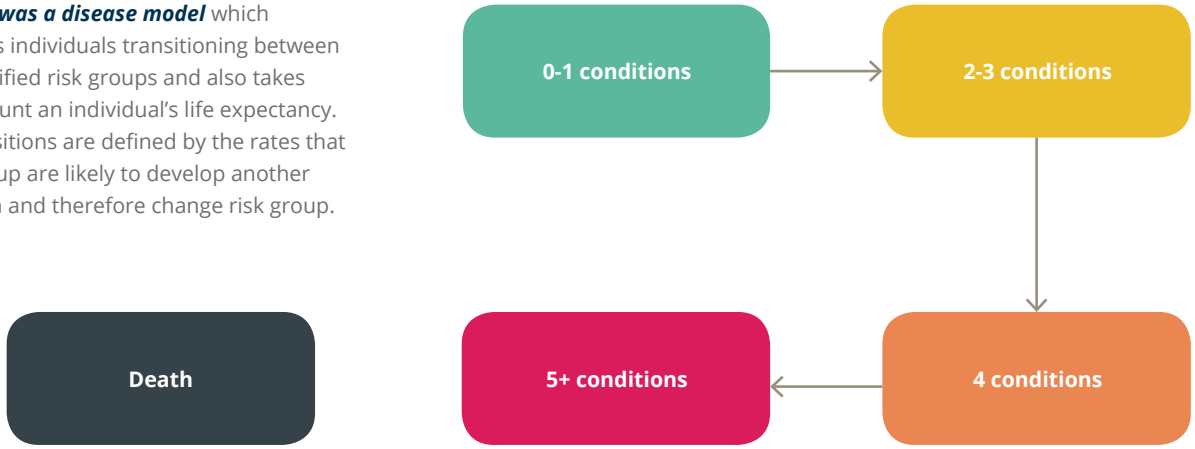


Figure 2: Disease Model

2. ***The second element is the service model*** which is linked to the disease model. Each individual has a likelihood of accessing one or more services and a further likelihood of accessing that service more than once in a year. The simulation allows you to change these probabilities by risk group but also by each year that the individual is in a particular group.

