



THE UNIVERSITY OF CHICAGO

Department of Statistics

MASTER'S THESIS PRESENTATION

MANDIE LIU

Department of Statistics
The University of Chicago

Modeling the Relationship Between Gut Microbiome and Human Behavior Based on Questionnaire Data from American Gut Project

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Jones 304, 5747 S. Ellis Avenue

ABSTRACT

Microbes that live in and on our bodies have co-evolved with humans and have huge impact on human metabolism. Among them, gut microbiota, are the most extensively investigated and have been shown to be correlated with many complex disease, i.e, obesity, cardiovascular diseases and type 2 diabetes. American Gut Project is one of the largest crowd sourced, citizen science projects, which operates an opensource database aiming to characterize human microbiome. In this presentation we explore the relationship between lifestyle information and the proportion of microbes at Phylum level through survey data. This approach echos with PheWAS which attempts to select among many phenotypes (the “phenome” being the collection of all phenotypic characteristics of an individual) the few that are associated with a single, chosen genetic variant. Also, to deal with the relatively large noise level in survey data, multiple imputation methods using random forest, and measures controlling false discovery rate have been implemented.

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