



Methods for Estimating Trend in Continuous Response Variables from Complex Survey Designs

Natural Resource Report NPS/NRSS/IMD/NRR—2018/1584



ON THE COVER

Physical Science Technician Laura Walkup collects water quality data at Tenaya Lake, Yosemite National Park. This Sierra Nevada Network lake monitoring project provided the data for the statistical analyses in this report.

Photo by: Dannique Aalbu, National Park Service.

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Abstract

The National Park Service (NPS) Inventory and Monitoring (I&M) Program tracks status and trends in the condition of natural resources in parks, often using spatially balanced sampling designs such as Generalized Random Tesselation Stratified (GRTS) designs to make inferences to populations represented by broad geographic areas or subpopulations defined by sampling strata or levels of a covariate. Complex design elements such as stratification, unequal probability sampling, and panel revisit designs are often used to address issues related to sample size, sampling effort, and statistical or logistical efficiency, but these elements also introduce analytical challenges to trend estimation and detection. Ignoring the associated design weights can lead to reduced power and biased estimates of trend.

The purpose of this project is to examine potential analysis techniques that can provide unbiased and precise trend estimation and powerful trend testing for natural resource monitoring data collected from complex GRTS sampling designs and revisit designs, and be performed using standard statistical software such as the R statistical software environment (R Core Team 2016). We tested three analytical approaches on simulated data representing a wide range of design and response scenarios. The simulation scenarios represented all combinations of the following design elements: sampling complexity (equiprobable, stratified, and unequal probability), several panel revisit designs, and sample size (20, 35, 50 sites per year). This resulted in a total of 216 different scenarios that were tested across the three analytical approaches.

We used lake water chemistry data from the NPS Sierra Nevada I&M Network lakes monitoring program to simulate populations with different annual trends (0%, 1% over 24 years, 2% over 12 years), underlying subpopulation trends (0%, 4%), and variance structure (low and high year-to-year variation). Data were simulated to have been collected over monitoring periods of 12 or 24 years and with consistent or periodically reduced annual sampling effort. The three trend analysis approaches included:

- 1) A linear mixed model, Piepho and Ogutu model (“PO” model), that does not incorporate design weights and represents a naïve analysis under complex sampling;
- 2) A simple linear regression on design-based estimates of annual status; and
- 3) A probability-weighted iterative generalized least squares approach (PWIGLS) with a linearization variance estimator.

We assessed performance of these three approaches by evaluating relative bias and confidence interval coverage of the trend estimate and statistical power and size of the trend test. We discuss performance of each approach and provide a decision flowchart to summarize the recommended approaches for various survey designs and population responses. In two case studies using lakes water chemistry, we illustrate the application of our results using the “TrendNPS” R-package developed for this project. R code and the performance results for each analytical approach are provided in Supplements A and B.

We found that the unweighted linear mixed model proposed by Piepho and Ogutu (2002) often yielded unbiased estimates of trend and nominal confidence interval coverage. For the range of trend magnitudes, sample sizes, and monitoring periods explored in this research, the Piepho and Ogutu model, which does not incorporate design weights, performed very well in many cases, even for some scenarios with sampling complexity and complex revisit designs. For every simulation scenario, the Piepho and Ogutu model yielded a two-sided test with nominal test size. However, the unweighted Piepho and Ogutu approach yielded biased estimates of trend with poor confidence interval coverage when a subpopulation exhibiting an extreme trend was undersampled. Under these circumstances, other analytical approaches performed better than the PO approach. The performance of trend approaches incorporating design weights was affected by the variance composition of the outcome of interest, the monitoring period, and the temporal revisit design. Unbiased estimates of trend with nominal confidence interval coverage were obtained from weighted and unweighted linear regression of design-based estimates and from probability-weighted iterative generalized least squares. However, no appropriate trend approach was identified for a trend in an outcome with high year-to-year variation from an undersampled subpopulation over a 24-year time period. In this case, changes must be made to the sampling design earlier in the monitoring period to achieve appropriate trend inference. We recommend considering variance composition and potential subpopulation trends when selecting sampling designs and analytical approaches for trend analysis.

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List of Acronyms

ANC	acid neutralizing capacity
GLS	generalized least squares
GRTS	generalized random tessellation stratification
I&M	Inventory & Monitoring
IGLS	iterative generalized least squares
NPS	National Park Service
PO model	Piepho and Ogutu trend model
PWIGLS	probability-weighted iterative least squares approach
REML	restricted maximum likelihood estimation
SEKI	Sequoia and Kings Canyon National Parks
SIEN	Sierra Nevada Network
SLRDB	simple linear regression of design-based estimates
WLRDB	weighted linear regression of design-based estimates

Introduction

The National Park Service (NPS) operates a long-term ecological program, known as Vital Signs Monitoring, to track status and trends in condition of natural resources in parks. Over 270 parks with significant natural resources were grouped into 32 Inventory and Monitoring (I&M) networks based on geography and shared natural resource characteristics (Fancy et al. 2009). Vital Signs representing unique and important ecological indicators were selected within each network for monitoring. Regular monitoring over time will provide the basis for trend analysis as replication is obtained at selected sites over time. Many I&M networks use probabilistic sampling for site selection in order to make inferences about status and trends to a larger population or area. Probabilistic sampling helped large, mountainous networks like the Sierra Nevada Network balance logistics, access, and safety concerns with the ability to make inference to lakes and other natural resources scattered across a rugged, and often remote landscape (Heard et al. 2012).

One of the more common probabilistic designs used across the networks is the Generalized Random Tesselation Stratified (GRTS) based sampling approach, which produces a spatially balanced probability sample and allows the incorporation of sampling complexity (e.g., stratification) or panel-based revisit designs (Stevens and Olsen 2003, 2004). A panel is a group of sites that is visited on a particular sampling occasion according to a designated return interval. These complex design elements allow scientists to address issues related to sample size and statistical and/or logistical efficiency, but they also introduce analytical challenges to trend estimation and detection, such as reduced power to detect trend and biased estimates of trend. If a trend test has low power, then monitoring activities may fail to detect an important trend (e.g., declining population). Alternatively, analyses may erroneously indicate a trend, triggering an unnecessary mitigation effort. Either error may be costly in terms of time and effort (fieldwork, laboratory processing, data entry and analysis, unnecessary restoration efforts or mitigation, etc.). The purpose of this project is to examine potential trend analysis techniques that can provide unbiased and precise trend estimation and powerful trend testing for natural resource monitoring data (such as NPS I&M data) collected from complex GRTS sampling designs and panel designs. Ideally, these approaches may be performed using standard statistical software, such as the R statistical software (2016) environment.

A variety of spatially balanced designs exist (see Robertson et al. 2013), but the most commonly used approach by NPS I&M networks is the GRTS approach (e.g., Heard et al. 2012, Irvine et al. 2016, McKinney et al. 2012). The GRTS approach has numerous advantages for natural resources monitoring data because:

- 1) it is more suitable when sample sizes are small relative to the extent of the sampling frame;
- 2) it can incorporate or be used in conjunction with a wide range of design complexity;
- 3) it can be used with discrete (e.g., lakes), linear (e.g., streams), or infinite (e.g., polygons) resources (Stevens and Olsen 2004); and
- 4) analysis tools are available to obtain design-based estimates of status from GRTS designs (Kincaid and Olsen 2015).

Many I&M networks have also employed panel revisit designs to increase the overall number of sites visited and to maintain some site-level replication over time. For example, some programs employ a GRTS sampling approach and a panel revisit design of [1-0, 1-3]. Developed by McDonald (2003), this panel design notation indicates a serially-alternating augmented revisit design where a single panel is visited annually and each of four ‘alternating’ panels is visited one year and then rested for the subsequent three years. Since each of the latter four panels is visited on an alternating basis, their panel inclusion probability differs from that of the annual panel and these inclusion probabilities must be incorporated into analyses.

For monitoring programs that employ both GRTS sampling and a panel revisit design, the typical procedure is to select the GRTS sample of sites and impose the revisit design on the selected sites. For the above [1-0,1-3] revisit design where the program plans to sample 20 sites per year, we would draw a GRTS sample of 50 sites and then allocate the first 10 sites in the list to the annual [1-0] panel and each subsequent, consecutive set of 10 sites (i.e., sites 11-20, 21-30, 31-40, 41-50) to each of the four alternating panels. By using consecutive sets of sites from the GRTS order in each panel, we have created spatially-balanced subsamples of the population in each panel.

In general, statistical inference of static systems may be obtained through design-based analysis. Randomization employed during probabilistic sampling provides the basis for inference (Lohr 2009). The probability that sampling unit i is selected is denoted as π_i , also called the inclusion probability. For equiprobable sampling designs, all sampling units in the population of interest have the same probability of inclusion. Complex sampling designs may employ different inclusion probabilities among sampling units in the population of interest.

Statistical inference of dynamic systems is generally obtained through model-based inference, and the outcome of interest is assumed to be a random variable following some probabilistic distribution that dictates how variability is estimated. A standard example of model-based inference arises from the simple linear regression model: $y_i = \beta_0 + x_i\beta_1 + e_i$, where the outcomes y_i are modeled as a linear function of some covariate x_i with intercept and slope β_0 and β_1 , respectively, and error terms e_i modeled as independent and identically distributed normal random variables with mean 0 and a specified common variance. For model-based analyses such as those to detect trend, design complexity is often ignored and considered unimportant as long as the probability of sample selection is not related to the outcome of interest (Schreuder et al. 2001). However, when the probability of selection is related to the outcome of interest, subpopulations such as strata or domains of interest defined by levels of a design covariate (e.g., elevational classes) are surveyed disproportionately to their population distribution. If disproportionately-sampled subpopulations exhibit different trends in the outcome of interest, trend modeling that ignores the design complexity may result in biased estimates of trend (Asparouhov 2006). For example, consider a sampling design in which lakes are sampled inversely-proportional to distance from the road. In this case, a lake that is close to the road would be assigned a higher sample inclusion probability. If lakes closer to the road have higher chloride concentrations due to increased exposure to vehicle emissions and this effect worsens over time, then failing to incorporate sampling weights into trend analyses may impact trend

analysis. In these cases, a model-assisted approach that combines elements of design-based inference with a model is needed for unbiased trend inference.

Trend modeling literature has examined but not necessarily resolved analytical challenges introduced by temporal revisit designs (Urquhart et al. 1993, Urquhart and Kincaid 1999). When sampling occurs under a temporal revisit design, groups of sites (panels) are visited annually, on an alternating schedule, or once or more and then never again. When all sites are not visited every year, data are considered “unbalanced” because data exist for each site for only a subset of sampling occasions. The trend model of Piepho and Ogutu (2002) performs reasonably well when data are unbalanced, but this approach does not account for, nor is its performance known, for sampling design complexity. A potential solution explored in this research is to model the trend in annual design-based estimates of the parameter of interest, similar to the approach used by Brus and de Gruijter (2011). Modeling approaches that incorporate design weights, such as the probability-weighted iterative generalized least squares (PWIGLS) approach (Pfeffermann et al. 1998, Skinner and Holmes 2003), generally incorporate very simple models that do not specifically examine population-level trend. You define clusters as the measurements taken each year for each sampled site. The cluster sizes examined in the literature can far exceed reasonable monitoring period lengths for effective management of natural resources. Bayesian approaches that incorporate heterogeneous design weights in model-based analysis include calibrated Bayes (Little 2013) and nonparametric Bayesian weighted sampling inference (Si et al. 2015). We restrict our investigation to frequentist approaches to avoid the computational cost of the Markov chain Monte Carlo algorithm within each simulation iteration. Nonparametric trend detection methods such as the Regional Kendall Tau (Helsel and Frans 2006) require that all sampled sites are visited annually and cannot incorporate data collected from a panel design.

In this project, we compare three general approaches for model-based trend analysis and assess the impact of ignoring design complexity under a range of survey design scenarios that included sampling design complexity, revisit designs, annual sample sizes, annual sampling effort, and monitoring periods. Our goal is to identify the ideal statistical method(s) that provide unbiased estimates of trend for data collected using complex spatial and temporal sampling designs and that can be implemented with widely-used statistical software such as R.

Methods

Survey Design Scenarios

We identified a range of survey scenarios (i.e., types and levels of sampling design complexity and sampling effort per year) that are common within the NPS I&M program (Gage et al. 2017, Heard et al. 2012, McKinney et al. 2012). We investigated GRTS sampling designs involving three levels of sampling complexity (equiprobable, stratified, and unequal probability) and temporal complexity (three panel revisit designs) (Table 1). We examined three levels of annual sample effort, ranging from 20 to 50 total sites per year, and monitoring periods of 12 and 24 years (i.e., periods encompassing at least three sampling cycles for alternating panel designs). We also examined test performance when annual sampling effort was consistent each year versus variable (only a 50% effort in every 5th year). We simulated populations with three levels of annual trend, two levels of subpopulation trends, and two levels of variance structure (Table 1).

Table 1. Survey designs: simulation inputs and levels

Simulation input	Levels
GRTS sampling designs	Equiprobable, stratified, and unequal probability sampling
Annual sample sizes	20, 35, and 50 sites
Revisit designs	[1-0], [1-0,1-3], and [1-3]
Monitoring periods	12 and 24 years
Annual trends	0%, 1% (24 years), and 2% (12 years)
Subpopulation trends	0%, 4%
Annual effort	1= Consistent annual effort 2 = Variable effort (a 50% effort every 5 th year)
Variance structure	ANC (high year-to-year variability), modified ANC (low year-to-year variability)

Pilot Data

We obtained pilot data for our simulations from the NPS Sierra Nevada Network (SIEN) I&M program, which monitors water chemistry of mountain lakes in Sequoia and Kings Canyon National Parks (SEKI) to determine if lake chemistry is changing over time. Each year, SIEN monitors an annual and an alternating panel of high-elevation lakes in SEKI that were drawn from a sample frame of 684 lakes (Figure 1). To improve survey efficiency and safety, SIEN staff applied a GRTS design with unequal sampling probabilities where lower selection probabilities were assigned to remote and difficult-to-reach lakes that are expensive to sample relative to lakes that are closer to roads and trails. SIEN also employed a serially alternating, augmented panel revisit scheme of [1-0,1-3]. We used lake chemistry data from surveys conducted by SIEN from 2008 to 2013 and focused on acid neutralizing capacity (ANC) because it is less susceptible to detection limit issues and demonstrated a variance composition similar to several other lake chemistry indicators.

A natural-log transformation was applied to the ANC data to better meet model assumptions of the Piepho and Ogutu model (“PO”; Piepho and Ogutu 2002), the first of our three tested approaches

(described later in the Trend Approaches section). We then used the coefficients from this model to simulate populations exhibiting known trend but with the same mean and variance structure observed in the pilot data. Our investigation of partial autocorrelation plots indicated little serial correlation in residuals from the PO model, so no adjustments for or additions of serial correlation were included in our simulated populations.

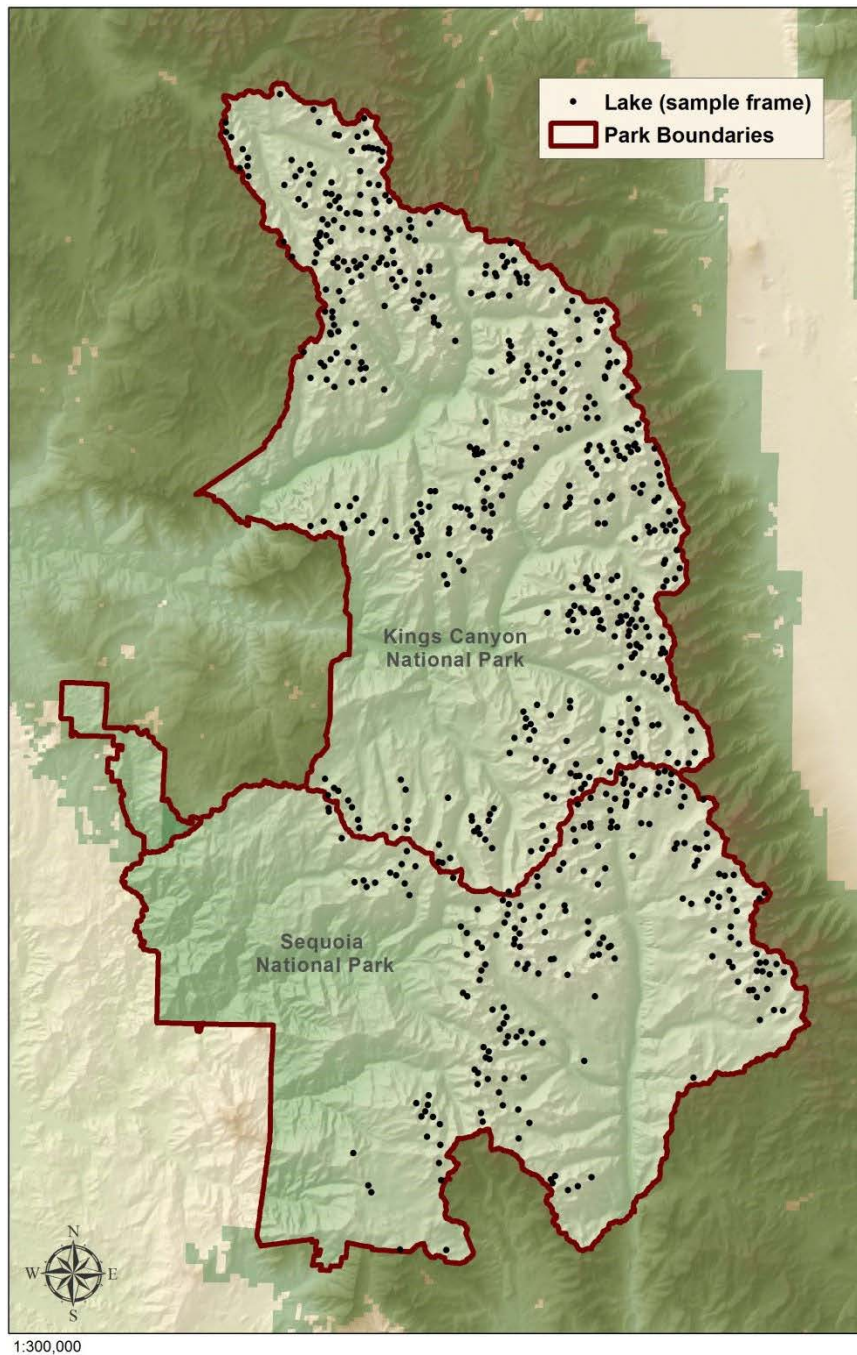


Figure 1. The sampling frame for SIEN lakes monitoring includes 684 high-elevation lakes in Sequoia and Kings Canyon National Parks.

The proportion of variance contained in different levels of the model could have an effect on the statistical properties of our trend detection procedures. One estimator may do well when year-to-year variation is high, while another may perform poorly. Using the unreplicated design of Piepho and Ogutu (2002), we model the variance structure of the ANC indicator with a random site intercept, a random site slope, a random year intercept, and a residual error term (this model is discussed in greater detail in the next section). To investigate the impact of variance composition on the trend approaches, we modified the ANC variable to create a second ANC-like variable (Table 2) with the same mean, random-slope variance, residual variance, and total variance as the original ANC variable, but with lower year-to-year variation. We reduced year-to-year variation in the original ANC (0.0157) to just 0.0001 in the modified version and added the reduction in year-to-year variation (i.e., 0.0156) to the random site intercept variance of the modified variable in order to maintain the same level of overall variance.

Table 2. Response variables: simulation inputs and levels.

Outcome	Site-to-site Variance	Site-level Slope Variance	Year-to-year Variance	Residual Variance	Total Variance	Prop. of Site-to-site Variance	Prop. of Site-level Slope Variance	Prop. of Year-to-year Variance	Prop. of Residual Variance
ANC	0.2947 ^A	0.0001	0.0157 ^A	0.0102	0.3207 ^B	91.89% ^A	0.03%	4.90% ^A	3.18%
Modified ANC	0.3103 ^A	0.0001	0.0001 ^A	0.0102	0.3207 ^B	96.76% ^A	0.03%	0.03% ^A	3.18%

^A Indicates the variance components that differed for the two ANC variables (also in light shading).

^B Demonstrates that total variance is equal for the two ANC variables (also in dark shading)

Trend analysis approaches

We examined three general approaches including a linear mixed model that does not incorporate design weights and represents a naïve analysis under complex sampling (Piepho and Ogutu 2002), a simple linear regression on design-based estimates of annual status similar to methods used by Brus and de Gruijter (2011), and probability-weighted iterative generalized least squares (Pfeffermann et al. 1998, Asparouhov 2006). Standard errors and confidence intervals for trend estimates from the third approach are obtained through a linearization variance estimator (Skinner et al. 1989) and a bootstrapping approach (Kovacevic 2006, Thai et al. 2013).

The methods investigated here assume that probabilistic sampling was used to select the sites in the sample, and the inclusion probability for each site is known and accurate. Therefore, any design weighting adjustments for nonresponse or frame error are assumed to have been applied prior to the trend analysis. For more information on adjusting design weights for nonsampling error, see Lessler and Kalsbeek (1992) and Starcevich et al. (2016).

We assume that spatially-balanced sampling does not contribute to design complexity any more than standard random sampling. The mechanism behind spatial balance is a probabilistic sample, so we treat GRTS samples no differently than standard random samples. In the sense of Schreuder et al. (2001), site selection in a GRTS sample is irrespective of the outcome of interest, and any

relationship induced through the use of design variables (e.g., strata, unequal probability selection classes) are considered in the analysis as if a non-balanced sampling approach were used. Tools exist that incorporate sampling weights from GRTS surveys and take advantage of the spatial balance for more precise estimation (Kincaid and Olsen 2015), but we assume that model-based estimation will be conducted and that no complexity due to balancing the sample spatially is needed.

We continue with a discussion of trend analysis methods and details on the underlying theory behind each method. We provide considerable detail for review, but encourage readers without an analytical background to be familiar only with the general differences among the approaches. The first approach simply represents the case for which we do nothing at all by applying a linear mixed model and ignoring the weights. In the second approach, the weights are used to obtain annual estimates of population status and a trend in the annual status is measured. In the third approach, the design weights are incorporated directly into the trend model.

Approach 1: Linear Mixed Model

The linear mixed model described by Piepho and Ogutu (2002) is a flexible trend model that does not incorporate design weights. For annual samples of s sites and n years in the monitoring period, the general linear mixed model proposed by Piepho and Ogutu (2002) for unreplicated data (i.e., one outcome of interest per site and year) is as follows:

$$y_{ij} = \gamma_0 + x_j\gamma_1 + b_j + a_i + x_jt_i + e_{ij}$$

Where

$$i = 1, \dots, s;$$

$$j = 1, \dots, n;$$

y_{ij} = outcome of interest for the i^{th} site in the j^{th} year;

x_j = location-shifted year variable representing the j^{th} year, not necessarily consecutive (e.g., 0, 1, 3, 4, etc.);

γ_0 and γ_1 = fixed intercept and slope, respectively, of linear trend in time;

b_j = random effect of the j^{th} year, independent and identically distributed as $N(0, \sigma_b^2)$;

a_i = random intercept of the i^{th} site, independent and identically distributed as $N(0, \sigma_a^2)$;

t_i = random slope of responses over time on the i^{th} site, independent and identically distributed as $N(0, \sigma_t^2)$; and

e_{ij} = residual error, independent and identically distributed as $N(0, \sigma_e^2)$.

This model, referred to here as the “PO” approach, represents a standard mixed-effects linear model containing random effects for year- and site-level intercepts and a random site-level slope to account for variation among site-level trends. Note that y_{ij} may represent a logarithmically-transformed

outcome of interest. This transformation is appropriate when exponential trend is modeled or when heterogeneity is present in the residuals from the trend model of an untransformed outcome. Site-specific trend slopes are obtained by adding the population-level fixed slope effect to the site-level random slope effect, by $\gamma_{1i} = \gamma_1 + t_i$. Estimation of coefficients in the PO model is conducted using restricted maximum likelihood estimation (REML, McCulloch et al. 2008).

The PO approach tests for trend in balanced and unbalanced data by comparing the Wald statistic for the mean trend coefficient (i.e., $\gamma_1/se(\gamma_1)$) against a t-distribution having degrees of freedom computed by the method of Satterthwaite (1946). The Giesbrecht-Burns (1985) approximation for Satterthwaite degrees of freedom maintained nominal test size (i.e., of size α) for trend tests, but other approximations such as that of Kenward and Roger (1997) have performed well in simulations (Hu 2002) but may have inflated test size for small samples (Gomez et al. 2005). Because the model does not incorporate survey weights, this approach constitutes a naïve analysis when complex sampling designs have been implemented and provides a basis for assessing bias when design weights are ignored. In simulations reported later, we used this model to generate populations that we then sampled using complex designs.

When stratified GRTS sampling has been conducted, trends on individual stratum (or subpopulations) can be estimated using a separate-slopes model that includes fixed effects for the year, stratum, and their interaction. The stratified trend model is:

$$y_{hij} = \gamma_0 + x_j\gamma_1 + \delta_{h0} + x_j\delta_{h1} + b_j + a_i + x_jt_i + e_{ij},$$

Where

$h = 1, \dots$

H indexes stratum

δ_{h0} is the additional (fixed) effect of stratum h

δ_{h1} is the additional (fixed) effect on slope of the response through time in stratum h relative to stratum 1.

Note that, in some cases, the residual error variance may vary by stratum levels. This variance heterogeneity should be modeled if present so that model assumptions are met (Pinheiro and Bates 2000).

The naïve analysis approach to trend estimation under a stratified design ignores stratum-specific design weights. Consequently, population-level trend estimates under this approach do not consider within-stratum sample sizes, spatial balance, etc. The population-level trend estimates under this approach do take into account variable stratum sizes by weighting stratum-specific parameters by their stratum size. To see this, we note that the trend estimate in stratum 1 (the reference stratum) is γ_1 , the estimated trend in stratum $h > 1$ is $\gamma_1 + \delta_{h1}$, and the non-design weighted estimator of population-level trend is:

$$\gamma_1^* = \frac{N_1}{N} \gamma_1 + \frac{N_2}{N} (\gamma_1 + \delta_{21}) + \dots + \frac{N_H}{N} (\gamma_1 + \delta_{H1}) = \gamma_1 + (\sum_{h=2}^H N_h \delta_{h1} / N),$$

Where

N_h is the stratum (or population) size of the h^{th} stratum

$N = \sum_{h=1}^H N_h$. This population-level estimator of trend is a simple linear combination of parameters from the stratified trend model, and a standard error for it can be obtained by standard methods (i.e., pre- and post-multiply the estimated variance-covariance matrix by the vector of weights).

We tested for presence of population-level trend by comparing the Wald t-test ($\gamma_1^*/se(\gamma_1^*)$) to a t-distribution having degrees of freedom equal to the sum of the Satterthwaite degrees of freedom from the stratum-level trend tests.

Approach 2: Regression Modeling of Design-based Estimates

The second approach estimates population-level trend by applying linear regression to annual design-based status estimates. Annual status may be the mean, total, proportion, or other indicator of the condition of a resource during a time period. In this approach, design weights to estimate status are applied prior to model-based inference of trend in order to mitigate the effects of design complexity on analysis.

In our simulation, we considered detecting trend in the mean of a resource. We computed a design-based estimate of the mean in year j using the Horvitz-Thompson estimator (Horvitz and Thompson 1952, Cordy 1993):

$$\hat{\mu}_j = \sum_{i=1}^{n_j} \frac{y_{ij}}{\pi_{ij}}$$

Where

n_j is the sample size in year j

y_{ij} is the outcome of interest measured at site i during year j

π_{ij} is the inclusion probability evaluated at site i during year j .

We assume sampling takes place over time and that some type of panel rotation scheme has been implemented. To account for panel rotation, we decompose the inclusion probability into $\pi_{ij} = \pi_i \pi_{j|i}$ where π_i is the original design weight from the GRTS sample draw and $\pi_{j|i}$ is the inclusion probability for site i during year j . We characterize $\pi_{j|i}$ as the panel-level inclusion probability, which is simply the proportion of visits to a site during a cycle of revisits prescribed by the revisit design given the site's inclusion in the sample. The panel inclusion probability represents the probability that a sampled site is visited in a particular year during the monitoring period. For example, a revisit design containing a panel visited annually and four panels visited once every four years (i.e., design

[(1-0), (1-3)]) would have panel inclusion probabilities of 1 and 0.25, respectively. We obtained annual estimates of resource status ($\hat{\mu}_j$) using the survey data analysis tools available in the R package *spsurvey* (Kincaid and Olsen 2015).

We calculated the variance of annual status estimate using the GRTS neighborhood variance estimator (Stevens and Olsen 2003, Stevens and Olsen 2004). The neighborhood variance estimator for a mean is:

$$\hat{V}_{NBH}(\hat{\mu}_j) = \left[\sum_i \frac{1}{\pi_{ij}^*} \right]^2 \sum_i \sum_{i' \neq i} w_{ii'} \left[\frac{y_{ij}}{\pi_{ij}^*} - \sum_{k \in D_i} w_{ik} \frac{y_{kj}}{\pi_{kj}^*} \right]^2$$

Where

D_i is the local neighborhood surrounding site i

$w_{ii'}$ are weights chosen to reflect the behavior of the pairwise inclusion function for GRTS, constrained so that $\sum_i w_{ii'} = \sum_{i'} w_{ii'} = 1$.

In the case of stratified sampling, the stratum-level means and variances are calculated independently then combined for population-level annual estimates.

To estimate trend, we fitted the simple linear regression model:

$$\hat{\mu}_j = \varphi_0 + x_j \varphi_1 + \varepsilon_{ij}$$

Where

φ_0 and φ_1 are (fixed) intercept and slope parameters, respectively

x_j is the year (same as in the previous section)

ε_{ij} is the normally-distributed unexplained error.

We tested trend by comparing the Wald t-test of the estimated slope $\hat{\varphi}_1 / \widehat{se}(\hat{\varphi}_1)$ to a t-distribution with $n - 2$ degrees of freedom. We refer to this trend approach as “simple linear regression of design-based estimates,” or SLRDB. In addition, we implemented a weighted least squares approach using weights equal to the inverse of the status estimator’s neighborhood variance estimate, i.e., $1/\hat{V}_{NBH}(\hat{\mu}_j)$. This weighted approach gave more estimation value to more precise estimates of $\hat{\mu}_j$. We refer to this trend approach as “weighted linear regression of design-based estimates,” or WLRDB.

Note that assumptions of the simple linear regression on status include independence of outcomes. While temporal replication at sites is required for trend estimation, high serial correlation among annual status estimates will upset the statistical properties of this trend test. We did not correct for serial correlation in $\hat{\mu}_j$ because the example data set we chose did not exhibit high annual correlation among estimates. If high correlation is present, we recommend applying time series models such as

AR(1) or other structures for $\text{var}(\varepsilon_{ij})$ or pre-whitening (Yue et al. 2002) prior to regression analysis. We expect that temporal revisit panels that incorporate annual panels or more frequent revisits to a panel would be more likely to require correlation structure modeling.

Approach 3: Probability-Weighted Iterative Generalized Least Squares

The third trend approach is a probability-weighted iterative generalized least squares, or PWIGLS, approach (Pfeffermann et al. 1998, Skinner and Holmes 2003). This estimator is similar to the PO approach, but sample weights are applied that make the regression estimators unbiased for their associated population-level parameters. This approach views the design which contains sampling over time as consisting of two stages, one for selection of the sites (stage one) and a second for sampling sites through time. By realizing that sites can be viewed as stage-one sampling units and that temporal revisits can be viewed as stage-two sampling units, the methods for complex two-stage designs from Pfeffermann et al. (1998) can be applied. The rest of this section describes the two-stage model of Pfeffermann et al. (1998).

The two-stage model of Pfeffermann et al. (1998) is

$$y_{ij} = x_{ij}\beta + z_{ij}u_i + z_{0ij}v_{ij} ,$$

Where

x_{ij} , z_{ij} , and z_{0ij} are fixed row vectors for fixed effects, random among-cluster effects, and random within-cluster effects, respectively, containing covariates such as year or stratum indicators

β is a fixed vector of regression parameters

u_i and v_{ij} are mutually independent random vectors containing effects for the site (stage-one) and time (stage-two), respectively.

Random vectors u_i and v_{ij} are assumed to follow multivariate normal distributions, i.e., $u_i \sim N(0, \Omega)$ and $v_{ij} \sim N(0, \sigma^2)$. As noted for the Piepho and Ogutu model, y_{ij} may represent a logarithmically-transformed outcome of interest.

To illustrate the PWIGLS model, we note that the PO model is a special case. To see this, we define the u_i vector to contain the site-level random intercepts and slopes (i.e., a_i and t_i of the PO approach), the z_{ij} vector to be $(1, x_{ij})$ where x_{ij} is the year value, and v_{ij} to contain the random intercept and the site-by-year level residual error (b_j and e_{ij} of the PO approach). If a_i and t_i are modeled as correlated, the PWIGLS model is equivalent to the PO model.

We incorporated design weights into the PWIGLS model as follows. We defined the site-based (stage-one) sampling weight to be w_i . These site-based weights come from the initial spatial design, and in this paper are GRTS design weights. We define the temporal (stage-two) sampling weight to be $w_{j|i}$. These temporal sampling weights come from the panel revisit scheme and are equal to the inverse of the panel inclusion probability, i.e., $w_{j|i} = 1/\pi_{j|i}$. The total design weight for site i during the j^{th} year is $w_{ij} = w_i * w_{j|i}$.

Scaling standardizes the design weights to reduce small-sample bias introduced by inflated weights. In standard scaling procedures, the scaling factor is applied to the design weight across both stages of sampling, impacting both w_i and w_{ji} . In some situations, the stage-one and stage-two effects are independent. A sampling mechanism is considered “invariant” when the random first-stage cluster effects are independent of the second-stage individual design weights given the covariate information at each level (Asparouhov 2006). In this application, invariance is achieved when the probability that a site is sampled in a given year is independent of the site’s random intercept and slope. In other words, the temporal revisit design is applied equally among the sample of sites. In this case, scaling is only used at the year-level and not at the site-level.

We examined six different scaling factors for site- and year-level weights in the PWIGLS approach (Table 3). One approach advocated by Pfeffermann et al. (1998) and simulated here is to multiply the responses and covariates by an appropriate design weight and apply the standard IGLS algorithm. The data transformation is achieved by replacing z_{ij} with $w_i^{-1/2} z_{ij}$, z_{0ij} with $w_{ij}^{-1/2} z_{0ij}$. In our simulations, we follow Pfeffermann et al. (1998) and call this approach the “A-only” approach.

Table 3. Scaling factors for each PWIGLS method. The statistical variable symbols used below are described above.

PWIGLS Method	Site Scaling Factor	Year Scaling Factor	Description
A-only	1	1	No scaling for either site-level or year-level design weights.
A	1	$\bar{w}_i$	Scaling for both site-level and year-level design weights with the mean site-level design weight.
AI	$1/\bar{w}_i$	$\bar{w}_i$	Scaling for only the year-level design weights with the mean site-level design weight.
B	1	$\tilde{w}_i$	Scaling for both site-level and year-level design weights with the effective mean site-level design weight.
BI	$1/\tilde{w}_i$	$\tilde{w}_i$	Scaling for only the year-level design weights with the effective mean site-level design weight.
C	1	$\sum_{ij} w_{ij} / \sum_i n_i$	Scaling for both site-level and year-level design weights with the grand mean of design weights across sites.

In addition to the A-only method, scaling and alternative weighting approaches were examined for the PWIGLS approach (Pfeffermann et al. 1998, Asparouhov 2006). Define the mean year-level design weight as $\bar{w}_i = \frac{1}{n_i} \sum_j w_{ij}$, where n_i is the number of years in which site i was surveyed. The effective sample size is defined as in Potthoff et al. (1992) and describes the effective number of years surveyed at site i based on design weights. Let s_{0i} be the effective sample size of years for site i such that $s_{0i} = \sum_j w_{ij}^2 / (\sum_j w_{ij})^2$. Let the “effective mean site-level design weight” be defined as $\tilde{w}_i = \frac{1}{s_{0i}} \sum_j w_{ij}$.

The combinations of weighting and scaling methods were then used to obtain 6 different PWIGLS estimates. The A-only method for PWIGLS (Table 3) does not employ scaling for site-level or year-level design weights (Pfeffermann et al. 1998). The A method scales panel weights with the mean site-level design weight, $\bar{w}_i$, and the invariant version, AI, adjusts the scaling at the site level.

Similarly, the B and BI methods scale with the effective mean site weight, $\bar{w}_i$. Method C scales only at the year level with the inverse of the average year-level weight and is commonly used for mean estimation. Note that, when the second-stage selection probabilities for years within a site are the same for all years within a panel and this holds for all panels, methods A and B are equivalent and methods AI and BI methods are equivalent under the current setting. This result holds because the panel inclusion probabilities always sum to the number of sites within a panel which is equal to the effective sample size under the same conditions. This situation would occur when samples are fully enumerated each year and sample sizes within each panel do not change, regardless of the monitoring period length. However, this scenario is unlikely given accessibility issues, changing budgets, and other factors that affect annual sampling effort.

Pfeffermann et al. (1998) provide additional adjustments for PWIGLS estimators that incorporate a modification called “Step B” for variance components estimation and scaling of second-stage weights to reduce bias and improve consistency. However, the initial modification without scaling (Step A only) is found in simulation to yield precise and unbiased estimates of both fixed effects and variance components when sampling is invariant, so this additional step was not incorporated.

Asparouhov (2006) found that the AI method was best for minimizing the bias in estimates of the mean (i.e., fixed effects such as the trend coefficient), regardless of the cluster size and informative index. Method BI is found to be best for estimating the error variance, and the unweighted analysis (represented by the Piepho and Ogutu (2002) model) is most appropriate for estimating the random effects variance components (Asparouhov 2006). Pfeffermann et al. (1998) and Asparouhov (2006) applied their methods to mixed models with simple structures and did not address trend estimation specifically. In this work, we examine the performance of the six scaling methods for the PWIGLS approach when estimating trend with the linear mixed model used in the PO approach for a range of sampling design factors.

The standard error of the regression coefficient for trend was obtained in two ways. First, the linearization variance estimator (Pfeffermann et al. 1998, Skinner et al. 1989), which incorporated design weights to calculate a variance-covariance matrix for the estimated fixed effects based on Taylor series linearization, was applied. Trend was assessed with a Wald t-test and Satterthwaite degrees of freedom and with a Wald chi-squared test (Skinner et al. 1989). Confidence intervals were constructed from the standard error obtained from the linearization variance estimator and were based on a t-distribution with Satterthwaite degrees of freedom. Initial simulations indicated that degrees of freedom from the PWIGLS methods were inflated, so the degrees of freedom from the PO approach were used for trend testing and confidence interval construction.

The second approach for estimating the standard error of the regression coefficient was a bootstrapping approach that accounted for the clustered nature of the data (years within sites) as well

as the design weights from a complex survey design. The nonparametric case bootstrap, found by Thai et al. (2013) to minimize bias in estimates of fixed and random effects variances, resamples clusters to preserve random effects structure. This approach was combined with the modified rescaled bootstrap (Kovacevic et al. 2006, Rao et al. 1992) to incorporate design weights. Panels were treated as strata in the bootstrap sampling design to account for varying levels of sampling effort across panels and to preserve the revisit design structure within each bootstrap sample (Thai et al. 2013). Due to the extensive time requirements needed to run a bootstrap within each iteration of a simulation, the bootstrapping approach was applied to two simulation scenarios for which the linearization variance yielded confidence interval coverage that was too high or too low. In these cases, 90%-confidence intervals were constructed from the 5th and 95th bootstrap percentiles which would form the basis for a two-sided hypothesis test of no significant trend in either direction.

As with the PO model, a separate-slopes model was used when a subpopulation trend was modeled. The relative proportions of the strata were used to obtain an estimate of the population-level trend. Stratum structure was incorporated into the linearization variance estimator to approximate the standard error of the population-level trend. Degrees of freedom for trend testing were calculated as the sum of the degrees of freedom from the two stratum-level trend coefficients (analogous to the calculation of γ_1^* in the discussion of Approach 1).

Simulation

We applied each trend analysis approach to the set of simulation scenarios (Table 1) as developed based on data from the SIEN lakes monitoring program. We implemented Monte Carlo simulations based on the PO model fitted to pilot data and compared the ability of our three approaches to detect trend. For each combination of GRTS sample design, sample size, temporal revisit design, monitoring period, trend magnitude, and annual effort we simulated ANC and modified ANC from the PO model and applied all approaches.

We simulated three levels of complexity on our GRTS sampling procedure, including equiprobable, stratified, and unequal probability. We divided lakes into high and low elevation strata because previous studies found a negative relationship between ANC and elevation; as elevation increases ANC decreases (Sullivan et al. 1990, Berg et al. 2005). A study of lakes in the Rocky Mountains identified 3000 m as the break point between higher and lower ANC concentrations (Nanus et al. 2009). We found a similar breakpoint at 3100 m which we used as the boundary to define for High and Low elevation strata. The High elevation stratum contained 598 lakes (88% of population) and the Low elevation stratum contained 84 lakes (12% of population). We allocated 60% of total sample size to the High stratum, 40% to Low stratum. This allocation simulated disproportionate sampling of more accessible Low elevation lakes.

We simulated an unequal probability design by estimating travel-costs to each lake and allocating greater effort to lower-cost lakes. We adopted as our cost surface the travel time estimates of Heard et al. (2012) which in turn were a function of slope, land cover, elevation, and distance from trailheads (Figure 2). To draw our unequal probability samples, we divided travel time estimates into six cost classes and allocated sample size in a way that disproportionately sampled more lower-cost classes. The relative proportions of the cost classes in the population are 6%, 13%, 29%, 25%, 18%,

and 8%. Ordered from low to high cost classes, we allocated sampling weight as 20%, 34%, 34%, 5%, 5%, and 2%. This allocation represents a higher proportion of lakes sampled in the lower cost classes than is represented in the population as a whole. Note that the lowest cost class contained the fewest lakes, so this class was given less weight to avoid unequal probability sampling errors. The unequal probability design was similar in nature to the stratified sample design because travel time was positively correlated with the elevation (Pearson correlation coefficient = 0.72, p -value < 0.0001), but the allocation of sampling effort was designed to be more disproportionate relative to the population. R code used to calculate estimates of trend for all trend analysis approaches is provided in Supplement A.

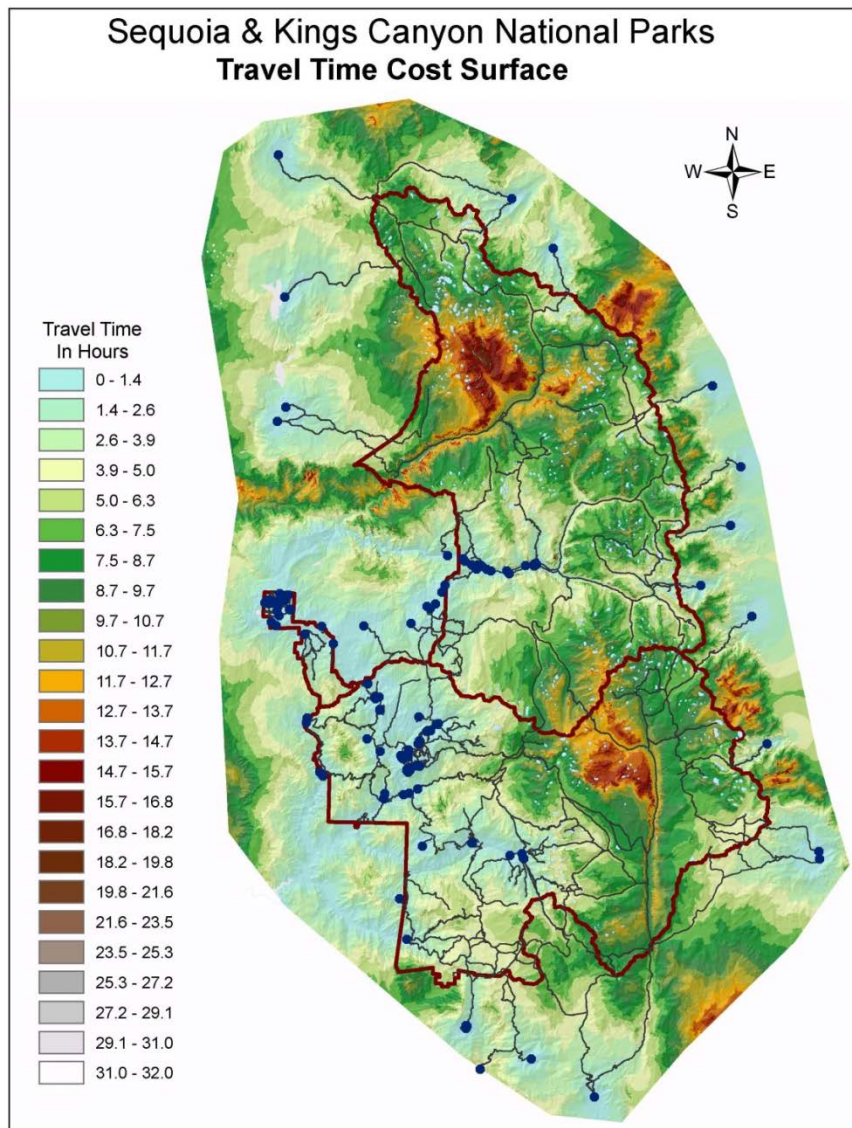


Figure 2. Cost surface model of relative travel hours to each lake in the sampling frame of 684 lakes in SEKI. From Heard et al. (2012).

We simulated data collected under three revisit designs [1-0], [1-0,1-3], and [1-3]. These revisit designs represent, respectively, a single panel of sites visited every year, an annual panel of sites combined with four panels visited on an alternating schedule, and a set of four panels visiting on an alternating schedule with no annual panel. We simulated samples of 20, 35, and 50 sites each year. Therefore, these annual sample sizes represent the size of each panel in the [1-0] design and each of the four panels in the [1-3] design. The annual panel [1-0,1-3] always contained 10 sites, so the alternating panels always included annual samples of 10, 25, and 40 sites to correspond to the annual total sample sizes of 20, 35, and 50 sites. Under stratified sampling, the annual panel contained six sites in the High elevation stratum and four sites in the Low elevation stratum.

The effect of inconsistent effort over time was evaluated by simulating periodic years of low effort by halving the annual sampling effort in every 5th year. For revisit designs incorporating both annual and alternating panels, the reduction in effort every 5th year occurred only within the alternating panel; thus sampling effort for the annual panel was unaffected. The reduced effort every 5th year is intended to simulate budget fluctuations that affect staffing and field effort.

We simulated populations containing a known amount of trend by imposing trend on pilot data estimates in each successive year, and then adding estimated variance components. We imposed annual trends of 2% over 12 years and 1% over 24 years on pilot data, each resulting in net increases in mean ANC of 27%. Trends of 0% were simulated to assess trend test size. For some simulation scenarios, we generated higher trends of 4% over 12 and 24 years at high-elevation lakes to assess the impact of an extreme trend at an undersampled subpopulation. We drew GRTS samples from each simulated population and allocated sites sequentially down the list to panels according to the revisit design.

Evaluating Trend Estimation Performance

We assess the performance of each trend approach by evaluating relative bias and confidence interval coverage of the trend estimate and the size and statistical power of the trend test. Relative bias is measured as the proportional difference of the estimated trend coefficient and the true trend coefficient $\left(\frac{\hat{\gamma}_1 - \gamma_1}{\gamma_1}\right)$. Assuming a Type I error rate of 0.10, confidence interval coverage is calculated as the proportion of times for a given simulation scenario that the 90%-confidence interval contains the true regression coefficient value. Test size is the proportion of times that the null hypothesis of no significant trend is incorrectly rejected when no trend is simulated. Because we are assuming a Type I error rate of 0.10, a trend test with size of 0.10 or less is desired and we refer to the test as having “nominal” test size. Test power is the proportion of times that the null hypothesis is correctly rejected when a non-zero trend is simulated. In this research, obtaining a trend test with power of at least 0.80 is of interest.

We applied all trend analysis approaches to 500 simulated populations in each design scenario and summarized results across these iterations. We assessed the relative bias of the trend coefficient, the 90%-confidence interval coverage (proportion of confidence intervals that contained the true trend coefficient), trend test size (proportion of iterations for which a non-zero trend was detected when no trend was present), and trend test power (proportion of iterations for which a trend was accurately

detected). We considered a trend estimate to be biased if the true trend coefficient was overestimated or underestimated by 5% or more. Confidence interval coverage was calculated as the proportion of iterations for which the 90%-confidence interval of the estimator contained the true trend regression parameter value. Trend test size and power were both calculated as the proportion of iterations within a simulation in which the null hypothesis was rejected, but the underlying population was generated without trend to calculate test size and with non-zero trend to calculate the power of the test. We tested trend at a significance level of 0.10. When evaluating the trend test size results, a trend test with test size near 0.10 was most desirable but we considered test size up to 0.13 to be acceptable and test size exceeding 0.13 to be inflated. Test size is approximated with simulation and can vary slightly among simulation runs, so classifying test size of 0.13 or less as “nearly-nominal” accounts for possible simulation variation so that acceptable tests are not omitted for consideration.

Results

The results for methods A and B of the PWIGLS approach are nearly identical when rounded to the second decimal place. Similarly, the results for methods AI and BI are nearly equivalent, and methods A-only and C approaches provide essentially the same results. Therefore, only the results from A-only, A, and AI PWIGLS approaches are reported in tables for brevity and so that the impacts of scaling and the invariance assumption could be assessed. Complete simulation results are provided in Supplement B.

The results of the simulation indicated that the simulation scenarios for which an extreme trend was present in a disproportionately-sampled subpopulation under unequal probability sampling represent the case for which design weighting is necessary for unbiased estimation and nominal confidence interval coverage. For each measure of simulation performance, these simulation scenarios are examined in separate figures to demonstrate the results of the estimators under this most extreme scenario.

Relative Bias of Trend Coefficient

For most simulation scenarios, the PO and PWIGLS trend approaches resulted in unbiased estimates of the ANC trend regression coefficient (Figures 3a and 3b). For the ANC outcome, relative bias is closest to zero for the PO and PWIGLS methods when simple random sampling was used. The SLRDB and WLRDB approaches tended to overestimate trend, but the relative bias of the trend coefficient was smaller for the shorter monitoring period. Estimates of the ANC trend regression coefficient were generally unbiased for both stratified and unequal probability GRTS sampling, both monitoring periods, and for the PO and PWIGLS methods when a subpopulation trend was not present. However, trend was underestimated by about 6% when the PWIGLS method was used with the [1-3] monitoring design for a 12-year monitoring period exhibiting a 2% annual trend (Supplement B, Table S1). When a 24-year trend was estimated (Figure 3b), the SLRDB trend estimate overestimated the true trend coefficient by 12.11% to 18.84% for an overall population trend of 1% and by 4.55% to 10.27% when an additional subpopulation trend of 4% was simulated (Supplement B, Table S1). Bias was reduced for the WLRDB approach compared to the SLRDB approach for 83% of the simulation scenarios.

Relative bias in the trend coefficient was similar for the modified ANC variable (Supplement B, Table S2), except estimates from the PWIGLS approach were unbiased for all simulation scenarios (Figures 3c and 3d). PO estimates were unbiased for all scenarios except for when a subpopulation trend was present in an undersampled subpopulation, and the SLRDB and WLRDB approaches were positively biased by as much as 18% for 24-year monitoring periods. The WLRDB trend estimate was less biased than the SLRDB trend estimates for all but one of the simulations (99.5%).

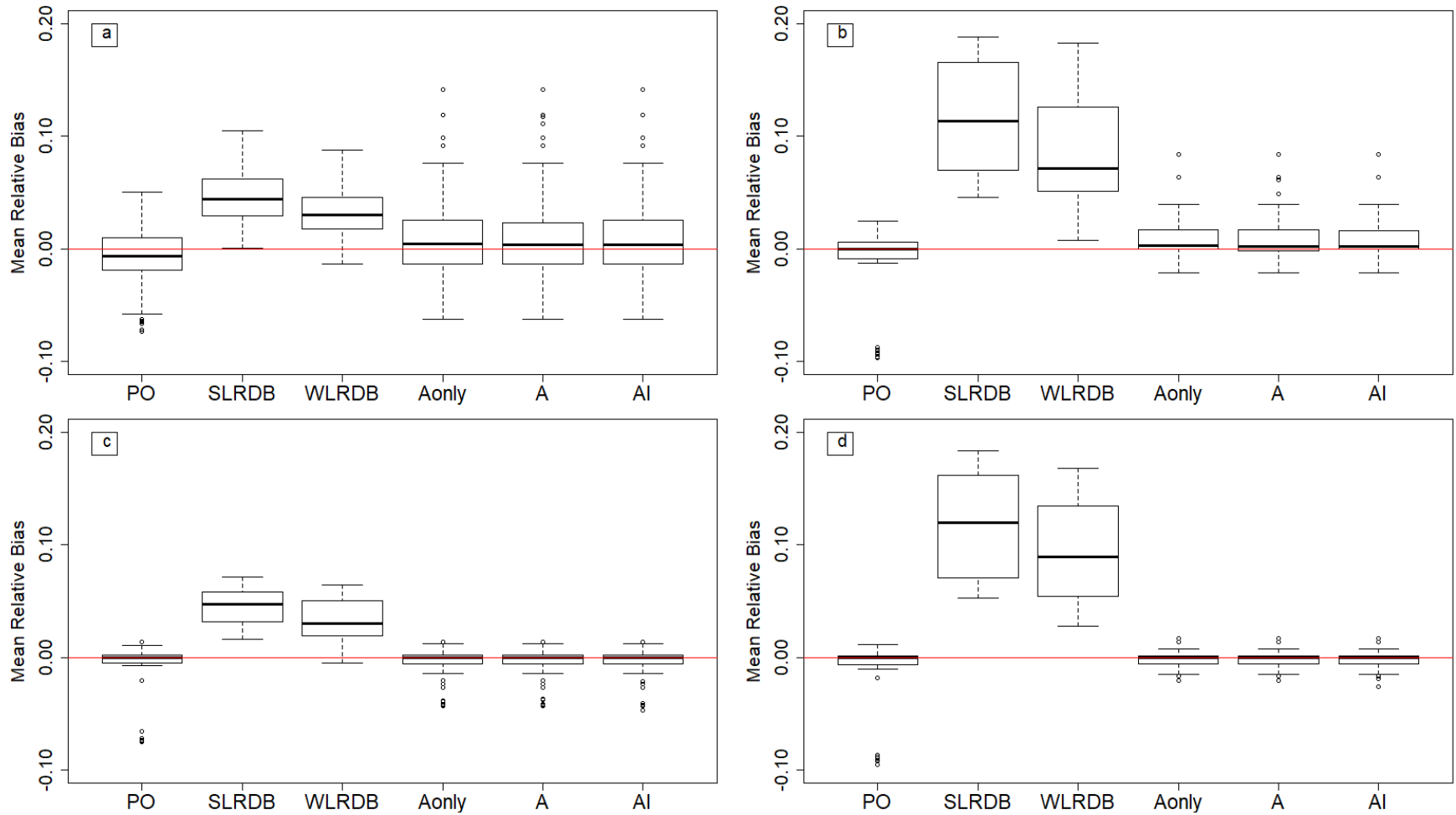


Figure 3. Mean relative bias of the trend regression coefficient for all simulation scenarios for (a) ANC trend over 12 years, (b) ANC trend over 24 years, (c) modified ANC trend over 12 years, and (d) modified ANC trend over 24 years for the unweighted linear mixed model (PO), simple linear regression for design-based estimates (SLRDB), weighted linear regression for design-based estimates (WLRDB), and probability-weighted iterative generalized least squares approaches A-only, A, and AI.

When unequal probability GRTS sampling was used and a subpopulation trend was present, the unweighted PO approach underestimated the true trend (Figure 4) because the sample included easily-accessed sites that were not experiencing the more extreme trend. The WLRDB approach produced the least biased estimates of the 12-year ANC trend (Figure 4a). The PO method underestimated trend by 5.15% to 7.91% and the PWIGLS methods overestimated by 4.49% to 14.15% for method A (Figure 4a). When a subpopulation trend of 4% was induced over 24 years (Figure 4b) for the ANC variable, the PO method underestimated the true trend regression coefficient by 8.56% to 9.75% for unequal probability sampling. In contrast, the WLRDB approach was unbiased for all revisit designs except a slight bias of 5.26% for an annual sample size of 50 sites with a [1-0] revisit design and equiprobable GRTS sampling (Supplement B, Table S1). The A-only and AI methods of the PWIGLS approach were unbiased for the [1-0] revisit design. The PO estimate of the modified ANC trend coefficient for unequal probability sampling (Supplement B, Table S2) underestimates the true value by 6.55% to 7.97% for 12 years (Figure 4c) and by 8.54% to 9.58% for 24 years when the a subpopulation trend of 4% is modeled (Figure 4d).

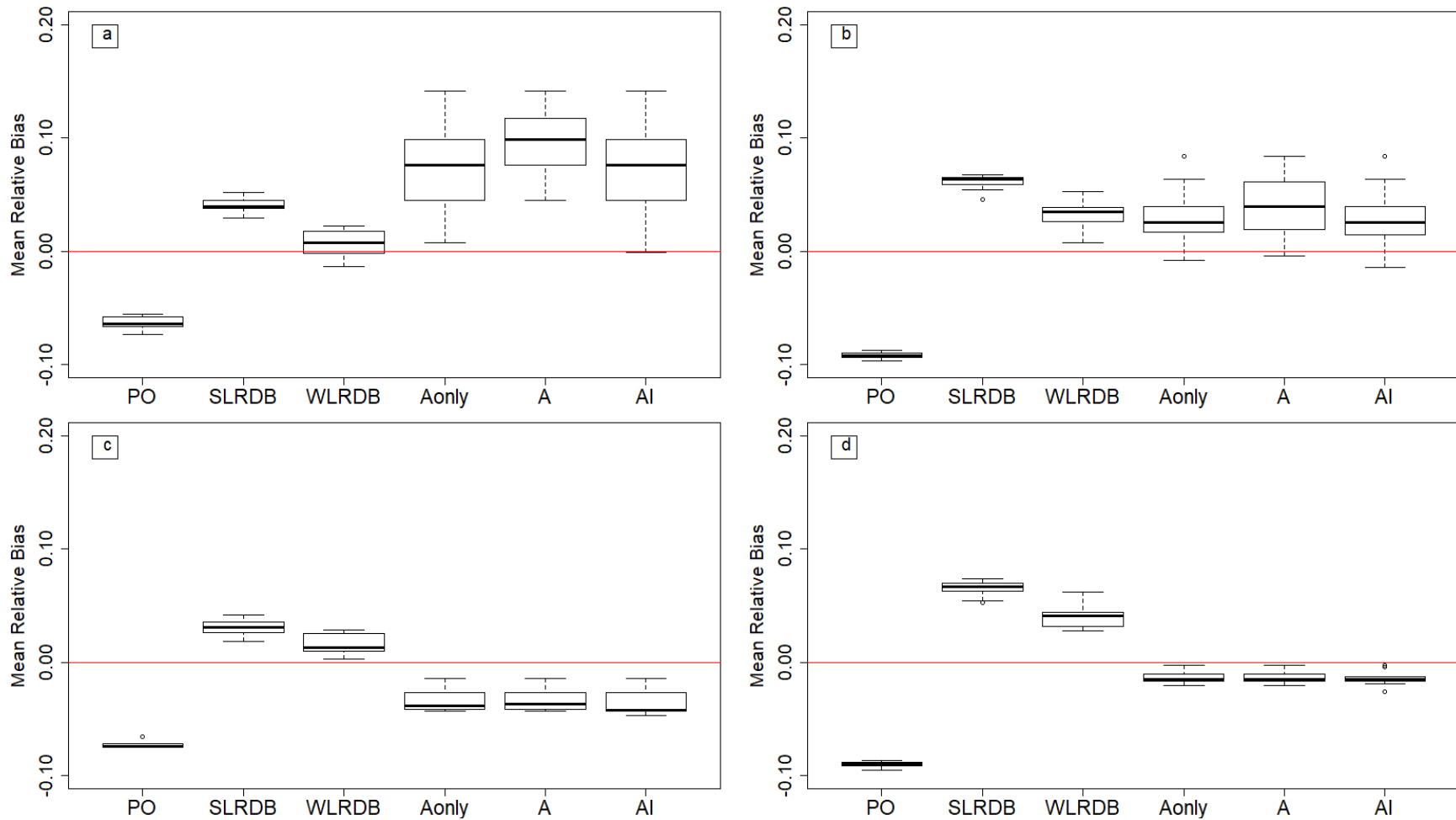


Figure 4. Mean relative bias of the trend regression coefficient for unequal probability GRTS designs, a 4% annual subpopulation trend, and equal annual sampling effort for (a) ANC trend over 12 years, (b) ANC trend over 24 years, (c) modified ANC trend over 12 years, and (d) modified ANC trend over 24 years for the unweighted linear mixed model (PO), simple linear regression for design-based estimates (SLRDB), weighted linear regression for design-based estimates (WLRDB), and probability-weighted iterative generalized least squares approaches A-only, A, and AI.

Trend Confidence Interval Coverage

Overall, confidence interval coverage for the ANC trend regression coefficient was closest to 90% for the PO trend approach (Figure 5). The SLRDB and WLRDB approaches performed well for the 12-year monitoring period, with the WLRDB approach providing slightly more nominal coverage. For the 24-year time period, the SLRDB and WLRDB approaches performed better for the [1-0,1-3] and [1-3] revisit designs (Supplement B, Table S3). The PWIGLS approach provided poor coverage for the ANC trend regression coefficient ranging from 34.8% to 81.4%.

For the modified ANC outcome, the PO model demonstrated nominal confidence interval coverage for nearly all scenarios of the 12-year monitoring period (Figures 5c and 5d). The SLRDB and WLRDB demonstrated both high and low confidence interval coverage of the modified ANC trend coefficient, with the poorest performance occurring for the [1-0] revisit design and for the longer monitoring period. Modified ANC confidence interval coverage for the PWIGLS estimates of trend ranged from 82% to 95% across all simulations scenarios in which the [1-0] revisit design was used and provided the best coverage of the true modified ANC trend (Supplement B, Table S4).

When a subpopulation trend in ANC was present, confidence interval coverage under the PO method was consistently below 90% for stratified sampling across both monitoring periods and for unequal probability sampling in the 24-year monitoring period (Figure 6b). When a subpopulation trend was present for a 12-year monitoring program, the WLRDB approach provided nominal confidence interval coverage for both stratified and unequal probability GRTS sampling when the [1-0,1-3] and [1-3] designs were used. When a subpopulation trend was present for a 24-year monitoring program, confidence interval coverage for the [1-0,1-3] and [1-3] revisit designs was closest to nominal for the SLRDB approach when unequal probability sampling was used, but no approach provided nominal confidence interval coverage for stratified GRTS sampling (Supplement B, Table S3). Nominal coverage was achieved for the PWIGLS approaches only for small samples.

For the modified ANC variable, confidence interval coverage from the PO model was exceptionally low when unequal probability sampling was used and a subpopulation trend was present (Figures 6c and 6d). However, coverage was near nominal for the PWIGLS approach (Supplement B, Table S4). As with the ANC data, confidence intervals from the SLRDB and WLRDB approaches covered the true modified ANC trend coefficient less frequently for the 24-year monitoring period than for the 12-year trend period.

Confidence interval coverage was assessed for two restricted scenarios to assess the performance of the bootstrapping approach for confidence interval construction (Table 4). Confidence interval coverage was much lower for the bootstrapping approach than for confidence intervals constructed with the linearization variance for both the ANC and modified ANC outcomes. Confidence interval coverage for the modified ANC variable exceeded nominal rates when the linearization variance was used, but the confidence intervals constructed from the 5th and 95th percentiles of bootstrap samples exhibited lower-than-nominal coverage.

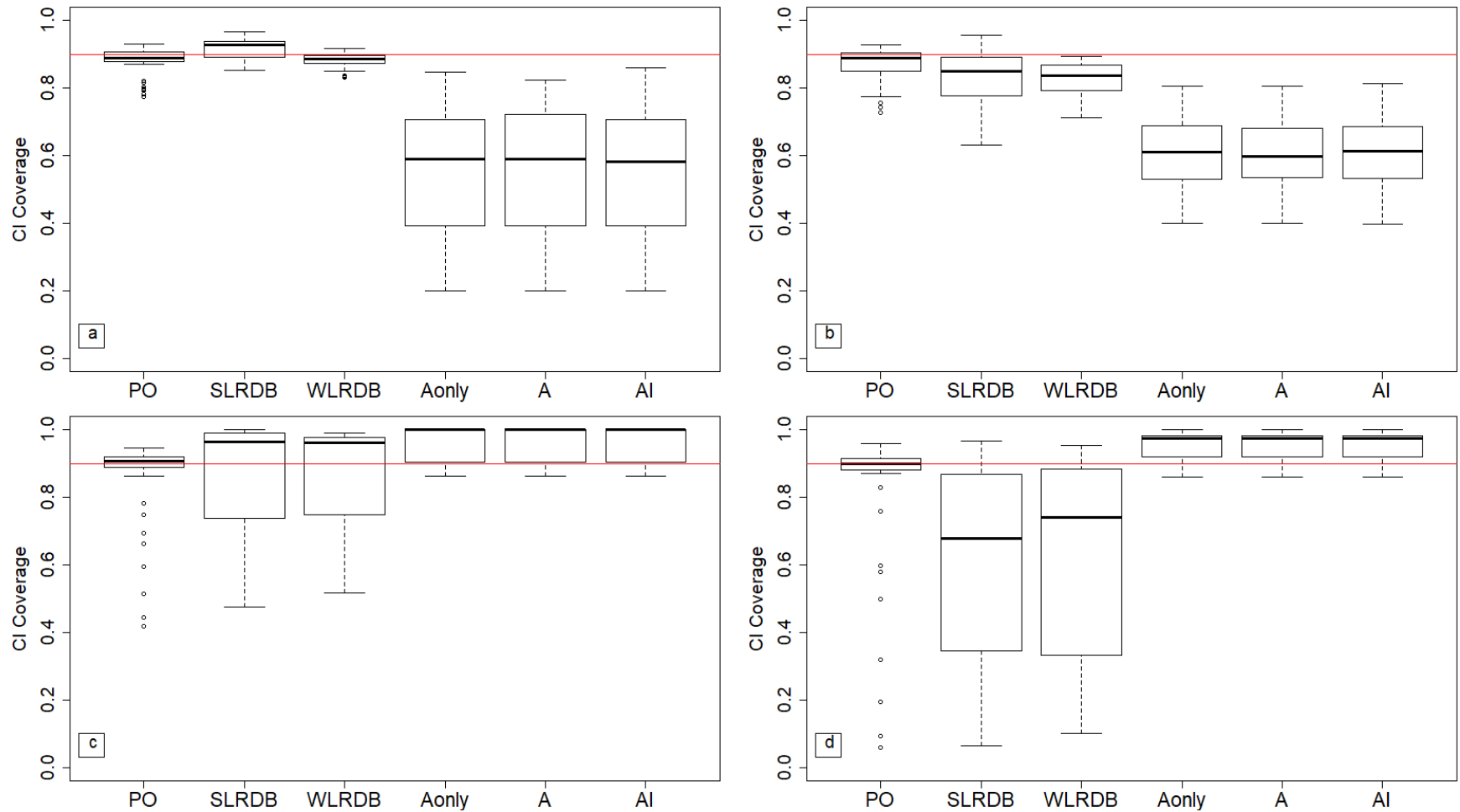


Figure 5. Mean confidence interval coverage of the trend regression coefficient for all simulation scenarios for (a) ANC trend over 12 years, (b) ANC trend over 24 years, (c) modified ANC trend over 12 years, and (d) modified ANC trend over 24 years for the unweighted linear mixed model (PO), simple linear regression for design-based estimates (SLRDB), weighted linear regression for design-based estimates (WLRDB), and probability-weighted iterative generalized least squares approaches A-only, A, and AI.

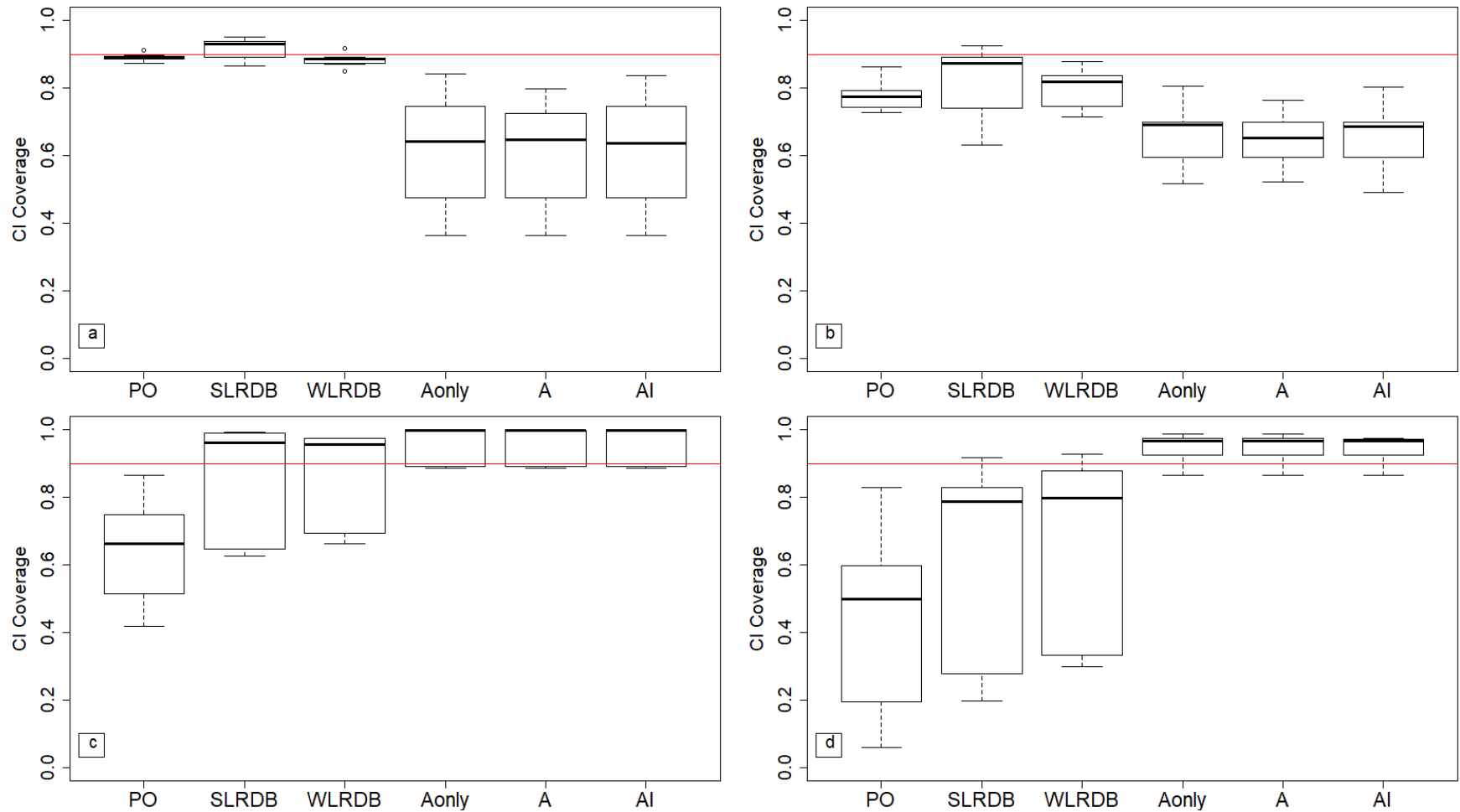


Figure 6. Mean confidence interval coverage of the trend regression coefficient for unequal probability GRTS designs and a 4% annual subpopulation trend for (a) ANC trend over 12 years, (b) ANC trend over 24 years, (c) modified ANC trend over 12 years, and (d) modified ANC trend over 24 years for the unweighted linear mixed model (PO), simple linear regression for design-based estimates (SLRDB), weighted linear regression for design-based estimates (WLRDB), and probability-weighted iterative generalized least squares approaches A-only, A, and AI.

Table 4. 90%-confidence interval coverage of the trend regression coefficient for a 2% annual trend, a 4% annual subpopulation trend, a [1-0,1-3] revisit design, and equal effort for two outcomes and sampling designs for confidence intervals constructed from the linearization variance and the bootstrap (BS).

Outcome	Sites	Design	A only	A	AI	A only (BS)	A (BS)	AI (BS)
ANC	20	Stratified	0.83	0.83	0.83	0.50	0.42	0.42
ANC	35	Stratified	0.69	0.70	0.69	0.38	0.33	0.36
Modified ANC	20	Unequal	1.00	1.00	1.00	0.80	0.80	0.76
Modified ANC	35	Unequal	1.00	1.00	1.00	0.74	0.73	0.70

Test size

Test size is evaluated as the proportion of iterations for which the null hypothesis of no trend is erroneously rejected. Therefore, we assess trend test size only for simulations in which no population-level or subpopulation-level trends are present. Trend test size is compared to the 0.10, the predetermined Type I error rate.

For the ANC variable, the size of the trend test based on the *t*-distribution from the PO model ranged between 0.07 and 0.14 for all simulation scenarios (Figures 7a and 7b). The SLRDB and WLRDB approaches yielded generally nominal trend tests for 12-year monitoring periods and all revisits designs and for 24-year monitoring periods when the [1-0,1-3] and [1-3] revisit designs were used (Supplement B, Table S5). Tests of ANC trend from PWIGLS models were nearly always inflated, with test size values as high as 0.81.

For the modified ANC variable, the trend tests from the PO model ranged from 0.05 to 0.11 for monitoring periods of 12 years (Figure 7c) and from 0.07 to 0.12 for monitoring periods of 24 years (Figure 7d). The trend tests from the SLRDB and WLRDB approaches achieved nominal levels when a [1-0,1-3] or [1-3] revisit design was used (Supplement B, Table S6). However, test size was slightly inflated for the [1-0,1-3] revisit design over a 24-year period and effort was equal among years. Nearly every scenario for the modified ANC variable using the PWIGLS approaches resulted in trend testing at significance level 0.10, but test size was often close to 0 when the revisit designs [1-0,1-3] or [1-3] were used.

A second Wald test for trend was based on the chi-squared distribution. Because this test is based on variance components, trend test size cannot be evaluated for the SLRDB and WLRDB approaches. Tests in trend for the ANC variable achieved nominal levels for the PO method when a 24-year monitoring period was examined, but test size was inflated for many of the 12-year simulation scenarios (Supplement B, Table S7). Nominal chi-squared trend test size was achieved for PWIGLS methods only when simple random sampling was used. Chi-squared trend test size based on the PWIGLS models of the modified ANC variable was nominal when simple random sampling and a [1-0] revisit design was used for a 12-year monitoring period and for all revisit designs when simple random sampling was used over 24 years (Supplement B, Table S8).

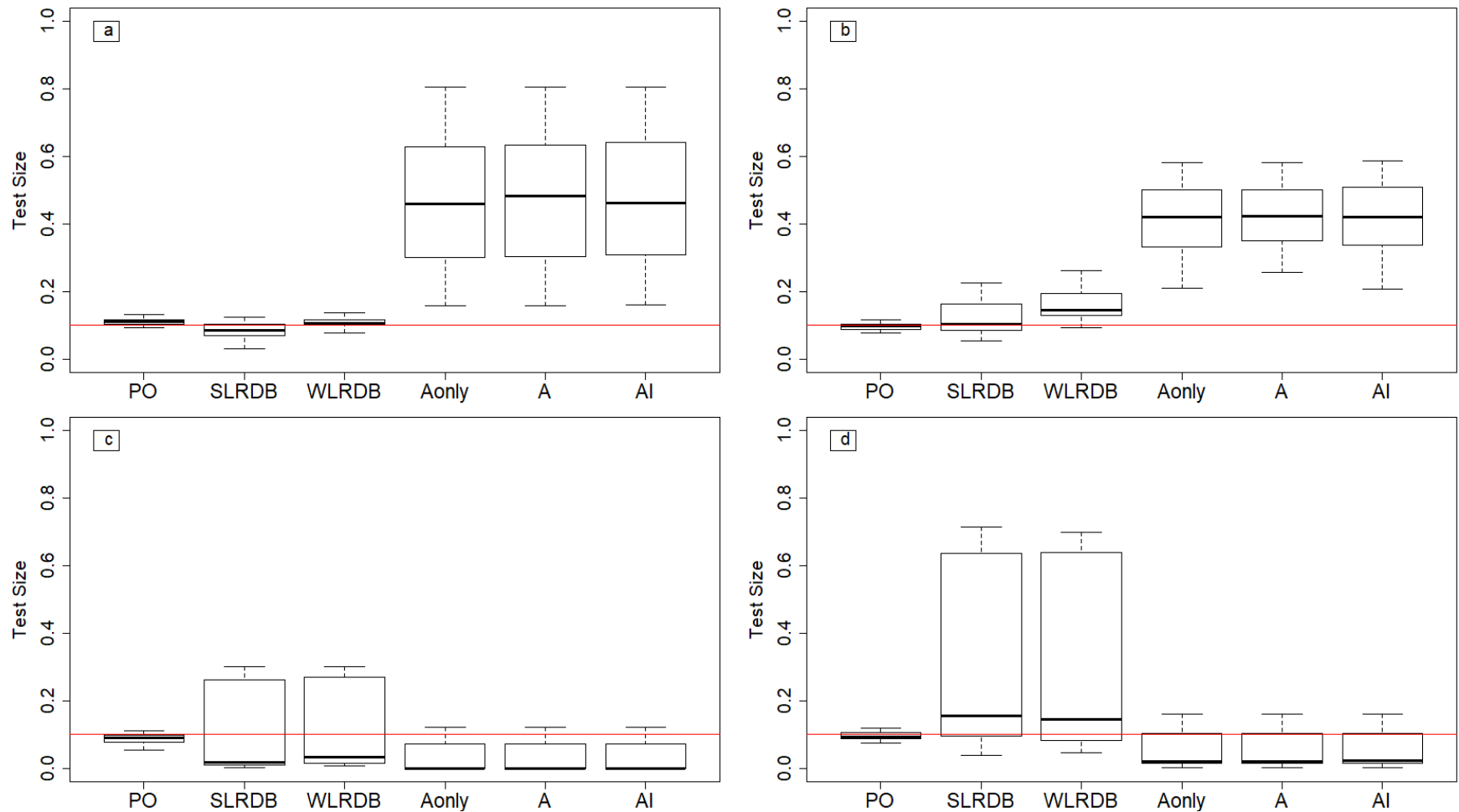


Figure 7. Mean test size of the trend test (Type I error = 0.10) for all simulation scenarios for (a) ANC trend over 12 years, (b) ANC trend over 24 years, (c) modified ANC trend over 12 years, and (d) modified ANC trend over 24 years for the unweighted linear mixed model (PO), simple linear regression for design-based estimates (SLRDB), weighted linear regression for design-based estimates (WLRDB), and probability-weighted iterative generalized least squares approaches A-only, A, and AI.

Test power

Test power was assessed only for scenarios exhibiting nominal test size since inflated test size results in overly-optimistic power. This restricted the power analysis to the PO approach for all scenarios, the SLRDB and WLRDB approaches for all scenarios except a 24-year monitoring cycle and a [1-0] revisit design, and the PWIGLS approaches when the year-to-year variation was low (the modified ANC variable).

The power of the t-test for a 12-year annual trend of 2% in ANC was consistently below 0.8 for the trend tests from PO and linear regression models with nominal test size (Supplement B, Table S9). However, test power exceeded 0.90 when a subpopulation trend was present for the 12-year monitoring period. For a 1% annual trend over a 24-year period, trend test power was slightly higher for the SLRDB approach (range: 0.77 to 0.85) than for tests based on the PO model (range: 0.75 to 0.82) when simple random sampling was used and a [1-0,1-3] revisit design was used. However, the power of 24-year trend tests based on the PO model (range: 0.70 to 0.98) was considerably higher than that observed for the SLRDB approach (range: 0.59 to 0.87) or the WLRDB approach (range: 0.61 to 0.79) when stratified sampling or unequal probability sampling were used with equal annual sampling effort. Power to detect a 24-year trend when a large subpopulation trend occurred exceeded 0.996 for all simulation scenarios.

Power of the chi-squared trend test (Supplement B, Table S10) for detecting 12-year trends in the ANC mean using the PO model for scenarios in which nominal test size is achieved was low for equiprobable GRTS sampling (range: 0.57 to 0.62) and unequal probability GRTS sampling (range: 0.57 to 0.62) but improved for stratified GRTS sampling (range: 0.75 to 0.82). For the [1-0] revisit design and a 24-year monitoring period, trend testing for an annual 1% trend with the PO model was least powerful for simple random sampling (range: 0.73 to 0.80) and unequal probability sampling (range: 0.71 to 0.80) and most powerful for stratified random sampling (range: 0.87 to 0.96). Power for the chi-squared trend test under simple random sampling ranged between 0.73 and 0.81 for all PWIGLS approaches with the [1-0] revisit design and between 0.77 and 0.85 for the [1-0,1-3] and [1-3] revisit designs with the A and B PWIGLS approaches. Power was perfect for chi-squared trend tests based on the PO model when a subpopulation trend was present.

Power to detect trends in the modified ANC variable with a t-test (Supplement B, Table S11) was uniformly high for scenarios in which nominal test size was attained, with power of at least 0.98 for the test from the PO model and at least 0.78 for the trend tests from the SLRDB and WLRDB approaches for a 24-year monitoring period and annual samples of at least 35 sites. Power from the PWIGLS approaches with nominal test size exceeded 0.83 for 12-year trend tests when at least 35 sites were surveyed per year and exceeded 0.94 for all 24-year data sets. Similarly for the chi-squared trend test, power for scenarios with nominal test size was observed was at least 0.98 for the PO model and at least 0.99 for the PWIGLS approaches (Supplement B, Table S12). However, note that the test based on the PO model achieved nominal test size for nearly all scenarios. Test power was not assessed for the bootstrapping approach because the poor confidence interval coverage would result in a test of less-than-nominal size.

Variance components estimation

Because variance components are not estimated in the SLRDB and WLRDB approaches, the bias of variance components was only calculated for the PO and PWIGLS methods. The ANC variance components estimates from the PO model were generally unbiased. Estimates of site-to-site variance component (σ_a^2) from the PO model were unbiased for all simulation scenarios and both outcomes of interest (Supplements B, Table S13 and S14). Estimates of the ANC random site-level slope (σ_t^2) from the PO model were unbiased when no subpopulation trend was present and equiprobable and unequal probability GRTS sampling were used for either time period or when stratified random sampling was used over a 24-year monitoring period (Supplement B, Tables S15 and S16). Estimates of year-to-year variation (σ_b^2) in the ANC outcome from the PO model were unbiased for equiprobable and unequal probability sampling, but year-to-year variance estimates for stratified sampling underestimated the true variance by -53.33% to -47.55% (Supplement B, Tables S17 and S18). Estimates of residual variation in the ANC outcome (Supplement B, Tables S19 and S20) were unbiased for the PO method except when stratified sampling was used (range: 61.45% to 80.26%). In contrast, variance component estimated with the PWIGLS approaches were severely overestimated for nearly all scenarios and both outcomes of interest with the exception of residual variance estimation which was unbiased for the modified ANC variable for all approaches.

Discussion

Simulations were used to compare measures of trend detection and estimation for a range of complex sampling design elements and variance compositions with three trend analysis methods. The performance of the modeling approaches was assessed by examining the bias and confidence interval coverage of the trend estimate, trend test size and power, and bias of variance components estimates. Several general patterns emerged from these simulations that provide guidance for sampling design, trend detection, and trend analysis.

Overall, trend detection was preferable with a *t*-test based on the PO model for the examined scenarios because tests maintained nominal test size and demonstrated high power for a two-sided trend test. Even for the cases when PO confidence coverage was low due to undersampled subpopulation trends, the trend *t*-test from the PO approach maintained nominal test size and high power to detect a nonzero trend. For the simulation inputs examined in this work, the Wald *t*-test obtained from the PO model should provide a powerful two-sided test of trend.

In most scenarios, the estimate of the trend regression coefficient from the unweighted trend model (PO approach) was unbiased (Figure 3) and exhibited nominal confidence interval coverage (Figure 5). However, when a subpopulation trend was present and subpopulations were sampled disproportionately relative to the population (e.g., due to easy access), use of the PO approach led to poor confidence interval coverage and underestimation of the trend regression coefficient by as much as 10% when a larger subpopulation trend was present (Figures 4 and 6). This magnitude of bias may not be ecologically significant for some indicators; in these cases, the conservative approach would be to ignore the design weights and proceed with the PO approach. However, this bias might influence management decisions for some indicators, so the impact of the weighted vs unweighted approaches should be considered when determining which approach to use. This scenario represents the most extreme impact of neglecting the complex sampling design when conducting model-based trend analysis with the PO linear mixed model. However, the benefit of weighting occurred only for the modified ANC indicator with low year-to-year variance.

When the [1-0] revisit design was used and the outcome had relatively-small year-to-year variance (0.03% of the total variation in this investigation), the PWIGLS method provided more accurate trend estimates with better confidence interval coverage than the unweighted PO method (Supplement B, Table S2). Confidence interval coverage was near 1 for the [1-0,1-3] and [1-3] designs, indicating that the linearization variance overestimates the standard error of the trend regression coefficient for those revisit designs (Supplement B, Table S4). This variance inflation may be due to the reduced site-level temporal replication when panel designs are used. For the simulation scenarios examined in this research, the six PWIGLS scaling methods performed very similarly. The WLRDB approach provided unbiased estimates of trend and near-nominal confidence interval coverage for scenarios involving unequal probability sampling relative to a category defining the subpopulation, a [1-3] revisit design, and an outcome with a large year-to-year variance component (5% of the total variation in this investigation).

Variance composition and fixed effects modeling can provide insight into the best sampling design and trend analysis approach. Without the benefit of a simulation, a trend analyst must consider *a priori* that subpopulation trends may be present in a population and ensure that sample sizes are adequate and spatially-dense enough to represent those subpopulations. Then a trend analysis incorporating a separate-slopes PO model may be used to determine if statistically-significant subpopulation trends are present and to estimate variance components. Note that a large random slope variance may indicate the presence of subpopulations exhibiting different trends.

The PO model was found to provide nominal confidence interval coverage for unequal probability sampling and a [1-0] revisit design for a 12-year sampling period but not for a 24-year sampling period when year-to-year variation was high and a subpopulation was present. In this case, a hybrid approach might be incorporated. For example, if a subpopulation trend is detected at 12 years, three new panels can be added to form a [1-3] revisit design for the next 12 years. The WLRDB approach, which appears to perform best when a larger number of total sites are visited, may then be applied to the 24-year time series. Note that a large initial GRTS sample (or sample with large oversample) should be drawn so that the sample of sites can be easily expanded while maintaining spatial balance and tractable design weights. While this amended revisit design was not tested in this research, this adaptation is likely to result in higher power than if the [1-0] revisit design was used due to the increase in the number of sites in the sample.

The variance components estimates from the PWIGLS methods greatly overestimated the true parameter values for all variance components except the residual variation in the equiprobable case. This result is likely because the step-B approach of Pfeiffermann et al. (1998) was not used. Variance component estimation also inflated the degrees of freedom from the PWIGLS modeling results requiring trend testing based on degrees of freedom from the unweighted PO model. Estimates of variance components for power analysis and degrees of freedom for trend testing should be obtained from the unweighted model (PO) as also found by Asparouhov (2006).

