

■ eAppendix. Hierarchical Linear Modeling Methods

The outcome was vaccination status. The level 1 variables in hierarchical linear modeling (HLM) were patient race and patient age. The level 2 variables were the survey variables; these items were considered fixed effects after testing for random errors. The following depicts the HLM analyses for a dichotomous variable (vaccinated or not) with a single level 2 predictor.

Level 1 model

$$\text{Prob}(\gamma = 1|\beta) = P$$
$$\log[P/(1 - P)] = \beta_0 + \beta_1 * (\text{age}) + \beta_2 * (\text{patient race})$$

Level 2 model

$$\beta_0 = \gamma_{00} + \gamma_{01} * (\text{nurse/office manager survey variable}) + \upsilon_0$$
$$\beta_1 = \gamma_{10}$$
$$\beta_2 = \gamma_{20}$$

Estimated (predicted) vaccination rates were calculated using the formula: probability = 1/[1 + exponent (-logit)]. A spreadsheet was used to calculate incremental impact using mean value and standard deviation for continuous variables (eg, mean time or mean age ± 1 standard deviation).