COMMUNITY WELLBEING AND THE TRIP TO WORK: INTEGRATING EPIDEMIOLOGY, POLICY AND COMMUNITY KNOWLEDGE USING PARTICIPATORY SYSTEM DYNAMICS MODELLING

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Background and Aims: Achieving healthy and sustainable urban planning requires integration of epidemiological knowledge with other kinds of information in ways that are useful for decision-makers. Informed participation in decisions by a range of stakeholders is also needed for effective policy implementation. Few methods have been described to meet these requirements. The *Community Wellbeing and the Trip to Work* project tested one such method to influence transport policy. We aimed to improve understanding of policy levers required to align health and sustainability outcomes in urban commuting, using a collaborative learning approach with decision-makers and wider stakeholders.
Methods: We used participatory system dynamics (PSD) modelling to explore commuting and wellbeing in Auckland, New Zealand's largest metropolis. This is a sprawling city of 1.4M people, where commuting is mostly by car; public transit ridership and walking are less common; and bicycling is rare. We considered commuting as a complex system comprising feedback, time lags and unexpected consequences. We developed a qualitative and a simulation model of the commuting system demonstrating the likely impacts of policies to change bicycle commuting on a range of outcomes.
Results: Both models provided policy insights. Quantitative simulations compared "business-as-usual" with two bicycling investment scenarios. Investment costs were integrated with health and environmental outcomes. Economic estimates of costs and benefits were compared. A range of stakeholders could explore the structural reasons for success or failure of policies.
Conclusions: PSD allowed the integration of epidemiologic and other knowledge to simulate transport policy outcomes. Learning about the dynamics of commuting and wellbeing improved understanding of factors leading to policy resistance or success. However, the more technical simulation process left some community stakeholders feeling disengaged. Further work will explore how accessibility of the simulation model can be improved through interfacing and web-based tools. PSD is a potentially useful tool to improve evidence-based integrated assessment in urban planning policy.