When the PO model was applied to scenarios with a significant subpopulation trend, the random-slope variance component was biased for equiprobable and unequal probability sampling designs, but not for a stratified sampling design. The latter result is likely due to the inclusion of a stratum fixed effect in the trend model of the mean for stratified sampling. Explicit modeling of the subpopulation trends with the separate-mean model reduced unexplained variation among site-level trends for more accurate estimation. Thus for equiprobable and unequal probability sampling designs, identifying subpopulations and including their classification in the mean structure of the trend model will likely improve random-slope variance component estimation.

When an alternating panel design is used in conjunction with equiprobable sampling, there is little difference between the performance of the PWIGLS method and the PO method. In this situation (i.e., equiprobable sample), data imbalance introduced by the panel revisit design is handled well by the PO method and the use of Satterthwaite degrees of freedom (Piepho and Ogutu 2002). Therefore, weighting an equiprobable sample to account for panel weights appears unnecessary.

A reduction in effort of 50% every 5th year did not have a substantial impact on the test size, power, or confidence interval coverage. In some cases, the confidence interval coverage improved when annual sampling effort was unequal, likely due to an increase in the standard error. This robustness to unequal sampling effort demonstrates the impact of consistent annual surveys despite occasional sampling effort reductions. However, reducing annual sampling effort by 50% is likely to have a greater impact on trend detection and estimation for monitoring periods of less than 12 years.

The bootstrapping approach yielded poor confidence interval coverage for the two simulation scenarios examined. The bootstrap may have performed poorly due to the restriction of sampling year clusters by site and the preservation of the panel design in the bootstrapping procedure. The linearization variance provided a better basis for confidence interval coverage and trend testing, especially for the modified ANC variable.

We summarized the results of the simulation in a flowchart (Figure 8). Our results demonstrated that the unweighted PO approach is appropriate for many scenarios involving complex designs. Within the scenarios we examined, a key piece of information for determining the appropriate trend analysis method is whether there is evidence of a subpopulation trend. Thus subpopulations must have been adequately sampled to allow identification of subpopulation trends, or other ecological knowledge may be used to infer whether subpopulation trends exist. If subpopulation trends exist and complex sampling design was used (i.e., not an equiprobable design), then the length of the monitoring period, the sampling design, the revisit design, and the variance composition must be considered when determining the appropriate trend analysis approach. To better understand the impact of weighting on trend inference, we recommend comparing results of weighted and unweighted approaches. Two case studies are presented in Supplement C to demonstrate how these methods and the flowchart are used.

Note that the flowchart summarizes the broad patterns demonstrated in the simulation results but may omit more detailed patterns in the interest of general recommendations. Also note that the recommendations may differ for other continuous outcomes exhibiting different mean structure or variance structure than was examined in this simulation study. Our study was limited to data that benefitted from a logarithmic transformation. We did not address issues related to nonsampling error such as minimum detection limit data or nonresponse mechanisms that cannot be remedied with only the data from accessible sites. Therefore, the results of this simulation exercise may provide general recommendations but additional study for a wider range of indicators would be useful for broader inference.

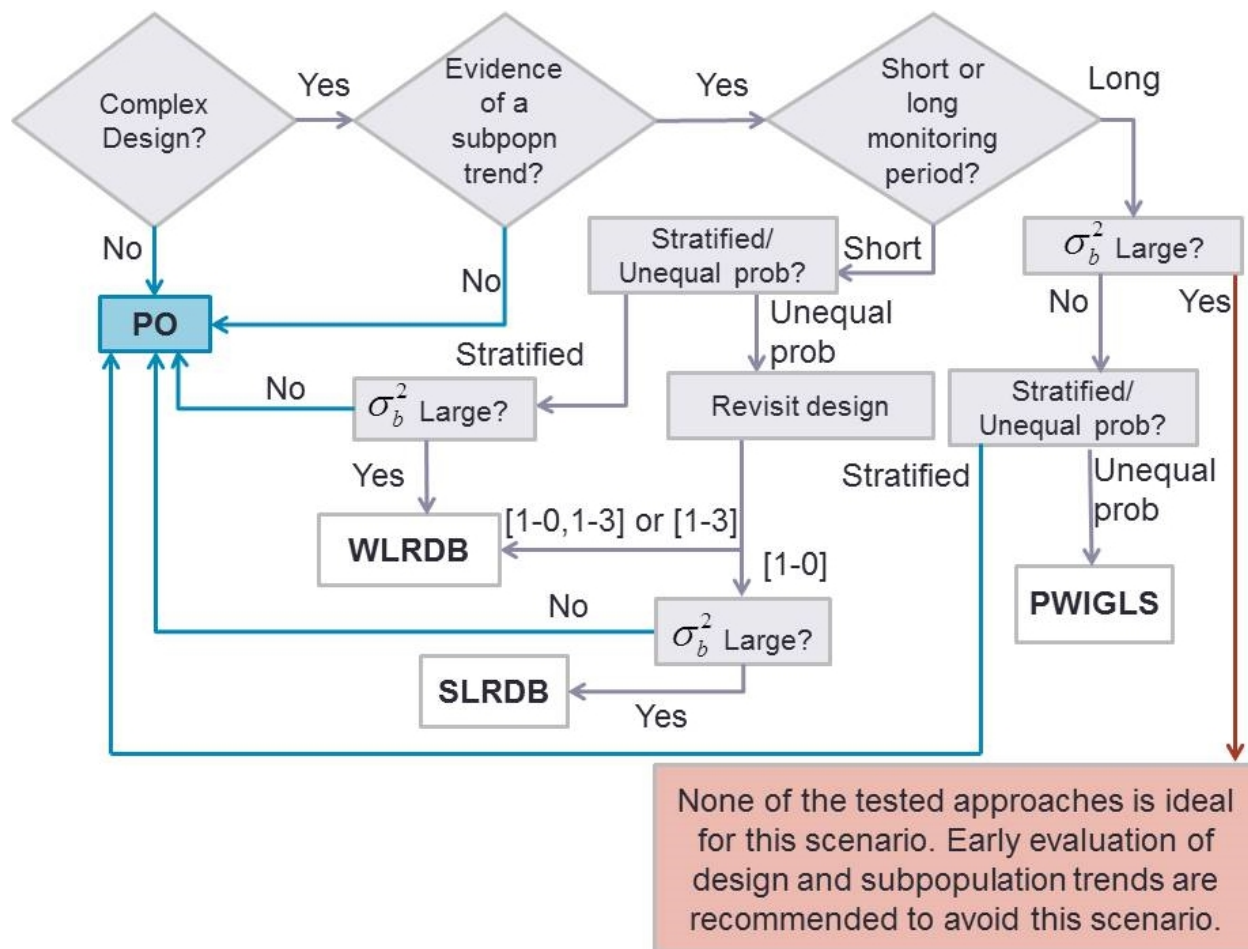


Figure 8. Flowchart of recommended approaches to trend analysis for data collected from complex sample designs. Analytical approaches include PO, WLRDB, SLRDB, and PWIGLS.

Conclusions

For the range of trend magnitudes, sample sizes, and monitoring periods explored in this research, the PO model, which does not incorporate design weights, performed very well, even for some scenarios with sampling and revisit design complexity. The PWIGLS approach provided the most nominal confidence interval coverage for complex sampling designs monitored over a 24-year period without a complex revisit design. If a complex revisit design is used, e.g., [1-3], the WLRDB approach may provide the most robust trend inference for 12-year monitoring programs.

The PWIGLS approach was very sensitive to variance composition. Nominal confidence interval coverage was obtained for the trend in modified ANC, which had low year-to-year variation, only when the [1-0] design was used. Nominal confidence interval coverage was rarely obtained for ANC, which had large year-to-year variation. Even relatively small year-to-year variation greatly impacts the power to detect trend (Urquhart and Kincaid 1999). The PO approach performed well when the year-to-year variation was high, with the exception of scenarios involving undersampled subpopulations with an extreme trend. The PWIGLS approach may be improved by incorporating step-B (Pfeffermann et al. 1998) to improve variance components estimates. This adaptation may also improve PWIGLS trend coefficient standard errors from the linearization variance that employ the inflated variance components estimates.

We demonstrated that unmodeled design complexity can lead to biased trend inference and poor trend tests under some approaches, but for most of cases explored here, the unweighted PO approach provided powerful trend tests of nominal test size and unbiased trend estimates with nominal confidence interval coverage. Accurate identification of subpopulations undergoing dramatic changes is necessary for unbiased trend inference at the population level. Attention to these details at the survey design stage will allow natural resource managers the flexibility to respond with the appropriate sampling design, temporal revisit design, and trend analysis technique.

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Supplement A: Simulation R Code

```
TrendEsts <- function(dat, design) {

# Function to calculate trend for the PO approach, SLRDB & WLRDB
# approach,
# and 6 methods of the PWIGLS approach.
# Dependent packages: lme4

# LA Starcevich 8.5.16

Sites = sort(unique(dat$Site))
Years=sort(unique(dat$Year))
yrs=sort(unique(dat$WYear))
ma = length(Sites)
mb = length(yrs)
models=c("Aonly", "A", "AI", "B", "BI", "C")
modelnum = length(models)

ans = data.frame(matrix(NA,9,10))
ans[,1] = c("PO", "SLRDB", "WLRDB", "Aonly", "A", "AI", "B", "BI", "C")
names(ans) =
c("Approach", "intercept", "trend", "SEtrend", "sig2a", "sig2t", "sigat", "
sig2b", "sig2e", "trend_df")
#####
#####
# METHOD 1: Naive analysis -- P & O
#####
#####

if(design!="StRS") fit_PO<-lmer(LogY ~ WYear + (1|Year)
+(1+WYear|Site), data=dat, control = lmerControl(check.nobs.vs.nRE =
"warning"))
if(design=="StRS") fit_PO<-lmer(LogY ~ WYear + Elev_Stratum +
(1|Year) +(1+WYear|Site), data=dat, control =
lmerControl(check.nobs.vs.nRE = "warning"))
  ans[1,2] <- fixef(fit_PO)[1] # mu
  ans[1,3] <- fixef(fit_PO)[2] # slope
  ans[1,4] <- sqrt(vcov(fit_PO)[2,2]) # SE of trend
estimate
  ans[1,5] <- VarCorr(fit_PO)$Site[1,1] # var(ai)
  ans[1,6] <- VarCorr(fit_PO)$Site[2,2] # var(ti)
  ans[1,7] <- VarCorr(fit_PO)$Site[1,2] # cov(ai,ti)
```

```

ans[1,8] <- VarCorr(fit_PO)$Year[1]          # var(bj)
ans[1,9] <- attr(VarCorr(fit_PO),"sc")^2    # residual var
ans[1,10] <-summary(fit_PO)$coef[2,3] # using lmerTest

print(summary(fit_PO))
#####
#####
# Model 2: SLRDB/WLRDB
#####
#####

# Calculate annual design-based estimates
MeanEsts<-data.frame(matrix(NA,mb,3))
MeanEsts[,1]<-yrs

for (g in 1:mb) {
  dat.g<-dat[dat$Year==Years[g],]
  if(design!="StRS")
    MeanEsts[g,2:3] <-cont.analysis(
      sites=data.frame(siteID=dat.g$Site, rep(TRUE,nrow(dat.g))),
      subpop= data.frame(siteID=dat.g$Site, Popn1=rep(1,
nrow(dat.g))),
      design= data.frame(siteID=dat.g$Site,
      wgt= dat.g$wgt, xcoord = dat.g$xcoord, ycoord =
dat.g$ycoord),
      data.cont= data.frame(siteID=dat.g$Site, Y=dat.g$Y),
      conf=90)$Pct[8,6:7]

  if(design=="StRS")
    MeanEsts[g,2:3] <-cont.analysis(
      sites=data.frame(siteID=dat.g$Site, rep(TRUE,nrow(dat.g))),
      subpop= data.frame(siteID=dat.g$Site, Popn1=rep(1,
nrow(dat.g))),
      design= data.frame(siteID=dat.g$Site,
      wgt= dat.g$wgt, xcoord = dat.g$xcoord, ycoord = dat.g$ycoord,
stratum=dat.g$Elev_Stratum),
      data.cont= data.frame(siteID=dat.g$Site, Y=dat.g$Y),
      conf=90)$Pct[8,6:7]
  }
  MeanEsts[,3]<-as.numeric(MeanEsts[,3])
  names(MeanEsts)<-c("Year", "Est.Mean", "SE")
  MeanEsts$WYear<-MeanEsts$Year-min(MeanEsts$Year)

# Simple linear regression of design-based estimates (SLRDB)
fit_SLRDB<- lm(log(Est.Mean) ~ WYear, data=MeanEsts)

```

```

ans[2,2] <- coef(fit_SLRDB)[1] # mu
ans[2,3] <- coef(fit_SLRDB)[2] # slope
ans[2,4] <- sqrt(vcov(fit_SLRDB)[2,2]) # SE
ans[2,5] <- ans[2,6] <- ans[2,7] <- ans[2,8] <- 0
ans[2,9] <- (summary(fit_SLRDB)$sigma)^2
ans[2,10] <- summary(fit_SLRDB)$df[2]

# Weighted linear regression of design-based estimates (WLRDB)
fit_WLRDB<-lm(log(Est.Mean) ~ WYear, weights=1/(SE^2),
data=MeanEsts)
ans[3,2]<- coef(fit_WLRDB)[1] # mu
ans[3,3]<- coef(fit_WLRDB)[2] # slope
ans[3,4]<-sqrt(vcov(fit_WLRDB)[2,2]) # SE
ans[3,5] <- ans[3,6] <- ans[3,7] <- ans[3,8] <- 0
ans[3,9] <- (summary(fit_WLRDB)$sigma)^2
ans[3,10] <-summary(fit_WLRDB)$df[2]

#####
#####
# PWIGLS methods
#####
#####

# Calculate Stage 2 weights
AnnualReps<-table(dat$Site)
# inverse of proportion of years sampled
Stage2wt<-data.frame(Site=names(AnnualReps), Stage2wt=
mb/AnnualReps)[, -2]
names(Stage2wt)<-c("Site", "Stage2wt")
Stage2wt<-Stage2wt[!is.na(Stage2wt$Stage2wt),]
dat<-merge(dat, Stage2wt)

fit.PWIGLS<-vector(modelnum, mode="list")

for (m in 1:modelnum) {
fit.PWIGLS.m<-PWIGLS(Z=getME(fit_P0,"Z"), dat=dat, stage1wt="wgt",
stage2wt="Stage2wt",method=models[m],BS=BS,ML="ML", design=design,
fitP0=fit_P0)
ans[3+m,2]<- as.numeric(fit.PWIGLS.m[1]) # mu
ans[3+m,3]<- as.numeric(fit.PWIGLS.m[2]) # slope
ans[3+m,4]<-as.numeric(fit.PWIGLS.m[3]) # SE
ans[3+m,5]<- fit.PWIGLS.m[5] # var(ai)
ans[3+m,6]<- fit.PWIGLS.m[6] # var(ti)
ans[3+m,7]<- fit.PWIGLS.m[7] # cov(ai,ti)
ans[3+m,8]<- fit.PWIGLS.m[8] # var(bj)

```

```
    ans[3+m,9]<- fit.PWIGLS.m[9]      # var(eij)
    ans[3+m,10]<- ans[1,10]          # Using P0 df
  }

  return(ans)
}
```

```
#####
#####
#####
#####
# Function to calculate PWIGLS
#####
#####
#####
#####
PWIGLS<-function(Z, dat, stage1wt, stage2wt, method, BS, ML, design,
fitP0) {
# wrapper function for PWIGLS_ALL
# Obtains appropriate model, returns quantities for simulation
# mu, beta, SE(beta), sig2a, sig2b, sig2t, sigat, sig2e
# las 4.1.15

if(design!="StRS") {
fit.all<-PWIGLS_ALL(Z=Z, dat=dat, stage1wt=stage1wt,
stage2wt=stage2wt, method=method,BS=BS,ML=ML,design=design)
fit<-fit.all[[1]]
mu<- fixef(fit)[1] # intercept
beta<- fixef(fit)[2] # slope
df<-NA # Using P0 df in main fcn
sig2a<- VarCorr(fit)$Site[1,1] # var(ai)
sig2t<- VarCorr(fit)$Site[2,2] # var(ti)
sigat<- VarCorr(fit)$Site[1,2] # cov(ai,ti)
sig2b<- VarCorr(fit)$Year[1] # var(bj)
sig2e<- attr(VarCorr(fit),"sc")^2 # var(eij)
pvalue_chi<-fit.all[[2]]
# Linearization variance -- Pfeffermann 1988
varij = sig2a + sig2b + dat$WYear*sigat +(dat$WYear^2)*sig2t
+sig2e
SEbeta<-sqrt(LinearizationVar(Site=dat$Site,
wij=dat[, stage1wt]*dat[, stage2wt],
xij=dat$WYear,
eij=dat$LogY-mu-(beta*dat$WYear),
varYij=varij))
}

if(design=="StRS") {
fit.all<-PWIGLS_ALL(Z=Z, dat=dat, stage1wt=stage1wt,
stage2wt=stage2wt, method=method,BS=BS,ML=ML,design=design)
fit<-fit.all[[1]]
mu<- fixef(fit)[1] # intercept
betaHigh<- fixef(fit)[2] # slope of High stratum

```

```

    betaLow<- fixef(fit)[4]          # slope of Low stratum-slope of
High stratum
    beta=betaHigh + 0.1231672*betaLow
    df<-NA      # Using PO df in main fcn
    sig2a<- VarCorr(fit)$Site[1,1]      # var(ai)
    sig2t<- VarCorr(fit)$Site[2,2]      # var(ti)
    sigat<- VarCorr(fit)$Site[1,2]      # cov(ai,ti)
    sig2b<- VarCorr(fit)$Year[1]        # var(bj)
    sig2e<- attr(VarCorr(fit),"sc")^2    # var(eij)
    pvalue_chi<-fit.all[[2]]
# Linearization variance -- Pfeiffermann 1988
    varij = sig2a + sig2b + dat$WYear*sigat +(dat$WYear^2)*sig2t
+sig2e
    ILij = as.numeric(dat$Elev_Stratum=="Low")
    SEbeta<-sqrt(LinearizationVar_StRS(Site=dat$Site,
    wij=dat$wgt*dat$Stage2wt,
    xij=data.frame(dat$WYear, ILij),
    eij=dat$LogY-mu-(betaHigh*dat$WYear)-(fixef(fit)[3]*ILij)-
    (betaLow*dat$WYear*ILij), varYij=varij))
    }

return(data.frame(mu=mu, beta=beta, SEbeta=SEbeta, df=df, sig2a=sig2a, si
g2t=sig2t, sigat=sigat, sig2b=sig2b, sig2e=sig2e, pvalue_chi=pvalue_chi)
)
}

```

```
#####
#####
#####
#####
# Function to calculate PWIGLS by method
#####
#####
#####
#####
```

```
PWIGLS_ALL<-function(Z, dat, stage1wt, stage2wt, Sitename="Site",
method, BS,ML,design) {
```

```
  print(c("Method = ",method))
  # Use PWIGLS from Pfeiffermann et al 1998 and Asparouhov 2006
  # Note that PSU = Level 2 = Stage 1 ==> s2j is weighting adj factor
  # Note that SSU = Level 1 = Stage 2 ==> s1j is weighting adj factor
```

```
  dat$Site<-dat[,Sitename]
  SitesTables<-table(dat$Site)
  Sites<-unique(as.character(dat$Site))
  Years<-sort(unique(dat$Year))
  ma=length(Sites)
  mb=length(Years)
  AnnualSites<-names(SitesTables)[SitesTables==length(Years)]
```

```
  Z_PWIGLS<-Z
```

```
  sitecol<-length(unique(dat$Site))*2 # assume 2 random site effects
  sitecolindex<-sitecol/2
  d<-ncol(Z_PWIGLS)
```

```
  # Adjust RE design matrix with sqrt of site design weights
  for (j in 1:sitecolindex) {
    Site.j<-Sites[j]
    rows.j<-which(Z_PWIGLS[,colnames(Z_PWIGLS) %in% Site.j][,1]==1)
```

```
  if(method=="P0") {
    # Unweighted, no scaling
    s2j<-s1j<-1
    dat[rows.j,stage1wt]<-1
    dat[rows.j,stage2wt]<-1
  }
```

```
  # Pfeiffermann Step A only from Pfeiffermann et al. 1998, no scaling
```

```

if(method=="Aonly") s2j<-s1j<-1

if(method=="AI") {
  n.j<-length(rows.j)
  wj.bar<-sum(dat[rows.j, stage2wt])/n.j
  s2j<-wj.bar
  s1j<-1/wj.bar
}

if(method=="BI") {
  n0.j<-(sum(dat[rows.j, stage2wt])^2)/sum(dat[rows.j, stage2wt]^2)
  wj.tilde<-sum(dat[rows.j, stage2wt])/n0.j
  s2j<-wj.tilde
  s1j<-1/wj.tilde
}

# Asperouhov method A = Pfeffermann Step A, scaling 2 = method in
Kovacevic if(method=="A") {
  if(method=="A") {
    n.j<-length(rows.j)
    wj.bar<-sum(dat[rows.j, stage2wt])/n.j
    s2j<-1
    s1j<-1/wj.bar
  }
}

# Asperouhov method B = Pfeffermann Step A, scaling 1
if(method=="B") {
  n0.j<-(sum(dat[rows.j, stage2wt])^2)/sum(dat[rows.j, stage2wt]^2)
  wj.tilde<-sum(dat[rows.j, stage2wt])/n0.j
  s2j<-1
  s1j<-1/wj.tilde
}

# Asperouhov method C
if(method=="C") {
  s2j<-1
  n.j.sum<-sum(SitesTables) # check this
  wij.sum<-sum(dat[, stage2wt])
  s1j<-n.j.sum/wij.sum
}

# PSU weight adj
# multiply sqrt design weight by all cols
Z_PWIGLS[rows.j,]<-
Z_PWIGLS[rows.j,]/sqrt(dat[rows.j, stage1wt]*s2j)# SSU weight adj

```

```

# multiply panel wgt for year effects
if(ma>mb) Z_PWIGLS[rows.j, (sitecol+1):d]<-
Z_PWIGLS[rows.j, (sitecol+1):d]/(sqrt(dat[rows.j, stage2wt]*s1j))
if(ma<=mb) Z_PWIGLS[rows.j, 1:mb]<-
Z_PWIGLS[rows.j, 1:mb]/(sqrt(dat[rows.j, stage2wt]*s1j))

} # end site loop

if(ma>mb) {
A<-Z_PWIGLS[, seq(1, sitecol-1, 2)]
T<-Z_PWIGLS[, seq(2, sitecol, 2)]
B<-Z_PWIGLS[, (sitecol+1):d]
}

if(ma<=mb) {
A<-Z_PWIGLS[, mb+seq(1, sitecol-1, 2)]
T<-Z_PWIGLS[, mb+seq(2, sitecol, 2)]
B<-Z_PWIGLS[, 1:mb]
}

# Sum across rows to pick up each weight
dat$SiteWt<-rowSums(A)
dat$SlopeWt<-rowSums(T)
dat$YearWt<-rowSums(B)

if(design!="StRS") {
if(ML=="REML") fit.PWIGLS.0<-lmer(LogY ~ WYear +(-1+YearWt|Year) +(-
1+SiteWt+SlopeWt|Site), data=dat, control =
lmerControl(check.nobs.vs.nRE = "warning"))
if(ML=="ML") fit.PWIGLS.0<-lmer(LogY ~ WYear +(-1+YearWt|Year) +(-
1+SiteWt+SlopeWt|Site), data=dat, REML=FALSE, control =
lmerControl(check.nobs.vs.nRE = "warning"))

# Test trend with Chi square test: Pfeiffermann + LaVange FE
hypothesis test from Skinner et al. (1989, p.247)
C<-matrix(c(0,1),1,2)
slope<- matrix(fixef(fit.PWIGLS.0)[2],2,1)
varslope<-vcov(fit.PWIGLS.0)
Chi<-
as.numeric(t(C%*%slope)%*%solve(C%*%varslope%*%t(C))%*%C%*%slope)
pvalue_chi<-pchisq(Chi,1, lower.tail = FALSE)
}
if(design=="StRS") {

```

```

if(ML=="REML") fit.PWIGLS.0<-lmer(LogY ~ WYear*Elev_Stratum +(-
1+YearWt|Year) +(-1+SiteWt+SlopeWt|Site), data=dat, control =
lmerControl(check.nobs.vs.nRE = "warning"))
if(ML=="ML") fit.PWIGLS.0<-lmer(LogY ~ WYear*Elev_Stratum +(-
1+YearWt|Year) +(-1+SiteWt+SlopeWt|Site), data=dat, REML=FALSE,
control = lmerControl(check.nobs.vs.nRE = "warning"))

# Test trend with Chi square test: Pfeiffermann + LaVange FE
hypothesis test from Skinner et al. (1989, p.247)
  C<-matrix(c(0,1,0,0.1231672),1,4)      # weight to get popn trend
  slope<-
matrix(c(0,fixef(fit.PWIGLS.0)[2],0,fixef(fit.PWIGLS.0)[4]),4,1)
  varslope<-vcov(fit.PWIGLS.0)
  Chi<-
as.numeric(t(C*%slope)%solve(C*%varslope*%t(C))%C*%slope)
  pvalue_chi<-pchisq(Chi,1, lower.tail = FALSE)
}

return(list(fit.PWIGLS.0,pvalue_chi))
}

```

```

# Take out all list indices
# Format results into a table for comparison?
# Look for a subpopulation trend within elevational strata!

```

```

LinearizationVar <- function (Site,wij,xij,eij,varYij) {
# Calculate the linearization variance (Skinner et al. 1989 p. 82-
83)
# of the trend coefficient
# Inputs:
# Site = vector of PSU's
# wij = inclusion weight = PSU wt * SSU wt
# xij = year var for trend estimation
# eij = residual
# varYij = total variance for yij

dTdB0 = matrix(c(sum(wij/varYij),
sum(xij*wij/varYij),
sum(eij*wij*(xij^2)/(varYij^2)),
sum(xij*wij*eij/(varYij^2)),
sum(eij*wij/(varYij^2))),1,5)

dTdB1 = matrix(c(sum(xij*wij/varYij),

```

```

sum((xij^2)*wij/varYij),
sum(eij*wij*(xij^3)/(varYij^2)),
sum((xij^2)*wij*eij/(varYij^2)),
sum(xij*eij*wij/(varYij^2))),1,5)

dTdsig2t = matrix(c(sum(eij*wij*(xij^2)/(varYij^2)),
sum(wij*(xij^3)*eij/(varYij^2)),
sum((- (xij^4)*wij/(2*(varYij^2)))+(wij*(xij^4)*(eij^2)/(varYij^3))),
sum((- (xij^3)*wij/(2*(varYij^2)))+(wij*(xij^3)*(eij^2)/(varYij^3))),
sum((-
(xij^2)*wij/(2*(varYij^2)))+(xij^2)*wij*(eij^2)/(varYij^3)))),1,5)

dTdsigat = matrix(c(sum(eij*xij*wij/(varYij^2)),
sum(wij*(xij^2)*eij/(varYij^2)),
sum((- (xij^3)*wij/(2*(varYij^2)))+(xij^3)*wij*(eij^2)/(varYij^3))),
sum((- (xij^2)*wij/(2*(varYij^2)))+(xij^2)*wij*(eij^2)/(varYij^3))),
sum((-wij*xij/(2*(varYij^2)))+(wij*xij*(eij^2)/(varYij^3)))),1,5)

dTdsig2abe = matrix(c(sum(eij*wij/(varYij^2)),
sum(xij*wij*eij/(varYij^2)),
sum((- (xij^2)*wij/(2*(varYij^2)))+(wij*(xij^2)*(eij^2)/(varYij^3))),
sum((-wij*xij/(2*(varYij^2)))+(wij*xij*(eij^2)/(varYij^3))),
sum((-wij/(2*(varYij^2)))+(wij*(eij^2)/(varYij^3)))) ,1,5)

I.mat = rbind(dTdB0,dTdB1,dTdsig2t,dTdsigat,dTdsig2abe)
I.mat.inv = solve(I.mat)

g = aggregate(list(g1=eij*wij/varYij,
g2 = xij*eij*wij/varYij,
g3 = (((-wij*(xij^2)/(2*varYij))) +
(wij*(xij^2)*(eij^2))/(2*(varYij^2))),
g4 = (((-wij*xij/(2*varYij))) + (wij*xij*(eij^2))/(2*(varYij^2))),
g5 = (((-wij/(2*varYij))) + (wij*(eij^2))/(2*(varYij^2)))),
list(Site=Site), sum)

VarL.T = nrow(g)* var(g[,2:6])
VarL.Beta = I.mat.inv%%VarL.T%%I.mat.inv

return(VarL.Beta[2,2])
}

LinearizationVar_StRS <- function (Site,wij,xij,eij,varYij) {
# Calculate the linearization variance (Skinner et al. 1989 p. 82-
83)
# of the trend coefficient

```

```

# Inputs:
# Site = vector of PSU's
# wij = inclusion weight = PSU wt * SSU wt
# xij = year var for trend estimation
# eij = residual
# varYij = total variance for yij

ILij<-xij[,2]
xij<-xij[,1]

dTdB0 = matrix(c(sum(wij/varYij),
sum(xij*wij/varYij),
sum(eij*wij*(xij^2)/(varYij^2)),
sum(xij*wij*eij/(varYij^2)),
sum(eij*wij/(varYij^2)),
sum(wij*ILij/varYij),
sum(xij*wij*ILij/varYij)),1,7)

dTdB1 = matrix(c(sum(xij*wij/varYij),
sum((xij^2)*wij/varYij),
sum(eij*wij*(xij^3)/(varYij^2)),
sum((xij^2)*wij*eij/(varYij^2)),
sum(xij*eij*wij/(varYij^2)),
sum(xij*wij*ILij/varYij),
sum((xij^2)*wij*ILij/varYij)),1,7)

dTdsig2t = matrix(c(sum(eij*wij*(xij^2)/(varYij^2)),
sum(wij*(xij^3)*eij/(varYij^2)),
sum((- (xij^4)*wij/(2*(varYij^2)))+(wij*(xij^4)*(eij^2)/(varYij^3))),
sum((- (xij^3)*wij/(2*(varYij^2)))+(wij*(xij^3)*(eij^2)/(varYij^3))),
sum((- (xij^2)*wij/(2*(varYij^2)))+(xij^2)*wij*(eij^2)/(varYij^3))),
sum(eij*wij*(xij^2)*ILij/(varYij^2)),
sum(wij*(xij^3)*eij*ILij/(varYij^2))),1,7)

dTdsigat = matrix(c(sum(eij*xij*wij/(varYij^2)),
sum(wij*(xij^2)*eij/(varYij^2)),
sum((- (xij^3)*wij/(2*(varYij^2)))+(xij^3)*wij*(eij^2)/(varYij^3))),
sum((- (xij^2)*wij/(2*(varYij^2)))+(xij^2)*wij*(eij^2)/(varYij^3))),
sum((-wij*xij/(2*(varYij^2)))+(wij*xij*(eij^2)/(varYij^3))),
sum(eij*xij*wij*ILij/(varYij^2)),
sum(wij*(xij^2)*eij*ILij/(varYij^2))),1,7)

dTdsig2abe = matrix(c(sum(eij*wij/(varYij^2)),
sum(xij*wij*eij/(varYij^2)),
sum((- (xij^2)*wij/(2*(varYij^2)))+(wij*(xij^2)*(eij^2)/(varYij^3))),

```

```

sum((-wij*xij/(2*(varYij^2)))+(wij*xij*(eij^2)/(varYij^3))),
sum((-wij/(2*(varYij^2)))+(wij*(eij^2)/(varYij^3))),
sum(eij*wij*ILij/(varYij^2)),
sum(xij*wij*eij*ILij/(varYij^2))) ,1,7)

dTdB2 = matrix(c(sum(wij*ILij/varYij),
sum(xij*wij*ILij/varYij),
sum(eij*wij*(xij^2)*ILij/(varYij^2)),
sum(xij*wij*eij*ILij/(varYij^2)),
sum(eij*wij*ILij/(varYij^2)),
sum(wij*ILij*ILij/varYij),
sum(xij*wij*ILij*ILij/varYij)),1,7)

dTdB3 = matrix(c(sum(xij*wij*ILij/varYij),
sum((xij^2)*wij*ILij/varYij),
sum(eij*wij*(xij^3)*ILij/(varYij^2)),
sum((xij^2)*wij*eij*ILij/(varYij^2)),
sum(xij*eij*wij*ILij/(varYij^2)),
sum(xij*wij*ILij*ILij/varYij),
sum((xij^2)*wij*ILij*ILij/varYij)),1,7)

I.mat = rbind(dTdB0,dTdB1,dTdsig2t,dTdsigat,dTdsig2abe,dTdB2,dTdB3)
I.mat.inv = solve(I.mat)

g = aggregate(list(g1 = eij*wij/varYij,
g2 = xij*eij*wij/varYij,
g3 = (((-wij*(xij^2)/(2*varYij))) +
(wij*(xij^2)*(eij^2))/(2*(varYij^2))),
g4 = (((-wij*xij/(2*varYij))) + (wij*xij*(eij^2))/(2*(varYij^2))),
g5 = (((-wij/(2*varYij))) + (wij*(eij^2))/(2*(varYij^2))),
g6 = eij*wij*ILij/varYij,
g7 = xij*eij*wij*ILij/varYij),
list(Site=Site), sum)

VarL.T = nrow(g)* var(g[,2:8])
VarL.Beta = I.mat.inv%%VarL.T%%I.mat.inv

# Use a contrast to get the population level trend variance across
two strata
C<-matrix(c(0,1,0,0.1231672),1,4) # weight to get popn trend (note
beta4 is a difference in slopes)
VarC<-C%%VarL.Beta[c(1:2,6:7),c(1:2,6:7)]%*%t(C)
return(VarC)

}