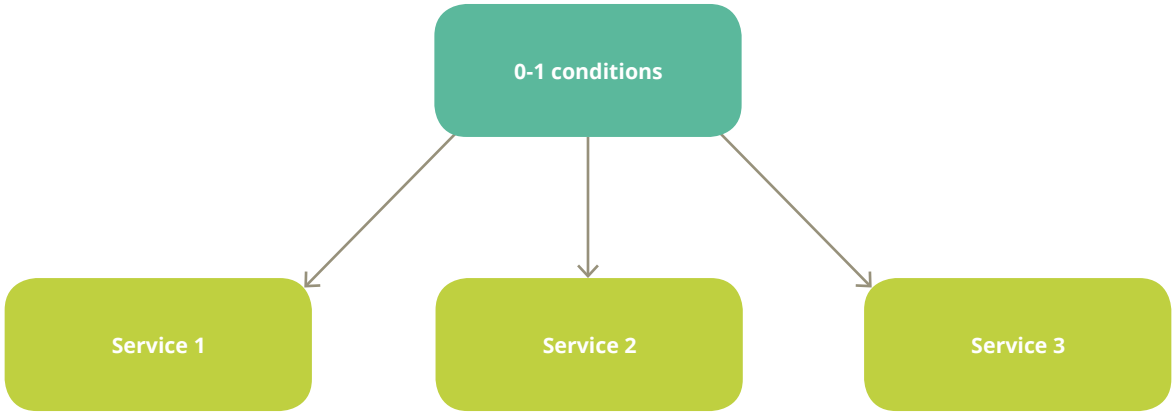
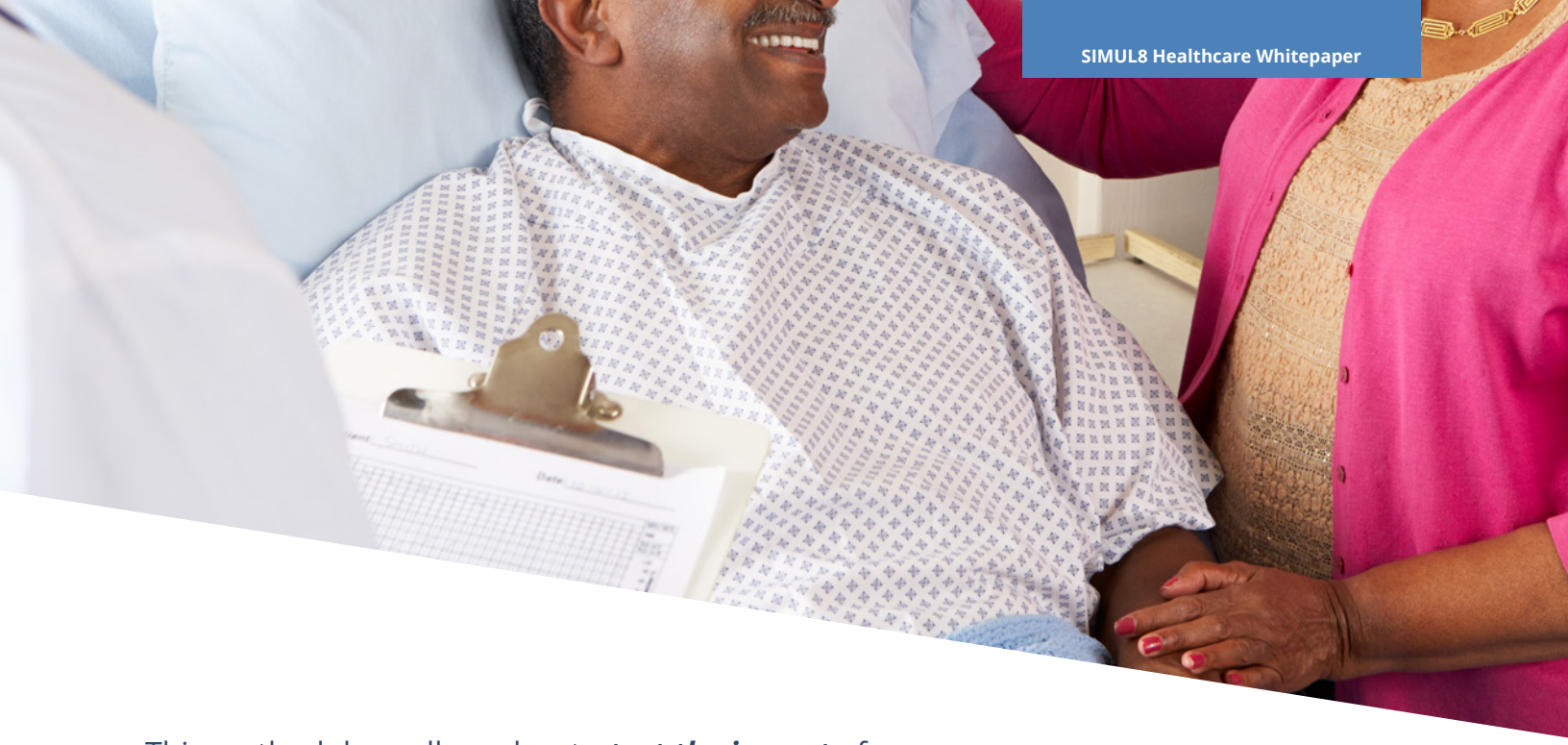


Figure 3: Service Model



This methodology allowed us to ***test the impact*** of different service interventions on the likelihood of disease progression, and to measure the impacts in terms of:

- Outcomes for individuals
- Service utilization
- Service costs

The results were then compared to a possible annual capitated payment to understand whether this payment would cover the likely costs for an individual over a year, and how this cost might change in future years as different interventions are applied.

This simulation has been applied across 8 different sites and found to work effectively in each. This gives us confidence that the generalizable principles behind the simulation are robust, and the model can be localized by uploading local data and allowing new sites to segment their population, apply costs and experiment with capitated payments as they would like.

This same methodology can be applied in other areas. For example, in Children and Young People's Mental Health or Learning Disabilities, as young people approach adulthood, they move into transitional and then adult services.

The same foundational structure used in the chronic disease model would allow the simulation of individuals as they get older, together with the ways in which their conditions could exacerbate, associating this progression with service models.

This would allow planners to ensure that appropriate services are in place for young people transitioning between children and adult services.

Make fast, confident decisions with simulation

SIMUL8's Executive Director of Health and Social Care Claire Cordeaux discusses the importance of early intervention when working with individuals with mental health problems. The paper also discusses how simulation is being used to predict the needs of those with multiple chronic conditions.

Learn more about using simulation for Healthcare on our website or contact the SIMUL8 Healthcare team to discuss how simulation could benefit your organization.

www.SIMUL8Healthcare.com/contact-us