SOCIAL NETWORKS & PLANT-BASED DIET DIFFUSION

AUTHORS

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**WIDER ADOPTION OF PLANT-BASED DIETS IS CONSIDERED TO BE A 'WIN-WIN'
FOR HUMAN HEALTH AND CLIMATE CHANGE MITIGATION AND ADAPTATION.
CAN AN INDIVIDUAL'S SOCIAL NETWORK INFLUENCE THEM TO EAT PLANT-BASED?**

INTRODUCTION

- With rising global temperatures and shifting growing seasons, there is increasing waste and disruption in global food supply chains.

- The global food system is also one of the largest drivers of climate change, and has contributed to a host of chronic illnesses through the consumption of low-nutrient, high-calorie diets.

- One solution is the wider adoption of plant-based diets, which are conducive to human and earth health.

- Evidence suggests that plant-based diets may be diffused by complex interactions among individuals within connected social networks of family members, co-workers and friends.

- We hypothesized that adopting plant-based diets may occur more rapidly if they are diffused through social networks.
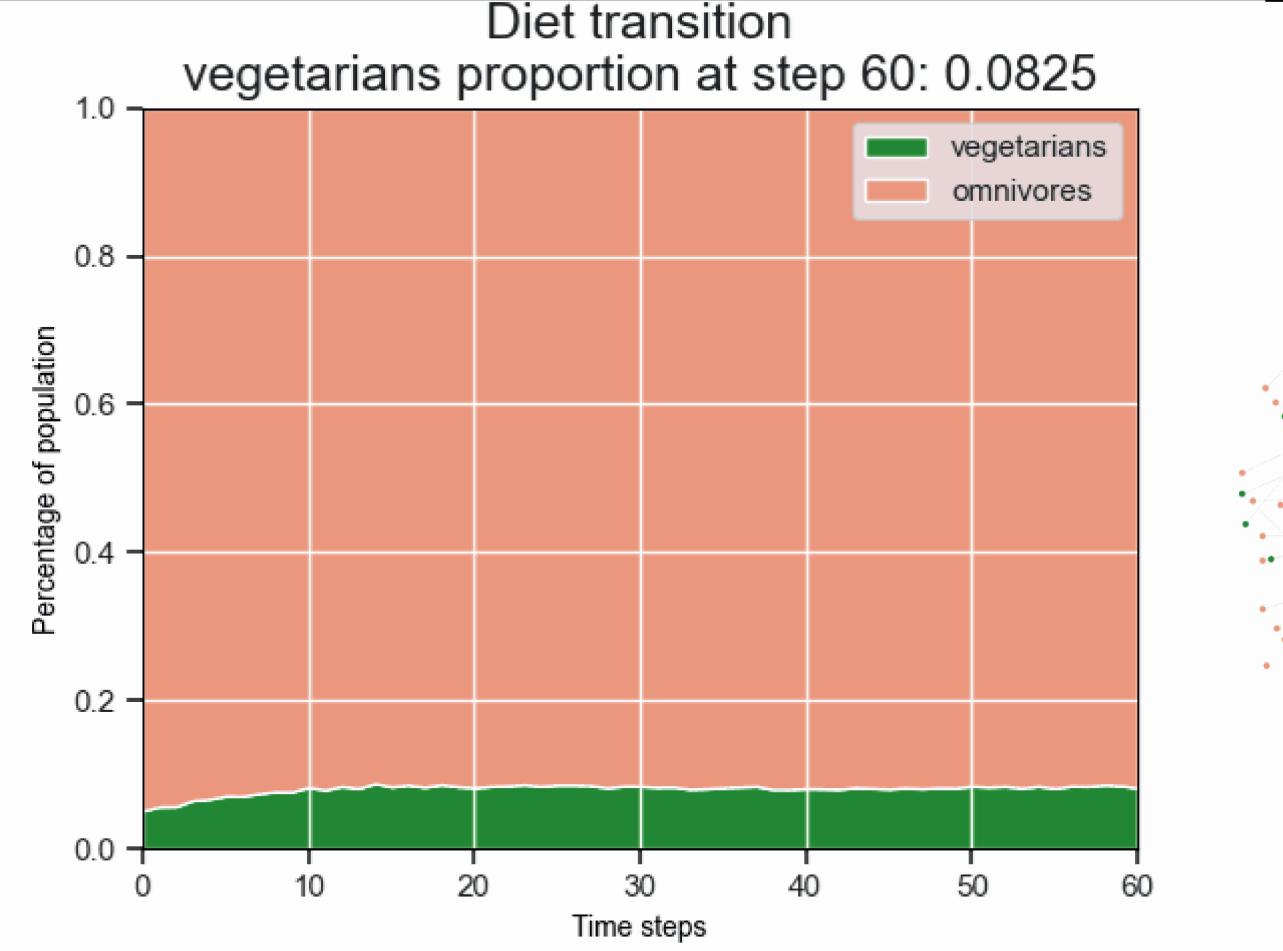
OBJECTIVE