```

ANC pilot data from Sequoia-Kings Canyon National Park

```
SEKIANC_Example <-  
structure(list(Site = structure(c(1L, 1L, 1L, 1L, 1L, 1L, 2L,  
2L, 2L, 2L, 2L, 3L, 3L, 3L, 3L, 3L, 3L, 4L, 4L, 4L, 4L, 4L, 4L,  
5L, 5L, 5L, 5L, 5L, 5L, 7L, 7L, 8L, 8L, 9L, 9L, 10L, 10L, 11L,  
11L, 12L, 12L, 13L, 13L, 15L, 15L, 16L, 16L, 17L, 18L, 19L, 20L,  
21L, 22L, 23L, 24L, 25L, 26L, 27L, 28L, 29L, 31L, 32L, 33L, 34L,  
35L, 36L, 37L, 38L, 39L, 40L, 41L, 42L, 43L, 44L, 46L, 47L, 48L,  
49L, 51L, 51L), .Label = c("SEKI_Lake-001", "SEKI_Lake-002",  
"SEKI_Lake-003", "SEKI_Lake-004", "SEKI_Lake-005", "SEKI_Lake-006",  
"SEKI_Lake-007", "SEKI_Lake-008", "SEKI_Lake-009", "SEKI_Lake-010",  
"SEKI_Lake-011", "SEKI_Lake-012", "SEKI_Lake-013", "SEKI_Lake-014",  
"SEKI_Lake-015", "SEKI_Lake-016", "SEKI_Lake-017", "SEKI_Lake-018",  
"SEKI_Lake-019", "SEKI_Lake-020", "SEKI_Lake-021", "SEKI_Lake-022",  
"SEKI_Lake-023", "SEKI_Lake-024", "SEKI_Lake-025", "SEKI_Lake-026",  
"SEKI_Lake-027", "SEKI_Lake-028", "SEKI_Lake-029", "SEKI_Lake-030",  
"SEKI_Lake-031", "SEKI_Lake-032", "SEKI_Lake-033", "SEKI_Lake-034",  
"SEKI_Lake-035", "SEKI_Lake-036", "SEKI_Lake-037", "SEKI_Lake-038",  
"SEKI_Lake-039", "SEKI_Lake-040", "SEKI_Lake-041", "SEKI_Lake-042",  
"SEKI_Lake-043", "SEKI_Lake-044", "SEKI_Lake-045", "SEKI_Lake-046",  
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# Estimate trend for pilot data with all approaches
require(lme4)
require(spsurvey)
require(lmerTest)
TrendEsts(SEKIANC_Example, "Unequal")

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Supplement B: Simulation Results

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Table SB1. Relative bias of the ANC trend slope estimate. Cells with values indicating more than 5% bias in a negative or positive direction are also shaded.

Years	Trend (p)	Subpop Trend	True Slope	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	0.02	SRS	1-0	1	20	-0.65%	4.83%	0.41%	-0.65%	-0.65%	-0.65%	-0.65%	-0.65%	-0.65%
12	0.02	0	0.02	SRS	1-0	1	35	-0.79%	3.91%	0.72%	-0.79%	-0.79%	-0.79%	-0.79%	-0.79%	-0.79%
12	0.02	0	0.02	SRS	1-0	1	50	-0.68%	4.39%	0.94%	-0.68%	-0.68%	-0.68%	-0.68%	-0.68%	-0.68%
12	0.02	0	0.02	SRS	1-0	2	20	1.43%	5.98%	-1.83%	1.19%	1.43%	1.17%	1.43%	1.17%	1.19%
12	0.02	0	0.02	SRS	1-0	2	35	3.11%	8.74%	3.52%	3.74%	3.11%	3.76%	3.11%	3.76%	3.74%
12	0.02	0	0.02	SRS	1-0	2	50	1.55%	6.97%	4.56%	0.94%	1.55%	0.91%	1.55%	0.91%	0.94%
12	0.02	0	0.02	SRS	1-0,1-3	1	20	5.00%	8.69%	5.57%	4.44%	5.00%	4.33%	5.00%	4.33%	4.44%
12	0.02	0	0.02	SRS	1-0,1-3	1	35	4.17%	10.53%	5.37%	5.65%	4.17%	5.66%	4.17%	5.66%	5.65%
12	0.02	0	0.02	SRS	1-0,1-3	1	50	3.25%	8.36%	5.67%	4.65%	3.25%	4.72%	3.25%	4.72%	4.65%
12	0.02	0	0.02	SRS	1-0,1-3	2	20	0.12%	5.74%	8.71%	-1.53%	0.11%	-1.70%	0.11%	-1.70%	-1.53%
12	0.02	0	0.02	SRS	1-0,1-3	2	35	-1.01%	4.80%	8.61%	-2.30%	-1.01%	-2.22%	-1.01%	-2.22%	-2.30%
12	0.02	0	0.02	SRS	1-0,1-3	2	50	-0.79%	4.61%	7.29%	-3.00%	-0.80%	-2.98%	-0.80%	-2.98%	-3.00%
12	0.02	0	0.02	SRS	1-3	1	20	-1.34%	4.84%	4.59%	-1.38%	-1.38%	-1.38%	-1.38%	-1.38%	-1.38%
12	0.02	0	0.02	SRS	1-3	1	35	-1.65%	3.22%	5.77%	-1.63%	-1.63%	-1.63%	-1.63%	-1.63%	-1.63%
12	0.02	0	0.02	SRS	1-3	1	50	-1.70%	3.78%	4.73%	-1.70%	-1.70%	-1.70%	-1.70%	-1.70%	-1.70%
12	0.02	0	0.02	SRS	1-3	2	20	-1.25%	1.68%	-3.14%	-2.41%	-1.18%	-2.38%	-1.18%	-2.38%	-2.41%
12	0.02	0	0.02	SRS	1-3	2	35	-2.37%	1.58%	-1.56%	-1.87%	-2.29%	-1.85%	-2.29%	-1.85%	-1.87%
12	0.02	0	0.02	SRS	1-3	2	50	-1.05%	5.12%	1.31%	-0.60%	-1.08%	-0.53%	-1.08%	-0.53%	-0.60%
12	0.02	0	0.02	StRS	1-0	1	20	-1.42%	2.90%	6.36%	-3.66%	-3.66%	-3.66%	-3.66%	-3.66%	-3.66%
12	0.02	0	0.02	StRS	1-0	1	35	-0.33%	3.90%	4.88%	-3.62%	-3.62%	-3.62%	-3.62%	-3.62%	-3.62%
12	0.02	0	0.02	StRS	1-0	1	50	-0.93%	4.68%	6.00%	-2.20%	-2.20%	-2.20%	-2.20%	-2.20%	-2.20%
12	0.02	0	0.02	StRS	1-0	2	20	-0.74%	1.37%	0.37%	-3.66%	-3.58%	-3.60%	-3.58%	-3.60%	-3.66%
12	0.02	0	0.02	StRS	1-0	2	35	-0.51%	3.65%	-0.42%	-2.56%	-2.65%	-2.74%	-2.65%	-2.74%	-2.55%
12	0.02	0	0.02	StRS	1-0	2	50	-0.89%	3.12%	0.41%	-2.46%	-2.63%	-2.48%	-2.63%	-2.48%	-2.46%
12	0.02	0	0.02	StRS	1-0,1-3	1	20	-0.05%	3.57%	-0.55%	-1.45%	-3.01%	-1.38%	-3.01%	-1.38%	-1.45%

Table SB1 (continued). Relative bias of the ANC trend slope estimate. Cells with values indicating more than 5% bias in a negative or positive direction are also shaded.

Years	Trend (p)	Subpop Trend	True Slope	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	0.02	StRS	1-0,1-3	1	35	0.53%	5.85%	0.81%	-1.53%	-2.66%	-1.47%	-2.66%	-1.47%	-1.53%
12	0.02	0	0.02	StRS	1-0,1-3	1	50	1.60%	8.16%	0.25%	1.19%	-0.24%	1.18%	-0.24%	1.18%	1.19%
12	0.02	0	0.02	StRS	1-0,1-3	2	20	-0.33%	5.55%	1.33%	-0.09%	0.02%	-0.04%	0.02%	-0.04%	-0.09%
12	0.02	0	0.02	StRS	1-0,1-3	2	35	0.03%	5.47%	0.43%	0.42%	0.40%	0.09%	0.40%	0.09%	0.42%
12	0.02	0	0.02	StRS	1-0,1-3	2	50	-0.73%	3.82%	1.03%	0.18%	1.23%	-0.33%	1.23%	-0.33%	0.18%
12	0.02	0	0.02	StRS	1-3	1	20	-1.91%	0.02%	6.03%	-4.90%	-4.72%	-4.90%	-4.72%	-4.90%	-4.72%
12	0.02	0	0.02	StRS	1-3	1	35	-2.80%	2.63%	4.89%	-6.08%	-6.09%	-6.09%	-6.09%	-6.09%	-6.09%
12	0.02	0	0.02	StRS	1-3	1	50	-1.98%	4.08%	8.79%	-6.25%	-6.25%	-6.25%	-6.25%	-6.25%	-6.25%
12	0.02	0	0.02	StRS	1-3	2	20	0.33%	8.93%	0.98%	1.57%	2.10%	1.73%	2.10%	1.73%	1.68%
12	0.02	0	0.02	StRS	1-3	2	35	0.78%	7.07%	-1.58%	1.60%	1.59%	1.58%	1.59%	1.58%	1.60%
12	0.02	0	0.02	StRS	1-3	2	50	0.13%	6.21%	1.74%	-0.69%	-0.63%	-0.64%	-0.63%	-0.64%	-0.69%
12	0.02	0	0.02	Unequal	1-0	1	20	0.11%	5.37%	3.27%	0.55%	0.55%	0.55%	0.55%	0.55%	0.55%
12	0.02	0	0.02	Unequal	1-0	1	35	0.59%	6.23%	4.49%	1.04%	1.04%	1.04%	1.04%	1.04%	1.04%
12	0.02	0	0.02	Unequal	1-0	1	50	0.82%	6.09%	2.24%	1.80%	1.80%	1.80%	1.80%	1.80%	1.80%
12	0.02	0	0.02	Unequal	1-0	2	20	-0.33%	3.06%	2.30%	-0.70%	-0.44%	-0.66%	-0.44%	-0.66%	-0.70%
12	0.02	0	0.02	Unequal	1-0	2	35	-0.13%	4.48%	7.08%	0.93%	0.85%	0.92%	0.85%	0.92%	0.93%
12	0.02	0	0.02	Unequal	1-0	2	50	0.25%	5.15%	3.69%	1.69%	1.52%	1.67%	1.52%	1.67%	1.69%
12	0.02	0	0.02	Unequal	1-0,1-3	1	20	1.46%	5.80%	0.76%	3.79%	1.51%	3.75%	1.51%	3.75%	3.79%
12	0.02	0	0.02	Unequal	1-0,1-3	1	35	2.48%	5.07%	5.24%	2.76%	1.90%	2.81%	1.90%	2.81%	2.76%
12	0.02	0	0.02	Unequal	1-0,1-3	1	50	2.61%	7.17%	5.67%	2.12%	2.32%	2.15%	2.32%	2.15%	2.12%
12	0.02	0	0.02	Unequal	1-0,1-3	2	20	0.62%	3.42%	3.42%	-1.40%	-0.66%	-1.21%	-0.66%	-1.21%	-1.40%
12	0.02	0	0.02	Unequal	1-0,1-3	2	35	0.46%	5.96%	-4.36%	0.20%	-0.02%	0.36%	-0.02%	0.36%	0.20%
12	0.02	0	0.02	Unequal	1-0,1-3	2	50	0.60%	4.30%	-2.49%	-0.86%	-2.21%	-0.88%	-2.21%	-0.88%	-0.86%
12	0.02	0	0.02	Unequal	1-3	1	20	1.07%	3.87%	4.53%	0.28%	0.28%	0.28%	0.28%	0.28%	0.28%
12	0.02	0	0.02	Unequal	1-3	1	35	0.70%	3.17%	2.18%	1.93%	1.93%	1.93%	1.93%	1.93%	1.93%

Table SB1 (continued). Relative bias of the ANC trend slope estimate. Cells with values indicating more than 5% bias in a negative or positive direction are also shaded.

Years	Trend (p)	Subpop Trend	True Slope	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	0.02	Unequal	1-3	1	50	1.09%	6.18%	2.08%	2.58%	2.58%	2.58%	2.58%	2.58%	2.58%
12	0.02	0	0.02	Unequal	1-3	2	20	1.28%	3.28%	2.56%	0.25%	0.25%	0.27%	0.25%	0.27%	0.27%
12	0.02	0	0.02	Unequal	1-3	2	35	1.14%	4.09%	5.19%	0.13%	0.12%	0.12%	0.12%	0.12%	0.13%
12	0.02	0	0.02	Unequal	1-3	2	50	1.87%	6.50%	8.12%	2.02%	2.25%	2.00%	2.25%	2.00%	2.02%
12	0.02	0.04	0.05	SRS	1-0	1	20	-1.37%	2.30%	3.02%	-1.37%	-1.37%	-1.37%	-1.37%	-1.37%	-1.37%
12	0.02	0.04	0.05	SRS	1-0	1	35	-0.95%	2.27%	2.30%	-0.95%	-0.95%	-0.95%	-0.95%	-0.95%	-0.95%
12	0.02	0.04	0.05	SRS	1-0	1	50	-1.22%	2.09%	2.55%	-1.22%	-1.22%	-1.22%	-1.22%	-1.22%	-1.22%
12	0.02	0.04	0.05	SRS	1-0	2	20	-0.24%	2.96%	0.08%	-0.20%	-0.23%	-0.17%	-0.23%	-0.17%	-0.20%
12	0.02	0.04	0.05	SRS	1-0	2	35	0.30%	3.61%	1.14%	0.54%	0.30%	0.58%	0.30%	0.58%	0.54%
12	0.02	0.04	0.05	SRS	1-0	2	50	-0.02%	3.33%	1.51%	-0.19%	-0.02%	-0.21%	-0.02%	-0.21%	-0.19%
12	0.02	0.04	0.05	SRS	1-0,1-3	1	20	-0.71%	2.50%	3.09%	-0.36%	-0.71%	-0.49%	-0.71%	-0.49%	-0.36%
12	0.02	0.04	0.05	SRS	1-0,1-3	1	35	-0.71%	2.58%	4.41%	0.30%	-0.71%	-0.04%	-0.71%	-0.04%	0.30%
12	0.02	0.04	0.05	SRS	1-0,1-3	1	50	-0.57%	2.41%	3.46%	-0.23%	-0.57%	-0.44%	-0.57%	-0.44%	-0.23%
12	0.02	0.04	0.05	SRS	1-0,1-3	2	20	1.11%	3.30%	1.01%	1.10%	1.11%	1.18%	1.11%	1.18%	1.10%
12	0.02	0.04	0.05	SRS	1-0,1-3	2	35	0.67%	3.64%	1.88%	0.91%	0.67%	0.72%	0.67%	0.72%	0.91%
12	0.02	0.04	0.05	SRS	1-0,1-3	2	50	1.01%	4.77%	1.29%	0.81%	1.02%	0.77%	1.02%	0.77%	0.81%
12	0.02	0.04	0.05	SRS	1-3	1	20	-2.90%	0.16%	3.00%	-2.89%	-2.89%	-2.89%	-2.89%	-2.89%	-2.89%
12	0.02	0.04	0.05	SRS	1-3	1	35	-2.12%	1.37%	3.97%	-2.11%	-2.11%	-2.11%	-2.11%	-2.11%	-2.11%
12	0.02	0.04	0.05	SRS	1-3	1	50	-1.73%	1.96%	2.86%	-1.76%	-1.76%	-1.76%	-1.76%	-1.76%	-1.76%
12	0.02	0.04	0.05	SRS	1-3	2	20	-0.62%	2.24%	-0.27%	-0.99%	-0.64%	-1.00%	-0.64%	-1.00%	-0.99%
12	0.02	0.04	0.05	SRS	1-3	2	35	-0.59%	2.72%	1.51%	-0.30%	-0.60%	-0.28%	-0.60%	-0.28%	-0.30%
12	0.02	0.04	0.05	SRS	1-3	2	50	-0.57%	2.85%	0.63%	-0.70%	-0.58%	-0.73%	-0.58%	-0.73%	-0.70%
12	0.02	0.04	0.05	StRS	1-0	1	20	0.95%	6.79%	3.51%	0.95%	0.95%	0.95%	0.95%	0.95%	0.95%
12	0.02	0.04	0.05	StRS	1-0	1	35	1.19%	7.52%	3.47%	1.19%	1.19%	1.19%	1.19%	1.19%	1.19%
12	0.02	0.04	0.05	StRS	1-0	1	50	1.25%	7.35%	4.15%	1.25%	1.25%	1.25%	1.25%	1.25%	1.25%

Table SB1 (continued). Relative bias of the ANC trend slope estimate. Cells with values indicating more than 5% bias in a negative or positive direction are also shaded.

Years	Trend (p)	Subpop Trend	True Slope	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0.04	0.05	StRS	1-0	2	20	-0.35%	5.00%	1.99%	-0.30%	-0.38%	-0.30%	-0.38%	-0.30%	-0.30%
12	0.02	0.04	0.05	StRS	1-0	2	35	-0.46%	5.22%	2.16%	-0.47%	-0.48%	-0.47%	-0.48%	-0.47%	-0.47%
12	0.02	0.04	0.05	StRS	1-0	2	50	-0.22%	5.57%	2.70%	-0.17%	-0.25%	-0.17%	-0.25%	-0.17%	-0.17%
12	0.02	0.04	0.05	StRS	1-0,1-3	1	20	0.95%	6.77%	2.10%	1.13%	0.98%	1.11%	0.98%	1.11%	1.13%
12	0.02	0.04	0.05	StRS	1-0,1-3	1	35	1.20%	6.90%	3.03%	1.02%	1.23%	1.02%	1.23%	1.02%	1.02%
12	0.02	0.04	0.05	StRS	1-0,1-3	1	50	1.39%	7.45%	3.24%	1.06%	1.41%	1.09%	1.41%	1.09%	1.06%
12	0.02	0.04	0.05	StRS	1-0,1-3	2	20	-1.05%	4.87%	3.27%	-1.01%	-1.04%	-1.01%	-1.04%	-1.01%	-1.01%
12	0.02	0.04	0.05	StRS	1-0,1-3	2	35	-1.18%	5.28%	3.67%	-1.35%	-1.26%	-1.38%	-1.26%	-1.38%	-1.35%
12	0.02	0.04	0.05	StRS	1-0,1-3	2	50	-1.18%	4.27%	4.81%	-1.21%	-1.32%	-1.25%	-1.32%	-1.25%	-1.21%
12	0.02	0.04	0.05	StRS	1-3	1	20	0.47%	6.82%	1.96%	0.36%	0.36%	0.36%	0.36%	0.36%	0.36%
12	0.02	0.04	0.05	StRS	1-3	1	35	0.27%	5.55%	2.33%	0.20%	0.20%	0.20%	0.20%	0.20%	0.20%
12	0.02	0.04	0.05	StRS	1-3	1	50	0.08%	5.51%	3.26%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%
12	0.02	0.04	0.05	StRS	1-3	2	20	-1.22%	4.19%	0.49%	-1.20%	-1.21%	-1.21%	-1.21%	-1.21%	-1.20%
12	0.02	0.04	0.05	StRS	1-3	2	35	-1.37%	3.18%	2.96%	-1.32%	-1.29%	-1.33%	-1.29%	-1.33%	-1.32%
12	0.02	0.04	0.05	StRS	1-3	2	50	-1.29%	4.91%	2.96%	-1.26%	-1.22%	-1.25%	-1.22%	-1.25%	-1.26%
12	0.02	0.04	0.05	Unequal	1-0	1	20	-7.38%	2.91%	0.60%	4.49%	4.49%	4.49%	4.49%	4.49%	4.49%
12	0.02	0.04	0.05	Unequal	1-0	1	35	-6.25%	3.81%	1.67%	7.65%	7.65%	7.65%	7.65%	7.65%	7.65%
12	0.02	0.04	0.05	Unequal	1-0	1	50	-7.19%	3.92%	1.75%	9.21%	9.21%	9.21%	9.21%	9.21%	9.21%
12	0.02	0.04	0.05	Unequal	1-0	2	20	-6.69%	2.86%	-1.20%	4.98%	5.12%	4.96%	5.12%	4.96%	4.98%
12	0.02	0.04	0.05	Unequal	1-0	2	35	-6.09%	3.44%	-0.40%	7.76%	8.04%	7.71%	8.04%	7.71%	7.76%
12	0.02	0.04	0.05	Unequal	1-0	2	50	-6.52%	4.34%	0.03%	9.48%	9.69%	9.45%	9.69%	9.45%	9.48%
12	0.02	0.04	0.05	Unequal	1-0,1-3	1	20	-6.53%	2.91%	-0.19%	0.78%	6.84%	-0.11%	6.84%	-0.11%	0.78%
12	0.02	0.04	0.05	Unequal	1-0,1-3	1	35	-6.46%	5.18%	2.20%	3.58%	11.15%	3.77%	11.15%	3.77%	3.58%
12	0.02	0.04	0.05	Unequal	1-0,1-3	1	50	-6.68%	3.76%	1.92%	4.92%	11.74%	5.96%	11.74%	5.96%	4.92%
12	0.02	0.04	0.05	Unequal	1-0,1-3	2	20	-7.19%	0.60%	-0.13%	-0.67%	5.53%	-1.80%	5.53%	-1.80%	-0.67%

Table SB1 (continued). Relative bias of the ANC trend slope estimate. Cells with values indicating more than 5% bias in a negative or positive direction are also shaded.

Years	Trend (p)	Subpop Trend	True Slope	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0.04	0.05	Unequal	1-0,1-3	2	35	-7.72%	1.72%	0.18%	0.87%	9.17%	0.73%	9.17%	0.73%	0.87%
12	0.02	0.04	0.05	Unequal	1-0,1-3	2	50	-7.91%	2.13%	-0.34%	2.01%	10.41%	2.65%	10.41%	2.65%	2.01%
12	0.02	0.04	0.05	Unequal	1-3	1	20	-5.57%	4.66%	-1.32%	9.87%	9.87%	9.87%	9.87%	9.87%	9.87%
12	0.02	0.04	0.05	Unequal	1-3	1	35	-5.58%	4.19%	0.76%	11.94%	11.94%	11.94%	11.94%	11.94%	11.94%
12	0.02	0.04	0.05	Unequal	1-3	1	50	-5.80%	4.51%	-0.36%	14.15%	14.15%	14.15%	14.15%	14.15%	14.15%
12	0.02	0.04	0.05	Unequal	1-3	2	20	-5.69%	1.89%	-3.66%	9.22%	9.66%	9.19%	9.66%	9.19%	9.22%
12	0.02	0.04	0.05	Unequal	1-3	2	35	-5.62%	4.22%	-0.02%	11.52%	12.10%	11.49%	12.10%	11.49%	11.52%
12	0.02	0.04	0.05	Unequal	1-3	2	50	-5.15%	5.24%	-1.16%	12.96%	13.65%	12.97%	13.65%	12.97%	12.96%
24	0.01	0	0.01	SRS	1-0	1	20	1.64%	17.24%	17.34%	1.64%	1.64%	1.64%	1.64%	1.64%	1.64%
24	0.01	0	0.01	SRS	1-0	1	35	2.09%	18.11%	18.29%	2.09%	2.09%	2.09%	2.09%	2.09%	2.09%
24	0.01	0	0.01	SRS	1-0	1	50	0.85%	17.30%	15.68%	0.85%	0.85%	0.85%	0.85%	0.85%	0.85%
24	0.01	0	0.01	SRS	1-0	2	20	-0.79%	15.21%	13.15%	-0.85%	-0.79%	-0.85%	-0.79%	-0.85%	-0.85%
24	0.01	0	0.01	SRS	1-0	2	35	-0.33%	16.84%	14.43%	-0.43%	-0.33%	-0.47%	-0.33%	-0.47%	-0.43%
24	0.01	0	0.01	SRS	1-0	2	50	-3.23%	13.78%	14.99%	-3.10%	-3.23%	-3.08%	-3.23%	-3.08%	-3.10%
24	0.01	0	0.01	SRS	1-0,1-3	1	20	-1.12%	14.56%	12.81%	-0.38%	-1.13%	-0.37%	-1.13%	-0.37%	-0.38%
24	0.01	0	0.01	SRS	1-0,1-3	1	35	-0.90%	14.89%	14.82%	-1.62%	-0.90%	-1.39%	-0.90%	-1.39%	-1.62%
24	0.01	0	0.01	SRS	1-0,1-3	1	50	-0.91%	15.60%	16.04%	0.70%	-0.91%	-0.06%	-0.91%	-0.06%	0.70%
24	0.01	0	0.01	SRS	1-0,1-3	2	20	1.28%	16.82%	12.32%	0.66%	1.27%	0.70%	1.27%	0.70%	0.66%
24	0.01	0	0.01	SRS	1-0,1-3	2	35	-0.66%	15.92%	16.30%	-0.97%	-0.67%	-1.16%	-0.67%	-1.16%	-0.97%
24	0.01	0	0.01	SRS	1-0,1-3	2	50	-0.61%	15.27%	11.70%	-2.03%	-0.61%	-1.67%	-0.61%	-1.67%	-2.03%
24	0.01	0	0.01	SRS	1-3	1	20	0.40%	15.05%	12.01%	0.40%	0.40%	0.40%	0.40%	0.40%	0.40%
24	0.01	0	0.01	SRS	1-3	1	35	1.21%	17.67%	12.32%	1.19%	1.19%	1.19%	1.19%	1.19%	1.19%
24	0.01	0	0.01	SRS	1-3	1	50	0.41%	16.79%	13.69%	0.41%	0.41%	0.41%	0.41%	0.41%	0.41%
24	0.01	0	0.01	SRS	1-3	2	20	1.00%	18.01%	10.74%	0.87%	1.00%	0.86%	1.00%	0.86%	0.87%
24	0.01	0	0.01	SRS	1-3	2	35	0.73%	17.13%	12.72%	0.63%	0.74%	0.57%	0.74%	0.57%	0.63%

Table SB1 (continued). Relative bias of the ANC trend slope estimate. Cells with values indicating more than 5% bias in a negative or positive direction are also shaded.

Years	Trend (p)	Subpop Trend	True Slope	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0	0.01	SRS	1-3	2	50	0.57%	17.46%	14.30%	0.45%	0.57%	0.43%	0.57%	0.43%	0.45%
24	0.01	0	0.01	StRS	1-0	1	20	-0.57%	16.17%	14.22%	0.82%	0.82%	0.82%	0.82%	0.82%	0.82%
24	0.01	0	0.01	StRS	1-0	1	35	1.63%	18.84%	14.18%	2.56%	2.56%	2.56%	2.56%	2.56%	2.56%
24	0.01	0	0.01	StRS	1-0	1	50	-0.50%	15.88%	13.36%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%
24	0.01	0	0.01	StRS	1-0	2	20	-1.97%	15.39%	15.90%	-1.14%	-1.14%	-1.33%	-1.14%	-1.33%	-1.14%
24	0.01	0	0.01	StRS	1-0	2	35	-0.39%	16.25%	16.22%	0.71%	0.70%	0.70%	0.70%	0.70%	0.71%
24	0.01	0	0.01	StRS	1-0	2	50	0.15%	17.36%	16.69%	1.41%	1.38%	1.39%	1.38%	1.39%	1.41%
24	0.01	0	0.01	StRS	1-0,1-3	1	20	0.57%	15.98%	11.50%	-0.65%	-0.91%	-0.30%	-0.91%	-0.30%	-0.65%
24	0.01	0	0.01	StRS	1-0,1-3	1	35	1.10%	16.59%	11.97%	0.80%	1.01%	0.85%	1.01%	0.85%	0.80%
24	0.01	0	0.01	StRS	1-0,1-3	1	50	0.70%	17.18%	10.20%	1.18%	0.93%	1.11%	0.93%	1.11%	1.18%
24	0.01	0	0.01	StRS	1-0,1-3	2	20	0.80%	14.52%	11.75%	0.25%	0.20%	0.27%	0.20%	0.27%	0.25%
24	0.01	0	0.01	StRS	1-0,1-3	2	35	0.98%	18.51%	11.88%	1.13%	1.76%	0.88%	1.76%	0.90%	1.13%
24	0.01	0	0.01	StRS	1-0,1-3	2	50	0.70%	17.56%	13.10%	0.41%	0.74%	0.39%	0.74%	0.39%	0.41%
24	0.01	0	0.01	StRS	1-3	1	20	1.28%	17.37%	9.40%	2.94%	2.94%	2.94%	2.94%	2.94%	2.94%
24	0.01	0	0.01	StRS	1-3	1	35	1.05%	17.43%	11.01%	2.61%	2.61%	2.61%	2.61%	2.61%	2.61%
24	0.01	0	0.01	StRS	1-3	1	50	-0.08%	17.56%	11.84%	1.66%	1.66%	1.66%	1.66%	1.66%	1.66%
24	0.01	0	0.01	StRS	1-3	2	20	0.40%	14.20%	7.15%	1.77%	1.73%	1.80%	1.73%	1.80%	1.77%
24	0.01	0	0.01	StRS	1-3	2	35	0.28%	15.86%	8.32%	1.20%	1.25%	1.21%	1.25%	1.21%	1.20%
24	0.01	0	0.01	StRS	1-3	2	50	-0.50%	16.27%	11.74%	0.43%	0.51%	0.43%	0.51%	0.43%	0.43%
24	0.01	0	0.01	Unequal	1-0	1	20	-1.31%	12.75%	18.16%	-2.18%	-2.18%	-2.18%	-2.18%	-2.18%	-2.18%
24	0.01	0	0.01	Unequal	1-0	1	35	-1.08%	16.21%	17.34%	1.42%	1.42%	1.42%	1.42%	1.42%	1.42%
24	0.01	0	0.01	Unequal	1-0	1	50	-0.36%	15.99%	16.82%	0.60%	0.60%	0.60%	0.60%	0.60%	0.60%
24	0.01	0	0.01	Unequal	1-0	2	20	0.19%	12.11%	12.32%	-0.55%	-0.59%	-0.57%	-0.59%	-0.57%	-0.55%
24	0.01	0	0.01	Unequal	1-0	2	35	-0.06%	13.98%	11.34%	-2.26%	-2.27%	-2.10%	-2.27%	-2.10%	-2.26%
24	0.01	0	0.01	Unequal	1-0	2	50	-0.34%	16.22%	12.38%	0.54%	0.61%	0.51%	0.61%	0.51%	0.54%

Table SB1 (continued). Relative bias of the ANC trend slope estimate. Cells with values indicating more than 5% bias in a negative or positive direction are also shaded.

Years	Trend (p)	Subpop Trend	True Slope	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0	0.01	Unequal	1-0,1-3	1	20	0.12%	12.87%	10.66%	-0.34%	-0.57%	0.11%	-0.57%	0.11%	-0.34%
24	0.01	0	0.01	Unequal	1-0,1-3	1	35	0.79%	14.35%	10.72%	0.24%	-0.20%	0.00%	-0.20%	0.00%	0.24%
24	0.01	0	0.01	Unequal	1-0,1-3	1	50	-0.28%	16.32%	12.60%	0.14%	0.26%	0.13%	0.26%	0.13%	0.14%
24	0.01	0	0.01	Unequal	1-0,1-3	2	20	2.67%	16.97%	5.04%	2.46%	1.88%	2.84%	1.88%	2.84%	2.46%
24	0.01	0	0.01	Unequal	1-0,1-3	2	35	2.19%	18.75%	7.32%	2.80%	2.20%	2.92%	2.20%	2.92%	2.80%
24	0.01	0	0.01	Unequal	1-0,1-3	2	50	2.17%	17.44%	7.47%	3.59%	3.38%	3.46%	3.38%	3.46%	3.59%
24	0.01	0	0.01	Unequal	1-3	1	20	2.43%	16.85%	4.44%	3.23%	3.23%	3.23%	3.23%	3.23%	3.23%
24	0.01	0	0.01	Unequal	1-3	1	35	2.43%	17.05%	6.72%	0.34%	0.34%	0.34%	0.34%	0.34%	0.34%
24	0.01	0	0.01	Unequal	1-3	1	50	2.14%	16.82%	5.83%	2.54%	2.54%	2.54%	2.54%	2.54%	2.54%
24	0.01	0	0.01	Unequal	1-3	2	20	1.65%	17.49%	3.30%	0.91%	0.93%	0.85%	0.93%	0.85%	0.91%
24	0.01	0	0.01	Unequal	1-3	2	35	1.98%	17.79%	5.72%	1.11%	1.17%	1.13%	1.17%	1.13%	1.11%
24	0.01	0	0.01	Unequal	1-3	2	50	1.94%	17.56%	6.17%	1.21%	1.09%	1.19%	1.09%	1.19%	1.21%
24	0.01	0.04	0.04	SRS	1-0	1	20	0.01%	6.96%	5.15%	0.01%	0.01%	0.01%	0.01%	0.01%	0.01%
24	0.01	0.04	0.04	SRS	1-0	1	35	0.02%	7.46%	5.37%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%
24	0.01	0.04	0.04	SRS	1-0	1	50	0.16%	7.24%	5.65%	0.16%	0.16%	0.16%	0.16%	0.16%	0.16%
24	0.01	0.04	0.04	SRS	1-0	2	20	0.01%	6.76%	2.86%	0.03%	0.01%	0.02%	0.01%	0.02%	0.03%
24	0.01	0.04	0.04	SRS	1-0	2	35	-0.05%	7.03%	3.85%	-0.05%	-0.05%	-0.04%	-0.05%	-0.04%	-0.05%
24	0.01	0.04	0.04	SRS	1-0	2	50	0.23%	7.37%	3.68%	0.13%	0.23%	0.06%	0.23%	0.06%	0.13%
24	0.01	0.04	0.04	SRS	1-0,1-3	1	20	-0.15%	6.59%	4.91%	-0.06%	-0.15%	-0.05%	-0.15%	-0.05%	-0.06%
24	0.01	0.04	0.04	SRS	1-0,1-3	1	35	0.22%	6.99%	5.29%	0.34%	0.22%	0.35%	0.22%	0.35%	0.34%
24	0.01	0.04	0.04	SRS	1-0,1-3	1	50	0.02%	6.93%	5.20%	0.19%	0.02%	0.16%	0.02%	0.16%	0.19%
24	0.01	0.04	0.04	SRS	1-0,1-3	2	20	-0.24%	6.63%	5.30%	-0.40%	-0.24%	-0.38%	-0.24%	-0.38%	-0.40%
24	0.01	0.04	0.04	SRS	1-0,1-3	2	35	-0.54%	6.44%	5.33%	-0.68%	-0.54%	-0.68%	-0.54%	-0.68%	-0.68%
24	0.01	0.04	0.04	SRS	1-0,1-3	2	50	-0.47%	6.54%	5.37%	-0.41%	-0.47%	-0.42%	-0.47%	-0.42%	-0.41%

Table SB1 (continued). Relative bias of the ANC trend slope estimate. Cells with values indicating more than 5% bias in a negative or positive direction are also shaded.

Years	Trend (p)	Subpop Trend	True Slope	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0.04	0.04	SRS	1-3	1	20	0.03%	6.78%	3.19%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%
24	0.01	0.04	0.04	SRS	1-3	1	35	-0.21%	6.72%	4.08%	-0.22%	-0.22%	-0.22%	-0.22%	-0.22%	-0.22%
24	0.01	0.04	0.04	SRS	1-3	1	50	0.09%	7.03%	4.51%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%
24	0.01	0.04	0.04	SRS	1-3	2	20	-0.08%	6.68%	3.22%	-0.07%	-0.08%	-0.05%	-0.08%	-0.05%	-0.07%
24	0.01	0.04	0.04	SRS	1-3	2	35	-0.21%	7.05%	4.23%	-0.29%	-0.21%	-0.32%	-0.21%	-0.32%	-0.29%
24	0.01	0.04	0.04	SRS	1-3	2	50	-0.19%	7.13%	4.15%	-0.36%	-0.19%	-0.40%	-0.19%	-0.40%	-0.36%
24	0.01	0.04	0.04	StRS	1-0	1	20	-0.36%	9.07%	7.78%	-0.36%	-0.36%	-0.36%	-0.36%	-0.36%	-0.36%
24	0.01	0.04	0.04	StRS	1-0	1	35	-0.05%	9.66%	7.89%	-0.05%	-0.05%	-0.05%	-0.05%	-0.05%	-0.05%
24	0.01	0.04	0.04	StRS	1-0	1	50	-0.18%	9.78%	7.32%	-0.18%	-0.18%	-0.18%	-0.18%	-0.18%	-0.18%
24	0.01	0.04	0.04	StRS	1-0	2	20	-0.39%	9.12%	6.02%	-0.38%	-0.38%	-0.39%	-0.38%	-0.39%	-0.38%
24	0.01	0.04	0.04	StRS	1-0	2	35	-0.04%	9.65%	7.27%	-0.01%	-0.02%	0.00%	-0.02%	0.00%	-0.01%
24	0.01	0.04	0.04	StRS	1-0	2	50	-0.42%	9.40%	7.84%	-0.38%	-0.40%	-0.39%	-0.40%	-0.39%	-0.38%
24	0.01	0.04	0.04	StRS	1-0,1-3	1	20	0.14%	9.58%	6.49%	0.09%	0.15%	0.08%	0.15%	0.08%	0.09%
24	0.01	0.04	0.04	StRS	1-0,1-3	1	35	0.21%	9.95%	5.91%	0.20%	0.21%	0.21%	0.21%	0.21%	0.20%
24	0.01	0.04	0.04	StRS	1-0,1-3	1	50	0.14%	9.99%	6.81%	0.12%	0.13%	0.10%	0.13%	0.10%	0.12%
24	0.01	0.04	0.04	StRS	1-0,1-3	2	20	-0.65%	8.54%	6.07%	-0.66%	-0.74%	-0.52%	-0.74%	-0.52%	-0.66%
24	0.01	0.04	0.04	StRS	1-0,1-3	2	35	-0.73%	8.90%	6.46%	-0.69%	-0.75%	-0.66%	-0.75%	-0.66%	-0.69%
24	0.01	0.04	0.04	StRS	1-0,1-3	2	50	-0.35%	9.63%	6.75%	-0.43%	-0.36%	-0.43%	-0.36%	-0.43%	-0.43%
24	0.01	0.04	0.04	StRS	1-3	1	20	-0.94%	8.63%	6.34%	-0.93%	-0.93%	-0.93%	-0.93%	-0.93%	-0.93%
24	0.01	0.04	0.04	StRS	1-3	1	35	-0.69%	9.20%	6.48%	-0.70%	-0.70%	-0.70%	-0.70%	-0.70%	-0.70%
24	0.01	0.04	0.04	StRS	1-3	1	50	-0.86%	9.00%	6.96%	-0.86%	-0.86%	-0.86%	-0.86%	-0.86%	-0.86%
24	0.01	0.04	0.04	StRS	1-3	2	20	0.20%	9.14%	5.51%	0.25%	0.23%	0.26%	0.23%	0.26%	0.25%
24	0.01	0.04	0.04	StRS	1-3	2	35	0.32%	10.27%	6.03%	0.34%	0.34%	0.34%	0.34%	0.34%	0.34%
24	0.01	0.04	0.04	StRS	1-3	2	50	0.35%	10.23%	7.83%	0.39%	0.36%	0.39%	0.36%	0.39%	0.39%

Table SB1 (continued). Relative bias of the ANC trend slope estimate. Cells with values indicating more than 5% bias in a negative or positive direction are also shaded.

Years	Trend (p)	Subpop Trend	True Slope	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0.04	0.04	Unequal	1-0	1	20	-9.37%	5.46%	3.48%	-0.44%	-0.44%	-0.44%	-0.44%	-0.44%	-0.44%
24	0.01	0.04	0.04	Unequal	1-0	1	35	-9.22%	6.51%	4.77%	1.92%	1.92%	1.92%	1.92%	1.92%	1.92%
24	0.01	0.04	0.04	Unequal	1-0	1	50	-9.01%	6.56%	5.26%	2.89%	2.89%	2.89%	2.89%	2.89%	2.89%
24	0.01	0.04	0.04	Unequal	1-0	2	20	-9.10%	5.46%	1.79%	0.33%	0.35%	0.32%	0.35%	0.32%	0.33%
24	0.01	0.04	0.04	Unequal	1-0	2	35	-8.56%	6.86%	3.80%	2.67%	2.74%	2.63%	2.74%	2.63%	2.67%
24	0.01	0.04	0.04	Unequal	1-0	2	50	-8.64%	7.26%	3.54%	3.46%	3.54%	3.43%	3.54%	3.43%	3.46%
24	0.01	0.04	0.04	Unequal	1-0,1-3	1	20	-9.66%	4.55%	3.21%	-0.85%	1.31%	-1.46%	1.31%	-1.46%	-0.85%
24	0.01	0.04	0.04	Unequal	1-0,1-3	1	35	-9.36%	5.92%	3.53%	1.65%	4.92%	1.43%	4.92%	1.43%	1.65%
24	0.01	0.04	0.04	Unequal	1-0,1-3	1	50	-9.75%	6.19%	3.86%	2.51%	6.12%	2.55%	6.12%	2.55%	2.51%
24	0.01	0.04	0.04	Unequal	1-0,1-3	2	20	-9.22%	5.79%	1.43%	-0.43%	2.01%	-1.22%	2.01%	-1.22%	-0.43%
24	0.01	0.04	0.04	Unequal	1-0,1-3	2	35	-9.07%	6.61%	3.09%	1.53%	5.50%	1.18%	5.50%	1.18%	1.53%
24	0.01	0.04	0.04	Unequal	1-0,1-3	2	50	-9.07%	6.57%	3.33%	3.13%	7.57%	3.12%	7.57%	3.12%	3.13%
24	0.01	0.04	0.04	Unequal	1-3	1	20	-8.80%	6.38%	0.72%	3.97%	3.97%	3.97%	3.97%	3.97%	3.97%
24	0.01	0.04	0.04	Unequal	1-3	1	35	-8.74%	6.76%	1.67%	6.40%	6.40%	6.40%	6.40%	6.40%	6.40%
24	0.01	0.04	0.04	Unequal	1-3	1	50	-9.02%	6.37%	2.59%	8.42%	8.42%	8.42%	8.42%	8.42%	8.42%
24	0.01	0.04	0.04	Unequal	1-3	2	20	-9.16%	5.43%	0.18%	3.32%	3.41%	3.28%	3.41%	3.28%	3.32%
24	0.01	0.04	0.04	Unequal	1-3	2	35	-8.99%	6.68%	2.15%	6.48%	6.62%	6.44%	6.62%	6.44%	6.48%
24	0.01	0.04	0.04	Unequal	1-3	2	50	-9.09%	6.10%	3.01%	8.26%	8.45%	8.20%	8.45%	8.20%	8.26%

Table SB2 (continued). Relative bias of the modified ANC trend slope estimate. Cells with values indicating more than 5% bias in a negative or positive direction are also shaded.

Years	Trend (p)	Subpop Trend	True Slope	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	0.02	SRS	1-0	1	20	1.38%	6.28%	5.58%	1.38%	1.38%	1.38%	1.38%	1.38%	1.38%
12	0.02	0	0.02	SRS	1-0	1	35	0.31%	5.74%	4.75%	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%
12	0.02	0	0.02	SRS	1-0	1	50	-0.02%	5.64%	4.71%	-0.02%	-0.02%	-0.02%	-0.02%	-0.02%	-0.02%
12	0.02	0	0.02	SRS	1-0	2	20	-0.71%	3.89%	1.26%	-0.70%	-0.71%	-0.68%	-0.71%	-0.68%	-0.70%
12	0.02	0	0.02	SRS	1-0	2	35	-0.93%	3.12%	3.84%	-0.91%	-0.93%	-0.89%	-0.93%	-0.89%	-0.91%
12	0.02	0	0.02	SRS	1-0	2	50	0.16%	6.08%	3.83%	0.16%	0.16%	0.13%	0.16%	0.13%	0.16%
12	0.02	0	0.02	SRS	1-0,1-3	1	20	-2.03%	2.74%	1.26%	-2.08%	-2.03%	-2.14%	-2.03%	-2.14%	-2.08%
12	0.02	0	0.02	SRS	1-0,1-3	1	35	-0.54%	5.14%	2.89%	-0.56%	-0.54%	-0.52%	-0.54%	-0.52%	-0.56%
12	0.02	0	0.02	SRS	1-0,1-3	1	50	-0.21%	5.12%	3.35%	-0.24%	-0.22%	-0.28%	-0.22%	-0.28%	-0.24%
12	0.02	0	0.02	SRS	1-0,1-3	2	20	-0.15%	4.84%	1.86%	-0.18%	-0.14%	-0.18%	-0.14%	-0.18%	-0.18%
12	0.02	0	0.02	SRS	1-0,1-3	2	35	0.00%	6.10%	3.92%	-0.02%	0.00%	-0.02%	0.00%	-0.02%	-0.02%
12	0.02	0	0.02	SRS	1-0,1-3	2	50	0.09%	5.81%	4.55%	0.12%	0.09%	0.10%	0.09%	0.10%	0.12%
12	0.02	0	0.02	SRS	1-3	1	20	0.40%	6.47%	-1.97%	0.40%	0.40%	0.40%	0.40%	0.40%	0.40%
12	0.02	0	0.02	SRS	1-3	1	35	0.03%	4.70%	3.00%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%
12	0.02	0	0.02	SRS	1-3	1	50	0.51%	4.49%	4.67%	0.52%	0.52%	0.52%	0.52%	0.52%	0.52%
12	0.02	0	0.02	SRS	1-3	2	20	0.06%	2.79%	-1.56%	0.08%	0.07%	0.10%	0.07%	0.10%	0.08%
12	0.02	0	0.02	SRS	1-3	2	35	-0.02%	3.26%	-0.28%	0.02%	-0.01%	0.03%	-0.01%	0.03%	0.02%
12	0.02	0	0.02	SRS	1-3	2	50	0.25%	5.44%	3.67%	0.26%	0.26%	0.26%	0.26%	0.26%	0.26%
12	0.02	0	0.02	StRS	1-0	1	20	0.30%	5.51%	5.52%	0.12%	0.12%	0.12%	0.12%	0.12%	0.12%
12	0.02	0	0.02	StRS	1-0	1	35	0.16%	4.99%	5.15%	-0.13%	-0.13%	-0.13%	-0.13%	-0.13%	-0.13%
12	0.02	0	0.02	StRS	1-0	1	50	0.14%	5.18%	4.89%	0.16%	0.16%	0.16%	0.16%	0.16%	0.16%
12	0.02	0	0.02	StRS	1-0	2	20	-0.79%	2.60%	-0.41%	-0.78%	-0.78%	-0.78%	-0.78%	-0.78%	-0.78%
12	0.02	0	0.02	StRS	1-0	2	35	-0.40%	3.34%	-0.32%	-0.82%	-0.82%	-0.84%	-0.82%	-0.84%	-0.82%
12	0.02	0	0.02	StRS	1-0	2	50	0.13%	5.60%	1.46%	0.19%	0.19%	0.16%	0.19%	0.16%	0.19%
12	0.02	0	0.02	StRS	1-0,1-3	1	20	0.64%	5.85%	3.91%	0.43%	0.41%	0.50%	0.41%	0.50%	0.43%

Table SB2 (continued). Relative bias of the modified ANC trend slope estimate. Cells with values indicating more than 5% bias in a negative or positive direction are also shaded.

Years	Trend (p)	Subpop Trend	True Slope	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	0.02	StRS	1-0,1-3	1	35	-0.32%	3.21%	4.11%	-0.57%	-0.55%	-0.56%	-0.55%	-0.56%	-0.57%
12	0.02	0	0.02	StRS	1-0,1-3	1	50	-0.02%	6.10%	3.59%	-0.16%	-0.20%	-0.10%	-0.20%	-0.10%	-0.16%
12	0.02	0	0.02	StRS	1-0,1-3	2	20	-0.47%	3.24%	3.32%	-0.30%	-0.31%	-0.27%	-0.31%	-0.27%	-0.30%
12	0.02	0	0.02	StRS	1-0,1-3	2	35	-0.02%	5.47%	4.06%	0.04%	0.02%	-0.06%	0.02%	-0.06%	0.04%
12	0.02	0	0.02	StRS	1-0,1-3	2	50	-0.20%	2.98%	3.82%	-0.28%	-0.20%	-0.29%	-0.20%	-0.29%	-0.28%
12	0.02	0	0.02	StRS	1-3	1	20	-0.47%	5.49%	2.43%	-0.49%	-0.49%	-0.49%	-0.49%	-0.49%	-0.49%
12	0.02	0	0.02	StRS	1-3	1	35	-0.51%	2.47%	2.28%	-0.55%	-0.55%	-0.55%	-0.55%	-0.55%	-0.55%
12	0.02	0	0.02	StRS	1-3	1	50	-0.22%	4.72%	3.33%	-0.30%	-0.30%	-0.30%	-0.30%	-0.30%	-0.30%
12	0.02	0	0.02	StRS	1-3	2	20	-0.51%	3.85%	0.96%	-0.59%	-0.60%	-0.57%	-0.60%	-0.57%	-0.59%
12	0.02	0	0.02	StRS	1-3	2	35	-0.06%	4.20%	2.73%	-0.05%	-0.05%	-0.04%	-0.05%	-0.04%	-0.05%
12	0.02	0	0.02	StRS	1-3	2	50	0.84%	5.53%	1.28%	0.87%	0.86%	0.87%	0.86%	0.87%	0.87%
12	0.02	0	0.02	Unequal	1-0	1	20	1.06%	5.84%	1.73%	1.18%	1.18%	1.18%	1.18%	1.18%	1.18%
12	0.02	0	0.02	Unequal	1-0	1	35	0.76%	4.58%	3.72%	0.39%	0.39%	0.39%	0.39%	0.39%	0.39%
12	0.02	0	0.02	Unequal	1-0	1	50	0.53%	5.87%	5.15%	0.46%	0.46%	0.46%	0.46%	0.46%	0.46%
12	0.02	0	0.02	Unequal	1-0	2	20	-0.43%	2.22%	-2.31%	-0.44%	-0.45%	-0.42%	-0.45%	-0.42%	-0.44%
12	0.02	0	0.02	Unequal	1-0	2	35	0.57%	3.96%	-0.54%	0.45%	0.45%	0.50%	0.45%	0.50%	0.45%
12	0.02	0	0.02	Unequal	1-0	2	50	0.89%	5.34%	1.54%	0.76%	0.76%	0.75%	0.76%	0.75%	0.76%
12	0.02	0	0.02	Unequal	1-0,1-3	1	20	-0.76%	1.74%	4.62%	-1.02%	-1.01%	-0.89%	-1.01%	-0.89%	-1.02%
12	0.02	0	0.02	Unequal	1-0,1-3	1	35	-0.35%	4.96%	5.52%	-0.57%	-0.61%	-0.55%	-0.61%	-0.55%	-0.57%
12	0.02	0	0.02	Unequal	1-0,1-3	1	50	0.43%	6.63%	3.24%	0.38%	0.49%	0.32%	0.49%	0.32%	0.38%
12	0.02	0	0.02	Unequal	1-0,1-3	2	20	0.76%	3.05%	3.18%	0.81%	0.84%	0.76%	0.84%	0.76%	0.81%
12	0.02	0	0.02	Unequal	1-0,1-3	2	35	-0.47%	5.86%	4.07%	-0.13%	-0.24%	-0.10%	-0.24%	-0.10%	-0.13%
12	0.02	0	0.02	Unequal	1-0,1-3	2	50	-0.44%	3.22%	3.36%	-0.66%	-0.74%	-0.57%	-0.74%	-0.57%	-0.66%
12	0.02	0	0.02	Unequal	1-3	1	20	0.09%	5.12%	-0.19%	-0.05%	-0.05%	-0.05%	-0.05%	-0.05%	-0.05%
12	0.02	0	0.02	Unequal	1-3	1	35	-0.05%	1.64%	0.49%	-0.11%	-0.11%	-0.11%	-0.11%	-0.11%	-0.11%

Table SB2 (continued). Relative bias of the modified ANC trend slope estimate. Cells with values indicating more than 5% bias in a negative or positive direction are also shaded.

Years	Trend (p)	Subpop Trend	True Slope	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	0.02	Unequal	1-3	1	50	0.05%	4.63%	3.92%	-0.06%	-0.06%	-0.06%	-0.06%	-0.06%	-0.06%
12	0.02	0	0.02	Unequal	1-3	2	20	-0.88%	0.35%	1.39%	-0.81%	-0.80%	-0.84%	-0.80%	-0.84%	-0.81%
12	0.02	0	0.02	Unequal	1-3	2	35	-0.87%	1.50%	1.20%	-0.76%	-0.76%	-0.77%	-0.76%	-0.77%	-0.76%
12	0.02	0	0.02	Unequal	1-3	2	50	-0.87%	7.23%	1.62%	-0.88%	-0.89%	-0.88%	-0.89%	-0.88%	-0.88%
12	0.02	0.04	0.05	SRS	1-0	1	20	0.06%	3.12%	2.58%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%
12	0.02	0.04	0.05	SRS	1-0	1	35	0.19%	3.57%	3.12%	0.19%	0.19%	0.19%	0.19%	0.19%	0.19%
12	0.02	0.04	0.05	SRS	1-0	1	50	0.09%	3.45%	3.01%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%
12	0.02	0.04	0.05	SRS	1-0	2	20	-0.12%	2.89%	1.53%	-0.12%	-0.12%	-0.15%	-0.12%	-0.15%	-0.12%
12	0.02	0.04	0.05	SRS	1-0	2	35	0.31%	3.48%	1.55%	0.31%	0.30%	0.33%	0.30%	0.33%	0.31%
12	0.02	0.04	0.05	SRS	1-0	2	50	-0.18%	3.65%	2.51%	-0.18%	-0.18%	-0.25%	-0.18%	-0.25%	-0.18%
12	0.02	0.04	0.05	SRS	1-0,1-3	1	20	-0.03%	3.18%	1.87%	-0.04%	-0.02%	0.14%	-0.02%	0.14%	-0.04%
12	0.02	0.04	0.05	SRS	1-0,1-3	1	35	0.21%	3.77%	2.30%	0.21%	0.22%	0.28%	0.22%	0.28%	0.22%
12	0.02	0.04	0.05	SRS	1-0,1-3	1	50	0.00%	3.34%	3.07%	0.01%	0.01%	0.09%	0.01%	0.09%	0.01%
12	0.02	0.04	0.05	SRS	1-0,1-3	2	20	-0.01%	2.15%	2.09%	-0.02%	-0.01%	0.29%	-0.01%	0.29%	-0.02%
12	0.02	0.04	0.05	SRS	1-0,1-3	2	35	0.05%	3.46%	1.37%	0.05%	0.05%	0.20%	0.05%	0.20%	0.05%
12	0.02	0.04	0.05	SRS	1-0,1-3	2	50	0.11%	3.85%	2.58%	0.12%	0.11%	0.11%	0.11%	0.11%	0.12%
12	0.02	0.04	0.05	SRS	1-3	1	20	0.22%	3.31%	2.04%	0.22%	0.22%	0.22%	0.22%	0.22%	0.22%
12	0.02	0.04	0.05	SRS	1-3	1	35	0.19%	3.55%	2.52%	0.19%	0.19%	0.19%	0.19%	0.19%	0.19%
12	0.02	0.04	0.05	SRS	1-3	1	50	0.11%	3.13%	2.51%	0.11%	0.11%	0.11%	0.11%	0.11%	0.11%
12	0.02	0.04	0.05	SRS	1-3	2	20	-0.20%	4.76%	1.33%	-0.21%	-0.21%	-0.24%	-0.21%	-0.24%	-0.21%
12	0.02	0.04	0.05	SRS	1-3	2	35	0.07%	3.83%	2.42%	0.08%	0.07%	0.08%	0.07%	0.08%	0.08%
12	0.02	0.04	0.05	SRS	1-3	2	50	-0.01%	3.79%	2.32%	-0.01%	-0.01%	-0.01%	-0.01%	-0.01%	-0.01%
12	0.02	0.04	0.05	StRS	1-0	1	20	0.21%	6.10%	5.60%	0.21%	0.21%	0.21%	0.21%	0.21%	0.21%
12	0.02	0.04	0.05	StRS	1-0	1	35	-0.10%	6.05%	5.93%	-0.10%	-0.10%	-0.10%	-0.10%	-0.10%	-0.10%
12	0.02	0.04	0.05	StRS	1-0	1	50	-0.02%	6.18%	6.10%	-0.02%	-0.02%	-0.02%	-0.02%	-0.02%	-0.02%

Table SB2 (continued). Relative bias of the modified ANC trend slope estimate. Cells with values indicating more than 5% bias in a negative or positive direction are also shaded.

Years	Trend (p)	Subpop Trend	True Slope	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0.04	0.05	StRS	1-0	2	20	0.22%	5.93%	2.92%	0.23%	0.23%	0.23%	0.23%	0.23%	0.23%
12	0.02	0.04	0.05	StRS	1-0	2	35	-0.21%	5.31%	3.84%	-0.22%	-0.22%	-0.23%	-0.22%	-0.23%	-0.22%
12	0.02	0.04	0.05	StRS	1-0	2	50	0.16%	6.24%	4.75%	0.16%	0.17%	0.16%	0.17%	0.16%	0.16%
12	0.02	0.04	0.05	StRS	1-0,1-3	1	20	-0.03%	6.07%	4.84%	-0.06%	-0.05%	-0.02%	-0.05%	-0.02%	-0.06%
12	0.02	0.04	0.05	StRS	1-0,1-3	1	35	-0.20%	5.38%	4.51%	-0.22%	-0.22%	-0.21%	-0.22%	-0.21%	-0.22%
12	0.02	0.04	0.05	StRS	1-0,1-3	1	50	-0.04%	6.58%	5.84%	-0.03%	-0.03%	-0.04%	-0.03%	-0.04%	-0.03%
12	0.02	0.04	0.05	StRS	1-0,1-3	2	20	0.12%	5.22%	4.13%	0.14%	0.15%	0.10%	0.15%	0.10%	0.14%
12	0.02	0.04	0.05	StRS	1-0,1-3	2	35	-0.01%	5.41%	3.98%	0.01%	0.01%	-0.01%	0.01%	-0.01%	0.02%
12	0.02	0.04	0.05	StRS	1-0,1-3	2	50	0.23%	6.52%	4.33%	0.25%	0.26%	0.24%	0.26%	0.24%	0.25%
12	0.02	0.04	0.05	StRS	1-3	1	20	0.49%	6.04%	4.65%	0.48%	0.49%	0.49%	0.49%	0.49%	0.49%
12	0.02	0.04	0.05	StRS	1-3	1	35	0.37%	5.45%	4.64%	0.37%	0.37%	0.37%	0.37%	0.37%	0.37%
12	0.02	0.04	0.05	StRS	1-3	1	50	0.05%	7.13%	5.22%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%
12	0.02	0.04	0.05	StRS	1-3	2	20	-0.23%	5.83%	3.31%	-0.24%	-0.24%	-0.25%	-0.24%	-0.25%	-0.24%
12	0.02	0.04	0.05	StRS	1-3	2	35	0.12%	6.27%	3.21%	0.10%	0.11%	0.10%	0.11%	0.10%	0.10%
12	0.02	0.04	0.05	StRS	1-3	2	50	0.21%	6.10%	4.24%	0.21%	0.21%	0.21%	0.21%	0.21%	0.21%
12	0.02	0.04	0.05	Unequal	1-0	1	20	-7.54%	1.80%	0.85%	-2.69%	-2.69%	-2.69%	-2.69%	-2.69%	-2.69%
12	0.02	0.04	0.05	Unequal	1-0	1	35	-6.55%	3.17%	2.23%	-1.46%	-1.46%	-1.46%	-1.46%	-1.46%	-1.46%
12	0.02	0.04	0.05	Unequal	1-0	1	50	-7.55%	3.06%	2.34%	-2.36%	-2.36%	-2.36%	-2.36%	-2.36%	-2.36%
12	0.02	0.04	0.05	Unequal	1-0	2	20	-7.61%	2.10%	-2.35%	-2.80%	-2.80%	-2.84%	-2.80%	-2.84%	-2.80%
12	0.02	0.04	0.05	Unequal	1-0	2	35	-7.24%	1.97%	0.82%	-2.47%	-2.46%	-2.50%	-2.46%	-2.50%	-2.47%
12	0.02	0.04	0.05	Unequal	1-0	2	50	-7.97%	2.42%	1.11%	-2.66%	-2.66%	-2.69%	-2.66%	-2.69%	-2.66%
12	0.02	0.04	0.05	Unequal	1-0,1-3	1	20	-7.39%	2.84%	0.88%	-3.89%	-3.77%	-4.69%	-3.77%	-4.69%	-3.89%
12	0.02	0.04	0.05	Unequal	1-0,1-3	1	35	-7.20%	3.58%	2.11%	-3.88%	-3.71%	-4.35%	-3.71%	-4.35%	-3.88%
12	0.02	0.04	0.05	Unequal	1-0,1-3	1	50	-7.23%	4.20%	0.42%	-3.95%	-3.69%	-4.32%	-3.69%	-4.32%	-3.95%
12	0.02	0.04	0.05	Unequal	1-0,1-3	2	20	-7.05%	1.81%	1.04%	-3.59%	-3.42%	-4.41%	-3.42%	-4.41%	-3.59%

Table SB2 (continued). Relative bias of the modified ANC trend slope estimate. Cells with values indicating more than 5% bias in a negative or positive direction are also shaded.

Years	Trend (p)	Subpop Trend	True Slope	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0.04	0.05	Unequal	1-0,1-3	2	35	-7.43%	2.42%	0.91%	-4.14%	-3.91%	-4.85%	-3.91%	-4.85%	-4.14%
12	0.02	0.04	0.05	Unequal	1-0,1-3	2	50	-7.31%	3.09%	1.44%	-4.18%	-3.87%	-4.74%	-3.87%	-4.74%	-4.18%
12	0.02	0.04	0.05	Unequal	1-3	1	20	-7.43%	3.75%	-1.24%	-4.24%	-4.24%	-4.24%	-4.24%	-4.24%	-4.24%
12	0.02	0.04	0.05	Unequal	1-3	1	35	-7.51%	2.16%	0.19%	-4.30%	-4.30%	-4.30%	-4.30%	-4.30%	-4.30%
12	0.02	0.04	0.05	Unequal	1-3	1	50	-7.46%	2.64%	1.80%	-4.18%	-4.15%	-4.10%	-4.15%	-4.10%	-4.15%
12	0.02	0.04	0.05	Unequal	1-3	2	20	-6.88%	2.29%	-3.84%	-3.99%	-3.98%	-4.07%	-3.98%	-4.07%	-3.98%
12	0.02	0.04	0.05	Unequal	1-3	2	35	-7.13%	3.27%	-0.35%	-4.13%	-4.11%	-4.21%	-4.11%	-4.21%	-4.13%
12	0.02	0.04	0.05	Unequal	1-3	2	50	-7.32%	3.33%	0.88%	-4.03%	-3.98%	-4.13%	-3.98%	-4.13%	-4.03%
24	0.01	0	0.01	SRS	1-0	1	20	-0.07%	15.09%	14.78%	-0.07%	-0.07%	-0.07%	-0.07%	-0.07%	-0.07%
24	0.01	0	0.01	SRS	1-0	1	35	0.08%	17.52%	16.17%	0.08%	0.08%	0.08%	0.08%	0.08%	0.08%
24	0.01	0	0.01	SRS	1-0	1	50	0.59%	17.26%	15.26%	0.59%	0.59%	0.59%	0.59%	0.59%	0.59%
24	0.01	0	0.01	SRS	1-0	2	20	-1.41%	14.86%	15.18%	-1.41%	-1.41%	-1.42%	-1.41%	-1.42%	-1.41%
24	0.01	0	0.01	SRS	1-0	2	35	-0.40%	14.97%	14.57%	-0.40%	-0.40%	-0.36%	-0.40%	-0.36%	-0.40%
24	0.01	0	0.01	SRS	1-0	2	50	-0.85%	15.42%	14.76%	-0.84%	-0.85%	-0.85%	-0.85%	-0.85%	-0.84%
24	0.01	0	0.01	SRS	1-0,1-3	1	20	0.03%	16.42%	8.92%	0.03%	0.03%	0.14%	0.03%	0.14%	0.03%
24	0.01	0	0.01	SRS	1-0,1-3	1	35	0.08%	16.33%	13.83%	0.07%	0.08%	0.00%	0.08%	0.00%	0.07%
24	0.01	0	0.01	SRS	1-0,1-3	1	50	0.07%	16.25%	14.77%	0.06%	0.07%	0.01%	0.07%	0.01%	0.06%
24	0.01	0	0.01	SRS	1-0,1-3	2	20	-0.34%	14.43%	11.70%	-0.35%	-0.34%	-0.57%	-0.34%	-0.57%	-0.35%
24	0.01	0	0.01	SRS	1-0,1-3	2	35	0.80%	17.82%	14.33%	0.81%	0.80%	0.72%	0.80%	0.72%	0.81%
24	0.01	0	0.01	SRS	1-0,1-3	2	50	-0.04%	16.28%	13.98%	-0.03%	-0.04%	-0.03%	-0.04%	-0.03%	-0.03%
24	0.01	0	0.01	SRS	1-3	1	20	-0.26%	15.38%	12.60%	-0.26%	-0.26%	-0.26%	-0.26%	-0.26%	-0.26%
24	0.01	0	0.01	SRS	1-3	1	35	0.42%	17.71%	12.70%	0.42%	0.42%	0.42%	0.42%	0.42%	0.42%
24	0.01	0	0.01	SRS	1-3	1	50	0.50%	17.01%	11.80%	0.50%	0.50%	0.50%	0.50%	0.50%	0.50%
24	0.01	0	0.01	SRS	1-3	2	20	-1.04%	13.68%	11.04%	-1.04%	-1.04%	-0.97%	-1.04%	-0.97%	-1.04%
24	0.01	0	0.01	SRS	1-3	2	35	0.57%	17.72%	13.33%	0.58%	0.57%	0.60%	0.57%	0.60%	0.58%

Table SB2 (continued). Relative bias of the modified ANC trend slope estimate. Cells with values indicating more than 5% bias in a negative or positive direction are also shaded.

Years	Trend (p)	Subpop Trend	True Slope	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0	0.01	SRS	1-3	2	50	-0.15%	17.03%	13.06%	-0.15%	-0.15%	-0.16%	-0.15%	-0.16%	-0.15%
24	0.01	0	0.01	StRS	1-0	1	20	1.07%	16.38%	14.20%	0.75%	0.75%	0.75%	0.75%	0.75%	0.75%
24	0.01	0	0.01	StRS	1-0	1	35	-0.25%	13.66%	14.49%	-1.01%	-1.01%	-1.01%	-1.01%	-1.01%	-1.01%
24	0.01	0	0.01	StRS	1-0	1	50	0.58%	17.13%	15.53%	0.31%	0.31%	0.31%	0.31%	0.31%	0.31%
24	0.01	0	0.01	StRS	1-0	2	20	1.18%	15.60%	11.29%	0.70%	0.70%	0.73%	0.70%	0.73%	0.70%
24	0.01	0	0.01	StRS	1-0	2	35	-0.60%	15.43%	12.78%	-0.76%	-0.76%	-0.76%	-0.76%	-0.76%	-0.76%
24	0.01	0	0.01	StRS	1-0	2	50	-0.36%	15.64%	15.04%	-0.81%	-0.81%	-0.85%	-0.81%	-0.85%	-0.81%
24	0.01	0	0.01	StRS	1-0,1-3	1	20	-0.64%	16.13%	12.81%	-0.61%	-0.60%	-0.65%	-0.60%	-0.65%	-0.61%
24	0.01	0	0.01	StRS	1-0,1-3	1	35	-0.95%	15.71%	13.60%	-1.12%	-1.12%	-0.98%	-1.12%	-0.98%	-1.12%
24	0.01	0	0.01	StRS	1-0,1-3	1	50	-0.29%	15.89%	12.10%	-0.17%	-0.16%	-0.17%	-0.16%	-0.17%	-0.17%
24	0.01	0	0.01	StRS	1-0,1-3	2	20	-0.77%	15.19%	11.77%	0.05%	0.06%	-0.49%	0.06%	-0.49%	0.05%
24	0.01	0	0.01	StRS	1-0,1-3	2	35	0.38%	15.71%	12.16%	0.63%	0.63%	0.54%	0.63%	0.54%	0.63%
24	0.01	0	0.01	StRS	1-0,1-3	2	50	0.54%	16.03%	13.82%	0.83%	0.83%	0.97%	0.83%	0.97%	0.83%
24	0.01	0	0.01	StRS	1-3	1	20	0.96%	16.90%	7.73%	1.40%	1.40%	1.40%	1.40%	1.40%	1.40%
24	0.01	0	0.01	StRS	1-3	1	35	1.14%	18.43%	9.60%	1.65%	1.65%	1.65%	1.65%	1.65%	1.65%
24	0.01	0	0.01	StRS	1-3	1	50	0.26%	16.18%	13.08%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%
24	0.01	0	0.01	StRS	1-3	2	20	-0.24%	15.33%	8.05%	-0.48%	-0.48%	-0.42%	-0.48%	-0.42%	-0.48%
24	0.01	0	0.01	StRS	1-3	2	35	-0.08%	13.95%	10.39%	-0.70%	-0.70%	-0.70%	-0.70%	-0.70%	-0.70%
24	0.01	0	0.01	StRS	1-3	2	50	0.07%	16.22%	13.10%	-0.16%	-0.16%	-0.15%	-0.16%	-0.15%	-0.16%
24	0.01	0	0.01	Unequal	1-0	1	20	-1.81%	14.56%	13.41%	-0.65%	-0.65%	-0.65%	-0.65%	-0.65%	-0.65%
24	0.01	0	0.01	Unequal	1-0	1	35	-0.72%	15.52%	16.59%	-0.82%	-0.82%	-0.82%	-0.82%	-0.82%	-0.82%
24	0.01	0	0.01	Unequal	1-0	1	50	-0.60%	16.27%	14.90%	0.23%	0.23%	0.23%	0.23%	0.23%	0.23%
24	0.01	0	0.01	Unequal	1-0	2	20	-0.03%	14.47%	10.43%	0.19%	0.19%	0.17%	0.19%	0.17%	0.19%
24	0.01	0	0.01	Unequal	1-0	2	35	0.24%	16.01%	11.62%	0.05%	0.05%	0.07%	0.05%	0.07%	0.05%
24	0.01	0	0.01	Unequal	1-0	2	50	-0.08%	17.60%	14.29%	0.83%	0.83%	0.90%	0.83%	0.90%	0.83%

Table SB2 (continued). Relative bias of the modified ANC trend slope estimate. Cells with values indicating more than 5% bias in a negative or positive direction are also shaded.

Years	Trend (p)	Subpop Trend	True Slope	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0	0.01	Unequal	1-0,1-3	1	20	0.49%	15.97%	9.07%	0.25%	0.25%	0.08%	0.25%	0.08%	0.25%
24	0.01	0	0.01	Unequal	1-0,1-3	1	35	0.09%	15.67%	10.74%	-0.25%	-0.26%	-0.24%	-0.26%	-0.24%	-0.25%
24	0.01	0	0.01	Unequal	1-0,1-3	1	50	0.73%	17.18%	12.05%	0.39%	0.37%	0.47%	0.37%	0.47%	0.39%
24	0.01	0	0.01	Unequal	1-0,1-3	2	20	-0.62%	14.32%	9.28%	-0.88%	-0.90%	-1.10%	-0.90%	-1.10%	-0.88%
24	0.01	0	0.01	Unequal	1-0,1-3	2	35	-0.20%	14.68%	11.75%	0.13%	0.12%	0.25%	0.12%	0.25%	0.13%
24	0.01	0	0.01	Unequal	1-0,1-3	2	50	0.41%	16.19%	12.39%	0.55%	0.53%	0.41%	0.53%	0.41%	0.55%
24	0.01	0	0.01	Unequal	1-3	1	20	0.40%	16.09%	7.32%	0.74%	0.74%	0.74%	0.74%	0.74%	0.74%
24	0.01	0	0.01	Unequal	1-3	1	35	0.66%	14.76%	10.04%	0.73%	0.73%	0.73%	0.73%	0.73%	0.73%
24	0.01	0	0.01	Unequal	1-3	1	50	-0.24%	15.63%	11.35%	-0.56%	-0.56%	-0.56%	-0.56%	-0.56%	-0.56%
24	0.01	0	0.01	Unequal	1-3	2	20	0.72%	14.13%	5.68%	0.27%	0.27%	0.26%	0.27%	0.26%	0.27%
24	0.01	0	0.01	Unequal	1-3	2	35	0.58%	15.82%	9.59%	0.50%	0.50%	0.48%	0.50%	0.48%	0.50%
24	0.01	0	0.01	Unequal	1-3	2	50	0.08%	16.02%	11.64%	-0.16%	-0.16%	-0.16%	-0.16%	-0.16%	-0.16%
24	0.01	0.04	0.04	SRS	1-0	1	20	-1.06%	5.94%	6.10%	-1.06%	-1.06%	-1.06%	-1.06%	-1.06%	-1.06%
24	0.01	0.04	0.04	SRS	1-0	1	35	-0.33%	6.89%	6.19%	-0.33%	-0.33%	-0.33%	-0.33%	-0.33%	-0.33%
24	0.01	0.04	0.04	SRS	1-0	1	50	-0.29%	6.99%	5.72%	-0.29%	-0.29%	-0.29%	-0.29%	-0.29%	-0.29%
24	0.01	0.04	0.04	SRS	1-0	2	20	0.02%	6.56%	4.92%	0.02%	0.02%	0.00%	0.02%	0.00%	0.02%
24	0.01	0.04	0.04	SRS	1-0	2	35	0.13%	7.18%	5.66%	0.13%	0.13%	0.14%	0.13%	0.14%	0.13%
24	0.01	0.04	0.04	SRS	1-0	2	50	0.02%	7.03%	6.14%	0.02%	0.02%	-0.02%	0.02%	-0.02%	0.02%
24	0.01	0.04	0.04	SRS	1-0,1-3	1	20	-0.13%	6.62%	4.54%	-0.13%	-0.13%	-0.02%	-0.13%	-0.02%	-0.13%
24	0.01	0.04	0.04	SRS	1-0,1-3	1	35	-0.04%	7.04%	5.51%	-0.04%	-0.04%	-0.02%	-0.04%	-0.02%	-0.04%
24	0.01	0.04	0.04	SRS	1-0,1-3	1	50	0.12%	6.98%	5.72%	0.12%	0.12%	0.17%	0.12%	0.17%	0.12%
24	0.01	0.04	0.04	SRS	1-0,1-3	2	20	-0.20%	6.45%	4.81%	-0.20%	-0.20%	-0.13%	-0.20%	-0.13%	-0.20%
24	0.01	0.04	0.04	SRS	1-0,1-3	2	35	-0.27%	6.56%	5.21%	-0.27%	-0.27%	-0.27%	-0.27%	-0.27%	-0.27%
24	0.01	0.04	0.04	SRS	1-0,1-3	2	50	-0.01%	6.88%	5.16%	-0.01%	-0.01%	0.05%	-0.01%	0.05%	-0.01%
24	0.01	0.04	0.04	SRS	1-3	1	20	0.00%	7.13%	4.84%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Table SB2 (continued). Relative bias of the modified ANC trend slope estimate. Cells with values indicating more than 5% bias in a negative or positive direction are also shaded.

Years	Trend (p)	Subpop Trend	True Slope	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0.04	0.04	SRS	1-3	1	35	0.11%	7.32%	5.17%	0.11%	0.11%	0.11%	0.11%	0.11%	0.11%
24	0.01	0.04	0.04	SRS	1-3	1	50	0.12%	7.04%	5.75%	0.12%	0.12%	0.12%	0.12%	0.12%	0.12%
24	0.01	0.04	0.04	SRS	1-3	2	20	0.03%	6.65%	3.50%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%
24	0.01	0.04	0.04	SRS	1-3	2	35	-0.02%	7.36%	5.04%	-0.03%	-0.02%	-0.05%	-0.02%	-0.05%	-0.03%
24	0.01	0.04	0.04	SRS	1-3	2	50	0.14%	7.36%	5.09%	0.14%	0.14%	0.10%	0.14%	0.10%	0.14%
24	0.01	0.04	0.04	StRS	1-0	1	20	-0.08%	9.38%	8.75%	-0.08%	-0.08%	-0.08%	-0.08%	-0.08%	-0.08%
24	0.01	0.04	0.04	StRS	1-0	1	35	-0.20%	9.78%	8.79%	-0.20%	-0.20%	-0.20%	-0.20%	-0.20%	-0.20%
24	0.01	0.04	0.04	StRS	1-0	1	50	-0.11%	10.02%	8.80%	-0.11%	-0.11%	-0.11%	-0.11%	-0.11%	-0.11%
24	0.01	0.04	0.04	StRS	1-0	2	20	0.07%	9.82%	7.62%	0.07%	0.07%	0.07%	0.07%	0.07%	0.07%
24	0.01	0.04	0.04	StRS	1-0	2	35	0.00%	9.62%	7.93%	-0.01%	-0.01%	-0.01%	-0.01%	-0.01%	-0.01%
24	0.01	0.04	0.04	StRS	1-0	2	50	0.13%	10.03%	9.13%	0.12%	0.12%	0.11%	0.12%	0.11%	0.12%
24	0.01	0.04	0.04	StRS	1-0,1-3	1	20	0.13%	10.36%	8.07%	0.13%	0.13%	0.12%	0.13%	0.12%	0.13%
24	0.01	0.04	0.04	StRS	1-0,1-3	1	35	0.03%	9.78%	8.29%	0.03%	0.03%	0.03%	0.03%	0.03%	0.03%
24	0.01	0.04	0.04	StRS	1-0,1-3	1	50	0.05%	10.01%	8.59%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%
24	0.01	0.04	0.04	StRS	1-0,1-3	2	20	0.19%	9.97%	7.70%	0.17%	0.17%	0.22%	0.17%	0.22%	0.17%
24	0.01	0.04	0.04	StRS	1-0,1-3	2	35	0.15%	10.35%	7.93%	0.15%	0.15%	0.17%	0.15%	0.17%	0.15%
24	0.01	0.04	0.04	StRS	1-0,1-3	2	50	0.17%	10.38%	7.86%	0.18%	0.18%	0.16%	0.18%	0.16%	0.18%
24	0.01	0.04	0.04	StRS	1-3	1	20	0.06%	9.28%	6.98%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%
24	0.01	0.04	0.04	StRS	1-3	1	35	-0.12%	9.73%	7.39%	-0.12%	-0.12%	-0.12%	-0.12%	-0.12%	-0.12%
24	0.01	0.04	0.04	StRS	1-3	1	50	0.12%	10.04%	7.99%	0.12%	0.12%	0.12%	0.12%	0.12%	0.12%
24	0.01	0.04	0.04	StRS	1-3	2	20	-0.14%	9.40%	5.76%	-0.14%	-0.14%	-0.14%	-0.14%	-0.14%	-0.14%
24	0.01	0.04	0.04	StRS	1-3	2	35	0.08%	10.44%	6.87%	0.08%	0.08%	0.09%	0.08%	0.09%	0.08%
24	0.01	0.04	0.04	StRS	1-3	2	50	-0.17%	9.86%	7.81%	-0.17%	-0.17%	-0.18%	-0.17%	-0.18%	-0.17%
24	0.01	0.04	0.04	Unequal	1-0	1	20	-9.03%	5.26%	4.68%	-1.67%	-1.67%	-1.67%	-1.67%	-1.67%	-1.67%
24	0.01	0.04	0.04	Unequal	1-0	1	35	-8.69%	7.37%	5.15%	-0.26%	-0.26%	-0.26%	-0.26%	-0.26%	-0.26%

Table SB2 (continued). Relative bias of the modified ANC trend slope estimate. Cells with values indicating more than 5% bias in a negative or positive direction are also shaded.

Years	Trend (p)	Subpop Trend	True Slope	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0.04	0.04	Unequal	1-0	1	50	-9.17%	6.65%	5.35%	-0.39%	-0.39%	-0.39%	-0.39%	-0.39%	-0.39%
24	0.01	0.04	0.04	Unequal	1-0	2	20	-8.63%	6.14%	3.06%	-1.02%	-1.02%	-1.01%	-1.02%	-1.01%	-1.02%
24	0.01	0.04	0.04	Unequal	1-0	2	35	-8.54%	7.35%	3.96%	0.19%	0.19%	0.06%	0.19%	0.06%	0.19%
24	0.01	0.04	0.04	Unequal	1-0	2	50	-9.44%	6.17%	4.15%	-1.42%	-1.42%	-1.46%	-1.42%	-1.46%	-1.42%
24	0.01	0.04	0.04	Unequal	1-0,1-3	1	20	-9.53%	5.41%	2.73%	-2.10%	-2.08%	-2.58%	-2.08%	-2.58%	-2.10%
24	0.01	0.04	0.04	Unequal	1-0,1-3	1	35	-8.83%	7.05%	4.69%	-1.05%	-1.01%	-1.28%	-1.01%	-1.28%	-1.05%
24	0.01	0.04	0.04	Unequal	1-0,1-3	1	50	-9.21%	6.66%	5.04%	-1.68%	-1.64%	-1.87%	-1.64%	-1.87%	-1.68%
24	0.01	0.04	0.04	Unequal	1-0,1-3	2	20	-9.58%	5.22%	4.20%	-2.01%	-1.99%	-2.48%	-1.99%	-2.48%	-2.01%
24	0.01	0.04	0.04	Unequal	1-0,1-3	2	35	-9.04%	6.69%	3.51%	-1.59%	-1.55%	-1.93%	-1.55%	-1.93%	-1.59%
24	0.01	0.04	0.04	Unequal	1-0,1-3	2	50	-9.03%	7.06%	3.49%	-1.70%	-1.64%	-1.92%	-1.64%	-1.92%	-1.70%
24	0.01	0.04	0.04	Unequal	1-3	1	20	-8.73%	6.85%	1.84%	-1.28%	-1.28%	-1.28%	-1.28%	-1.28%	-1.28%
24	0.01	0.04	0.04	Unequal	1-3	1	35	-9.00%	6.32%	3.34%	-1.66%	-1.66%	-1.66%	-1.66%	-1.66%	-1.66%
24	0.01	0.04	0.04	Unequal	1-3	1	50	-9.05%	7.02%	4.16%	-1.49%	-1.49%	-1.49%	-1.49%	-1.49%	-1.49%
24	0.01	0.04	0.04	Unequal	1-3	2	20	-8.96%	6.32%	0.93%	-1.46%	-1.46%	-1.46%	-1.46%	-1.46%	-1.46%
24	0.01	0.04	0.04	Unequal	1-3	2	35	-9.17%	6.42%	2.63%	-1.84%	-1.84%	-1.85%	-1.84%	-1.85%	-1.84%
24	0.01	0.04	0.04	Unequal	1-3	2	50	-9.04%	6.70%	3.07%	-1.69%	-1.69%	-1.73%	-1.69%	-1.73%	-1.69%

Table SB3. Confidence Interval (CI) coverage of the ANC trend slope estimate ($\alpha = 0.10$). For $\alpha = 0.10$, CI coverage should be about 90%. Cells with low CI coverage, or <87%, are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	SRS	1-0	1	20	0.88	0.87	0.90	0.33	0.33	0.33	0.33	0.33	0.33
12	0.02	0	SRS	1-0	1	35	0.89	0.88	0.89	0.28	0.28	0.28	0.28	0.28	0.28
12	0.02	0	SRS	1-0	1	50	0.87	0.87	0.88	0.26	0.26	0.26	0.26	0.26	0.26
12	0.02	0	SRS	1-0	2	20	0.93	0.93	0.89	0.42	0.42	0.42	0.42	0.42	0.42
12	0.02	0	SRS	1-0	2	35	0.94	0.92	0.87	0.34	0.34	0.34	0.34	0.34	0.34
12	0.02	0	SRS	1-0	2	50	0.93	0.93	0.88	0.28	0.32	0.27	0.32	0.27	0.28
12	0.02	0	SRS	1-0,1-3	1	20	0.88	0.90	0.89	0.71	0.75	0.71	0.75	0.71	0.71
12	0.02	0	SRS	1-0,1-3	1	35	0.88	0.90	0.91	0.59	0.63	0.59	0.63	0.59	0.59
12	0.02	0	SRS	1-0,1-3	1	50	0.88	0.90	0.91	0.48	0.55	0.48	0.55	0.48	0.48
12	0.02	0	SRS	1-0,1-3	2	20	0.91	0.93	0.88	0.83	0.87	0.82	0.87	0.82	0.83
12	0.02	0	SRS	1-0,1-3	2	35	0.90	0.92	0.89	0.66	0.71	0.67	0.71	0.67	0.66
12	0.02	0	SRS	1-0,1-3	2	50	0.90	0.91	0.91	0.58	0.64	0.57	0.64	0.57	0.58
12	0.02	0	SRS	1-3	1	20	0.93	0.95	0.89	0.73	0.73	0.73	0.73	0.73	0.73
12	0.02	0	SRS	1-3	1	35	0.91	0.93	0.87	0.63	0.63	0.63	0.63	0.63	0.63
12	0.02	0	SRS	1-3	1	50	0.91	0.92	0.89	0.52	0.53	0.52	0.53	0.52	0.53
12	0.02	0	SRS	1-3	2	20	0.92	0.95	0.87	0.79	0.80	0.79	0.80	0.79	0.79
12	0.02	0	SRS	1-3	2	35	0.92	0.94	0.90	0.68	0.70	0.68	0.70	0.68	0.68
12	0.02	0	SRS	1-3	2	50	0.91	0.94	0.88	0.58	0.61	0.57	0.61	0.57	0.58
12	0.02	0	StRS	1-0	1	20	0.90	0.89	0.87	0.38	0.38	0.38	0.38	0.38	0.38
12	0.02	0	StRS	1-0	1	35	0.91	0.92	0.87	0.27	0.27	0.27	0.27	0.27	0.27
12	0.02	0	StRS	1-0	1	50	0.92	0.92	0.87	0.20	0.20	0.20	0.20	0.20	0.20
12	0.02	0	StRS	1-0	2	20	0.92	0.94	0.88	0.41	0.40	0.40	0.40	0.40	0.41
12	0.02	0	StRS	1-0	2	35	0.91	0.94	0.90	0.31	0.31	0.31	0.31	0.31	0.31
12	0.02	0	StRS	1-0	2	50	0.90	0.92	0.89	0.21	0.21	0.20	0.21	0.20	0.21
12	0.02	0	StRS	1-0,1-3	1	20	0.90	0.93	0.88	0.85	0.73	0.86	0.73	0.86	0.85

Table SB3 (continued). Confidence Interval (CI) coverage of the ANC trend slope estimate ($\alpha = 0.10$). For $\alpha = 0.10$, CI coverage should be about 90%. Cells with low CI coverage, or <87%, are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	StRS	1-0,1-3	1	35	0.91	0.93	0.91	0.66	0.51	0.66	0.51	0.66	0.66
12	0.02	0	StRS	1-0,1-3	1	50	0.92	0.94	0.90	0.56	0.42	0.54	0.42	0.54	0.56
12	0.02	0	StRS	1-0,1-3	2	20	0.90	0.91	0.91	0.91	0.81	0.91	0.81	0.91	0.91
12	0.02	0	StRS	1-0,1-3	2	35	0.92	0.93	0.90	0.75	0.60	0.74	0.60	0.74	0.75
12	0.02	0	StRS	1-0,1-3	2	50	0.89	0.92	0.89	0.63	0.49	0.62	0.49	0.62	0.63
12	0.02	0	StRS	1-3	1	20	0.88	0.95	0.91	0.66	0.65	0.65	0.65	0.65	0.65
12	0.02	0	StRS	1-3	1	35	0.89	0.94	0.90	0.50	0.50	0.49	0.50	0.49	0.50
12	0.02	0	StRS	1-3	1	50	0.88	0.94	0.90	0.42	0.43	0.40	0.43	0.40	0.43
12	0.02	0	StRS	1-3	2	20	0.90	0.95	0.89	0.74	0.74	0.74	0.74	0.74	0.74
12	0.02	0	StRS	1-3	2	35	0.89	0.94	0.88	0.56	0.56	0.55	0.56	0.55	0.56
12	0.02	0	StRS	1-3	2	50	0.90	0.91	0.90	0.46	0.46	0.44	0.46	0.44	0.47
12	0.02	0	Unequal	1-0	1	20	0.91	0.89	0.83	0.39	0.39	0.39	0.39	0.39	0.39
12	0.02	0	Unequal	1-0	1	35	0.91	0.89	0.83	0.34	0.34	0.34	0.34	0.34	0.34
12	0.02	0	Unequal	1-0	1	50	0.91	0.90	0.84	0.33	0.33	0.33	0.33	0.33	0.33
12	0.02	0	Unequal	1-0	2	20	0.91	0.93	0.87	0.44	0.44	0.44	0.44	0.44	0.44
12	0.02	0	Unequal	1-0	2	35	0.91	0.91	0.88	0.38	0.38	0.39	0.38	0.39	0.38
12	0.02	0	Unequal	1-0	2	50	0.92	0.92	0.88	0.37	0.38	0.38	0.38	0.38	0.37
12	0.02	0	Unequal	1-0,1-3	1	20	0.91	0.93	0.87	0.83	0.82	0.83	0.82	0.83	0.83
12	0.02	0	Unequal	1-0,1-3	1	35	0.89	0.93	0.88	0.76	0.72	0.77	0.72	0.77	0.76
12	0.02	0	Unequal	1-0,1-3	1	50	0.89	0.93	0.90	0.69	0.68	0.67	0.68	0.67	0.70
12	0.02	0	Unequal	1-0,1-3	2	20	0.91	0.93	0.87	0.91	0.89	0.91	0.89	0.91	0.91
12	0.02	0	Unequal	1-0,1-3	2	35	0.91	0.94	0.89	0.84	0.83	0.83	0.83	0.83	0.84
12	0.02	0	Unequal	1-0,1-3	2	50	0.91	0.94	0.88	0.79	0.79	0.78	0.79	0.78	0.79
12	0.02	0	Unequal	1-3	1	20	0.89	0.97	0.90	0.82	0.82	0.82	0.82	0.82	0.82

Table SB3 (continued). Confidence Interval (CI) coverage of the ANC trend slope estimate ($\alpha = 0.10$). For $\alpha = 0.10$, CI coverage should be about 90%. Cells with low CI coverage, or <87%, are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	Unequal	1-3	1	35	0.88	0.95	0.90	0.72	0.73	0.72	0.73	0.72	0.73
12	0.02	0	Unequal	1-3	1	50	0.89	0.94	0.89	0.68	0.70	0.66	0.70	0.66	0.70
12	0.02	0	Unequal	1-3	2	20	0.88	0.95	0.90	0.86	0.87	0.86	0.87	0.86	0.86
12	0.02	0	Unequal	1-3	2	35	0.88	0.95	0.88	0.77	0.77	0.77	0.77	0.77	0.77
12	0.02	0	Unequal	1-3	2	50	0.88	0.93	0.88	0.76	0.76	0.75	0.76	0.75	0.77
12	0.02	0.04	SRS	1-0	1	20	0.88	0.85	0.87	0.45	0.45	0.45	0.45	0.45	0.45
12	0.02	0.04	SRS	1-0	1	35	0.89	0.87	0.88	0.36	0.36	0.36	0.36	0.36	0.36
12	0.02	0.04	SRS	1-0	1	50	0.89	0.88	0.88	0.32	0.32	0.32	0.32	0.32	0.32
12	0.02	0.04	SRS	1-0	2	20	0.89	0.90	0.85	0.51	0.50	0.51	0.50	0.51	0.51
12	0.02	0.04	SRS	1-0	2	35	0.90	0.89	0.88	0.39	0.38	0.39	0.38	0.39	0.39
12	0.02	0.04	SRS	1-0	2	50	0.90	0.89	0.87	0.32	0.34	0.32	0.34	0.32	0.32
12	0.02	0.04	SRS	1-0,1-3	1	20	0.90	0.93	0.88	0.78	0.78	0.78	0.78	0.78	0.78
12	0.02	0.04	SRS	1-0,1-3	1	35	0.90	0.92	0.87	0.59	0.67	0.60	0.67	0.60	0.59
12	0.02	0.04	SRS	1-0,1-3	1	50	0.91	0.94	0.89	0.55	0.58	0.56	0.58	0.56	0.55
12	0.02	0.04	SRS	1-0,1-3	2	20	0.90	0.91	0.86	0.82	0.87	0.82	0.87	0.82	0.82
12	0.02	0.04	SRS	1-0,1-3	2	35	0.89	0.92	0.87	0.70	0.72	0.69	0.72	0.69	0.70
12	0.02	0.04	SRS	1-0,1-3	2	50	0.90	0.92	0.89	0.57	0.63	0.57	0.63	0.57	0.57
12	0.02	0.04	SRS	1-3	1	20	0.92	0.96	0.89	0.75	0.75	0.75	0.75	0.75	0.75
12	0.02	0.04	SRS	1-3	1	35	0.92	0.93	0.90	0.63	0.63	0.63	0.63	0.63	0.63
12	0.02	0.04	SRS	1-3	1	50	0.91	0.93	0.87	0.55	0.56	0.55	0.56	0.55	0.56
12	0.02	0.04	SRS	1-3	2	20	0.88	0.94	0.89	0.75	0.77	0.75	0.77	0.75	0.75
12	0.02	0.04	SRS	1-3	2	35	0.90	0.94	0.90	0.65	0.66	0.65	0.66	0.65	0.65
12	0.02	0.04	SRS	1-3	2	50	0.89	0.91	0.88	0.55	0.59	0.55	0.59	0.55	0.55
12	0.02	0.04	StRS	1-0	1	20	0.80	0.86	0.87	0.39	0.39	0.39	0.39	0.39	0.39

Table SB3 (continued). Confidence Interval (CI) coverage of the ANC trend slope estimate ($\alpha = 0.10$). For $\alpha = 0.10$, CI coverage should be about 90%. Cells with low CI coverage, or <87%, are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0.04	StRS	1-0	1	35	0.77	0.86	0.87	0.30	0.30	0.30	0.30	0.30	0.30
12	0.02	0.04	StRS	1-0	1	50	0.78	0.86	0.87	0.26	0.26	0.26	0.26	0.26	0.26
12	0.02	0.04	StRS	1-0	2	20	0.82	0.90	0.87	0.46	0.46	0.46	0.46	0.46	0.46
12	0.02	0.04	StRS	1-0	2	35	0.77	0.88	0.86	0.36	0.36	0.36	0.36	0.36	0.36
12	0.02	0.04	StRS	1-0	2	50	0.79	0.89	0.86	0.33	0.31	0.32	0.31	0.32	0.33
12	0.02	0.04	StRS	1-0,1-3	1	20	0.82	0.94	0.89	0.83	0.82	0.83	0.82	0.83	0.83
12	0.02	0.04	StRS	1-0,1-3	1	35	0.79	0.93	0.89	0.66	0.68	0.66	0.68	0.66	0.67
12	0.02	0.04	StRS	1-0,1-3	1	50	0.78	0.92	0.89	0.53	0.58	0.53	0.58	0.53	0.53
12	0.02	0.04	StRS	1-0,1-3	2	20	0.78	0.91	0.89	0.89	0.90	0.89	0.90	0.89	0.89
12	0.02	0.04	StRS	1-0,1-3	2	35	0.78	0.91	0.86	0.75	0.76	0.76	0.76	0.76	0.75
12	0.02	0.04	StRS	1-0,1-3	2	50	0.78	0.92	0.86	0.67	0.67	0.66	0.67	0.66	0.67
12	0.02	0.04	StRS	1-3	1	20	0.82	0.95	0.90	0.78	0.78	0.77	0.78	0.77	0.78
12	0.02	0.04	StRS	1-3	1	35	0.80	0.94	0.88	0.70	0.70	0.69	0.70	0.69	0.70
12	0.02	0.04	StRS	1-3	1	50	0.80	0.92	0.89	0.61	0.61	0.61	0.61	0.61	0.61
12	0.02	0.04	StRS	1-3	2	20	0.79	0.96	0.88	0.84	0.83	0.83	0.83	0.83	0.84
12	0.02	0.04	StRS	1-3	2	35	0.79	0.95	0.88	0.70	0.70	0.70	0.70	0.70	0.70
12	0.02	0.04	StRS	1-3	2	50	0.78	0.91	0.90	0.64	0.64	0.63	0.64	0.63	0.64
12	0.02	0.04	Unequal	1-0	1	20	0.89	0.87	0.85	0.48	0.48	0.48	0.48	0.48	0.48
12	0.02	0.04	Unequal	1-0	1	35	0.89	0.88	0.87	0.39	0.39	0.39	0.39	0.39	0.39
12	0.02	0.04	Unequal	1-0	1	50	0.89	0.89	0.87	0.36	0.36	0.36	0.36	0.36	0.36
12	0.02	0.04	Unequal	1-0	2	20	0.88	0.90	0.84	0.50	0.49	0.50	0.49	0.50	0.50
12	0.02	0.04	Unequal	1-0	2	35	0.89	0.90	0.86	0.42	0.42	0.42	0.42	0.42	0.42
12	0.02	0.04	Unequal	1-0	2	50	0.88	0.91	0.90	0.36	0.37	0.35	0.37	0.35	0.36
12	0.02	0.04	Unequal	1-0,1-3	1	20	0.91	0.94	0.88	0.84	0.80	0.84	0.80	0.84	0.84

Table SB3 (continued). Confidence Interval (CI) coverage of the ANC trend slope estimate ($\alpha = 0.10$). For $\alpha = 0.10$, CI coverage should be about 90%. Cells with low CI coverage, or $<87\%$, are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0.04	Unequal	1-0,1-3	1	35	0.89	0.93	0.89	0.79	0.72	0.79	0.72	0.79	0.79
12	0.02	0.04	Unequal	1-0,1-3	1	50	0.90	0.94	0.89	0.71	0.66	0.67	0.66	0.67	0.71
12	0.02	0.04	Unequal	1-0,1-3	2	20	0.90	0.92	0.89	0.90	0.89	0.90	0.89	0.90	0.90
12	0.02	0.04	Unequal	1-0,1-3	2	35	0.91	0.95	0.87	0.86	0.81	0.86	0.81	0.86	0.86
12	0.02	0.04	Unequal	1-0,1-3	2	50	0.90	0.94	0.87	0.80	0.73	0.78	0.73	0.78	0.80
12	0.02	0.04	Unequal	1-3	1	20	0.87	0.94	0.89	0.75	0.75	0.75	0.75	0.75	0.75
12	0.02	0.04	Unequal	1-3	1	35	0.89	0.95	0.89	0.64	0.65	0.64	0.65	0.64	0.65
12	0.02	0.04	Unequal	1-3	1	50	0.88	0.93	0.92	0.59	0.59	0.57	0.59	0.57	0.59
12	0.02	0.04	Unequal	1-3	2	20	0.88	0.95	0.90	0.80	0.79	0.79	0.79	0.79	0.80
12	0.02	0.04	Unequal	1-3	2	35	0.87	0.94	0.90	0.76	0.75	0.76	0.75	0.76	0.76
12	0.02	0.04	Unequal	1-3	2	50	0.90	0.92	0.87	0.69	0.69	0.67	0.69	0.67	0.70
24	0.01	0	SRS	1-0	1	20	0.90	0.78	0.80	0.59	0.59	0.59	0.59	0.59	0.59
24	0.01	0	SRS	1-0	1	35	0.89	0.78	0.84	0.51	0.51	0.51	0.51	0.51	0.51
24	0.01	0	SRS	1-0	1	50	0.87	0.80	0.84	0.41	0.41	0.41	0.41	0.41	0.41
24	0.01	0	SRS	1-0	2	20	0.90	0.83	0.78	0.62	0.63	0.63	0.63	0.63	0.62
24	0.01	0	SRS	1-0	2	35	0.90	0.82	0.79	0.50	0.50	0.50	0.50	0.50	0.50
24	0.01	0	SRS	1-0	2	50	0.89	0.86	0.80	0.44	0.46	0.44	0.46	0.44	0.44
24	0.01	0	SRS	1-0,1-3	1	20	0.89	0.88	0.86	0.65	0.67	0.64	0.67	0.64	0.65
24	0.01	0	SRS	1-0,1-3	1	35	0.89	0.90	0.89	0.53	0.53	0.52	0.53	0.52	0.53
24	0.01	0	SRS	1-0,1-3	1	50	0.88	0.87	0.87	0.43	0.45	0.43	0.45	0.43	0.43
24	0.01	0	SRS	1-0,1-3	2	20	0.91	0.89	0.83	0.57	0.56	0.57	0.56	0.57	0.57
24	0.01	0	SRS	1-0,1-3	2	35	0.90	0.90	0.88	0.45	0.46	0.45	0.46	0.45	0.45
24	0.01	0	SRS	1-0,1-3	2	50	0.90	0.91	0.88	0.37	0.41	0.39	0.41	0.39	0.37
24	0.01	0	SRS	1-3	1	20	0.87	0.92	0.87	0.60	0.60	0.59	0.60	0.59	0.60

Table SB3 (continued). Confidence Interval (CI) coverage of the ANC trend slope estimate ($\alpha = 0.10$). For $\alpha = 0.10$, CI coverage should be about 90%. Cells with low CI coverage, or $<87\%$, are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0	SRS	1-3	1	35	0.85	0.87	0.86	0.49	0.49	0.49	0.49	0.49	0.49
24	0.01	0	SRS	1-3	1	50	0.87	0.88	0.88	0.40	0.40	0.40	0.40	0.40	0.40
24	0.01	0	SRS	1-3	2	20	0.89	0.92	0.84	0.58	0.58	0.57	0.58	0.57	0.58
24	0.01	0	SRS	1-3	2	35	0.89	0.93	0.87	0.47	0.47	0.47	0.47	0.47	0.47
24	0.01	0	SRS	1-3	2	50	0.89	0.91	0.88	0.36	0.36	0.36	0.36	0.36	0.37
24	0.01	0	StRS	1-0	1	20	0.89	0.75	0.76	0.66	0.66	0.66	0.66	0.66	0.66
24	0.01	0	StRS	1-0	1	35	0.88	0.78	0.80	0.57	0.57	0.57	0.57	0.57	0.57
24	0.01	0	StRS	1-0	1	50	0.92	0.81	0.80	0.49	0.49	0.49	0.49	0.49	0.49
24	0.01	0	StRS	1-0	2	20	0.89	0.80	0.79	0.66	0.65	0.65	0.65	0.65	0.66
24	0.01	0	StRS	1-0	2	35	0.90	0.82	0.80	0.56	0.56	0.55	0.56	0.55	0.56
24	0.01	0	StRS	1-0	2	50	0.90	0.81	0.83	0.49	0.49	0.50	0.49	0.50	0.49
24	0.01	0	StRS	1-0,1-3	1	20	0.91	0.89	0.84	0.78	0.75	0.81	0.75	0.81	0.78
24	0.01	0	StRS	1-0,1-3	1	35	0.90	0.89	0.87	0.62	0.55	0.63	0.55	0.63	0.62
24	0.01	0	StRS	1-0,1-3	1	50	0.90	0.88	0.85	0.51	0.44	0.51	0.44	0.51	0.51
24	0.01	0	StRS	1-0,1-3	2	20	0.90	0.90	0.84	0.65	0.60	0.66	0.60	0.66	0.65
24	0.01	0	StRS	1-0,1-3	2	35	0.92	0.92	0.86	0.51	0.44	0.51	0.44	0.51	0.51
24	0.01	0	StRS	1-0,1-3	2	50	0.92	0.89	0.88	0.43	0.37	0.41	0.37	0.41	0.43
24	0.01	0	StRS	1-3	1	20	0.92	0.96	0.89	0.68	0.68	0.68	0.68	0.68	0.68
24	0.01	0	StRS	1-3	1	35	0.92	0.94	0.86	0.54	0.54	0.53	0.54	0.53	0.54
24	0.01	0	StRS	1-3	1	50	0.92	0.92	0.88	0.43	0.44	0.42	0.44	0.42	0.44
24	0.01	0	StRS	1-3	2	20	0.90	0.95	0.88	0.61	0.61	0.61	0.61	0.61	0.61
24	0.01	0	StRS	1-3	2	35	0.89	0.93	0.88	0.43	0.42	0.43	0.42	0.43	0.43
24	0.01	0	StRS	1-3	2	50	0.88	0.93	0.89	0.36	0.36	0.35	0.36	0.35	0.37
24	0.01	0	Unequal	1-0	1	20	0.91	0.76	0.75	0.57	0.57	0.57	0.57	0.57	0.57

Table SB3 (continued). Confidence Interval (CI) coverage of the ANC trend slope estimate ($\alpha = 0.10$). For $\alpha = 0.10$, CI coverage should be about 90%. Cells with low CI coverage, or <87%,

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0	Unequal	1-0	1	35	0.91	0.80	0.79	0.53	0.53	0.53	0.53	0.53	0.53
24	0.01	0	Unequal	1-0	1	50	0.91	0.82	0.79	0.53	0.53	0.53	0.53	0.53	0.53
24	0.01	0	Unequal	1-0	2	20	0.90	0.79	0.76	0.56	0.56	0.56	0.56	0.56	0.56
24	0.01	0	Unequal	1-0	2	35	0.87	0.78	0.81	0.48	0.48	0.49	0.48	0.49	0.48
24	0.01	0	Unequal	1-0	2	50	0.89	0.84	0.81	0.51	0.51	0.51	0.51	0.51	0.51
24	0.01	0	Unequal	1-0,1-3	1	20	0.88	0.90	0.85	0.73	0.70	0.76	0.70	0.76	0.73
24	0.01	0	Unequal	1-0,1-3	1	35	0.91	0.93	0.86	0.67	0.65	0.68	0.65	0.68	0.67
24	0.01	0	Unequal	1-0,1-3	1	50	0.91	0.89	0.86	0.62	0.59	0.62	0.59	0.62	0.62
24	0.01	0	Unequal	1-0,1-3	2	20	0.90	0.88	0.83	0.69	0.66	0.71	0.66	0.71	0.69
24	0.01	0	Unequal	1-0,1-3	2	35	0.90	0.92	0.84	0.64	0.59	0.65	0.59	0.65	0.64
24	0.01	0	Unequal	1-0,1-3	2	50	0.90	0.92	0.86	0.55	0.51	0.54	0.51	0.54	0.55
24	0.01	0	Unequal	1-3	1	20	0.90	0.95	0.88	0.74	0.74	0.74	0.74	0.74	0.74
24	0.01	0	Unequal	1-3	1	35	0.89	0.94	0.86	0.65	0.65	0.65	0.65	0.65	0.65
24	0.01	0	Unequal	1-3	1	50	0.90	0.93	0.88	0.60	0.61	0.59	0.61	0.59	0.61
24	0.01	0	Unequal	1-3	2	20	0.86	0.95	0.88	0.65	0.65	0.65	0.65	0.65	0.65
24	0.01	0	Unequal	1-3	2	35	0.90	0.93	0.91	0.59	0.59	0.58	0.59	0.58	0.59
24	0.01	0	Unequal	1-3	2	50	0.89	0.93	0.88	0.51	0.51	0.51	0.51	0.51	0.51
24	0.01	0.04	SRS	1-0	1	20	0.93	0.69	0.75	0.75	0.75	0.75	0.75	0.75	0.75
24	0.01	0.04	SRS	1-0	1	35	0.90	0.74	0.76	0.69	0.69	0.69	0.69	0.69	0.69
24	0.01	0.04	SRS	1-0	1	50	0.92	0.75	0.77	0.66	0.66	0.66	0.66	0.66	0.66
24	0.01	0.04	SRS	1-0	2	20	0.90	0.73	0.76	0.73	0.72	0.73	0.72	0.73	0.73
24	0.01	0.04	SRS	1-0	2	35	0.90	0.74	0.76	0.65	0.66	0.65	0.66	0.65	0.65
24	0.01	0.04	SRS	1-0	2	50	0.89	0.74	0.78	0.57	0.57	0.57	0.57	0.57	0.57
24	0.01	0.04	SRS	1-0,1-3	1	20	0.90	0.81	0.84	0.76	0.79	0.76	0.79	0.76	0.76

Table SB3 (continued). Confidence Interval (CI) coverage of the ANC trend slope estimate ($\alpha = 0.10$). For $\alpha = 0.10$, CI coverage should be about 90%. Cells with low CI coverage, or $<87\%$, are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0.04	SRS	1-0,1-3	1	35	0.90	0.85	0.82	0.61	0.64	0.62	0.64	0.62	0.61
24	0.01	0.04	SRS	1-0,1-3	1	50	0.90	0.82	0.84	0.52	0.54	0.53	0.54	0.53	0.52
24	0.01	0.04	SRS	1-0,1-3	2	20	0.91	0.83	0.79	0.65	0.66	0.65	0.66	0.65	0.65
24	0.01	0.04	SRS	1-0,1-3	2	35	0.90	0.85	0.82	0.52	0.56	0.53	0.56	0.53	0.52
24	0.01	0.04	SRS	1-0,1-3	2	50	0.88	0.85	0.82	0.47	0.51	0.48	0.51	0.48	0.47
24	0.01	0.04	SRS	1-3	1	20	0.91	0.88	0.88	0.67	0.67	0.67	0.67	0.67	0.67
24	0.01	0.04	SRS	1-3	1	35	0.91	0.86	0.87	0.56	0.56	0.56	0.56	0.56	0.56
24	0.01	0.04	SRS	1-3	1	50	0.92	0.84	0.88	0.50	0.50	0.50	0.50	0.50	0.50
24	0.01	0.04	SRS	1-3	2	20	0.90	0.89	0.85	0.67	0.68	0.67	0.68	0.67	0.67
24	0.01	0.04	SRS	1-3	2	35	0.89	0.85	0.85	0.57	0.57	0.57	0.57	0.57	0.57
24	0.01	0.04	SRS	1-3	2	50	0.91	0.83	0.85	0.49	0.51	0.47	0.51	0.47	0.49
24	0.01	0.04	StRS	1-0	1	20	0.85	0.64	0.71	0.72	0.72	0.72	0.72	0.72	0.72
24	0.01	0.04	StRS	1-0	1	35	0.86	0.67	0.72	0.66	0.66	0.66	0.66	0.66	0.66
24	0.01	0.04	StRS	1-0	1	50	0.86	0.66	0.75	0.57	0.57	0.57	0.57	0.57	0.57
24	0.01	0.04	StRS	1-0	2	20	0.86	0.73	0.73	0.68	0.68	0.68	0.68	0.68	0.68
24	0.01	0.04	StRS	1-0	2	35	0.83	0.68	0.75	0.58	0.58	0.58	0.58	0.58	0.58
24	0.01	0.04	StRS	1-0	2	50	0.84	0.69	0.72	0.56	0.57	0.55	0.57	0.55	0.56
24	0.01	0.04	StRS	1-0,1-3	1	20	0.85	0.78	0.82	0.80	0.81	0.80	0.81	0.80	0.80
24	0.01	0.04	StRS	1-0,1-3	1	35	0.81	0.76	0.84	0.63	0.63	0.62	0.63	0.62	0.63
24	0.01	0.04	StRS	1-0,1-3	1	50	0.83	0.76	0.81	0.57	0.57	0.56	0.57	0.56	0.57
24	0.01	0.04	StRS	1-0,1-3	2	20	0.79	0.80	0.80	0.60	0.60	0.60	0.60	0.60	0.60
24	0.01	0.04	StRS	1-0,1-3	2	35	0.79	0.81	0.83	0.52	0.53	0.53	0.53	0.53	0.52
24	0.01	0.04	StRS	1-0,1-3	2	50	0.81	0.79	0.80	0.45	0.47	0.45	0.47	0.45	0.45
24	0.01	0.04	StRS	1-3	1	20	0.82	0.88	0.83	0.73	0.73	0.73	0.73	0.73	0.73

Table SB3 (continued). Confidence Interval (CI) coverage of the ANC trend slope estimate ($\alpha = 0.10$). For $\alpha = 0.10$, CI coverage should be about 90%. Cells with low CI coverage, or <87%,

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0.04	StRS	1-3	1	35	0.81	0.83	0.83	0.61	0.61	0.61	0.61	0.61	0.61
24	0.01	0.04	StRS	1-3	1	50	0.82	0.81	0.82	0.54	0.55	0.54	0.55	0.54	0.55
24	0.01	0.04	StRS	1-3	2	20	0.84	0.88	0.85	0.69	0.68	0.69	0.68	0.69	0.69
24	0.01	0.04	StRS	1-3	2	35	0.82	0.81	0.81	0.54	0.54	0.53	0.54	0.53	0.54
24	0.01	0.04	StRS	1-3	2	50	0.83	0.79	0.80	0.48	0.47	0.48	0.47	0.48	0.48
24	0.01	0.04	Unequal	1-0	1	20	0.86	0.63	0.71	0.72	0.72	0.72	0.72	0.72	0.72
24	0.01	0.04	Unequal	1-0	1	35	0.81	0.74	0.73	0.70	0.70	0.70	0.70	0.70	0.70
24	0.01	0.04	Unequal	1-0	1	50	0.79	0.71	0.75	0.60	0.60	0.60	0.60	0.60	0.60
24	0.01	0.04	Unequal	1-0	2	20	0.86	0.74	0.75	0.71	0.71	0.71	0.71	0.71	0.71
24	0.01	0.04	Unequal	1-0	2	35	0.82	0.75	0.74	0.67	0.67	0.66	0.67	0.66	0.67
24	0.01	0.04	Unequal	1-0	2	50	0.81	0.77	0.75	0.59	0.59	0.60	0.59	0.60	0.59
24	0.01	0.04	Unequal	1-0,1-3	1	20	0.78	0.85	0.78	0.81	0.76	0.80	0.76	0.80	0.81
24	0.01	0.04	Unequal	1-0,1-3	1	35	0.74	0.88	0.82	0.70	0.65	0.69	0.65	0.69	0.70
24	0.01	0.04	Unequal	1-0,1-3	1	50	0.73	0.87	0.82	0.67	0.59	0.65	0.59	0.65	0.67
24	0.01	0.04	Unequal	1-0,1-3	2	20	0.79	0.84	0.78	0.75	0.72	0.75	0.72	0.75	0.75
24	0.01	0.04	Unequal	1-0,1-3	2	35	0.78	0.87	0.83	0.62	0.53	0.63	0.53	0.63	0.62
24	0.01	0.04	Unequal	1-0,1-3	2	50	0.76	0.89	0.85	0.61	0.51	0.60	0.51	0.60	0.61
24	0.01	0.04	Unequal	1-3	1	20	0.77	0.93	0.88	0.69	0.69	0.69	0.69	0.69	0.69
24	0.01	0.04	Unequal	1-3	1	35	0.76	0.89	0.87	0.58	0.58	0.58	0.58	0.58	0.58
24	0.01	0.04	Unequal	1-3	1	50	0.74	0.89	0.84	0.52	0.52	0.49	0.52	0.49	0.52
24	0.01	0.04	Unequal	1-3	2	20	0.80	0.94	0.84	0.69	0.69	0.69	0.69	0.69	0.69
24	0.01	0.04	Unequal	1-3	2	35	0.76	0.91	0.82	0.58	0.58	0.58	0.58	0.58	0.58
24	0.01	0.04	Unequal	1-3	2	50	0.76	0.90	0.81	0.46	0.45	0.44	0.45	0.44	0.46

Table SB4. Confidence Interval (CI) coverage of the modified ANC trend slope estimate ($\alpha = 0.10$). For $\alpha = 0.10$, CI coverage should be about 90%. Cells with Low CI coverage, or <87%, are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	SRS	1-0	1	20	0.91	0.74	0.70	0.90	0.90	0.90	0.90	0.90	0.90
12	0.02	0	SRS	1-0	1	35	0.92	0.76	0.75	0.89	0.89	0.89	0.89	0.89	0.89
12	0.02	0	SRS	1-0	1	50	0.90	0.71	0.75	0.87	0.87	0.87	0.87	0.87	0.87
12	0.02	0	SRS	1-0	2	20	0.92	0.91	0.88	0.91	0.91	0.91	0.91	0.91	0.91
12	0.02	0	SRS	1-0	2	35	0.91	0.90	0.85	0.90	0.90	0.91	0.90	0.91	0.90
12	0.02	0	SRS	1-0	2	50	0.90	0.89	0.86	0.90	0.90	0.90	0.90	0.90	0.90
12	0.02	0	SRS	1-0,1-3	1	20	0.91	0.97	0.97	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	SRS	1-0,1-3	1	35	0.89	0.99	0.97	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	SRS	1-0,1-3	1	50	0.91	0.99	0.98	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	SRS	1-0,1-3	2	20	0.89	0.95	0.94	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	SRS	1-0,1-3	2	35	0.93	0.97	0.97	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	SRS	1-0,1-3	2	50	0.91	0.98	0.97	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	SRS	1-3	1	20	0.90	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	SRS	1-3	1	35	0.90	0.99	0.99	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	SRS	1-3	1	50	0.91	0.99	0.97	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	SRS	1-3	2	20	0.91	0.99	0.98	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	SRS	1-3	2	35	0.92	0.98	0.98	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	SRS	1-3	2	50	0.92	0.99	0.97	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	StRS	1-0	1	20	0.90	0.74	0.73	0.90	0.90	0.90	0.90	0.90	0.90
12	0.02	0	StRS	1-0	1	35	0.92	0.74	0.70	0.90	0.90	0.90	0.90	0.90	0.90
12	0.02	0	StRS	1-0	1	50	0.91	0.72	0.75	0.90	0.90	0.90	0.90	0.90	0.90
12	0.02	0	StRS	1-0	2	20	0.90	0.90	0.84	0.92	0.91	0.91	0.91	0.91	0.92
12	0.02	0	StRS	1-0	2	35	0.88	0.89	0.89	0.92	0.92	0.93	0.92	0.93	0.92
12	0.02	0	StRS	1-0	2	50	0.90	0.87	0.88	0.92	0.92	0.92	0.92	0.92	0.92

Table SB4 (continued). Confidence Interval (CI) coverage of the modified ANC trend slope estimate ($\alpha = 0.10$). For $\alpha = 0.10$, CI coverage should be about 90%. Cells with Low CI coverage, or <87%, are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	StRS	1-0,1-3	1	20	0.92	0.99	0.97	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	StRS	1-0,1-3	1	35	0.93	0.99	0.98	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	StRS	1-0,1-3	1	50	0.92	0.99	0.98	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	StRS	1-0,1-3	2	20	0.92	0.97	0.96	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	StRS	1-0,1-3	2	35	0.93	0.99	0.96	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	StRS	1-0,1-3	2	50	0.92	0.97	0.97	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	StRS	1-3	1	20	0.92	0.99	0.98	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	StRS	1-3	1	35	0.93	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	StRS	1-3	1	50	0.93	0.99	0.98	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	StRS	1-3	2	20	0.93	0.99	0.98	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	StRS	1-3	2	35	0.93	0.99	0.98	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	StRS	1-3	2	50	0.91	0.99	0.99	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	Unequal	1-0	1	20	0.91	0.73	0.75	0.87	0.87	0.87	0.87	0.87	0.87
12	0.02	0	Unequal	1-0	1	35	0.91	0.77	0.78	0.91	0.91	0.91	0.91	0.91	0.91
12	0.02	0	Unequal	1-0	1	50	0.92	0.75	0.72	0.94	0.94	0.94	0.94	0.94	0.94
12	0.02	0	Unequal	1-0	2	20	0.93	0.90	0.87	0.90	0.90	0.90	0.90	0.90	0.90
12	0.02	0	Unequal	1-0	2	35	0.90	0.90	0.87	0.92	0.92	0.92	0.92	0.92	0.92
12	0.02	0	Unequal	1-0	2	50	0.93	0.90	0.85	0.95	0.95	0.95	0.95	0.95	0.95
12	0.02	0	Unequal	1-0,1-3	1	20	0.93	0.97	0.94	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	Unequal	1-0,1-3	1	35	0.91	0.98	0.98	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	Unequal	1-0,1-3	1	50	0.90	0.99	0.98	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	Unequal	1-0,1-3	2	20	0.91	0.95	0.93	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	Unequal	1-0,1-3	2	35	0.89	0.98	0.95	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	Unequal	1-0,1-3	2	50	0.91	0.98	0.98	1.00	1.00	1.00	1.00	1.00	1.00

Table SB4 (continued). Confidence Interval (CI) coverage of the modified ANC trend slope estimate ($\alpha = 0.10$). For $\alpha = 0.10$, CI coverage should be about 90%. Cells with Low CI coverage, or <87%, are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	Unequal	1-3	1	20	0.90	0.99	0.98	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	Unequal	1-3	1	35	0.91	1.00	0.99	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	Unequal	1-3	1	50	0.92	0.99	0.99	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	Unequal	1-3	2	20	0.92	0.99	0.96	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	Unequal	1-3	2	35	0.92	0.99	0.98	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0	Unequal	1-3	2	50	0.91	1.00	0.97	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	SRS	1-0	1	20	0.92	0.64	0.63	0.90	0.90	0.90	0.90	0.90	0.90
12	0.02	0.04	SRS	1-0	1	35	0.92	0.59	0.60	0.91	0.91	0.91	0.91	0.91	0.91
12	0.02	0.04	SRS	1-0	1	50	0.95	0.60	0.64	0.94	0.94	0.94	0.94	0.94	0.94
12	0.02	0.04	SRS	1-0	2	20	0.92	0.84	0.80	0.93	0.93	0.92	0.93	0.92	0.93
12	0.02	0.04	SRS	1-0	2	35	0.92	0.81	0.77	0.92	0.92	0.92	0.92	0.92	0.92
12	0.02	0.04	SRS	1-0	2	50	0.92	0.76	0.76	0.93	0.93	0.92	0.93	0.92	0.93
12	0.02	0.04	SRS	1-0,1-3	1	20	0.94	0.94	0.96	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	SRS	1-0,1-3	1	35	0.90	0.95	0.96	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	SRS	1-0,1-3	1	50	0.93	0.97	0.97	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	SRS	1-0,1-3	2	20	0.92	0.97	0.92	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	SRS	1-0,1-3	2	35	0.94	0.96	0.95	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	SRS	1-0,1-3	2	50	0.92	0.95	0.97	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	SRS	1-3	1	20	0.95	0.99	0.98	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	SRS	1-3	1	35	0.92	0.98	0.98	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	SRS	1-3	1	50	0.92	0.98	0.97	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	SRS	1-3	2	20	0.93	0.99	0.98	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	SRS	1-3	2	35	0.94	0.98	0.97	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	SRS	1-3	2	50	0.93	0.97	0.98	1.00	1.00	1.00	1.00	1.00	1.00

Table SB4 (continued). Confidence Interval (CI) coverage of the modified ANC trend slope estimate ($\alpha = 0.10$). For $\alpha = 0.10$, CI coverage should be about 90%. Cells with Low CI coverage, or <87%, are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0.04	StRS	1-0	1	20	0.89	0.63	0.65	0.87	0.87	0.87	0.87	0.87	0.87
12	0.02	0.04	StRS	1-0	1	35	0.90	0.56	0.55	0.89	0.89	0.89	0.89	0.89	0.89
12	0.02	0.04	StRS	1-0	1	50	0.88	0.48	0.52	0.86	0.86	0.86	0.86	0.86	0.86
12	0.02	0.04	StRS	1-0	2	20	0.90	0.85	0.81	0.90	0.90	0.90	0.90	0.90	0.90
12	0.02	0.04	StRS	1-0	2	35	0.89	0.82	0.76	0.88	0.88	0.88	0.88	0.88	0.88
12	0.02	0.04	StRS	1-0	2	50	0.90	0.74	0.71	0.90	0.90	0.90	0.90	0.90	0.90
12	0.02	0.04	StRS	1-0,1-3	1	20	0.89	0.94	0.95	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	StRS	1-0,1-3	1	35	0.89	0.96	0.96	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	StRS	1-0,1-3	1	50	0.89	0.95	0.95	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	StRS	1-0,1-3	2	20	0.86	0.94	0.91	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	StRS	1-0,1-3	2	35	0.88	0.95	0.94	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	StRS	1-0,1-3	2	50	0.92	0.95	0.94	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	StRS	1-3	1	20	0.89	0.98	0.96	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	StRS	1-3	1	35	0.86	0.96	0.98	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	StRS	1-3	1	50	0.90	0.96	0.95	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	StRS	1-3	2	20	0.92	0.99	0.97	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	StRS	1-3	2	35	0.89	0.98	0.97	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	StRS	1-3	2	50	0.90	0.96	0.96	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	Unequal	1-0	1	20	0.87	0.64	0.66	0.89	0.89	0.89	0.89	0.89	0.89
12	0.02	0.04	Unequal	1-0	1	35	0.78	0.63	0.69	0.89	0.89	0.89	0.89	0.89	0.89
12	0.02	0.04	Unequal	1-0	1	50	0.66	0.65	0.66	0.89	0.89	0.89	0.89	0.89	0.89
12	0.02	0.04	Unequal	1-0	2	20	0.86	0.85	0.80	0.89	0.89	0.89	0.89	0.89	0.89
12	0.02	0.04	Unequal	1-0	2	35	0.77	0.84	0.78	0.90	0.90	0.89	0.90	0.89	0.90
12	0.02	0.04	Unequal	1-0	2	50	0.65	0.85	0.81	0.92	0.92	0.91	0.92	0.91	0.92

Table SB4 (continued). Confidence Interval (CI) coverage of the modified ANC trend slope estimate ($\alpha = 0.10$). For $\alpha = 0.10$, CI coverage should be about 90%. Cells with Low CI coverage, or <87%, are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0.04	Unequal	1-0,1-3	1	20	0.75	0.95	0.94	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	Unequal	1-0,1-3	1	35	0.59	0.96	0.96	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	Unequal	1-0,1-3	1	50	0.44	0.97	0.97	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	Unequal	1-0,1-3	2	20	0.78	0.93	0.89	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	Unequal	1-0,1-3	2	35	0.65	0.97	0.95	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	Unequal	1-0,1-3	2	50	0.49	0.96	0.96	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	Unequal	1-3	1	20	0.69	0.99	0.98	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	Unequal	1-3	1	35	0.51	0.99	0.97	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	Unequal	1-3	1	50	0.42	0.99	0.97	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	Unequal	1-3	2	20	0.77	0.99	0.97	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	Unequal	1-3	2	35	0.59	0.99	0.96	1.00	1.00	1.00	1.00	1.00	1.00
12	0.02	0.04	Unequal	1-3	2	50	0.46	0.99	0.98	1.00	1.00	1.00	1.00	1.00	1.00
24	0.01	0	SRS	1-0	1	20	0.92	0.34	0.34	0.92	0.92	0.92	0.92	0.92	0.92
24	0.01	0	SRS	1-0	1	35	0.89	0.32	0.31	0.89	0.89	0.89	0.89	0.89	0.89
24	0.01	0	SRS	1-0	1	50	0.90	0.27	0.31	0.90	0.90	0.90	0.90	0.90	0.90
24	0.01	0	SRS	1-0	2	20	0.91	0.61	0.58	0.90	0.90	0.91	0.90	0.91	0.90
24	0.01	0	SRS	1-0	2	35	0.90	0.55	0.53	0.89	0.89	0.88	0.89	0.88	0.89
24	0.01	0	SRS	1-0	2	50	0.88	0.51	0.53	0.87	0.87	0.88	0.87	0.88	0.87
24	0.01	0	SRS	1-0,1-3	1	20	0.93	0.83	0.85	0.98	0.98	0.98	0.98	0.98	0.98
24	0.01	0	SRS	1-0,1-3	1	35	0.91	0.84	0.88	0.98	0.98	0.98	0.98	0.98	0.98
24	0.01	0	SRS	1-0,1-3	1	50	0.89	0.79	0.83	0.97	0.97	0.98	0.97	0.98	0.97
24	0.01	0	SRS	1-0,1-3	2	20	0.90	0.89	0.85	0.91	0.90	0.88	0.90	0.88	0.91
24	0.01	0	SRS	1-0,1-3	2	35	0.88	0.89	0.87	0.91	0.91	0.91	0.91	0.91	0.91
24	0.01	0	SRS	1-0,1-3	2	50	0.89	0.89	0.89	0.94	0.94	0.95	0.94	0.95	0.94

Table SB4 (continued). Confidence Interval (CI) coverage of the modified ANC trend slope estimate ($\alpha = 0.10$). For $\alpha = 0.10$, CI coverage should be about 90%. Cells with Low CI coverage, or <87%, are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0	SRS	1-3	1	20	0.91	0.96	0.89	0.99	0.99	0.99	0.99	0.99	0.99
24	0.01	0	SRS	1-3	1	35	0.88	0.89	0.90	0.99	0.99	0.99	0.99	0.99	0.99
24	0.01	0	SRS	1-3	1	50	0.88	0.87	0.91	0.97	0.97	0.97	0.97	0.97	0.97
24	0.01	0	SRS	1-3	2	20	0.91	0.97	0.93	0.96	0.96	0.97	0.96	0.97	0.96
24	0.01	0	SRS	1-3	2	35	0.89	0.92	0.95	0.96	0.96	0.96	0.96	0.96	0.96
24	0.01	0	SRS	1-3	2	50	0.88	0.90	0.92	0.94	0.94	0.94	0.94	0.94	0.94
24	0.01	0	StRS	1-0	1	20	0.89	0.36	0.33	0.89	0.89	0.89	0.89	0.89	0.89
24	0.01	0	StRS	1-0	1	35	0.90	0.35	0.39	0.90	0.90	0.90	0.90	0.90	0.90
24	0.01	0	StRS	1-0	1	50	0.89	0.32	0.30	0.90	0.90	0.90	0.90	0.90	0.90
24	0.01	0	StRS	1-0	2	20	0.89	0.61	0.54	0.88	0.88	0.87	0.88	0.87	0.88
24	0.01	0	StRS	1-0	2	35	0.91	0.58	0.55	0.89	0.89	0.90	0.89	0.90	0.89
24	0.01	0	StRS	1-0	2	50	0.89	0.54	0.51	0.88	0.88	0.89	0.88	0.89	0.88
24	0.01	0	StRS	1-0,1-3	1	20	0.91	0.82	0.79	0.99	0.99	0.98	0.99	0.98	0.99
24	0.01	0	StRS	1-0,1-3	1	35	0.90	0.87	0.84	0.98	0.98	0.98	0.98	0.98	0.98
24	0.01	0	StRS	1-0,1-3	1	50	0.87	0.88	0.88	0.97	0.97	0.98	0.97	0.98	0.97
24	0.01	0	StRS	1-0,1-3	2	20	0.91	0.87	0.81	0.89	0.89	0.88	0.89	0.88	0.89
24	0.01	0	StRS	1-0,1-3	2	35	0.90	0.93	0.91	0.95	0.95	0.95	0.95	0.95	0.95
24	0.01	0	StRS	1-0,1-3	2	50	0.89	0.91	0.91	0.96	0.96	0.96	0.96	0.96	0.96
24	0.01	0	StRS	1-3	1	20	0.89	0.94	0.95	0.99	0.99	0.99	0.99	0.99	0.99
24	0.01	0	StRS	1-3	1	35	0.89	0.91	0.93	0.99	0.99	0.99	0.99	0.99	0.99
24	0.01	0	StRS	1-3	1	50	0.93	0.91	0.90	0.99	0.99	0.99	0.99	0.99	0.99
24	0.01	0	StRS	1-3	2	20	0.89	0.97	0.93	0.97	0.97	0.96	0.97	0.96	0.97
24	0.01	0	StRS	1-3	2	35	0.92	0.96	0.95	0.96	0.96	0.96	0.96	0.96	0.96
24	0.01	0	StRS	1-3	2	50	0.89	0.94	0.94	0.97	0.97	0.97	0.97	0.97	0.97

Table SB4 (continued). Confidence Interval (CI) coverage of the modified ANC trend slope estimate ($\alpha = 0.10$). For $\alpha = 0.10$, CI coverage should be about 90%. Cells with Low CI coverage, or <87%, are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0	Unequal	1-0	1	20	0.90	0.36	0.36	0.86	0.86	0.86	0.86	0.86	0.86
24	0.01	0	Unequal	1-0	1	35	0.90	0.37	0.35	0.89	0.89	0.89	0.89	0.89	0.89
24	0.01	0	Unequal	1-0	1	50	0.89	0.34	0.32	0.87	0.87	0.87	0.87	0.87	0.87
24	0.01	0	Unequal	1-0	2	20	0.87	0.58	0.55	0.82	0.82	0.82	0.82	0.82	0.82
24	0.01	0	Unequal	1-0	2	35	0.89	0.57	0.59	0.89	0.89	0.89	0.89	0.89	0.89
24	0.01	0	Unequal	1-0	2	50	0.91	0.56	0.58	0.89	0.89	0.89	0.89	0.89	0.89
24	0.01	0	Unequal	1-0,1-3	1	20	0.90	0.84	0.79	0.97	0.97	0.98	0.97	0.98	0.97
24	0.01	0	Unequal	1-0,1-3	1	35	0.90	0.89	0.87	1.00	1.00	1.00	1.00	1.00	1.00
24	0.01	0	Unequal	1-0,1-3	1	50	0.92	0.90	0.89	0.99	0.99	0.99	0.99	0.99	0.99
24	0.01	0	Unequal	1-0,1-3	2	20	0.89	0.87	0.83	0.93	0.93	0.94	0.93	0.94	0.93
24	0.01	0	Unequal	1-0,1-3	2	35	0.89	0.93	0.88	0.98	0.98	0.98	0.98	0.98	0.98
24	0.01	0	Unequal	1-0,1-3	2	50	0.91	0.93	0.92	0.99	0.99	0.99	0.99	0.99	0.99
24	0.01	0	Unequal	1-3	1	20	0.89	0.97	0.95	0.99	0.99	0.99	0.99	0.99	0.99
24	0.01	0	Unequal	1-3	1	35	0.89	0.95	0.95	0.99	0.99	0.99	0.99	0.99	0.99
24	0.01	0	Unequal	1-3	1	50	0.91	0.96	0.92	1.00	1.00	1.00	1.00	1.00	1.00
24	0.01	0	Unequal	1-3	2	20	0.91	0.98	0.95	0.98	0.98	0.98	0.98	0.98	0.98
24	0.01	0	Unequal	1-3	2	35	0.92	0.96	0.94	0.98	0.98	0.98	0.98	0.98	0.98
24	0.01	0	Unequal	1-3	2	50	0.92	0.97	0.95	0.99	0.99	0.98	0.99	0.98	0.99
24	0.01	0.04	SRS	1-0	1	20	0.93	0.23	0.27	0.93	0.93	0.93	0.93	0.93	0.93
24	0.01	0.04	SRS	1-0	1	35	0.93	0.16	0.25	0.93	0.93	0.93	0.93	0.93	0.93
24	0.01	0.04	SRS	1-0	1	50	0.93	0.13	0.24	0.93	0.93	0.93	0.93	0.93	0.93
24	0.01	0.04	SRS	1-0	2	20	0.90	0.40	0.44	0.90	0.90	0.90	0.90	0.90	0.90
24	0.01	0.04	SRS	1-0	2	35	0.92	0.32	0.39	0.92	0.92	0.92	0.92	0.92	0.92
24	0.01	0.04	SRS	1-0	2	50	0.93	0.27	0.31	0.93	0.93	0.93	0.93	0.93	0.93

Table SB4 (continued). Confidence Interval (CI) coverage of the modified ANC trend slope estimate ($\alpha = 0.10$). For $\alpha = 0.10$, CI coverage should be about 90%. Cells with Low CI coverage, or <87%, are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0.04	SRS	1-0,1-3	1	20	0.93	0.64	0.74	0.97	0.97	0.97	0.97	0.97	0.97
24	0.01	0.04	SRS	1-0,1-3	1	35	0.94	0.64	0.73	0.98	0.98	0.98	0.98	0.98	0.98
24	0.01	0.04	SRS	1-0,1-3	1	50	0.96	0.59	0.69	0.99	0.99	0.99	0.99	0.99	0.99
24	0.01	0.04	SRS	1-0,1-3	2	20	0.93	0.74	0.73	0.93	0.92	0.91	0.92	0.91	0.93
24	0.01	0.04	SRS	1-0,1-3	2	35	0.93	0.75	0.78	0.95	0.95	0.93	0.95	0.93	0.95
24	0.01	0.04	SRS	1-0,1-3	2	50	0.96	0.68	0.81	0.97	0.97	0.96	0.97	0.96	0.97
24	0.01	0.04	SRS	1-3	1	20	0.95	0.79	0.88	0.98	0.98	0.98	0.98	0.98	0.98
24	0.01	0.04	SRS	1-3	1	35	0.95	0.71	0.81	0.98	0.98	0.98	0.98	0.98	0.98
24	0.01	0.04	SRS	1-3	1	50	0.95	0.63	0.74	0.98	0.98	0.98	0.98	0.98	0.98
24	0.01	0.04	SRS	1-3	2	20	0.94	0.86	0.92	0.96	0.96	0.96	0.96	0.96	0.96
24	0.01	0.04	SRS	1-3	2	35	0.95	0.77	0.87	0.97	0.97	0.97	0.97	0.97	0.97
24	0.01	0.04	SRS	1-3	2	50	0.95	0.70	0.86	0.97	0.97	0.97	0.97	0.97	0.97
24	0.01	0.04	StRS	1-0	1	20	0.90	0.21	0.23	0.89	0.89	0.89	0.89	0.89	0.89
24	0.01	0.04	StRS	1-0	1	35	0.89	0.11	0.14	0.87	0.87	0.87	0.87	0.87	0.87
24	0.01	0.04	StRS	1-0	1	50	0.90	0.06	0.10	0.90	0.90	0.90	0.90	0.90	0.90
24	0.01	0.04	StRS	1-0	2	20	0.90	0.40	0.44	0.86	0.86	0.86	0.86	0.86	0.86
24	0.01	0.04	StRS	1-0	2	35	0.91	0.30	0.34	0.91	0.91	0.90	0.91	0.90	0.91
24	0.01	0.04	StRS	1-0	2	50	0.89	0.19	0.22	0.89	0.89	0.89	0.89	0.89	0.89
24	0.01	0.04	StRS	1-0,1-3	1	20	0.90	0.59	0.65	0.96	0.96	0.96	0.96	0.96	0.96
24	0.01	0.04	StRS	1-0,1-3	1	35	0.91	0.54	0.65	0.98	0.98	0.98	0.98	0.98	0.98
24	0.01	0.04	StRS	1-0,1-3	1	50	0.87	0.49	0.58	0.97	0.97	0.97	0.97	0.97	0.97
24	0.01	0.04	StRS	1-0,1-3	2	20	0.90	0.63	0.73	0.90	0.90	0.89	0.90	0.89	0.90
24	0.01	0.04	StRS	1-0,1-3	2	35	0.91	0.56	0.72	0.94	0.94	0.93	0.94	0.93	0.94
24	0.01	0.04	StRS	1-0,1-3	2	50	0.91	0.50	0.69	0.95	0.95	0.95	0.95	0.95	0.95

Table SB4 (continued). Confidence Interval (CI) coverage of the modified ANC trend slope estimate ($\alpha = 0.10$). For $\alpha = 0.10$, CI coverage should be about 90%. Cells with Low CI coverage, or <87%, are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0.04	StRS	1-3	1	20	0.91	0.80	0.83	0.98	0.98	0.98	0.98	0.98	0.98
24	0.01	0.04	StRS	1-3	1	35	0.88	0.64	0.74	0.98	0.98	0.98	0.98	0.98	0.98
24	0.01	0.04	StRS	1-3	1	50	0.87	0.51	0.70	0.98	0.98	0.98	0.98	0.98	0.98
24	0.01	0.04	StRS	1-3	2	20	0.89	0.85	0.87	0.95	0.95	0.95	0.95	0.95	0.95
24	0.01	0.04	StRS	1-3	2	35	0.90	0.71	0.85	0.95	0.95	0.95	0.95	0.95	0.95
24	0.01	0.04	StRS	1-3	2	50	0.90	0.61	0.73	0.96	0.96	0.96	0.96	0.96	0.96
24	0.01	0.04	Unequal	1-0	1	20	0.83	0.27	0.33	0.87	0.87	0.87	0.87	0.87	0.87
24	0.01	0.04	Unequal	1-0	1	35	0.76	0.20	0.32	0.89	0.89	0.89	0.89	0.89	0.89
24	0.01	0.04	Unequal	1-0	1	50	0.60	0.28	0.30	0.93	0.93	0.93	0.93	0.93	0.93
24	0.01	0.04	Unequal	1-0	2	20	0.86	0.46	0.51	0.87	0.87	0.87	0.87	0.87	0.87
24	0.01	0.04	Unequal	1-0	2	35	0.74	0.42	0.48	0.87	0.87	0.88	0.87	0.88	0.87
24	0.01	0.04	Unequal	1-0	2	50	0.60	0.45	0.51	0.89	0.89	0.89	0.89	0.89	0.89
24	0.01	0.04	Unequal	1-0,1-3	1	20	0.58	0.75	0.73	0.96	0.96	0.93	0.96	0.93	0.96
24	0.01	0.04	Unequal	1-0,1-3	1	35	0.32	0.79	0.80	0.98	0.98	0.97	0.98	0.97	0.98
24	0.01	0.04	Unequal	1-0,1-3	1	50	0.09	0.79	0.80	0.99	0.99	0.97	0.99	0.97	0.99
24	0.01	0.04	Unequal	1-0,1-3	2	20	0.63	0.80	0.79	0.90	0.90	0.89	0.90	0.89	0.90
24	0.01	0.04	Unequal	1-0,1-3	2	35	0.27	0.83	0.85	0.96	0.96	0.96	0.96	0.96	0.96
24	0.01	0.04	Unequal	1-0,1-3	2	50	0.10	0.81	0.90	0.96	0.96	0.96	0.96	0.96	0.96
24	0.01	0.04	Unequal	1-3	1	20	0.50	0.92	0.93	0.98	0.98	0.98	0.98	0.98	0.98
24	0.01	0.04	Unequal	1-3	1	35	0.19	0.87	0.91	0.97	0.97	0.97	0.97	0.97	0.97
24	0.01	0.04	Unequal	1-3	1	50	0.06	0.83	0.88	0.97	0.97	0.97	0.97	0.97	0.97
24	0.01	0.04	Unequal	1-3	2	20	0.47	0.94	0.91	0.96	0.96	0.97	0.96	0.97	0.96
24	0.01	0.04	Unequal	1-3	2	35	0.18	0.92	0.93	0.97	0.97	0.96	0.97	0.96	0.97
24	0.01	0.04	Unequal	1-3	2	50	0.06	0.89	0.95	0.96	0.96	0.96	0.96	0.96	0.96

Table SB5. Trend Test Size of the *t*-test for the ANC Trend Slope Estimate. When test size at > 0.13 or <0.07, cells are also shaded

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0	0	SRS	1-0	1	20	0.11	0.12	0.11	0.65	0.65	0.65	0.65	0.65	0.65
12	0	0	SRS	1-0	1	35	0.10	0.11	0.12	0.71	0.71	0.71	0.71	0.71	0.71
12	0	0	SRS	1-0	1	50	0.10	0.12	0.14	0.76	0.76	0.76	0.76	0.76	0.76
12	0	0	SRS	1-0	2	20	0.11	0.11	0.12	0.63	0.63	0.63	0.63	0.63	0.63
12	0	0	SRS	1-0	2	35	0.10	0.10	0.11	0.71	0.70	0.71	0.70	0.71	0.71
12	0	0	SRS	1-0	2	50	0.11	0.09	0.12	0.77	0.77	0.76	0.77	0.76	0.77
12	0	0	SRS	1-0,1-3	1	20	0.11	0.10	0.11	0.27	0.25	0.28	0.25	0.28	0.27
12	0	0	SRS	1-0,1-3	1	35	0.10	0.08	0.10	0.43	0.40	0.43	0.40	0.43	0.43
12	0	0	SRS	1-0,1-3	1	50	0.11	0.09	0.11	0.48	0.48	0.50	0.48	0.50	0.48
12	0	0	SRS	1-0,1-3	2	20	0.10	0.08	0.11	0.17	0.12	0.18	0.12	0.18	0.17
12	0	0	SRS	1-0,1-3	2	35	0.10	0.07	0.09	0.34	0.26	0.34	0.26	0.34	0.34
12	0	0	SRS	1-0,1-3	2	50	0.10	0.08	0.12	0.43	0.35	0.44	0.35	0.44	0.43
12	0	0	SRS	1-3	1	20	0.11	0.05	0.08	0.29	0.29	0.29	0.29	0.29	0.29
12	0	0	SRS	1-3	1	35	0.11	0.08	0.11	0.38	0.38	0.39	0.38	0.39	0.38
