**Model specifications S1: Vietnam and China prevalence comparisons**

Model for Vietnam and Chinese comparison sites, estimated separately for each country:

, where

*s* denotes a province. Many provinces were appropriate for Vietnam, and only one was appropriate for China.

*ds* is an indicator that equals 1 if an observation is from province *s*,

 is an intercept term for province *s*,

*t* is a time variable that ranges from 0 to 1. In Vietnam, 0 indicates 2004 and 1 indicates 2009; in China, 0 indicates 2002 and 1 indicates 2007.

is a linear time parameter for province *s*,

*t2* is the square of *t*, only appearing in the model for China,

 is a squared time parameter for province *s*,

*HIVPrevalences,t* is the HIV prevalence from province *s* at time *t*, and

 is a heteroskedastic error term specific to province *s* at time *t*. It is a weighted least squares error term, where the weights are proportional to the square root of the number of people tested in province *s* at time *t.*

For Vietnam, we attempted higher order time trends such as time squared and time cubed, but they were not statistically different from zero and were rejected from inclusion using an F-test. For China, we rejected including a time cubed term.

Model for Lang Son, Ha Giang, and Ning Ming, estimated separately for each project site

, where

*i* denotes an individual,

*a* is an intercept term,

*s* denotes a commune from which the sample was taken(used only in the model for Lang Son),

 is an intercept term for commune *s*,

*ds,i* is an indicator that equals 1 if an individual is from province *s*,

*t* is a time variable that ranges from 0 to 1. For Vietnam, 0 indicates 2004 and 1 indicates 2009; for China, 0 indicates 2002 and 1 indicates 2007.

 is a linear time parameter,

*Xc* is a vector of covariates, denoted by *c*, to improve the efficiency of the estimated trend. These include whether a respondent was aged 21 to 30, male, married, never married, or an ethnic minority member,

 are the parameters associated with *Xc*

*HIVStatusi* is the HIV prevalence for individual *i*, and

 is an iid error term in Lang Son and Ha Giang, and an error term taking into account within-person correlations in Ning Ming.