

Health in Leeds

What contribution might transport policy make?



A System Dynamics Society open networking event – 7th February 2017, 2:30 to 5:00pm

University of Leeds, Institute for Transport Studies, Rooms 1.11a-c

Event objectives:

- To provide an interdisciplinary opportunity for discussing the application of System Dynamics to a significant challenge facing our cities;
- To provide a networking opportunity for those in Leeds, and wider afield, with an interest in System Dynamics;
- To provide an opportunity for people to find out more about System Dynamics and its applications.

Outline programme:

Refreshments available	2:30pm
Context setting – the health challenges for the city of Leeds	3:00pm
Transport policy and health – what are the connections?	3:15pm
A population health system dynamics model for the City of Leeds	3:45pm
Round table discussions – making the connections	4:00pm
Facilitated plenary to capture system insights	4:30pm
Concluding remarks	4:55pm
Retire for further refreshments and networking.....	5:00pm

What follows is a 'primer' for the health input, expecting that it might stimulate thinking about connections with transport policy.....

Whole population modelling of future health and wellbeing

1 Context

Sustainability and Transformation Plans (STPs) are designed to deliver on the vision set out in the Department of Health's 'Five Year Forward View'. The 'sustainability' bit of this equation relies on a range of preventive and pro-active approaches to health. The Whole Systems Partnership (WSP) is working with the Leeds Integrated Informatics Team in support of the Leeds CCGs to develop a whole population model for future health needs – with early work reflected in this primer.

However, managing demand growth for 'illness services' has long been recognised as being reliant on far more than just how health and social care organise themselves to deliver more prevention services or act in ways that are increasingly pro-active. Wider public health measures, and sectors such as housing, have long been recognised as playing a major part in population health improvements.

Some areas of transport policy may have an immediate effect on accidents – clearly a good thing – but we need to look further ahead as well into areas such as transport's contribution to pollution levels and how reductions may impact favourably on future levels of respiratory conditions; or on transport policies contribution to levels of walking or cycling and how that improves rates of cardiovascular disease. What's the evidence, and how do we combine these two areas of policy to understand impact and benefit?

2 Estimating population cohort prevalence

We have used National Household survey data to identify population cohorts of healthy, at risk, single conditions, multiple conditions and frailty and triangulated this with Leeds' own population data. The use of the survey data for this purpose has advantages over normal health population segmentation approaches because it includes the whole population irrespective of whether they have 'touched' the health system during a particular period, and because it enables us to ensure there is no duplication of overlap in identified cohorts of the population. Figure 1 shows our work in progress of estimating need by population cohort.

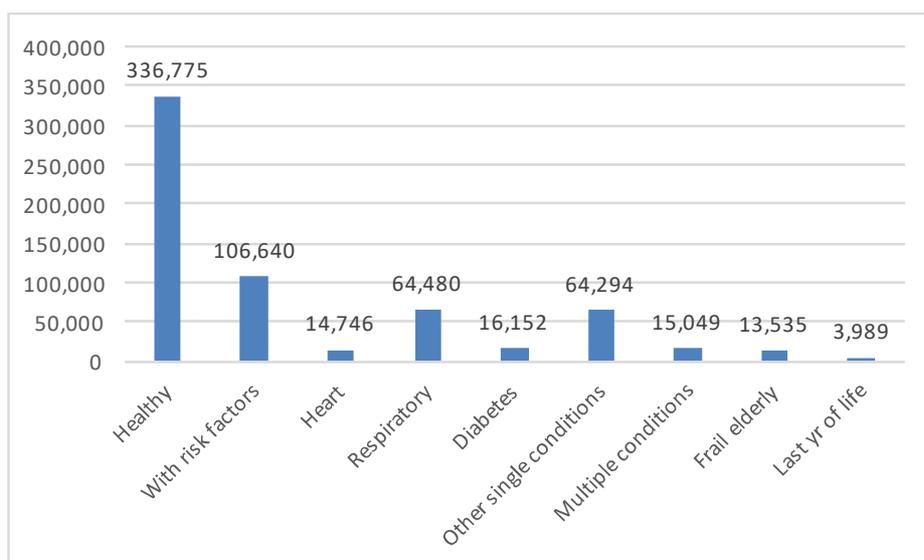


Figure 1 Estimate of Leeds population cohorts

The benefit of adopting a cohort approach, coupled with System Dynamics modelling is that we can start to understand the progression of need between different groups over time. This is illustrated in Figure 2, which is a slightly simplified version of the model currently under development for the Leeds population. Our

goal should always be to explore ways, and seek evidence, for the slowing down of progression from lower to higher levels of need.

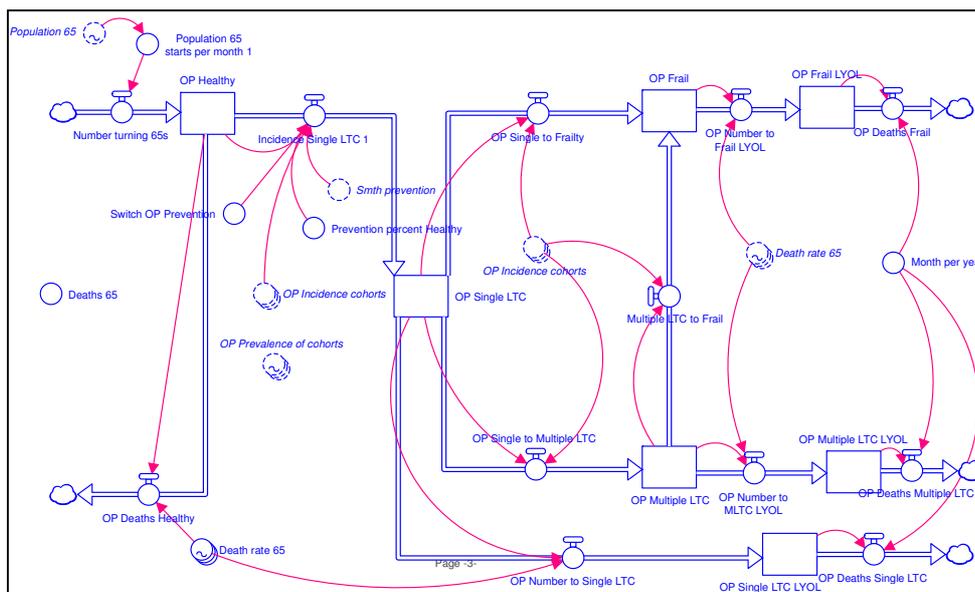


Figure 2 A System Dynamics representation of population cohorts of need and the transitions between different states¹

Finally, using data on resource utilisation for different cohorts of need, it is possible to model the impact of slowing the progression of need, over time. As an illustration of that impact Figure 3 shows the possible impact on GP appointments as a result of a range of primary prevention interventions.



Figure 3 Comparative output for GP appointments across Leeds under a 'do nothing' and a 'health improvement' scenario

3 The primer.....

This framework, and in particular the use of System Dynamics, provides a context for applying evidence from other sectors, like transport, and asking the question about their impact on health and on health service utilisation. If there is evidence of impact on the incidence or severity of certain health conditions arising from different transport policies, then we have the potential to explore the implications for the wider health and care system.....

¹ Abbreviations include LTC = long term condition; LYOL = last year of life; OP = older people.