12	0	0	SRS	1-3	1	50	0.11	0.08	0.10	0.46	0.46	0.46	0.46	0.46	0.46
12	0	0	SRS	1-3	2	20	0.10	0.05	0.12	0.24	0.21	0.25	0.21	0.25	0.24
12	0	0	SRS	1-3	2	35	0.10	0.07	0.11	0.39	0.34	0.39	0.34	0.39	0.39
12	0	0	SRS	1-3	2	50	0.11	0.07	0.11	0.46	0.41	0.46	0.41	0.46	0.46
12	0	0	StRS	1-0	1	20	0.12	0.12	0.10	0.61	0.61	0.61	0.61	0.61	0.61
12	0	0	StRS	1-0	1	35	0.09	0.10	0.11	0.76	0.76	0.76	0.76	0.76	0.76
12	0	0	StRS	1-0	1	50	0.10	0.10	0.10	0.81	0.81	0.81	0.81	0.81	0.81
12	0	0	StRS	1-0	2	20	0.10	0.11	0.11	0.63	0.64	0.64	0.64	0.64	0.63
12	0	0	StRS	1-0	2	35	0.09	0.10	0.10	0.74	0.73	0.74	0.73	0.74	0.74
12	0	0	StRS	1-0	2	50	0.10	0.08	0.11	0.80	0.81	0.80	0.81	0.80	0.80
12	0	0	StRS	1-0,1-3	1	20	0.12	0.09	0.09	0.19	0.30	0.18	0.30	0.18	0.19
12	0	0	StRS	1-0,1-3	1	35	0.12	0.08	0.09	0.36	0.49	0.36	0.49	0.36	0.36
12	0	0	StRS	1-0,1-3	1	50	0.13	0.09	0.09	0.49	0.63	0.52	0.63	0.52	0.49
12	0	0	StRS	1-0,1-3	2	20	0.09	0.06	0.13	0.08	0.19	0.08	0.19	0.08	0.08

Table SB5 (continued). Trend Test Size of the *t*-test for the ANC Trend Slope Estimate. When test size at > 0.13 or <0.07, cells are also shaded

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0	0	StRS	1-0,1-3	2	35	0.10	0.06	0.13	0.27	0.40	0.26	0.40	0.26	0.27
12	0	0	StRS	1-0,1-3	2	50	0.09	0.09	0.12	0.39	0.50	0.40	0.50	0.40	0.38
12	0	0	StRS	1-3	1	20	0.10	0.06	0.11	0.34	0.34	0.35	0.34	0.35	0.34
12	0	0	StRS	1-3	1	35	0.10	0.06	0.10	0.54	0.54	0.55	0.54	0.55	0.54
12	0	0	StRS	1-3	1	50	0.11	0.08	0.12	0.62	0.61	0.64	0.61	0.64	0.61
12	0	0	StRS	1-3	2	20	0.07	0.05	0.12	0.29	0.29	0.29	0.29	0.29	0.29
12	0	0	StRS	1-3	2	35	0.08	0.05	0.10	0.47	0.49	0.48	0.49	0.48	0.47
12	0	0	StRS	1-3	2	50	0.08	0.05	0.10	0.55	0.55	0.56	0.55	0.56	0.54
12	0	0	Unequal	1-0	1	20	0.12	0.12	0.10	0.59	0.59	0.59	0.59	0.59	0.59
12	0	0	Unequal	1-0	1	35	0.10	0.10	0.08	0.64	0.64	0.64	0.64	0.64	0.64
12	0	0	Unequal	1-0	1	50	0.10	0.11	0.08	0.66	0.66	0.66	0.66	0.66	0.66
12	0	0	Unequal	1-0	2	20	0.10	0.11	0.09	0.57	0.57	0.57	0.57	0.57	0.57
12	0	0	Unequal	1-0	2	35	0.13	0.11	0.12	0.65	0.65	0.65	0.65	0.65	0.65
12	0	0	Unequal	1-0	2	50	0.13	0.13	0.10	0.66	0.66	0.66	0.66	0.66	0.66
12	0	0	Unequal	1-0,1-3	1	20	0.12	0.09	0.12	0.21	0.23	0.20	0.23	0.20	0.21
12	0	0	Unequal	1-0,1-3	1	35	0.11	0.07	0.13	0.27	0.26	0.27	0.26	0.27	0.27
12	0	0	Unequal	1-0,1-3	1	50	0.10	0.07	0.11	0.31	0.31	0.32	0.31	0.32	0.31
12	0	0	Unequal	1-0,1-3	2	20	0.12	0.07	0.12	0.10	0.12	0.11	0.12	0.11	0.10
12	0	0	Unequal	1-0,1-3	2	35	0.13	0.07	0.12	0.17	0.19	0.18	0.19	0.18	0.17
12	0	0	Unequal	1-0,1-3	2	50	0.11	0.06	0.15	0.23	0.22	0.24	0.22	0.24	0.23
12	0	0	Unequal	1-3	1	20	0.13	0.03	0.10	0.16	0.16	0.16	0.16	0.16	0.16
12	0	0	Unequal	1-3	1	35	0.12	0.06	0.12	0.29	0.29	0.30	0.29	0.30	0.29
12	0	0	Unequal	1-3	1	50	0.12	0.05	0.13	0.34	0.32	0.35	0.32	0.35	0.32
12	0	0	Unequal	1-3	2	20	0.11	0.05	0.10	0.14	0.14	0.13	0.14	0.13	0.13
12	0	0	Unequal	1-3	2	35	0.10	0.06	0.14	0.21	0.21	0.22	0.21	0.22	0.21
12	0	0	Unequal	1-3	2	50	0.10	0.05	0.13	0.25	0.25	0.26	0.25	0.26	0.24
24	0	0	SRS	1-0	1	20	0.10	0.19	0.20	0.37	0.37	0.37	0.37	0.37	0.37
24	0	0	SRS	1-0	1	35	0.09	0.16	0.17	0.46	0.46	0.46	0.46	0.46	0.46

Table SB5 (continued). Trend Test Size of the *t*-test for the ANC Trend Slope Estimate. When test size at > 0.13 or <0.07, cells are also shaded

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0	0	SRS	1-0	1	50	0.10	0.17	0.16	0.54	0.54	0.54	0.54	0.54	0.54
24	0	0	SRS	1-0	2	20	0.09	0.17	0.19	0.37	0.37	0.38	0.37	0.38	0.37
24	0	0	SRS	1-0	2	35	0.10	0.18	0.17	0.49	0.48	0.49	0.48	0.49	0.49
24	0	0	SRS	1-0	2	50	0.08	0.11	0.16	0.54	0.54	0.53	0.54	0.53	0.54
24	0	0	SRS	1-0,1-3	1	20	0.09	0.10	0.17	0.34	0.33	0.34	0.33	0.34	0.34
24	0	0	SRS	1-0,1-3	1	35	0.10	0.12	0.12	0.46	0.43	0.46	0.43	0.46	0.46
24	0	0	SRS	1-0,1-3	1	50	0.09	0.09	0.14	0.55	0.50	0.53	0.50	0.53	0.55
24	0	0	SRS	1-0,1-3	2	20	0.10	0.11	0.16	0.45	0.44	0.46	0.44	0.46	0.45
24	0	0	SRS	1-0,1-3	2	35	0.11	0.11	0.14	0.51	0.53	0.52	0.53	0.52	0.51
24	0	0	SRS	1-0,1-3	2	50	0.10	0.10	0.12	0.60	0.55	0.58	0.55	0.58	0.60
24	0	0	SRS	1-3	1	20	0.10	0.09	0.14	0.37	0.37	0.37	0.37	0.37	0.37
24	0	0	SRS	1-3	1	35	0.10	0.10	0.15	0.53	0.53	0.53	0.53	0.53	0.53
24	0	0	SRS	1-3	1	50	0.10	0.10	0.14	0.58	0.58	0.59	0.58	0.59	0.58
24	0	0	SRS	1-3	2	20	0.10	0.07	0.10	0.42	0.42	0.43	0.42	0.43	0.43
24	0	0	SRS	1-3	2	35	0.09	0.08	0.07	0.50	0.51	0.50	0.51	0.50	0.50
24	0	0	SRS	1-3	2	50	0.11	0.09	0.10	0.60	0.59	0.61	0.59	0.61	0.60
24	0	0	StRS	1-0	1	20	0.08	0.22	0.26	0.32	0.32	0.32	0.32	0.32	0.32
24	0	0	StRS	1-0	1	35	0.09	0.18	0.22	0.42	0.42	0.42	0.42	0.42	0.42
24	0	0	StRS	1-0	1	50	0.11	0.15	0.20	0.50	0.50	0.50	0.50	0.50	0.50
24	0	0	StRS	1-0	2	20	0.10	0.22	0.20	0.35	0.34	0.35	0.34	0.35	0.35
24	0	0	StRS	1-0	2	35	0.09	0.15	0.19	0.44	0.45	0.43	0.45	0.43	0.44
24	0	0	StRS	1-0	2	50	0.11	0.17	0.18	0.48	0.48	0.48	0.48	0.48	0.48
24	0	0	StRS	1-0,1-3	1	20	0.09	0.11	0.19	0.21	0.26	0.21	0.26	0.21	0.21
24	0	0	StRS	1-0,1-3	1	35	0.10	0.07	0.13	0.39	0.46	0.38	0.46	0.38	0.39
24	0	0	StRS	1-0,1-3	1	50	0.11	0.11	0.13	0.50	0.57	0.52	0.57	0.52	0.50
24	0	0	StRS	1-0,1-3	2	20	0.09	0.10	0.14	0.33	0.37	0.34	0.37	0.34	0.33
24	0	0	StRS	1-0,1-3	2	35	0.09	0.07	0.11	0.43	0.51	0.43	0.51	0.43	0.43
24	0	0	StRS	1-0,1-3	2	50	0.10	0.06	0.14	0.54	0.63	0.56	0.63	0.56	0.54

Table SB5 (continued). Trend Test Size of the *t*-test for the ANC Trend Slope Estimate. When test size at > 0.13 or <0.07, cells are also shaded

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0	0	StRS	1-3	1	20	0.11	0.05	0.12	0.31	0.31	0.32	0.31	0.32	0.31
24	0	0	StRS	1-3	1	35	0.10	0.07	0.09	0.51	0.51	0.51	0.51	0.51	0.51
24	0	0	StRS	1-3	1	50	0.10	0.09	0.10	0.57	0.56	0.57	0.56	0.57	0.56
24	0	0	StRS	1-3	2	20	0.07	0.05	0.13	0.36	0.37	0.37	0.37	0.37	0.36
24	0	0	StRS	1-3	2	35	0.09	0.07	0.13	0.56	0.57	0.56	0.57	0.56	0.56
24	0	0	StRS	1-3	2	50	0.09	0.08	0.13	0.62	0.63	0.64	0.63	0.64	0.62
24	0	0	Unequal	1-0	1	20	0.10	0.23	0.26	0.40	0.40	0.40	0.40	0.40	0.40
24	0	0	Unequal	1-0	1	35	0.11	0.21	0.21	0.42	0.42	0.42	0.42	0.42	0.42
24	0	0	Unequal	1-0	1	50	0.12	0.21	0.24	0.50	0.50	0.50	0.50	0.50	0.50
24	0	0	Unequal	1-0	2	20	0.08	0.16	0.23	0.39	0.39	0.38	0.39	0.38	0.39
24	0	0	Unequal	1-0	2	35	0.09	0.18	0.20	0.44	0.44	0.43	0.44	0.43	0.44
24	0	0	Unequal	1-0	2	50	0.08	0.15	0.18	0.46	0.46	0.47	0.46	0.47	0.46
24	0	0	Unequal	1-0,1-3	1	20	0.08	0.11	0.16	0.24	0.27	0.22	0.27	0.22	0.24
24	0	0	Unequal	1-0,1-3	1	35	0.09	0.09	0.14	0.30	0.35	0.32	0.35	0.32	0.30
24	0	0	Unequal	1-0,1-3	1	50	0.08	0.08	0.12	0.33	0.36	0.33	0.36	0.33	0.33
24	0	0	Unequal	1-0,1-3	2	20	0.09	0.08	0.15	0.30	0.33	0.30	0.33	0.30	0.30
24	0	0	Unequal	1-0,1-3	2	35	0.08	0.06	0.13	0.35	0.39	0.37	0.39	0.37	0.35
24	0	0	Unequal	1-0,1-3	2	50	0.08	0.06	0.15	0.41	0.44	0.41	0.44	0.41	0.41
24	0	0	Unequal	1-3	1	20	0.10	0.05	0.13	0.31	0.31	0.31	0.31	0.31	0.31
24	0	0	Unequal	1-3	1	35	0.10	0.05	0.13	0.37	0.37	0.38	0.37	0.38	0.37
24	0	0	Unequal	1-3	1	50	0.11	0.08	0.10	0.45	0.44	0.45	0.44	0.45	0.44
24	0	0	Unequal	1-3	2	20	0.13	0.07	0.11	0.35	0.35	0.35	0.35	0.35	0.35
24	0	0	Unequal	1-3	2	35	0.12	0.06	0.12	0.45	0.45	0.45	0.45	0.45	0.45
24	0	0	Unequal	1-3	2	50	0.14	0.08	0.16	0.48	0.47	0.49	0.47	0.49	0.48

Table SB6. Trend Test Size of the *t*-test for the modified ANC Trend Slope Estimate. When test size is >0.13, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0	0	SRS	1-0	1	20	0.07	0.25	0.30	0.10	0.10	0.10	0.10	0.10	0.10
12	0	0	SRS	1-0	1	35	0.10	0.30	0.29	0.12	0.12	0.12	0.12	0.12	0.12
12	0	0	SRS	1-0	1	50	0.09	0.26	0.27	0.11	0.11	0.11	0.11	0.11	0.11
12	0	0	SRS	1-0	2	20	0.06	0.09	0.12	0.08	0.08	0.08	0.08	0.08	0.08
12	0	0	SRS	1-0	2	35	0.08	0.11	0.15	0.09	0.09	0.08	0.09	0.08	0.09
12	0	0	SRS	1-0	2	50	0.10	0.13	0.15	0.10	0.10	0.10	0.10	0.10	0.10
12	0	0	SRS	1-0,1-3	1	20	0.10	0.03	0.05	0.00	0.00	0.00	0.00	0.00	0.00
12	0	0	SRS	1-0,1-3	1	35	0.07	0.02	0.03	0.00	0.00	0.00	0.00	0.00	0.00
12	0	0	SRS	1-0,1-3	1	50	0.08	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00
12	0	0	SRS	1-0,1-3	2	20	0.07	0.04	0.05	0.00	0.00	0.00	0.00	0.00	0.00
12	0	0	SRS	1-0,1-3	2	35	0.09	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00
12	0	0	SRS	1-0,1-3	2	50	0.09	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00
12	0	0	SRS	1-3	1	20	0.08	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
12	0	0	SRS	1-3	1	35	0.07	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
12	0	0	SRS	1-3	1	50	0.10	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00
12	0	0	SRS	1-3	2	20	0.08	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00
12	0	0	SRS	1-3	2	35	0.11	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
12	0	0	SRS	1-3	2	50	0.10	0.03	0.01	0.00	0.00	0.00	0.00	0.00	0.00
12	0	0	StRS	1-0	1	20	0.07	0.27	0.27	0.06	0.06	0.06	0.06	0.06	0.06
12	0	0	StRS	1-0	1	35	0.11	0.28	0.30	0.12	0.12	0.12	0.12	0.12	0.12
12	0	0	StRS	1-0	1	50	0.09	0.26	0.28	0.09	0.09	0.09	0.09	0.09	0.09
12	0	0	StRS	1-0	2	20	0.08	0.10	0.14	0.06	0.06	0.06	0.06	0.06	0.06
12	0	0	StRS	1-0	2	35	0.10	0.12	0.12	0.09	0.09	0.09	0.09	0.09	0.09
12	0	0	StRS	1-0	2	50	0.09	0.11	0.12	0.06	0.06	0.06	0.06	0.06	0.06
12	0	0	StRS	1-0,1-3	1	20	0.11	0.02	0.04	0.00	0.00	0.00	0.00	0.00	0.00

Table SB6 (continued). Trend Test Size of the *t*-test for the modified ANC Trend Slope Estimate. When test size is >0.13, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0	0	StRS	1-0,1-3	1	35	0.09	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00
12	0	0	StRS	1-0,1-3	1	50	0.06	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00
12	0	0	StRS	1-0,1-3	2	20	0.09	0.03	0.04	0.00	0.00	0.00	0.00	0.00	0.00
12	0	0	StRS	1-0,1-3	2	35	0.08	0.01	0.03	0.00	0.00	0.00	0.00	0.00	0.00
12	0	0	StRS	1-0,1-3	2	50	0.08	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00
12	0	0	StRS	1-3	1	20	0.10	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
12	0	0	StRS	1-3	1	35	0.05	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00
12	0	0	StRS	1-3	1	50	0.08	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
12	0	0	StRS	1-3	2	20	0.07	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00
12	0	0	StRS	1-3	2	35	0.06	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
12	0	0	StRS	1-3	2	50	0.07	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00
12	0	0	Unequal	1-0	1	20	0.08	0.27	0.26	0.12	0.12	0.12	0.12	0.12	0.12
12	0	0	Unequal	1-0	1	35	0.11	0.30	0.30	0.09	0.09	0.09	0.09	0.09	0.09
12	0	0	Unequal	1-0	1	50	0.07	0.28	0.27	0.04	0.04	0.04	0.04	0.04	0.04
12	0	0	Unequal	1-0	2	20	0.09	0.13	0.16	0.08	0.08	0.09	0.08	0.09	0.08
12	0	0	Unequal	1-0	2	35	0.08	0.12	0.16	0.07	0.07	0.07	0.07	0.07	0.07
12	0	0	Unequal	1-0	2	50	0.08	0.09	0.13	0.04	0.04	0.05	0.04	0.05	0.04
12	0	0	Unequal	1-0,1-3	1	20	0.08	0.02	0.04	0.00	0.00	0.00	0.00	0.00	0.00
12	0	0	Unequal	1-0,1-3	1	35	0.10	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00
12	0	0	Unequal	1-0,1-3	1	50	0.09	0.01	0.02	0.00	0.00	0.00	0.00	0.00	0.00
12	0	0	Unequal	1-0,1-3	2	20	0.11	0.05	0.06	0.00	0.00	0.00	0.00	0.00	0.00
12	0	0	Unequal	1-0,1-3	2	35	0.09	0.03	0.04	0.00	0.00	0.00	0.00	0.00	0.00
12	0	0	Unequal	1-0,1-3	2	50	0.10	0.03	0.04	0.00	0.00	0.00	0.00	0.00	0.00
12	0	0	Unequal	1-3	1	20	0.08	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
12	0	0	Unequal	1-3	1	35	0.10	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00

Table SB6 (continued). Trend Test Size of the *t*-test for the modified ANC Trend Slope Estimate. When test size is >0.13, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0	0	Unequal	1-3	1	50	0.09	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
12	0	0	Unequal	1-3	2	20	0.06	0.01	0.04	0.00	0.00	0.00	0.00	0.00	0.00
12	0	0	Unequal	1-3	2	35	0.09	0.02	0.02	0.00	0.00	0.00	0.00	0.00	0.00
12	0	0	Unequal	1-3	2	50	0.09	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.00
24	0	0	SRS	1-0	1	20	0.10	0.67	0.64	0.11	0.11	0.11	0.11	0.11	0.11
24	0	0	SRS	1-0	1	35	0.11	0.66	0.65	0.12	0.12	0.12	0.12	0.12	0.12
24	0	0	SRS	1-0	1	50	0.09	0.71	0.69	0.10	0.10	0.10	0.10	0.10	0.10
24	0	0	SRS	1-0	2	20	0.08	0.44	0.48	0.09	0.09	0.09	0.09	0.09	0.09
24	0	0	SRS	1-0	2	35	0.11	0.48	0.52	0.12	0.12	0.12	0.12	0.12	0.12
24	0	0	SRS	1-0	2	50	0.11	0.55	0.52	0.11	0.11	0.12	0.11	0.12	0.11
24	0	0	SRS	1-0,1-3	1	20	0.09	0.19	0.24	0.03	0.03	0.03	0.03	0.03	0.03
24	0	0	SRS	1-0,1-3	1	35	0.09	0.14	0.14	0.02	0.02	0.02	0.02	0.02	0.02
24	0	0	SRS	1-0,1-3	1	50	0.10	0.16	0.15	0.02	0.02	0.02	0.02	0.02	0.02
24	0	0	SRS	1-0,1-3	2	20	0.12	0.12	0.18	0.12	0.12	0.15	0.12	0.15	0.12
24	0	0	SRS	1-0,1-3	2	35	0.07	0.12	0.15	0.05	0.05	0.06	0.05	0.06	0.05
24	0	0	SRS	1-0,1-3	2	50	0.10	0.10	0.14	0.06	0.06	0.06	0.06	0.06	0.06
24	0	0	SRS	1-3	1	20	0.08	0.07	0.07	0.01	0.01	0.01	0.01	0.01	0.01
24	0	0	SRS	1-3	1	35	0.10	0.11	0.09	0.02	0.02	0.02	0.02	0.02	0.02
24	0	0	SRS	1-3	1	50	0.09	0.14	0.10	0.02	0.02	0.02	0.02	0.02	0.02
24	0	0	SRS	1-3	2	20	0.12	0.04	0.05	0.06	0.06	0.06	0.06	0.06	0.06
24	0	0	SRS	1-3	2	35	0.09	0.07	0.04	0.05	0.05	0.04	0.05	0.04	0.05
24	0	0	SRS	1-3	2	50	0.10	0.08	0.08	0.05	0.05	0.06	0.05	0.06	0.05
24	0	0	StRS	1-0	1	20	0.12	0.64	0.65	0.10	0.10	0.10	0.10	0.10	0.10
24	0	0	StRS	1-0	1	35	0.09	0.64	0.65	0.11	0.11	0.11	0.11	0.11	0.11
24	0	0	StRS	1-0	1	50	0.11	0.70	0.70	0.14	0.14	0.14	0.14	0.14	0.14

Table SB6 (continued). Trend Test Size of the *t*-test for the modified ANC Trend Slope Estimate. When test size is >0.13, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0	0	StRS	1-0	2	20	0.11	0.43	0.45	0.12	0.12	0.13	0.12	0.13	0.12
24	0	0	StRS	1-0	2	35	0.09	0.44	0.46	0.10	0.10	0.10	0.10	0.10	0.10
24	0	0	StRS	1-0	2	50	0.10	0.49	0.49	0.11	0.11	0.12	0.11	0.12	0.11
24	0	0	StRS	1-0,1-3	1	20	0.08	0.17	0.20	0.02	0.02	0.03	0.02	0.03	0.02
24	0	0	StRS	1-0,1-3	1	35	0.08	0.15	0.15	0.02	0.02	0.02	0.02	0.02	0.02
24	0	0	StRS	1-0,1-3	1	50	0.11	0.15	0.13	0.01	0.01	0.01	0.01	0.01	0.01
24	0	0	StRS	1-0,1-3	2	20	0.09	0.12	0.18	0.08	0.08	0.07	0.08	0.07	0.08
24	0	0	StRS	1-0,1-3	2	35	0.10	0.10	0.11	0.04	0.04	0.05	0.04	0.05	0.04
24	0	0	StRS	1-0,1-3	2	50	0.09	0.10	0.09	0.03	0.03	0.04	0.03	0.04	0.03
24	0	0	StRS	1-3	1	20	0.10	0.04	0.07	0.02	0.02	0.02	0.02	0.02	0.02
24	0	0	StRS	1-3	1	35	0.11	0.08	0.06	0.02	0.02	0.02	0.02	0.02	0.02
24	0	0	StRS	1-3	1	50	0.08	0.09	0.07	0.02	0.02	0.02	0.02	0.02	0.02
24	0	0	StRS	1-3	2	20	0.10	0.04	0.04	0.04	0.04	0.05	0.04	0.05	0.04
24	0	0	StRS	1-3	2	35	0.11	0.05	0.04	0.05	0.05	0.05	0.05	0.05	0.05
24	0	0	StRS	1-3	2	50	0.10	0.07	0.05	0.04	0.04	0.04	0.04	0.04	0.04
24	0	0	Unequal	1-0	1	20	0.09	0.63	0.63	0.16	0.16	0.16	0.16	0.16	0.16
24	0	0	Unequal	1-0	1	35	0.10	0.62	0.64	0.12	0.12	0.12	0.12	0.12	0.12
24	0	0	Unequal	1-0	1	50	0.12	0.65	0.66	0.11	0.11	0.11	0.11	0.11	0.11
24	0	0	Unequal	1-0	2	20	0.10	0.41	0.39	0.13	0.13	0.14	0.13	0.14	0.13
24	0	0	Unequal	1-0	2	35	0.08	0.39	0.46	0.10	0.10	0.10	0.10	0.10	0.10
24	0	0	Unequal	1-0	2	50	0.10	0.44	0.46	0.11	0.11	0.11	0.11	0.11	0.11
24	0	0	Unequal	1-0,1-3	1	20	0.07	0.17	0.17	0.02	0.02	0.02	0.02	0.02	0.02
24	0	0	Unequal	1-0,1-3	1	35	0.09	0.11	0.13	0.01	0.01	0.01	0.01	0.01	0.01
24	0	0	Unequal	1-0,1-3	1	50	0.09	0.10	0.11	0.01	0.01	0.01	0.01	0.01	0.01
24	0	0	Unequal	1-0,1-3	2	20	0.07	0.13	0.20	0.07	0.07	0.05	0.07	0.05	0.07

Table SB6 (continued). Trend Test Size of the *t*-test for the modified ANC Trend Slope Estimate. When test size is >0.13, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0	0	Unequal	1-0,1-3	2	35	0.09	0.08	0.08	0.04	0.03	0.03	0.03	0.03	0.04
24	0	0	Unequal	1-0,1-3	2	50	0.10	0.06	0.10	0.01	0.02	0.02	0.02	0.02	0.01
24	0	0	Unequal	1-3	1	20	0.10	0.04	0.07	0.01	0.01	0.01	0.01	0.01	0.01
24	0	0	Unequal	1-3	1	35	0.09	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00
24	0	0	Unequal	1-3	1	50	0.11	0.07	0.05	0.00	0.00	0.00	0.00	0.00	0.00
24	0	0	Unequal	1-3	2	20	0.08	0.03	0.07	0.02	0.02	0.02	0.02	0.02	0.02
24	0	0	Unequal	1-3	2	35	0.10	0.03	0.04	0.02	0.02	0.02	0.02	0.02	0.02
24	0	0	Unequal	1-3	2	50	0.09	0.06	0.04	0.01	0.01	0.01	0.01	0.01	0.01

Table SB7. Trend Test Size of the χ^2 -test for the ANC trend slope estimate. When χ^2 is > 0.13 or <0.07, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0	0	SRS	1-0	1	20	0.14	0.15	0.15	0.15	0.15	0.15	0.15
12	0	0	SRS	1-0	1	35	0.12	0.14	0.14	0.14	0.14	0.14	0.14
12	0	0	SRS	1-0	1	50	0.14	0.15	0.15	0.15	0.15	0.15	0.15
12	0	0	SRS	1-0	2	20	0.14	0.17	0.15	0.18	0.15	0.18	0.17
12	0	0	SRS	1-0	2	35	0.13	0.16	0.15	0.16	0.15	0.16	0.16
12	0	0	SRS	1-0	2	50	0.12	0.17	0.14	0.17	0.14	0.17	0.17
12	0	0	SRS	1-0,1-3	1	20	0.14	0.44	0.15	0.46	0.15	0.46	0.44
12	0	0	SRS	1-0,1-3	1	35	0.12	0.50	0.14	0.51	0.14	0.51	0.50
12	0	0	SRS	1-0,1-3	1	50	0.14	0.53	0.17	0.52	0.17	0.52	0.53
12	0	0	SRS	1-0,1-3	2	20	0.13	0.44	0.14	0.45	0.14	0.45	0.44
12	0	0	SRS	1-0,1-3	2	35	0.13	0.51	0.15	0.51	0.15	0.51	0.51
12	0	0	SRS	1-0,1-3	2	50	0.14	0.55	0.15	0.55	0.15	0.55	0.55
12	0	0	SRS	1-3	1	20	0.15	0.16	0.16	0.16	0.16	0.16	0.16
12	0	0	SRS	1-3	1	35	0.15	0.18	0.18	0.18	0.18	0.18	0.18
12	0	0	SRS	1-3	1	50	0.15	0.17	0.17	0.17	0.17	0.17	0.17
12	0	0	SRS	1-3	2	20	0.15	0.19	0.17	0.19	0.17	0.19	0.19
12	0	0	SRS	1-3	2	35	0.14	0.25	0.17	0.25	0.17	0.25	0.25
12	0	0	SRS	1-3	2	50	0.14	0.25	0.17	0.26	0.17	0.26	0.25
12	0	0	StRS	1-0	1	20	0.14	0.45	0.45	0.45	0.45	0.45	0.45
12	0	0	StRS	1-0	1	35	0.13	0.62	0.62	0.62	0.62	0.62	0.62
12	0	0	StRS	1-0	1	50	0.12	0.68	0.68	0.68	0.68	0.68	0.68
12	0	0	StRS	1-0	2	20	0.12	0.52	0.51	0.52	0.51	0.52	0.52
12	0	0	StRS	1-0	2	35	0.12	0.61	0.61	0.61	0.61	0.61	0.61
12	0	0	StRS	1-0	2	50	0.13	0.69	0.69	0.69	0.69	0.69	0.69
12	0	0	StRS	1-0,1-3	1	20	0.16	0.53	0.55	0.52	0.55	0.52	0.53

Table SB7 (continued). Trend Test Size of the χ^2 -test for the ANC trend slope estimate. When χ^2 is > 0.13 or <0.07, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0	0	StRS	1-0,1-3	1	35	0.16	0.63	0.67	0.62	0.67	0.62	0.63
12	0	0	StRS	1-0,1-3	1	50	0.19	0.70	0.73	0.71	0.73	0.71	0.70
12	0	0	StRS	1-0,1-3	2	20	0.12	0.47	0.47	0.47	0.47	0.47	0.47
12	0	0	StRS	1-0,1-3	2	35	0.13	0.59	0.63	0.59	0.63	0.59	0.59
12	0	0	StRS	1-0,1-3	2	50	0.13	0.61	0.67	0.62	0.67	0.62	0.61
12	0	0	StRS	1-3	1	20	0.15	0.56	0.56	0.56	0.56	0.56	0.56
12	0	0	StRS	1-3	1	35	0.14	0.66	0.66	0.66	0.66	0.66	0.66
12	0	0	StRS	1-3	1	50	0.15	0.73	0.73	0.73	0.73	0.73	0.73
12	0	0	StRS	1-3	2	20	0.12	0.54	0.55	0.54	0.55	0.54	0.54
12	0	0	StRS	1-3	2	35	0.11	0.66	0.67	0.67	0.67	0.67	0.66
12	0	0	StRS	1-3	2	50	0.13	0.71	0.72	0.72	0.72	0.72	0.71
12	0	0	Unequal	1-0	1	20	0.15	0.39	0.39	0.39	0.39	0.39	0.39
12	0	0	Unequal	1-0	1	35	0.13	0.47	0.47	0.47	0.47	0.47	0.47
12	0	0	Unequal	1-0	1	50	0.13	0.53	0.53	0.53	0.53	0.53	0.53
12	0	0	Unequal	1-0	2	20	0.14	0.38	0.37	0.38	0.37	0.38	0.38
12	0	0	Unequal	1-0	2	35	0.16	0.51	0.51	0.51	0.51	0.51	0.51
12	0	0	Unequal	1-0	2	50	0.15	0.55	0.54	0.55	0.54	0.55	0.55
12	0	0	Unequal	1-0,1-3	1	20	0.14	0.50	0.47	0.51	0.47	0.51	0.50
12	0	0	Unequal	1-0,1-3	1	35	0.15	0.56	0.50	0.57	0.50	0.57	0.56
12	0	0	Unequal	1-0,1-3	1	50	0.13	0.62	0.55	0.61	0.55	0.61	0.62
12	0	0	Unequal	1-0,1-3	2	20	0.15	0.46	0.40	0.47	0.40	0.47	0.46
12	0	0	Unequal	1-0,1-3	2	35	0.16	0.62	0.54	0.63	0.54	0.63	0.62
12	0	0	Unequal	1-0,1-3	2	50	0.16	0.64	0.55	0.65	0.55	0.65	0.64
12	0	0	Unequal	1-3	1	20	0.17	0.43	0.43	0.43	0.43	0.43	0.43
12	0	0	Unequal	1-3	1	35	0.16	0.51	0.51	0.51	0.51	0.51	0.51

Table SB7 (continued). Trend Test Size of the χ^2 -test for the ANC trend slope estimate. When χ^2 is > 0.13 or <0.07, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0	0	Unequal	1-3	1	50	0.15	0.59	0.59	0.59	0.59	0.59	0.59
12	0	0	Unequal	1-3	2	20	0.14	0.45	0.44	0.45	0.44	0.45	0.45
12	0	0	Unequal	1-3	2	35	0.14	0.48	0.47	0.48	0.47	0.48	0.48
12	0	0	Unequal	1-3	2	50	0.15	0.54	0.55	0.54	0.55	0.54	0.54
24	0	0	SRS	1-0	1	20	0.10	0.11	0.11	0.11	0.11	0.11	0.11
24	0	0	SRS	1-0	1	35	0.10	0.11	0.11	0.11	0.11	0.11	0.11
24	0	0	SRS	1-0	1	50	0.11	0.11	0.11	0.11	0.11	0.11	0.11
24	0	0	SRS	1-0	2	20	0.11	0.11	0.11	0.11	0.11	0.11	0.11
24	0	0	SRS	1-0	2	35	0.11	0.13	0.12	0.13	0.12	0.13	0.13
24	0	0	SRS	1-0	2	50	0.09	0.10	0.09	0.11	0.09	0.11	0.10
24	0	0	SRS	1-0,1-3	1	20	0.10	0.29	0.10	0.31	0.10	0.31	0.29
24	0	0	SRS	1-0,1-3	1	35	0.11	0.31	0.12	0.27	0.12	0.27	0.31
24	0	0	SRS	1-0,1-3	1	50	0.10	0.35	0.10	0.29	0.10	0.29	0.35
24	0	0	SRS	1-0,1-3	2	20	0.11	0.31	0.11	0.34	0.11	0.34	0.31
24	0	0	SRS	1-0,1-3	2	35	0.12	0.36	0.12	0.34	0.12	0.34	0.36
24	0	0	SRS	1-0,1-3	2	50	0.11	0.34	0.12	0.31	0.12	0.31	0.34
24	0	0	SRS	1-3	1	20	0.12	0.13	0.13	0.13	0.13	0.13	0.13
24	0	0	SRS	1-3	1	35	0.11	0.12	0.12	0.12	0.12	0.12	0.12
24	0	0	SRS	1-3	1	50	0.12	0.13	0.13	0.13	0.13	0.13	0.13
24	0	0	SRS	1-3	2	20	0.12	0.13	0.13	0.13	0.13	0.13	0.13
24	0	0	SRS	1-3	2	35	0.11	0.12	0.12	0.12	0.12	0.12	0.12
24	0	0	SRS	1-3	2	50	0.12	0.15	0.13	0.15	0.13	0.15	0.15
24	0	0	StRS	1-0	1	20	0.09	0.29	0.29	0.29	0.29	0.29	0.29
24	0	0	StRS	1-0	1	35	0.10	0.35	0.35	0.35	0.35	0.35	0.35
24	0	0	StRS	1-0	1	50	0.12	0.41	0.41	0.41	0.41	0.41	0.41

Table SB7 (continued). Trend Test Size of the χ^2 -test for the ANC trend slope estimate. When χ^2 is > 0.13 or <0.07, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0	0	StRS	1-0	2	20	0.11	0.32	0.32	0.32	0.32	0.32	0.32
24	0	0	StRS	1-0	2	35	0.09	0.35	0.35	0.36	0.35	0.36	0.35
24	0	0	StRS	1-0	2	50	0.12	0.41	0.41	0.41	0.41	0.41	0.41
24	0	0	StRS	1-0,1-3	1	20	0.10	0.37	0.36	0.40	0.36	0.40	0.37
24	0	0	StRS	1-0,1-3	1	35	0.11	0.48	0.49	0.50	0.49	0.50	0.48
24	0	0	StRS	1-0,1-3	1	50	0.12	0.57	0.56	0.57	0.56	0.57	0.57
24	0	0	StRS	1-0,1-3	2	20	0.10	0.37	0.34	0.38	0.34	0.38	0.37
24	0	0	StRS	1-0,1-3	2	35	0.09	0.45	0.44	0.46	0.44	0.46	0.45
24	0	0	StRS	1-0,1-3	2	50	0.12	0.54	0.57	0.55	0.57	0.55	0.54
24	0	0	StRS	1-3	1	20	0.12	0.38	0.38	0.38	0.38	0.38	0.38
24	0	0	StRS	1-3	1	35	0.11	0.52	0.52	0.52	0.52	0.52	0.52
24	0	0	StRS	1-3	1	50	0.11	0.57	0.57	0.57	0.57	0.57	0.57
24	0	0	StRS	1-3	2	20	0.08	0.38	0.38	0.38	0.38	0.38	0.38
24	0	0	StRS	1-3	2	35	0.11	0.53	0.52	0.52	0.52	0.52	0.53
24	0	0	StRS	1-3	2	50	0.11	0.59	0.59	0.59	0.59	0.59	0.59
24	0	0	Unequal	1-0	1	20	0.11	0.34	0.34	0.34	0.34	0.34	0.34
24	0	0	Unequal	1-0	1	35	0.12	0.40	0.40	0.40	0.40	0.40	0.40
24	0	0	Unequal	1-0	1	50	0.13	0.50	0.50	0.50	0.50	0.50	0.50
24	0	0	Unequal	1-0	2	20	0.09	0.34	0.33	0.34	0.33	0.34	0.34
24	0	0	Unequal	1-0	2	35	0.09	0.42	0.41	0.42	0.41	0.42	0.42
24	0	0	Unequal	1-0	2	50	0.09	0.48	0.48	0.48	0.48	0.48	0.48
24	0	0	Unequal	1-0,1-3	1	20	0.09	0.42	0.39	0.41	0.39	0.41	0.42
24	0	0	Unequal	1-0,1-3	1	35	0.10	0.45	0.42	0.46	0.42	0.46	0.45
24	0	0	Unequal	1-0,1-3	1	50	0.09	0.50	0.45	0.48	0.45	0.48	0.50
24	0	0	Unequal	1-0,1-3	2	20	0.10	0.41	0.35	0.41	0.35	0.41	0.41

Table SB7 (continued). Trend Test Size of the χ^2 -test for the ANC trend slope estimate. When χ^2 is > 0.13 or <0.07, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0	0	Unequal	1-0,1-3	2	35	0.09	0.45	0.43	0.44	0.43	0.45	0.45
24	0	0	Unequal	1-0,1-3	2	50	0.10	0.50	0.46	0.46	0.46	0.46	0.50
24	0	0	Unequal	1-3	1	20	0.12	0.43	0.43	0.43	0.43	0.43	0.43
24	0	0	Unequal	1-3	1	35	0.12	0.47	0.47	0.47	0.47	0.47	0.47
24	0	0	Unequal	1-3	1	50	0.13	0.51	0.51	0.51	0.51	0.51	0.51
24	0	0	Unequal	1-3	2	20	0.15	0.42	0.41	0.42	0.41	0.42	0.42
24	0	0	Unequal	1-3	2	35	0.13	0.50	0.49	0.49	0.49	0.49	0.50
24	0	0	Unequal	1-3	2	50	0.16	0.52	0.52	0.52	0.52	0.52	0.52

Table SB8. Trend Test Size of the χ^2 -test for the modified ANC trend slope estimate. When $\alpha > 0.13$, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0	0	SRS	1-0	1	20	0.10	0.11	0.11	0.11	0.11	0.11	0.11
12	0	0	SRS	1-0	1	35	0.11	0.11	0.11	0.11	0.11	0.11	0.11
12	0	0	SRS	1-0	1	50	0.10	0.11	0.11	0.11	0.11	0.11	0.11
12	0	0	SRS	1-0	2	20	0.09	0.10	0.10	0.10	0.10	0.10	0.10
12	0	0	SRS	1-0	2	35	0.10	0.10	0.10	0.11	0.10	0.11	0.10
12	0	0	SRS	1-0	2	50	0.12	0.12	0.12	0.13	0.12	0.13	0.12
12	0	0	SRS	1-0,1-3	1	20	0.12	0.14	0.13	0.15	0.13	0.15	0.14
12	0	0	SRS	1-0,1-3	1	35	0.08	0.10	0.09	0.13	0.09	0.13	0.10
12	0	0	SRS	1-0,1-3	1	50	0.10	0.12	0.11	0.13	0.11	0.13	0.12
12	0	0	SRS	1-0,1-3	2	20	0.10	0.11	0.10	0.12	0.10	0.12	0.11
12	0	0	SRS	1-0,1-3	2	35	0.10	0.11	0.11	0.14	0.11	0.14	0.11
12	0	0	SRS	1-0,1-3	2	50	0.12	0.14	0.13	0.16	0.13	0.16	0.14
12	0	0	SRS	1-3	1	20	0.10	0.11	0.11	0.11	0.11	0.11	0.11
12	0	0	SRS	1-3	1	35	0.09	0.11	0.11	0.11	0.11	0.11	0.11
12	0	0	SRS	1-3	1	50	0.13	0.14	0.14	0.14	0.14	0.14	0.14
12	0	0	SRS	1-3	2	20	0.10	0.11	0.11	0.12	0.11	0.12	0.11
12	0	0	SRS	1-3	2	35	0.13	0.14	0.14	0.14	0.14	0.14	0.14
12	0	0	SRS	1-3	2	50	0.12	0.13	0.13	0.13	0.13	0.13	0.13
12	0	0	StRS	1-0	1	20	0.08	0.12	0.12	0.12	0.12	0.12	0.12
12	0	0	StRS	1-0	1	35	0.12	0.18	0.18	0.18	0.18	0.18	0.18
12	0	0	StRS	1-0	1	50	0.10	0.16	0.16	0.16	0.16	0.16	0.16
12	0	0	StRS	1-0	2	20	0.10	0.15	0.14	0.14	0.14	0.14	0.15
12	0	0	StRS	1-0	2	35	0.11	0.20	0.20	0.19	0.20	0.19	0.20
12	0	0	StRS	1-0	2	50	0.10	0.15	0.16	0.15	0.16	0.15	0.15
12	0	0	StRS	1-0,1-3	1	20	0.12	0.17	0.17	0.17	0.17	0.17	0.17

Table SB8 (continued). Trend Test Size of the χ^2 -test for the modified ANC trend slope estimate. When $\alpha > 0.13$, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0	0	StRS	1-0,1-3	1	35	0.11	0.17	0.16	0.16	0.16	0.16	0.17
12	0	0	StRS	1-0,1-3	1	50	0.08	0.12	0.12	0.12	0.12	0.12	0.12
12	0	0	StRS	1-0,1-3	2	20	0.10	0.15	0.14	0.15	0.14	0.15	0.15
12	0	0	StRS	1-0,1-3	2	35	0.09	0.12	0.12	0.13	0.12	0.13	0.12
12	0	0	StRS	1-0,1-3	2	50	0.10	0.15	0.15	0.15	0.15	0.15	0.15
12	0	0	StRS	1-3	1	20	0.11	0.13	0.13	0.13	0.13	0.13	0.13
12	0	0	StRS	1-3	1	35	0.07	0.11	0.11	0.11	0.11	0.11	0.11
12	0	0	StRS	1-3	1	50	0.10	0.12	0.12	0.12	0.12	0.12	0.12
12	0	0	StRS	1-3	2	20	0.10	0.11	0.12	0.11	0.12	0.11	0.11
12	0	0	StRS	1-3	2	35	0.08	0.10	0.11	0.11	0.11	0.11	0.10
12	0	0	StRS	1-3	2	50	0.09	0.14	0.13	0.14	0.13	0.14	0.13
12	0	0	Unequal	1-0	1	20	0.10	0.17	0.17	0.17	0.17	0.17	0.17
12	0	0	Unequal	1-0	1	35	0.12	0.18	0.18	0.18	0.18	0.18	0.18
12	0	0	Unequal	1-0	1	50	0.09	0.16	0.16	0.16	0.16	0.16	0.16
12	0	0	Unequal	1-0	2	20	0.11	0.15	0.15	0.15	0.15	0.15	0.15
12	0	0	Unequal	1-0	2	35	0.09	0.14	0.14	0.14	0.14	0.14	0.14
12	0	0	Unequal	1-0	2	50	0.10	0.15	0.15	0.15	0.15	0.15	0.15
12	0	0	Unequal	1-0,1-3	1	20	0.10	0.14	0.13	0.13	0.13	0.13	0.14
12	0	0	Unequal	1-0,1-3	1	35	0.12	0.16	0.15	0.17	0.15	0.17	0.16
12	0	0	Unequal	1-0,1-3	1	50	0.10	0.13	0.13	0.15	0.13	0.15	0.13
12	0	0	Unequal	1-0,1-3	2	20	0.14	0.18	0.17	0.18	0.17	0.18	0.18
12	0	0	Unequal	1-0,1-3	2	35	0.10	0.15	0.14	0.15	0.14	0.15	0.15
12	0	0	Unequal	1-0,1-3	2	50	0.11	0.16	0.16	0.15	0.16	0.15	0.16
12	0	0	Unequal	1-3	1	20	0.11	0.13	0.13	0.13	0.13	0.13	0.13
12	0	0	Unequal	1-3	1	35	0.11	0.13	0.13	0.13	0.13	0.13	0.13

Table SB8 (continued). Trend Test Size of the χ^2 -test for the modified ANC trend slope estimate. When $\alpha > 0.13$, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0	0	Unequal	1-3	1	50	0.12	0.16	0.16	0.16	0.16	0.16	0.16
12	0	0	Unequal	1-3	2	20	0.08	0.12	0.11	0.12	0.11	0.12	0.12
12	0	0	Unequal	1-3	2	35	0.10	0.14	0.14	0.14	0.14	0.14	0.14
12	0	0	Unequal	1-3	2	50	0.11	0.14	0.14	0.14	0.14	0.14	0.14
24	0	0	SRS	1-0	1	20	0.12	0.13	0.13	0.13	0.13	0.13	0.13
24	0	0	SRS	1-0	1	35	0.12	0.12	0.12	0.12	0.12	0.12	0.12
24	0	0	SRS	1-0	1	50	0.09	0.10	0.10	0.10	0.10	0.10	0.10
24	0	0	SRS	1-0	2	20	0.10	0.10	0.10	0.10	0.10	0.10	0.10
24	0	0	SRS	1-0	2	35	0.12	0.12	0.12	0.13	0.12	0.13	0.12
24	0	0	SRS	1-0	2	50	0.12	0.12	0.12	0.13	0.12	0.13	0.12
24	0	0	SRS	1-0,1-3	1	20	0.10	0.10	0.10	0.12	0.10	0.12	0.10
24	0	0	SRS	1-0,1-3	1	35	0.09	0.10	0.09	0.11	0.09	0.11	0.10
24	0	0	SRS	1-0,1-3	1	50	0.10	0.11	0.11	0.11	0.11	0.11	0.11
24	0	0	SRS	1-0,1-3	2	20	0.13	0.14	0.13	0.16	0.13	0.16	0.14
24	0	0	SRS	1-0,1-3	2	35	0.08	0.08	0.08	0.11	0.08	0.11	0.08
24	0	0	SRS	1-0,1-3	2	50	0.10	0.10	0.10	0.11	0.10	0.11	0.10
24	0	0	SRS	1-3	1	20	0.10	0.10	0.10	0.10	0.10	0.10	0.10
24	0	0	SRS	1-3	1	35	0.10	0.10	0.10	0.10	0.10	0.10	0.10
24	0	0	SRS	1-3	1	50	0.09	0.09	0.09	0.09	0.09	0.09	0.09
24	0	0	SRS	1-3	2	20	0.12	0.12	0.12	0.12	0.12	0.12	0.12
24	0	0	SRS	1-3	2	35	0.09	0.09	0.09	0.09	0.09	0.09	0.09
24	0	0	SRS	1-3	2	50	0.10	0.10	0.10	0.10	0.10	0.10	0.10
24	0	0	StRS	1-0	1	20	0.13	0.18	0.18	0.18	0.18	0.18	0.18
24	0	0	StRS	1-0	1	35	0.10	0.17	0.17	0.17	0.17	0.17	0.17
24	0	0	StRS	1-0	1	50	0.12	0.19	0.19	0.19	0.19	0.19	0.19

Table SB8 (continued). Trend Test Size of the χ^2 -test for the modified ANC trend slope estimate. When $\alpha > 0.13$, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0	0	StRS	1-0	2	20	0.12	0.20	0.20	0.20	0.20	0.20	0.20
24	0	0	StRS	1-0	2	35	0.10	0.18	0.17	0.18	0.17	0.18	0.18
24	0	0	StRS	1-0	2	50	0.11	0.19	0.19	0.18	0.19	0.18	0.19
24	0	0	StRS	1-0,1-3	1	20	0.08	0.16	0.16	0.18	0.16	0.18	0.16
24	0	0	StRS	1-0,1-3	1	35	0.08	0.15	0.15	0.15	0.15	0.15	0.15
24	0	0	StRS	1-0,1-3	1	50	0.11	0.18	0.18	0.19	0.18	0.19	0.18
24	0	0	StRS	1-0,1-3	2	20	0.10	0.13	0.14	0.17	0.14	0.17	0.13
24	0	0	StRS	1-0,1-3	2	35	0.10	0.14	0.14	0.16	0.14	0.16	0.14
24	0	0	StRS	1-0,1-3	2	50	0.10	0.17	0.17	0.19	0.17	0.19	0.17
24	0	0	StRS	1-3	1	20	0.11	0.17	0.17	0.17	0.17	0.17	0.17
24	0	0	StRS	1-3	1	35	0.11	0.16	0.16	0.16	0.16	0.16	0.16
24	0	0	StRS	1-3	1	50	0.08	0.18	0.18	0.18	0.18	0.18	0.18
24	0	0	StRS	1-3	2	20	0.10	0.17	0.17	0.17	0.17	0.17	0.17
24	0	0	StRS	1-3	2	35	0.12	0.20	0.20	0.20	0.20	0.20	0.20
24	0	0	StRS	1-3	2	50	0.11	0.16	0.16	0.17	0.16	0.17	0.16
24	0	0	Unequal	1-0	1	20	0.11	0.30	0.30	0.30	0.30	0.30	0.30
24	0	0	Unequal	1-0	1	35	0.10	0.26	0.26	0.26	0.26	0.26	0.26
24	0	0	Unequal	1-0	1	50	0.12	0.28	0.28	0.28	0.28	0.28	0.28
24	0	0	Unequal	1-0	2	20	0.12	0.27	0.27	0.28	0.27	0.28	0.27
24	0	0	Unequal	1-0	2	35	0.09	0.26	0.26	0.25	0.26	0.25	0.26
24	0	0	Unequal	1-0	2	50	0.10	0.30	0.30	0.30	0.30	0.30	0.30
24	0	0	Unequal	1-0,1-3	1	20	0.08	0.23	0.23	0.21	0.23	0.21	0.23
24	0	0	Unequal	1-0,1-3	1	35	0.10	0.23	0.23	0.21	0.23	0.21	0.23
24	0	0	Unequal	1-0,1-3	1	50	0.09	0.22	0.20	0.21	0.20	0.21	0.22
24	0	0	Unequal	1-0,1-3	2	20	0.09	0.21	0.21	0.21	0.21	0.21	0.21

Table SB8 (continued). Trend Test Size of the χ^2 -test for the modified ANC trend slope estimate. When $\alpha > 0.13$, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0	0	Unequal	1-0,1-3	2	35	0.10	0.21	0.21	0.21	0.21	0.21	0.21
24	0	0	Unequal	1-0,1-3	2	50	0.11	0.20	0.21	0.20	0.21	0.20	0.20
24	0	0	Unequal	1-3	1	20	0.10	0.18	0.18	0.18	0.18	0.18	0.18
24	0	0	Unequal	1-3	1	35	0.10	0.21	0.21	0.21	0.21	0.21	0.21
24	0	0	Unequal	1-3	1	50	0.11	0.20	0.20	0.20	0.20	0.20	0.20
24	0	0	Unequal	1-3	2	20	0.08	0.17	0.17	0.16	0.17	0.16	0.17
24	0	0	Unequal	1-3	2	35	0.11	0.19	0.19	0.20	0.19	0.20	0.19
24	0	0	Unequal	1-3	2	50	0.10	0.20	0.20	0.20	0.20	0.20	0.20

Table SB9. Trend Test Power of the *t*-test for the ANC Trend Slope Estimate. When the power is below 0.8, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	SRS	1-0	1	20	0.53	0.57	0.54	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0	1	35	0.54	0.57	0.55	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0	1	50	0.54	0.56	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0	2	20	0.52	0.51	0.50	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0	2	35	0.58	0.57	0.56	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0	2	50	0.56	0.58	0.56	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0,1-3	1	20	0.56	0.48	0.45	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0,1-3	1	35	0.56	0.48	0.47	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0,1-3	1	50	0.55	0.51	0.48	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0,1-3	2	20	0.52	0.45	0.49	—*	0.60	—*	0.60	—*	—*
12	0.02	0	SRS	1-0,1-3	2	35	0.52	0.41	0.51	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0,1-3	2	50	0.53	0.49	0.52	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-3	1	20	0.47	0.36	0.37	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-3	1	35	0.48	0.41	0.44	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-3	1	50	0.48	0.43	0.48	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-3	2	20	0.48	0.31	0.36	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-3	2	35	0.50	0.42	0.43	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-3	2	50	0.53	0.48	0.48	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0	1	20	0.74	0.61	0.62	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0	1	35	0.77	0.65	0.63	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0	1	50	0.75	0.64	0.64	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0	2	20	0.76	0.53	0.54	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0	2	35	0.79	0.56	0.55	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0	2	50	0.78	0.56	0.58	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0,1-3	1	20	0.74	0.42	0.47	—*	—*	—*	—*	—*	—*

* Indicates test size was greater than 0.13.

Table SB9 (continued). Trend Test Power of the *t*-test for the ANC Trend Slope Estimate. When the power is below 0.8, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	StRS	1-0,1-3	1	35	0.77	0.46	0.48	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0,1-3	1	50	—*	0.52	0.50	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0,1-3	2	20	0.73	0.43	0.44	0.52	—*	0.53	—*	0.53	0.52
12	0.02	0	StRS	1-0,1-3	2	35	0.76	0.43	0.44	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0,1-3	2	50	0.76	0.47	0.49	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-3	1	20	0.70	0.33	0.40	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-3	1	35	0.73	0.39	0.47	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-3	1	50	0.73	0.48	0.48	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-3	2	20	0.68	0.32	0.37	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-3	2	35	0.71	0.41	0.41	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-3	2	50	0.72	0.44	0.47	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0	1	20	0.53	0.54	0.54	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0	1	35	0.56	0.57	0.55	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0	1	50	0.57	0.60	0.54	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0	2	20	0.54	0.47	0.49	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0	2	35	—*	0.51	0.53	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0	2	50	—*	—*	0.53	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0,1-3	1	20	0.54	0.37	0.40	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0,1-3	1	35	0.55	0.39	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0,1-3	1	50	0.55	0.42	0.42	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0,1-3	2	20	0.52	0.35	0.42	0.40	0.41	0.41	0.41	0.41	0.40
12	0.02	0	Unequal	1-0,1-3	2	35	—*	0.38	0.39	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0,1-3	2	50	0.53	0.39	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-3	1	20	—*	0.26	0.38	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-3	1	35	0.51	0.32	0.39	—*	—*	—*	—*	—*	—*

* Indicates test size was greater than 0.13.

Table SB9 (continued). Trend Test Power of the *t*-test for the ANC Trend Slope Estimate. When the power is below 0.8, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	Unequal	1-3	1	50	0.51	0.38	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-3	2	20	0.48	0.25	0.34	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-3	2	35	0.51	0.30	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-3	2	50	0.50	0.37	0.44	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0	1	20	1.00	—*	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0	1	35	1.00	—*	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0	1	50	1.00	—*	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0	2	20	1.00	—*	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0	2	35	1.00	—*	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0	2	50	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0,1-3	1	20	1.00	0.99	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0,1-3	1	35	1.00	0.99	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0,1-3	1	50	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0,1-3	2	20	1.00	0.99	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0,1-3	2	35	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0,1-3	2	50	1.00	0.99	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-3	1	20	1.00	0.96	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-3	1	35	1.00	0.99	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-3	1	50	1.00	0.99	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-3	2	20	1.00	0.95	0.93	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-3	2	35	1.00	0.99	0.97	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-3	2	50	1.00	0.98	0.98	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0	1	20	1.00	—*	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0	1	35	1.00	—*	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0	1	50	1.00	—*	—*	—*	—*	—*	—*	—*	—*

* Indicates test size was greater than 0.13.

Table SB9 (continued). Trend Test Power of the *t*-test for the ANC Trend Slope Estimate. When the power is below 0.8, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0.04	StRS	1-0	2	20	1.00	—*	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0	2	35	1.00	—*	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0	2	50	1.00	—*	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0,1-3	1	20	1.00	0.99	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0,1-3	1	35	1.00	1.00	0.99	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0,1-3	1	50	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0,1-3	2	20	1.00	0.98	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0,1-3	2	35	1.00	0.99	0.99	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0,1-3	2	50	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-3	1	20	1.00	0.97	0.95	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-3	1	35	1.00	0.99	0.97	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-3	1	50	1.00	1.00	0.99	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-3	2	20	1.00	0.93	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-3	2	35	1.00	0.98	0.98	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-3	2	50	1.00	0.99	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0	1	20	0.99	—*	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0	1	35	0.99	—*	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0	1	50	0.99	—*	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0	2	20	1.00	—*	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0	2	35	1.00	—*	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0	2	50	1.00	—*	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0,1-3	1	20	1.00	0.96	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0,1-3	1	35	1.00	0.97	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0,1-3	1	50	1.00	0.99	0.97	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0,1-3	2	20	1.00	0.94	—*	—*	—*	—*	—*	—*	—*

* Indicates test size was greater than 0.13.

Table SB9 (continued). Trend Test Power of the *t*-test for the ANC Trend Slope Estimate. When the power is below 0.8, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0.04	Unequal	1-0,1-3	2	35	1.00	0.96	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0,1-3	2	50	1.00	0.98	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-3	1	20	0.99	0.89	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-3	1	35	0.99	0.95	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-3	1	50	1.00	0.98	0.95	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-3	2	20	—*	0.87	0.84	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-3	2	35	0.99	0.96	0.93	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-3	2	50	—*	0.96	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-0	1	20	0.71	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-0	1	35	0.79	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-0	1	50	0.76	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-0	2	20	0.72	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-0	2	35	0.75	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-0	2	50	0.76	0.85	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-0,1-3	1	20	0.75	0.77	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-0,1-3	1	35	0.78	0.81	0.83	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-0,1-3	1	50	0.79	0.83	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-0,1-3	2	20	0.79	0.81	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-0,1-3	2	35	0.79	0.82	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-0,1-3	2	50	0.82	0.85	0.80	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-3	1	20	0.78	0.71	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-3	1	35	0.80	0.79	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-3	1	50	0.79	0.82	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-3	2	20	0.77	0.70	0.64	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-3	2	35	0.80	0.82	0.76	—*	—*	—*	—*	—*	—*

* Indicates test size was greater than 0.13.

Table SB9 (continued). Trend Test Power of the *t*-test for the ANC Trend Slope Estimate. When the power is below 0.8, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0	SRS	1-3	2	50	0.81	0.82	0.77	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0	1	20	0.86	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0	1	35	0.94	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0	1	50	0.95	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0	2	20	0.84	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0	2	35	0.92	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0	2	50	0.94	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0,1-3	1	20	0.93	0.78	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0,1-3	1	35	0.96	0.83	0.78	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0,1-3	1	50	0.97	0.87	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0,1-3	2	20	0.91	0.75	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0,1-3	2	35	0.96	0.84	0.78	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0,1-3	2	50	0.97	0.83		—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-3	1	20	0.96	0.70	0.67	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-3	1	35	0.98	0.81	0.73	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-3	1	50	0.97	0.85	0.80	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-3	2	20	0.94	0.60	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-3	2	35	0.96	0.78	0.72	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-3	2	50	0.94	0.83	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0	1	20	0.70	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0	1	35	0.74	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0	1	50	0.78	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0	2	20	0.72	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0	2	35	0.74	—*	—*	—*	—*	—*	—*	—*	—*

* Indicates test size was greater than 0.13.

Table SB9 (continued). Trend Test Power of the *t*-test for the ANC Trend Slope Estimate. When the power is below 0.8, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0	Unequal	1-0	2	50	0.78	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0,1-3	1	20	0.77	0.66	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0,1-3	1	35	0.82	0.70	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0,1-3	1	50	0.81	0.77	0.75	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0,1-3	2	20	0.82	0.65	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0,1-3	2	35	0.83	0.73	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0,1-3	2	50	0.82	0.74	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-3	1	20	0.81	0.59	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-3	1	35	0.84	0.68	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-3	1	50	0.83	0.74	0.69	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-3	2	20	—*	0.53	0.52	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-3	2	35	0.81	0.68	0.59	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-3	2	50	—*	0.71	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-0	1	20	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-0	1	35	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-0	1	50	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-0	2	20	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-0	2	35	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-0	2	50	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-0,1-3	1	20	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-0,1-3	1	35	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-0,1-3	1	50	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-0,1-3	2	20	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-0,1-3	2	35	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-0,1-3	2	50	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*

* Indicates test size was greater than 0.13.

Table SB9 (continued). Trend Test Power of the *t*-test for the ANC Trend Slope Estimate. When the power is below 0.8, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0.04	SRS	1-3	1	20	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-3	1	35	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-3	1	50	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-3	2	20	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-3	2	35	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-3	2	50	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0	1	20	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0	1	35	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0	1	50	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0	2	20	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0	2	35	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0	2	50	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0,1-3	1	20	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0,1-3	1	35	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0,1-3	1	50	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0,1-3	2	20	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0,1-3	2	35	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0,1-3	2	50	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-3	1	20	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-3	1	35	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-3	1	50	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-3	2	20	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-3	2	35	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-3	2	50	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0	1	20	1.00	—*	—*	—*	—*	—*	—*	—*	—*

* Indicates test size was greater than 0.13.

Table SB9 (continued). Trend Test Power of the *t*-test for the ANC Trend Slope Estimate. When the power is below 0.8, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0.04	Unequal	1-0	1	35	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0	1	50	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0	2	20	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0	2	35	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0	2	50	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0,1-3	1	20	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0,1-3	1	35	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0,1-3	1	50	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0,1-3	2	20	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0,1-3	2	35	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0,1-3	2	50	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-3	1	20	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-3	1	35	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-3	1	50	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-3	2	20		1.00	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-3	2	35	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-3	2	50	—*	1.00	—*	—*	—*	—*	—*	—*	—*

* Indicates test size was greater than 0.13.

Table SB10. Trend Test Power of the χ^2 -test for the ANC Trend Slope Estimate. When the power is below 0.8, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	SRS	1-0	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0	1	35	0.59	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0	1	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0	2	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0	2	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0	2	50	0.62	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0,1-3	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0,1-3	1	35	0.62	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0,1-3	1	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0,1-3	2	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0,1-3	2	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0,1-3	2	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-3	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-3	1	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-3	1	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-3	2	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-3	2	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-3	2	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0	1	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0	1	50	0.78	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0	2	20	0.81	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0	2	35	0.81	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0	2	50	—*	—*	—*	—*	—*	—*	—*

* Indicates test size was greater than 0.13.

Table SB10 (continued). Trend Test Power of the χ^2 -test for the ANC Trend Slope Estimate. When the power is below 0.8, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	StRS	1-0,1-3	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0,1-3	1	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0,1-3	1	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0,1-3	2	20	0.79	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0,1-3	2	35	0.81	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0,1-3	2	50	0.82	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-3	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-3	1	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-3	1	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-3	2	20	0.75	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-3	2	35	0.77	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-3	2	50	0.78	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0	1	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0	1	50	0.61	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0	2	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0	2	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0	2	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0,1-3	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0,1-3	1	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0,1-3	1	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0,1-3	2	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0,1-3	2	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0,1-3	2	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-3	1	20	—*	—*	—*	—*	—*	—*	—*

* Indicates test size was greater than 0.13.

Table SB10 (continued). Trend Test Power of the χ^2 -test for the ANC Trend Slope Estimate. When the power is below 0.8, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	Unequal	1-3	1	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-3	1	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-3	2	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-3	2	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-3	2	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0	1	35	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0	1	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0	2	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0	2	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0	2	50	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0,1-3	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0,1-3	1	35	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0,1-3	1	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0,1-3	2	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0,1-3	2	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0,1-3	2	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-3	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-3	1	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-3	1	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-3	2	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-3	2	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-3	2	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0	1	35	—*	—*	—*	—*	—*	—*	—*

* Indicates test size was greater than 0.13.

Table SB10 (continued). Trend Test Power of the χ^2 -test for the ANC Trend Slope Estimate. When the power is below 0.8, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0.04	StRS	1-0	1	50	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0	2	20	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0	2	35	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0	2	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0,1-3	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0,1-3	1	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0,1-3	1	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0,1-3	2	20	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0,1-3	2	35	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0,1-3	2	50	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-3	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-3	1	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-3	1	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-3	2	20	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-3	2	35	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-3	2	50	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0	1	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0	1	50	0.99	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0	2	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0	2	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0	2	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0,1-3	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0,1-3	1	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0,1-3	1	50	—*	—*	—*	—*	—*	—*	—*

* Indicates test size was greater than 0.13.

Table SB10 (continued). Trend Test Power of the χ^2 -test for the ANC Trend Slope Estimate. When the power is below 0.8, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0.04	Unequal	1-0,1-3	2	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0,1-3	2	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0,1-3	2	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-3	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-3	1	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-3	1	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-3	2	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-3	2	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-3	2	50	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-0	1	20	0.73	0.75	0.75	0.75	0.75	0.75	0.75
24	0.01	0	SRS	1-0	1	35	0.80	0.81	0.81	0.81	0.81	0.81	0.81
24	0.01	0	SRS	1-0	1	50	0.78	0.78	0.78	0.78	0.78	0.78	0.78
24	0.01	0	SRS	1-0	2	20	0.73	0.74	0.73	0.74	0.73	0.74	0.74
24	0.01	0	SRS	1-0	2	35	0.76	0.78	0.78	0.77	0.78	0.77	0.78
24	0.01	0	SRS	1-0	2	50	0.77	0.79	0.78	0.78	0.78	0.78	0.79
24	0.01	0	SRS	1-0,1-3	1	20	0.77	—*	0.77	—*	0.77	—*	—*
24	0.01	0	SRS	1-0,1-3	1	35	0.79	—*	0.80	—*	0.80	—*	—*
24	0.01	0	SRS	1-0,1-3	1	50	0.82	—*	0.83	—*	0.83	—*	—*
24	0.01	0	SRS	1-0,1-3	2	20	0.81	—*	0.82	—*	0.82	—*	—*
24	0.01	0	SRS	1-0,1-3	2	35	0.81	—*	0.82	—*	0.82	—*	—*
24	0.01	0	SRS	1-0,1-3	2	50	0.83	—*	0.84	—*	0.84	—*	—*
24	0.01	0	SRS	1-3	1	20	0.80	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-3	1	35	0.82	0.83	0.83	0.83	0.83	0.83	0.83
24	0.01	0	SRS	1-3	1	50	0.80	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-3	2	20	0.80	0.82	0.82	0.81	0.82	0.81	0.82

* Indicates test size was greater than 0.13.

Table SB10 (continued). Trend Test Power of the χ^2 -test for the ANC Trend Slope Estimate. When the power is below 0.8, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0	SRS	1-3	2	35	0.83	0.84	0.84	0.84	0.84	0.84	0.84
24	0.01	0	SRS	1-3	2	50	0.83	—*	0.85	—*	0.85	—*	—*
24	0.01	0	StRS	1-0	1	20	0.87	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0	1	35	0.94	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0	1	50	0.96	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0	2	20	0.85	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0	2	35	0.93	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0	2	50	0.94	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0,1-3	1	20	0.94	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0,1-3	1	35	0.96	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0,1-3	1	50	0.97	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0,1-3	2	20	0.92	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0,1-3	2	35	0.96	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0,1-3	2	50	0.98	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-3	1	20	0.97	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-3	1	35	0.98	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-3	1	50	0.98	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-3	2	20	0.95	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-3	2	35	0.96	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-3	2	50	0.95	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0	1	20	0.71	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0	1	35	0.75	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0	1	50	0.80	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0	2	20	0.74	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0	2	35	0.76	—*	—*	—*	—*	—*	—*

* Indicates test size was greater than 0.13.

Table SB10 (continued). Trend Test Power of the χ^2 -test for the ANC Trend Slope Estimate. When the power is below 0.8, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0	Unequal	1-0	2	50	0.79	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0,1-3	1	20	0.78	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0,1-3	1	35	0.84	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0,1-3	1	50	0.84	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0,1-3	2	20	0.83	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0,1-3	2	35	0.84	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0,1-3	2	50	0.84	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-3	1	20	0.85	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-3	1	35	0.86	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-3	1	50	0.86	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-3	2	20	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-3	2	35	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-3	2	50	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-0	1	20	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	0.01	0.04	SRS	1-0	1	35	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	0.01	0.04	SRS	1-0	1	50	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	0.01	0.04	SRS	1-0	2	20	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	0.01	0.04	SRS	1-0	2	35	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	0.01	0.04	SRS	1-0	2	50	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	0.01	0.04	SRS	1-0,1-3	1	20	1.00	—*	1.00	—*	1.00	—*	—*
24	0.01	0.04	SRS	1-0,1-3	1	35	1.00	—*	1.00	—*	1.00	—*	—*
24	0.01	0.04	SRS	1-0,1-3	1	50	1.00	—*	1.00	—*	1.00	—*	—*
24	0.01	0.04	SRS	1-0,1-3	2	20	1.00	—*	1.00	—*	1.00	—*	—*
24	0.01	0.04	SRS	1-0,1-3	2	35	1.00	—*	1.00	—*	1.00	—*	—*
24	0.01	0.04	SRS	1-0,1-3	2	50	1.00	—*	1.00	—*	1.00	—*	—*

* Indicates test size was greater than 0.13.

Table SB10 (continued). Trend Test Power of the χ^2 -test for the ANC Trend Slope Estimate. When the power is below 0.8, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0.04	SRS	1-3	1	20	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-3	1	35	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	0.01	0.04	SRS	1-3	1	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-3	2	20	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	0.01	0.04	SRS	1-3	2	35	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	0.01	0.04	SRS	1-3	2	50	1.00	—*	1.00	—*	1.00	—*	—*
24	0.01	0.04	StRS	1-0	1	20	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0	1	35	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0	1	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0	2	20	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0	2	35	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0	2	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0,1-3	1	20	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0,1-3	1	35	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0,1-3	1	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0,1-3	2	20	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0,1-3	2	35	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0,1-3	2	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-3	1	20	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-3	1	35	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-3	1	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-3	2	20	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-3	2	35	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-3	2	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0	1	20	1.00	—*	—*	—*	—*	—*	—*

* Indicates test size was greater than 0.13.

Table SB10 (continued). Trend Test Power of the χ^2 -test for the ANC Trend Slope Estimate. When the power is below 0.8, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0.04	Unequal	1-0	1	35	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0	1	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0	2	20	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0	2	35	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0	2	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0,1-3	1	20	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0,1-3	1	35	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0,1-3	1	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0,1-3	2	20	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0,1-3	2	35	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0,1-3	2	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-3	1	20	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-3	1	35	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-3	1	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-3	2	20	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-3	2	35	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-3	2	50	—*	—*	—*	—*	—*	—*	—*

* Indicates test size was greater than 0.13.

Table SB11. Trend Test Power of the *t*-test for the modified ANC Trend Slope Estimate. When the power is below 0.8, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	SRS	1-0	1	20	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0	1	35	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0	1	50	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0	2	20	1.00	0.96	0.93	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0	2	35	1.00	0.98	0.97	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0	2	50	1.00	1.00	0.99	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0,1-3	1	20	1.00	0.81	0.84	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0,1-3	1	35	1.00	0.90	0.90	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0,1-3	1	50	1.00	0.96	0.94	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0,1-3	2	20	1.00	0.82	0.80	—*	0.84	—*	0.84	—*	—*
12	0.02	0	SRS	1-0,1-3	2	35	1.00	0.85	0.89	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0,1-3	2	50	1.00	0.93	0.93	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-3	1	20	1.00	0.66	0.65	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-3	1	35	1.00	0.84	0.85	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-3	1	50	1.00	0.89	0.92	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-3	2	20	1.00	0.56	0.62	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-3	2	35	1.00	0.74	0.80	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-3	2	50	1.00	0.88	0.89	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0	1	20	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0	1	35	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0	1	50	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0	2	20	1.00	0.92	0.91	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0	2	35	1.00	0.97	0.93	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0	2	50	1.00	1.00	0.96	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0,1-3	1	20	1.00	0.76	0.80	—*	—*	—*	—*	—*	—*

* Indicates test size was greater than 0.13.

Table SB11 (continued). Trend Test Power of the *t*-test for the modified ANC Trend Slope Estimate. When the power is below 0.8, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	StRS	1-0,1-3	1	35	1.00	0.81	0.81	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0,1-3	1	50	—*	0.87	0.89	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0,1-3	2	20	1.00	0.70	0.76	0.63	—*	0.63	—*	0.63	0.63
12	0.02	0	StRS	1-0,1-3	2	35	1.00	0.77	0.80	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0,1-3	2	50	1.00	0.82	0.85	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-3	1	20	1.00	0.56	0.58	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-3	1	35	1.00	0.71	0.73	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-3	1	50	1.00	0.81	0.84	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-3	2	20	1.00	0.51	0.53	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-3	2	35	1.00	0.63	0.70	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-3	2	50	1.00	0.78	0.78	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0	1	20	1.00	0.99	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0	1	35	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0	1	50	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0	2	20	1.00	0.87	0.84	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0	2	35	—*	0.95	0.89	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0	2	50	—*	—*	0.93	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0,1-3	1	20	1.00	0.59	0.71	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0,1-3	1	35	1.00	0.68	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0,1-3	1	50	1.00	0.71	0.78	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0,1-3	2	20	1.00	0.57	0.66	0.46	0.46	0.46	0.46	0.46	0.46
12	0.02	0	Unequal	1-0,1-3	2	35	—*	0.62	0.69	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0,1-3	2	50	1.00	0.64	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-3	1	20	—*	0.42	0.49	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-3	1	35	1.00	0.50	0.61	—*	—*	—*	—*	—*	—*

* Indicates test size was greater than 0.13.

Table SB11 (continued). Trend Test Power of the *t*-test for the modified ANC Trend Slope Estimate. When the power is below 0.8, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	Unequal	1-3	1	50	1.00	0.65	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-3	2	20	1.00	0.33	0.45	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-3	2	35	1.00	0.47	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-3	2	50	1.00	0.62	0.65	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0	1	20	1.00	—*	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0	1	35	1.00	—*	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0	1	50	1.00	—*	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0	2	20	1.00	—*	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0	2	35	1.00	—*	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0	2	50	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0,1-3	1	20	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0,1-3	1	35	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0,1-3	1	50	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0,1-3	2	20	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0,1-3	2	35	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0,1-3	2	50	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-3	1	20	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-3	1	35	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-3	1	50	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-3	2	20	1.00	1.00	0.99	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-3	2	35	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-3	2	50	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0	1	20	1.00	—*	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0	1	35	1.00	—*	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0	1	50	1.00	—*	—*	—*	—*	—*	—*	—*	—*

* Indicates test size was greater than 0.13.

Table SB11 (continued). Trend Test Power of the *t*-test for the modified ANC Trend Slope Estimate. When the power is below 0.8, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0.04	StRS	1-0	2	20	1.00	—*	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0	2	35	1.00	—*	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0	2	50	1.00	—*	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0,1-3	1	20	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0,1-3	1	35	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0,1-3	1	50	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0,1-3	2	20	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0,1-3	2	35	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0,1-3	2	50	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-3	1	20	1.00	0.99	0.98	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-3	1	35	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-3	1	50	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-3	2	20	1.00	0.97	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-3	2	35	1.00	1.00	0.99	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-3	2	50	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0	1	20	1.00	—*	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0	1	35	1.00	—*	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0	1	50	1.00	—*	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0	2	20	1.00	—*	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0	2	35	1.00	—*	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0	2	50	1.00	—*	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0,1-3	1	20	1.00	0.99	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0,1-3	1	35	1.00	0.99	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0,1-3	1	50	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0,1-3	2	20	1.00	0.97	—*	—*	—*	—*	—*	—*	—*

* Indicates test size was greater than 0.13.

Table SB11 (continued). Trend Test Power of the *t*-test for the modified ANC Trend Slope Estimate. When the power is below 0.8, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0.04	Unequal	1-0,1-3	2	35	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0,1-3	2	50	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-3	1	20	1.00	0.95	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-3	1	35	1.00	0.98	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-3	1	50	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-3	2	20	—*	0.93	0.94	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-3	2	35	1.00	0.98	0.99	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-3	2	50	—*	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-0	1	20	0.99	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-0	1	35	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-0	1	50	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-0	2	20	0.99	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-0	2	35	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-0	2	50	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-0,1-3	1	20	1.00	0.99	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-0,1-3	1	35	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-0,1-3	1	50	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-0,1-3	2	20	1.00	0.98	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-0,1-3	2	35	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-0,1-3	2	50	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-3	1	20	1.00	0.94	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-3	1	35	1.00	0.99	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-3	1	50	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-3	2	20	1.00	0.89	0.89	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-3	2	35	1.00	0.99	0.98	—*	—*	—*	—*	—*	—*

* Indicates test size was greater than 0.13.

Table SB11 (continued). Trend Test Power of the *t*-test for the modified ANC Trend Slope Estimate. When the power is below 0.8, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0	SRS	1-3	2	50	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0	1	20	0.99	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0	1	35	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0	1	50	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0	2	20	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0	2	35	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0	2	50	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0,1-3	1	20	1.00	0.94	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0,1-3	1	35	1.00	0.98	0.99	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0,1-3	1	50	1.00	0.99	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0,1-3	2	20	1.00	0.95	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0,1-3	2	35	1.00	0.97	0.97	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0,1-3	2	50	1.00	0.99	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-3	1	20	1.00	0.87	0.82	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-3	1	35	1.00	0.98	0.95	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-3	1	50	1.00	0.99	0.98	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-3	2	20	1.00	0.79	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-3	2	35	1.00	0.94	0.93	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-3	2	50	1.00	0.99	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0	1	20	0.99	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0	1	35	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0	1	50	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0	2	20	0.98	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0	2	35	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0	2	50	1.00	—*	—*	—*	—*	—*	—*	—*	—*

* Indicates test size was greater than 0.13.

Table SB11 (continued). Trend Test Power of the *t*-test for the modified ANC Trend Slope Estimate. When the power is below 0.8, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0	Unequal	1-0,1-3	1	20	1.00	0.86	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0,1-3	1	35	1.00	0.92	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0,1-3	1	50	1.00	0.94	0.96	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0,1-3	2	20	1.00	0.86	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0,1-3	2	35	1.00	0.92	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0,1-3	2	50	1.00	0.95	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-3	1	20	1.00	0.72	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-3	1	35	1.00	0.87	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-3	1	50	1.00	0.94	0.96	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-3	2	20	—*	0.69	0.70	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-3	2	35	1.00	0.84	0.83	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-3	2	50	—*	0.91	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-0	1	20	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-0	1	35	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-0	1	50	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-0	2	20	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-0	2	35	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-0	2	50	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-0,1-3	1	20	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-0,1-3	1	35	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-0,1-3	1	50	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-0,1-3	2	20	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-0,1-3	2	35	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-0,1-3	2	50	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-3	1	20	1.00	1.00	—*	—*	—*	—*	—*	—*	—*

* Indicates test size was greater than 0.13.

Table SB11 (continued). Trend Test Power of the *t*-test for the modified ANC Trend Slope Estimate. When the power is below 0.8, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0.04	SRS	1-3	1	35	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-3	1	50	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-3	2	20	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-3	2	35	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-3	2	50	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0	1	20	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0	1	35	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0	1	50	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0	2	20	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0	2	35	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0	2	50	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0,1-3	1	20	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0,1-3	1	35	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0,1-3	1	50	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0,1-3	2	20	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0,1-3	2	35	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0,1-3	2	50	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-3	1	20	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-3	1	35	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-3	1	50	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-3	2	20	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-3	2	35	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-3	2	50	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0	1	20	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0	1	35	1.00	—*	—*	—*	—*	—*	—*	—*	—*

* Indicates test size was greater than 0.13.

Table SB11 (continued). Trend Test Power of the *t*-test for the modified ANC Trend Slope Estimate. When the power is below 0.8, cells are also shaded.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	SLRDB	WLRDB	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0.04	Unequal	1-0	1	50	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0	2	20	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0	2	35	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0	2	50	1.00	—*	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0,1-3	1	20	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0,1-3	1	35	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0,1-3	1	50	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0,1-3	2	20	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0,1-3	2	35	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0,1-3	2	50	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-3	1	20	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-3	1	35	1.00	1.00	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-3	1	50	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-3	2	20	—*	1.00	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-3	2	35	1.00	1.00	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-3	2	50	—*	1.00	—*	—*	—*	—*	—*	—*	—*

* Indicates test size was greater than 0.13.

Table SB12. Trend Test Power of the χ^2 -test for the modified ANC Trend Slope Estimate.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	SRS	1-0	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0	1	35	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0	1	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0	2	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0	2	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0	2	50	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0,1-3	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0,1-3	1	35	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0,1-3	1	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0,1-3	2	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0,1-3	2	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-0,1-3	2	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-3	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-3	1	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-3	1	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-3	2	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-3	2	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	SRS	1-3	2	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0	1	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0	1	50	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0	2	20	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0	2	35	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0	2	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0,1-3	1	20	—*	—*	—*	—*	—*	—*	—*

* Indicates test size was greater than 0.13.

Table SB12 (continued). Trend Test Power of the χ^2 -test for the modified ANC Trend Slope Estimate.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	StRS	1-0,1-3	1	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0,1-3	1	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0,1-3	2	20	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0,1-3	2	35	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-0,1-3	2	50	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-3	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-3	1	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-3	1	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-3	2	20	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-3	2	35	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0	StRS	1-3	2	50	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0	1	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0	1	50	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0	2	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0	2	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0	2	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0,1-3	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0,1-3	1	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0,1-3	1	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0,1-3	2	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0,1-3	2	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-0,1-3	2	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-3	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-3	1	35	—*	—*	—*	—*	—*	—*	—*

* Indicates test size was greater than 0.13.

Table SB12 (continued). Trend Test Power of the χ^2 -test for the modified ANC Trend Slope Estimate.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	Unequal	1-3	1	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-3	2	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-3	2	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0	Unequal	1-3	2	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0	1	35	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0	1	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0	2	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0	2	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0	2	50	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0,1-3	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0,1-3	1	35	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0,1-3	1	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0,1-3	2	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0,1-3	2	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-0,1-3	2	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-3	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-3	1	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-3	1	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-3	2	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-3	2	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	SRS	1-3	2	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0	1	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0	1	50	1.00	—*	—*	—*	—*	—*	—*

* Indicates test size was greater than 0.13.