To develop a simulation model exploring how planetary diets may diffuse through social networks.
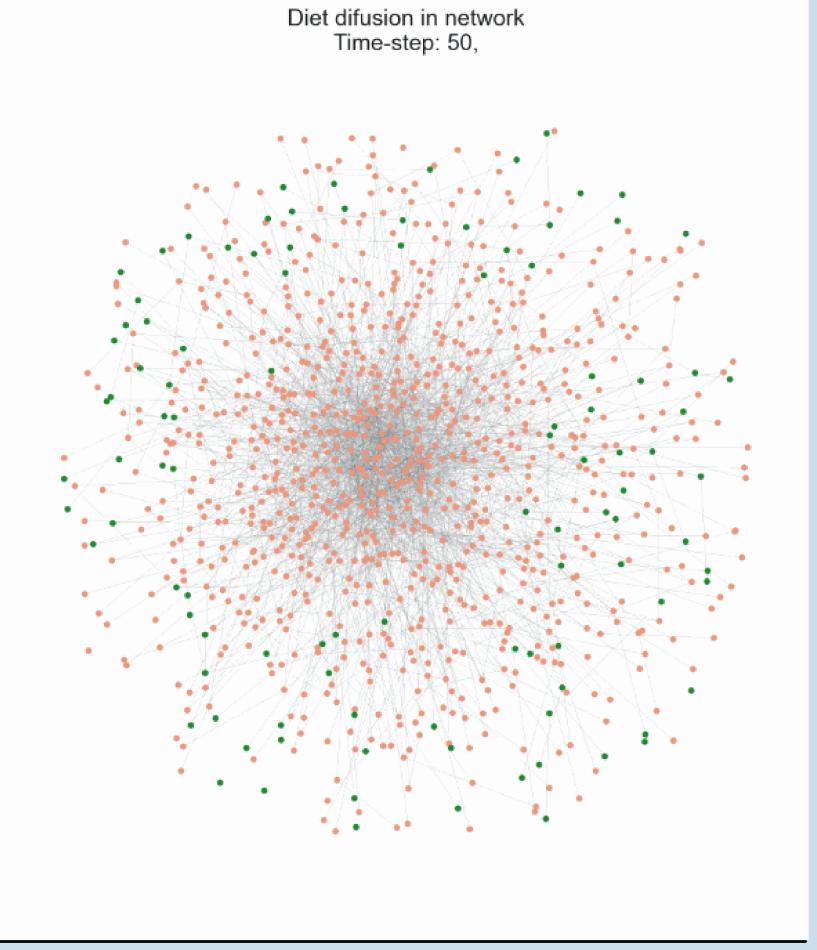
METHODS

- We used Python to develop Vegetarian Contagion Model (VEGCON), which simulates the diffusion of plant-based diets over time. VEGCON is a hybrid agent-based model, and incorporates elements from microsimulation.

- VEGCON's synthetic population is based on data from Lifelines, a representative sample of the northern Netherlands. Data from 55,000 individuals are used. Information on demographic characteristics, vegetarian diet status, and social connections inform agents' characteristics.

- We hypothesize that social connections are based on preferential attachment, so that agents with more shared features are more likely to form connections. In VECGON, social networks can be generated either with the extended Barabási-Albert Model, or with the Holme-Kim Power Law Cluster Model. While both models are premised on preferential attachment, the latter takes into account clustering within networks.

- Agents' individual characteristics determine (1) the probability that they are vegetarian at baseline, (2) the probability that they will be influenced by their social networks, and (3) the probability that they will influence their social networks. Based on (1) and (2), a probability of adopting and then maintaining a vegetarian diet is calculated.

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Diet transition
vegetarians proportion at step 60: 0.0825

Diet difusion in network
Time-step: 50,

KEY FINDINGS

- Across simulations with different network models and sizes, we find a modest increase in the share of vegetarians, from 5% at baseline to around 9% at later steps.

- Leveraging social networks in diet-change interventions may help to increase their effectiveness.