Drugs and Gluttony

• How do people change their food purchasing habits when given a new prescription drug?

• We focused on the drug Metformin for Type II Diabetes
  • Laboratory studies indicate that this drug can cause decrease in appetite

Data Cleaning

- Prescription Data
- Food Purchase Data
- Aggregated Panel Data
  - Timeunits (4 weeks)
  - Amount of nutrients purchased within each timeunit
  - k-value (timeunits before/after start of prescription)

k := Number of timeunits after first prescription
Modeling

1. Original Model

\[ \log(Y_{i,t}) = \alpha_t + \gamma_i + \delta_{i,t}^k \]

- \( Y_{i,t} \): nutrients per time, person
- \( \alpha_t \): indicator variable of time units
- \( \gamma_i \): indicator variable of individuals
- \( \delta_{i,t}^k \): indicator variable of \( k \) time units before/after start of prescription

2. Final Model

\[ \log(Y_{i,t}) = \alpha_t + \gamma_i + B_1 I(k < -1) + B_2 I(-1 \leq k \leq 3) + B_3 I(k > 3) \]

- \( I(k) \): indicator variable of \( k \) within \([-1,3]\) and before/after the range

### Graphs

- **Single Person Households**
  - Original Model: Coefficients on \( K \)
  - Values estimates: \(-0.1\) to \(0.2\)

- **Two Person Households**
  - Original Model: Coefficients on \( K \)
  - Values estimates: \(-0.1\) to \(0.1\)

- **Final Model: Coefficients on \( K \) Value Groups**
  - \( k < -1 \): \(-0.1\) to \(0.0\)
  - \(-1 \leq k \leq 3 \): \(-0.05\) to \(0.05\)
  - \( k > 3 \): \(-0.05\) to \(0.10\)
Summary

Results

- We find a decrease in calories purchased starting 1 month before first prescription which persists until around 3 months after first prescription
  - Decrease begins before Metformin start date, it is likely driven by a diagnosis or other health event, not Metformin
- In our data, the decrease is larger for single person households
  - For single person households averaging 2000 calories per day, we predict a 159 calorie per day decrease
  - For 2 person households averaging 4000 calories per day, we predict a decrease of approximately 74 calories per day

Impacts

- Results consistent with literature on diet changes following Diabetes diagnosis
- With the analytics tools we built, future research can do further analysis for different kinds of drugs for different medication treatments