Table SB12 (continued). Trend Test Power of the χ^2 -test for the modified ANC Trend Slope Estimate.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0.04	StRS	1-0	2	20	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0	2	35	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0	2	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0,1-3	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0,1-3	1	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0,1-3	1	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0,1-3	2	20	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0,1-3	2	35	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-0,1-3	2	50	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-3	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-3	1	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-3	1	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-3	2	20	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-3	2	35	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	StRS	1-3	2	50	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0	1	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0	1	50	1.00	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0	2	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0	2	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0	2	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0,1-3	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0,1-3	1	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0,1-3	1	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0,1-3	2	20	—*	—*	—*	—*	—*	—*	—*

* Indicates test size was greater than 0.13.

Table SB12 (continued). Trend Test Power of the χ^2 -test for the modified ANC Trend Slope Estimate.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0.04	Unequal	1-0,1-3	2	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-0,1-3	2	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-3	1	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-3	1	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-3	1	50	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-3	2	20	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-3	2	35	—*	—*	—*	—*	—*	—*	—*
12	0.02	0.04	Unequal	1-3	2	50	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-0	1	20	0.99	0.99	0.99	0.99	0.99	0.99	0.99
24	0.01	0	SRS	1-0	1	35	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	0.01	0	SRS	1-0	1	50	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	0.01	0	SRS	1-0	2	20	1.00	1.00	1.00	0.99	1.00	0.99	1.00
24	0.01	0	SRS	1-0	2	35	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	0.01	0	SRS	1-0	2	50	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	0.01	0	SRS	1-0,1-3	1	20	1.00	—*	1.00	—*	1.00	—*	—*
24	0.01	0	SRS	1-0,1-3	1	35	1.00	—*	1.00	—*	1.00	—*	—*
24	0.01	0	SRS	1-0,1-3	1	50	1.00	—*	1.00	—*	1.00	—*	—*
24	0.01	0	SRS	1-0,1-3	2	20	1.00	—*	1.00	—*	1.00	—*	—*
24	0.01	0	SRS	1-0,1-3	2	35	1.00	—*	1.00	—*	1.00	—*	—*
24	0.01	0	SRS	1-0,1-3	2	50	1.00	—*	1.00	—*	1.00	—*	—*
24	0.01	0	SRS	1-3	1	20	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-3	1	35	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	0.01	0	SRS	1-3	1	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	SRS	1-3	2	20	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	0.01	0	SRS	1-3	2	35	1.00	1.00	1.00	1.00	1.00	1.00	1.00

* Indicates test size was greater than 0.13.

Table SB12 (continued). Trend Test Power of the χ^2 -test for the modified ANC Trend Slope Estimate.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0	SRS	1-3	2	50	1.00	—*	1.00	—*	1.00	—*	—*
24	0.01	0	StRS	1-0	1	20	0.99	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0	1	35	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0	1	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0	2	20	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0	2	35	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0	2	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0,1-3	1	20	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0,1-3	1	35	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0,1-3	1	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0,1-3	2	20	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0,1-3	2	35	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-0,1-3	2	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-3	1	20	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-3	1	35	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-3	1	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-3	2	20	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-3	2	35	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	StRS	1-3	2	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0	1	20	0.99	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0	1	35	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0	1	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0	2	20	0.98	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0	2	35	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0	2	50	1.00	—*	—*	—*	—*	—*	—*

* Indicates test size was greater than 0.13.

Table SB12 (continued). Trend Test Power of the χ^2 -test for the modified ANC Trend Slope Estimate.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0	Unequal	1-0,1-3	1	20	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0,1-3	1	35	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0,1-3	1	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0,1-3	2	20	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0,1-3	2	35	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-0,1-3	2	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-3	1	20	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-3	1	35	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-3	1	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-3	2	20	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-3	2	35	—*	—*	—*	—*	—*	—*	—*
24	0.01	0	Unequal	1-3	2	50	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-0	1	20	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	0.01	0.04	SRS	1-0	1	35	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	0.01	0.04	SRS	1-0	1	50	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	0.01	0.04	SRS	1-0	2	20	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	0.01	0.04	SRS	1-0	2	35	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	0.01	0.04	SRS	1-0	2	50	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	0.01	0.04	SRS	1-0,1-3	1	20	1.00	—*	1.00	—*	1.00	—*	—*
24	0.01	0.04	SRS	1-0,1-3	1	35	1.00	—*	1.00	—*	1.00	—*	—*
24	0.01	0.04	SRS	1-0,1-3	1	50	1.00	—*	1.00	—*	1.00	—*	—*
24	0.01	0.04	SRS	1-0,1-3	2	20	1.00	—*	1.00	—*	1.00	—*	—*
24	0.01	0.04	SRS	1-0,1-3	2	35	1.00	—*	1.00	—*	1.00	—*	—*
24	0.01	0.04	SRS	1-0,1-3	2	50	1.00	—*	1.00	—*	1.00	—*	—*
24	0.01	0.04	SRS	1-3	1	20	1.00	—*	—*	—*	—*	—*	—*

* Indicates test size was greater than 0.13.

Table SB12 (continued). Trend Test Power of the χ^2 -test for the modified ANC Trend Slope Estimate.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0.04	SRS	1-3	1	35	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	0.01	0.04	SRS	1-3	1	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	SRS	1-3	2	20	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	0.01	0.04	SRS	1-3	2	35	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	0.01	0.04	SRS	1-3	2	50	1.00	—*	1.00	—*	1.00	—*	—*
24	0.01	0.04	StRS	1-0	1	20	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0	1	35	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0	1	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0	2	20	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0	2	35	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0	2	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0,1-3	1	20	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0,1-3	1	35	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0,1-3	1	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0,1-3	2	20	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0,1-3	2	35	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-0,1-3	2	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-3	1	20	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-3	1	35	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-3	1	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-3	2	20	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-3	2	35	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	StRS	1-3	2	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0	1	20	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0	1	35	1.00	—*	—*	—*	—*	—*	—*

* Indicates test size was greater than 0.13.

Table SB12 (continued). Trend Test Power of the χ^2 -test for the modified ANC Trend Slope Estimate.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0.04	Unequal	1-0	1	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0	2	20	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0	2	35	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0	2	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0,1-3	1	20	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0,1-3	1	35	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0,1-3	1	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0,1-3	2	20	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0,1-3	2	35	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-0,1-3	2	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-3	1	20	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-3	1	35	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-3	1	50	1.00	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-3	2	20	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-3	2	35	—*	—*	—*	—*	—*	—*	—*
24	0.01	0.04	Unequal	1-3	2	50	—*	—*	—*	—*	—*	—*	—*

Table SB13. Relative Bias of the ANC Site-to-Site Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	SRS	1-0	1	20	3.34%	3260.02%	3260.02%	3260.02%	3260.02%	3260.02%	3260.02%
12	0.02	0	SRS	1-0	1	35	-0.53%	1789.54%	1789.54%	1789.54%	1789.54%	1789.54%	1789.54%
12	0.02	0	SRS	1-0	1	50	2.61%	1275.98%	1275.98%	1275.98%	1275.98%	1275.98%	1275.98%
12	0.02	0	SRS	1-0	2	20	-1.04%	3118.09%	3118.73%	3439.46%	3118.73%	3439.46%	3118.09%
12	0.02	0	SRS	1-0	2	35	-0.21%	1795.46%	1795.79%	1979.76%	1795.79%	1979.76%	1795.46%
12	0.02	0	SRS	1-0	2	50	-0.04%	1240.47%	1240.62%	1373.78%	1240.62%	1373.78%	1240.47%
12	0.02	0	SRS	1-0,1-3	1	20	0.02%	1241.12%	1240.90%	4426.15%	1240.90%	4426.15%	1241.12%
12	0.02	0	SRS	1-0,1-3	1	35	-0.14%	515.30%	515.03%	2172.25%	515.03%	2172.25%	515.30%
12	0.02	0	SRS	1-0,1-3	1	50	-0.32%	297.93%	298.40%	1409.81%	298.40%	1409.81%	297.93%
12	0.02	0	SRS	1-0,1-3	2	20	-1.09%	1231.10%	1226.33%	5403.69%	1226.33%	5403.69%	1231.10%
12	0.02	0	SRS	1-0,1-3	2	35	1.16%	524.16%	523.09%	2587.47%	523.09%	2587.47%	524.16%
12	0.02	0	SRS	1-0,1-3	2	50	0.19%	300.23%	300.42%	1653.79%	300.42%	1653.79%	300.23%
12	0.02	0	SRS	1-3	1	20	0.70%	750.93%	750.93%	3303.73%	750.93%	3303.73%	750.93%
12	0.02	0	SRS	1-3	1	35	-0.05%	384.91%	384.91%	1839.66%	384.91%	1839.66%	384.91%
12	0.02	0	SRS	1-3	1	50	0.23%	241.00%	241.00%	1263.99%	241.00%	1263.99%	241.00%
12	0.02	0	SRS	1-3	2	20	1.13%	754.51%	754.52%	3740.31%	754.52%	3740.31%	754.51%
12	0.02	0	SRS	1-3	2	35	0.47%	387.31%	387.43%	2086.70%	387.43%	2086.70%	387.31%
12	0.02	0	SRS	1-3	2	50	-0.44%	238.71%	238.64%	1422.97%	238.64%	1422.97%	238.71%
12	0.02	0	StRS	1-0	1	20	1.30%	3036.05%	3036.05%	3036.05%	3036.05%	3036.05%	3036.05%
12	0.02	0	StRS	1-0	1	35	-1.84%	1693.13%	1693.13%	1693.13%	1693.13%	1693.13%	1693.13%
12	0.02	0	StRS	1-0	1	50	-0.56%	1194.79%	1194.79%	1194.79%	1194.79%	1194.79%	1194.79%
12	0.02	0	StRS	1-0	2	20	1.93%	3047.09%	3046.16%	3346.82%	3046.16%	3346.82%	3047.09%
12	0.02	0	StRS	1-0	2	35	1.08%	1738.61%	1738.16%	1928.17%	1738.16%	1928.17%	1738.45%
12	0.02	0	StRS	1-0	2	50	0.91%	1216.09%	1216.03%	1346.50%	1216.03%	1346.50%	1216.09%

Table SB13 (continued). Relative Bias of the ANC Site-to-Site Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	StRS	1-0,1-3	1	20	-0.47%	1195.07%	1193.38%	4215.95%	1193.38%	4215.95%	1195.07%
12	0.02	0	StRS	1-0,1-3	1	35	-0.68%	493.61%	493.30%	2096.51%	493.30%	2096.51%	493.61%
12	0.02	0	StRS	1-0,1-3	1	50	-0.54%	286.64%	287.04%	1372.99%	287.04%	1372.99%	286.64%
12	0.02	0	StRS	1-0,1-3	2	20	-0.50%	1184.88%	1181.85%	5188.22%	1181.85%	5188.22%	1184.88%
12	0.02	0	StRS	1-0,1-3	2	35	-0.12%	497.17%	497.90%	2487.30%	497.90%	2487.30%	497.17%
12	0.02	0	StRS	1-0,1-3	2	50	0.04%	290.53%	290.90%	1609.61%	290.90%	1609.61%	290.53%
12	0.02	0	StRS	1-3	1	20	0.34%	717.42%	717.44%	3169.68%	717.44%	3169.68%	717.44%
12	0.02	0	StRS	1-3	1	35	0.68%	377.01%	377.02%	1808.07%	377.02%	1808.07%	377.02%
12	0.02	0	StRS	1-3	1	50	0.43%	232.93%	232.93%	1231.72%	232.93%	1231.72%	232.93%
12	0.02	0	StRS	1-3	2	20	0.86%	721.05%	720.91%	3585.27%	720.91%	3585.27%	721.11%
12	0.02	0	StRS	1-3	2	35	0.85%	377.71%	377.62%	2053.02%	377.62%	2053.02%	377.71%
12	0.02	0	StRS	1-3	2	50	0.32%	232.75%	232.73%	1394.07%	232.73%	1394.07%	232.75%
12	0.02	0	Unequal	1-0	1	20	-2.79%	2582.55%	2582.55%	2582.55%	2582.55%	2582.55%	2582.55%
12	0.02	0	Unequal	1-0	1	35	0.92%	1662.25%	1662.25%	1662.25%	1662.25%	1662.25%	1662.25%
12	0.02	0	Unequal	1-0	1	50	-0.33%	1164.46%	1164.46%	1164.46%	1164.46%	1164.46%	1164.46%
12	0.02	0	Unequal	1-0	2	20	1.83%	2748.27%	2747.85%	3023.37%	2747.85%	3023.37%	2748.27%
12	0.02	0	Unequal	1-0	2	35	1.08%	1734.58%	1734.60%	1912.71%	1734.60%	1912.71%	1734.58%
12	0.02	0	Unequal	1-0	2	50	0.03%	1169.66%	1169.72%	1297.07%	1169.72%	1297.07%	1169.66%
12	0.02	0	Unequal	1-0,1-3	1	20	-0.40%	1121.78%	1123.45%	3923.26%	1123.45%	3923.26%	1121.78%
12	0.02	0	Unequal	1-0,1-3	1	35	0.20%	479.29%	481.25%	2040.27%	481.25%	2040.27%	479.29%
12	0.02	0	Unequal	1-0,1-3	1	50	-0.47%	274.49%	275.83%	1316.37%	275.83%	1316.37%	274.49%
12	0.02	0	Unequal	1-0,1-3	2	20	0.41%	1140.01%	1137.31%	4874.57%	1137.31%	4874.57%	1140.01%
12	0.02	0	Unequal	1-0,1-3	2	35	0.40%	479.25%	480.34%	2360.36%	480.34%	2360.36%	479.25%
12	0.02	0	Unequal	1-0,1-3	2	50	-0.71%	274.77%	276.48%	1523.79%	276.48%	1523.79%	274.77%

Table SB13 (continued). Relative Bias of the ANC Site-to-Site Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	Unequal	1-3	1	20	-0.73%	701.99%	701.99%	3107.95%	701.99%	3107.95%	701.99%
12	0.02	0	Unequal	1-3	1	35	-1.33%	351.69%	351.69%	1706.76%	351.69%	1706.76%	351.69%
12	0.02	0	Unequal	1-3	1	50	-0.57%	219.79%	219.79%	1179.15%	219.79%	1179.15%	219.79%
12	0.02	0	Unequal	1-3	2	20	0.67%	702.79%	702.67%	3502.23%	702.67%	3502.23%	702.85%
12	0.02	0	Unequal	1-3	2	35	-0.50%	354.90%	354.76%	1922.37%	354.76%	1922.37%	354.90%
12	0.02	0	Unequal	1-3	2	50	0.10%	221.15%	221.05%	1336.39%	221.05%	1336.39%	221.15%
12	0.02	0.04	SRS	1-0	1	20	-1.50%	3104.46%	3104.46%	3104.46%	3104.46%	3104.46%	3104.46%
12	0.02	0.04	SRS	1-0	1	35	-0.19%	1796.38%	1796.38%	1796.38%	1796.38%	1796.38%	1796.38%
12	0.02	0.04	SRS	1-0	1	50	0.20%	1243.93%	1243.93%	1243.93%	1243.93%	1243.93%	1243.93%
12	0.02	0.04	SRS	1-0	2	20	0.74%	3177.14%	3177.73%	3496.87%	3177.73%	3496.87%	3177.14%
12	0.02	0.04	SRS	1-0	2	35	0.03%	1800.47%	1800.71%	1984.72%	1800.71%	1984.72%	1800.47%
12	0.02	0.04	SRS	1-0	2	50	0.63%	1249.61%	1249.76%	1382.73%	1249.76%	1382.73%	1249.61%
12	0.02	0.04	SRS	1-0,1-3	1	20	0.28%	1248.07%	1244.73%	4413.94%	1244.73%	4413.94%	1248.07%
12	0.02	0.04	SRS	1-0,1-3	1	35	-0.73%	512.37%	511.43%	2147.69%	511.43%	2147.69%	512.37%
12	0.02	0.04	SRS	1-0,1-3	1	50	-0.39%	297.85%	298.12%	1405.04%	298.12%	1405.04%	297.85%
12	0.02	0.04	SRS	1-0,1-3	2	20	2.05%	1272.15%	1268.57%	5538.67%	1268.57%	5538.67%	1272.15%
12	0.02	0.04	SRS	1-0,1-3	2	35	0.24%	519.16%	517.43%	2544.48%	517.43%	2544.48%	519.16%
12	0.02	0.04	SRS	1-0,1-3	2	50	-0.26%	299.12%	298.65%	1639.32%	298.65%	1639.32%	299.12%
12	0.02	0.04	SRS	1-3	1	20	0.44%	748.75%	748.75%	3295.02%	748.75%	3295.02%	748.75%
12	0.02	0.04	SRS	1-3	1	35	0.01%	385.20%	385.20%	1840.82%	385.20%	1840.82%	385.20%
12	0.02	0.04	SRS	1-3	1	50	-0.21%	239.44%	239.44%	1257.75%	239.44%	1257.75%	239.44%
12	0.02	0.04	SRS	1-3	2	20	-0.11%	744.38%	744.17%	3698.21%	744.17%	3698.21%	744.38%
12	0.02	0.04	SRS	1-3	2	35	-0.04%	384.90%	384.88%	2073.19%	384.88%	2073.19%	384.90%
12	0.02	0.04	SRS	1-3	2	50	0.07%	240.53%	240.45%	1429.48%	240.45%	1429.48%	240.53%

Table SB13 (continued). Relative Bias of the ANC Site-to-Site Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0.04	StRS	1-0	1	20	-2.88%	2900.04%	2900.04%	2900.04%	2900.04%	2900.04%	2900.04%
12	0.02	0.04	StRS	1-0	1	35	-0.39%	1736.19%	1736.19%	1736.19%	1736.19%	1736.19%	1736.19%
12	0.02	0.04	StRS	1-0	1	50	-1.96%	1180.43%	1180.43%	1180.43%	1180.43%	1180.43%	1180.43%
12	0.02	0.04	StRS	1-0	2	20	-0.28%	2949.67%	2949.75%	3246.96%	2949.75%	3246.96%	2949.67%
12	0.02	0.04	StRS	1-0	2	35	-0.36%	1742.15%	1742.22%	1932.90%	1742.22%	1932.90%	1742.15%
12	0.02	0.04	StRS	1-0	2	50	0.96%	1224.74%	1224.79%	1356.98%	1224.79%	1356.98%	1224.74%
12	0.02	0.04	StRS	1-0,1-3	1	20	1.04%	1215.43%	1214.41%	4289.29%	1214.41%	4289.29%	1215.47%
12	0.02	0.04	StRS	1-0,1-3	1	35	-0.06%	498.09%	498.17%	2107.18%	498.17%	2107.18%	498.09%
12	0.02	0.04	StRS	1-0,1-3	1	50	-0.23%	287.66%	287.78%	1372.71%	287.78%	1372.71%	287.66%
12	0.02	0.04	StRS	1-0,1-3	2	20	-1.38%	1167.80%	1165.42%	5080.02%	1165.42%	5080.02%	1167.80%
12	0.02	0.04	StRS	1-0,1-3	2	35	0.23%	502.30%	501.97%	2516.97%	501.97%	2516.97%	502.30%
12	0.02	0.04	StRS	1-0,1-3	2	50	-1.63%	282.24%	282.15%	1573.08%	282.15%	1573.08%	282.24%
12	0.02	0.04	StRS	1-3	1	20	0.47%	721.26%	721.28%	3185.12%	721.28%	3185.12%	721.28%
12	0.02	0.04	StRS	1-3	1	35	-0.08%	374.49%	374.49%	1797.97%	374.49%	1797.97%	374.49%
12	0.02	0.04	StRS	1-3	1	50	-0.91%	228.41%	228.41%	1213.64%	228.41%	1213.64%	228.41%
12	0.02	0.04	StRS	1-3	2	20	0.20%	714.08%	713.96%	3558.19%	713.96%	3558.19%	714.08%
12	0.02	0.04	StRS	1-3	2	35	1.54%	377.78%	377.66%	2059.15%	377.66%	2059.15%	377.78%
12	0.02	0.04	StRS	1-3	2	50	0.73%	233.56%	233.51%	1396.28%	233.51%	1396.28%	233.56%
12	0.02	0.04	Unequal	1-0	1	20	-0.83%	2594.00%	2594.00%	2594.00%	2594.00%	2594.00%	2594.00%
12	0.02	0.04	Unequal	1-0	1	35	1.49%	1731.74%	1731.74%	1731.74%	1731.74%	1731.74%	1731.74%
12	0.02	0.04	Unequal	1-0	1	50	0.08%	1171.45%	1171.45%	1171.45%	1171.45%	1171.45%	1171.45%
12	0.02	0.04	Unequal	1-0	2	20	-2.81%	2525.24%	2525.31%	2788.84%	2525.31%	2788.84%	2525.24%
12	0.02	0.04	Unequal	1-0	2	35	1.36%	1707.41%	1707.50%	1881.69%	1707.50%	1881.69%	1707.41%
12	0.02	0.04	Unequal	1-0	2	50	0.40%	1176.90%	1177.00%	1304.57%	1177.00%	1304.57%	1176.90%

Table SB13 (continued). Relative Bias of the ANC Site-to-Site Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0.04	Unequal	1-0,1-3	1	20	-0.14%	1108.45%	1110.93%	3890.10%	1110.93%	3890.10%	1108.45%
12	0.02	0.04	Unequal	1-0,1-3	1	35	-0.07%	480.26%	481.75%	2034.33%	481.75%	2034.33%	480.26%
12	0.02	0.04	Unequal	1-0,1-3	1	50	0.69%	273.55%	275.06%	1304.58%	275.06%	1304.58%	273.55%
12	0.02	0.04	Unequal	1-0,1-3	2	20	-0.83%	1096.42%	1092.70%	4718.24%	1092.70%	4718.24%	1096.42%
12	0.02	0.04	Unequal	1-0,1-3	2	35	-0.96%	467.35%	467.48%	2301.85%	467.48%	2301.85%	467.35%
12	0.02	0.04	Unequal	1-0,1-3	2	50	0.14%	270.57%	272.66%	1498.67%	272.66%	1498.67%	270.57%
12	0.02	0.04	Unequal	1-3	1	20	-0.02%	684.01%	684.01%	3036.04%	684.01%	3036.04%	684.01%
12	0.02	0.04	Unequal	1-3	1	35	-0.53%	351.49%	351.49%	1705.98%	351.49%	1705.98%	351.49%
12	0.02	0.04	Unequal	1-3	1	50	-0.06%	219.63%	219.63%	1178.53%	219.63%	1178.53%	219.63%
12	0.02	0.04	Unequal	1-3	2	20	0.14%	673.08%	672.78%	3367.53%	672.78%	3367.53%	673.08%
12	0.02	0.04	Unequal	1-3	2	35	0.17%	344.82%	344.69%	1885.44%	344.69%	1885.44%	344.82%
12	0.02	0.04	Unequal	1-3	2	50	-0.61%	214.64%	214.59%	1310.24%	214.59%	1310.24%	214.64%
24	0.01	0	SRS	1-0	1	20	0.45%	3164.54%	3164.54%	3164.54%	3164.54%	3164.54%	3164.54%
24	0.01	0	SRS	1-0	1	35	0.10%	1799.81%	1799.81%	1799.81%	1799.81%	1799.81%	1799.81%
24	0.01	0	SRS	1-0	1	50	-1.99%	1213.32%	1213.32%	1213.32%	1213.32%	1213.32%	1213.32%
24	0.01	0	SRS	1-0	2	20	1.69%	3204.42%	3204.79%	3533.15%	3204.79%	3533.15%	3204.42%
24	0.01	0	SRS	1-0	2	35	0.16%	1800.88%	1800.98%	1985.65%	1800.98%	1985.65%	1800.88%
24	0.01	0	SRS	1-0	2	50	-0.12%	1238.26%	1238.40%	1371.41%	1238.40%	1371.41%	1238.26%
24	0.01	0	SRS	1-0,1-3	1	20	1.77%	1264.48%	1263.37%	4490.82%	1263.37%	4490.82%	1264.48%
24	0.01	0	SRS	1-0,1-3	1	35	-0.26%	514.66%	513.90%	2182.01%	513.90%	2182.01%	514.66%
24	0.01	0	SRS	1-0,1-3	1	50	1.41%	305.09%	305.07%	1444.18%	305.07%	1444.18%	305.09%
24	0.01	0	SRS	1-0,1-3	2	20	-0.23%	1236.90%	1236.66%	5252.89%	1236.66%	5252.89%	1236.90%
24	0.01	0	SRS	1-0,1-3	2	35	0.24%	517.08%	516.94%	2487.42%	516.94%	2487.42%	517.08%
24	0.01	0	SRS	1-0,1-3	2	50	0.51%	301.75%	301.50%	1615.51%	301.50%	1615.51%	301.75%

Table SB13 (continued). Relative Bias of the ANC Site-to-Site Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0	SRS	1-3	1	20	-0.55%	738.97%	738.97%	3255.87%	738.97%	3255.87%	738.97%
24	0.01	0	SRS	1-3	1	35	0.58%	387.38%	387.38%	1849.51%	387.38%	1849.51%	387.38%
24	0.01	0	SRS	1-3	1	50	-0.13%	239.41%	239.41%	1257.63%	239.41%	1257.63%	239.41%
24	0.01	0	SRS	1-3	2	20	-0.01%	743.65%	743.54%	3609.23%	743.54%	3609.23%	743.65%
24	0.01	0	SRS	1-3	2	35	-0.65%	381.38%	381.41%	2012.71%	381.41%	2012.71%	381.38%
24	0.01	0	SRS	1-3	2	50	-0.44%	238.37%	238.37%	1387.03%	238.37%	1387.03%	238.37%
24	0.01	0	StRS	1-0	1	20	0.28%	3018.99%	3018.99%	3018.99%	3018.99%	3018.99%	3018.99%
24	0.01	0	StRS	1-0	1	35	0.58%	1757.17%	1757.17%	1757.17%	1757.17%	1757.17%	1757.17%
24	0.01	0	StRS	1-0	1	50	-0.31%	1197.90%	1197.90%	1197.90%	1197.90%	1197.90%	1197.90%
24	0.01	0	StRS	1-0	2	20	3.34%	3096.66%	3096.71%	3414.41%	3096.71%	3414.41%	3096.66%
24	0.01	0	StRS	1-0	2	35	-2.82%	1690.32%	1690.39%	1878.15%	1690.39%	1878.15%	1690.32%
24	0.01	0	StRS	1-0	2	50	1.56%	1230.98%	1231.03%	1362.69%	1231.03%	1362.69%	1230.98%
24	0.01	0	StRS	1-0,1-3	1	20	0.40%	1192.27%	1192.76%	4216.41%	1192.76%	4216.41%	1192.27%
24	0.01	0	StRS	1-0,1-3	1	35	0.43%	501.61%	501.64%	2122.22%	501.64%	2122.22%	501.61%
24	0.01	0	StRS	1-0,1-3	1	50	-0.63%	286.51%	286.69%	1369.59%	286.69%	1369.59%	286.51%
24	0.01	0	StRS	1-0,1-3	2	20	0.02%	1191.81%	1190.51%	4985.63%	1190.51%	4985.63%	1191.81%
24	0.01	0	StRS	1-0,1-3	2	35	0.06%	501.37%	501.33%	2429.33%	501.33%	2429.25%	501.37%
24	0.01	0	StRS	1-0,1-3	2	50	-0.17%	289.61%	289.62%	1561.48%	289.62%	1561.48%	289.61%
24	0.01	0	StRS	1-3	1	20	-1.07%	709.25%	709.25%	3137.02%	709.25%	3137.02%	709.25%
24	0.01	0	StRS	1-3	1	35	0.22%	371.85%	371.85%	1787.38%	371.85%	1787.38%	371.85%
24	0.01	0	StRS	1-3	1	50	0.23%	231.69%	231.69%	1226.76%	231.69%	1226.76%	231.69%
24	0.01	0	StRS	1-3	2	20	-0.21%	709.61%	709.60%	3456.46%	709.60%	3456.46%	709.61%
24	0.01	0	StRS	1-3	2	35	-0.70%	365.43%	365.45%	1952.93%	365.45%	1952.93%	365.43%
24	0.01	0	StRS	1-3	2	50	0.20%	230.53%	230.52%	1352.83%	230.52%	1352.83%	230.53%

Table SB13 (continued). Relative Bias of the ANC Site-to-Site Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0	Unequal	1-0	1	20	0.24%	2667.16%	2667.16%	2667.16%	2667.16%	2667.16%	2667.16%
24	0.01	0	Unequal	1-0	1	35	1.83%	1700.87%	1700.87%	1700.87%	1700.87%	1700.87%	1700.87%
24	0.01	0	Unequal	1-0	1	50	0.23%	1159.35%	1159.35%	1159.35%	1159.35%	1159.35%	1159.35%
24	0.01	0	Unequal	1-0	2	20	-2.16%	2619.38%	2619.39%	2877.84%	2619.39%	2877.84%	2619.38%
24	0.01	0	Unequal	1-0	2	35	0.08%	1703.88%	1703.93%	1873.19%	1703.93%	1873.19%	1703.88%
24	0.01	0	Unequal	1-0	2	50	0.23%	1151.67%	1151.73%	1279.01%	1151.73%	1279.01%	1151.67%
24	0.01	0	Unequal	1-0,1-3	1	20	-1.72%	1131.84%	1131.62%	4023.93%	1131.62%	4023.93%	1131.84%
24	0.01	0	Unequal	1-0,1-3	1	35	0.30%	486.24%	487.06%	2060.47%	487.06%	2060.47%	486.24%
24	0.01	0	Unequal	1-0,1-3	1	50	-0.01%	278.71%	279.34%	1337.13%	279.34%	1337.13%	278.71%
24	0.01	0	Unequal	1-0,1-3	2	20	0.68%	1131.78%	1131.70%	4769.86%	1131.70%	4769.87%	1131.78%
24	0.01	0	Unequal	1-0,1-3	2	35	0.44%	493.58%	494.15%	2370.31%	494.15%	2370.31%	493.58%
24	0.01	0	Unequal	1-0,1-3	2	50	0.07%	281.88%	282.64%	1521.93%	282.64%	1521.93%	281.88%
24	0.01	0	Unequal	1-3	1	20	-0.21%	694.17%	694.17%	3076.68%	694.17%	3076.68%	694.17%
24	0.01	0	Unequal	1-3	1	35	-0.90%	363.42%	363.42%	1753.67%	363.42%	1753.67%	363.42%
24	0.01	0	Unequal	1-3	1	50	-0.42%	223.40%	223.40%	1193.61%	223.40%	1193.61%	223.40%
24	0.01	0	Unequal	1-3	2	20	0.10%	702.66%	702.62%	3428.88%	702.62%	3428.88%	702.66%
24	0.01	0	Unequal	1-3	2	35	0.49%	357.20%	357.19%	1903.43%	357.19%	1903.43%	357.20%
24	0.01	0	Unequal	1-3	2	50	0.55%	226.58%	226.60%	1334.99%	226.60%	1334.99%	226.58%
24	0.01	0.04	SRS	1-0	1	20	-1.57%	3102.26%	3102.26%	3102.26%	3102.26%	3102.26%	3102.26%
24	0.01	0.04	SRS	1-0	1	35	-1.02%	1780.23%	1780.23%	1780.23%	1780.23%	1780.23%	1780.23%
24	0.01	0.04	SRS	1-0	1	50	-1.22%	1224.51%	1224.51%	1224.51%	1224.51%	1224.51%	1224.51%
24	0.01	0.04	SRS	1-0	2	20	-1.46%	3105.56%	3105.97%	3430.76%	3105.97%	3430.76%	3105.56%
24	0.01	0.04	SRS	1-0	2	35	0.87%	1815.73%	1815.90%	2001.29%	1815.90%	2001.29%	1815.73%
24	0.01	0.04	SRS	1-0	2	50	-0.58%	1232.99%	1233.08%	1365.12%	1233.08%	1365.12%	1232.99%

Table SB13 (continued). Relative Bias of the ANC Site-to-Site Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0.04	SRS	1-0,1-3	1	20	0.19%	1243.15%	1243.17%	4432.37%	1243.17%	4432.37%	1243.15%
24	0.01	0.04	SRS	1-0,1-3	1	35	0.27%	517.74%	517.35%	2192.05%	517.35%	2192.05%	517.74%
24	0.01	0.04	SRS	1-0,1-3	1	50	-0.39%	298.57%	297.97%	1420.96%	297.97%	1420.96%	298.57%
24	0.01	0.04	SRS	1-0,1-3	2	20	-0.52%	1232.79%	1233.42%	5230.00%	1233.42%	5230.00%	1232.79%
24	0.01	0.04	SRS	1-0,1-3	2	35	-0.02%	515.67%	515.49%	2491.82%	515.49%	2491.82%	515.67%
24	0.01	0.04	SRS	1-0,1-3	2	50	0.65%	302.43%	302.08%	1623.65%	302.08%	1623.65%	302.43%
24	0.01	0.04	SRS	1-3	1	20	-0.51%	739.73%	739.73%	3258.91%	739.73%	3258.91%	739.73%
24	0.01	0.04	SRS	1-3	1	35	-0.43%	382.58%	382.58%	1830.32%	382.58%	1830.32%	382.58%
24	0.01	0.04	SRS	1-3	1	50	-0.04%	239.75%	239.75%	1259.00%	239.75%	1259.00%	239.75%
24	0.01	0.04	SRS	1-3	2	20	-0.29%	741.58%	741.52%	3603.83%	741.52%	3603.83%	741.58%
24	0.01	0.04	SRS	1-3	2	35	-0.25%	383.37%	383.42%	2019.24%	383.42%	2019.24%	383.37%
24	0.01	0.04	SRS	1-3	2	50	-0.94%	236.65%	236.68%	1380.22%	236.68%	1380.22%	236.65%
24	0.01	0.04	StRS	1-0	1	20	0.26%	3004.47%	3004.47%	3004.47%	3004.47%	3004.47%	3004.47%
24	0.01	0.04	StRS	1-0	1	35	-0.37%	1735.32%	1735.32%	1735.32%	1735.32%	1735.32%	1735.32%
24	0.01	0.04	StRS	1-0	1	50	0.95%	1220.64%	1220.64%	1220.64%	1220.64%	1220.64%	1220.64%
24	0.01	0.04	StRS	1-0	2	20	2.35%	3029.26%	3029.35%	3339.23%	3029.35%	3339.23%	3029.26%
24	0.01	0.04	StRS	1-0	2	35	1.64%	1771.43%	1771.47%	1964.12%	1771.47%	1964.12%	1771.43%
24	0.01	0.04	StRS	1-0	2	50	0.60%	1212.84%	1212.86%	1344.75%	1212.86%	1344.75%	1212.84%
24	0.01	0.04	StRS	1-0,1-3	1	20	1.54%	1217.25%	1216.12%	4286.76%	1216.12%	4286.76%	1217.25%
24	0.01	0.04	StRS	1-0,1-3	1	35	-0.96%	493.24%	493.69%	2094.28%	493.69%	2094.28%	493.24%
24	0.01	0.04	StRS	1-0,1-3	1	50	-1.09%	283.70%	284.02%	1356.87%	284.02%	1356.87%	283.70%
24	0.01	0.04	StRS	1-0,1-3	2	20	-1.99%	1175.96%	1175.31%	4918.78%	1175.31%	4918.78%	1175.96%
24	0.01	0.04	StRS	1-0,1-3	2	35	-0.70%	495.85%	496.00%	2409.60%	496.00%	2409.60%	495.85%
24	0.01	0.04	StRS	1-0,1-3	2	50	-0.96%	284.25%	284.56%	1539.56%	284.56%	1539.56%	284.25%

Table SB13 (continued). Relative Bias of the ANC Site-to-Site Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0.04	StRS	1-3	1	20	-0.24%	713.38%	713.38%	3153.53%	713.38%	3153.53%	713.38%
24	0.01	0.04	StRS	1-3	1	35	-0.54%	366.92%	366.92%	1767.68%	366.92%	1767.68%	366.92%
24	0.01	0.04	StRS	1-3	1	50	-0.06%	231.76%	231.76%	1227.03%	231.76%	1227.03%	231.76%
24	0.01	0.04	StRS	1-3	2	20	-0.33%	712.60%	712.57%	3477.97%	712.57%	3477.97%	712.60%
24	0.01	0.04	StRS	1-3	2	35	-0.38%	367.37%	367.40%	1963.38%	367.40%	1963.38%	367.37%
24	0.01	0.04	StRS	1-3	2	50	0.33%	232.31%	232.32%	1361.69%	232.32%	1361.69%	232.31%
24	0.01	0.04	Unequal	1-0	1	20	-1.21%	2618.63%	2618.63%	2618.63%	2618.63%	2618.63%	2618.63%
24	0.01	0.04	Unequal	1-0	1	35	0.65%	1642.58%	1642.58%	1642.58%	1642.58%	1642.58%	1642.58%
24	0.01	0.04	Unequal	1-0	1	50	0.04%	1182.18%	1182.18%	1182.18%	1182.18%	1182.18%	1182.18%
24	0.01	0.04	Unequal	1-0	2	20	-1.61%	2563.27%	2563.39%	2820.23%	2563.39%	2820.23%	2563.27%
24	0.01	0.04	Unequal	1-0	2	35	-1.14%	1689.79%	1689.78%	1863.77%	1689.78%	1863.77%	1689.79%
24	0.01	0.04	Unequal	1-0	2	50	0.28%	1170.37%	1170.33%	1295.98%	1170.33%	1295.98%	1170.37%
24	0.01	0.04	Unequal	1-0,1-3	1	20	0.26%	1147.78%	1149.63%	4112.47%	1149.63%	4112.47%	1147.78%
24	0.01	0.04	Unequal	1-0,1-3	1	35	-0.96%	477.30%	478.98%	2028.42%	478.98%	2028.42%	477.30%
24	0.01	0.04	Unequal	1-0,1-3	1	50	-0.28%	275.14%	276.19%	1323.14%	276.19%	1323.14%	275.14%
24	0.01	0.04	Unequal	1-0,1-3	2	20	0.41%	1145.65%	1147.51%	4790.69%	1147.51%	4790.69%	1145.65%
24	0.01	0.04	Unequal	1-0,1-3	2	35	0.69%	483.35%	484.90%	2313.99%	484.90%	2313.99%	483.35%
24	0.01	0.04	Unequal	1-0,1-3	2	50	-0.66%	267.74%	269.40%	1468.66%	269.40%	1468.66%	267.74%
24	0.01	0.04	Unequal	1-3	1	20	0.05%	682.41%	682.41%	3029.63%	682.41%	3029.63%	682.41%
24	0.01	0.04	Unequal	1-3	1	35	0.41%	358.37%	358.37%	1733.47%	358.37%	1733.47%	358.37%
24	0.01	0.04	Unequal	1-3	1	50	-0.41%	217.89%	217.89%	1171.58%	217.89%	1171.58%	217.89%
24	0.01	0.04	Unequal	1-3	2	20	0.79%	699.60%	699.68%	3412.78%	699.68%	3412.78%	699.60%
24	0.01	0.04	Unequal	1-3	2	35	0.12%	357.45%	357.50%	1907.31%	357.50%	1907.31%	357.45%
24	0.01	0.04	Unequal	1-3	2	50	-0.60%	212.20%	212.23%	1271.60%	212.23%	1271.60%	212.20%

Table SB14. Relative Bias of the modified ANC Site-to-Site Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	SRS	1-0	1	20	3.32%	3245.80%	3245.80%	3245.80%	3245.80%	3245.80%	3245.80%
12	0.02	0	SRS	1-0	1	35	-0.11%	1790.38%	1790.38%	1790.38%	1790.38%	1790.38%	1790.38%
12	0.02	0	SRS	1-0	1	50	0.17%	1238.79%	1238.79%	1238.79%	1238.79%	1238.79%	1238.79%
12	0.02	0	SRS	1-0	2	20	0.58%	3156.87%	3156.87%	3481.07%	3156.87%	3481.07%	3156.87%
12	0.02	0	SRS	1-0	2	35	-0.74%	1778.46%	1778.46%	1964.42%	1778.46%	1964.42%	1778.46%
12	0.02	0	SRS	1-0	2	50	-1.02%	1222.91%	1222.91%	1355.86%	1222.91%	1355.86%	1222.91%
12	0.02	0	SRS	1-0,1-3	1	20	-1.22%	1219.88%	1219.61%	4320.80%	1219.61%	4320.80%	1219.88%
12	0.02	0	SRS	1-0,1-3	1	35	-1.30%	506.35%	506.22%	2143.62%	506.22%	2143.62%	506.35%
12	0.02	0	SRS	1-0,1-3	1	50	-0.35%	297.42%	297.36%	1411.97%	297.36%	1411.97%	297.42%
12	0.02	0	SRS	1-0,1-3	2	20	-0.16%	1233.96%	1233.71%	5437.66%	1233.71%	5437.66%	1233.97%
12	0.02	0	SRS	1-0,1-3	2	35	-1.54%	504.76%	504.68%	2499.36%	504.68%	2499.36%	504.76%
12	0.02	0	SRS	1-0,1-3	2	50	-0.05%	298.64%	298.55%	1645.09%	298.55%	1645.09%	298.64%
12	0.02	0	SRS	1-3	1	20	0.42%	745.05%	745.06%	3280.22%	745.06%	3280.22%	745.06%
12	0.02	0	SRS	1-3	1	35	0.75%	387.20%	387.19%	1848.78%	387.19%	1848.78%	387.19%
12	0.02	0	SRS	1-3	1	50	-0.15%	238.74%	238.74%	1254.94%	238.74%	1254.94%	238.74%
12	0.02	0	SRS	1-3	2	20	0.09%	742.31%	742.31%	3687.02%	742.31%	3687.02%	742.33%
12	0.02	0	SRS	1-3	2	35	0.35%	385.28%	385.27%	2076.58%	385.27%	2076.58%	385.28%
12	0.02	0	SRS	1-3	2	50	-0.72%	236.79%	236.79%	1416.84%	236.79%	1416.84%	236.79%
12	0.02	0	StRS	1-0	1	20	0.93%	3075.73%	3075.73%	3075.73%	3075.73%	3075.73%	3075.73%
12	0.02	0	StRS	1-0	1	35	-0.62%	1725.98%	1725.98%	1725.98%	1725.98%	1725.98%	1725.98%
12	0.02	0	StRS	1-0	1	50	-1.24%	1195.64%	1195.64%	1195.64%	1195.64%	1195.64%	1195.64%
12	0.02	0	StRS	1-0	2	20	0.25%	3023.28%	3023.28%	3333.02%	3023.28%	3333.02%	3023.28%
12	0.02	0	StRS	1-0	2	35	-0.67%	1712.84%	1712.84%	1899.60%	1712.84%	1899.60%	1712.84%
12	0.02	0	StRS	1-0	2	50	0.75%	1220.51%	1220.50%	1350.14%	1220.50%	1350.14%	1220.51%

Table SB14 (continued). Relative Bias of the modified ANC Site-to-Site Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	StRS	1-0,1-3	1	20	0.98%	1210.19%	1210.11%	4272.16%	1210.11%	4272.16%	1210.19%
12	0.02	0	StRS	1-0,1-3	1	35	0.82%	507.45%	507.39%	2150.86%	507.39%	2150.86%	507.45%
12	0.02	0	StRS	1-0,1-3	1	50	1.33%	298.05%	298.03%	1417.21%	298.03%	1417.21%	298.05%
12	0.02	0	StRS	1-0,1-3	2	20	-1.36%	1177.26%	1177.17%	5167.20%	1177.17%	5167.20%	1177.26%
12	0.02	0	StRS	1-0,1-3	2	35	-0.70%	499.44%	499.41%	2504.09%	499.41%	2504.09%	499.44%
12	0.02	0	StRS	1-0,1-3	2	50	-0.59%	290.00%	289.96%	1613.37%	289.96%	1613.37%	290.00%
12	0.02	0	StRS	1-3	1	20	-0.45%	717.60%	717.60%	3170.39%	717.60%	3170.39%	717.60%
12	0.02	0	StRS	1-3	1	35	0.22%	374.58%	374.58%	1798.32%	374.58%	1798.32%	374.58%
12	0.02	0	StRS	1-3	1	50	0.38%	235.52%	235.52%	1242.07%	235.52%	1242.07%	235.52%
12	0.02	0	StRS	1-3	2	20	-1.12%	709.94%	709.96%	3542.50%	709.96%	3542.50%	709.95%
12	0.02	0	StRS	1-3	2	35	0.12%	375.18%	375.17%	2046.86%	375.17%	2046.86%	375.18%
12	0.02	0	StRS	1-3	2	50	-0.82%	229.34%	229.33%	1379.66%	229.33%	1379.66%	229.34%
12	0.02	0	Unequal	1-0	1	20	-1.20%	2665.98%	2665.98%	2665.98%	2665.98%	2665.98%	2665.98%
12	0.02	0	Unequal	1-0	1	35	0.58%	1702.09%	1702.09%	1702.09%	1702.09%	1702.09%	1702.09%
12	0.02	0	Unequal	1-0	1	50	0.12%	1183.63%	1183.63%	1183.63%	1183.63%	1183.63%	1183.63%
12	0.02	0	Unequal	1-0	2	20	1.96%	2641.47%	2641.44%	2907.94%	2641.44%	2907.94%	2641.47%
12	0.02	0	Unequal	1-0	2	35	-1.44%	1685.21%	1685.20%	1852.93%	1685.20%	1852.93%	1685.21%
12	0.02	0	Unequal	1-0	2	50	0.47%	1171.03%	1171.03%	1297.77%	1171.03%	1297.77%	1171.03%
12	0.02	0	Unequal	1-0,1-3	1	20	0.22%	1143.10%	1142.87%	4049.80%	1142.87%	4049.80%	1143.10%
12	0.02	0	Unequal	1-0,1-3	1	35	0.50%	488.33%	488.31%	2065.41%	488.31%	2065.41%	488.33%
12	0.02	0	Unequal	1-0,1-3	1	50	-0.01%	279.13%	279.10%	1337.20%	279.10%	1337.20%	279.13%
12	0.02	0	Unequal	1-0,1-3	2	20	2.53%	1173.08%	1172.82%	5055.06%	1172.82%	5055.06%	1173.09%
12	0.02	0	Unequal	1-0,1-3	2	35	-1.03%	474.43%	474.36%	2343.64%	474.36%	2343.64%	474.43%
12	0.02	0	Unequal	1-0,1-3	2	50	-0.40%	273.49%	273.45%	1524.02%	273.45%	1524.02%	273.49%

Table SB14 (continued). Relative Bias of the modified ANC Site-to-Site Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	Unequal	1-3	1	20	-1.12%	688.03%	688.02%	3052.10%	688.02%	3052.10%	688.02%
12	0.02	0	Unequal	1-3	1	35	-0.72%	360.67%	360.68%	1742.71%	360.68%	1742.71%	360.68%
12	0.02	0	Unequal	1-3	1	50	-0.44%	223.71%	223.71%	1194.83%	223.71%	1194.83%	223.71%
12	0.02	0	Unequal	1-3	2	20	0.18%	691.08%	691.06%	3453.14%	691.06%	3453.14%	691.09%
12	0.02	0	Unequal	1-3	2	35	-0.17%	359.04%	359.04%	1944.63%	359.04%	1944.63%	359.04%
12	0.02	0	Unequal	1-3	2	50	0.09%	222.42%	222.42%	1343.61%	222.42%	1343.61%	222.42%
12	0.02	0.04	SRS	1-0	1	20	-0.72%	3115.03%	3115.03%	3115.03%	3115.03%	3115.03%	3115.03%
12	0.02	0.04	SRS	1-0	1	35	-1.33%	1767.30%	1767.30%	1767.30%	1767.30%	1767.30%	1767.30%
12	0.02	0.04	SRS	1-0	1	50	-1.19%	1220.62%	1220.62%	1220.62%	1220.62%	1220.62%	1220.62%
12	0.02	0.04	SRS	1-0	2	20	2.95%	3233.91%	3233.90%	3566.55%	3233.90%	3566.55%	3233.91%
12	0.02	0.04	SRS	1-0	2	35	1.34%	1817.82%	1817.82%	2005.37%	1817.82%	2005.37%	1817.82%
12	0.02	0.04	SRS	1-0	2	50	-1.34%	1218.64%	1218.64%	1349.56%	1218.64%	1349.56%	1218.64%
12	0.02	0.04	SRS	1-0,1-3	1	20	-0.19%	1233.80%	1233.37%	4334.70%	1233.37%	4334.70%	1233.80%
12	0.02	0.04	SRS	1-0,1-3	1	35	0.16%	515.26%	515.18%	2176.68%	515.18%	2176.68%	515.27%
12	0.02	0.04	SRS	1-0,1-3	1	50	0.71%	301.65%	301.57%	1425.54%	301.57%	1425.54%	301.65%
12	0.02	0.04	SRS	1-0,1-3	2	20	-0.14%	1234.17%	1233.89%	5413.52%	1233.89%	5413.52%	1234.17%
12	0.02	0.04	SRS	1-0,1-3	2	35	-1.09%	507.60%	507.47%	2509.63%	507.47%	2509.63%	507.60%
12	0.02	0.04	SRS	1-0,1-3	2	50	-0.42%	297.11%	297.05%	1640.32%	297.05%	1640.32%	297.11%
12	0.02	0.04	SRS	1-3	1	20	0.66%	747.01%	747.01%	3288.05%	747.01%	3288.05%	747.01%
12	0.02	0.04	SRS	1-3	1	35	-0.17%	382.75%	382.75%	1831.02%	382.75%	1831.02%	382.75%
12	0.02	0.04	SRS	1-3	1	50	-1.00%	235.86%	235.86%	1243.44%	235.86%	1243.44%	235.86%
12	0.02	0.04	SRS	1-3	2	20	0.23%	743.38%	743.37%	3688.28%	743.37%	3688.28%	743.39%
12	0.02	0.04	SRS	1-3	2	35	0.19%	384.50%	384.49%	2070.21%	384.49%	2070.21%	384.50%
12	0.02	0.04	SRS	1-3	2	50	0.83%	242.07%	242.06%	1439.82%	242.06%	1439.82%	242.07%

Table SB14 (continued). Relative Bias of the modified ANC Site-to-Site Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0.04	StRS	1-0	1	20	-0.38%	2955.34%	2955.34%	2955.34%	2955.34%	2955.34%	2955.34%
12	0.02	0.04	StRS	1-0	1	35	-0.64%	1748.33%	1748.33%	1748.33%	1748.33%	1748.33%	1748.33%
12	0.02	0.04	StRS	1-0	1	50	0.46%	1203.34%	1203.34%	1203.34%	1203.34%	1203.34%	1203.34%
12	0.02	0.04	StRS	1-0	2	20	2.09%	3055.91%	3055.91%	3371.63%	3055.91%	3371.63%	3055.91%
12	0.02	0.04	StRS	1-0	2	35	0.46%	1735.79%	1735.79%	1926.53%	1735.79%	1926.53%	1735.79%
12	0.02	0.04	StRS	1-0	2	50	0.76%	1222.91%	1222.91%	1352.20%	1222.91%	1352.20%	1222.91%
12	0.02	0.04	StRS	1-0,1-3	1	20	-0.53%	1186.19%	1185.96%	4225.71%	1185.96%	4225.71%	1186.19%
12	0.02	0.04	StRS	1-0,1-3	1	35	-1.01%	496.21%	496.14%	2112.21%	496.14%	2112.21%	496.21%
12	0.02	0.04	StRS	1-0,1-3	1	50	-0.35%	291.37%	291.35%	1392.15%	291.35%	1392.15%	291.37%
12	0.02	0.04	StRS	1-0,1-3	2	20	1.37%	1212.74%	1212.47%	5373.24%	1212.47%	5373.24%	1212.75%
12	0.02	0.04	StRS	1-0,1-3	2	35	-0.12%	498.66%	498.57%	2509.93%	498.57%	2509.93%	498.66%
12	0.02	0.04	StRS	1-0,1-3	2	50	0.40%	293.26%	293.22%	1627.64%	293.22%	1627.64%	293.26%
12	0.02	0.04	StRS	1-3	1	20	0.16%	724.53%	724.53%	3198.12%	724.53%	3198.12%	724.53%
12	0.02	0.04	StRS	1-3	1	35	-0.43%	370.37%	370.37%	1781.48%	370.37%	1781.48%	370.37%
12	0.02	0.04	StRS	1-3	1	50	0.61%	234.99%	234.99%	1239.97%	234.99%	1239.97%	234.99%
12	0.02	0.04	StRS	1-3	2	20	-0.02%	722.24%	722.24%	3595.58%	722.24%	3595.58%	722.24%
12	0.02	0.04	StRS	1-3	2	35	-0.77%	370.04%	370.04%	2021.51%	370.04%	2021.51%	370.04%
12	0.02	0.04	StRS	1-3	2	50	-0.21%	232.40%	232.40%	1395.00%	232.40%	1395.00%	232.40%
12	0.02	0.04	Unequal	1-0	1	20	-0.96%	2589.44%	2589.44%	2589.44%	2589.44%	2589.44%	2589.44%
12	0.02	0.04	Unequal	1-0	1	35	1.22%	1665.04%	1665.04%	1665.04%	1665.04%	1665.04%	1665.04%
12	0.02	0.04	Unequal	1-0	1	50	0.84%	1196.51%	1196.51%	1196.51%	1196.51%	1196.51%	1196.51%
12	0.02	0.04	Unequal	1-0	2	20	0.98%	2660.87%	2660.88%	2933.70%	2660.88%	2933.70%	2660.87%
12	0.02	0.04	Unequal	1-0	2	35	-0.26%	1661.07%	1661.06%	1829.45%	1661.06%	1829.45%	1661.07%
12	0.02	0.04	Unequal	1-0	2	50	0.84%	1177.70%	1177.69%	1303.78%	1177.69%	1303.78%	1177.70%

Table SB14 (continued). Relative Bias of the modified ANC Site-to-Site Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0.04	Unequal	1-0,1-3	1	20	0.50%	1124.88%	1124.67%	3931.33%	1124.67%	3931.33%	1124.88%
12	0.02	0.04	Unequal	1-0,1-3	1	35	-0.62%	476.34%	476.25%	2019.31%	476.25%	2019.31%	476.34%
12	0.02	0.04	Unequal	1-0,1-3	1	50	-0.36%	278.81%	278.78%	1328.79%	278.78%	1328.79%	278.81%
12	0.02	0.04	Unequal	1-0,1-3	2	20	0.81%	1125.99%	1125.84%	4912.22%	1125.84%	4912.22%	1125.99%
12	0.02	0.04	Unequal	1-0,1-3	2	35	-0.11%	474.16%	474.05%	2349.42%	474.05%	2349.42%	474.16%
12	0.02	0.04	Unequal	1-0,1-3	2	50	-0.02%	272.02%	271.96%	1509.33%	271.96%	1509.33%	272.02%
12	0.02	0.04	Unequal	1-3	1	20	1.13%	698.97%	698.96%	3095.86%	698.96%	3095.86%	698.96%
12	0.02	0.04	Unequal	1-3	1	35	1.14%	359.40%	359.40%	1737.62%	359.40%	1737.62%	359.40%
12	0.02	0.04	Unequal	1-3	1	50	0.06%	216.48%	216.48%	1165.88%	216.48%	1165.88%	216.48%
12	0.02	0.04	Unequal	1-3	2	20	0.21%	684.71%	684.70%	3423.73%	684.70%	3423.73%	684.72%
12	0.02	0.04	Unequal	1-3	2	35	1.16%	354.05%	354.05%	1920.55%	354.05%	1920.55%	354.05%
12	0.02	0.04	Unequal	1-3	2	50	0.94%	220.70%	220.70%	1337.19%	220.70%	1337.19%	220.70%
24	0.01	0	SRS	1-0	1	20	-0.02%	3138.19%	3138.19%	3138.19%	3138.19%	3138.19%	3138.19%
24	0.01	0	SRS	1-0	1	35	1.57%	1822.50%	1822.50%	1822.50%	1822.50%	1822.50%	1822.50%
24	0.01	0	SRS	1-0	1	50	0.23%	1239.66%	1239.66%	1239.66%	1239.66%	1239.66%	1239.66%
24	0.01	0	SRS	1-0	2	20	-0.88%	3110.28%	3110.28%	3421.74%	3110.28%	3421.74%	3110.28%
24	0.01	0	SRS	1-0	2	35	-1.90%	1756.70%	1756.70%	1932.89%	1756.70%	1932.89%	1756.70%
24	0.01	0	SRS	1-0	2	50	1.08%	1251.02%	1251.02%	1384.64%	1251.02%	1384.64%	1251.02%
24	0.01	0	SRS	1-0,1-3	1	20	1.09%	1251.15%	1250.96%	4445.86%	1250.96%	4445.86%	1251.15%
24	0.01	0	SRS	1-0,1-3	1	35	0.91%	519.87%	519.84%	2199.77%	519.84%	2199.77%	519.87%
24	0.01	0	SRS	1-0,1-3	1	50	-0.03%	298.66%	298.65%	1419.27%	298.65%	1419.27%	298.66%
24	0.01	0	SRS	1-0,1-3	2	20	-0.28%	1232.57%	1232.48%	5193.46%	1232.48%	5193.46%	1232.57%
24	0.01	0	SRS	1-0,1-3	2	35	0.29%	516.09%	516.04%	2488.10%	516.04%	2488.10%	516.09%
24	0.01	0	SRS	1-0,1-3	2	50	-0.56%	296.59%	296.56%	1595.07%	296.56%	1595.07%	296.59%

Table SB14 (continued). Relative Bias of the modified ANC Site-to-Site Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0	SRS	1-3	1	20	0.49%	745.82%	745.82%	3283.29%	745.82%	3283.29%	745.82%
24	0.01	0	SRS	1-3	1	35	0.00%	383.60%	383.60%	1834.40%	383.60%	1834.40%	383.60%
24	0.01	0	SRS	1-3	1	50	0.10%	239.63%	239.63%	1258.51%	239.63%	1258.51%	239.63%
24	0.01	0	SRS	1-3	2	20	-1.13%	732.16%	732.16%	3558.49%	732.16%	3558.49%	732.16%
24	0.01	0	SRS	1-3	2	35	-0.81%	379.71%	379.71%	2005.63%	379.71%	2005.63%	379.71%
24	0.01	0	SRS	1-3	2	50	-0.67%	237.01%	237.01%	1382.67%	237.01%	1382.67%	237.01%
24	0.01	0	StRS	1-0	1	20	-0.37%	3005.39%	3005.39%	3005.39%	3005.39%	3005.39%	3005.39%
24	0.01	0	StRS	1-0	1	35	0.62%	1763.58%	1763.58%	1763.58%	1763.58%	1763.58%	1763.58%
24	0.01	0	StRS	1-0	1	50	0.39%	1218.23%	1218.23%	1218.23%	1218.23%	1218.23%	1218.23%
24	0.01	0	StRS	1-0	2	20	-1.56%	2959.19%	2959.19%	3256.03%	2959.19%	3256.03%	2959.19%
24	0.01	0	StRS	1-0	2	35	-3.06%	1692.07%	1692.07%	1880.35%	1692.07%	1880.35%	1692.07%
24	0.01	0	StRS	1-0	2	50	0.00%	1216.10%	1216.10%	1347.78%	1216.10%	1347.78%	1216.10%
24	0.01	0	StRS	1-0,1-3	1	20	-1.31%	1181.25%	1181.18%	4202.41%	1181.18%	4202.41%	1181.25%
24	0.01	0	StRS	1-0,1-3	1	35	-0.08%	503.63%	503.64%	2135.89%	503.64%	2135.89%	503.63%
24	0.01	0	StRS	1-0,1-3	1	50	-0.66%	288.43%	288.42%	1378.24%	288.42%	1378.24%	288.43%
24	0.01	0	StRS	1-0,1-3	2	20	-0.24%	1190.74%	1190.70%	5013.63%	1190.70%	5013.63%	1190.74%
24	0.01	0	StRS	1-0,1-3	2	35	1.28%	513.21%	513.20%	2488.79%	513.20%	2488.79%	513.21%
24	0.01	0	StRS	1-0,1-3	2	50	0.73%	294.40%	294.39%	1585.23%	294.39%	1585.23%	294.40%
24	0.01	0	StRS	1-3	1	20	-1.47%	706.07%	706.07%	3124.30%	706.07%	3124.30%	706.07%
24	0.01	0	StRS	1-3	1	35	0.06%	374.49%	374.49%	1797.95%	374.49%	1797.95%	374.49%
24	0.01	0	StRS	1-3	1	50	0.01%	233.43%	233.43%	1233.72%	233.43%	1233.72%	233.43%
24	0.01	0	StRS	1-3	2	20	0.38%	724.23%	724.22%	3521.77%	724.22%	3521.77%	724.23%
24	0.01	0	StRS	1-3	2	35	-0.02%	373.35%	373.35%	1989.35%	373.35%	1989.35%	373.35%

Table SB14 (continued). Relative Bias of the modified ANC Site-to-Site Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0	StRS	1-3	2	50	-0.18%	233.34%	233.34%	1367.14%	233.34%	1367.14%	233.34%
24	0.01	0	Unequal	1-0	1	20	2.64%	2710.79%	2710.79%	2710.79%	2710.79%	2710.79%	2710.79%
24	0.01	0	Unequal	1-0	1	35	-0.14%	1698.63%	1698.63%	1698.63%	1698.63%	1698.63%	1698.63%
24	0.01	0	Unequal	1-0	1	50	1.09%	1209.92%	1209.92%	1209.92%	1209.92%	1209.92%	1209.92%
24	0.01	0	Unequal	1-0	2	20	-0.70%	2619.63%	2619.62%	2888.99%	2619.62%	2888.99%	2619.63%
24	0.01	0	Unequal	1-0	2	35	2.67%	1738.39%	1738.39%	1916.84%	1738.39%	1916.84%	1738.39%
24	0.01	0	Unequal	1-0	2	50	0.69%	1181.27%	1181.27%	1304.94%	1181.27%	1304.94%	1181.27%
24	0.01	0	Unequal	1-0,1-3	1	20	0.55%	1122.02%	1121.97%	3965.83%	1121.97%	3965.83%	1122.02%
24	0.01	0	Unequal	1-0,1-3	1	35	0.48%	495.84%	495.84%	2102.92%	495.84%	2102.92%	495.84%
24	0.01	0	Unequal	1-0,1-3	1	50	0.43%	287.09%	287.08%	1372.70%	287.08%	1372.70%	287.09%
24	0.01	0	Unequal	1-0,1-3	2	20	1.46%	1185.43%	1185.27%	5024.58%	1185.27%	5024.58%	1185.43%
24	0.01	0	Unequal	1-0,1-3	2	35	1.16%	496.17%	496.14%	2379.28%	496.14%	2379.28%	496.17%
24	0.01	0	Unequal	1-0,1-3	2	50	1.00%	287.50%	287.51%	1555.15%	287.51%	1555.15%	287.50%
24	0.01	0	Unequal	1-3	1	20	-0.02%	700.16%	700.16%	3100.62%	700.16%	3100.62%	700.16%
24	0.01	0	Unequal	1-3	1	35	-0.76%	360.51%	360.51%	1742.05%	360.51%	1742.05%	360.51%
24	0.01	0	Unequal	1-3	1	50	-0.46%	226.35%	226.35%	1205.40%	226.35%	1205.40%	226.35%
24	0.01	0	Unequal	1-3	2	20	0.28%	691.22%	691.22%	3382.24%	691.22%	3382.24%	691.22%
24	0.01	0	Unequal	1-3	2	35	0.87%	360.46%	360.46%	1921.67%	360.46%	1921.67%	360.46%
24	0.01	0	Unequal	1-3	2	50	0.96%	223.80%	223.79%	1322.63%	223.79%	1322.63%	223.80%
24	0.01	0.04	SRS	1-0	1	20	-0.34%	3127.86%	3127.86%	3127.86%	3127.86%	3127.86%	3127.86%
24	0.01	0.04	SRS	1-0	1	35	-1.21%	1769.74%	1769.74%	1769.74%	1769.74%	1769.74%	1769.74%
24	0.01	0.04	SRS	1-0	1	50	-1.17%	1221.06%	1221.06%	1221.06%	1221.06%	1221.06%	1221.06%
24	0.01	0.04	SRS	1-0	2	20	-1.61%	3086.54%	3086.54%	3403.81%	3086.54%	3403.81%	3086.54%
24	0.01	0.04	SRS	1-0	2	35	0.86%	1809.01%	1809.01%	1995.16%	1809.01%	1995.16%	1809.01%

Table SB14 (continued). Relative Bias of the modified ANC Site-to-Site Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0.04	SRS	1-0	2	50	-0.05%	1235.99%	1235.99%	1368.05%	1235.99%	1368.05%	1235.99%
24	0.01	0.04	SRS	1-0,1-3	1	20	0.03%	1236.81%	1236.76%	4389.18%	1236.76%	4389.18%	1236.81%
24	0.01	0.04	SRS	1-0,1-3	1	35	0.55%	517.72%	517.69%	2195.18%	517.69%	2195.18%	517.72%
24	0.01	0.04	SRS	1-0,1-3	1	50	-0.73%	295.90%	295.88%	1409.05%	295.88%	1409.05%	295.90%
24	0.01	0.04	SRS	1-0,1-3	2	20	0.83%	1247.55%	1247.40%	5286.37%	1247.40%	5286.37%	1247.55%
24	0.01	0.04	SRS	1-0,1-3	2	35	-0.16%	513.36%	513.32%	2475.35%	513.32%	2475.35%	513.36%
24	0.01	0.04	SRS	1-0,1-3	2	50	-0.36%	297.38%	297.36%	1602.20%	297.36%	1602.20%	297.38%
24	0.01	0.04	SRS	1-3	1	20	0.34%	744.52%	744.52%	3278.07%	744.52%	3278.07%	744.52%
24	0.01	0.04	SRS	1-3	1	35	0.48%	385.94%	385.94%	1843.75%	385.94%	1843.75%	385.94%
24	0.01	0.04	SRS	1-3	1	50	-0.03%	239.17%	239.17%	1256.70%	239.17%	1256.70%	239.17%
24	0.01	0.04	SRS	1-3	2	20	-0.96%	733.61%	733.61%	3568.09%	733.61%	3568.08%	733.61%
24	0.01	0.04	SRS	1-3	2	35	-0.62%	380.62%	380.62%	2006.27%	380.62%	2006.27%	380.62%
24	0.01	0.04	SRS	1-3	2	50	0.44%	240.78%	240.78%	1398.65%	240.78%	1398.65%	240.78%
24	0.01	0.04	StRS	1-0	1	20	-1.11%	2960.40%	2960.40%	2960.40%	2960.40%	2960.40%	2960.40%
24	0.01	0.04	StRS	1-0	1	35	1.04%	1750.70%	1750.70%	1750.70%	1750.70%	1750.70%	1750.70%
24	0.01	0.04	StRS	1-0	1	50	-1.02%	1196.44%	1196.44%	1196.44%	1196.44%	1196.44%	1196.44%
24	0.01	0.04	StRS	1-0	2	20	-0.51%	2980.37%	2980.37%	3283.47%	2980.37%	3283.47%	2980.37%
24	0.01	0.04	StRS	1-0	2	35	-0.99%	1739.86%	1739.86%	1934.52%	1739.86%	1934.52%	1739.86%
24	0.01	0.04	StRS	1-0	2	50	-0.32%	1223.41%	1223.41%	1353.10%	1223.41%	1353.10%	1223.41%
24	0.01	0.04	StRS	1-0,1-3	1	20	-1.82%	1183.06%	1183.08%	4202.93%	1183.08%	4202.93%	1183.06%
24	0.01	0.04	StRS	1-0,1-3	1	35	-0.32%	500.68%	500.67%	2124.76%	500.67%	2124.76%	500.68%
24	0.01	0.04	StRS	1-0,1-3	1	50	0.37%	294.64%	294.63%	1402.71%	294.63%	1402.71%	294.64%
24	0.01	0.04	StRS	1-0,1-3	2	20	-1.60%	1190.25%	1190.20%	5027.26%	1190.20%	5027.26%	1190.25%
24	0.01	0.04	StRS	1-0,1-3	2	35	-0.23%	502.98%	502.96%	2439.86%	502.96%	2439.86%	502.98%

Table SB14 (continued). Relative Bias of the modified ANC Site-to-Site Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0.04	StRS	1-0,1-3	2	50	-0.76%	287.69%	287.69%	1557.17%	287.69%	1557.17%	287.70%
24	0.01	0.04	StRS	1-3	1	20	-0.32%	722.66%	722.66%	3190.65%	722.66%	3190.65%	722.66%
24	0.01	0.04	StRS	1-3	1	35	-0.77%	369.73%	369.73%	1778.93%	369.73%	1778.93%	369.73%
24	0.01	0.04	StRS	1-3	1	50	-0.60%	231.09%	231.09%	1224.34%	231.09%	1224.34%	231.09%
24	0.01	0.04	StRS	1-3	2	20	-0.95%	715.47%	715.46%	3485.08%	715.46%	3485.08%	715.47%
24	0.01	0.04	StRS	1-3	2	35	0.15%	374.75%	374.75%	1996.42%	374.75%	1996.42%	374.75%
24	0.01	0.04	StRS	1-3	2	50	-0.65%	231.52%	231.52%	1358.48%	231.52%	1358.48%	231.52%
24	0.01	0.04	Unequal	1-0	1	20	-0.72%	2540.62%	2540.62%	2540.62%	2540.62%	2540.62%	2540.62%
24	0.01	0.04	Unequal	1-0	1	35	-3.02%	1622.39%	1622.39%	1622.39%	1622.39%	1622.39%	1622.39%
24	0.01	0.04	Unequal	1-0	1	50	-0.20%	1158.01%	1158.01%	1158.01%	1158.01%	1158.01%	1158.01%
24	0.01	0.04	Unequal	1-0	2	20	0.64%	2666.93%	2666.93%	2950.36%	2666.93%	2950.36%	2666.93%
24	0.01	0.04	Unequal	1-0	2	35	-1.49%	1663.47%	1663.47%	1836.64%	1663.47%	1836.64%	1663.47%
24	0.01	0.04	Unequal	1-0	2	50	0.97%	1178.02%	1178.02%	1306.53%	1178.02%	1306.53%	1178.02%
24	0.01	0.04	Unequal	1-0,1-3	1	20	-0.62%	1120.21%	1120.15%	3943.93%	1120.15%	3943.93%	1120.21%
24	0.01	0.04	Unequal	1-0,1-3	1	35	0.54%	490.30%	490.30%	2078.87%	490.30%	2078.87%	490.30%
24	0.01	0.04	Unequal	1-0,1-3	1	50	0.32%	278.11%	278.10%	1332.73%	278.10%	1332.73%	278.11%
24	0.01	0.04	Unequal	1-0,1-3	2	20	-0.34%	1139.22%	1139.12%	4819.59%	1139.12%	4819.59%	1139.22%
24	0.01	0.04	Unequal	1-0,1-3	2	35	-0.35%	480.23%	480.20%	2312.73%	480.20%	2312.73%	480.23%
24	0.01	0.04	Unequal	1-0,1-3	2	50	0.02%	277.48%	277.48%	1500.14%	277.48%	1500.14%	277.48%
24	0.01	0.04	Unequal	1-3	1	20	-0.05%	688.73%	688.73%	3054.93%	688.73%	3054.93%	688.73%
24	0.01	0.04	Unequal	1-3	1	35	0.50%	358.64%	358.64%	1734.55%	358.64%	1734.55%	358.64%
24	0.01	0.04	Unequal	1-3	1	50	0.20%	222.40%	222.40%	1189.59%	222.40%	1189.59%	222.40%
24	0.01	0.04	Unequal	1-3	2	20	-0.27%	696.60%	696.60%	3404.26%	696.60%	3404.26%	696.60%
24	0.01	0.04	Unequal	1-3	2	35	-0.55%	353.32%	353.31%	1885.09%	353.31%	1885.09%	353.32%
24	0.01	0.04	Unequal	1-3	2	50	-0.65%	218.82%	218.82%	1299.87%	218.82%	1299.87%	218.82%

Table SB15. Relative Bias of the ANC Site-Level Slope Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	SRS	1-0	1	20	-2.66%	3170.55%	3170.55%	3170.55%	3170.55%	3170.55%	3170.55%
12	0.02	0	SRS	1-0	1	35	-0.06%	1837.79%	1837.79%	1837.79%	1837.79%	1837.79%	1837.79%
12	0.02	0	SRS	1-0	1	50	3.53%	1308.38%	1308.38%	1308.38%	1308.38%	1308.38%	1308.38%
12	0.02	0	SRS	1-0	2	20	2.97%	3341.48%	3360.87%	3650.52%	3360.87%	3650.52%	3341.48%
12	0.02	0	SRS	1-0	2	35	2.38%	1873.35%	1884.08%	2042.39%	1884.08%	2042.39%	1873.35%
12	0.02	0	SRS	1-0	2	50	-1.89%	1226.71%	1234.62%	1343.10%	1234.62%	1343.10%	1226.71%
12	0.02	0	SRS	1-0,1-3	1	20	-0.13%	1437.72%	1251.79%	1944.90%	1251.79%	1944.90%	1437.72%
12	0.02	0	SRS	1-0,1-3	1	35	-2.27%	491.53%	504.50%	811.57%	504.50%	811.57%	491.53%
12	0.02	0	SRS	1-0,1-3	1	50	-1.92%	242.38%	293.00%	492.16%	293.00%	492.16%	242.39%
12	0.02	0	SRS	1-0,1-3	2	20	-1.92%	1539.13%	1224.80%	2075.18%	1224.80%	2075.18%	1539.13%
12	0.02	0	SRS	1-0,1-3	2	35	1.02%	565.55%	524.68%	857.89%	524.68%	857.89%	565.55%
12	0.02	0	SRS	1-0,1-3	2	50	-0.62%	256.84%	298.09%	450.01%	298.09%	450.01%	256.84%
12	0.02	0	SRS	1-3	1	20	2.54%	771.24%	771.17%	3384.97%	771.17%	3384.97%	771.17%
12	0.02	0	SRS	1-3	1	35	3.27%	402.34%	402.39%	1909.55%	402.39%	1909.55%	402.39%
12	0.02	0	SRS	1-3	1	50	2.26%	248.43%	248.45%	1293.78%	248.45%	1293.78%	248.45%
12	0.02	0	SRS	1-3	2	20	8.38%	820.35%	820.19%	3680.84%	820.19%	3680.84%	820.35%
12	0.02	0	SRS	1-3	2	35	-0.76%	383.68%	382.60%	1866.96%	382.60%	1866.96%	383.68%
12	0.02	0	SRS	1-3	2	50	1.51%	246.06%	245.86%	1304.55%	245.86%	1304.55%	246.06%
12	0.02	0	StRS	1-0	1	20	6.22%	1506.31%	1506.31%	1506.31%	1506.31%	1506.31%	1506.31%
12	0.02	0	StRS	1-0	1	35	2.70%	521.88%	521.88%	521.88%	521.88%	521.88%	521.88%
12	0.02	0	StRS	1-0	1	50	0.37%	259.66%	259.66%	259.66%	259.66%	259.66%	259.66%
12	0.02	0	StRS	1-0	2	20	7.80%	1438.38%	1428.75%	1577.86%	1428.75%	1577.89%	1438.38%
12	0.02	0	StRS	1-0	2	35	3.20%	525.08%	513.60%	578.95%	513.60%	578.95%	525.72%
12	0.02	0	StRS	1-0	2	50	1.29%	256.28%	250.21%	287.64%	250.21%	287.65%	256.28%

Table SB15 (continued). Relative Bias of the ANC Site-Level Slope Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	StRS	1-0,1-3	1	20	12.48%	621.04%	440.42%	1316.58%	440.42%	1316.58%	621.04%
12	0.02	0	StRS	1-0,1-3	1	35	20.00%	172.54%	115.71%	488.75%	115.71%	488.75%	172.54%
12	0.02	0	StRS	1-0,1-3	1	50	21.78%	41.38%	23.67%	252.29%	23.67%	252.29%	41.38%
12	0.02	0	StRS	1-0,1-3	2	20	14.09%	695.93%	442.67%	1768.03%	442.67%	1768.03%	695.93%
12	0.02	0	StRS	1-0,1-3	2	35	32.71%	199.44%	108.39%	576.86%	108.39%	576.86%	199.44%
12	0.02	0	StRS	1-0,1-3	2	50	37.38%	67.71%	24.42%	292.18%	24.42%	292.18%	67.71%
12	0.02	0	StRS	1-3	1	20	69.48%	455.73%	452.25%	2122.97%	452.25%	2122.97%	452.25%
12	0.02	0	StRS	1-3	1	35	58.01%	151.84%	151.86%	907.46%	151.86%	907.46%	151.86%
12	0.02	0	StRS	1-3	1	50	55.88%	70.21%	70.21%	580.84%	70.21%	580.84%	70.21%
12	0.02	0	StRS	1-3	2	20	66.10%	468.10%	457.50%	2277.22%	457.50%	2277.22%	467.41%
12	0.02	0	StRS	1-3	2	35	58.88%	168.31%	165.48%	1013.43%	165.48%	1013.43%	168.30%
12	0.02	0	StRS	1-3	2	50	59.99%	91.18%	89.10%	684.62%	89.10%	684.62%	91.18%
12	0.02	0	Unequal	1-0	1	20	-2.15%	1479.20%	1479.20%	1479.20%	1479.20%	1479.20%	1479.20%
12	0.02	0	Unequal	1-0	1	35	1.31%	860.68%	860.68%	860.68%	860.68%	860.68%	860.68%
12	0.02	0	Unequal	1-0	1	50	-0.26%	522.27%	522.27%	522.27%	522.27%	522.27%	522.27%
12	0.02	0	Unequal	1-0	2	20	0.76%	1536.76%	1541.73%	1685.87%	1541.73%	1685.87%	1536.76%
12	0.02	0	Unequal	1-0	2	35	0.92%	840.83%	840.49%	922.87%	840.49%	922.87%	840.83%
12	0.02	0	Unequal	1-0	2	50	0.27%	524.12%	525.32%	579.50%	525.32%	579.50%	524.12%
12	0.02	0	Unequal	1-0,1-3	1	20	2.48%	545.53%	477.97%	946.99%	477.97%	946.99%	545.53%
12	0.02	0	Unequal	1-0,1-3	1	35	-0.07%	105.52%	128.28%	331.08%	128.28%	331.08%	105.52%
12	0.02	0	Unequal	1-0,1-3	1	50	1.01%	6.02%	35.15%	143.31%	35.15%	143.31%	6.02%
12	0.02	0	Unequal	1-0,1-3	2	20	0.82%	521.53%	461.58%	1017.56%	461.58%	1017.56%	521.53%
12	0.02	0	Unequal	1-0,1-3	2	35	2.33%	116.85%	128.49%	340.01%	128.49%	340.01%	116.81%
12	0.02	0	Unequal	1-0,1-3	2	50	-0.39%	4.16%	28.41%	151.48%	28.41%	151.48%	4.16%

Table SB15 (continued). Relative Bias of the ANC Site-Level Slope Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	Unequal	1-3	1	20	3.89%	186.90%	186.88%	1047.60%	186.88%	1047.60%	186.88%
12	0.02	0	Unequal	1-3	1	35	-1.42%	33.71%	33.79%	435.11%	33.79%	435.11%	33.79%
12	0.02	0	Unequal	1-3	1	50	4.46%	-8.31%	-8.31%	266.76%	-8.31%	266.76%	-8.31%
12	0.02	0	Unequal	1-3	2	20	12.74%	201.29%	199.20%	1161.56%	199.20%	1161.56%	201.59%
12	0.02	0	Unequal	1-3	2	35	1.37%	28.12%	26.96%	431.77%	26.96%	431.77%	28.12%
12	0.02	0	Unequal	1-3	2	50	-0.22%	-16.60%	-16.37%	246.80%	-16.37%	246.80%	-16.63%
12	0.02	0.04	SRS	1-0	1	20	162.94%	8721.32%	8721.32%	8721.32%	8721.32%	8721.32%	8721.32%
12	0.02	0.04	SRS	1-0	1	35	156.53%	4869.40%	4869.40%	4869.40%	4869.40%	4869.40%	4869.40%
12	0.02	0.04	SRS	1-0	1	50	162.64%	3471.26%	3471.26%	3471.26%	3471.26%	3471.26%	3471.26%
12	0.02	0.04	SRS	1-0	2	20	171.92%	9009.43%	9025.10%	9858.32%	9025.10%	9858.32%	9009.43%
12	0.02	0.04	SRS	1-0	2	35	159.63%	4918.33%	4928.73%	5371.73%	4928.73%	5371.73%	4918.33%
12	0.02	0.04	SRS	1-0	2	50	157.71%	3396.95%	3404.03%	3734.32%	3404.03%	3734.32%	3396.95%
12	0.02	0.04	SRS	1-0,1-3	1	20	160.37%	3791.97%	3430.08%	7435.53%	3430.08%	7435.53%	3791.97%
12	0.02	0.04	SRS	1-0,1-3	1	35	165.88%	1587.86%	1545.58%	4067.94%	1545.58%	4067.94%	1587.86%
12	0.02	0.04	SRS	1-0,1-3	1	50	160.51%	912.81%	944.23%	2694.55%	944.23%	2694.55%	912.81%
12	0.02	0.04	SRS	1-0,1-3	2	20	164.37%	3940.05%	3478.37%	6968.58%	3478.37%	6968.58%	3940.05%
12	0.02	0.04	SRS	1-0,1-3	2	35	155.55%	1577.31%	1481.11%	3750.90%	1481.11%	3750.90%	1577.31%
12	0.02	0.04	SRS	1-0,1-3	2	50	161.34%	941.43%	947.34%	2648.17%	947.34%	2648.17%	941.43%
12	0.02	0.04	SRS	1-3	1	20	165.18%	2155.14%	2155.21%	8920.82%	2155.21%	8920.82%	2155.21%
12	0.02	0.04	SRS	1-3	1	35	160.96%	1170.13%	1170.13%	4980.52%	1170.13%	4980.52%	1170.13%
12	0.02	0.04	SRS	1-3	1	50	159.48%	784.42%	784.42%	3437.70%	784.42%	3437.70%	784.42%
12	0.02	0.04	SRS	1-3	2	20	167.50%	2182.43%	2173.54%	9339.58%	2173.54%	9339.58%	2182.43%
12	0.02	0.04	SRS	1-3	2	35	161.18%	1171.79%	1171.08%	5156.14%	1171.08%	5156.14%	1171.79%
12	0.02	0.04	SRS	1-3	2	50	157.76%	779.71%	778.44%	3544.49%	778.44%	3544.49%	779.71%

Table SB15 (continued). Relative Bias of the ANC Site-Level Slope Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0.04	StRS	1-0	1	20	-45.87%	837.36%	837.36%	837.36%	837.36%	837.36%	837.36%
12	0.02	0.04	StRS	1-0	1	35	-51.48%	370.83%	370.83%	370.83%	370.83%	370.83%	370.83%
12	0.02	0.04	StRS	1-0	1	50	-52.29%	192.57%	192.57%	192.57%	192.57%	192.57%	192.57%
12	0.02	0.04	StRS	1-0	2	20	-45.06%	784.65%	785.91%	869.20%	785.91%	869.21%	784.64%
12	0.02	0.04	StRS	1-0	2	35	-51.53%	356.92%	358.41%	399.54%	358.41%	399.54%	356.92%
12	0.02	0.04	StRS	1-0	2	50	-48.75%	218.57%	219.61%	248.13%	219.61%	248.13%	218.57%
12	0.02	0.04	StRS	1-0,1-3	1	20	-32.74%	338.87%	327.56%	873.81%	327.56%	873.81%	340.76%
12	0.02	0.04	StRS	1-0,1-3	1	35	-25.30%	55.65%	67.86%	256.25%	67.86%	256.25%	55.65%
12	0.02	0.04	StRS	1-0,1-3	1	50	-17.82%	-1.61%	20.24%	136.46%	20.24%	136.46%	-1.62%
12	0.02	0.04	StRS	1-0,1-3	2	20	-33.57%	325.96%	313.18%	922.79%	313.18%	922.79%	325.96%
12	0.02	0.04	StRS	1-0,1-3	2	35	-20.42%	72.71%	78.99%	311.36%	78.99%	311.36%	72.76%
12	0.02	0.04	StRS	1-0,1-3	2	50	-24.49%	-11.14%	5.94%	118.05%	5.94%	118.05%	-11.14%
12	0.02	0.04	StRS	1-3	1	20	16.72%	348.12%	348.03%	1692.13%	348.03%	1692.13%	348.03%
12	0.02	0.04	StRS	1-3	1	35	10.40%	127.91%	127.92%	811.42%	127.92%	811.42%	127.92%
12	0.02	0.04	StRS	1-3	1	50	4.85%	46.45%	46.45%	485.81%	46.45%	485.81%	46.45%
12	0.02	0.04	StRS	1-3	2	20	29.97%	376.59%	374.16%	1904.66%	374.16%	1904.66%	376.64%
12	0.02	0.04	StRS	1-3	2	35	16.91%	125.87%	125.38%	846.80%	125.38%	846.80%	125.86%
12	0.02	0.04	StRS	1-3	2	50	21.20%	67.68%	67.45%	603.36%	67.45%	603.36%	67.68%
12	0.02	0.04	Unequal	1-0	1	20	265.93%	6305.68%	6305.68%	6305.68%	6305.68%	6305.68%	6305.68%
12	0.02	0.04	Unequal	1-0	1	35	262.62%	3694.81%	3694.81%	3694.81%	3694.81%	3694.81%	3694.81%
12	0.02	0.04	Unequal	1-0	1	50	260.56%	2429.94%	2429.94%	2429.94%	2429.94%	2429.94%	2429.94%
12	0.02	0.04	Unequal	1-0	2	20	268.82%	6256.91%	6254.87%	6852.35%	6254.87%	6852.35%	6256.91%
12	0.02	0.04	Unequal	1-0	2	35	260.18%	3644.81%	3638.92%	3990.49%	3638.92%	3990.49%	3644.80%
12	0.02	0.04	Unequal	1-0	2	50	260.81%	2431.84%	2428.88%	2671.11%	2428.88%	2671.11%	2431.84%

Table SB15 (continued). Relative Bias of the ANC Site-Level Slope Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0.04	Unequal	1-0,1-3	1	20	254.84%	2488.27%	2233.96%	5507.71%	2233.96%	5507.71%	2488.27%
12	0.02	0.04	Unequal	1-0,1-3	1	35	261.71%	1010.33%	956.05%	2892.25%	956.05%	2892.25%	1010.33%
12	0.02	0.04	Unequal	1-0,1-3	1	50	260.89%	544.98%	547.99%	1832.84%	547.99%	1832.84%	544.98%
12	0.02	0.04	Unequal	1-0,1-3	2	20	263.43%	2681.34%	2292.49%	5761.42%	2292.49%	5761.42%	2681.34%
12	0.02	0.04	Unequal	1-0,1-3	2	35	264.71%	1026.77%	944.22%	2913.43%	944.22%	2913.43%	1026.77%
12	0.02	0.04	Unequal	1-0,1-3	2	50	265.93%	554.12%	549.85%	1854.11%	549.85%	1854.11%	554.12%
12	0.02	0.04	Unequal	1-3	1	20	267.80%	1273.43%	1273.43%	5393.74%	1273.43%	5393.74%	1273.43%
12	0.02	0.04	Unequal	1-3	1	35	259.00%	641.47%	641.47%	2865.89%	641.47%	2865.89%	641.47%
12	0.02	0.04	Unequal	1-3	1	50	262.88%	427.07%	427.07%	2008.27%	427.07%	2008.27%	427.07%
12	0.02	0.04	Unequal	1-3	2	20	262.71%	1178.17%	1177.62%	5244.95%	1177.62%	5244.95%	1178.17%
12	0.02	0.04	Unequal	1-3	2	35	265.78%	656.55%	653.98%	3047.98%	653.98%	3047.98%	656.55%
12	0.02	0.04	Unequal	1-3	2	50	259.99%	404.05%	401.95%	2003.35%	401.95%	2003.35%	404.05%
24	0.01	0	SRS	1-0	1	20	1.46%	3286.16%	3286.16%	3286.16%	3286.16%	3286.16%	3286.16%
24	0.01	0	SRS	1-0	1	35	0.48%	1840.97%	1840.97%	1840.97%	1840.97%	1840.97%	1840.97%
24	0.01	0	SRS	1-0	1	50	0.47%	1263.65%	1263.65%	1263.65%	1263.65%	1263.65%	1263.65%
24	0.01	0	SRS	1-0	2	20	-1.13%	3197.46%	3200.46%	3515.48%	3200.46%	3515.48%	3197.46%
24	0.01	0	SRS	1-0	2	35	-0.87%	1813.11%	1814.72%	1992.34%	1814.72%	1992.34%	1813.11%
24	0.01	0	SRS	1-0	2	50	0.94%	1268.71%	1269.93%	1402.51%	1269.93%	1402.51%	1268.71%
24	0.01	0	SRS	1-0,1-3	1	20	2.23%	1307.66%	1285.57%	4052.02%	1285.57%	4052.02%	1307.66%
24	0.01	0	SRS	1-0,1-3	1	35	0.01%	523.42%	518.98%	2068.71%	518.98%	2068.71%	523.42%
24	0.01	0	SRS	1-0,1-3	1	50	0.40%	303.25%	302.42%	1377.36%	302.42%	1377.36%	303.25%
24	0.01	0	SRS	1-0,1-3	2	20	-0.12%	1308.47%	1253.75%	4654.85%	1253.75%	4654.85%	1308.47%
24	0.01	0	SRS	1-0,1-3	2	35	0.73%	534.94%	523.41%	2358.77%	523.41%	2358.77%	534.94%
24	0.01	0	SRS	1-0,1-3	2	50	-0.31%	301.92%	299.60%	1534.24%	299.60%	1534.24%	301.92%

Table SB15 (continued). Relative Bias of the ANC Site-Level Slope Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0	SRS	1-3	1	20	-0.72%	743.98%	743.98%	3275.92%	743.98%	3275.92%	743.98%
24	0.01	0	SRS	1-3	1	35	0.67%	389.88%	389.88%	1859.52%	389.88%	1859.52%	389.88%
24	0.01	0	SRS	1-3	1	50	0.08%	241.07%	241.07%	1264.29%	241.07%	1264.29%	241.07%
24	0.01	0	SRS	1-3	2	20	1.62%	763.23%	763.70%	3671.69%	763.70%	3671.69%	763.23%
24	0.01	0	SRS	1-3	2	35	-1.19%	380.60%	380.80%	1994.23%	380.80%	1994.23%	380.60%
24	0.01	0	SRS	1-3	2	50	-0.24%	239.62%	239.97%	1383.67%	239.97%	1383.67%	239.62%
24	0.01	0	StRS	1-0	1	20	-1.76%	2611.96%	2611.96%	2611.96%	2611.96%	2611.96%	2611.96%
24	0.01	0	StRS	1-0	1	35	-1.68%	1464.51%	1464.51%	1464.51%	1464.51%	1464.51%	1464.51%
24	0.01	0	StRS	1-0	1	50	-2.77%	993.59%	993.59%	993.59%	993.59%	993.59%	993.59%
24	0.01	0	StRS	1-0	2	20	1.94%	2664.88%	2666.14%	2928.13%	2666.14%	2928.13%	2664.88%
24	0.01	0	StRS	1-0	2	35	-0.43%	1497.98%	1498.50%	1656.51%	1498.50%	1656.51%	1497.98%
24	0.01	0	StRS	1-0	2	50	2.62%	1061.01%	1061.07%	1171.14%	1061.07%	1171.14%	1061.01%
24	0.01	0	StRS	1-0,1-3	1	20	1.28%	888.56%	868.96%	2303.97%	868.96%	2303.97%	888.56%
24	0.01	0	StRS	1-0,1-3	1	35	-1.99%	310.64%	301.61%	1149.55%	301.61%	1149.55%	310.64%
24	0.01	0	StRS	1-0,1-3	1	50	-1.67%	158.58%	154.11%	756.46%	154.11%	756.46%	158.58%
24	0.01	0	StRS	1-0,1-3	2	20	0.03%	872.98%	848.43%	2455.49%	848.43%	2455.49%	872.98%
24	0.01	0	StRS	1-0,1-3	2	35	0.21%	310.97%	302.83%	1259.58%	302.83%	1258.17%	310.97%
24	0.01	0	StRS	1-0,1-3	2	50	-0.49%	156.26%	151.53%	821.27%	151.53%	821.27%	156.26%
24	0.01	0	StRS	1-3	1	20	-2.65%	430.72%	430.72%	2022.88%	430.72%	2022.88%	430.72%
24	0.01	0	StRS	1-3	1	35	-2.29%	199.07%	199.07%	1096.27%	199.07%	1096.27%	199.07%
24	0.01	0	StRS	1-3	1	50	-0.47%	113.06%	113.06%	752.25%	113.06%	752.25%	113.06%
24	0.01	0	StRS	1-3	2	20	-1.79%	416.75%	416.42%	2152.47%	416.42%	2152.47%	416.75%
24	0.01	0	StRS	1-3	2	35	0.22%	198.06%	198.05%	1200.11%	198.05%	1200.11%	198.06%
24	0.01	0	StRS	1-3	2	50	-0.99%	102.71%	102.60%	783.20%	102.60%	783.20%	102.71%

Table SB15 (continued). Relative Bias of the ANC Site-Level Slope Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0	Unequal	1-0	1	20	0.89%	2238.31%	2238.31%	2238.31%	2238.31%	2238.31%	2238.31%
24	0.01	0	Unequal	1-0	1	35	-0.23%	1334.46%	1334.46%	1334.46%	1334.46%	1334.46%	1334.46%
24	0.01	0	Unequal	1-0	1	50	-0.04%	876.29%	876.29%	876.29%	876.29%	876.29%	876.29%
24	0.01	0	Unequal	1-0	2	20	-0.48%	2182.39%	2182.65%	2405.99%	2182.65%	2405.99%	2182.39%
24	0.01	0	Unequal	1-0	2	35	-0.91%	1304.99%	1305.18%	1432.07%	1305.18%	1432.07%	1304.99%
24	0.01	0	Unequal	1-0	2	50	0.27%	892.61%	893.01%	987.38%	893.01%	987.38%	892.61%
24	0.01	0	Unequal	1-0,1-3	1	20	0.12%	750.41%	728.10%	2249.87%	728.10%	2249.87%	750.41%
24	0.01	0	Unequal	1-0,1-3	1	35	-0.05%	276.55%	274.74%	1141.24%	274.74%	1141.24%	276.55%
24	0.01	0	Unequal	1-0,1-3	1	50	0.85%	132.81%	133.38%	721.19%	133.38%	721.19%	132.81%
24	0.01	0	Unequal	1-0,1-3	2	20	0.78%	755.08%	722.82%	2552.58%	722.82%	2552.58%	755.08%
24	0.01	0	Unequal	1-0,1-3	2	35	1.51%	277.55%	277.40%	1280.72%	277.40%	1280.72%	277.55%
24	0.01	0	Unequal	1-0,1-3	2	50	0.34%	124.59%	127.41%	772.37%	127.41%	772.37%	124.59%
24	0.01	0	Unequal	1-3	1	20	0.77%	394.69%	394.69%	1878.76%	394.69%	1878.76%	394.69%
24	0.01	0	Unequal	1-3	1	35	-0.47%	173.76%	173.76%	995.05%	173.76%	995.05%	173.76%
24	0.01	0	Unequal	1-3	1	50	-0.77%	89.23%	89.23%	656.92%	89.23%	656.92%	89.23%
24	0.01	0	Unequal	1-3	2	20	-0.61%	381.15%	381.19%	2002.22%	381.19%	2002.22%	381.15%
24	0.01	0	Unequal	1-3	2	35	0.03%	168.74%	168.92%	1070.53%	168.92%	1070.53%	168.74%
24	0.01	0	Unequal	1-3	2	50	-1.49%	86.81%	86.93%	716.00%	86.93%	716.00%	86.81%
24	0.01	0.04	SRS	1-0	1	20	164.20%	8635.02%	8635.02%	8635.02%	8635.02%	8635.02%	8635.02%
24	0.01	0.04	SRS	1-0	1	35	169.85%	5085.47%	5085.47%	5085.47%	5085.47%	5085.47%	5085.47%
24	0.01	0.04	SRS	1-0	1	50	164.00%	3472.11%	3472.11%	3472.11%	3472.11%	3472.11%	3472.11%
24	0.01	0.04	SRS	1-0	2	20	163.22%	8599.30%	8603.59%	9473.26%	8603.59%	9473.26%	8599.30%
24	0.01	0.04	SRS	1-0	2	35	164.73%	4986.03%	4988.21%	5461.58%	4988.21%	5461.58%	4986.03%
24	0.01	0.04	SRS	1-0	2	50	163.97%	3470.16%	3471.63%	3837.15%	3471.63%	3837.15%	3470.16%

Table SB15 (continued). Relative Bias of the ANC Site-Level Slope Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0.04	SRS	1-0,1-3	1	20	161.98%	3466.68%	3442.30%	11319.55%	3442.30%	11319.55%	3466.68%
24	0.01	0.04	SRS	1-0,1-3	1	35	161.55%	1529.37%	1517.40%	5827.58%	1517.40%	5827.58%	1529.37%
24	0.01	0.04	SRS	1-0,1-3	1	50	163.76%	965.10%	956.71%	3909.35%	956.71%	3909.35%	965.10%
24	0.01	0.04	SRS	1-0,1-3	2	20	162.57%	3490.03%	3448.87%	13441.03%	3448.87%	13441.03%	3490.03%
24	0.01	0.04	SRS	1-0,1-3	2	35	164.22%	1543.35%	1533.66%	6643.30%	1533.66%	6643.30%	1543.35%
24	0.01	0.04	SRS	1-0,1-3	2	50	165.41%	969.57%	963.28%	4387.55%	963.28%	4387.55%	969.57%
24	0.01	0.04	SRS	1-3	1	20	166.60%	2163.38%	2163.38%	8953.50%	2163.38%	8953.50%	2163.38%
24	0.01	0.04	SRS	1-3	1	35	162.83%	1178.18%	1178.18%	5012.71%	1178.18%	5012.71%	1178.18%
24	0.01	0.04	SRS	1-3	1	50	162.11%	792.92%	792.92%	3471.69%	792.92%	3471.69%	792.92%
24	0.01	0.04	SRS	1-3	2	20	163.63%	2137.39%	2137.85%	9717.56%	2137.85%	9717.56%	2137.39%
24	0.01	0.04	SRS	1-3	2	35	163.33%	1180.34%	1180.52%	5507.12%	1180.52%	5507.12%	1180.34%
24	0.01	0.04	SRS	1-3	2	50	163.42%	796.91%	797.34%	3838.64%	797.34%	3838.64%	796.91%
24	0.01	0.04	StRS	1-0	1	20	-8.53%	2438.88%	2438.88%	2438.88%	2438.88%	2438.88%	2438.88%
24	0.01	0.04	StRS	1-0	1	35	-6.01%	1447.67%	1447.67%	1447.67%	1447.67%	1447.67%	1447.67%
24	0.01	0.04	StRS	1-0	1	50	-6.76%	988.87%	988.87%	988.87%	988.87%	988.87%	988.87%
24	0.01	0.04	StRS	1-0	2	20	-7.86%	2423.64%	2424.89%	2660.21%	2424.89%	2660.21%	2423.64%
24	0.01	0.04	StRS	1-0	2	35	-5.20%	1452.92%	1453.63%	1606.70%	1453.63%	1606.70%	1452.92%
24	0.01	0.04	StRS	1-0	2	50	-6.50%	980.00%	980.44%	1082.83%	980.44%	1082.83%	980.00%
24	0.01	0.04	StRS	1-0,1-3	1	20	-7.56%	784.17%	779.01%	1980.02%	779.01%	1980.02%	784.17%
24	0.01	0.04	StRS	1-0,1-3	1	35	-5.34%	295.50%	298.19%	1091.62%	298.19%	1091.62%	295.50%
24	0.01	0.04	StRS	1-0,1-3	1	50	-5.49%	149.75%	153.13%	726.44%	153.13%	726.44%	149.75%
24	0.01	0.04	StRS	1-0,1-3	2	20	-5.74%	792.71%	780.49%	2196.85%	780.49%	2196.85%	792.71%
24	0.01	0.04	StRS	1-0,1-3	2	35	-6.61%	280.62%	282.65%	1129.60%	282.65%	1129.10%	280.62%
24	0.01	0.04	StRS	1-0,1-3	2	50	-6.81%	137.96%	143.42%	747.75%	143.42%	747.75%	137.96%

Table SB15 (continued). Relative Bias of the ANC Site-Level Slope Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0.04	StRS	1-3	1	20	-9.43%	381.77%	381.77%	1827.09%	381.77%	1827.09%	381.77%
24	0.01	0.04	StRS	1-3	1	35	-7.57%	185.76%	185.76%	1043.03%	185.76%	1043.03%	185.76%
24	0.01	0.04	StRS	1-3	1	50	-8.01%	99.71%	99.71%	698.85%	99.71%	698.85%	99.71%
24	0.01	0.04	StRS	1-3	2	20	-8.59%	376.59%	376.97%	1977.89%	376.97%	1977.89%	376.59%
24	0.01	0.04	StRS	1-3	2	35	-8.10%	181.24%	181.52%	1128.74%	181.52%	1128.74%	181.24%
24	0.01	0.04	StRS	1-3	2	50	-7.33%	101.12%	101.27%	776.08%	101.27%	776.08%	101.12%
24	0.01	0.04	Unequal	1-0	1	20	285.59%	8061.56%	8061.56%	8061.56%	8061.56%	8061.56%	8061.56%
24	0.01	0.04	Unequal	1-0	1	35	272.86%	4551.68%	4551.68%	4551.68%	4551.68%	4551.68%	4551.68%
24	0.01	0.04	Unequal	1-0	1	50	270.56%	3151.74%	3151.74%	3151.74%	3151.74%	3151.74%	3151.74%
24	0.01	0.04	Unequal	1-0	2	20	267.05%	7226.98%	7227.28%	7934.85%	7227.28%	7934.85%	7226.98%
24	0.01	0.04	Unequal	1-0	2	35	262.68%	4475.28%	4473.35%	4923.55%	4473.35%	4923.55%	4475.28%
24	0.01	0.04	Unequal	1-0	2	50	267.45%	3096.40%	3094.97%	3419.25%	3094.97%	3419.25%	3096.40%
24	0.01	0.04	Unequal	1-0,1-3	1	20	265.06%	2909.82%	2852.55%	9510.73%	2852.55%	9510.73%	2909.82%
24	0.01	0.04	Unequal	1-0,1-3	1	35	263.15%	1283.77%	1257.77%	4891.50%	1257.77%	4891.50%	1283.77%
24	0.01	0.04	Unequal	1-0,1-3	1	50	266.17%	783.12%	765.38%	3197.97%	765.38%	3197.97%	783.12%
24	0.01	0.04	Unequal	1-0,1-3	2	20	269.40%	3050.86%	2957.47%	11632.75%	2957.47%	11632.75%	3050.86%
24	0.01	0.04	Unequal	1-0,1-3	2	35	266.20%	1306.60%	1267.11%	5572.86%	1267.11%	5572.86%	1306.60%
24	0.01	0.04	Unequal	1-0,1-3	2	50	268.54%	788.56%	765.82%	3602.69%	765.82%	3602.69%	788.56%
24	0.01	0.04	Unequal	1-3	1	20	263.87%	1772.32%	1772.32%	7389.29%	1772.32%	7389.29%	1772.32%
24	0.01	0.04	Unequal	1-3	1	35	267.48%	956.96%	956.96%	4127.83%	956.96%	4127.83%	956.96%
24	0.01	0.04	Unequal	1-3	1	50	265.89%	632.82%	632.82%	2831.26%	632.82%	2831.26%	632.82%
24	0.01	0.04	Unequal	1-3	2	20	269.51%	1779.03%	1778.49%	8137.79%	1778.49%	8137.79%	1779.03%
24	0.01	0.04	Unequal	1-3	2	35	267.93%	947.98%	947.64%	4484.32%	947.64%	4484.32%	947.98%
24	0.01	0.04	Unequal	1-3	2	50	266.41%	621.90%	621.30%	3066.42%	621.30%	3066.42%	621.90%

Table SB16. Relative Bias of the modified ANC Site-Level Slope Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	SRS	1-0	1	20	-2.26%	2970.59%	2970.59%	2970.59%	2970.59%	2970.59%	2970.59%
12	0.02	0	SRS	1-0	1	35	-0.24%	1758.54%	1758.54%	1758.54%	1758.54%	1758.54%	1758.54%
12	0.02	0	SRS	1-0	1	50	-0.08%	1222.20%	1222.20%	1222.20%	1222.20%	1222.20%	1222.20%
12	0.02	0	SRS	1-0	2	20	0.70%	3061.71%	3062.10%	3346.49%	3062.10%	3346.50%	3061.73%
12	0.02	0	SRS	1-0	2	35	-3.82%	1688.04%	1687.95%	1838.88%	1687.95%	1838.88%	1688.02%
12	0.02	0	SRS	1-0	2	50	2.38%	1254.07%	1254.20%	1373.50%	1254.20%	1373.50%	1254.06%
12	0.02	0	SRS	1-0,1-3	1	20	5.44%	1264.40%	1251.81%	1867.95%	1251.81%	1867.95%	1264.40%
12	0.02	0	SRS	1-0,1-3	1	35	-1.38%	498.32%	491.99%	922.52%	491.99%	922.52%	498.32%
12	0.02	0	SRS	1-0,1-3	1	50	-4.54%	278.06%	274.90%	606.30%	274.90%	606.30%	278.13%
12	0.02	0	SRS	1-0,1-3	2	20	0.28%	1187.39%	1174.16%	1808.07%	1174.16%	1808.07%	1187.46%
12	0.02	0	SRS	1-0,1-3	2	35	0.52%	508.21%	501.37%	810.21%	501.37%	810.21%	508.24%
12	0.02	0	SRS	1-0,1-3	2	50	-0.58%	294.24%	289.77%	577.42%	289.77%	577.42%	294.28%
12	0.02	0	SRS	1-3	1	20	4.93%	759.43%	759.56%	3338.20%	759.56%	3338.20%	759.56%
12	0.02	0	SRS	1-3	1	35	1.02%	380.91%	380.83%	1823.74%	380.83%	1823.74%	380.83%
12	0.02	0	SRS	1-3	1	50	-0.48%	233.51%	233.49%	1234.14%	233.49%	1234.14%	233.49%
12	0.02	0	SRS	1-3	2	20	6.13%	768.17%	766.65%	3513.04%	766.65%	3513.04%	768.43%
12	0.02	0	SRS	1-3	2	35	8.55%	415.99%	415.52%	2016.51%	415.52%	2016.51%	415.95%
12	0.02	0	SRS	1-3	2	50	1.18%	238.89%	238.68%	1277.73%	238.68%	1277.73%	238.88%
12	0.02	0	StRS	1-0	1	20	0.50%	2089.29%	2089.29%	2089.29%	2089.29%	2089.29%	2089.29%
12	0.02	0	StRS	1-0	1	35	-4.30%	1051.15%	1051.15%	1051.15%	1051.15%	1051.15%	1051.15%
12	0.02	0	StRS	1-0	1	50	0.79%	771.10%	771.10%	771.10%	771.10%	771.10%	771.10%
12	0.02	0	StRS	1-0	2	20	0.53%	2050.06%	2049.80%	2244.41%	2049.80%	2244.40%	2050.06%
12	0.02	0	StRS	1-0	2	35	2.49%	1145.09%	1145.15%	1259.97%	1145.15%	1259.97%	1145.10%
12	0.02	0	StRS	1-0	2	50	1.04%	757.09%	757.14%	834.28%	757.14%	834.28%	757.09%

Table SB16 (continued). Relative Bias of the modified ANC Site-Level Slope Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	StRS	1-0,1-3	1	20	-0.27%	627.27%	620.90%	1260.53%	620.90%	1260.53%	627.28%
12	0.02	0	StRS	1-0,1-3	1	35	-2.91%	180.42%	177.94%	511.85%	177.94%	511.85%	180.45%
12	0.02	0	StRS	1-0,1-3	1	50	0.43%	76.65%	75.35%	334.11%	75.35%	334.11%	76.66%
12	0.02	0	StRS	1-0,1-3	2	20	4.53%	683.80%	675.36%	1443.71%	675.36%	1443.71%	683.83%
12	0.02	0	StRS	1-0,1-3	2	35	-2.37%	199.06%	195.82%	565.80%	195.82%	565.80%	199.06%
12	0.02	0	StRS	1-0,1-3	2	50	-1.48%	78.74%	76.68%	320.73%	76.68%	320.73%	78.74%
12	0.02	0	StRS	1-3	1	20	3.51%	257.39%	257.42%	1329.68%	257.42%	1329.68%	257.42%
12	0.02	0	StRS	1-3	1	35	2.49%	82.23%	82.25%	629.09%	82.25%	629.09%	82.25%
12	0.02	0	StRS	1-3	1	50	0.10%	22.53%	22.53%	390.15%	22.53%	390.15%	22.53%
12	0.02	0	StRS	1-3	2	20	4.76%	243.19%	242.94%	1340.89%	242.94%	1340.89%	243.28%
12	0.02	0	StRS	1-3	2	35	4.08%	90.22%	90.27%	692.18%	90.27%	692.18%	90.23%
12	0.02	0	StRS	1-3	2	50	0.69%	21.05%	20.95%	401.18%	20.95%	401.18%	21.04%
12	0.02	0	Unequal	1-0	1	20	1.79%	1728.33%	1728.33%	1728.33%	1728.33%	1728.33%	1728.33%
12	0.02	0	Unequal	1-0	1	35	2.61%	986.32%	986.32%	986.32%	986.32%	986.32%	986.32%
12	0.02	0	Unequal	1-0	1	50	-2.49%	592.95%	592.95%	592.95%	592.95%	592.95%	592.95%
12	0.02	0	Unequal	1-0	2	20	4.01%	1706.11%	1706.26%	1871.61%	1706.26%	1871.60%	1706.15%
12	0.02	0	Unequal	1-0	2	35	4.42%	981.50%	981.33%	1076.63%	981.33%	1076.63%	981.50%
12	0.02	0	Unequal	1-0	2	50	0.67%	602.21%	602.22%	664.65%	602.22%	664.65%	602.21%
12	0.02	0	Unequal	1-0,1-3	1	20	-1.02%	564.41%	557.84%	1089.71%	557.84%	1089.71%	564.41%
12	0.02	0	Unequal	1-0,1-3	1	35	2.06%	191.55%	188.47%	516.39%	188.47%	516.39%	191.55%
12	0.02	0	Unequal	1-0,1-3	1	50	1.34%	75.54%	74.36%	287.43%	74.36%	287.43%	75.56%
12	0.02	0	Unequal	1-0,1-3	2	20	3.15%	581.61%	575.09%	1184.88%	575.09%	1184.88%	581.60%
12	0.02	0	Unequal	1-0,1-3	2	35	-3.37%	172.39%	169.16%	452.91%	169.16%	452.91%	172.41%
12	0.02	0	Unequal	1-0,1-3	2	50	1.88%	77.45%	75.49%	283.45%	75.49%	283.45%	77.48%

Table SB16 (continued). Relative Bias of the modified ANC Site-Level Slope Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	Unequal	1-3	1	20	0.03%	257.01%	257.12%	1328.35%	257.12%	1328.35%	257.12%
12	0.02	0	Unequal	1-3	1	35	3.23%	91.03%	91.02%	664.17%	91.02%	664.17%	91.02%
12	0.02	0	Unequal	1-3	1	50	1.63%	33.15%	33.13%	432.50%	33.13%	432.50%	33.13%
12	0.02	0	Unequal	1-3	2	20	12.05%	285.31%	285.08%	1512.81%	285.08%	1512.81%	285.31%
12	0.02	0	Unequal	1-3	2	35	4.03%	91.87%	91.85%	691.42%	91.85%	691.42%	91.88%
12	0.02	0	Unequal	1-3	2	50	1.45%	26.68%	26.57%	418.53%	26.57%	418.53%	26.67%
12	0.02	0.04	SRS	1-0	1	20	158.55%	8179.37%	8179.37%	8179.37%	8179.37%	8179.37%	8179.37%
12	0.02	0.04	SRS	1-0	1	35	154.32%	4686.82%	4686.82%	4686.82%	4686.82%	4686.82%	4686.82%
12	0.02	0.04	SRS	1-0	1	50	159.33%	3354.00%	3354.00%	3354.00%	3354.00%	3354.00%	3354.00%
12	0.02	0.04	SRS	1-0	2	20	162.88%	8317.18%	8316.71%	9110.06%	8316.71%	9110.07%	8317.20%
12	0.02	0.04	SRS	1-0	2	35	163.16%	4851.98%	4851.95%	5303.05%	4851.95%	5303.05%	4851.98%
12	0.02	0.04	SRS	1-0	2	50	166.53%	3449.37%	3449.48%	3793.52%	3449.48%	3793.52%	3449.37%
12	0.02	0.04	SRS	1-0,1-3	1	20	168.42%	3443.07%	3425.76%	6695.39%	3425.76%	6695.39%	3443.07%
12	0.02	0.04	SRS	1-0,1-3	1	35	162.11%	1503.85%	1497.13%	4086.63%	1497.13%	4086.63%	1503.93%
12	0.02	0.04	SRS	1-0,1-3	1	50	166.44%	960.80%	957.19%	3109.16%	957.19%	3109.16%	960.91%
12	0.02	0.04	SRS	1-0,1-3	2	20	166.72%	3403.61%	3383.80%	6080.25%	3383.80%	6080.25%	3403.61%
12	0.02	0.04	SRS	1-0,1-3	2	35	164.53%	1517.60%	1507.70%	3852.12%	1507.70%	3852.12%	1517.58%
12	0.02	0.04	SRS	1-0,1-3	2	50	161.45%	941.04%	935.63%	2922.38%	935.63%	2922.38%	941.07%
12	0.02	0.04	SRS	1-3	1	20	159.87%	2060.71%	2060.76%	8543.06%	2060.76%	8543.06%	2060.76%
12	0.02	0.04	SRS	1-3	1	35	164.96%	1173.17%	1173.25%	4993.04%	1173.25%	4993.04%	1173.25%
12	0.02	0.04	SRS	1-3	1	50	157.30%	769.18%	769.20%	3376.84%	769.20%	3376.84%	769.20%
12	0.02	0.04	SRS	1-3	2	20	160.30%	2058.60%	2056.82%	8822.23%	2056.82%	8822.23%	2058.68%
12	0.02	0.04	SRS	1-3	2	35	167.77%	1184.98%	1184.35%	5230.51%	1184.35%	5230.51%	1185.05%
12	0.02	0.04	SRS	1-3	2	50	155.33%	761.61%	761.23%	3470.36%	761.23%	3470.36%	761.65%

Table SB16 (continued). Relative Bias of the modified ANC Site-Level Slope Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0.04	StRS	1-0	1	20	1.59%	1864.93%	1864.93%	1864.93%	1864.93%	1864.93%	1864.93%
12	0.02	0.04	StRS	1-0	1	35	-1.12%	1034.17%	1034.17%	1034.17%	1034.17%	1034.17%	1034.17%
12	0.02	0.04	StRS	1-0	1	50	-0.10%	716.53%	716.53%	716.53%	716.53%	716.53%	716.53%
12	0.02	0.04	StRS	1-0	2	20	1.25%	1843.50%	1843.59%	2022.31%	1843.59%	2022.31%	1843.47%
12	0.02	0.04	StRS	1-0	2	35	-1.81%	989.60%	989.63%	1088.27%	989.63%	1088.27%	989.60%
12	0.02	0.04	StRS	1-0	2	50	-2.35%	672.02%	672.09%	741.01%	672.09%	741.01%	672.02%
12	0.02	0.04	StRS	1-0,1-3	1	20	3.37%	603.61%	596.98%	1273.11%	596.98%	1273.11%	603.61%
12	0.02	0.04	StRS	1-0,1-3	1	35	3.97%	185.29%	182.29%	527.24%	182.29%	527.24%	185.31%
12	0.02	0.04	StRS	1-0,1-3	1	50	0.23%	67.05%	65.77%	311.10%	65.77%	311.10%	67.07%
12	0.02	0.04	StRS	1-0,1-3	2	20	-2.76%	542.31%	533.67%	1243.11%	533.67%	1243.11%	543.25%
12	0.02	0.04	StRS	1-0,1-3	2	35	1.31%	184.70%	181.56%	512.31%	181.56%	512.31%	184.71%
12	0.02	0.04	StRS	1-0,1-3	2	50	-2.67%	65.35%	63.47%	292.73%	63.47%	292.73%	65.35%
12	0.02	0.04	StRS	1-3	1	20	8.43%	238.78%	238.82%	1255.27%	238.82%	1255.27%	238.82%
12	0.02	0.04	StRS	1-3	1	35	-1.84%	71.13%	71.14%	584.56%	71.14%	584.56%	71.14%
12	0.02	0.04	StRS	1-3	1	50	1.55%	18.15%	18.17%	372.70%	18.17%	372.70%	18.17%
12	0.02	0.04	StRS	1-3	2	20	6.79%	243.09%	242.63%	1345.02%	242.63%	1345.02%	243.09%
12	0.02	0.04	StRS	1-3	2	35	4.22%	75.69%	75.62%	629.71%	75.62%	629.71%	75.70%
12	0.02	0.04	StRS	1-3	2	50	3.41%	15.28%	15.32%	376.11%	15.32%	376.11%	15.29%
12	0.02	0.04	Unequal	1-0	1	20	267.08%	6735.53%	6735.53%	6735.53%	6735.53%	6735.53%	6735.53%
12	0.02	0.04	Unequal	1-0	1	35	253.29%	3869.48%	3869.48%	3869.48%	3869.48%	3869.48%	3869.48%
12	0.02	0.04	Unequal	1-0	1	50	264.38%	2704.19%	2704.19%	2704.19%	2704.19%	2704.19%	2704.19%
12	0.02	0.04	Unequal	1-0	2	20	273.61%	6921.58%	6921.31%	7590.83%	6921.31%	7590.83%	6921.56%
12	0.02	0.04	Unequal	1-0	2	35	256.05%	3907.24%	3906.95%	4280.66%	3906.95%	4280.67%	3907.24%
12	0.02	0.04	Unequal	1-0	2	50	268.98%	2705.23%	2705.15%	2974.32%	2705.15%	2974.31%	2705.23%

Table SB16 (continued). Relative Bias of the modified ANC Site-Level Slope Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0.04	Unequal	1-0,1-3	1	20	257.73%	2489.36%	2478.03%	5965.85%	2478.03%	5965.85%	2489.36%
12	0.02	0.04	Unequal	1-0,1-3	1	35	256.67%	1083.73%	1079.63%	3470.88%	1079.63%	3470.88%	1083.73%
12	0.02	0.04	Unequal	1-0,1-3	1	50	251.73%	624.99%	622.11%	2298.90%	622.11%	2298.90%	624.98%
12	0.02	0.04	Unequal	1-0,1-3	2	20	260.26%	2524.77%	2509.84%	5773.39%	2509.84%	5773.39%	2524.80%
12	0.02	0.04	Unequal	1-0,1-3	2	35	265.03%	1100.05%	1093.51%	3512.73%	1093.51%	3512.73%	1100.08%
12	0.02	0.04	Unequal	1-0,1-3	2	50	256.15%	626.51%	622.57%	2345.53%	622.57%	2345.53%	626.51%
12	0.02	0.04	Unequal	1-3	1	20	274.80%	1514.40%	1514.41%	6357.32%	1514.41%	6357.32%	1514.41%
12	0.02	0.04	Unequal	1-3	1	35	267.51%	781.45%	781.38%	3425.56%	781.38%	3425.56%	781.38%
12	0.02	0.04	Unequal	1-3	1	50	266.83%	518.78%	518.72%	2374.24%	518.72%	2374.24%	518.72%
12	0.02	0.04	Unequal	1-3	2	20	265.63%	1457.10%	1456.02%	6397.73%	1456.02%	6397.73%	1456.84%
12	0.02	0.04	Unequal	1-3	2	35	264.01%	763.48%	763.08%	3505.70%	763.08%	3505.70%	763.48%
12	0.02	0.04	Unequal	1-3	2	50	268.01%	511.17%	511.03%	2452.11%	511.03%	2452.11%	511.17%
24	0.01	0	SRS	1-0	1	20	-2.00%	3063.21%	3063.21%	3063.21%	3063.21%	3063.21%	3063.21%
24	0.01	0	SRS	1-0	1	35	-2.27%	1746.76%	1746.76%	1746.76%	1746.76%	1746.76%	1746.76%
24	0.01	0	SRS	1-0	1	50	2.16%	1264.15%	1264.15%	1264.15%	1264.15%	1264.15%	1264.15%
24	0.01	0	SRS	1-0	2	20	0.43%	3141.10%	3141.11%	3452.99%	3141.11%	3453.00%	3141.09%
24	0.01	0	SRS	1-0	2	35	-1.52%	1760.71%	1760.72%	1938.13%	1760.72%	1938.13%	1760.71%
24	0.01	0	SRS	1-0	2	50	-1.18%	1219.46%	1219.47%	1347.90%	1219.47%	1347.90%	1219.46%
24	0.01	0	SRS	1-0,1-3	1	20	-0.63%	1222.24%	1221.43%	3818.45%	1221.43%	3818.45%	1222.25%
24	0.01	0	SRS	1-0,1-3	1	35	-0.01%	513.52%	512.95%	2042.91%	512.95%	2042.91%	513.53%
24	0.01	0	SRS	1-0,1-3	1	50	-0.50%	296.50%	296.32%	1360.71%	296.32%	1360.71%	296.50%
24	0.01	0	SRS	1-0,1-3	2	20	0.08%	1232.13%	1230.27%	4406.78%	1230.27%	4406.78%	1232.13%
24	0.01	0	SRS	1-0,1-3	2	35	0.32%	515.52%	514.84%	2308.89%	514.84%	2308.98%	515.53%
24	0.01	0	SRS	1-0,1-3	2	50	0.35%	300.06%	299.66%	1535.20%	299.66%	1535.20%	300.06%

Table SB16 (continued). Relative Bias of the modified ANC Site-Level Slope Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0	SRS	1-3	1	20	1.11%	748.13%	748.13%	3292.51%	748.13%	3292.51%	748.13%
24	0.01	0	SRS	1-3	1	35	0.60%	385.67%	385.69%	1842.70%	385.69%	1842.70%	385.69%
24	0.01	0	SRS	1-3	1	50	0.19%	239.58%	239.58%	1258.34%	239.58%	1258.34%	239.58%
24	0.01	0	SRS	1-3	2	20	-1.09%	729.40%	729.39%	3525.16%	729.39%	3525.13%	729.43%
24	0.01	0	SRS	1-3	2	35	0.69%	386.06%	386.04%	2018.19%	386.04%	2018.19%	386.06%
24	0.01	0	SRS	1-3	2	50	-0.37%	237.66%	237.66%	1375.52%	237.66%	1375.52%	237.66%
24	0.01	0	StRS	1-0	1	20	-0.69%	2850.25%	2850.25%	2850.25%	2850.25%	2850.25%	2850.25%
24	0.01	0	StRS	1-0	1	35	-1.49%	1643.07%	1643.07%	1643.07%	1643.07%	1643.07%	1643.07%
24	0.01	0	StRS	1-0	1	50	1.99%	1169.97%	1169.97%	1169.97%	1169.97%	1169.97%	1169.97%
24	0.01	0	StRS	1-0	2	20	-0.70%	2866.47%	2866.47%	3154.07%	2866.47%	3154.07%	2866.48%
24	0.01	0	StRS	1-0	2	35	-0.41%	1655.33%	1655.32%	1831.59%	1655.32%	1831.59%	1655.33%
24	0.01	0	StRS	1-0	2	50	0.24%	1149.42%	1149.42%	1268.63%	1149.42%	1268.63%	1149.42%
24	0.01	0	StRS	1-0,1-3	1	20	0.87%	1007.22%	1006.33%	2939.04%	1006.33%	2939.04%	1007.22%
24	0.01	0	StRS	1-0,1-3	1	35	0.01%	392.51%	392.33%	1532.51%	392.33%	1532.51%	392.51%
24	0.01	0	StRS	1-0,1-3	1	50	-0.65%	211.18%	211.11%	1003.16%	211.11%	1003.16%	211.18%
24	0.01	0	StRS	1-0,1-3	2	20	-1.42%	975.43%	974.65%	3181.91%	974.65%	3181.91%	975.42%
24	0.01	0	StRS	1-0,1-3	2	35	-0.67%	377.12%	376.89%	1677.01%	376.89%	1677.01%	377.12%
24	0.01	0	StRS	1-0,1-3	2	50	0.12%	210.46%	210.33%	1107.19%	210.33%	1107.19%	210.46%
24	0.01	0	StRS	1-3	1	20	0.53%	550.02%	550.02%	2500.12%	550.02%	2500.12%	550.02%
24	0.01	0	StRS	1-3	1	35	-1.11%	265.91%	265.93%	1363.73%	265.93%	1363.73%	265.93%
24	0.01	0	StRS	1-3	1	50	0.73%	162.86%	162.87%	951.47%	162.87%	951.47%	162.87%
24	0.01	0	StRS	1-3	2	20	2.11%	556.90%	556.88%	2765.68%	556.88%	2765.64%	556.90%
24	0.01	0	StRS	1-3	2	35	0.14%	265.59%	265.59%	1498.58%	265.59%	1498.58%	265.59%
24	0.01	0	StRS	1-3	2	50	0.34%	157.76%	157.76%	1024.52%	157.76%	1024.52%	157.76%

Table SB16 (continued). Relative Bias of the modified ANC Site-Level Slope Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0	Unequal	1-0	1	20	0.85%	2297.03%	2297.03%	2297.03%	2297.03%	2297.03%	2297.03%
24	0.01	0	Unequal	1-0	1	35	1.62%	1425.65%	1425.65%	1425.65%	1425.65%	1425.65%	1425.65%
24	0.01	0	Unequal	1-0	1	50	0.48%	950.72%	950.72%	950.72%	950.72%	950.72%	950.72%
24	0.01	0	Unequal	1-0	2	20	-2.67%	2176.27%	2176.27%	2394.07%	2176.27%	2394.07%	2176.27%
24	0.01	0	Unequal	1-0	2	35	0.52%	1404.81%	1404.80%	1550.12%	1404.80%	1550.12%	1404.81%
24	0.01	0	Unequal	1-0	2	50	-0.11%	926.97%	926.96%	1027.20%	926.96%	1027.20%	926.97%
24	0.01	0	Unequal	1-0,1-3	1	20	0.06%	748.14%	747.47%	2304.67%	747.47%	2304.67%	748.14%
24	0.01	0	Unequal	1-0,1-3	1	35	0.31%	292.12%	291.89%	1225.57%	291.89%	1225.57%	292.13%
24	0.01	0	Unequal	1-0,1-3	1	50	0.15%	142.16%	142.02%	767.95%	142.02%	767.95%	142.16%
24	0.01	0	Unequal	1-0,1-3	2	20	-0.76%	758.73%	757.50%	2653.68%	757.50%	2653.68%	758.73%
24	0.01	0	Unequal	1-0,1-3	2	35	1.39%	290.53%	290.11%	1363.92%	290.11%	1363.92%	290.53%
24	0.01	0	Unequal	1-0,1-3	2	50	-0.10%	137.18%	137.03%	839.34%	137.03%	839.34%	137.18%
24	0.01	0	Unequal	1-3	1	20	-1.34%	396.68%	396.69%	1886.74%	396.69%	1886.74%	396.69%
24	0.01	0	Unequal	1-3	1	35	-0.45%	179.61%	179.61%	1018.43%	179.61%	1018.43%	179.61%
24	0.01	0	Unequal	1-3	1	50	-0.86%	96.88%	96.88%	687.53%	96.88%	687.53%	96.88%
24	0.01	0	Unequal	1-3	2	20	-1.21%	392.40%	392.39%	2052.58%	392.39%	2052.58%	392.41%
24	0.01	0	Unequal	1-3	2	35	-0.18%	180.38%	180.38%	1123.00%	180.38%	1123.00%	180.39%
24	0.01	0	Unequal	1-3	2	50	-0.20%	95.58%	95.57%	754.65%	95.57%	754.65%	95.58%
24	0.01	0.04	SRS	1-0	1	20	171.83%	8694.88%	8694.88%	8694.88%	8694.88%	8694.88%	8694.88%
24	0.01	0.04	SRS	1-0	1	35	165.58%	4924.12%	4924.12%	4924.12%	4924.12%	4924.12%	4924.12%
24	0.01	0.04	SRS	1-0	1	50	161.83%	3398.64%	3398.64%	3398.64%	3398.64%	3398.64%	3398.64%
24	0.01	0.04	SRS	1-0	2	20	165.28%	8481.61%	8481.59%	9340.00%	8481.59%	9340.00%	8481.60%
24	0.01	0.04	SRS	1-0	2	35	157.80%	4776.40%	4776.40%	5243.94%	4776.40%	5243.94%	4776.40%
24	0.01	0.04	SRS	1-0	2	50	162.52%	3407.80%	3407.82%	3764.51%	3407.82%	3764.51%	3407.80%

Table SB16 (continued). Relative Bias of the modified ANC Site-Level Slope Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0.04	SRS	1-0,1-3	1	20	162.49%	3402.96%	3402.01%	11238.21%	3402.01%	11238.21%	3402.97%
24	0.01	0.04	SRS	1-0,1-3	1	35	162.53%	1511.86%	1511.56%	5784.29%	1511.56%	5784.29%	1511.86%
24	0.01	0.04	SRS	1-0,1-3	1	50	164.92%	956.16%	956.02%	3880.54%	956.02%	3880.54%	956.16%
24	0.01	0.04	SRS	1-0,1-3	2	20	158.42%	3348.50%	3346.82%	12922.46%	3346.82%	12922.46%	3348.51%
24	0.01	0.04	SRS	1-0,1-3	2	35	162.83%	1513.62%	1513.26%	6551.06%	1513.26%	6551.06%	1513.61%
24	0.01	0.04	SRS	1-0,1-3	2	50	161.02%	940.66%	940.45%	4276.33%	940.45%	4276.33%	940.66%
24	0.01	0.04	SRS	1-3	1	20	166.32%	2138.95%	2138.99%	8855.93%	2138.99%	8855.93%	2138.99%
24	0.01	0.04	SRS	1-3	1	35	163.38%	1173.02%	1173.03%	4992.11%	1173.03%	4992.11%	1173.03%
24	0.01	0.04	SRS	1-3	1	50	162.98%	791.94%	791.94%	3467.76%	791.94%	3467.76%	791.94%
