Analysis Plan

Project Name: Increasing immunization compliance among schools and daycare centers in D.C.

Project Code: 1737

Date Finalized: 10/30/17

This document serves as a basis for distinguishing between planned (confirmatory) analysis and any unplanned (exploratory) analysis that might be conducted on project data. This is crucial to ensuring that results of statistical tests will be properly interpreted and reported. In order that the Analysis Plan fulfill this purpose, it is essential that it be finalized and date-stamped before we begin looking at the data — ideally, before we take possession of the data. Once this plan is finalized, a date is entered above, and the document is posted publicly on our team website.

Data and Data Structure

This section describes variables that will be analyzed, as well as changes that will be made to the raw data with respect to data structure and variables.

Outcome Variables to Be Analyzed:
The primary data outcomes are logins to the District of Columbia Immunization Information System (DOCIIS), and compliance rates at the school/licensed child development centers (LCDC) level.

Secondary outcomes will be: HPV compliance and compliance for each vaccine. All of these data are reported directly by DC Department of Health (DOH).

Transformations of Variables:
No transformations are planned.

Imported Variables:
Blocking variables from the randomization conducted will be merged in. Randomization was blocked by school type (LCDC, elementary, middle, high, and other).

Transformations of Data Structure:
No transformations of data structure are planned.

Data Exclusion:
We don't anticipate excluding any data.

Treatment of Missing Data:

We don't anticipate any missing data, since DC is mandated to collect this information for all schools. However, if compliance rates are missing, those schools will be excluded from the analysis. We will report the share of observations with missing data and test whether it's different comparing across treatment and control.

Statistical Models & Hypothesis Tests

This section describes the statistical models and hypothesis tests that will make up the analysis — including any follow-ups on effects in the main statistical model and any exploratory analyses that can be anticipated prior to analysis.

Statistical Models:
For outcome data, we will conduct linear regressions of the outcomes of interest on a treatment dummy and strata/block fixed effects.

We will also estimate specifications with and without controls for baseline school characteristics: school size, dummy variables for ward, school type (private, public, parochial, charter) and schools' initial relative standing (measured by including the school's baseline level, categories for above/at/below the comparison level, or number ranking).

Follow-Up Analyses:
No follow-up analyses are planned.

Inference Criteria, Including Any Adjustments for Multiple Comparisons:
The tests conducted will be two-tailed tests with standard cut-offs (10/5/1 percent).

Limitations:
The primary limitations are as follows:

-The observed lower compliance rates primarily reflect low compliance with the male HPV vaccine, given that this is a relatively new requirement and for a vaccine with lower overall uptake nationally, and thus is concentrated among schools who have children eligible for this vaccine (middle and high schools). Compliance rates for other types of vaccines and other schools are much higher. This may render it more challenging to detect a significant effect. Because we do not have individual-level student data (or data by gender), we are unlikely to be able to detect the impact of the intervention on male students in general, or on male students for HPV.

-The method of a mailing to the school leader is untried. It's unclear whether the principals / LCDC directors would regard this communication as important, and whether they would take action or simply (in the case of the principals) defer to school nurses. During the feedback session from DOH's Education partners, the partners were supportive of the effort. They did not provide the names of individual school leaders who could review the intervention though; we have planned to check in with individual school leaders following the launch of the campaign, either in November or December (if we find that they have a lot of feedback!), or after the final mailing in February.

-Related to the above, the DOH has only minimally liaised with schools directly in the past. This is generally the responsibility of the educational authorities.

Exploratory Analysis:
As additional exploratory analysis, we will explore heterogeneity with respect to whether the school has its own school nurse, as the DOH hypothesizes this may meaningfully shape the response to the intervention.

Link to an Analysis Code/Script: