P25 Piloting a group-based modelling approach to explore local food systems with an agent-based model

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Abstract

**Background** Daily dietary choices can be influenced by a host of behavioural factors (e.g., personal preferences, mental health state), as well as the social and policy environment (affordability, acceptability, and availability). Prioritising food environment policy changes to address dietary quality is thus challenging, and not well suited to some traditional research approaches.

Complex systems science is increasingly gaining ground in public health research and can be leveraged to better understand the determinants of poor dietary intake. Key methods include conceptual model building and computational modelling techniques. A co-production process called group model building (GMB) aims to bridge local issues and policy options. Traditionally, GMB has been used alongside system dynamics but not in agent-based modelling (ABM).

We, therefore, pilot a group modelling approach to inform development of a conceptual model of the local food environment in the Liverpool City Region to inform an ABM.

**Methods** We adapted and piloted a series of GMB stakeholder engagement activities (called scripts) for use in the ABM conceptual model with academics and partners from the local authority. We also developed a series of use-cases – policy scenarios to be modelled by the ABM – to facilitate discussion and solicit feedback on the conceptual model specifications. The feedback from the sessions were collated and reviewed and adjustments were made to both the conceptual model and the use-cases.

**Results** Upon reaching a shared understanding of the model concept, participants identified gaps in the conceptual model and developed new use case scenarios to be adjusted for future iterations. A number of feedback loops in the model were also highlighted for further consideration (e.g., travel choice, food price elasticity). Data collected from the session also supplied valuable input into development of suitable visual boundary objects that will be used to facilitate additional group modelling exercises and conversations with stakeholders. Additional meetings with stakeholders will further refine the conceptual model and provide ground truthing to the computational model.

**Conclusion** This iterative process facilitated the understanding of the complex systems underpinning local food environments and allows for ground truthing and future validation of the ABM. Co-development of model use cases facilitated a shared understanding of the purposes of the model and will help to maximise its usefulness for stakeholders.