24	0.01	0.04	SRS	1-3	2	20	162.14%	2103.85%	2103.75%	9567.44%	2103.75%	9567.43%	2103.85%
24	0.01	0.04	SRS	1-3	2	35	162.77%	1170.03%	1170.01%	5460.03%	1170.01%	5460.03%	1170.04%
24	0.01	0.04	SRS	1-3	2	50	160.77%	784.38%	784.38%	3782.48%	784.38%	3782.48%	784.38%
24	0.01	0.04	StRS	1-0	1	20	-0.87%	2765.15%	2765.15%	2765.15%	2765.15%	2765.15%	2765.15%
24	0.01	0.04	StRS	1-0	1	35	0.10%	1638.98%	1638.98%	1638.98%	1638.98%	1638.98%	1638.98%
24	0.01	0.04	StRS	1-0	1	50	1.12%	1161.56%	1161.56%	1161.56%	1161.56%	1161.56%	1161.56%
24	0.01	0.04	StRS	1-0	2	20	-1.61%	2725.33%	2725.32%	2997.29%	2725.32%	2997.29%	2725.33%
24	0.01	0.04	StRS	1-0	2	35	-0.96%	1594.53%	1594.53%	1766.22%	1594.53%	1766.22%	1594.53%
24	0.01	0.04	StRS	1-0	2	50	-0.23%	1131.12%	1131.11%	1251.13%	1131.11%	1251.13%	1131.12%
24	0.01	0.04	StRS	1-0,1-3	1	20	0.84%	1007.61%	1006.67%	2883.48%	1006.67%	2883.48%	1007.62%
24	0.01	0.04	StRS	1-0,1-3	1	35	0.05%	385.79%	385.64%	1503.75%	385.64%	1503.75%	385.79%
24	0.01	0.04	StRS	1-0,1-3	1	50	0.44%	214.62%	214.58%	1018.04%	214.58%	1018.04%	214.62%
24	0.01	0.04	StRS	1-0,1-3	2	20	-0.56%	967.29%	966.31%	3089.23%	966.31%	3089.23%	967.29%
24	0.01	0.04	StRS	1-0,1-3	2	35	-0.72%	377.33%	377.04%	1653.73%	377.04%	1653.73%	377.33%
24	0.01	0.04	StRS	1-0,1-3	2	50	-0.79%	207.04%	206.93%	1089.22%	206.93%	1089.22%	207.05%

Table SB16 (continued). Relative Bias of the modified ANC Site-Level Slope Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0.04	StRS	1-3	1	20	-0.71%	533.67%	533.66%	2434.68%	533.66%	2434.68%	533.66%
24	0.01	0.04	StRS	1-3	1	35	-1.17%	263.27%	263.27%	1353.10%	263.27%	1353.10%	263.27%
24	0.01	0.04	StRS	1-3	1	50	-0.60%	156.30%	156.30%	925.20%	156.30%	925.20%	156.30%
24	0.01	0.04	StRS	1-3	2	20	0.22%	530.21%	530.21%	2649.85%	530.21%	2649.85%	530.20%
24	0.01	0.04	StRS	1-3	2	35	1.37%	267.86%	267.86%	1509.20%	267.86%	1509.19%	267.87%
24	0.01	0.04	StRS	1-3	2	50	0.45%	156.05%	156.03%	1017.13%	156.03%	1017.13%	156.05%
24	0.01	0.04	Unequal	1-0	1	20	269.39%	7365.02%	7365.02%	7365.02%	7365.02%	7365.02%	7365.02%
24	0.01	0.04	Unequal	1-0	1	35	268.59%	4652.79%	4652.79%	4652.79%	4652.79%	4652.79%	4652.79%
24	0.01	0.04	Unequal	1-0	1	50	270.34%	3183.48%	3183.48%	3183.48%	3183.48%	3183.48%	3183.48%
24	0.01	0.04	Unequal	1-0	2	20	271.74%	7604.05%	7604.02%	8354.76%	7604.02%	8354.76%	7604.05%
24	0.01	0.04	Unequal	1-0	2	35	265.52%	4556.98%	4556.94%	5024.36%	4556.94%	5024.36%	4556.98%
24	0.01	0.04	Unequal	1-0	2	50	266.63%	3254.12%	3254.10%	3585.35%	3254.10%	3585.35%	3254.12%
24	0.01	0.04	Unequal	1-0,1-3	1	20	270.18%	3003.12%	3001.93%	9879.68%	3001.93%	9879.68%	3003.12%
24	0.01	0.04	Unequal	1-0,1-3	1	35	264.14%	1315.20%	1314.81%	5038.29%	1314.81%	5038.29%	1315.21%
24	0.01	0.04	Unequal	1-0,1-3	1	50	267.50%	813.66%	813.38%	3331.74%	813.38%	3331.74%	813.66%
24	0.01	0.04	Unequal	1-0,1-3	2	20	264.44%	2959.27%	2957.94%	11351.32%	2957.94%	11351.32%	2959.27%
24	0.01	0.04	Unequal	1-0,1-3	2	35	261.08%	1320.52%	1319.75%	5634.17%	1319.75%	5634.17%	1320.52%
24	0.01	0.04	Unequal	1-0,1-3	2	50	263.92%	795.61%	795.29%	3662.32%	795.29%	3662.32%	795.61%
24	0.01	0.04	Unequal	1-3	1	20	264.43%	1841.92%	1841.92%	7667.66%	1841.92%	7667.66%	1841.92%
24	0.01	0.04	Unequal	1-3	1	35	266.22%	1010.82%	1010.82%	4343.29%	1010.82%	4343.29%	1010.82%
24	0.01	0.04	Unequal	1-3	1	50	265.34%	673.53%	673.53%	2994.11%	673.53%	2994.11%	673.53%
24	0.01	0.04	Unequal	1-3	2	20	264.01%	1814.63%	1814.55%	8295.56%	1814.55%	8295.56%	1814.63%
24	0.01	0.04	Unequal	1-3	2	35	267.55%	1000.92%	1000.90%	4719.49%	1000.90%	4719.49%	1000.92%
24	0.01	0.04	Unequal	1-3	2	50	265.71%	669.52%	669.51%	3277.39%	669.51%	3277.39%	669.53%

Table SB17. Relative Bias of the ANC Year-to-Year Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	SRS	1-0	1	20	-2.38%	2900.08%	2900.08%	2900.08%	2900.08%	2900.08%	2900.08%
12	0.02	0	SRS	1-0	1	35	-1.40%	1623.96%	1623.96%	1623.96%	1623.96%	1623.96%	1623.96%
12	0.02	0	SRS	1-0	1	50	-1.67%	1099.04%	1099.04%	1099.04%	1099.04%	1099.04%	1099.04%
12	0.02	0	SRS	1-0	2	20	2.91%	3293.62%	3057.81%	3293.97%	3057.81%	3293.97%	3010.82%
12	0.02	0	SRS	1-0	2	35	2.23%	1819.07%	1685.91%	1819.35%	1685.91%	1819.35%	1663.72%
12	0.02	0	SRS	1-0	2	50	2.16%	1240.89%	1144.20%	1241.09%	1144.20%	1241.09%	1129.15%
12	0.02	0	SRS	1-0,1-3	1	20	-3.57%	1453.71%	1070.78%	1479.42%	1070.78%	1479.42%	521.49%
12	0.02	0	SRS	1-0,1-3	1	35	-3.05%	772.33%	428.28%	787.98%	428.28%	787.98%	177.56%
12	0.02	0	SRS	1-0,1-3	1	50	-2.57%	549.65%	240.64%	558.85%	240.64%	558.85%	91.07%
12	0.02	0	SRS	1-0,1-3	2	20	-0.65%	1423.39%	1105.77%	1452.53%	1105.77%	1452.53%	458.58%
12	0.02	0	SRS	1-0,1-3	2	35	0.59%	762.98%	448.04%	783.48%	448.04%	783.48%	152.36%
12	0.02	0	SRS	1-0,1-3	2	50	0.04%	536.87%	249.71%	549.78%	249.71%	549.78%	71.71%
12	0.02	0	SRS	1-3	1	20	3.91%	2890.17%	647.54%	2890.18%	647.54%	2890.18%	647.54%
12	0.02	0	SRS	1-3	1	35	2.71%	1581.67%	320.42%	1581.67%	320.42%	1581.67%	320.42%
12	0.02	0	SRS	1-3	1	50	3.89%	1085.66%	196.42%	1085.66%	196.42%	1085.66%	196.42%
12	0.02	0	SRS	1-3	2	20	0.82%	2959.14%	622.89%	2965.58%	622.89%	2965.58%	601.05%
12	0.02	0	SRS	1-3	2	35	0.49%	1657.40%	310.66%	1660.68%	310.66%	1660.68%	303.78%
12	0.02	0	SRS	1-3	2	50	-2.23%	1100.98%	179.86%	1109.88%	179.86%	1109.88%	175.22%
12	0.02	0	StRS	1-0	1	20	-50.04%	807.95%	807.95%	807.95%	807.95%	807.95%	807.95%
12	0.02	0	StRS	1-0	1	35	-49.17%	533.84%	533.84%	533.84%	533.84%	533.84%	533.84%
12	0.02	0	StRS	1-0	1	50	-48.72%	376.48%	376.48%	376.48%	376.48%	376.48%	376.48%
12	0.02	0	StRS	1-0	2	20	-51.19%	855.84%	793.32%	855.42%	793.32%	855.42%	776.19%
12	0.02	0	StRS	1-0	2	35	-49.85%	558.73%	519.78%	561.15%	519.78%	561.15%	501.91%
12	0.02	0	StRS	1-0	2	50	-49.64%	400.29%	368.84%	401.13%	368.84%	401.13%	358.60%

Table SB17 (continued). Relative Bias of the ANC Year-to-Year Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	StRS	1-0,1-3	1	20	-51.18%	313.80%	279.17%	316.97%	279.17%	316.97%	65.52%
12	0.02	0	StRS	1-0,1-3	1	35	-50.61%	162.47%	98.20%	168.92%	98.20%	168.92%	-16.49%
12	0.02	0	StRS	1-0,1-3	1	50	-50.33%	110.75%	37.08%	122.28%	37.08%	122.28%	-38.02%
12	0.02	0	StRS	1-0,1-3	2	20	-49.84%	306.46%	304.75%	309.50%	304.75%	309.50%	49.03%
12	0.02	0	StRS	1-0,1-3	2	35	-48.53%	164.93%	125.75%	173.71%	125.75%	173.71%	-22.93%
12	0.02	0	StRS	1-0,1-3	2	50	-48.21%	115.43%	58.13%	135.67%	58.13%	135.67%	-41.92%
12	0.02	0	StRS	1-3	1	20	-52.63%	1077.81%	195.14%	1077.81%	195.14%	1077.81%	195.14%
12	0.02	0	StRS	1-3	1	35	-51.59%	672.53%	93.16%	672.64%	93.16%	672.64%	93.16%
12	0.02	0	StRS	1-3	1	50	-51.94%	467.59%	41.90%	467.59%	41.90%	467.59%	41.90%
12	0.02	0	StRS	1-3	2	20	-51.87%	991.32%	165.57%	997.12%	165.57%	997.12%	150.52%
12	0.02	0	StRS	1-3	2	35	-49.68%	656.38%	83.30%	658.31%	83.30%	658.31%	72.89%
12	0.02	0	StRS	1-3	2	50	-50.25%	471.84%	38.59%	472.36%	38.59%	472.36%	31.05%
12	0.02	0	Unequal	1-0	1	20	-1.59%	1351.08%	1351.08%	1351.08%	1351.08%	1351.08%	1351.08%
12	0.02	0	Unequal	1-0	1	35	-1.98%	759.13%	759.13%	759.13%	759.13%	759.13%	759.13%
12	0.02	0	Unequal	1-0	1	50	-2.41%	471.32%	471.32%	471.32%	471.32%	471.32%	471.32%
12	0.02	0	Unequal	1-0	2	20	-3.04%	1437.51%	1333.12%	1437.43%	1333.12%	1437.43%	1309.38%
12	0.02	0	Unequal	1-0	2	35	-3.17%	811.72%	752.16%	811.85%	752.16%	811.85%	737.91%
12	0.02	0	Unequal	1-0	2	50	-3.57%	504.26%	463.73%	504.32%	463.73%	504.32%	453.90%
12	0.02	0	Unequal	1-0,1-3	1	20	1.18%	693.78%	508.43%	701.13%	508.43%	701.13%	217.51%
12	0.02	0	Unequal	1-0,1-3	1	35	1.12%	356.81%	178.17%	360.45%	178.17%	360.45%	45.35%
12	0.02	0	Unequal	1-0,1-3	1	50	0.68%	232.51%	76.28%	234.22%	76.28%	234.22%	-2.20%
12	0.02	0	Unequal	1-0,1-3	2	20	2.68%	640.37%	508.60%	645.91%	508.60%	645.91%	171.47%
12	0.02	0	Unequal	1-0,1-3	2	35	3.08%	342.17%	187.01%	346.27%	187.01%	346.27%	29.30%
12	0.02	0	Unequal	1-0,1-3	2	50	1.39%	217.31%	79.77%	219.30%	79.77%	219.30%	-14.45%

Table SB17 (continued). Relative Bias of the ANC Year-to-Year Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	Unequal	1-3	1	20	0.94%	1375.80%	268.95%	1375.80%	268.95%	1375.80%	268.95%
12	0.02	0	Unequal	1-3	1	35	-1.08%	727.27%	106.82%	727.27%	106.82%	727.27%	106.82%
12	0.02	0	Unequal	1-3	1	50	-0.34%	486.32%	46.58%	486.32%	46.58%	486.32%	46.58%
12	0.02	0	Unequal	1-3	2	20	2.61%	1467.75%	275.04%	1471.40%	275.04%	1471.40%	259.54%
12	0.02	0	Unequal	1-3	2	35	-0.16%	775.90%	108.94%	777.28%	108.94%	777.28%	101.25%
12	0.02	0	Unequal	1-3	2	50	1.59%	529.32%	50.38%	533.55%	50.38%	533.55%	44.22%
12	0.02	0.04	SRS	1-0	1	20	-5.62%	2818.04%	2818.04%	2818.04%	2818.04%	2818.04%	2818.04%
12	0.02	0.04	SRS	1-0	1	35	-4.83%	1570.77%	1570.77%	1570.77%	1570.77%	1570.77%	1570.77%
12	0.02	0.04	SRS	1-0	1	50	-5.71%	1053.66%	1053.66%	1053.66%	1053.66%	1053.66%	1053.66%
12	0.02	0.04	SRS	1-0	2	20	0.36%	3225.41%	2999.00%	3225.69%	2999.00%	3225.69%	2948.30%
12	0.02	0.04	SRS	1-0	2	35	-0.15%	1777.56%	1650.94%	1777.85%	1650.94%	1777.85%	1625.56%
12	0.02	0.04	SRS	1-0	2	50	-0.42%	1208.17%	1116.74%	1208.30%	1116.74%	1208.30%	1099.16%
12	0.02	0.04	SRS	1-0,1-3	1	20	-2.26%	1446.94%	1089.98%	1474.42%	1089.98%	1474.42%	518.78%
12	0.02	0.04	SRS	1-0,1-3	1	35	-2.35%	762.32%	432.76%	772.06%	432.76%	772.06%	174.38%
12	0.02	0.04	SRS	1-0,1-3	1	50	-2.94%	528.03%	239.65%	532.47%	239.65%	532.47%	84.71%
12	0.02	0.04	SRS	1-0,1-3	2	20	0.53%	1406.17%	1123.87%	1437.38%	1123.87%	1437.38%	452.26%
12	0.02	0.04	SRS	1-0,1-3	2	35	0.66%	729.84%	448.83%	749.56%	448.83%	749.56%	142.67%
12	0.02	0.04	SRS	1-0,1-3	2	50	-0.38%	508.30%	248.39%	520.15%	248.39%	520.15%	64.00%
12	0.02	0.04	SRS	1-3	1	20	-1.48%	2734.51%	608.63%	2734.51%	608.63%	2734.51%	608.63%
12	0.02	0.04	SRS	1-3	1	35	-1.92%	1507.31%	301.83%	1507.31%	301.83%	1507.31%	301.83%
12	0.02	0.04	SRS	1-3	1	50	-1.69%	1024.27%	181.07%	1024.27%	181.07%	1024.27%	181.07%
12	0.02	0.04	SRS	1-3	2	20	4.38%	3063.43%	649.72%	3075.36%	649.72%	3075.36%	624.95%
12	0.02	0.04	SRS	1-3	2	35	1.85%	1667.47%	318.00%	1675.52%	318.00%	1675.52%	306.10%
12	0.02	0.04	SRS	1-3	2	50	4.71%	1174.14%	198.82%	1183.32%	198.82%	1183.32%	191.99%

Table SB17 (continued). Relative Bias of the ANC Year-to-Year Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0.04	StRS	1-0	1	20	-50.24%	644.06%	644.06%	644.06%	644.06%	644.06%	644.06%
12	0.02	0.04	StRS	1-0	1	35	-49.42%	333.41%	333.41%	333.41%	333.41%	333.41%	333.41%
12	0.02	0.04	StRS	1-0	1	50	-48.99%	206.35%	206.35%	206.35%	206.35%	206.35%	206.35%
12	0.02	0.04	StRS	1-0	2	20	-49.45%	724.31%	666.05%	724.38%	666.05%	724.38%	655.62%
12	0.02	0.04	StRS	1-0	2	35	-49.00%	380.44%	346.38%	380.47%	346.38%	380.47%	339.26%
12	0.02	0.04	StRS	1-0	2	50	-48.37%	241.13%	216.75%	241.14%	216.75%	241.14%	212.70%
12	0.02	0.04	StRS	1-0,1-3	1	20	-52.64%	281.25%	187.48%	282.86%	187.48%	282.86%	52.50%
12	0.02	0.04	StRS	1-0,1-3	1	35	-50.83%	128.47%	35.00%	129.40%	35.00%	129.40%	-27.30%
12	0.02	0.04	StRS	1-0,1-3	1	50	-50.57%	72.67%	-11.38%	73.35%	-11.38%	73.35%	-49.22%
12	0.02	0.04	StRS	1-0,1-3	2	20	-51.91%	259.54%	186.41%	260.97%	186.41%	260.97%	31.83%
12	0.02	0.04	StRS	1-0,1-3	2	35	-50.50%	113.09%	33.65%	114.49%	33.65%	114.49%	-38.01%
12	0.02	0.04	StRS	1-0,1-3	2	50	-49.50%	64.43%	-11.67%	65.05%	-11.67%	65.05%	-55.67%
12	0.02	0.04	StRS	1-3	1	20	-49.31%	645.68%	86.53%	646.12%	86.53%	646.12%	86.53%
12	0.02	0.04	StRS	1-3	1	35	-48.65%	342.99%	10.75%	343.00%	10.75%	343.00%	10.75%
12	0.02	0.04	StRS	1-3	1	50	-47.55%	218.70%	-20.32%	218.70%	-20.32%	218.70%	-20.32%
12	0.02	0.04	StRS	1-3	2	20	-50.52%	671.43%	84.09%	672.76%	84.09%	672.76%	76.79%
12	0.02	0.04	StRS	1-3	2	35	-50.73%	352.50%	7.74%	352.78%	7.74%	352.78%	3.43%
12	0.02	0.04	StRS	1-3	2	50	-50.12%	226.36%	-22.62%	226.75%	-22.62%	226.75%	-25.21%
12	0.02	0.04	Unequal	1-0	1	20	3.96%	1476.12%	1476.12%	1476.12%	1476.12%	1476.12%	1476.12%
12	0.02	0.04	Unequal	1-0	1	35	3.51%	854.71%	854.71%	854.71%	854.71%	854.71%	854.71%
12	0.02	0.04	Unequal	1-0	1	50	3.32%	551.55%	551.55%	551.55%	551.55%	551.55%	551.55%
12	0.02	0.04	Unequal	1-0	2	20	-3.02%	1483.39%	1376.49%	1483.33%	1376.49%	1483.33%	1351.44%
12	0.02	0.04	Unequal	1-0	2	35	-2.78%	853.99%	793.44%	854.35%	793.44%	854.35%	776.76%
12	0.02	0.04	Unequal	1-0	2	50	-2.60%	555.90%	512.30%	556.21%	512.30%	556.21%	501.24%

Table SB17 (continued). Relative Bias of the ANC Year-to-Year Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0.04	Unequal	1-0,1-3	1	20	0.82%	672.10%	535.81%	683.31%	535.81%	683.31%	208.84%
12	0.02	0.04	Unequal	1-0,1-3	1	35	0.58%	362.26%	210.43%	376.69%	210.43%	376.69%	47.08%
12	0.02	0.04	Unequal	1-0,1-3	1	50	-0.03%	239.68%	96.28%	252.87%	96.28%	252.87%	-0.09%
12	0.02	0.04	Unequal	1-0,1-3	2	20	-0.81%	621.63%	531.61%	633.15%	531.61%	633.15%	164.60%
12	0.02	0.04	Unequal	1-0,1-3	2	35	0.62%	328.16%	206.72%	342.55%	206.72%	342.55%	25.21%
12	0.02	0.04	Unequal	1-0,1-3	2	50	-0.11%	218.47%	98.32%	231.25%	98.32%	231.25%	-14.14%
12	0.02	0.04	Unequal	1-3	1	20	5.42%	1650.76%	337.69%	1650.76%	337.69%	1650.76%	337.69%
12	0.02	0.04	Unequal	1-3	1	35	5.68%	912.31%	153.08%	912.31%	153.08%	912.31%	153.08%
12	0.02	0.04	Unequal	1-3	1	50	5.73%	629.74%	82.44%	629.74%	82.44%	629.74%	82.44%
12	0.02	0.04	Unequal	1-3	2	20	1.18%	1631.58%	316.43%	1635.32%	316.43%	1635.32%	296.82%
12	0.02	0.04	Unequal	1-3	2	35	-1.31%	894.46%	139.94%	900.09%	139.94%	900.09%	128.49%
12	0.02	0.04	Unequal	1-3	2	50	1.06%	630.34%	75.89%	634.21%	75.89%	634.21%	67.37%
24	0.01	0	SRS	1-0	1	20	-1.99%	3119.09%	3119.09%	3119.09%	3119.09%	3119.09%	3119.09%
24	0.01	0	SRS	1-0	1	35	-1.55%	1740.21%	1740.21%	1740.21%	1740.21%	1740.21%	1740.21%
24	0.01	0	SRS	1-0	1	50	-1.70%	1182.83%	1182.83%	1182.83%	1182.83%	1182.83%	1182.83%
24	0.01	0	SRS	1-0	2	20	1.94%	3491.05%	3245.12%	3491.27%	3245.12%	3491.27%	3191.80%
24	0.01	0	SRS	1-0	2	35	1.55%	1932.14%	1797.02%	1932.27%	1797.02%	1932.27%	1767.64%
24	0.01	0	SRS	1-0	2	50	1.63%	1323.88%	1225.72%	1323.96%	1225.72%	1323.96%	1205.22%
24	0.01	0	SRS	1-0,1-3	1	20	1.21%	1684.95%	1219.13%	1683.16%	1219.13%	1683.16%	613.98%
24	0.01	0	SRS	1-0,1-3	1	35	1.22%	939.17%	495.77%	933.74%	495.77%	933.74%	230.65%
24	0.01	0	SRS	1-0,1-3	1	50	1.52%	677.38%	285.17%	672.07%	285.17%	672.07%	128.64%
24	0.01	0	SRS	1-0,1-3	2	20	2.54%	1618.44%	1235.70%	1620.00%	1235.70%	1620.00%	530.10%
24	0.01	0	SRS	1-0,1-3	2	35	2.34%	906.93%	502.22%	903.07%	502.22%	903.07%	194.45%
24	0.01	0	SRS	1-0,1-3	2	50	2.85%	659.61%	290.12%	655.89%	290.12%	655.89%	104.80%

Table SB17 (continued). Relative Bias of the ANC Year-to-Year Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0	SRS	1-3	1	20	-1.85%	3059.62%	689.90%	3059.61%	689.90%	3059.61%	689.90%
24	0.01	0	SRS	1-3	1	35	-0.03%	1731.16%	357.79%	1731.16%	357.79%	1731.16%	357.79%
24	0.01	0	SRS	1-3	1	50	-0.91%	1167.29%	216.82%	1167.29%	216.82%	1167.29%	216.82%
24	0.01	0	SRS	1-3	2	20	2.21%	3421.03%	721.92%	3423.95%	721.92%	3423.95%	706.90%
24	0.01	0	SRS	1-3	2	35	1.88%	1896.04%	366.35%	1898.03%	366.35%	1898.03%	358.61%
24	0.01	0	SRS	1-3	2	50	2.94%	1310.25%	228.67%	1311.93%	228.67%	1311.93%	223.18%
24	0.01	0	StRS	1-0	1	20	-52.08%	688.90%	688.90%	688.90%	688.90%	688.90%	688.90%
24	0.01	0	StRS	1-0	1	35	-51.16%	363.93%	363.93%	363.93%	363.93%	363.93%	363.93%
24	0.01	0	StRS	1-0	1	50	-50.91%	228.83%	228.83%	228.83%	228.83%	228.83%	228.83%
24	0.01	0	StRS	1-0	2	20	-50.61%	786.52%	723.21%	786.55%	723.21%	786.55%	712.64%
24	0.01	0	StRS	1-0	2	35	-49.75%	421.35%	384.58%	421.41%	384.58%	421.41%	376.66%
24	0.01	0	StRS	1-0	2	50	-49.39%	271.43%	245.66%	271.46%	245.66%	271.46%	240.47%
24	0.01	0	StRS	1-0,1-3	1	20	-50.96%	332.55%	227.24%	334.71%	227.24%	334.71%	73.02%
24	0.01	0	StRS	1-0,1-3	1	35	-50.21%	164.17%	57.44%	166.59%	57.44%	166.59%	-15.95%
24	0.01	0	StRS	1-0,1-3	1	50	-49.47%	107.57%	7.89%	110.99%	7.89%	110.99%	-38.95%
24	0.01	0	StRS	1-0,1-3	2	20	-53.33%	288.42%	207.59%	290.85%	207.59%	290.85%	42.42%
24	0.01	0	StRS	1-0,1-3	2	35	-51.96%	144.07%	51.69%	146.51%	51.69%	146.52%	-29.00%
24	0.01	0	StRS	1-0,1-3	2	50	-51.33%	90.55%	3.56%	94.55%	3.56%	94.55%	-48.63%
24	0.01	0	StRS	1-3	1	20	-51.33%	748.73%	112.18%	748.73%	112.18%	748.73%	112.18%
24	0.01	0	StRS	1-3	1	35	-49.83%	433.17%	33.29%	433.17%	33.29%	433.17%	33.29%
24	0.01	0	StRS	1-3	1	50	-49.81%	286.21%	-3.45%	286.21%	-3.45%	286.21%	-3.45%
24	0.01	0	StRS	1-3	2	20	-51.34%	793.50%	108.48%	793.92%	108.48%	793.92%	104.76%
24	0.01	0	StRS	1-3	2	35	-49.65%	467.61%	32.48%	468.07%	32.48%	468.07%	29.74%
24	0.01	0	StRS	1-3	2	50	-49.29%	318.61%	-2.06%	319.06%	-2.06%	319.06%	-4.07%

Table SB17 (continued). Relative Bias of the ANC Year-to-Year Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0	Unequal	1-0	1	20	2.59%	1489.12%	1489.12%	1489.12%	1489.12%	1489.12%	1489.12%
24	0.01	0	Unequal	1-0	1	35	2.64%	845.54%	845.54%	845.54%	845.54%	845.54%	845.54%
24	0.01	0	Unequal	1-0	1	50	2.99%	541.11%	541.11%	541.11%	541.11%	541.11%	541.11%
24	0.01	0	Unequal	1-0	2	20	-1.55%	1543.68%	1431.09%	1543.54%	1431.09%	1543.54%	1406.71%
24	0.01	0	Unequal	1-0	2	35	-0.89%	884.52%	818.92%	884.42%	818.92%	884.42%	804.82%
24	0.01	0	Unequal	1-0	2	50	-1.12%	565.87%	520.49%	565.86%	520.49%	565.86%	510.38%
24	0.01	0	Unequal	1-0,1-3	1	20	-1.48%	729.97%	522.56%	731.89%	522.56%	731.89%	231.99%
24	0.01	0	Unequal	1-0,1-3	1	35	-1.77%	394.11%	188.14%	396.03%	188.14%	396.03%	57.22%
24	0.01	0	Unequal	1-0,1-3	1	50	-1.74%	262.55%	83.68%	263.96%	83.68%	263.96%	6.63%
24	0.01	0	Unequal	1-0,1-3	2	20	-0.46%	687.04%	524.58%	689.22%	524.58%	689.22%	188.58%
24	0.01	0	Unequal	1-0,1-3	2	35	-1.24%	379.34%	190.28%	381.23%	190.28%	381.23%	40.17%
24	0.01	0	Unequal	1-0,1-3	2	50	-1.02%	258.43%	84.69%	259.98%	84.69%	259.98%	-3.37%
24	0.01	0	Unequal	1-3	1	20	-0.40%	1521.26%	305.32%	1521.26%	305.32%	1521.26%	305.32%
24	0.01	0	Unequal	1-3	1	35	0.37%	826.05%	131.51%	826.05%	131.51%	826.05%	131.51%
24	0.01	0	Unequal	1-3	1	50	0.17%	545.37%	61.34%	545.37%	61.34%	545.37%	61.34%
24	0.01	0	Unequal	1-3	2	20	-1.40%	1605.07%	298.18%	1606.74%	298.18%	1606.74%	290.74%
24	0.01	0	Unequal	1-3	2	35	-0.97%	872.13%	127.40%	872.89%	127.40%	872.89%	123.36%
24	0.01	0	Unequal	1-3	2	50	-1.38%	577.94%	58.30%	578.46%	58.30%	578.46%	55.36%
24	0.01	0.04	SRS	1-0	1	20	-0.67%	3188.04%	3188.04%	3188.04%	3188.04%	3188.04%	3188.04%
24	0.01	0.04	SRS	1-0	1	35	-0.55%	1771.52%	1771.52%	1771.52%	1771.52%	1771.52%	1771.52%
24	0.01	0.04	SRS	1-0	1	50	-0.68%	1203.35%	1203.35%	1203.35%	1203.35%	1203.35%	1203.35%
24	0.01	0.04	SRS	1-0	2	20	-0.37%	3439.57%	3197.23%	3439.89%	3197.23%	3439.89%	3144.61%
24	0.01	0.04	SRS	1-0	2	35	-0.49%	1904.94%	1772.34%	1905.11%	1772.34%	1905.11%	1742.63%
24	0.01	0.04	SRS	1-0	2	50	0.22%	1311.01%	1214.97%	1311.17%	1214.97%	1311.17%	1193.43%

Table SB17 (continued). Relative Bias of the ANC Year-to-Year Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0.04	SRS	1-0,1-3	1	20	2.89%	1709.00%	1248.08%	1710.58%	1248.08%	1710.58%	623.60%
24	0.01	0.04	SRS	1-0,1-3	1	35	2.72%	940.10%	506.62%	936.95%	506.62%	936.95%	230.94%
24	0.01	0.04	SRS	1-0,1-3	1	50	2.30%	670.71%	289.07%	666.38%	289.07%	666.38%	126.68%
24	0.01	0.04	SRS	1-0,1-3	2	20	-2.61%	1524.71%	1176.43%	1526.33%	1176.43%	1526.33%	495.73%
24	0.01	0.04	SRS	1-0,1-3	2	35	-2.51%	844.91%	475.98%	842.48%	475.98%	842.48%	176.31%
24	0.01	0.04	SRS	1-0,1-3	2	50	-2.15%	611.88%	272.31%	608.65%	272.31%	608.65%	91.93%
24	0.01	0.04	SRS	1-3	1	20	3.14%	3231.58%	732.90%	3231.58%	732.90%	3231.58%	732.90%
24	0.01	0.04	SRS	1-3	1	35	2.57%	1783.34%	370.83%	1783.34%	370.83%	1783.34%	370.83%
24	0.01	0.04	SRS	1-3	1	50	2.00%	1206.16%	226.54%	1206.16%	226.54%	1206.16%	226.54%
24	0.01	0.04	SRS	1-3	2	20	-1.51%	3307.53%	695.23%	3311.13%	695.23%	3311.13%	680.89%
24	0.01	0.04	SRS	1-3	2	35	-1.99%	1825.61%	350.00%	1827.27%	350.00%	1827.27%	342.43%
24	0.01	0.04	SRS	1-3	2	50	-2.10%	1245.68%	213.66%	1246.36%	213.66%	1246.36%	208.38%
24	0.01	0.04	StRS	1-0	1	20	-50.97%	710.85%	710.85%	710.85%	710.85%	710.85%	710.85%
24	0.01	0.04	StRS	1-0	1	35	-49.72%	376.43%	376.43%	376.43%	376.43%	376.43%	376.43%
24	0.01	0.04	StRS	1-0	1	50	-49.24%	236.09%	236.09%	236.09%	236.09%	236.09%	236.09%
24	0.01	0.04	StRS	1-0	2	20	-50.35%	769.41%	707.75%	769.46%	707.75%	769.46%	696.96%
24	0.01	0.04	StRS	1-0	2	35	-49.93%	404.96%	369.24%	404.99%	369.24%	404.99%	361.68%
24	0.01	0.04	StRS	1-0	2	50	-49.34%	257.33%	232.33%	257.35%	232.33%	257.35%	227.55%
24	0.01	0.04	StRS	1-0,1-3	1	20	-50.41%	330.52%	221.29%	332.52%	221.29%	332.52%	72.21%
24	0.01	0.04	StRS	1-0,1-3	1	35	-49.15%	163.63%	51.27%	163.68%	51.27%	163.68%	-16.12%
24	0.01	0.04	StRS	1-0,1-3	1	50	-49.07%	100.20%	-0.51%	99.79%	-0.51%	99.79%	-41.12%
24	0.01	0.04	StRS	1-0,1-3	2	20	-51.27%	297.64%	211.25%	299.39%	211.25%	299.39%	45.80%
24	0.01	0.04	StRS	1-0,1-3	2	35	-50.34%	143.96%	46.61%	144.35%	46.61%	144.34%	-29.03%
24	0.01	0.04	StRS	1-0,1-3	2	50	-50.00%	89.42%	-3.36%	89.10%	-3.36%	89.10%	-48.93%

Table SB17 (continued). Relative Bias of the ANC Year-to-Year Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0.04	StRS	1-3	1	20	-50.04%	715.43%	103.86%	715.43%	103.86%	715.43%	103.86%
24	0.01	0.04	StRS	1-3	1	35	-49.11%	385.30%	21.33%	385.30%	21.33%	385.30%	21.33%
24	0.01	0.04	StRS	1-3	1	50	-48.48%	245.57%	-13.61%	245.57%	-13.61%	245.57%	-13.61%
24	0.01	0.04	StRS	1-3	2	20	-50.35%	784.54%	106.03%	784.92%	106.03%	784.92%	102.71%
24	0.01	0.04	StRS	1-3	2	35	-49.14%	426.23%	22.58%	426.49%	22.58%	426.49%	20.28%
24	0.01	0.04	StRS	1-3	2	50	-48.81%	275.08%	-12.59%	275.25%	-12.59%	275.25%	-14.04%
24	0.01	0.04	Unequal	1-0	1	20	-1.75%	1425.57%	1425.57%	1425.57%	1425.57%	1425.57%	1425.57%
24	0.01	0.04	Unequal	1-0	1	35	-1.31%	826.32%	826.32%	826.32%	826.32%	826.32%	826.32%
24	0.01	0.04	Unequal	1-0	1	50	-1.50%	528.24%	528.24%	528.24%	528.24%	528.24%	528.24%
24	0.01	0.04	Unequal	1-0	2	20	0.31%	1570.10%	1456.04%	1570.11%	1456.04%	1570.11%	1430.92%
24	0.01	0.04	Unequal	1-0	2	35	-0.20%	903.01%	836.99%	903.20%	836.99%	903.20%	821.81%
24	0.01	0.04	Unequal	1-0	2	50	-0.22%	586.27%	540.12%	586.38%	540.12%	586.38%	529.08%
24	0.01	0.04	Unequal	1-0,1-3	1	20	0.98%	759.60%	551.06%	761.85%	551.06%	761.85%	243.84%
24	0.01	0.04	Unequal	1-0,1-3	1	35	1.08%	429.01%	218.82%	432.20%	218.82%	432.20%	68.32%
24	0.01	0.04	Unequal	1-0,1-3	1	50	1.23%	296.81%	110.10%	303.31%	110.10%	303.31%	16.71%
24	0.01	0.04	Unequal	1-0,1-3	2	20	2.17%	720.88%	560.75%	722.66%	560.75%	722.66%	200.99%
24	0.01	0.04	Unequal	1-0,1-3	2	35	1.64%	409.62%	224.84%	412.29%	224.84%	412.29%	49.03%
24	0.01	0.04	Unequal	1-0,1-3	2	50	1.72%	284.51%	114.52%	291.50%	114.52%	291.50%	3.67%
24	0.01	0.04	Unequal	1-3	1	20	0.08%	1639.75%	334.94%	1639.75%	334.94%	1639.75%	334.94%
24	0.01	0.04	Unequal	1-3	1	35	0.20%	946.94%	161.73%	946.94%	161.73%	946.94%	161.73%
24	0.01	0.04	Unequal	1-3	1	50	0.69%	673.48%	93.37%	673.48%	93.37%	673.48%	93.37%
24	0.01	0.04	Unequal	1-3	2	20	2.12%	1803.45%	344.64%	1804.98%	344.64%	1804.98%	336.21%
24	0.01	0.04	Unequal	1-3	2	35	0.99%	1021.84%	162.90%	1022.68%	162.90%	1022.68%	157.76%
24	0.01	0.04	Unequal	1-3	2	50	1.55%	731.95%	94.74%	733.05%	94.74%	733.05%	90.66%

Table SB18. Relative Bias of the modified ANC Year-to-Year Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	SRS	1-0	1	20	73.07%	4857.25%	4857.25%	4857.25%	4857.25%	4857.25%	4857.25%
12	0.02	0	SRS	1-0	1	35	30.35%	2082.21%	2082.21%	2082.21%	2082.21%	2082.21%	2082.21%
12	0.02	0	SRS	1-0	1	50	12.63%	1230.14%	1230.14%	1230.14%	1230.14%	1230.14%	1230.14%
12	0.02	0	SRS	1-0	2	20	94.07%	5815.10%	5391.43%	5812.68%	5391.43%	5813.67%	5323.12%
12	0.02	0	SRS	1-0	2	35	28.03%	2165.38%	1996.20%	2163.80%	1996.20%	2163.80%	1981.09%
12	0.02	0	SRS	1-0	2	50	18.47%	1392.69%	1287.10%	1392.17%	1287.10%	1392.17%	1267.94%
12	0.02	0	SRS	1-0,1-3	1	20	62.53%	2424.00%	1603.05%	2256.36%	1603.05%	2256.36%	909.86%
12	0.02	0	SRS	1-0,1-3	1	35	29.08%	1150.97%	506.93%	1078.69%	506.93%	1078.69%	297.96%
12	0.02	0	SRS	1-0,1-3	1	50	22.49%	751.04%	279.73%	715.97%	279.73%	715.97%	152.48%
12	0.02	0	SRS	1-0,1-3	2	20	96.46%	2701.50%	1965.79%	2554.67%	1965.79%	2554.67%	928.29%
12	0.02	0	SRS	1-0,1-3	2	35	41.75%	1158.63%	562.53%	1059.03%	562.53%	1059.03%	268.50%
12	0.02	0	SRS	1-0,1-3	2	50	30.20%	749.24%	294.89%	702.40%	294.89%	702.40%	129.52%
12	0.02	0	SRS	1-3	1	20	87.89%	4530.09%	1058.05%	4532.19%	1058.05%	4532.19%	1058.05%
12	0.02	0	SRS	1-3	1	35	51.54%	2064.78%	439.29%	2068.08%	439.29%	2068.08%	439.29%
12	0.02	0	SRS	1-3	1	50	21.29%	1118.80%	204.02%	1121.09%	204.02%	1121.09%	204.02%
12	0.02	0	SRS	1-3	2	20	117.06%	5268.36%	1198.94%	5281.83%	1198.94%	5281.83%	1130.95%
12	0.02	0	SRS	1-3	2	35	56.20%	2179.77%	439.87%	2172.47%	439.87%	2172.47%	424.52%
12	0.02	0	SRS	1-3	2	50	31.59%	1268.22%	228.32%	1271.42%	228.32%	1271.42%	214.30%
12	0.02	0	StRS	1-0	1	20	37.03%	2016.02%	2016.02%	2016.02%	2016.02%	2016.02%	2016.02%
12	0.02	0	StRS	1-0	1	35	-10.69%	702.56%	702.56%	702.56%	702.56%	702.56%	702.56%
12	0.02	0	StRS	1-0	1	50	-25.10%	383.07%	383.07%	383.07%	383.07%	383.07%	383.07%
12	0.02	0	StRS	1-0	2	20	36.77%	2221.97%	2032.09%	2219.78%	2032.09%	2219.68%	2028.52%
12	0.02	0	StRS	1-0	2	35	0.07%	896.17%	820.46%	896.06%	820.46%	896.10%	810.81%
12	0.02	0	StRS	1-0	2	50	-26.29%	414.92%	377.93%	414.69%	377.93%	414.60%	372.03%

Table SB18 (continued). Relative Bias of the modified ANC Year-to-Year Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	StRS	1-0,1-3	1	20	35.57%	1166.95%	742.36%	1133.75%	742.36%	1133.75%	407.01%
12	0.02	0	StRS	1-0,1-3	1	35	-1.40%	356.67%	136.73%	345.97%	136.73%	345.97%	45.77%
12	0.02	0	StRS	1-0,1-3	1	50	-17.88%	187.12%	22.30%	184.34%	22.30%	184.34%	-15.30%
12	0.02	0	StRS	1-0,1-3	2	20	57.69%	1181.37%	773.41%	1115.43%	773.41%	1115.43%	370.64%
12	0.02	0	StRS	1-0,1-3	2	35	1.98%	352.60%	143.62%	345.13%	143.62%	345.13%	32.32%
12	0.02	0	StRS	1-0,1-3	2	50	-10.64%	240.66%	51.32%	234.03%	51.32%	234.03%	-8.01%
12	0.02	0	StRS	1-3	1	20	47.75%	1925.18%	407.19%	1929.36%	407.19%	1929.36%	407.19%
12	0.02	0	StRS	1-3	1	35	15.32%	742.55%	111.11%	743.96%	111.11%	743.96%	111.11%
12	0.02	0	StRS	1-3	1	50	-14.92%	373.19%	18.66%	375.03%	18.66%	375.03%	18.66%
12	0.02	0	StRS	1-3	2	20	71.62%	2148.58%	436.86%	2151.64%	436.86%	2151.64%	418.21%
12	0.02	0	StRS	1-3	2	35	17.83%	907.51%	137.26%	903.03%	137.26%	903.03%	129.64%
12	0.02	0	StRS	1-3	2	50	-6.77%	430.95%	27.18%	432.23%	27.18%	432.23%	21.47%
12	0.02	0	Unequal	1-0	1	20	64.36%	2223.54%	2223.54%	2223.54%	2223.54%	2223.54%	2223.54%
12	0.02	0	Unequal	1-0	1	35	29.19%	975.42%	975.42%	975.42%	975.42%	975.42%	975.42%
12	0.02	0	Unequal	1-0	1	50	5.37%	480.92%	480.92%	480.92%	480.92%	480.92%	480.92%
12	0.02	0	Unequal	1-0	2	20	68.80%	2494.15%	2294.62%	2492.46%	2294.62%	2492.03%	2279.31%
12	0.02	0	Unequal	1-0	2	35	19.86%	1015.36%	921.55%	1014.86%	921.55%	1014.91%	925.07%
12	0.02	0	Unequal	1-0	2	50	12.33%	581.45%	531.65%	580.94%	531.65%	581.00%	524.66%
12	0.02	0	Unequal	1-0,1-3	1	20	99.46%	1399.90%	930.82%	1345.52%	930.82%	1345.52%	500.20%
12	0.02	0	Unequal	1-0,1-3	1	35	41.23%	532.29%	212.98%	506.82%	212.98%	506.82%	101.00%
12	0.02	0	Unequal	1-0,1-3	1	50	22.74%	293.86%	82.54%	279.46%	82.54%	279.46%	15.85%
12	0.02	0	Unequal	1-0,1-3	2	20	94.08%	1293.59%	902.89%	1225.03%	902.89%	1225.03%	410.77%
12	0.02	0	Unequal	1-0,1-3	2	35	58.29%	537.75%	268.97%	510.19%	268.97%	510.19%	87.02%
12	0.02	0	Unequal	1-0,1-3	2	50	29.12%	320.04%	89.68%	303.08%	89.68%	303.08%	13.93%

Table SB18 (continued). Relative Bias of the modified ANC Year-to-Year Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	Unequal	1-3	1	20	102.22%	2383.24%	525.02%	2399.29%	525.02%	2399.29%	525.02%
12	0.02	0	Unequal	1-3	1	35	37.65%	858.74%	140.14%	862.71%	140.14%	862.71%	140.14%
12	0.02	0	Unequal	1-3	1	50	17.67%	473.11%	43.62%	474.38%	43.62%	474.38%	43.62%
12	0.02	0	Unequal	1-3	2	20	116.69%	2539.56%	518.13%	2520.13%	518.13%	2520.13%	504.23%
12	0.02	0	Unequal	1-3	2	35	52.74%	987.33%	160.67%	984.95%	160.67%	984.95%	150.25%
12	0.02	0	Unequal	1-3	2	50	38.26%	621.02%	71.21%	620.08%	71.21%	620.08%	65.52%
12	0.02	0.04	SRS	1-0	1	20	48.25%	4414.72%	4414.72%	4414.72%	4414.72%	4414.72%	4414.72%
12	0.02	0.04	SRS	1-0	1	35	28.17%	2172.24%	2172.24%	2172.24%	2172.24%	2172.24%	2172.24%
12	0.02	0.04	SRS	1-0	1	50	2.84%	1183.60%	1183.60%	1183.60%	1183.60%	1183.60%	1183.60%
12	0.02	0.04	SRS	1-0	2	20	75.10%	5677.23%	5203.67%	5677.38%	5203.67%	5677.85%	5197.88%
12	0.02	0.04	SRS	1-0	2	35	28.74%	2340.10%	2155.83%	2339.02%	2155.83%	2339.02%	2142.25%
12	0.02	0.04	SRS	1-0	2	50	9.97%	1362.94%	1258.69%	1362.57%	1258.69%	1362.57%	1240.58%
12	0.02	0.04	SRS	1-0,1-3	1	20	91.27%	2979.93%	2081.28%	2756.34%	2081.28%	2756.34%	1131.93%
12	0.02	0.04	SRS	1-0,1-3	1	35	37.25%	1126.84%	587.80%	1064.30%	587.80%	1064.30%	291.83%
12	0.02	0.04	SRS	1-0,1-3	1	50	15.25%	688.66%	265.70%	668.96%	265.70%	668.96%	133.38%
12	0.02	0.04	SRS	1-0,1-3	2	20	78.56%	2640.87%	1880.51%	2277.55%	1880.51%	2277.55%	904.99%
12	0.02	0.04	SRS	1-0,1-3	2	35	37.87%	1142.46%	562.65%	1025.83%	562.65%	1025.83%	265.17%
12	0.02	0.04	SRS	1-0,1-3	2	50	18.12%	663.71%	264.54%	610.72%	264.54%	610.72%	106.88%
12	0.02	0.04	SRS	1-3	1	20	84.87%	4509.37%	1053.72%	4515.04%	1053.72%	4515.04%	1053.72%
12	0.02	0.04	SRS	1-3	1	35	38.08%	1915.28%	405.90%	1922.58%	405.90%	1922.58%	405.90%
12	0.02	0.04	SRS	1-3	1	50	25.77%	1211.90%	228.84%	1216.06%	228.84%	1216.06%	228.84%
12	0.02	0.04	SRS	1-3	2	20	106.02%	5118.37%	1139.24%	5066.22%	1139.24%	5066.22%	1098.81%
12	0.02	0.04	SRS	1-3	2	35	56.46%	2216.12%	458.71%	2226.57%	458.71%	2226.57%	436.05%
12	0.02	0.04	SRS	1-3	2	50	20.81%	1156.78%	197.93%	1145.54%	197.93%	1145.54%	188.77%

Table SB18 (continued). Relative Bias of the modified ANC Year-to-Year Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0.04	StRS	1-0	1	20	18.04%	1668.30%	1668.30%	1668.30%	1668.30%	1668.30%	1668.30%
12	0.02	0.04	StRS	1-0	1	35	-18.35%	605.60%	605.60%	605.60%	605.60%	605.60%	605.60%
12	0.02	0.04	StRS	1-0	1	50	-23.74%	335.96%	335.96%	335.96%	335.96%	335.96%	335.96%
12	0.02	0.04	StRS	1-0	2	20	29.61%	1940.56%	1779.30%	1940.89%	1779.30%	1941.13%	1769.28%
12	0.02	0.04	StRS	1-0	2	35	-8.43%	765.10%	703.00%	764.31%	703.00%	764.55%	690.95%
12	0.02	0.04	StRS	1-0	2	50	-24.56%	373.75%	340.85%	373.78%	340.85%	373.74%	334.24%
12	0.02	0.04	StRS	1-0,1-3	1	20	37.55%	1128.55%	647.66%	1111.36%	647.66%	1111.36%	391.93%
12	0.02	0.04	StRS	1-0,1-3	1	35	12.59%	415.45%	165.13%	411.19%	165.13%	411.19%	64.53%
12	0.02	0.04	StRS	1-0,1-3	1	50	-17.80%	176.41%	13.93%	172.19%	13.93%	172.19%	-18.43%
12	0.02	0.04	StRS	1-0,1-3	2	20	62.76%	1140.48%	798.24%	1138.08%	798.24%	1138.08%	355.03%
12	0.02	0.04	StRS	1-0,1-3	2	35	23.43%	440.81%	182.73%	425.17%	182.73%	425.17%	57.45%
12	0.02	0.04	StRS	1-0,1-3	2	50	-9.96%	216.36%	23.96%	209.29%	23.96%	209.29%	-14.75%
12	0.02	0.04	StRS	1-3	1	20	47.01%	1673.27%	344.47%	1678.55%	344.47%	1678.55%	344.47%
12	0.02	0.04	StRS	1-3	1	35	13.72%	734.12%	108.80%	735.60%	108.80%	735.60%	108.80%
12	0.02	0.04	StRS	1-3	1	50	-13.33%	320.79%	5.93%	323.62%	5.93%	323.62%	5.93%
12	0.02	0.04	StRS	1-3	2	20	59.21%	1808.28%	356.49%	1814.65%	356.49%	1814.65%	337.46%
12	0.02	0.04	StRS	1-3	2	35	22.09%	722.27%	95.78%	722.96%	95.78%	722.96%	87.83%
12	0.02	0.04	StRS	1-3	2	50	-12.69%	344.79%	6.77%	347.97%	6.77%	347.97%	3.36%
12	0.02	0.04	Unequal	1-0	1	20	62.60%	2470.19%	2470.19%	2470.19%	2470.19%	2470.19%	2470.19%
12	0.02	0.04	Unequal	1-0	1	35	11.44%	931.47%	931.47%	931.47%	931.47%	931.47%	931.47%
12	0.02	0.04	Unequal	1-0	1	50	5.28%	552.57%	552.57%	552.57%	552.57%	552.57%	552.57%
12	0.02	0.04	Unequal	1-0	2	20	62.71%	2583.48%	2371.13%	2583.54%	2371.13%	2583.44%	2358.25%
12	0.02	0.04	Unequal	1-0	2	35	34.14%	1245.76%	1136.78%	1245.33%	1136.78%	1246.08%	1136.97%
12	0.02	0.04	Unequal	1-0	2	50	15.41%	701.73%	640.48%	701.61%	640.48%	701.23%	634.92%

Table SB18 (continued). Relative Bias of the modified ANC Year-to-Year Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0.04	Unequal	1-0,1-3	1	20	89.45%	1378.76%	1026.03%	1298.94%	1026.03%	1298.94%	491.46%
12	0.02	0.04	Unequal	1-0,1-3	1	35	38.48%	552.75%	273.97%	521.25%	273.97%	521.25%	107.68%
12	0.02	0.04	Unequal	1-0,1-3	1	50	17.71%	368.82%	136.94%	354.94%	136.94%	354.94%	37.70%
12	0.02	0.04	Unequal	1-0,1-3	2	20	88.98%	1318.55%	1045.96%	1164.82%	1045.96%	1164.82%	420.83%
12	0.02	0.04	Unequal	1-0,1-3	2	35	38.51%	573.54%	307.41%	536.56%	307.41%	536.56%	97.28%
12	0.02	0.04	Unequal	1-0,1-3	2	50	33.74%	367.44%	151.23%	346.01%	151.23%	346.01%	25.87%
12	0.02	0.04	Unequal	1-3	1	20	75.58%	2456.78%	539.22%	2455.80%	539.22%	2455.80%	539.22%
12	0.02	0.04	Unequal	1-3	1	35	27.32%	1167.53%	218.83%	1176.31%	218.83%	1176.31%	218.83%
12	0.02	0.04	Unequal	1-3	1	50	21.85%	743.60%	119.81%	842.02%	119.81%	842.02%	119.81%
12	0.02	0.04	Unequal	1-3	2	20	78.66%	3255.36%	686.99%	3247.97%	686.99%	3247.97%	680.30%
12	0.02	0.04	Unequal	1-3	2	35	49.01%	1251.31%	224.47%	1249.50%	224.47%	1249.50%	210.64%
12	0.02	0.04	Unequal	1-3	2	50	31.02%	926.21%	151.42%	888.51%	151.42%	888.51%	135.22%
24	0.01	0	SRS	1-0	1	20	36.37%	4434.82%	4434.82%	4434.82%	4434.82%	4434.82%	4434.82%
24	0.01	0	SRS	1-0	1	35	16.27%	2117.46%	2117.46%	2117.46%	2117.46%	2117.46%	2117.46%
24	0.01	0	SRS	1-0	1	50	-7.50%	1138.10%	1138.10%	1138.10%	1138.10%	1138.10%	1138.10%
24	0.01	0	SRS	1-0	2	20	31.99%	4639.82%	4270.70%	4637.48%	4270.70%	4639.10%	4243.04%
24	0.01	0	SRS	1-0	2	35	15.87%	2286.93%	2104.51%	2286.84%	2104.51%	2286.84%	2093.64%
24	0.01	0	SRS	1-0	2	50	3.06%	1383.46%	1275.80%	1383.37%	1275.80%	1383.37%	1259.89%
24	0.01	0	SRS	1-0,1-3	1	20	49.00%	2742.83%	1834.24%	2698.55%	1834.24%	2698.55%	1038.96%
24	0.01	0	SRS	1-0,1-3	1	35	15.00%	1156.28%	574.87%	1154.01%	574.87%	1154.01%	300.06%
24	0.01	0	SRS	1-0,1-3	1	50	5.88%	748.70%	301.71%	750.59%	301.71%	750.59%	150.30%
24	0.01	0	SRS	1-0,1-3	2	20	56.20%	2694.57%	1917.85%	2634.34%	1917.85%	2634.34%	924.60%
24	0.01	0	SRS	1-0,1-3	2	35	23.88%	1168.90%	620.29%	1159.83%	620.29%	1163.66%	271.64%
24	0.01	0	SRS	1-0,1-3	2	50	6.51%	757.93%	301.26%	759.20%	301.26%	759.20%	132.18%

Table SB18 (continued). Relative Bias of the modified ANC Year-to-Year Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0	SRS	1-3	1	20	44.78%	4441.94%	1040.58%	4456.53%	1040.58%	4456.53%	1040.58%
24	0.01	0	SRS	1-3	1	35	16.19%	2002.77%	425.45%	2008.98%	425.45%	2008.98%	425.45%
24	0.01	0	SRS	1-3	1	50	6.53%	1261.14%	240.23%	1261.13%	240.23%	1261.13%	240.23%
24	0.01	0	SRS	1-3	2	20	44.81%	4689.00%	1021.06%	4749.28%	1021.06%	4746.08%	1010.54%
24	0.01	0	SRS	1-3	2	35	4.91%	1919.24%	369.19%	1918.19%	369.19%	1918.19%	364.36%
24	0.01	0	SRS	1-3	2	50	12.23%	1426.34%	254.93%	1432.78%	254.93%	1432.78%	251.95%
24	0.01	0	StRS	1-0	1	20	-12.91%	1463.18%	1463.18%	1463.18%	1463.18%	1463.18%	1463.18%
24	0.01	0	StRS	1-0	1	35	-28.96%	648.04%	648.04%	648.04%	648.04%	648.04%	648.04%
24	0.01	0	StRS	1-0	1	50	-36.96%	358.23%	358.23%	358.23%	358.23%	358.23%	358.23%
24	0.01	0	StRS	1-0	2	20	-7.70%	1871.61%	1721.12%	1871.11%	1721.12%	1871.42%	1707.44%
24	0.01	0	StRS	1-0	2	35	-21.20%	787.91%	716.97%	787.45%	716.97%	787.74%	711.70%
24	0.01	0	StRS	1-0	2	50	-38.84%	371.15%	335.21%	371.08%	335.21%	371.07%	331.85%
24	0.01	0	StRS	1-0,1-3	1	20	11.60%	1086.92%	701.67%	1050.86%	701.67%	1050.86%	374.83%
24	0.01	0	StRS	1-0,1-3	1	35	-24.77%	350.85%	130.76%	341.57%	130.76%	341.57%	43.37%
24	0.01	0	StRS	1-0,1-3	1	50	-36.33%	176.76%	22.95%	173.06%	22.95%	173.06%	-18.57%
24	0.01	0	StRS	1-0,1-3	2	20	-7.56%	825.78%	536.67%	775.17%	536.67%	775.17%	238.89%
24	0.01	0	StRS	1-0,1-3	2	35	-21.36%	336.75%	132.74%	323.61%	132.74%	323.54%	27.30%
24	0.01	0	StRS	1-0,1-3	2	50	-32.16%	208.14%	35.89%	202.03%	35.89%	202.01%	-16.90%
24	0.01	0	StRS	1-3	1	20	4.02%	1680.95%	345.81%	1685.51%	345.81%	1685.51%	345.81%
24	0.01	0	StRS	1-3	1	35	-26.71%	546.44%	63.34%	554.20%	63.34%	554.20%	63.34%
24	0.01	0	StRS	1-3	1	50	-28.76%	344.90%	11.72%	346.89%	11.72%	346.89%	11.72%
24	0.01	0	StRS	1-3	2	20	2.29%	1653.81%	302.91%	1652.79%	302.91%	1649.36%	302.05%
24	0.01	0	StRS	1-3	2	35	-19.45%	679.08%	81.55%	678.57%	81.55%	678.57%	78.12%
24	0.01	0	StRS	1-3	2	50	-35.18%	370.59%	9.02%	369.83%	9.02%	369.46%	7.80%

Table SB18 (continued). Relative Bias of the modified ANC Year-to-Year Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0	Unequal	1-0	1	20	24.40%	1808.60%	1808.60%	1808.60%	1808.60%	1808.60%	1808.60%
24	0.01	0	Unequal	1-0	1	35	8.54%	895.10%	895.10%	895.10%	895.10%	895.10%	895.10%
24	0.01	0	Unequal	1-0	1	50	8.47%	578.42%	578.42%	578.42%	578.42%	578.42%	578.42%
24	0.01	0	Unequal	1-0	2	20	37.92%	2189.86%	2015.34%	2189.46%	2015.34%	2189.33%	1998.97%
24	0.01	0	Unequal	1-0	2	35	7.79%	1001.09%	918.92%	1001.04%	918.92%	1001.04%	911.96%
24	0.01	0	Unequal	1-0	2	50	3.78%	587.39%	534.03%	587.37%	534.03%	587.37%	530.10%
24	0.01	0	Unequal	1-0,1-3	1	20	42.14%	1123.30%	752.39%	1106.33%	752.39%	1106.33%	389.48%
24	0.01	0	Unequal	1-0,1-3	1	35	9.82%	463.15%	204.51%	459.86%	204.51%	459.86%	79.37%
24	0.01	0	Unequal	1-0,1-3	1	50	11.70%	333.26%	97.59%	333.30%	97.59%	333.30%	27.65%
24	0.01	0	Unequal	1-0,1-3	2	20	63.41%	1290.64%	891.80%	1256.81%	891.80%	1256.81%	409.89%
24	0.01	0	Unequal	1-0,1-3	2	35	24.91%	550.89%	240.25%	544.74%	240.25%	544.68%	90.49%
24	0.01	0	Unequal	1-0,1-3	2	50	10.02%	303.70%	89.65%	301.44%	89.65%	301.49%	8.87%
24	0.01	0	Unequal	1-3	1	20	32.35%	1789.26%	372.89%	1793.14%	372.89%	1793.14%	372.89%
24	0.01	0	Unequal	1-3	1	35	25.09%	930.76%	157.95%	931.70%	157.95%	931.70%	157.95%
24	0.01	0	Unequal	1-3	1	50	5.67%	525.97%	56.17%	526.18%	56.17%	526.18%	56.17%
24	0.01	0	Unequal	1-3	2	20	40.09%	2065.90%	403.76%	2066.57%	403.76%	2067.02%	397.50%
24	0.01	0	Unequal	1-3	2	35	22.97%	953.71%	146.83%	954.23%	146.83%	954.05%	142.72%
24	0.01	0	Unequal	1-3	2	50	12.34%	608.88%	64.21%	609.35%	64.21%	609.29%	62.56%
24	0.01	0.04	SRS	1-0	1	20	35.73%	4476.27%	4476.27%	4476.27%	4476.27%	4476.27%	4476.27%
24	0.01	0.04	SRS	1-0	1	35	16.89%	2156.63%	2156.63%	2156.63%	2156.63%	2156.63%	2156.63%
24	0.01	0.04	SRS	1-0	1	50	1.67%	1274.60%	1274.60%	1274.60%	1274.60%	1274.60%	1274.60%
24	0.01	0.04	SRS	1-0	2	20	38.99%	4976.34%	4577.63%	4976.19%	4577.63%	4976.52%	4552.48%
24	0.01	0.04	SRS	1-0	2	35	6.54%	2120.06%	1953.45%	2120.09%	1953.45%	2120.09%	1939.60%
24	0.01	0.04	SRS	1-0	2	50	6.33%	1457.31%	1336.31%	1457.30%	1336.31%	1457.30%	1327.54%

Table SB18 (continued). Relative Bias of the modified ANC Year-to-Year Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0.04	SRS	1-0,1-3	1	20	49.88%	2727.62%	1893.02%	2712.58%	1893.02%	2712.58%	1031.51%
24	0.01	0.04	SRS	1-0,1-3	1	35	17.93%	1185.90%	609.16%	1188.59%	609.16%	1188.59%	310.23%
24	0.01	0.04	SRS	1-0,1-3	1	50	1.26%	776.86%	294.21%	776.41%	294.21%	776.41%	157.79%
24	0.01	0.04	SRS	1-0,1-3	2	20	33.42%	2355.33%	1662.80%	2326.21%	1662.80%	2326.21%	801.34%
24	0.01	0.04	SRS	1-0,1-3	2	35	10.77%	1112.69%	563.04%	1112.36%	563.04%	1112.22%	255.93%
24	0.01	0.04	SRS	1-0,1-3	2	50	8.80%	804.49%	321.41%	804.89%	321.41%	804.89%	143.94%
24	0.01	0.04	SRS	1-3	1	20	38.56%	4382.31%	1036.61%	4442.21%	1036.61%	4442.21%	1036.61%
24	0.01	0.04	SRS	1-3	1	35	11.69%	1988.12%	424.43%	1997.19%	424.43%	1997.19%	424.43%
24	0.01	0.04	SRS	1-3	1	50	4.28%	1271.08%	242.89%	1272.05%	242.89%	1272.05%	242.89%
24	0.01	0.04	SRS	1-3	2	20	51.51%	5236.91%	1127.93%	5249.46%	1127.93%	5248.06%	1121.81%
24	0.01	0.04	SRS	1-3	2	35	17.22%	2246.32%	446.04%	2255.06%	446.04%	2255.06%	441.16%
24	0.01	0.04	SRS	1-3	2	50	2.81%	1341.12%	236.48%	1349.13%	236.48%	1349.13%	232.27%
24	0.01	0.04	StRS	1-0	1	20	-5.27%	1645.43%	1645.43%	1645.43%	1645.43%	1645.43%	1645.43%
24	0.01	0.04	StRS	1-0	1	35	-25.08%	652.82%	652.82%	652.82%	652.82%	652.82%	652.82%
24	0.01	0.04	StRS	1-0	1	50	-41.07%	339.40%	339.40%	339.40%	339.40%	339.40%	339.40%
24	0.01	0.04	StRS	1-0	2	20	-5.83%	1827.15%	1675.64%	1827.69%	1675.64%	1827.28%	1666.86%
24	0.01	0.04	StRS	1-0	2	35	-29.10%	726.82%	661.67%	726.64%	661.67%	726.66%	655.94%
24	0.01	0.04	StRS	1-0	2	50	-37.18%	405.35%	362.39%	405.28%	362.39%	405.28%	363.13%
24	0.01	0.04	StRS	1-0,1-3	1	20	6.16%	1102.42%	653.11%	1066.15%	653.11%	1066.15%	381.72%
24	0.01	0.04	StRS	1-0,1-3	1	35	-29.38%	327.18%	122.17%	318.80%	122.17%	318.80%	36.23%
24	0.01	0.04	StRS	1-0,1-3	1	50	-38.68%	180.38%	22.78%	176.93%	22.78%	176.93%	-17.38%
24	0.01	0.04	StRS	1-0,1-3	2	20	1.20%	936.82%	606.28%	874.47%	606.28%	874.47%	280.17%
24	0.01	0.04	StRS	1-0,1-3	2	35	-21.12%	347.77%	123.40%	333.23%	123.40%	333.13%	30.22%
24	0.01	0.04	StRS	1-0,1-3	2	50	-35.35%	176.41%	24.51%	171.36%	24.51%	171.36%	-25.15%

Table SB18 (continued). Relative Bias of the modified ANC Year-to-Year Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0.04	StRS	1-3	1	20	0.15%	1632.62%	332.06%	1632.60%	332.06%	1632.60%	332.06%
24	0.01	0.04	StRS	1-3	1	35	-26.15%	634.02%	83.97%	636.50%	83.97%	636.50%	83.97%
24	0.01	0.04	StRS	1-3	1	50	-39.91%	289.54%	-2.22%	291.51%	-2.22%	291.51%	-2.22%
24	0.01	0.04	StRS	1-3	2	20	16.86%	1978.62%	383.98%	1975.50%	383.98%	1975.49%	375.42%
24	0.01	0.04	StRS	1-3	2	35	-18.21%	771.86%	102.82%	776.23%	102.82%	776.58%	100.55%
24	0.01	0.04	StRS	1-3	2	50	-34.40%	338.81%	0.77%	338.63%	0.77%	338.39%	0.65%
24	0.01	0.04	Unequal	1-0	1	20	33.35%	2051.86%	2051.86%	2051.86%	2051.86%	2051.86%	2051.86%
24	0.01	0.04	Unequal	1-0	1	35	11.60%	949.24%	949.24%	949.24%	949.24%	949.24%	949.24%
24	0.01	0.04	Unequal	1-0	1	50	5.19%	561.32%	561.32%	561.32%	561.32%	561.32%	561.32%
24	0.01	0.04	Unequal	1-0	2	20	34.26%	2215.12%	2037.80%	2214.48%	2037.80%	2214.87%	2022.11%
24	0.01	0.04	Unequal	1-0	2	35	13.55%	1060.96%	973.12%	1060.83%	973.12%	1060.83%	966.98%
24	0.01	0.04	Unequal	1-0	2	50	3.34%	623.36%	568.91%	622.99%	568.91%	623.28%	563.08%
24	0.01	0.04	Unequal	1-0,1-3	1	20	37.39%	1187.52%	808.18%	1178.88%	808.18%	1178.88%	415.02%
24	0.01	0.04	Unequal	1-0,1-3	1	35	21.32%	574.61%	258.50%	572.14%	258.50%	572.14%	114.91%
24	0.01	0.04	Unequal	1-0,1-3	1	50	6.07%	330.61%	102.40%	329.82%	102.40%	329.82%	26.95%
24	0.01	0.04	Unequal	1-0,1-3	2	20	60.15%	1368.50%	977.72%	1350.23%	977.72%	1350.23%	438.36%
24	0.01	0.04	Unequal	1-0,1-3	2	35	20.66%	585.84%	259.44%	579.97%	259.44%	579.92%	100.56%
24	0.01	0.04	Unequal	1-0,1-3	2	50	12.42%	341.99%	113.20%	340.08%	113.20%	340.21%	19.24%
24	0.01	0.04	Unequal	1-3	1	20	57.36%	2496.77%	549.06%	2490.47%	549.06%	2490.47%	549.06%
24	0.01	0.04	Unequal	1-3	1	35	16.06%	999.66%	175.43%	1003.04%	175.43%	1003.04%	175.43%
24	0.01	0.04	Unequal	1-3	1	50	11.75%	642.70%	85.91%	643.57%	85.91%	643.57%	85.91%
24	0.01	0.04	Unequal	1-3	2	20	44.09%	2536.22%	506.56%	2536.83%	506.56%	2536.92%	504.31%
24	0.01	0.04	Unequal	1-3	2	35	14.01%	1037.36%	163.48%	1038.34%	163.48%	1038.67%	162.02%
24	0.01	0.04	Unequal	1-3	2	50	11.06%	704.63%	87.87%	708.69%	87.87%	709.41%	85.66%

Table SB19. Relative Bias of the ANC Residual Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded.A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	SRS	1-0	1	20	-0.13%	-0.10%	-0.10%	-0.10%	-0.10%	-0.10%	-0.10%
12	0.02	0	SRS	1-0	1	35	0.31%	0.32%	0.32%	0.32%	0.32%	0.32%	0.32%
12	0.02	0	SRS	1-0	1	50	-0.48%	-0.48%	-0.48%	-0.48%	-0.48%	-0.48%	-0.48%
12	0.02	0	SRS	1-0	2	20	0.52%	0.81%	0.55%	0.84%	0.55%	0.84%	0.81%
12	0.02	0	SRS	1-0	2	35	0.28%	0.57%	0.29%	0.61%	0.29%	0.61%	0.57%
12	0.02	0	SRS	1-0	2	50	-0.02%	0.29%	-0.01%	0.32%	-0.01%	0.32%	0.29%
12	0.02	0	SRS	1-0,1-3	1	20	0.30%	10.03%	0.35%	15.07%	0.35%	15.07%	10.03%
12	0.02	0	SRS	1-0,1-3	1	35	-0.34%	13.90%	-0.31%	19.33%	-0.31%	19.33%	13.90%
12	0.02	0	SRS	1-0,1-3	1	50	0.11%	14.29%	0.13%	19.28%	0.13%	19.28%	14.29%
12	0.02	0	SRS	1-0,1-3	2	20	0.27%	8.81%	0.32%	14.51%	0.32%	14.51%	8.81%
12	0.02	0	SRS	1-0,1-3	2	35	0.76%	15.12%	0.78%	22.22%	0.78%	22.22%	15.12%
12	0.02	0	SRS	1-0,1-3	2	50	0.07%	16.06%	0.09%	22.33%	0.09%	22.33%	16.06%
12	0.02	0	SRS	1-3	1	20	-0.74%	-0.70%	-0.70%	-0.70%	-0.70%	-0.70%	-0.70%
12	0.02	0	SRS	1-3	1	35	-0.40%	-0.39%	-0.39%	-0.39%	-0.39%	-0.39%	-0.39%
12	0.02	0	SRS	1-3	1	50	-0.25%	-0.24%	-0.24%	-0.24%	-0.24%	-0.24%	-0.24%
12	0.02	0	SRS	1-3	2	20	-1.29%	-0.98%	-1.23%	-0.30%	-1.23%	-0.30%	-0.98%
12	0.02	0	SRS	1-3	2	35	-0.05%	0.19%	-0.02%	0.91%	-0.02%	0.91%	0.19%
12	0.02	0	SRS	1-3	2	50	-0.78%	-0.49%	-0.77%	0.28%	-0.77%	0.28%	-0.49%
12	0.02	0	StRS	1-0	1	20	75.16%	86.09%	86.09%	86.09%	86.09%	86.09%	86.09%
12	0.02	0	StRS	1-0	1	35	75.14%	86.49%	86.49%	86.49%	86.49%	86.49%	86.49%
12	0.02	0	StRS	1-0	1	50	73.96%	85.42%	85.42%	85.42%	85.42%	85.42%	85.42%
12	0.02	0	StRS	1-0	2	20	74.77%	87.37%	87.24%	87.41%	87.24%	87.41%	87.37%
12	0.02	0	StRS	1-0	2	35	74.29%	86.83%	86.69%	86.84%	86.69%	86.84%	86.82%
12	0.02	0	StRS	1-0	2	50	74.16%	87.13%	87.05%	87.15%	87.05%	87.15%	87.13%

Table SB19 (continued). Relative Bias of the ANC Residual Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	StRS	1-0,1-3	1	20	77.77%	96.98%	91.05%	99.84%	91.05%	99.84%	96.98%
12	0.02	0	StRS	1-0,1-3	1	35	76.34%	97.99%	90.47%	100.92%	90.47%	100.92%	97.99%
12	0.02	0	StRS	1-0,1-3	1	50	73.99%	96.91%	88.72%	98.65%	88.72%	98.65%	96.91%
12	0.02	0	StRS	1-0,1-3	2	20	77.27%	95.13%	89.51%	98.18%	89.51%	98.18%	95.13%
12	0.02	0	StRS	1-0,1-3	2	35	72.14%	93.76%	85.12%	97.31%	85.12%	97.31%	93.76%
12	0.02	0	StRS	1-0,1-3	2	50	70.13%	93.14%	84.20%	96.14%	84.20%	96.14%	93.14%
12	0.02	0	StRS	1-3	1	20	67.84%	81.17%	81.19%	81.17%	81.19%	81.17%	81.19%
12	0.02	0	StRS	1-3	1	35	68.33%	82.03%	82.01%	82.01%	82.01%	82.01%	82.01%
12	0.02	0	StRS	1-3	1	50	66.82%	80.11%	80.11%	80.11%	80.11%	80.11%	80.11%
12	0.02	0	StRS	1-3	2	20	66.79%	81.46%	81.30%	81.90%	81.30%	81.90%	81.38%
12	0.02	0	StRS	1-3	2	35	66.77%	81.65%	81.38%	82.24%	81.38%	82.24%	81.65%
12	0.02	0	StRS	1-3	2	50	65.60%	79.38%	79.09%	80.05%	79.09%	80.05%	79.38%
12	0.02	0	Unequal	1-0	1	20	0.54%	13.47%	13.47%	13.47%	13.47%	13.47%	13.47%
12	0.02	0	Unequal	1-0	1	35	-0.19%	13.82%	13.82%	13.82%	13.82%	13.82%	13.82%
12	0.02	0	Unequal	1-0	1	50	0.29%	14.41%	14.41%	14.41%	14.41%	14.41%	14.41%
12	0.02	0	Unequal	1-0	2	20	-0.13%	13.33%	13.14%	13.36%	13.14%	13.36%	13.33%
12	0.02	0	Unequal	1-0	2	35	0.03%	14.73%	14.58%	14.76%	14.58%	14.76%	14.73%
12	0.02	0	Unequal	1-0	2	50	-0.32%	14.34%	14.09%	14.37%	14.09%	14.37%	14.34%
12	0.02	0	Unequal	1-0,1-3	1	20	0.70%	27.94%	17.47%	31.27%	17.47%	31.27%	27.94%
12	0.02	0	Unequal	1-0,1-3	1	35	0.25%	32.86%	18.77%	35.09%	18.77%	35.09%	32.86%
12	0.02	0	Unequal	1-0,1-3	1	50	-0.30%	33.18%	19.23%	35.15%	19.23%	35.15%	33.18%
12	0.02	0	Unequal	1-0,1-3	2	20	-0.03%	26.43%	17.32%	29.84%	17.32%	29.84%	26.43%
12	0.02	0	Unequal	1-0,1-3	2	35	-0.69%	32.35%	18.23%	35.28%	18.23%	35.28%	32.35%
12	0.02	0	Unequal	1-0,1-3	2	50	0.66%	35.39%	20.51%	37.47%	20.51%	37.47%	35.39%

Table SB19 (continued). Relative Bias of the ANC Residual Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	Unequal	1-3	1	20	-1.64%	18.40%	18.40%	18.40%	18.40%	18.40%	18.40%
12	0.02	0	Unequal	1-3	1	35	0.42%	21.14%	21.13%	21.13%	21.13%	21.13%	21.13%
12	0.02	0	Unequal	1-3	1	50	-0.49%	21.83%	21.83%	21.83%	21.83%	21.83%	21.83%
12	0.02	0	Unequal	1-3	2	20	-1.66%	21.33%	21.00%	21.63%	21.00%	21.63%	21.23%
12	0.02	0	Unequal	1-3	2	35	-0.23%	22.87%	22.67%	23.17%	22.67%	23.17%	22.87%
12	0.02	0	Unequal	1-3	2	50	0.09%	23.34%	22.93%	23.65%	22.93%	23.65%	23.34%
12	0.02	0.04	SRS	1-0	1	20	-0.51%	-0.48%	-0.48%	-0.48%	-0.48%	-0.48%	-0.48%
12	0.02	0.04	SRS	1-0	1	35	0.62%	0.63%	0.63%	0.63%	0.63%	0.63%	0.63%
12	0.02	0.04	SRS	1-0	1	50	0.26%	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%
12	0.02	0.04	SRS	1-0	2	20	-1.30%	-0.94%	-1.28%	-0.93%	-1.28%	-0.93%	-0.94%
12	0.02	0.04	SRS	1-0	2	35	0.12%	0.43%	0.13%	0.45%	0.13%	0.45%	0.43%
12	0.02	0.04	SRS	1-0	2	50	0.00%	0.29%	0.01%	0.32%	0.01%	0.32%	0.29%
12	0.02	0.04	SRS	1-0,1-3	1	20	-1.14%	8.47%	-1.10%	15.57%	-1.10%	15.57%	8.47%
12	0.02	0.04	SRS	1-0,1-3	1	35	-0.29%	12.82%	-0.27%	20.13%	-0.27%	20.13%	12.82%
12	0.02	0.04	SRS	1-0,1-3	1	50	-0.16%	14.02%	-0.14%	20.38%	-0.14%	20.38%	14.02%
12	0.02	0.04	SRS	1-0,1-3	2	20	0.50%	7.96%	0.56%	17.16%	0.56%	17.16%	7.96%
12	0.02	0.04	SRS	1-0,1-3	2	35	-0.42%	12.82%	-0.39%	22.75%	-0.39%	22.75%	12.82%
12	0.02	0.04	SRS	1-0,1-3	2	50	-0.06%	14.14%	-0.04%	23.13%	-0.04%	23.13%	14.14%
12	0.02	0.04	SRS	1-3	1	20	-0.64%	-0.59%	-0.59%	-0.59%	-0.59%	-0.59%	-0.59%
12	0.02	0.04	SRS	1-3	1	35	0.54%	0.56%	0.56%	0.56%	0.56%	0.56%	0.56%
12	0.02	0.04	SRS	1-3	1	50	0.04%	0.05%	0.05%	0.05%	0.05%	0.05%	0.05%
12	0.02	0.04	SRS	1-3	2	20	-0.69%	-0.46%	-0.61%	0.95%	-0.61%	0.95%	-0.46%
12	0.02	0.04	SRS	1-3	2	35	0.33%	0.53%	0.35%	1.81%	0.35%	1.81%	0.53%
12	0.02	0.04	SRS	1-3	2	50	0.78%	0.97%	0.80%	2.15%	0.80%	2.15%	0.97%

Table SB19 (continued). Relative Bias of the ANC Residual Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0.04	StRS	1-0	1	20	79.15%	91.49%	91.49%	91.49%	91.49%	91.49%	91.49%
12	0.02	0.04	StRS	1-0	1	35	79.47%	92.40%	92.40%	92.40%	92.40%	92.40%	92.40%
12	0.02	0.04	StRS	1-0	1	50	77.36%	90.80%	90.80%	90.80%	90.80%	90.80%	90.80%
12	0.02	0.04	StRS	1-0	2	20	74.29%	86.12%	86.05%	86.11%	86.05%	86.11%	86.12%
12	0.02	0.04	StRS	1-0	2	35	73.51%	85.32%	85.18%	85.34%	85.18%	85.34%	85.32%
12	0.02	0.04	StRS	1-0	2	50	72.97%	85.26%	85.15%	85.25%	85.15%	85.25%	85.26%
12	0.02	0.04	StRS	1-0,1-3	1	20	76.10%	93.12%	88.12%	94.36%	88.12%	94.36%	93.09%
12	0.02	0.04	StRS	1-0,1-3	1	35	71.62%	92.91%	86.53%	94.41%	86.53%	94.41%	92.91%
12	0.02	0.04	StRS	1-0,1-3	1	50	68.88%	90.95%	84.29%	92.53%	84.29%	92.53%	90.95%
12	0.02	0.04	StRS	1-0,1-3	2	20	74.66%	92.09%	87.89%	93.67%	87.89%	93.67%	92.09%
12	0.02	0.04	StRS	1-0,1-3	2	35	70.62%	92.87%	86.73%	94.93%	86.73%	94.93%	92.87%
12	0.02	0.04	StRS	1-0,1-3	2	50	70.34%	94.00%	87.21%	95.82%	87.21%	95.82%	94.00%
12	0.02	0.04	StRS	1-3	1	20	63.80%	80.35%	80.31%	80.31%	80.31%	80.31%	80.31%
12	0.02	0.04	StRS	1-3	1	35	62.07%	79.25%	79.25%	79.25%	79.25%	79.25%	79.25%
12	0.02	0.04	StRS	1-3	1	50	63.34%	80.40%	80.40%	80.40%	80.40%	80.40%	80.40%
12	0.02	0.04	StRS	1-3	2	20	62.41%	79.62%	79.50%	80.10%	79.50%	80.10%	79.62%
12	0.02	0.04	StRS	1-3	2	35	62.20%	78.85%	78.76%	79.29%	78.76%	79.29%	78.85%
12	0.02	0.04	StRS	1-3	2	50	61.46%	78.35%	78.27%	78.71%	78.27%	78.71%	78.35%
12	0.02	0.04	Unequal	1-0	1	20	-0.68%	13.46%	13.46%	13.46%	13.46%	13.46%	13.46%
12	0.02	0.04	Unequal	1-0	1	35	-0.08%	14.79%	14.79%	14.79%	14.79%	14.79%	14.79%
12	0.02	0.04	Unequal	1-0	1	50	0.01%	14.99%	14.99%	14.99%	14.99%	14.99%	14.99%
12	0.02	0.04	Unequal	1-0	2	20	-0.16%	13.32%	13.07%	13.34%	13.07%	13.34%	13.32%
12	0.02	0.04	Unequal	1-0	2	35	-0.77%	13.85%	13.60%	13.87%	13.60%	13.87%	13.85%
12	0.02	0.04	Unequal	1-0	2	50	-0.39%	14.12%	13.92%	14.14%	13.92%	14.14%	14.12%

Table SB19 (continued). Relative Bias of the ANC Residual Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0.04	Unequal	1-0,1-3	1	20	-0.10%	26.88%	16.84%	33.45%	16.84%	33.45%	26.88%
12	0.02	0.04	Unequal	1-0,1-3	1	35	-0.66%	31.77%	18.51%	37.57%	18.51%	37.57%	31.77%
12	0.02	0.04	Unequal	1-0,1-3	1	50	-0.65%	33.51%	19.54%	38.14%	19.54%	38.14%	33.51%
12	0.02	0.04	Unequal	1-0,1-3	2	20	-0.86%	22.07%	14.73%	31.11%	14.73%	31.11%	22.07%
12	0.02	0.04	Unequal	1-0,1-3	2	35	-1.12%	32.39%	18.87%	40.81%	18.87%	40.81%	32.39%
12	0.02	0.04	Unequal	1-0,1-3	2	50	-0.11%	35.86%	20.74%	42.88%	20.74%	42.88%	35.86%
12	0.02	0.04	Unequal	1-3	1	20	-1.53%	22.45%	22.45%	22.45%	22.45%	22.45%	22.45%
12	0.02	0.04	Unequal	1-3	1	35	-0.77%	23.82%	23.82%	23.82%	23.82%	23.82%	23.82%
12	0.02	0.04	Unequal	1-3	1	50	-0.26%	23.57%	23.57%	23.57%	23.57%	23.57%	23.57%
12	0.02	0.04	Unequal	1-3	2	20	-1.08%	26.33%	25.90%	27.41%	25.90%	27.41%	26.33%
12	0.02	0.04	Unequal	1-3	2	35	0.50%	25.34%	25.00%	26.59%	25.00%	26.59%	25.34%
12	0.02	0.04	Unequal	1-3	2	50	-0.15%	26.33%	26.00%	27.42%	26.00%	27.42%	26.33%
24	0.01	0	SRS	1-0	1	20	-0.09%	-0.08%	-0.08%	-0.08%	-0.08%	-0.08%	-0.08%
24	0.01	0	SRS	1-0	1	35	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%
24	0.01	0	SRS	1-0	1	50	-0.08%	-0.08%	-0.08%	-0.08%	-0.08%	-0.08%	-0.08%
24	0.01	0	SRS	1-0	2	20	0.18%	0.51%	0.19%	0.51%	0.19%	0.51%	0.51%
24	0.01	0	SRS	1-0	2	35	-0.17%	0.13%	-0.17%	0.14%	-0.17%	0.14%	0.13%
24	0.01	0	SRS	1-0	2	50	-0.25%	0.03%	-0.25%	0.04%	-0.25%	0.04%	0.03%
24	0.01	0	SRS	1-0,1-3	1	20	0.32%	14.53%	0.33%	15.69%	0.33%	15.69%	14.53%
24	0.01	0	SRS	1-0,1-3	1	35	-0.18%	15.81%	-0.18%	16.51%	-0.18%	16.51%	15.81%
24	0.01	0	SRS	1-0,1-3	1	50	-0.12%	15.21%	-0.12%	15.69%	-0.12%	15.69%	15.21%
24	0.01	0	SRS	1-0,1-3	2	20	-0.48%	14.01%	-0.46%	15.75%	-0.46%	15.75%	14.01%
24	0.01	0	SRS	1-0,1-3	2	35	-0.29%	18.04%	-0.28%	19.04%	-0.28%	19.04%	18.04%
24	0.01	0	SRS	1-0,1-3	2	50	-0.07%	18.04%	-0.07%	18.77%	-0.07%	18.77%	18.04%

Table SB19 (continued). Relative Bias of the ANC Residual Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0	SRS	1-3	1	20	-0.31%	-0.30%	-0.30%	-0.30%	-0.30%	-0.30%	-0.30%
24	0.01	0	SRS	1-3	1	35	-0.08%	-0.08%	-0.08%	-0.08%	-0.08%	-0.08%	-0.08%
24	0.01	0	SRS	1-3	1	50	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%	0.02%
24	0.01	0	SRS	1-3	2	20	-0.10%	0.22%	-0.09%	0.28%	-0.09%	0.28%	0.22%
24	0.01	0	SRS	1-3	2	35	-0.08%	0.18%	-0.08%	0.25%	-0.08%	0.25%	0.18%
24	0.01	0	SRS	1-3	2	50	0.03%	0.34%	0.04%	0.41%	0.04%	0.41%	0.34%
24	0.01	0	StRS	1-0	1	20	78.98%	90.93%	90.93%	90.93%	90.93%	90.93%	90.93%
24	0.01	0	StRS	1-0	1	35	77.08%	88.73%	88.73%	88.73%	88.73%	88.73%	88.73%
24	0.01	0	StRS	1-0	1	50	77.18%	88.63%	88.63%	88.63%	88.63%	88.63%	88.63%
24	0.01	0	StRS	1-0	2	20	76.51%	88.18%	88.09%	88.20%	88.09%	88.20%	88.18%
24	0.01	0	StRS	1-0	2	35	75.53%	86.73%	86.57%	86.76%	86.57%	86.76%	86.73%
24	0.01	0	StRS	1-0	2	50	74.57%	85.44%	85.30%	85.45%	85.30%	85.45%	85.44%
24	0.01	0	StRS	1-0,1-3	1	20	79.58%	100.00%	93.50%	103.21%	93.50%	103.21%	100.00%
24	0.01	0	StRS	1-0,1-3	1	35	78.66%	100.92%	93.61%	103.41%	93.61%	103.41%	100.92%
24	0.01	0	StRS	1-0,1-3	1	50	77.55%	100.19%	93.07%	102.09%	93.07%	102.09%	100.19%
24	0.01	0	StRS	1-0,1-3	2	20	80.26%	100.93%	94.93%	105.32%	94.93%	105.32%	100.93%
24	0.01	0	StRS	1-0,1-3	2	35	77.61%	101.38%	93.35%	104.80%	93.35%	104.84%	101.38%
24	0.01	0	StRS	1-0,1-3	2	50	77.37%	102.08%	94.09%	104.69%	94.09%	104.69%	102.08%
24	0.01	0	StRS	1-3	1	20	78.26%	95.68%	95.68%	95.68%	95.68%	95.68%	95.68%
24	0.01	0	StRS	1-3	1	35	75.71%	92.59%	92.59%	92.59%	92.59%	92.59%	92.59%
24	0.01	0	StRS	1-3	1	50	74.86%	91.83%	91.83%	91.83%	91.83%	91.83%	91.83%
24	0.01	0	StRS	1-3	2	20	77.21%	96.57%	96.43%	96.69%	96.43%	96.69%	96.57%
24	0.01	0	StRS	1-3	2	35	73.29%	92.02%	91.86%	92.17%	91.86%	92.17%	92.02%
24	0.01	0	StRS	1-3	2	50	73.17%	91.70%	91.55%	91.82%	91.55%	91.82%	91.70%

Table SB19 (continued). Relative Bias of the ANC Residual Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0	Unequal	1-0	1	20	-0.12%	13.32%	13.32%	13.32%	13.32%	13.32%	13.32%
24	0.01	0	Unequal	1-0	1	35	-0.17%	14.16%	14.16%	14.16%	14.16%	14.16%	14.16%
24	0.01	0	Unequal	1-0	1	50	-0.21%	14.22%	14.22%	14.22%	14.22%	14.22%	14.22%
24	0.01	0	Unequal	1-0	2	20	-0.66%	12.76%	12.45%	12.76%	12.45%	12.76%	12.76%
24	0.01	0	Unequal	1-0	2	35	-0.16%	14.30%	14.07%	14.31%	14.07%	14.31%	14.30%
24	0.01	0	Unequal	1-0	2	50	-0.21%	14.02%	13.76%	14.03%	13.76%	14.03%	14.02%
24	0.01	0	Unequal	1-0,1-3	1	20	0.81%	28.94%	16.73%	30.31%	16.73%	30.31%	28.94%
24	0.01	0	Unequal	1-0,1-3	1	35	-0.45%	31.40%	17.16%	32.36%	17.16%	32.36%	31.40%
24	0.01	0	Unequal	1-0,1-3	1	50	0.30%	31.10%	17.74%	31.74%	17.74%	31.74%	31.10%
24	0.01	0	Unequal	1-0,1-3	2	20	0.09%	29.68%	16.30%	31.85%	16.30%	31.85%	29.68%
24	0.01	0	Unequal	1-0,1-3	2	35	0.50%	35.36%	18.97%	36.75%	18.97%	36.75%	35.36%
24	0.01	0	Unequal	1-0,1-3	2	50	-0.03%	34.33%	18.38%	35.36%	18.38%	35.36%	34.33%
24	0.01	0	Unequal	1-3	1	20	-0.87%	17.98%	17.98%	17.98%	17.98%	17.98%	17.98%
24	0.01	0	Unequal	1-3	1	35	-0.18%	18.85%	18.85%	18.85%	18.85%	18.85%	18.85%
24	0.01	0	Unequal	1-3	1	50	-0.45%	18.61%	18.61%	18.61%	18.61%	18.61%	18.61%
24	0.01	0	Unequal	1-3	2	20	-0.78%	19.28%	19.03%	19.36%	19.03%	19.36%	19.28%
24	0.01	0	Unequal	1-3	2	35	-0.13%	19.94%	19.71%	20.01%	19.71%	20.01%	19.94%
24	0.01	0	Unequal	1-3	2	50	-0.22%	19.60%	19.34%	19.67%	19.34%	19.67%	19.60%
24	0.01	0.04	SRS	1-0	1	20	0.05%	0.06%	0.06%	0.06%	0.06%	0.06%	0.06%
24	0.01	0.04	SRS	1-0	1	35	0.45%	0.45%	0.45%	0.45%	0.45%	0.45%	0.45%
24	0.01	0.04	SRS	1-0	1	50	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%	0.09%
24	0.01	0.04	SRS	1-0	2	20	0.26%	0.60%	0.27%	0.61%	0.27%	0.61%	0.60%
24	0.01	0.04	SRS	1-0	2	35	-0.10%	0.22%	-0.10%	0.22%	-0.10%	0.22%	0.22%
24	0.01	0.04	SRS	1-0	2	50	0.13%	0.44%	0.13%	0.44%	0.13%	0.44%	0.44%

Table SB19 (continued). Relative Bias of the ANC Residual Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0.04	SRS	1-0,1-3	1	20	-0.11%	14.15%	-0.10%	14.64%	-0.10%	14.64%	14.15%
24	0.01	0.04	SRS	1-0,1-3	1	35	-0.03%	16.23%	-0.03%	16.52%	-0.03%	16.52%	16.23%
24	0.01	0.04	SRS	1-0,1-3	1	50	0.36%	15.43%	0.36%	15.62%	0.36%	15.62%	15.43%
24	0.01	0.04	SRS	1-0,1-3	2	20	-0.26%	13.56%	-0.24%	14.25%	-0.24%	14.25%	13.56%
24	0.01	0.04	SRS	1-0,1-3	2	35	0.33%	18.02%	0.34%	18.45%	0.34%	18.45%	18.02%
24	0.01	0.04	SRS	1-0,1-3	2	50	0.02%	16.83%	0.02%	17.14%	0.02%	17.14%	16.83%
24	0.01	0.04	SRS	1-3	1	20	-0.34%	-0.33%	-0.33%	-0.33%	-0.33%	-0.33%	-0.33%
24	0.01	0.04	SRS	1-3	1	35	0.28%	0.29%	0.29%	0.29%	0.29%	0.29%	0.29%
24	0.01	0.04	SRS	1-3	1	50	-0.09%	-0.09%	-0.09%	-0.09%	-0.09%	-0.09%	-0.09%
24	0.01	0.04	SRS	1-3	2	20	0.09%	0.40%	0.10%	0.44%	0.10%	0.44%	0.40%
24	0.01	0.04	SRS	1-3	2	35	-0.07%	0.21%	-0.07%	0.26%	-0.07%	0.26%	0.21%
24	0.01	0.04	SRS	1-3	2	50	-0.03%	0.28%	-0.02%	0.33%	-0.02%	0.33%	0.28%
24	0.01	0.04	StRS	1-0	1	20	76.70%	88.32%	88.32%	88.32%	88.32%	88.32%	88.32%
24	0.01	0.04	StRS	1-0	1	35	76.06%	87.53%	87.53%	87.53%	87.53%	87.53%	87.53%
24	0.01	0.04	StRS	1-0	1	50	74.58%	86.07%	86.07%	86.07%	86.07%	86.07%	86.07%
24	0.01	0.04	StRS	1-0	1	50	74.58%	86.07%	86.07%	86.07%	86.07%	86.07%	86.07%
24	0.01	0.04	StRS	1-0	2	20	76.85%	89.86%	89.73%	89.87%	89.73%	89.87%	89.86%
24	0.01	0.04	StRS	1-0	2	35	75.26%	87.55%	87.39%	87.56%	87.39%	87.56%	87.55%
24	0.01	0.04	StRS	1-0	2	50	74.47%	86.79%	86.67%	86.81%	86.67%	86.81%	86.79%
24	0.01	0.04	StRS	1-0,1-3	1	20	80.09%	101.54%	95.20%	104.54%	95.20%	104.54%	101.54%
24	0.01	0.04	StRS	1-0,1-3	1	35	77.66%	101.58%	94.07%	104.05%	94.07%	104.05%	101.58%
24	0.01	0.04	StRS	1-0,1-3	1	50	77.92%	101.83%	94.36%	103.80%	94.36%	103.80%	101.83%
24	0.01	0.04	StRS	1-0,1-3	2	20	78.49%	101.20%	94.52%	105.47%	94.52%	105.47%	101.20%
24	0.01	0.04	StRS	1-0,1-3	2	35	77.19%	102.88%	94.32%	106.53%	94.32%	106.55%	102.88%

Table SB19 (continued). Relative Bias of the ANC Residual Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0.04	StRS	1-0,1-3	2	50	74.96%	101.05%	92.44%	103.66%	92.44%	103.66%	101.05%
24	0.01	0.04	StRS	1-3	1	20	78.52%	98.11%	98.11%	98.11%	98.11%	98.11%	98.11%
24	0.01	0.04	StRS	1-3	1	35	75.63%	94.59%	94.59%	94.59%	94.59%	94.59%	94.59%
24	0.01	0.04	StRS	1-3	1	50	74.92%	93.75%	93.75%	93.75%	93.75%	93.75%	93.75%
24	0.01	0.04	StRS	1-3	2	20	78.44%	97.88%	97.76%	97.97%	97.76%	97.97%	97.88%
24	0.01	0.04	StRS	1-3	2	35	77.60%	96.57%	96.37%	96.69%	96.37%	96.69%	96.57%
24	0.01	0.04	StRS	1-3	2	50	75.50%	93.77%	93.65%	93.88%	93.65%	93.88%	93.77%
24	0.01	0.04	Unequal	1-0	1	20	0.30%	13.37%	13.37%	13.37%	13.37%	13.37%	13.37%
24	0.01	0.04	Unequal	1-0	1	35	-0.11%	13.40%	13.40%	13.40%	13.40%	13.40%	13.40%
24	0.01	0.04	Unequal	1-0	1	50	0.09%	13.84%	13.84%	13.84%	13.84%	13.84%	13.84%
24	0.01	0.04	Unequal	1-0	2	20	-0.09%	13.00%	12.72%	13.00%	12.72%	13.00%	13.00%
24	0.01	0.04	Unequal	1-0	2	35	0.11%	14.64%	14.39%	14.65%	14.39%	14.65%	14.64%
24	0.01	0.04	Unequal	1-0	2	50	-0.10%	13.91%	13.66%	13.91%	13.66%	13.91%	13.91%
24	0.01	0.04	Unequal	1-0,1-3	1	20	-0.09%	27.39%	14.97%	28.04%	14.97%	28.04%	27.39%
24	0.01	0.04	Unequal	1-0,1-3	1	35	-0.09%	30.38%	16.02%	30.82%	16.02%	30.82%	30.38%
24	0.01	0.04	Unequal	1-0,1-3	1	50	-0.06%	29.82%	16.38%	30.15%	16.38%	30.15%	29.82%
24	0.01	0.04	Unequal	1-0,1-3	2	20	-0.22%	28.24%	15.33%	29.12%	15.33%	29.12%	28.24%
24	0.01	0.04	Unequal	1-0,1-3	2	35	-0.26%	32.25%	16.37%	32.88%	16.37%	32.88%	32.25%
24	0.01	0.04	Unequal	1-0,1-3	2	50	-0.63%	31.48%	15.73%	31.94%	15.73%	31.94%	31.48%
24	0.01	0.04	Unequal	1-3	1	20	-0.14%	16.75%	16.75%	16.75%	16.75%	16.75%	16.75%
24	0.01	0.04	Unequal	1-3	1	35	-0.46%	16.29%	16.29%	16.29%	16.29%	16.29%	16.29%
24	0.01	0.04	Unequal	1-3	1	50	0.14%	16.87%	16.87%	16.87%	16.87%	16.87%	16.87%
24	0.01	0.04	Unequal	1-3	2	20	-0.08%	18.01%	17.77%	18.07%	17.77%	18.07%	18.01%
24	0.01	0.04	Unequal	1-3	2	35	0.08%	17.67%	17.38%	17.74%	17.38%	17.74%	17.67%
24	0.01	0.04	Unequal	1-3	2	50	0.06%	17.80%	17.51%	17.84%	17.51%	17.84%	17.80%

Table SB20. Relative Bias of the modified ANC Residual Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	SRS	1-0	1	20	-1.35%	-1.22%	-1.22%	-1.22%	-1.22%	-1.22%	-1.22%
12	0.02	0	SRS	1-0	1	35	-0.22%	-0.15%	-0.15%	-0.15%	-0.15%	-0.15%	-0.15%
12	0.02	0	SRS	1-0	1	50	-0.48%	-0.42%	-0.42%	-0.42%	-0.42%	-0.42%	-0.42%
12	0.02	0	SRS	1-0	2	20	-1.05%	-0.91%	-0.91%	-0.88%	-0.91%	-0.88%	-0.91%
12	0.02	0	SRS	1-0	2	35	-0.51%	-0.43%	-0.42%	-0.38%	-0.42%	-0.38%	-0.43%
12	0.02	0	SRS	1-0	2	50	-0.32%	-0.25%	-0.26%	-0.22%	-0.26%	-0.22%	-0.25%
12	0.02	0	SRS	1-0,1-3	1	20	-0.95%	-0.86%	-0.73%	2.93%	-0.73%	2.93%	-0.86%
12	0.02	0	SRS	1-0,1-3	1	35	0.02%	-0.03%	0.18%	4.81%	0.18%	4.81%	-0.03%
12	0.02	0	SRS	1-0,1-3	1	50	0.39%	0.40%	0.51%	5.44%	0.51%	5.44%	0.39%
12	0.02	0	SRS	1-0,1-3	2	20	-0.35%	-0.20%	-0.10%	3.49%	-0.10%	3.49%	-0.20%
12	0.02	0	SRS	1-0,1-3	2	35	-0.31%	-0.30%	-0.12%	5.61%	-0.12%	5.61%	-0.30%
12	0.02	0	SRS	1-0,1-3	2	50	-0.46%	-0.47%	-0.32%	5.75%	-0.32%	5.75%	-0.48%
12	0.02	0	SRS	1-3	1	20	-1.94%	-1.81%	-1.81%	-1.81%	-1.81%	-1.81%	-1.81%
12	0.02	0	SRS	1-3	1	35	-0.48%	-0.36%	-0.35%	-0.36%	-0.35%	-0.36%	-0.35%
12	0.02	0	SRS	1-3	1	50	0.24%	0.36%	0.36%	0.36%	0.36%	0.36%	0.36%
12	0.02	0	SRS	1-3	2	20	-1.49%	-1.33%	-1.32%	-0.93%	-1.32%	-0.93%	-1.33%
12	0.02	0	SRS	1-3	2	35	-1.84%	-1.70%	-1.68%	-1.08%	-1.68%	-1.08%	-1.70%
12	0.02	0	SRS	1-3	2	50	-0.70%	-0.58%	-0.57%	0.16%	-0.57%	0.16%	-0.58%
12	0.02	0	StRS	1-0	1	20	-0.78%	0.49%	0.49%	0.49%	0.49%	0.49%	0.49%
12	0.02	0	StRS	1-0	1	35	0.24%	1.63%	1.63%	1.63%	1.63%	1.63%	1.63%
12	0.02	0	StRS	1-0	1	50	0.21%	1.61%	1.61%	1.61%	1.61%	1.61%	1.61%
12	0.02	0	StRS	1-0	2	20	-0.57%	0.92%	0.93%	0.94%	0.93%	0.94%	0.92%
12	0.02	0	StRS	1-0	2	35	0.00%	1.59%	1.59%	1.61%	1.59%	1.61%	1.59%
12	0.02	0	StRS	1-0	2	50	0.23%	1.81%	1.81%	1.82%	1.81%	1.82%	1.81%
12	0.02	0	StRS	1-0,1-3	1	20	0.14%	2.51%	2.64%	4.42%	2.64%	4.42%	2.51%
12	0.02	0	StRS	1-0,1-3	1	35	0.71%	4.60%	4.69%	6.85%	4.69%	6.85%	4.60%
12	0.02	0	StRS	1-0,1-3	1	50	0.51%	5.19%	5.28%	7.26%	5.28%	7.26%	5.19%

Table SB20 (continued). Relative Bias of the modified ANC Residual Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0	StRS	1-0,1-3	2	20	-0.25%	2.21%	2.40%	4.46%	2.40%	4.46%	2.21%
12	0.02	0	StRS	1-0,1-3	2	35	0.55%	4.00%	4.13%	6.64%	4.13%	6.64%	4.00%
12	0.02	0	StRS	1-0,1-3	2	50	0.50%	4.85%	5.00%	7.72%	5.00%	7.72%	4.85%
12	0.02	0	StRS	1-3	1	20	-0.76%	5.30%	5.29%	5.29%	5.29%	5.29%	5.29%
12	0.02	0	StRS	1-3	1	35	-0.79%	6.15%	6.14%	6.14%	6.14%	6.14%	6.14%
12	0.02	0	StRS	1-3	1	50	0.03%	6.96%	6.96%	6.96%	6.96%	6.96%	6.96%
12	0.02	0	StRS	1-3	2	20	-1.63%	5.19%	5.19%	5.42%	5.19%	5.42%	5.18%
12	0.02	0	StRS	1-3	2	35	-1.30%	5.69%	5.69%	5.97%	5.69%	5.97%	5.69%
12	0.02	0	StRS	1-3	2	50	-0.05%	7.35%	7.36%	7.65%	7.36%	7.65%	7.35%
12	0.02	0	Unequal	1-0	1	20	-1.28%	-0.34%	-0.34%	-0.34%	-0.34%	-0.34%	-0.34%
12	0.02	0	Unequal	1-0	1	35	-0.12%	1.11%	1.11%	1.11%	1.11%	1.11%	1.11%
12	0.02	0	Unequal	1-0	1	50	-0.26%	0.96%	0.96%	0.96%	0.96%	0.96%	0.96%
12	0.02	0	Unequal	1-0	2	20	-1.30%	-0.13%	-0.13%	-0.10%	-0.13%	-0.10%	-0.13%
12	0.02	0	Unequal	1-0	2	35	-0.77%	0.53%	0.55%	0.55%	0.55%	0.55%	0.53%
12	0.02	0	Unequal	1-0	2	50	-0.53%	0.81%	0.81%	0.84%	0.81%	0.84%	0.81%
12	0.02	0	Unequal	1-0,1-3	1	20	-0.60%	1.24%	1.36%	3.84%	1.36%	3.84%	1.24%
12	0.02	0	Unequal	1-0,1-3	1	35	-0.16%	3.26%	3.41%	6.43%	3.41%	6.43%	3.26%
12	0.02	0	Unequal	1-0,1-3	1	50	-0.75%	3.25%	3.29%	6.71%	3.29%	6.71%	3.25%
12	0.02	0	Unequal	1-0,1-3	2	20	-1.01%	1.26%	1.38%	4.17%	1.38%	4.17%	1.26%
12	0.02	0	Unequal	1-0,1-3	2	35	-0.05%	3.58%	3.63%	7.20%	3.63%	7.20%	3.57%
12	0.02	0	Unequal	1-0,1-3	2	50	0.06%	4.26%	4.41%	8.42%	4.41%	8.42%	4.26%
12	0.02	0	Unequal	1-3	1	20	-0.15%	4.66%	4.65%	4.65%	4.65%	4.65%	4.65%
12	0.02	0	Unequal	1-3	1	35	-0.74%	5.31%	5.31%	5.30%	5.31%	5.30%	5.31%
12	0.02	0	Unequal	1-3	1	50	-1.19%	4.62%	4.62%	4.62%	4.62%	4.62%	4.62%
12	0.02	0	Unequal	1-3	2	20	-2.99%	3.02%	3.06%	3.39%	3.06%	3.39%	3.02%
12	0.02	0	Unequal	1-3	2	35	-1.31%	5.22%	5.22%	5.67%	5.22%	5.67%	5.22%
12	0.02	0	Unequal	1-3	2	50	-0.88%	5.81%	5.83%	6.35%	5.83%	6.35%	5.81%

Table SB20 (continued). Relative Bias of the modified ANC Residual Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0.04	SRS	1-0	1	20	-0.44%	-0.36%	-0.36%	-0.36%	-0.36%	-0.36%	-0.36%
12	0.02	0.04	SRS	1-0	1	35	-0.30%	-0.26%	-0.26%	-0.26%	-0.26%	-0.26%	-0.26%
12	0.02	0.04	SRS	1-0	1	50	0.35%	0.39%	0.39%	0.39%	0.39%	0.39%	0.39%
12	0.02	0.04	SRS	1-0	2	20	-0.31%	-0.23%	-0.22%	-0.21%	-0.22%	-0.21%	-0.23%
12	0.02	0.04	SRS	1-0	2	35	-0.21%	-0.16%	-0.16%	-0.14%	-0.16%	-0.14%	-0.16%
12	0.02	0.04	SRS	1-0	2	50	0.19%	0.23%	0.23%	0.26%	0.23%	0.26%	0.23%
12	0.02	0.04	SRS	1-0,1-3	1	20	-0.46%	-0.39%	-0.28%	5.43%	-0.28%	5.43%	-0.39%
12	0.02	0.04	SRS	1-0,1-3	1	35	-1.00%	-0.95%	-0.88%	4.53%	-0.88%	4.53%	-0.95%
12	0.02	0.04	SRS	1-0,1-3	1	50	-0.15%	-0.14%	-0.05%	4.01%	-0.05%	4.01%	-0.15%
12	0.02	0.04	SRS	1-0,1-3	2	20	-2.05%	-2.00%	-1.82%	5.17%	-1.82%	5.17%	-2.00%
12	0.02	0.04	SRS	1-0,1-3	2	35	-0.51%	-0.56%	-0.33%	7.50%	-0.33%	7.50%	-0.56%
12	0.02	0.04	SRS	1-0,1-3	2	50	0.13%	0.11%	0.26%	6.86%	0.26%	6.86%	0.10%
12	0.02	0.04	SRS	1-3	1	20	-0.51%	-0.32%	-0.32%	-0.32%	-0.32%	-0.32%	-0.32%
12	0.02	0.04	SRS	1-3	1	35	-0.92%	-0.79%	-0.80%	-0.80%	-0.80%	-0.80%	-0.80%
12	0.02	0.04	SRS	1-3	1	50	0.20%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%
12	0.02	0.04	SRS	1-3	2	20	-1.33%	-1.06%	-1.03%	0.32%	-1.03%	0.32%	-1.07%
12	0.02	0.04	SRS	1-3	2	35	-1.10%	-0.92%	-0.92%	0.17%	-0.92%	0.17%	-0.93%
12	0.02	0.04	SRS	1-3	2	50	-0.35%	-0.22%	-0.20%	0.93%	-0.20%	0.93%	-0.22%
12	0.02	0.04	StRS	1-0	1	20	-0.34%	1.15%	1.15%	1.15%	1.15%	1.15%	1.15%
12	0.02	0.04	StRS	1-0	1	35	0.71%	2.26%	2.26%	2.26%	2.26%	2.26%	2.26%
12	0.02	0.04	StRS	1-0	1	50	0.23%	1.88%	1.88%	1.88%	1.88%	1.88%	1.88%
12	0.02	0.04	StRS	1-0	2	20	0.28%	1.96%	1.97%	1.97%	1.97%	1.97%	1.96%
12	0.02	0.04	StRS	1-0	2	35	0.03%	1.74%	1.73%	1.75%	1.73%	1.75%	1.74%
12	0.02	0.04	StRS	1-0	2	50	0.07%	1.84%	1.84%	1.85%	1.84%	1.85%	1.84%
12	0.02	0.04	StRS	1-0,1-3	1	20	-1.15%	1.46%	1.67%	2.90%	1.67%	2.90%	1.45%
12	0.02	0.04	StRS	1-0,1-3	1	35	-0.60%	3.63%	3.74%	5.85%	3.74%	5.85%	3.63%
12	0.02	0.04	StRS	1-0,1-3	1	50	-0.11%	4.86%	4.96%	6.78%	4.96%	6.78%	4.85%

Table SB20 (continued). Relative Bias of the modified ANC Residual Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
12	0.02	0.04	StRS	1-0,1-3	2	20	-0.52%	2.22%	2.34%	3.67%	2.34%	3.67%	2.20%
12	0.02	0.04	StRS	1-0,1-3	2	35	-0.15%	3.82%	3.96%	6.66%	3.96%	6.66%	3.82%
12	0.02	0.04	StRS	1-0,1-3	2	50	0.76%	5.40%	5.59%	7.94%	5.59%	7.94%	5.40%
12	0.02	0.04	StRS	1-3	1	20	-1.68%	4.81%	4.81%	4.81%	4.81%	4.81%	4.81%
12	0.02	0.04	StRS	1-3	1	35	-0.32%	6.06%	6.06%	6.06%	6.06%	6.06%	6.06%
12	0.02	0.04	StRS	1-3	1	50	0.09%	7.25%	7.25%	7.25%	7.25%	7.25%	7.25%
12	0.02	0.04	StRS	1-3	2	20	-0.77%	5.65%	5.66%	5.84%	5.66%	5.84%	5.65%
12	0.02	0.04	StRS	1-3	2	35	0.13%	7.49%	7.50%	7.79%	7.50%	7.79%	7.49%
12	0.02	0.04	StRS	1-3	2	50	0.03%	7.95%	7.95%	8.25%	7.95%	8.25%	7.95%
12	0.02	0.04	Unequal	1-0	1	20	-0.45%	-0.07%	-0.07%	-0.07%	-0.07%	-0.07%	-0.07%
12	0.02	0.04	Unequal	1-0	1	35	0.36%	0.94%	0.94%	0.94%	0.94%	0.94%	0.94%
12	0.02	0.04	Unequal	1-0	1	50	0.09%	0.84%	0.84%	0.84%	0.84%	0.84%	0.84%
12	0.02	0.04	Unequal	1-0	2	20	-1.11%	-0.66%	-0.65%	-0.66%	-0.65%	-0.66%	-0.66%
12	0.02	0.04	Unequal	1-0	2	35	-0.25%	0.32%	0.33%	0.33%	0.33%	0.33%	0.32%
12	0.02	0.04	Unequal	1-0	2	50	-0.10%	0.62%	0.62%	0.64%	0.62%	0.64%	0.62%
12	0.02	0.04	Unequal	1-0,1-3	1	20	-0.53%	1.71%	1.72%	6.12%	1.72%	6.12%	1.71%
12	0.02	0.04	Unequal	1-0,1-3	1	35	-0.28%	3.04%	3.11%	6.42%	3.11%	6.42%	3.04%
12	0.02	0.04	Unequal	1-0,1-3	1	50	0.35%	4.31%	4.39%	6.84%	4.39%	6.84%	4.31%
12	0.02	0.04	Unequal	1-0,1-3	2	20	-0.84%	0.93%	1.00%	7.55%	1.00%	7.55%	0.92%
12	0.02	0.04	Unequal	1-0,1-3	2	35	0.41%	3.67%	3.81%	9.20%	3.81%	9.20%	3.67%
12	0.02	0.04	Unequal	1-0,1-3	2	50	-0.80%	3.52%	3.62%	7.90%	3.62%	7.90%	3.52%
12	0.02	0.04	Unequal	1-3	1	20	-1.41%	4.12%	4.12%	4.12%	4.12%	4.12%	4.12%
12	0.02	0.04	Unequal	1-3	1	35	-0.86%	5.69%	5.69%	5.69%	5.69%	5.69%	5.69%
12	0.02	0.04	Unequal	1-3	1	50	-0.17%	6.18%	6.17%	6.17%	6.17%	6.17%	6.17%
12	0.02	0.04	Unequal	1-3	2	20	-0.41%	6.53%	6.54%	7.89%	6.54%	7.89%	6.52%
12	0.02	0.04	Unequal	1-3	2	35	-0.41%	7.07%	7.08%	8.21%	7.08%	8.21%	7.07%
12	0.02	0.04	Unequal	1-3	2	50	-0.76%	6.75%	6.75%	8.05%	6.75%	8.05%	6.75%

Table SB20 (continued). Relative Bias of the modified ANC Residual Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0	SRS	1-0	1	20	-0.44%	-0.42%	-0.42%	-0.42%	-0.42%	-0.42%	-0.42%
24	0.01	0	SRS	1-0	1	35	0.28%	0.30%	0.30%	0.30%	0.30%	0.30%	0.30%
24	0.01	0	SRS	1-0	1	50	-0.09%	-0.08%	-0.08%	-0.08%	-0.08%	-0.08%	-0.08%
24	0.01	0	SRS	1-0	2	20	-0.18%	-0.16%	-0.16%	-0.16%	-0.16%	-0.16%	-0.16%
24	0.01	0	SRS	1-0	2	35	-0.21%	-0.21%	-0.20%	-0.20%	-0.20%	-0.20%	-0.21%
24	0.01	0	SRS	1-0	2	50	0.12%	0.13%	0.13%	0.14%	0.13%	0.14%	0.13%
24	0.01	0	SRS	1-0,1-3	1	20	-0.54%	-0.49%	-0.50%	0.43%	-0.50%	0.43%	-0.49%
24	0.01	0	SRS	1-0,1-3	1	35	-0.21%	-0.13%	-0.18%	0.37%	-0.18%	0.37%	-0.13%
24	0.01	0	SRS	1-0,1-3	1	50	0.05%	0.15%	0.07%	0.49%	0.07%	0.49%	0.15%
24	0.01	0	SRS	1-0,1-3	2	20	-0.63%	-0.56%	-0.58%	0.75%	-0.58%	0.75%	-0.56%
24	0.01	0	SRS	1-0,1-3	2	35	-0.28%	-0.16%	-0.24%	0.53%	-0.24%	0.53%	-0.16%
24	0.01	0	SRS	1-0,1-3	2	50	-0.18%	-0.11%	-0.15%	0.38%	-0.15%	0.38%	-0.12%
24	0.01	0	SRS	1-3	1	20	0.01%	0.07%	0.06%	0.07%	0.06%	0.07%	0.06%
24	0.01	0	SRS	1-3	1	35	-0.09%	-0.05%	-0.05%	-0.05%	-0.05%	-0.05%	-0.05%
24	0.01	0	SRS	1-3	1	50	-0.23%	-0.20%	-0.20%	-0.20%	-0.20%	-0.20%	-0.20%
24	0.01	0	SRS	1-3	2	20	-0.36%	-0.27%	-0.28%	-0.20%	-0.28%	-0.20%	-0.29%
24	0.01	0	SRS	1-3	2	35	0.26%	0.30%	0.30%	0.37%	0.30%	0.37%	0.30%
24	0.01	0	SRS	1-3	2	50	-0.04%	-0.01%	-0.01%	0.06%	-0.01%	0.06%	-0.02%
24	0.01	0	StRS	1-0	1	20	0.30%	0.53%	0.53%	0.53%	0.53%	0.53%	0.53%
24	0.01	0	StRS	1-0	1	35	0.27%	0.46%	0.46%	0.46%	0.46%	0.46%	0.46%
24	0.01	0	StRS	1-0	1	50	0.21%	0.41%	0.41%	0.41%	0.41%	0.41%	0.41%
24	0.01	0	StRS	1-0	2	20	-0.13%	0.04%	0.04%	0.04%	0.04%	0.04%	0.04%
24	0.01	0	StRS	1-0	2	35	0.09%	0.32%	0.32%	0.33%	0.32%	0.33%	0.32%
24	0.01	0	StRS	1-0	2	50	0.50%	0.73%	0.73%	0.74%	0.73%	0.74%	0.73%
24	0.01	0	StRS	1-0,1-3	1	20	-0.18%	1.03%	1.04%	2.41%	1.04%	2.41%	1.03%
24	0.01	0	StRS	1-0,1-3	1	35	0.16%	2.03%	2.03%	3.00%	2.03%	3.00%	2.03%
24	0.01	0	StRS	1-0,1-3	1	50	0.45%	2.58%	2.57%	3.28%	2.57%	3.28%	2.58%

Table SB20 (continued). Relative Bias of the modified ANC Residual Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0	StRS	1-0,1-3	2	20	-0.09%	1.26%	1.29%	3.20%	1.29%	3.20%	1.26%
24	0.01	0	StRS	1-0,1-3	2	35	0.18%	2.37%	2.36%	3.68%	2.36%	3.68%	2.37%
24	0.01	0	StRS	1-0,1-3	2	50	0.50%	2.93%	2.94%	3.93%	2.94%	3.93%	2.93%
24	0.01	0	StRS	1-3	1	20	-0.66%	2.27%	2.27%	2.27%	2.27%	2.27%	2.27%
24	0.01	0	StRS	1-3	1	35	0.74%	3.80%	3.80%	3.80%	3.80%	3.80%	3.80%
24	0.01	0	StRS	1-3	1	50	0.23%	3.22%	3.22%	3.22%	3.22%	3.22%	3.22%
24	0.01	0	StRS	1-3	2	20	0.03%	3.58%	3.58%	3.64%	3.58%	3.64%	3.57%
24	0.01	0	StRS	1-3	2	35	0.28%	3.88%	3.87%	3.96%	3.87%	3.96%	3.88%
24	0.01	0	StRS	1-3	2	50	0.28%	3.79%	3.80%	3.89%	3.80%	3.89%	3.80%
24	0.01	0	Unequal	1-0	1	20	-0.64%	-0.31%	-0.31%	-0.31%	-0.31%	-0.31%	-0.31%
24	0.01	0	Unequal	1-0	1	35	-0.35%	0.07%	0.07%	0.07%	0.07%	0.07%	0.07%
24	0.01	0	Unequal	1-0	1	50	-0.14%	0.41%	0.41%	0.41%	0.41%	0.41%	0.41%
24	0.01	0	Unequal	1-0	2	20	-0.71%	-0.29%	-0.29%	-0.29%	-0.29%	-0.29%	-0.29%
24	0.01	0	Unequal	1-0	2	35	-0.39%	0.07%	0.07%	0.07%	0.07%	0.07%	0.07%
24	0.01	0	Unequal	1-0	2	50	-0.38%	0.23%	0.23%	0.23%	0.23%	0.23%	0.23%
24	0.01	0	Unequal	1-0,1-3	1	20	-0.40%	1.45%	1.41%	2.36%	1.41%	2.36%	1.45%
24	0.01	0	Unequal	1-0,1-3	1	35	-0.15%	2.59%	2.53%	3.20%	2.53%	3.20%	2.59%
24	0.01	0	Unequal	1-0,1-3	1	50	-0.20%	3.09%	3.04%	3.47%	3.04%	3.47%	3.09%
24	0.01	0	Unequal	1-0,1-3	2	20	-0.89%	1.12%	1.12%	2.47%	1.12%	2.47%	1.12%
24	0.01	0	Unequal	1-0,1-3	2	35	-0.14%	2.98%	2.98%	3.82%	2.98%	3.82%	2.98%
24	0.01	0	Unequal	1-0,1-3	2	50	-0.12%	3.70%	3.64%	4.31%	3.64%	4.31%	3.70%
24	0.01	0	Unequal	1-3	1	20	-0.12%	4.07%	4.06%	4.06%	4.06%	4.06%	4.06%
24	0.01	0	Unequal	1-3	1	35	-0.04%	4.14%	4.13%	4.13%	4.13%	4.13%	4.13%
24	0.01	0	Unequal	1-3	1	50	-0.29%	4.05%	4.05%	4.05%	4.05%	4.05%	4.05%
24	0.01	0	Unequal	1-3	2	20	-1.23%	3.38%	3.38%	3.44%	3.38%	3.44%	3.38%
24	0.01	0	Unequal	1-3	2	35	0.21%	5.18%	5.18%	5.24%	5.18%	5.24%	5.18%
24	0.01	0	Unequal	1-3	2	50	0.10%	5.11%	5.11%	5.17%	5.11%	5.17%	5.11%

Table SB20 (continued). Relative Bias of the modified ANC Residual Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0.04	SRS	1-0	1	20	-0.57%	-0.57%	-0.57%	-0.57%	-0.57%	-0.57%	-0.57%
24	0.01	0.04	SRS	1-0	1	35	-0.27%	-0.26%	-0.26%	-0.26%	-0.26%	-0.26%	-0.26%
24	0.01	0.04	SRS	1-0	1	50	-0.25%	-0.24%	-0.24%	-0.24%	-0.24%	-0.24%	-0.24%
24	0.01	0.04	SRS	1-0	2	20	0.07%	0.07%	0.08%	0.07%	0.08%	0.07%	0.07%
24	0.01	0.04	SRS	1-0	2	35	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%
24	0.01	0.04	SRS	1-0	2	50	0.16%	0.16%	0.16%	0.16%	0.16%	0.16%	0.16%
24	0.01	0.04	SRS	1-0,1-3	1	20	-0.15%	-0.08%	-0.13%	0.29%	-0.13%	0.29%	-0.08%
24	0.01	0.04	SRS	1-0,1-3	1	35	-0.16%	-0.06%	-0.14%	0.14%	-0.14%	0.14%	-0.06%
24	0.01	0.04	SRS	1-0,1-3	1	50	-0.58%	-0.54%	-0.56%	-0.40%	-0.56%	-0.40%	-0.54%
24	0.01	0.04	SRS	1-0,1-3	2	20	-0.70%	-0.67%	-0.68%	-0.15%	-0.68%	-0.15%	-0.68%
24	0.01	0.04	SRS	1-0,1-3	2	35	-0.66%	-0.61%	-0.64%	-0.32%	-0.64%	-0.32%	-0.61%
24	0.01	0.04	SRS	1-0,1-3	2	50	0.20%	0.26%	0.22%	0.48%	0.22%	0.48%	0.26%
24	0.01	0.04	SRS	1-3	1	20	-0.28%	-0.24%	-0.26%	-0.26%	-0.26%	-0.26%	-0.26%
24	0.01	0.04	SRS	1-3	1	35	-0.11%	-0.09%	-0.09%	-0.09%	-0.09%	-0.09%	-0.09%
24	0.01	0.04	SRS	1-3	1	50	0.08%	0.10%	0.10%	0.10%	0.10%	0.10%	0.10%
24	0.01	0.04	SRS	1-3	2	20	-0.76%	-0.74%	-0.72%	-0.69%	-0.72%	-0.69%	-0.73%
24	0.01	0.04	SRS	1-3	2	35	-0.05%	-0.03%	-0.03%	0.02%	-0.03%	0.02%	-0.03%
24	0.01	0.04	SRS	1-3	2	50	-0.10%	-0.08%	-0.08%	-0.03%	-0.08%	-0.03%	-0.08%
24	0.01	0.04	StRS	1-0	1	20	0.34%	0.57%	0.57%	0.57%	0.57%	0.57%	0.57%
24	0.01	0.04	StRS	1-0	1	35	0.17%	0.40%	0.40%	0.40%	0.40%	0.40%	0.40%
24	0.01	0.04	StRS	1-0	1	50	0.68%	0.86%	0.86%	0.86%	0.86%	0.86%	0.86%
24	0.01	0.04	StRS	1-0	2	20	0.20%	0.44%	0.45%	0.45%	0.45%	0.45%	0.44%
24	0.01	0.04	StRS	1-0	2	35	0.82%	1.03%	1.04%	1.04%	1.04%	1.04%	1.03%
24	0.01	0.04	StRS	1-0	2	50	0.63%	0.85%	0.85%	0.85%	0.85%	0.85%	0.85%
24	0.01	0.04	StRS	1-0,1-3	1	20	-0.05%	1.13%	1.21%	2.53%	1.21%	2.53%	1.12%
24	0.01	0.04	StRS	1-0,1-3	1	35	0.18%	2.02%	2.01%	2.99%	2.01%	2.99%	2.02%
24	0.01	0.04	StRS	1-0,1-3	1	50	0.28%	2.40%	2.40%	3.09%	2.40%	3.09%	2.40%

Table SB20 (continued). Relative Bias of the modified ANC Residual Variance Estimate. When > 5% or < -5% relative bias, cells are also shaded. A positive value indicates the parameter was overestimated, and a negative value indicates underestimation of the parameter by the percentage indicated.

Years	Trend (p)	Subpop Trend	Sampling Design	Revisit Design	Effort	Sites	PO	PWIGLS A-only	PWIGLS A	PWIGLS AI	PWIGLS B	PWIGLS BI	PWIGLS C
24	0.01	0.04	StRS	1-0,1-3	2	20	-0.28%	1.14%	1.18%	3.16%	1.18%	3.16%	1.14%
24	0.01	0.04	StRS	1-0,1-3	2	35	0.20%	2.40%	2.43%	3.77%	2.43%	3.77%	2.40%
24	0.01	0.04	StRS	1-0,1-3	2	50	0.09%	2.64%	2.64%	3.66%	2.64%	3.66%	2.64%
24	0.01	0.04	StRS	1-3	1	20	-0.36%	2.67%	2.67%	2.67%	2.67%	2.67%	2.67%
24	0.01	0.04	StRS	1-3	1	35	0.27%	3.29%	3.29%	3.29%	3.29%	3.29%	3.29%
24	0.01	0.04	StRS	1-3	1	50	0.60%	3.64%	3.63%	3.63%	3.63%	3.63%	3.63%
24	0.01	0.04	StRS	1-3	2	20	-0.08%	3.56%	3.56%	3.65%	3.56%	3.65%	3.57%
24	0.01	0.04	StRS	1-3	2	35	0.34%	3.86%	3.86%	3.97%	3.86%	3.97%	3.86%
24	0.01	0.04	StRS	1-3	2	50	0.27%	3.82%	3.83%	3.90%	3.83%	3.90%	3.82%
24	0.01	0.04	Unequal	1-0	1	20	-0.75%	-0.62%	-0.62%	-0.62%	-0.62%	-0.62%	-0.62%
24	0.01	0.04	Unequal	1-0	1	35	0.35%	0.52%	0.52%	0.52%	0.52%	0.52%	0.52%
24	0.01	0.04	Unequal	1-0	1	50	0.18%	0.38%	0.38%	0.38%	0.38%	0.38%	0.38%
24	0.01	0.04	Unequal	1-0	2	20	0.15%	0.29%	0.30%	0.30%	0.30%	0.30%	0.29%
24	0.01	0.04	Unequal	1-0	2	35	0.06%	0.23%	0.23%	0.23%	0.23%	0.23%	0.23%
24	0.01	0.04	Unequal	1-0	2	50	-0.04%	0.16%	0.16%	0.16%	0.16%	0.16%	0.16%
24	0.01	0.04	Unequal	1-0,1-3	1	20	-0.28%	0.55%	0.49%	0.94%	0.49%	0.94%	0.55%
24	0.01	0.04	Unequal	1-0,1-3	1	35	-0.24%	1.03%	0.99%	1.30%	0.99%	1.30%	1.03%
24	0.01	0.04	Unequal	1-0,1-3	1	50	-0.18%	1.50%	1.44%	1.71%	1.44%	1.71%	1.50%
24	0.01	0.04	Unequal	1-0,1-3	2	20	-0.29%	0.61%	0.57%	1.16%	0.57%	1.16%	0.61%
24	0.01	0.04	Unequal	1-0,1-3	2	35	-0.17%	1.30%	1.30%	1.70%	1.30%	1.70%	1.30%
24	0.01	0.04	Unequal	1-0,1-3	2	50	-0.41%	1.50%	1.42%	1.80%	1.42%	1.80%	1.50%
24	0.01	0.04	Unequal	1-3	1	20	0.08%	1.96%	1.96%	1.96%	1.96%	1.96%	1.96%
24	0.01	0.04	Unequal	1-3	1	35	0.20%	2.32%	2.32%	2.32%	2.32%	2.32%	2.32%
24	0.01	0.04	Unequal	1-3	1	50	-0.28%	1.83%	1.83%	1.83%	1.83%	1.83%	1.83%
24	0.01	0.04	Unequal	1-3	2	20	0.35%	2.47%	2.48%	2.52%	2.48%	2.52%	2.47%
24	0.01	0.04	Unequal	1-3	2	35	-0.08%	2.37%	2.37%	2.41%	2.37%	2.41%	2.36%
24	0.01	0.04	Unequal	1-3	2	50	-0.04%	2.42%	2.41%	2.45%	2.41%	2.45%	2.41%

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We present two case studies to demonstrate the application of our research and provide examples to scientists implementing these methods. The case studies use the SIEN lake chemistry data set and examine i) trend in pH across Yosemite National Park (YOSE) and ii) trend in chloride across SIEN with the parks as stratum. Prior to delving into the individual case studies, we provide an overview of the data set and data set preparations required prior to the conducting any of the analyses.

Example trend analyses are conducted in R with the TrendNPS package (Starcevich and Mitchell 2017) developed for this research project and with tools available in the spsurvey (Kincaid and Olsen 2015) and lme4 (Bates et al. 2015) packages. Data collected for the SIEN lake chemistry monitoring program between 2008 and 2013 are analyzed to determine if trends are present. The sampling design for the SIEN lake chemistry survey employed strata defined by SEKI and YOSE and unequal probability sampling relative to cost classes (Figure 2) within each stratum. A total of 25 lakes were visited each year across the two parks in a [1-0, 1-3] revisit design for a total of 76 unique sites. A large oversample was also drawn to provide a pool of sites in case nonsampling error occurred. See the Pilot Data section for more sampling design information. Note that, due to budget restrictions, in 2013 only the annual panel of sites was visited. Periodically reduced sampling years are part of SIEN's long-term budget strategy. Only the annual sites and the sites visited in 2008 and 2012 are included in this trend analysis, because modeling the full model that includes the random site-level slope effect requires temporal replication at all sites.

Prior to conducting trend analyses, the evaluation status must be determined and design weights calculated for each site. When a GRTS sample is drawn, a design file is generated containing the sampled points in spatially-balanced order. The "EvalStatus" and "EvalReason" fields are columns in the design file for recording the status and notes on site evaluation relative to target population membership and sampling success. The default value is "NotEval" indicating that the site has not yet been evaluated. The panels of sites scheduled to be visited during a given year are evaluated and classified in one of four categories (Table SC1). The "EvalStatus" field is then used to adjust the design weights so that the appropriate sample and frame are represented. A small amount of nonsampling error was encountered during the surveys (Table SC2). In 2010 and 2011, two lakes were deemed to not meet the definition of the target population. Three sites in the first alternating panel were replaced due to inaccessibility based on safety concerns; two of these sites were sampled once (2008) and known to be part of the target population and one was not assessed. Two lakes in 2011 were considered inaccessible that season due to snow and thus not sampled. One site was an annual site and previously confirmed to be part of the target population. The second site was not previously visited, but initially assumed to be part of the target population (the site was visited and confirmed to be part of the target population in 2016). Four lakes were added to the sample from the oversample to maintain the desired annual sample size.

Note that these definitions of the EvalStatus field are year-specific. For example, two sites that were surveyed successfully in 2008 were considered for later years to be inaccessible due to safety concerns. The EvalStatus for these sites is "Target - Surveyed" in 2008 but "Target - Not Surveyed" in subsequent years. The non-target evaluation is also year-specific which may make sense if water levels in lake change dramatically enough from year to year to affect a lake's inclusion in the target population. Determining a site's EvalStatus may be year-specific or may be constant across years, depending on the qualities of the specific target population.

Table SC1. Post-survey coding for EvalStatus field in GRTS design file.

EvalStatus	Description
"Target - Surveyed"	The site was assessed and found to be a member of the target population. Data were successfully collected.
"Target - Not Surveyed"	The site was assessed and found to be a member of the target population. Data were not collected due to an issue such as inaccessibility or landowner denial of access.
"Non-Target"	The site was not a member of the target population.
"NotEval"	The site was not evaluated or sampled. This could occur when the sampling season is ending and there is not enough time to visit all sites. This would also be the appropriate survey evaluation for a site in the overall sample but not surveyed in a given year.

Table SC2. Nonsampling error in the SIEN lake chemistry surveys, 2008 – 2013.

EvalStatus	2008	2009	2010	2011	2012	2013
Non-Target	0	0	0	2	0	0
NotEval	55	55	56	55	53	72
Target - Not Surveyed	0	0	0	0	2	0
Target - Surveyed	25	25	24	23	25	8

Design weights were adjusted assuming that the missing values (i.e., Target-Not Surveyed) was completely at random and not associated with the sampling design, covariates, or the outcome of interest. Ecologists could make different assumptions on the missing values, but the number of missing sites in this example, two, is too small for most weighting adjustment techniques. When nonsampling error occurs or the sample size changes from what was initially planned, the design weights must be adjusted. To account for differences in effort and/or nonsampling error across years, design weights are adjusted by year. The AdjWgt function in the TrendNPS R package (Starcevich and Mitchell 2017) requires that the EvalStatus field be formatted as described in Table 5. For a given year, sites that were surveyed in previous years but not members of the current year's panel are assigned a value of "NotEval" in the EvalStatus values for that year. The resulting adjusted design weights are year specific. To obtain the Stage 1 site-level adjusted design weight for the trend approaches, the adjusted year-specific weight is divided by the panel weight. See the case study for an example of how the design weights are adjusted for the trend approaches. See Starcevich et al. (2016) for more information on single-year weighting adjustments for nonsampling error and for other relevant references. R code to read the SIEN lake chemistry data set, add variables for the trend analysis, format the EvalStatus field, and calculate panel weights is provided below.

To begin the analysis, the TrendNPS should be installed and loaded in R. Installing the TrendNPS package either from a local zipped file or from a binary source file is a straightforward process. When using RStudio as an interface for R, first install the TrendNPS package from a standard R application and then the package will be accessible through RStudio. The installation files should be available on the user's hard drive in a known directory. These files may be downloaded from the following web site:

<https://irma.nps.gov/DataStore/Reference/Profile/2248489>.

To begin installation of TrendNPS, open the R program, ensure that an internet connection is available, and, in the command window at the prompt (indicated by a greater-than symbol: >), type the following and hit Enter to install the dependent packages required by TrendNPS:

