**F.1. Aim 1 The Impact of Vape use on Respiratory Outcomes in Latinx Adolescents:** We will investigate the impact of vape exposure on measures of lung function controlling for known and suspected confounders using a sequence of linear mixed models (LMMs). In particular, we will model the impulse oscillometry outcomes (primary: R5; secondary: R20, X5, X20, R20-5, Freq/VT) as a function of our primary explanatory variable: vaping exposure (ENDS use group; vaping/control), controlling for relevant confounders and precision variables as additional fixed effects. As multiple measurements will be taken on each participant, we will include subject-level random effects or a separate variance structure which best accommodates dependence in the outcome (selected on the basis of Akaike’s information criterion). A similar LMM framework will be used to assess the relationship between vaping and our secondary outcomes, which include conventional spirometric measurements including forced expiratory volume in one second (FEV1), forced vital capacity (FVC), and their ratio (FEV1/FVC), as well as SGRQ quality of life score and log-transformed FeNO. We will evaluate the effect of interest within each model using a likelihood ratio test, which assesses if the model fit for lung function is improved by including the vaping variable (adjusting for confounders). We will compute and report both unadjusted p-values and false-discovery-rate (FDR) corrected p-values using the Benjamini-Hochberg FDR adjustment to account for multiplicity. Missing outcome data will be handled implicitly by the LMM procedure, and missing covariate data will be accounted for using multiple imputation by chained equations; model results will be pooled across multiply imputed data sets using Rubin’s rules.

We will repeat these modeling procedures with continuous quantitative measures of ENDS use (e.g., urine cotinine concentration) for dose-response analyses, replacing the categorical vaping/control group variable with the continuous measurement of urinary cotinine. As dose-response curves can be non-linear (e.g., J-shaped curves, thresholding effects), we will consider transformations of the exposure or natural cubic B-splines as needed to best capture the functional forms of the relationship between vaping exposure and lung function.

Finally, we will assess the impact of concurrent co-use of THC and/or tobacco by presenting additional results from models adjusted for these variables as added fixed effects. We will also test via interaction terms whether the effects of vape exposure on lung function are modified by THC or tobacco usage.

**F.2. Power Calculation for Aim 1:** The following power calculation makes the following conservative assumptions: the primary test of interest is performed via a 2-sample t-test (1 time-point per individual), we recruit 100 subjects in the non-vaping group and 200 subjects in the vaping group, we observe 15% drop-out, and the standard deviation of the primary outcome (R5) is approximately 0.2 kPa/L/s [CITE]. Under these assumptions, we will have 90% power to detect a difference of 0.086 kPa/L/s in R5 at the 5% significance level (corresponding to Cohen’s *d* = 0.43; a small-to-medium effect). We will additionally have >96% power to detect at least medium sized effects (*d=0.5*) in secondary outcomes. Since the analysis will involve additional longitudinally collected data as well as multiple imputation, these estimates are quite conservative; we expect to be able to detect even smaller effect sizes.