

# **An Agent-Based Modeling Approach to Understanding the Obesity Epidemic in the United States**

Michelle Saksena

Phd Student

Agricultural, Environmental and Development Economics (AEDE)  
The Ohio State University

Despite growing concern for the obesity epidemic in the United States, data constraints have limited social science analyses to correlative studies. This limits our capacity to make causal statements of which factors contribute to weight gain. This is further compounded by the fact that the nature of the obesity problem is plagued with endogeneity issues as it is not clear whether lifestyle choices lead to weight gain or if weight status dictates behavioral changes. Currently, no national database within the United States collects longitudinal data on individuals' weight outcomes, dietary intake and economic and geographic indicators. However, this form of data is necessary in order to treat endogeneity problems and thus has thwarted more sophisticated examinations of the obesity problem.

In this paper I treat the obesity epidemic as a complex system. The obesity epidemic warrants a complex systems analysis because individuals are highly heterogeneous both in their preferences and local environments while the existence of social contagion effects have been shown to have significant influences on lifestyle choices. I am particularly interested in the consumptive behavior of individuals by income class. I theorize that the lowest income individuals will tend to be the most obese because they are relegated to food choices, which are calorically dense, but nutritionally lax and thus these individuals will tend to over-consume. Furthermore, cohorts of like income ranges will have a tendency to live close to each other. This may result in altered individual behavior based on observing and mimicking consumption patterns of his or her cohort.

Preliminary results show that in fact the lowest income individuals do not tend to be overweight. This is because they are heavily dominated by negative income effects and are still not able to purchase enough calories to maintain or increase weight. Middle class individuals show the highest prevalence of obesity, which may indicate that incremental increases in income have very large effects on calorie availability. These individuals tend to be overweight because they can afford more calories yet are out-priced from purchasing healthy, less calorie dense foods. My further research will focus on implementing social networks and testing how influential social effects are on obesity outcomes.