```
install.packages( c("lme4", "lmerTest", "spsurvey", "stats"),  
  repos="http://cran.r-project.org")
```

To install from the zipped installation file (TrendNPS_0.0.5.4.zip), open R and select the drop-down menu item Packages>Install package(s) from local zip files... then use the browser window to locate and select the zipped installation file. If any dependent packages are missing, an error messages will print indicating which packages are needed. Install these missing packages and the TrendNPS package. When the TrendNPS package is successfully installed, the message “package ‘TrendNPS’ successfully unpacked and MD5 sums checked” will print to the console.

The remaining instructions will focus on installing directly from a binary source program. Download the TrendNPS installation file TrendNPS_0.0.5.4.tar.gz and store it in an appropriate directory on your computer. Let “..PATH..” represent the directory on the user’s computer where the file TrendNPS_1.0.tar.gz is stored. Install TrendNPS by typing the following line and hitting enter:

```
install.packages("../PATH../TrendNPS_0.0.5.4.tar.gz", type="source",  
  repos=NULL)
```

For example, if the installation file is downloaded to the TEMP directory on the C drive, then the path is “C:/TEMP” and the following command would be used to install TrendNPS:

```
install.packages("C:/TEMP/TrendNPS_0.0.5.4.tar.gz", type="source",  
  repos=NULL)
```

If you have already changed your working directory to the location of the installation file, then enter:

```
install.packages("TrendNPS_0.0.5.4.tar.gz", type="source", repos=NULL)
```

Once the package is installed, the user can load the TrendNPS package into the R environment by either typing at the command line:

```
require(TrendNPS)
```

or by navigating on the menu to Packages/Load package... and selecting TrendNPS from the list of installed packages.

