

**Summer Capstone Project 2020**

**Project Control Plan Outline**

**Project Title:** Empire State Poll 2019 Data Analysis

**Client:** Dr. Jessica Ancker

**Faculty Advisor:** Dr. Jessica Ancker

**Research Team Members:**

Zihan Yang, Haojia Li, Tianran Zhang

**Research Question:** Is numeracy associated with self-reported health status in both unadjusted and adjusted setting in New York State 2019?

**Project Overview:**

**Introduction**

Tasks relying on numeracy, the ability to understand and use numbers in daily life, are common in healthcare such as interpreting clinical data and understand the instruction from doctors.[1] Varieties of previous researches have indicated that poor numeracy would tend to affect health, one of which indicated that numeracy was positively related to self-rated health (SRH) for immigrants and U.S.-born adults.[2] However, there is no enough evidence to conclude that numeracy is associated with SRH directly in New York State. Hence, the objective of this survey study is to test the hypothesis that numeracy in New York State is associated with SRH.

**Methods**

**Study Design:** Cross Sectional Study

**Study Population:** New York State residents age 18 and over.

**Data Source:** Empire State Poll 2019, a random-digit-dial telephone survey conducted by the Survey Research from February to April in 2019 that covers 800 completed interviews.

**Study Variable:**

* Outcome Variable: JAq4: self-reported health status. (Excellent/Very good/Good/Fair/Poor/Do not know/Refused)
* Predictor Variable: JAq1: rate competence related to fractions. (Not good at all/ Extremely good/ Do not know/ Refused); JAq2: rate competence related to percentages. (Not good at all/ Extremely good/ Do not know/ Refused); JAq3: rate usefulness related to numerical information. (Never/ Very often/ Do not know/ Refused)
* Covariates: hhince: exact household income in 2018 before taxes; educ: education level; race; hisp:ethnicity; RVq2: Number of visits to healthcare providers

**Statistical Analysis**

At baseline, numeracy will be assessed for demographic characteristics. Fisher’s test or Chi-square tests will be used to test for group differences in categorical variables. Wilcoxon tests or t-tests will be used to test for group differences in continuous variables. All the baseline analysis results will generate a typical Table1. For dependent variable Jaq4, univariate and multivariate ordinal logistic regression model will be created with the independent variables JAq1, JAq2, Jaq3 and other potential demographic covariates.

All p-values will be two-sided with statistical significance evaluated at the 0.05 alpha level. Ninety-five percent confidence intervals and power for all parameters will be calculated to assess the precision of the obtained estimates. All analyses will be performed in R Version 3.6.0 (R Foundation for Statistical Computing, Vienna, Austria).

* Expected Results: We expected to find significant evidence that numeracy is positively associated with health status even in models that control for confounders.
* Benefits of the study: Get a good sense of how poor numeracy affects people’s health status, and thus encourage doctors to pay more attention on patients with poor numeracy.

**Team Roles and Responsibilities:**

* Haojia Li – Project Manager (PM): The PM would be responsible for ensuring the implementation of the PCP and revising it when necessary.
* Zihan Yang – Client Liaison: The client liaison will be the communicator who will be responsible for all communication with the client.
* Tianran Zhang – Prime Data Analyst: The data analyst will be responsible for managing the methods applied in the project and consolidating all the outcomes.

**Project Timeline:**

* Begin draft of report: Tuesday, June 2, 2020
* Mid-year briefing on the project’s progress to faculty/clients: Tuesday, June 9, 2020
* Oral briefing of the final report to the client: Tuesday, June 16, 2020
* Deliverables to the client: Tuesday, June 23, 2020
* Final report to faculty: Friday, June 26, 2020
* Final presentation preparation: Friday, July 3, 2020

**Reference:**

[1] Rothman, Russell L et al. “Perspective: the role of numeracy in health care.” *Journal of health communication* vol. 13,6 (2008): 583-95. doi:10.1080/10810730802281791

[2] Prins, Esther, and Shannon Monnat. “Examining Associations between Self-Rated Health and Proficiency in Literacy and Numeracy among Immigrants and U.S.-Born Adults: Evidence from the Program for the International Assessment of Adult Competencies (PIAAC).” *PloS one* vol. 10,7 e0130257. 1 Jul. 2015, doi:10.1371/journal.pone.0130257