Predicting U.S. Childhood Obesity through Mathematical Modeling

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In the past 50 years, observational studies have shown obesity to be the most prevalent nutritional based disease in the most affluent countries of the world, including the United States. The proportion of obese and overweight people combined has been increasing globally. This trend appears across all ages, genders, and ethnic groups. A variety of diseases, which result in a higher mortality rate, have been linked to those who suffer with obesity. Another link has been found in which children with obesity have a higher rate of becoming obese adults in comparison to children who never suffered with obesity. This link raises concerns and has led to an increase in preventative efforts to reduce this rate through several public health programs in and out of schools to, hopefully, reverse the epidemic trend.

In this presentation, after discussing some of the known implications and concerns of the increasing trend of obesity, I will provide my own interpretation to how I modeled the trend. I will focus on the social and nonsocial factors that influence obesity and the degree at which those factors influence people by applying United States' data to a new differential equations model. This model will adopt similar strategies that were developed by DM Thomas and her colleagues (2014). I will discuss the modified version of the SIR model I have created which interprets population changes in regards to obesity trends. Through these models, predictions can be made that will identify future childhood obesity trends in the US. Based on these results, the rate at which obese children later become obese adults will be

found. This rate can then be used in a predictive way as a way to form implications

on how the problem can be reduced and hopefully resolved.