Supplementary Technical Details of the Model

The general model has the following regression format:

E(Yij |Xij,Zij) =g-1(Xijβ + Zijγi)

where g is a monotone link function, i = the ith site, j = the jth time, Y is the outcome of interest, and X and Z represent vectors of fixed and random effect covariates, respectively, which include the pre-specified covariates identified in the conceptual model. The form of the link function is decided based on the scale/nature of the outcome data. We used the log link for count outcomes, logit link for binary outcomes, and identity link for Gaussian outcomes. The model was fitted using SAS PROC GLIMMIX. The mixed model was able to account for any fixed effect variables and random effect components such as clustering by provider/facility, correlation due to repeated measurements, and other unobserved latent effects due to unmeasured genetic and environmental effects (Fitzmaurice et al 2004).

Fitzmaurice G, Laird N, Ware J. [Applied Longitudinal Analysis](http://www.biostat.harvard.edu/~fitzmaur/ala)*.* New York: John Wiley

and Sons; 2004.