```
#####  
# Read data  
#####  
# GRTS sample/design file  
GRTSSample = read.csv("GRTSSample.csv", header=TRUE)  
# Lake chemistry monitoring data  
LakeData_orig = read.csv("LakeData_orig.csv", header=TRUE)  
#####
```

```

# Load R packages
#####
require(lme4)
require(lmerTest)
require(spsurvey)
require(TrendNPS)
#####
# Merge monitoring data with GRTS sample design file
#####
# Create set of oversample sites
OverSampSites = c("Y030-Out", "Y029-Out", "S051-Out", "S052-Out")
# flag main sample and oversample sites used
index = (GRTSSample$panel!="OverSamp") |(GRTSSample$siteID %in%
OverSampSites)
sum(index) # 80 records
# Define the years in the monitoring plan
Years = 2008:2013
# Create a function to create a dataframe containing the sampling frame
# for each year
FrameByYears = function(frame,years) {
  ans = data.frame(Year=Years[1],frame)
  for (i in Years[-1]) ans = rbind(ans, data.frame(Year=i,frame))
  return(ans)
}

GRTSSample_Years = FrameByYears(GRTSSample[index,],Years)
dim(GRTSSample_Years) # 480 11
# Merge data with GRTS design file. Use all=TRUE to get complete
# GRTS sample and all weights
dim(LakeData_orig) # 130 6
dim(GRTSSample_Years) # 461 11
LakeDataAll=merge(GRTSSample_Years,LakeData_orig,all=TRUE,by=c("Year", "Pa
rk", "siteID"))
dim(LakeDataAll) # 480 14
#####
# Create EvalStatus field
#####
# default is set as "Target - Sampled"
LakeDataAll$EvalStatus = "Target - Sampled"
# If the data field is empty/NA, the site was not evaluated
LakeDataAll$EvalStatus[is.na(LakeDataAll$pH)]= "NotEval"
# One annual site was not surveyed in 2011
LakeDataAll$EvalStatus[LakeDataAll$siteID == "S002-Out" &
LakeDataAll$Year==2011]= "NotEval"
LakeDataAll$EvalStatus[LakeDataAll$siteID == "S002-Out" &
LakeDataAll$Year!=2011]= "Target - Sampled"

```

```

# Sites "S006-Out" and "Y009-Out" were inaccessible
LakeDataAll$EvalStatus[LakeDataAll$siteID=="S006-Out" &
LakeDataAll$Year==2008]="Target - Sampled"
LakeDataAll$EvalStatus[LakeDataAll$siteID=="S006-Out" &
LakeDataAll$Year==2012]="Target - Not Sampled"
LakeDataAll$EvalStatus[LakeDataAll$siteID=="Y009-Out" &
LakeDataAll$Year==2008]="Target - Sampled"
LakeDataAll$EvalStatus[LakeDataAll$siteID=="Y009-Out" &
LakeDataAll$Year==2012]="Target - Not Sampled"
# Sites "Y020-Out" and "Y024-Out" were determined to not be members of
the target population
LakeDataAll$EvalStatus[LakeDataAll$siteID %in% c("Y020-Out", "Y024-Out") &
LakeDataAll$Year==2011]="Non-target"
table(LakeDataAll$EvalStatus, LakeDataAll$Year)
#
      2008 2009 2010 2011 2012 2013
# Non-target      0  0  0  2  0  0
# Not Evaluated   55 55 56 55 53 72
# Target - Not Sampled 0  0  0  0  2  0
# Target - Sampled  25 25 24 23 25  8

#####
# Adjust weights for nonresponse, frame error, and reduced annual effort
#####
#
# Need the weights to represent the entire sample each year so that the
# weights sum to the frame size.
# Adjust weights by Park since stratified GRTS sampling used.
# Use the AdjWgt function in the TrendNPS package
LakeDataAll$AdjWgt = NULL
for (i in 2008:2013) {
  index = LakeDataAll$Park=="SEKI" & LakeDataAll$Year==i &
(LakeDataAll$panel!="OverSamp"|LakeDataAll$EvalStatus!="Not Evaluated")
  LakeDataAll$AdjWgt[index] =
AdjWgt(dat=LakeDataAll[index, ], popn="Target", evalstatus =
"EvalStatus", wgt = "wgt")
  index = LakeDataAll$Park=="YOSE" & LakeDataAll$Year==i &
(LakeDataAll$panel!="OverSamp"|LakeDataAll$EvalStatus!="Not Evaluated")
  LakeDataAll$AdjWgt[index] =
AdjWgt(dat=LakeDataAll[index, ], popn="Target", evalstatus =
"EvalStatus", wgt = "wgt")
}
# The sum of the adjusted weights should sum to the size of the sampling
frame after adjusting for frame error.
aggregate(LakeDataAll$AdjWgt[LakeDataAll$EvalStatus=="Target - Sampled"],
list(LakeDataAll$Year[LakeDataAll$EvalStatus=="Target -

```

```

Sampled"], LakeDataAll$Park[LakeDataAll$EvalStatus=="Target -
Sampled"]), sum)
aggregate(LakeDataAll$wgt[LakeDataAll$panel!="OverSamp"],
list(LakeDataAll$Year[LakeDataAll$panel!="OverSamp"], LakeDataAll$Park[Lak
eDataAll$panel!="OverSamp"]), sum)
# Adjusted weights to not exactly sum to the frame size because unequal
probability sampling was used.
# These adjusted weights are calculated by year and represent the
# design weight within each year.
# For the trend approaches, we need the adjusted design weight at the
# site level. To obtain this value, we divide the annual adjusted weights
# by the panel weight. Now we create the panel weights.

#####
# Create panel weights
#####
dim(LakeDataAll)          # 480 17
LakeData = LakeDataAll[!is.na(LakeDataAll$pH),]
dim(LakeData)             # 130 17
# Create panel weights
a=table(LakeData$siteID, LakeData$Year)
rowSums(a)
PanelWt = data.frame(siteID=rownames(a), PanelWt=6/rowSums(a))
rownames(PanelWt) = NULL
LakeData = merge(LakeData, PanelWt)
dim(LakeData)             # 130 18

# Modify adjusted weights to obtain an adjusted site-level design weight
LakeData$AdjWgt = LakeData$AdjWgt/ LakeData$PanelWt

#####
# For trend analyses, use only sites with replication in time
#####
# Examine replication by siteID and use only sites with at least
# 2 years of data
b=table(LakeData$siteID, LakeData$Year)
LakeData_Rep = rownames(b)[rowSums(b)>=2]
LakeDataRep = LakeData[LakeData$siteID %in% LakeData_Rep,]
dim(LakeData)             # 130 18
dim(LakeDataRep)          # 77 18

#####
# Data formatting for the trend model
#####
# Create WYear
LakeDataRep$WYear = LakeDataRep$Year - 2008

```

```
# Make Year a factor for modeling
LakeDataRep$Year = as.factor(LakeDataRep$Year)
# Rename "siteID" to "Site"
names(LakeDataRep)[which(names(LakeDataRep)=="siteID")] = "Site"
```

Case Study 1: pH Trend in Yosemite

Our first case study uses the SIEN lakes data set and examines trend in pH for YOSE. In this case study we describe the data analysis approach step-by-step and provide associated R code. We describe how to fit the PO model using the lme4 (Bates et al. 2015) R package, assess the model fit using residual diagnostics, examine the data set for subpopulation trends, identify the appropriate trend method using the flowchart (Figure 8), and conduct the trend analysis.

Fitting the PO Model

First, a new data set is created that includes only the YOSE sites and then the pH data from YOSE are plotted by year to visually assess the measure over time (Figure SC1).

```
# Use YOSE data only
YOSEData = LakeDataRep[LakeDataRep$Park=="YOSE",]
Sites = sort(unique(YOSEData$Site))
par(mfrow=c(1,1))

# Plot data
plot(YOSEData$WYear+2008, YOSEData$pH, xlab="Year", ylab="pH",
ylim=c(5, 7.2), pch=19, col=as.factor(YOSEData$Site))
legend(2010.75, 5.55, col=1:4, pch=19, legend= Sites[1:4], cex=0.7)
legend("bottomright", col=5:8, pch=19, legend= Sites[5:8], cex=0.7)
```

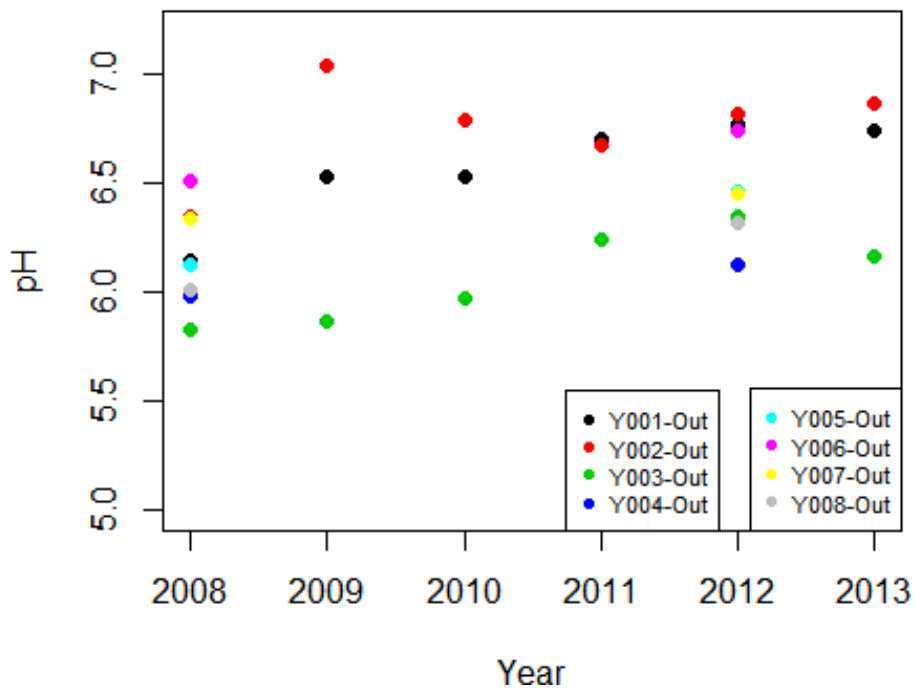


Figure SC1. Yosemite pH by Year.

Now the Piepho and Ogutu (2002) trend model will be fit to the data. We start with the PO model to obtain variance components estimates and to assess model fit. Initial modeling indicated heterogeneity in the residuals (as evidence by an increasing funnel panel in the plot of residuals versus fitted values) so a logarithmic transformation was used for the pH outcome. The code and resulting output are as follows:

```
# Fit the PO model in the lme4 package with the lmer function for
# linear mixed-effects models
TrendFit_pH_YOSE<- lmer(log(pH) ~ WYear+ (1|Year) +(1+WYear|Site),
data=YOSEData)
summary(TrendFit_pH_YOSE)
```

Random effects:

Groups	Name	Variance	Std.Dev.	Corr
Site	(Intercept)	1.748e-03	0.041814	
WYear		1.313e-06	0.001146	-1.00
Year	(Intercept)	1.233e-05	0.003512	
Residual		4.889e-04	0.022111	

Number of obs: 28, groups: Site, 8; Year, 6

Fixed effects:

	Estimate	Std. Error	df	t value	Pr(> t)
(Intercept)	1.825515	0.016581	6.453000	110.097	8.25e-12 ***
WYear	0.011674	0.002501	1.440000	4.667	0.0773 .

Note that the site intercept and site slope random effects are perfectly correlated (1.00, indicated in red), which indicates that this model is overspecified. In an effort to achieve a better fit, we amended the model and dropped the random slope term.

```
# Fit the reduced P0 model without the random slope term
TrendFit_pH_YOSE2<- lmer(log(pH) ~ wYear+ (1|Year) +(1|Site),
data=YOSEData)
summary(TrendFit_pH_YOSE2)
```

Random effects:

Groups	Name	Variance	Std.Dev.
Site	(Intercept)	1.536e-03	0.03920
Year	(Intercept)	1.325e-05	0.00364
Residual		4.958e-04	0.02227

Number of obs: 28, groups: Site, 8; Year, 6

Fixed effects:

	Estimate	Std. Error	df	t value	Pr(> t)
(Intercept)	1.825597	0.015792	7.269000	115.599	3.9e-13 ***
wYear	0.011553	0.002501	1.475000	4.619	0.0754 .

Examining Subpopulation Trends

We next examine whether any subpopulations exhibit a trend. Subpopulation trends may affect both the mean structure and variance structure. First, we plot the indicator of interest against covariates that may exhibit differing trends. These covariates are best identified from relevant literature or by ecologists familiar with the monitored systems. It is critical that potential domains be identified *a priori* based on ecological knowledge so that spurious effects, which will almost always be present in large monitoring datasets, are not incorrectly used. The SIEN data set contains covariate information on lake area, perimeter, and elevation that we used to assess the presence of domains within which pH trend might differ. Plots of pH against each of the possible covariates indicate a possible relationship with pH and elevation (Figure SC2).

```
par(mfrow=c(2,2))
plot(YOSEData$Elevation_m, YOSEData$pH,main = "Elevation",xlab="Elevation
(m)",ylab="pH")
plot(YOSEData$lake_area, YOSEData$pH,main = "Area",xlab="Area
(m2)",ylab="pH")
plot(YOSEData$lake_perim, YOSEData$pH,main = "Perimeter",xlab="Perimeter
(m)",ylab="pH")
```

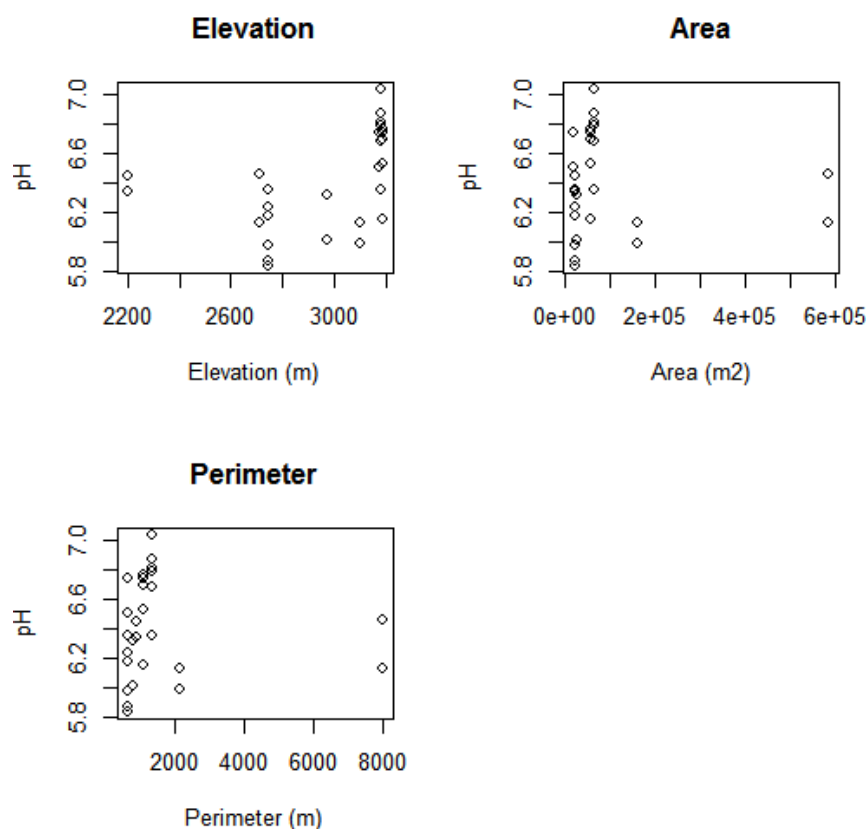


Figure SC2. Plots of pH against elevation, lake area, and lake perimeter.

We further investigate the relationship between pH and elevation by examining trends based on elevational stratification of above or below 3100m defined earlier. The results of the separate slopes model for the two-level elevational stratum indicates no significant difference between trends in the high- and low-elevational stratum (p -value = 0.7848). The difference in the log-transformed outcome for the two strata is 0.0013 (90% confidence interval of (-0.0070, 0.0097)), which is unlikely to have ecological significance in addition to its lack of statistical significance. Note also that the addition of the two new fixed effects has resulted in a year-to-year variance component estimate of 0, indicating that the data set is too small to estimate more parameters.

```
YOSEData$ElevStratum = ifelse(YOSEData$Elevation_m>3100, "High", "Low")
TrendFit_pH_YOSE3<- lmer(log(pH) ~ WYear*ElevStratum+ (1|Year) +(1|Site),
data=YOSEData)
summary(TrendFit_pH_YOSE3)
```

Random effects:

Groups	Name	Variance	Std.Dev.
Site	(Intercept)	0.0011686	0.03419
Year	(Intercept)	0.0000000	0.00000
Residual		0.0005354	0.02314

Number of obs: 28, groups: Site, 8; Year, 6

Fixed effects:

	<i>Estimate</i>	<i>Std. Error</i>	<i>df</i>	<i>t value</i>	<i>Pr(> t)</i>	
(Intercept)	1.847506	0.019726	7.549000	93.657	7.54e-13	***
WYear	0.011076	0.003237	17.94100	3.422	0.00305	**
ElevStratumLow	-0.045795	0.028192	7.863000	-1.624	0.14360	
WYear:ElevStratumLow	0.001340	0.004833	17.94000	0.277	0.78475	

Testing Assumptions of the Linear Mixed Model

Next we assess the assumptions of the linear mixed model using the following criteria (Pinheiro and Bates 2000):

- 1) Within-group errors are:
 - a) Independent
 - b) Identically normally-distributed $N(0, \sigma_e^2)$, and are
 - c) Independent of group-level random effects
- 2) Random effects are:
 - a) Normally distributed $N(0, \Psi)$ and are
 - b) Independent for different groups

Assumption 1 is assessed by evaluating within-group residuals, where groups in this setting are defined by Year and Site. Within-group fitted values, observed values, and covariates of interest may also be used in assessing Assumption 1. Assumption 1a is examined with partial autocorrelation functions of site-level residuals to determine if any serial correlation remains in the trend model residuals. This is assessed for the annual panel sites only. A function to create a time series of the residuals for each site and plot the partial autocorrelation function is provided.

```
Residual_ts=function(resids,yr,site) {
# Function to format residuals to examine serial correlation by site
# requires reshape package
  dat=data.frame(res=resids,yr=yr,site=site)
  yy=unique(data.frame(yr=dat$yr))
  yy=data.frame(yy,ind=1:nrow(yy))
  dat=merge(dat,yy)
  dat$variable=dat$res
  dat_cast=cast(dat,ind~site)
  dat_ts=ts(dat_cast,start=c(2008,1),deltat=1/nrow(yy),class= c("mts",
"ts", "matrix"))
  return(dat_ts)
}
fit = TrendFit_pH_YOSE2
dat = YOSEData
dat$Resid <- residuals(fit, type='pearson')
Years <- sort(unique(dat$Year))
AnnualSites = c("Y001-Out","Y002-Out","Y003-Out")

require(reshape)
```

```

Y0SEph_ts=Residual_ts(resids=residuals(fit), yr=dat$Year,site=dat$Site)
op <- par(mfrow=c(2,2),
        oma = c(0,2,1,0) + 0.1,
        mar = c(2,1.5,3.5,1) + 0.1)
for (i in which(colnames(Y0SEph_ts) %in% c("Y001-Out", "Y002-Out", "Y003-
Out")))) {
  if(length(Y0SEph_ts[!is.na(Y0SEph_ts[,i]),i])>2) Y0SEph_ts.i =
  pacf(Y0SEph_ts[!is.na(Y0SEph_ts[,i]),i], na.action=na.pass, plot=FALSE)
  plot(Y0SEph_ts.i, type="h", main=colnames(Y0SEph_ts)[i])
}

```

The resulting partial autocorrelation plots for each site indicate no substantial serial correlation in trend model residuals (Figures S3 and S4).

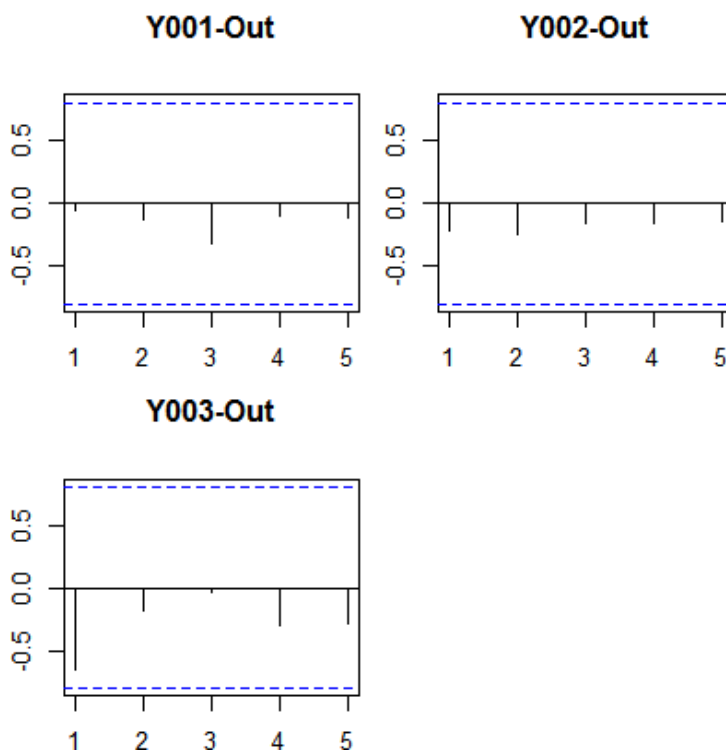


Figure SC3. Partial autocorrelation function plots of residuals for annual sites Y001-Out to Y003-Out.

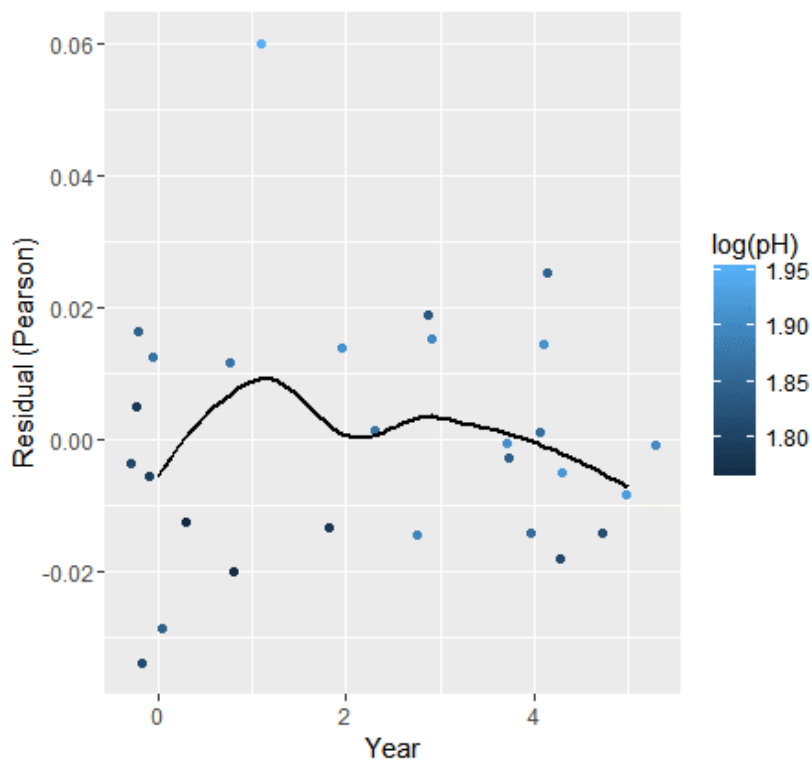


Figure SC4. Pearson residuals by Year.

The equal variance requirement specified by Assumption 1b is assessed with a plot of Pearson residuals against fitted values across all groups (Figure 12). We see some deviations from a mean of 0, and a large residual corresponding to a pH of 7.04 which was the maximum value and observed at Site Y002-Out. The following code will create a plot of residuals against fitted values:

```
require(ggplot2)
ggplot(data=dat, aes(x=wYear, y=Resid)) + geom_jitter(aes(colour=log(pH)),
width=0.75) + stat_smooth(se=FALSE, colour="black") + xlab("Year") +
ylab("Residual (Pearson)") # Figure SC4
```

Now we examine the residuals by group, beginning with grouping by Site (Figures SC5 and SC6) and then by Year (Figures SC7 and SC8). The residuals are centered on zero overall and some heterogeneity is observed. With only six years of data and three sites in the annual panel, the sample size is still very small and thus we wouldn't expect to see strong heterogeneity this early in the project.

```
# Examine residuals by Site across Years
plot(fit, Site~resid(.), abline = 0) # Figure SC5
plot(fit, resid(., type = "pearson") ~ fitted(.) | Site) # Figure SC6

# Examine residuals by Site across Years
plot(fit, Year~resid(.), abline = 0) # Figure SC7
plot(fit, resid(., type = "pearson") ~ fitted(.) | Year) # Figure SC8
```

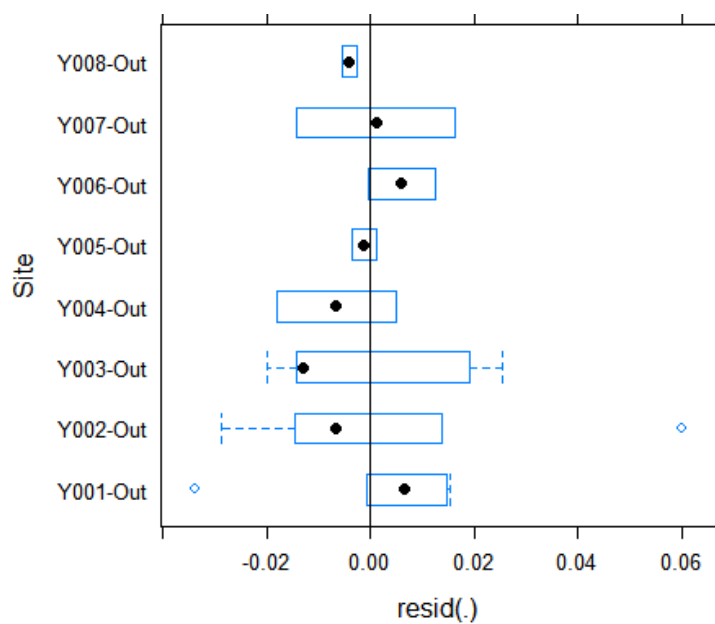


Figure SC5. Boxplot of Pearson residuals by Site across Years.

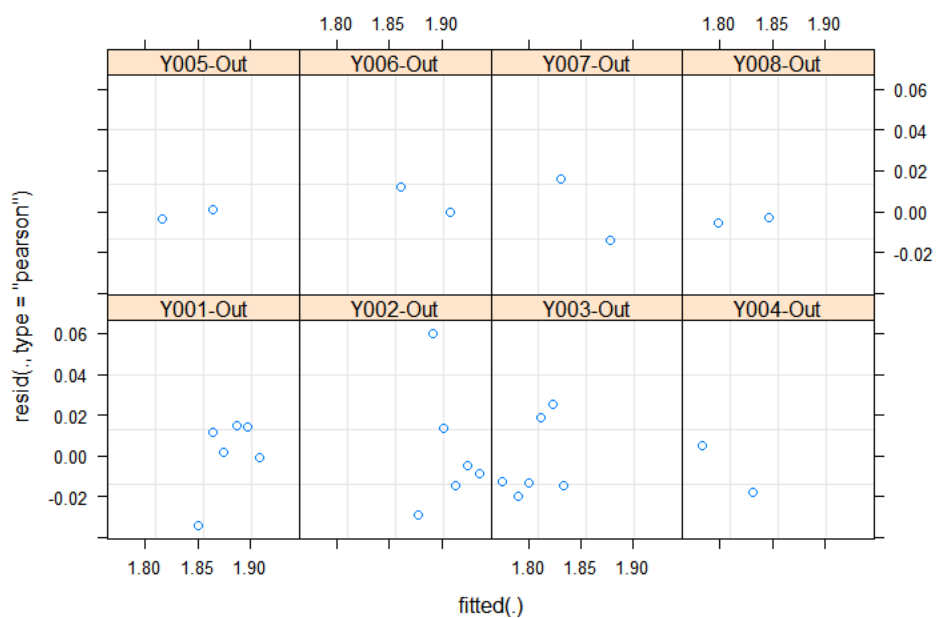


Figure SC6. Pearson residuals by Site.

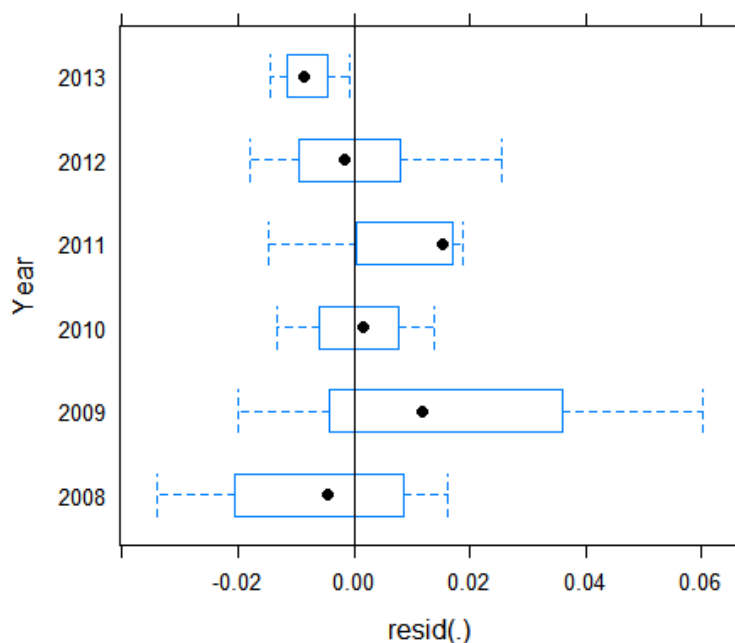


Figure SC7. Boxplot of Pearson residuals by Year across Sites.

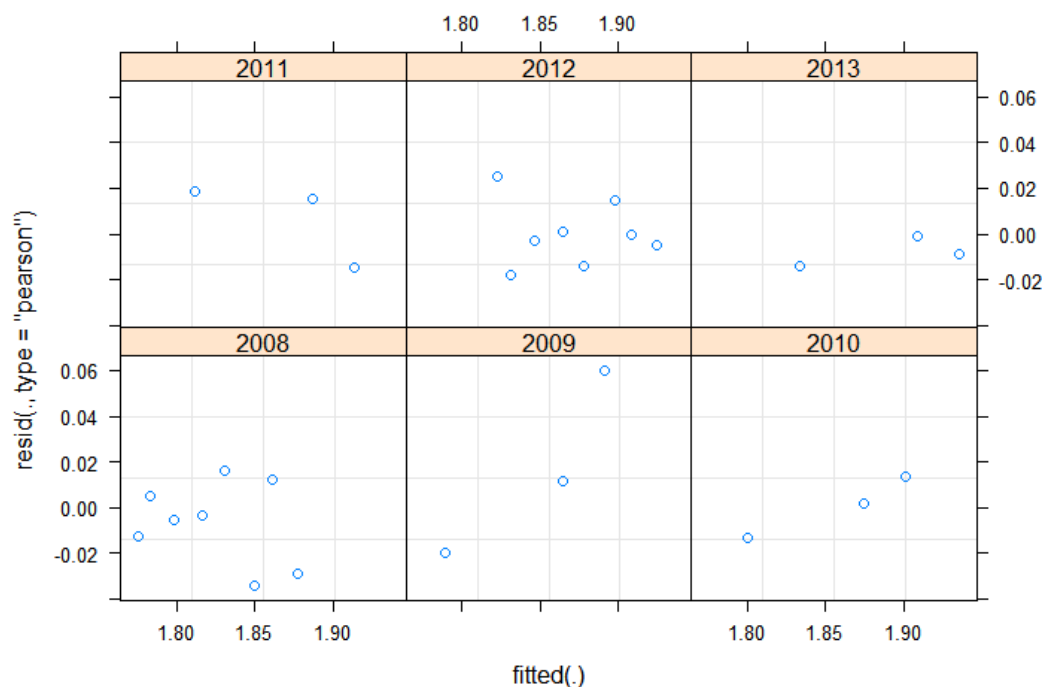


Figure SC8. Pearson residuals by Year.

The normality portion of Assumption 1b is assessed by reviewing normal distribution quantile-quantile plots of group-level residuals by site and by year. Note that it is difficult to assess the normality of residuals for sites in panels visited only twice, so only the sites with at least two years of data are examined. Results indicate that the normality assumption is tenuous for the first two sites due to skewness caused by an outlier for each site (Figures SC9 and SC10).

```

# Quantile-quantile plots of residuals by site
siteVec <- unique(dat$Site)
length(siteVec) # 8
par(mfrow=c(3,3))
for(w in which(siteVec%in%AnnualSites)) {
  qqnorm(dat$Resid[dat$Site == siteVec[w]],
    main = paste("Site",siteVec[w]))
  qqline(dat$Resid[dat$Site==siteVec[w]])
}

```

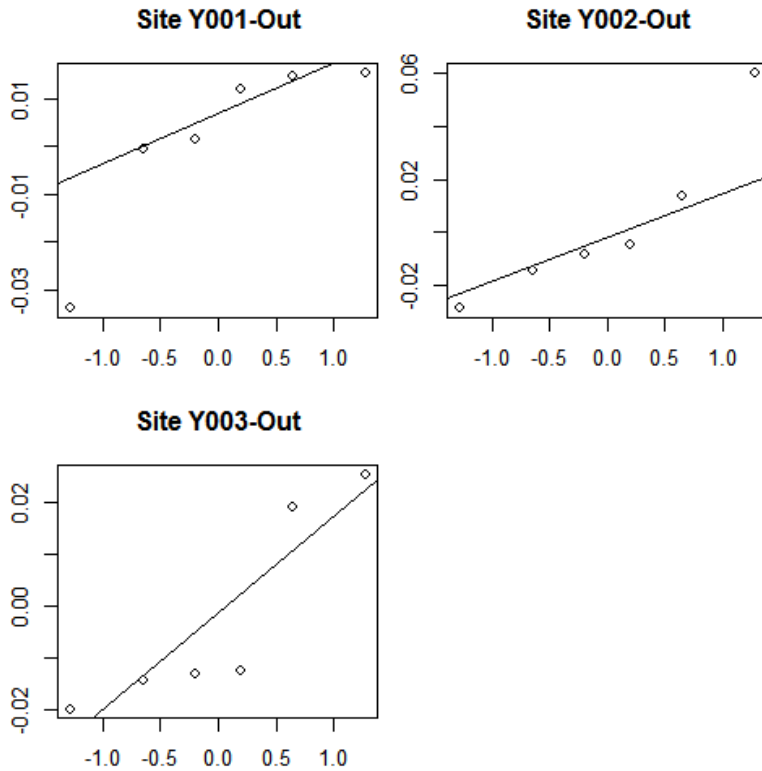


Figure SC9. Normal quantile-quantile plots of Pearson residuals by Site.

```

# Quantile-quantile plots of residuals by year
par(mfrow=c(3,2))
for(w in 1:6) {
  qqnorm(dat$Resid[dat$Year == Years[w]],
    main = Years[w])
  qqline(dat$Resid[dat$Year==Years[w]])
}

```

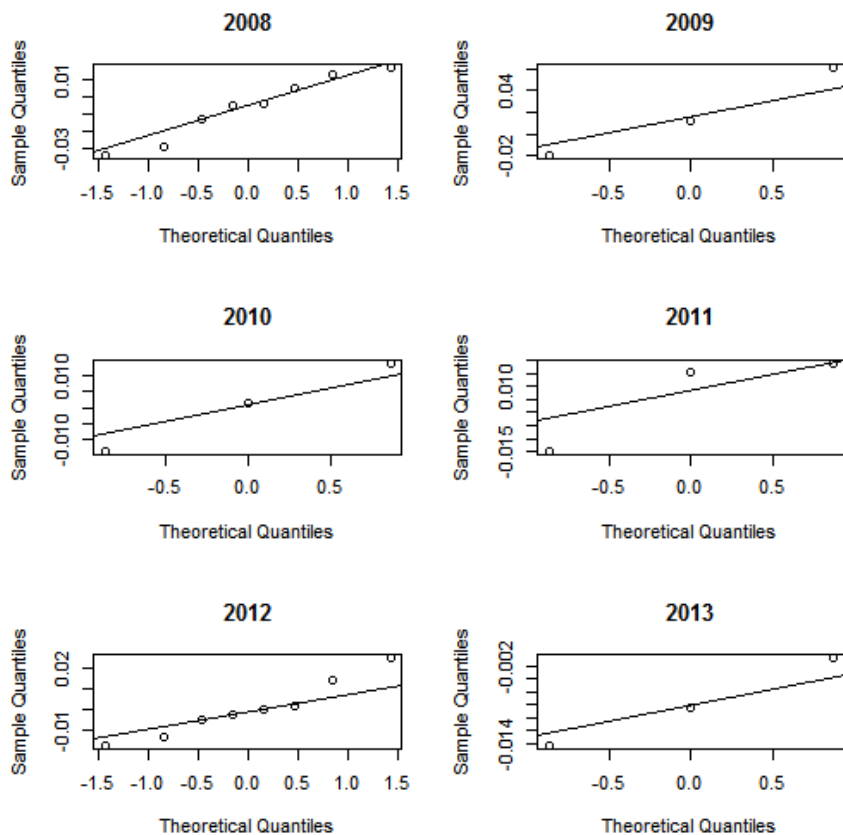


Figure SC10. Normal quantile-quantile plots of Pearson residuals by Year.

Assumption 1c, that within group errors are independent of random effects, is addressed by examining possible correlation between the residuals and the site- and year-level random effects. Pearson's correlation tests are conducted to assess any possible linear correlation. As shown by the test results with and without the outlier (code and results below), the one large residual appears to influence the relationship between the residuals and site-level random effects (p-value = 0.0525). When the outlier is removed, no significant correlation is found between residuals and site-level random effects (p-value = 0.3222) and between residuals and year-level random effects (p-value = 0.9825). Plots also demonstrate the influence of the one large residual (Figure SC11). Possible correlation will be better addressed as more years of data are available.

```
# Assumption 1c -- independence of RE and resid
SiteRE =
data.frame(Site=rownames(ranef(fit)$Site), SiteRE=ranef(fit)$Site)
names(SiteRE)[2] = 'SiteRE'
rownames(SiteRE)=NULL
YearRE =
data.frame(Year=rownames(ranef(fit)$Year), YearRE=ranef(fit)$Year)
names(YearRE)[2] = 'YearRE'
rownames(YearRE)=NULL

dim(dat)# 28 21
```

```

dat = merge(dat, SiteRE)
dat = merge(dat, YearRE)
dim(dat)# 28 23
cor.test(dat$Resid, dat$YearRE)
# t = 2.0315, df = 26, p-value = 0.0525
cor.test(dat$Resid[dat$Resid<0.06], dat$YearRE[dat$Resid<0.06])
# t = 1.01, df = 25, p-value = 0.3222
cor.test(dat$Resid, dat$SiteRE)
# t = 0.79423, df = 26, p-value = 0.4343
cor.test(dat$Resid[dat$Resid<0.06], dat$SiteRE[dat$Resid<0.06])
# t = 0.022161, df = 25, p-value = 0.9825

par(mfrow=c(2,1))
plot(Resid ~ SiteRE, data=dat, main="Site Random Effects", xlab="Site
RE", ylab="Residuals")
plot(Resid ~ YearRE, data=dat, main="Year Random Effects", xlab="Year
RE", ylab="Residuals")

```

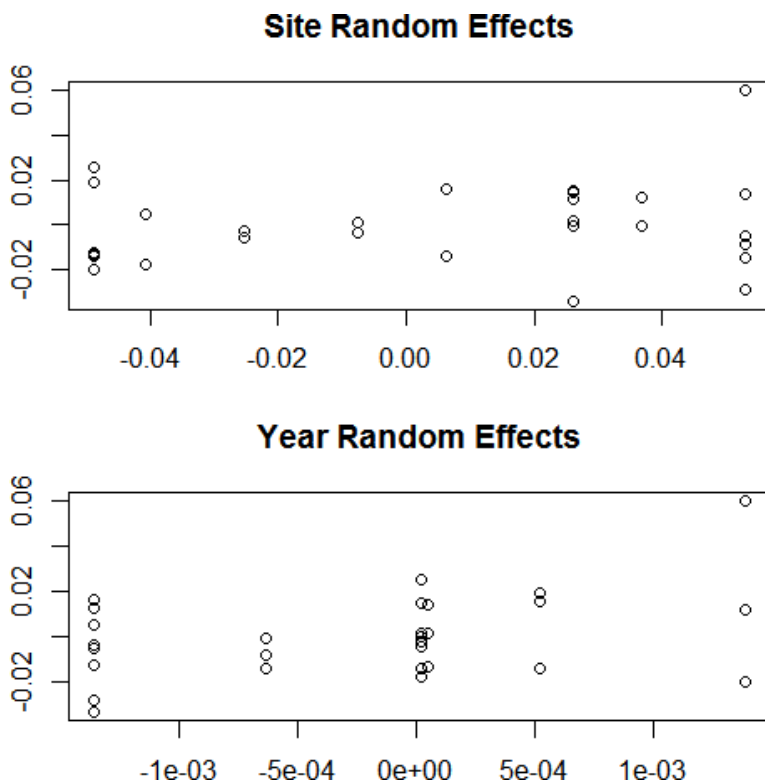


Figure SC11. Plots of residuals against Site- and Year-level random effects.

Assumption 2 addresses assumptions on the estimated random effects, also called “best least unbiased estimators,” or BLUPs. These are obtained in the lme4 package with the ranef(fit) function. First, the normality of the BLUPs, specified in Assumption 2a, is assessed with normal quantile-quantile plots for each group (Figure SC12) which indicates approximate normality.

```

par(mfrow=c(2,1))
qqnorm(ranef(fit)$Site[,1], main = "Random site-intercept effect")
qqline(ranef(fit)$Site[,1])
qqnorm(ranef(fit)$Year[,1], main = "Random year-intercept effect")
qqline(ranef(fit)$Year[,1])

```

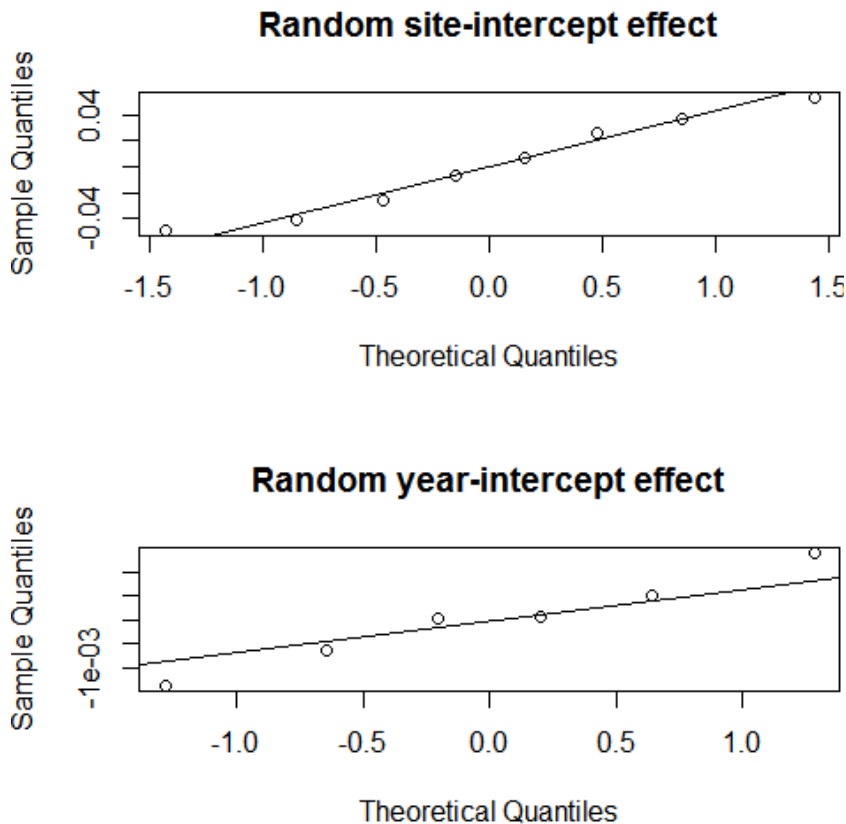


Figure SC12. Normal quantile-quantile plots of random effects by group.

Histograms of the site- and year-level random effects are examined to assess the part of Assumption 2a that each group of random effects is centered on zero. The histograms indicate that the random effects are centered on zero but the small sample size prohibits the more familiar bell-shaped curve (Figure SC13).

```

par(mfrow=c(2,1))
hist(ranef(fit)$Site[,1],breaks=seq(-0.06,0.06,0.02),xlab="Site RE",
main="Random site-intercept effect")
hist(ranef(fit)$Year[,1],breaks=seq(-0.002,0.002,0.0005), xlab="Year
RE",main="Random year-intercept effect")

```

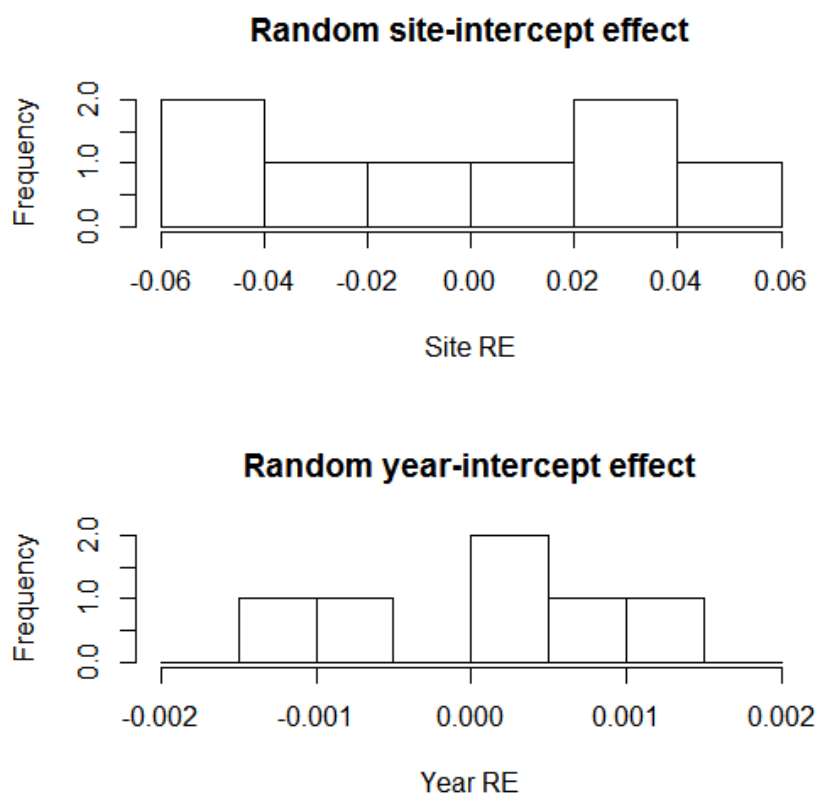


Figure SC13. Histograms of random effects (RE) by Site and Year.

Assumption 2b stipulates that random effects are independent for each group. Groups could include fixed effects from the trend model or other random effects. Pinheiro and Bates (2000) suggest testing the independence assumption with different covariance structures, which requires the nlme (Bates et al. 2016) package. More complex variance structures were attempted for this pilot data set, but the sample size was insufficient to consider more covariance parameters. Please refer to Pinheiro and Bates (2000) for more information on assessing the assumption of linear mixed models.

Determine and Run Appropriate Trend Analysis Method

We now use the flowchart (Figure 8) to help select a reasonable trend analysis procedure. Note that the flowchart demonstrates the broad patterns observed in the simulation but may omit more detailed patterns. Given that we have a complex sample design and no significant trend in a subpopulation was found, the flowchart suggests using the PO model for trend estimation. However, note that other subpopulation trends may be present but undetected.

From this point we can refer back to the original trend model we ran at the beginning of the process (refer to the Fitting the PO model section) -- assigned to the R object name TrendFit_pH_YOSE2. The results indicate some evidence of an increasing trend in pH between 2008 and 2013 (p-value = 0.0754). Next we use tools in the TrendNPS (Starcevich and Mitchell 2017) package to calculate the annual trend in pH on the original scale, to calculate confidence intervals, and to conduct a two-sided test of no trend. Using the trend estimation tool for continuous data, TrendNPS_Cont, the trend analysis method is specified as “PO” and the trend model is estimated without the random slope effect (slope=FALSE) to reflect the model overspecification observed previously. The results of the trend analysis are provided below.

```

Ests_pH_YOSE_PO =
TrendNPS_Cont(alpha=0.1, dat=YOSEData, method="PO", slope=FALSE, Y="pH")
Ests_pH_YOSE_PO
$ModelEstimates
      mu      trend      SEtrend      sig2a sig2t sigat      sig2b
1 1.825597 0.01155319 0.002501485 0.001536352  0      0 0.000013
      sig2e      eta
1 0.0004957606 1.474772

$TrendTest
      trend      SEtrend      t-stat      eta      pvalue
1 0.01155319 0.002501485 4.618532 1.474772 0.07535985

$TrendCI
      trend      trend.1      trend.2
1 0.01162019 0.00212758 0.02120271

```

The output of the TrendNPS_Cont function includes (i) the model estimates from the trend regression model (\$ModelEstimates), (ii) the trend test results conducted at the specified alpha level of 0.10 (\$TrendTest), and (iii) the estimate of the annual percent trend (0.0116 or 1.16% annually) with 100(1 – α) %-confidence interval, (0.0021, 0.0212) or (0.21%, 2.12%) (\$TrendCI). Note that, while this trend is statistically significant, an annual trend of 1.16% over a short time frame may not be ecologically significant enough to trigger a management action.

Case Study 2: Chloride Trend in Sierra Nevada Network

For the second case study, trend in chloride is examined for the entire Sierra Nevada Network, and stratification by SEKI and YOSE is incorporated in the analysis. We start with the PO model, assess linear mixed model assumptions with residual diagnostics, determine the appropriate trend method using the flowchart (Figure 8), and conduct the trend analysis.

Fitting the PO Model

The first step is to plot the chloride data by year to visually assess the measure over time. The plot of the SIEN chloride data indicates a possible declining trend in SEKI but a stable-to-increasing trend in YOSE (Figure SC14).

```

# Plot data
plot(LakeDataRep$WYear+2008, LakeDataRep$Cl, xlab="Year", ylab="Chloride",
pch=19, col=LakeDataRep$Park)
legend("topright", col=1:2, pch=19, legend=c("SEKI", "YOSE"))

```

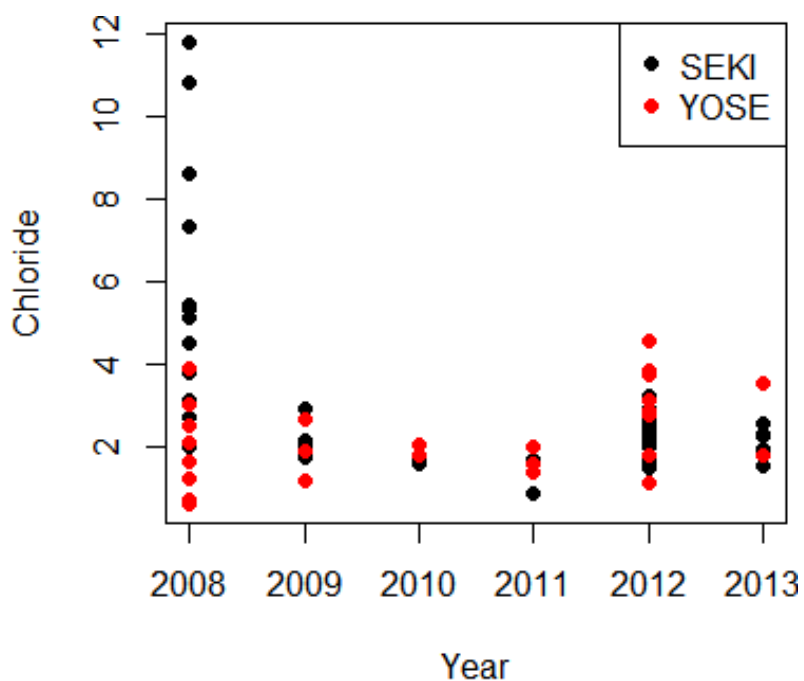


Figure SC14. Sierra Nevada Network chloride by Park and Year.

The PO model is fit with the lmer function so that residuals may be assessed. Initial modeling indicated that a log transformation provided a better fit and homogeneity in the residuals. Given that the sampling design incorporated stratification by park, we begin with the separate-slopes model with a different trend for each park is applied. The results (below) indicate significant slopes in different directions for the two parks ($p = 0.0002$), indicating that a subpopulation trend exists for Cl across the population of interest.

```
TrendFit_Cl<- lmer(log(Cl) ~ WYear*Park+ (1|Year) +(1+WYear|Site),
data=LakeDataRep) #
summary(TrendFit_Cl)      #
```

Random effects:

Groups	Name	Variance	Std.Dev.	Corr
Site	(Intercept)	0.284650	0.5335	
	WYear	0.009664	0.0983	-0.99
Year	(Intercept)	0.040799	0.2020	
	Residual	0.081336	0.2852	

Number of obs: 77, groups: Site, 23; Year, 6

Fixed effects:

	Estimate	Std. Error	df	t value	Pr(> t)	
(Intercept)	1.26953	0.21529	10.34300	5.897	0.000133	***
WYear	-0.15143	0.05966	5.656000	-2.538	0.046542	*
ParkYOSE	-0.88639	0.25937	20.50600	-3.418	0.002656	**
WYear:ParkYOSE	0.25659	0.05668	19.29000	4.527	0.000223	***

Testing Assumptions of the Linear Mixed Model

As in the first case study, the assumptions of the linear mixed model are assessed based on the guidance from Pinheiro and Bates (2000). First, partial autocorrelation plots of site-level residuals are plotted to assess independence (Figures SC15 and SC16) for the annual panel sites. The plots indicate that any serial correlation was effectively modeled with the random effects in the trend model.

```
Sites = sort(unique(LakeDataRep$Site))
Years = sort(unique(LakeDataRep$Year))
length(Sites) # 23

dat=LakeDataRep
fit = TrendFit_Cl
dat$Resid = residuals(fit, type='pearson')

# Independence -- pacf of resids by site
require(reshape)
SIENCL_ts=Residual_ts(resids=residuals(fit), yr=dat$Year, site=dat$Site)

par(mfrow=c(3,2), oma = c(0,2,1,0) + 0.1, mar = c(2,1.5,3.5,1) + 0.1)
for (i in which(colnames(SIENCL_ts) %in% c("S001-Out", "S002-Out", "S003-Out", "S004-Out", "S005-Out"))){
  if(length(SIENCL_ts[!is.na(SIENCL_ts[,i]),i])>2) SIENCL_ts.i =
  pacf(SIENCL_ts[!is.na(SIENCL_ts[,i]),i], na.action=na.pass, plot=FALSE)
  plot(SIENCL_ts.i, type="h", main=colnames(SIENCL_ts)[i])}
par(mfrow=c(3,2), oma = c(0,2,1,0) + 0.1, mar = c(2,1.5,3.5,1) + 0.1)
for (i in which(colnames(SIENCL_ts) %in% c("Y001-Out", "Y002-Out", "Y003-Out"))){
  if(length(SIENCL_ts[!is.na(SIENCL_ts[,i]),i])>2) SIENCL_ts.i =
  pacf(SIENCL_ts[!is.na(SIENCL_ts[,i]),i], na.action=na.pass, plot=FALSE)
  plot(SIENCL_ts.i, type="h", main=colnames(SIENCL_ts)[i])}
```

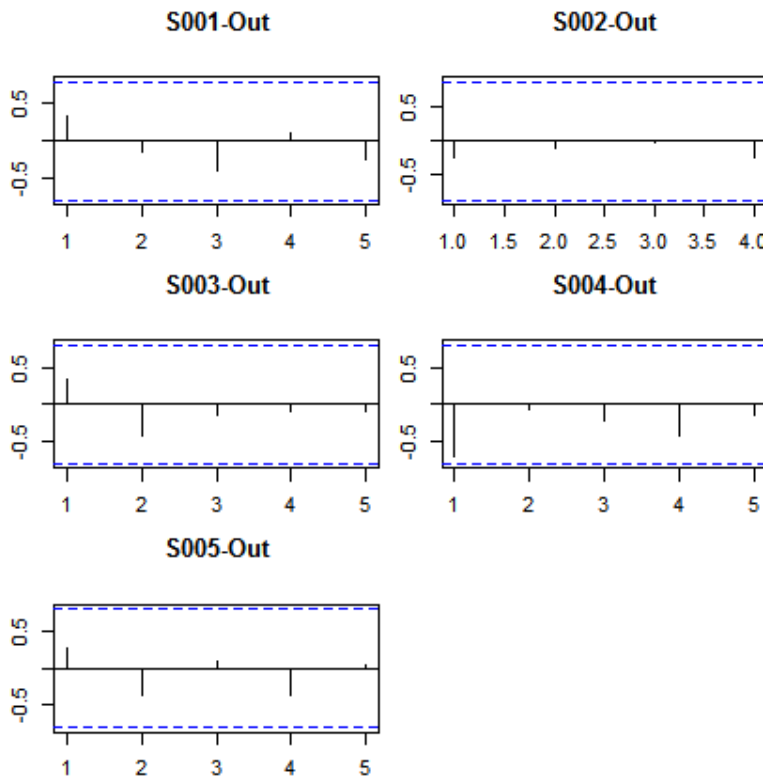


Figure SC15. Partial autocorrelation function plots of residuals for annual sites S001-Out to S005-Out.

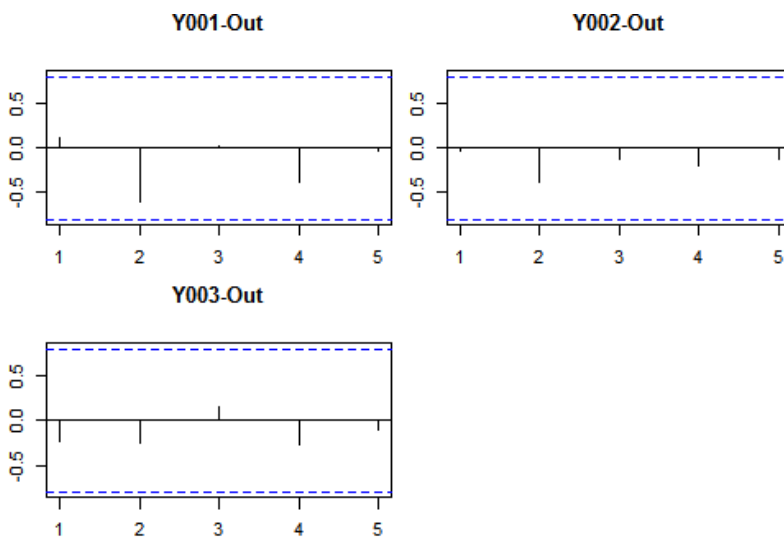


Figure SC16. Partial autocorrelation function plots of residuals for annual sites Y001-Out to Y003-Out.

The equal variance assumption is evaluated with a plot of residuals against fitted values across all groups (Figure SC17). We conclude our data meet this assumption given that the mean is consistently near 0 and the variance appears to be approximately equal aside from two extreme residuals.

```
require(ggplot2)
```

```
ggplot(data=dat, aes(x=WYear, y=Resid)) +geom_jitter(aes(colour=log(Cl)),
width=0.75) + stat_smooth(se=FALSE, colour="black") + xlab("Year") +
ylab("Residual (Pearson)")
```

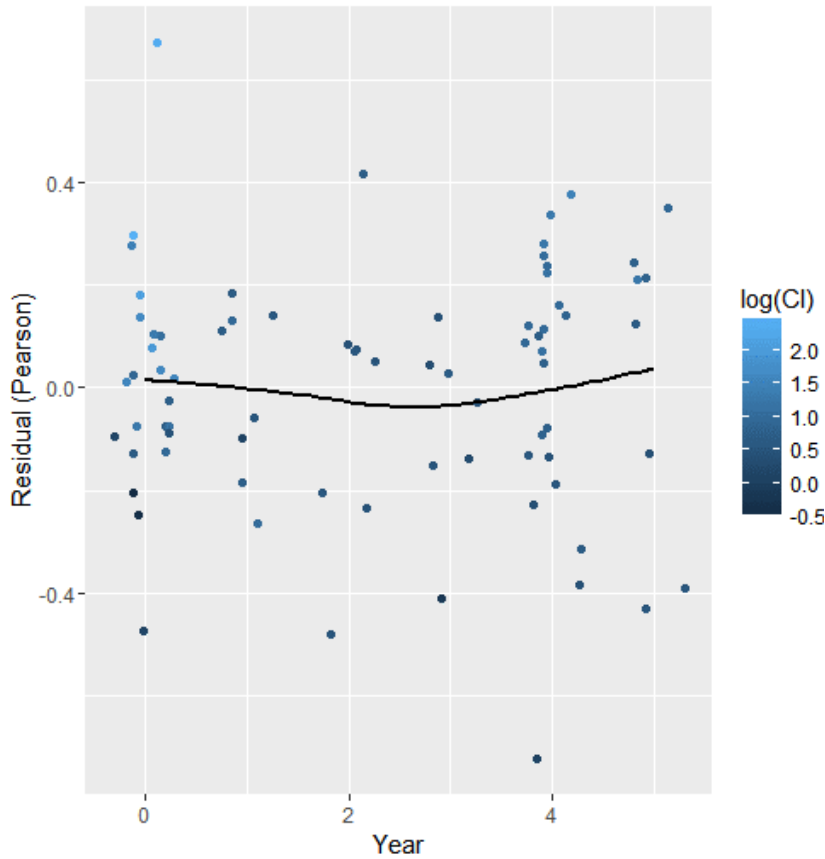


Figure SC17. Pearson residuals by Year.

Examining the residuals by Site indicates some heterogeneity (Figures SC18 and SC19) and then by Year (Figures SC20 and SC21). Some heterogeneity is observed but the residuals are centered on zero overall. As in the previous case study, we expect some heterogeneity with only six total years of data and only two years of data in the alternating panels.

```
# Examine residuals by Site across Years
plot(fit, Site~resid(.), abline = 0) # Figure SC18
plot(fit, resid(., type = "pearson") ~ fitted(.) | Site) # Figure SC19

# Examine residuals by Site across Years
plot(fit, Year~resid(.), abline = 0) # Figure SC20
plot(fit, resid(., type = "pearson") ~ fitted(.) | Year) # Figure SC21
```

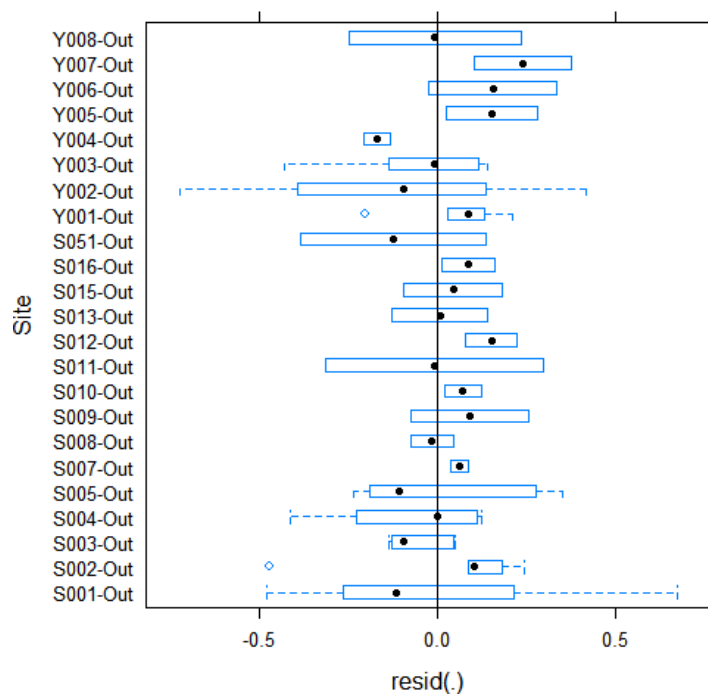


Figure SC18. Boxplot of Pearson residuals by Site across Years.

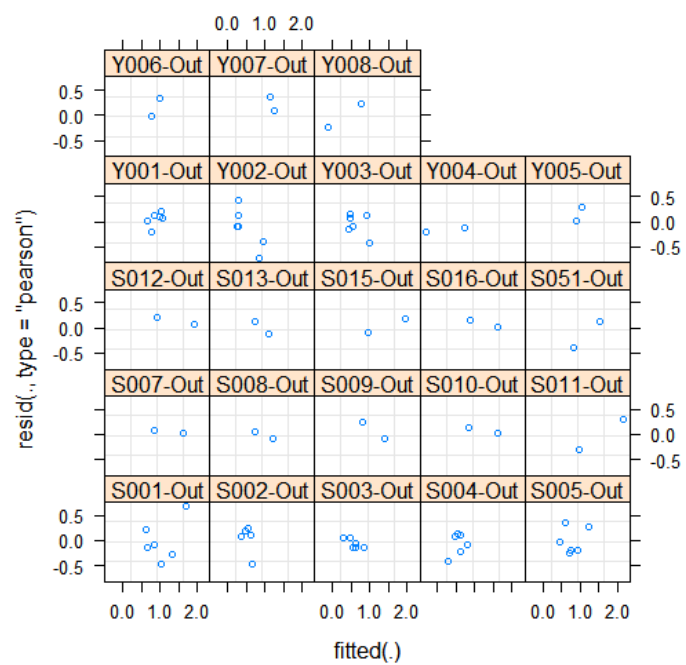


Figure SC19. Pearson residuals by Site.

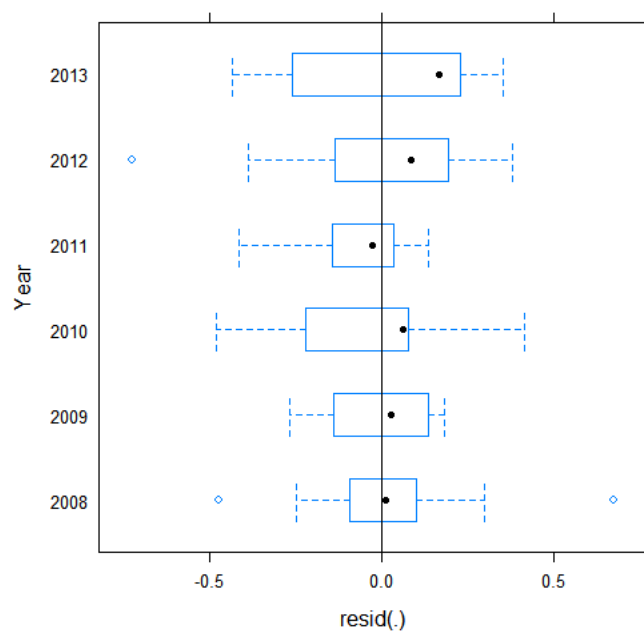


Figure SC20. Boxplot of Pearson residuals by Year across Sites.

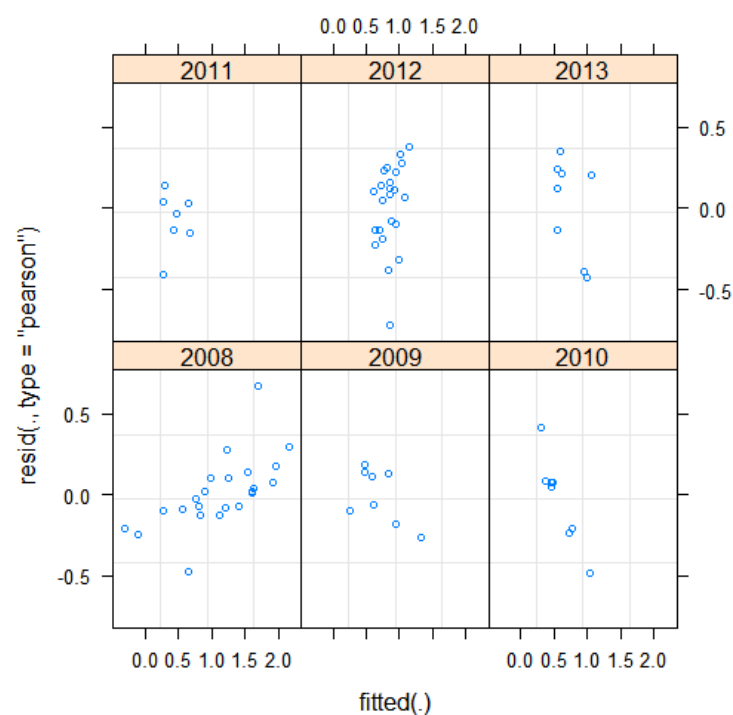


Figure SC21. Pearson residuals by Year.

The normality of residuals by group is assessed with normal distribution quantile-quantile plots of group-level residuals for sites with more than two years of data. The plots indicate that the normality assumption is generally met for the SIEN data set (Figures SC22 and SC23).

```
# Quantile-quantile plots of residuals by site
siteVec <- unique(dat$Site)
```

```

AnnualSites = c("S001-Out", "S002-Out", "S003-Out", "S004-Out", "S005-
Out", "Y001-Out", "Y002-Out", "Y003-Out")
par(mfrow=c(4,2))
for(w in which(siteVec %in% AnnualSites)) {
  qqnorm(dat$Resid[dat$Site == siteVec[w]],main =
paste("Site",siteVec[w]))
  qqline(dat$Resid[dat$Site==siteVec[w]])}

# Quantile-quantile plots of residuals by year
Years <- sort(unique(dat$Year))
par(mfrow=c(3,2))
for(w in 1:6) {
  qqnorm(dat$Resid[dat$Year == Years[w]],main = Years[w])
  qqline(dat$Resid[dat$Year==Years[w]])}

```

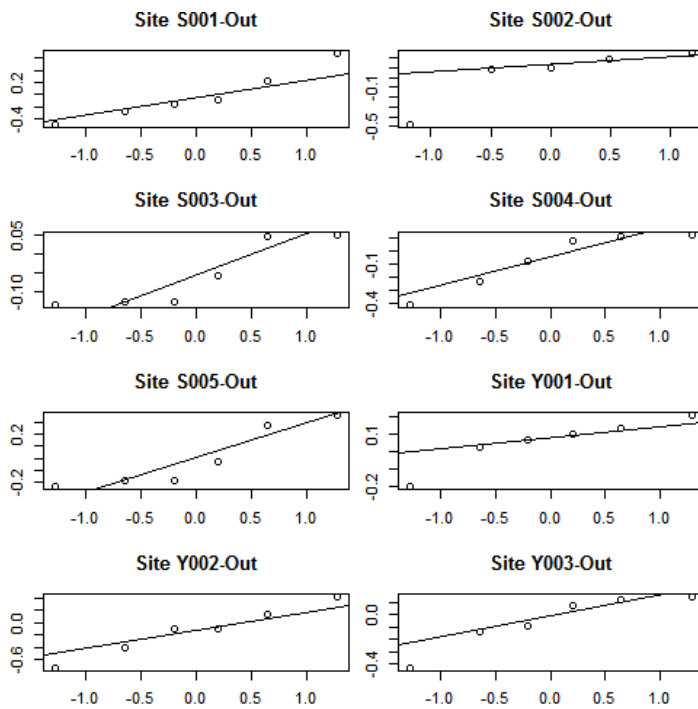


Figure SC22. Normal quantile-quantile plots of Pearson residuals by Site.

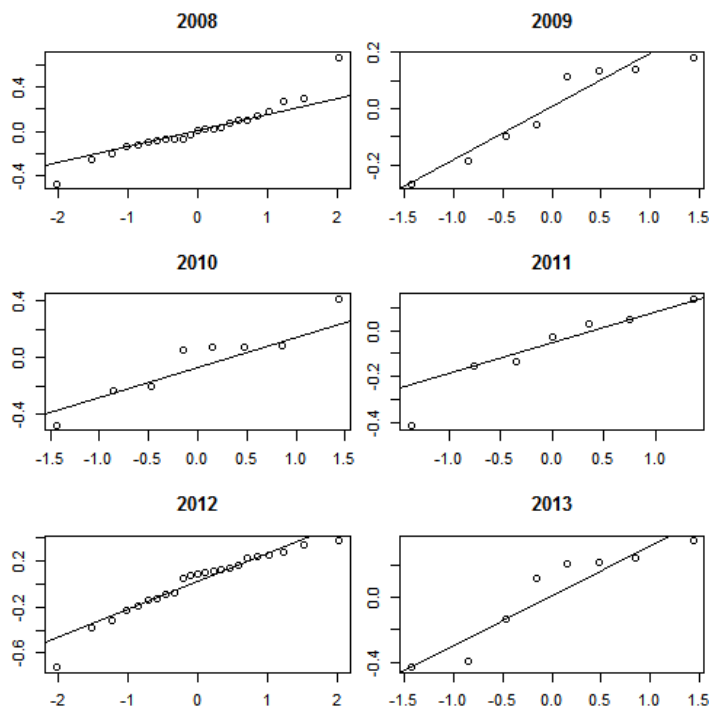


Figure SC23. Normal quantile-quantile plots of Pearson residuals by Year.

The assumption of independence between residuals and random effects is assessed with Pearson's correlation tests of linear correlation and plots (Figure SC24). The random effects are added to the data set and tested with the `cor.test` function in R. No linear correlation is detected between year random effects and residuals (p-value = 0.3381), but some correlation may be present between residuals and site effects (p-value = 0.0626). Note that removing the two extreme residuals results in a test with unconvincing statistical significance (p-value = 0.0995). As the sample size of years increases, the data with which to assess this assumption will improve. If correlation is present, the variance structure should be adjusted to account for this dependence.

```
# Assumption 1c -- independence of RE and resids
SiteRE =
data.frame(Site=rownames(ranef(fit)$Site),SiteRE=ranef(fit)$Site[,1])
names(SiteRE)[2] = 'SiteRE'
rownames(SiteRE)=NULL
SlopeRE =
data.frame(Slope=rownames(ranef(fit)$Site),SlopeRE=ranef(fit)$Site[,2])
names(SlopeRE) = c('Site','SlopeRE')
rownames(SlopeRE)=NULL
YearRE =
data.frame(Year=rownames(ranef(fit)$Year),YearRE=ranef(fit)$Year)
names(YearRE)[2] = 'YearRE'
rownames(YearRE)=NULL

dim(dat)# 77 20
```

```

dat = merge(dat, SiteRE)
dat = merge(dat, SlopeRE)
dat = merge(dat, YearRE)
dim(dat)# 77 23

cor.test(dat$Resid, dat$YearRE)
# t = 0.96405, df = 75, p-value = 0.3381
cor.test(dat$Resid[abs(dat$Resid)<0.6], dat$YearRE[abs(dat$Resid)<0.6])
# t = 1.0467, df = 73, p-value = 0.2987
cor.test(dat$Resid, dat$SiteRE)
# t = 1.8901, df = 75, p-value = 0.06261
cor.test(dat$Resid[abs(dat$Resid)<0.6], dat$SiteRE[abs(dat$Resid)<0.6])
# t = 1.6684, df = 73, p-value = 0.09953
cor.test(dat$Resid, dat$SlopeRE)
# t = -1.8189, df = 75, p-value = 0.07291
cor.test(dat$Resid[abs(dat$Resid)<0.6], dat$SlopeRE[abs(dat$Resid)<0.6])
# t = -1.6099, df = 73, p-value = 0.1117

par(mfrow=c(2,2))
plot(Resid ~ SiteRE, data=dat, main="Site Random Effects", xlab="Site
RE", ylab="Residuals")
plot(Resid ~ SlopeRE, data=dat, main="Slope Random Effects", xlab="Slope
RE", ylab="Residuals")
plot(Resid ~ YearRE, data=dat, main="Year Random Effects", xlab="Year
RE", ylab="Residuals")

```

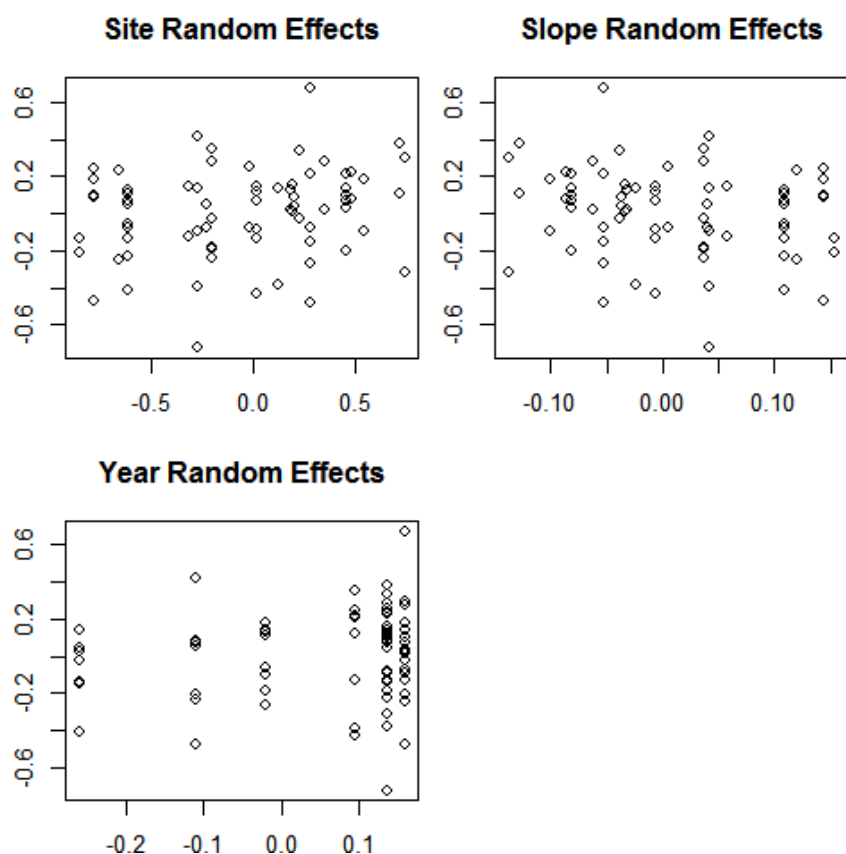


Figure SC24. Plots of residuals against Site-, Slope-, and Year-level random effects.

The normality of the estimated random effects is assessed with normal quantile-quantile plots. In contrast with the first case study, the current model also contains a random slope effect which is also plotted (Figure SC25). A review of the plots indicated that the normality assumption appears to be met.

```
par(mfrow=c(2,2))
qqnorm(ranef(fit)$Site[,1], main = "Random site-intercept effect")
qqline(ranef(fit)$Site[,1])
qqnorm(ranef(fit)$Site[,2], main = "Random site-slope effect")
qqline(ranef(fit)$Site[,2])
qqnorm(ranef(fit)$Year[,1], main = "Random year-intercept effect")
qqline(ranef(fit)$Year[,1])
```

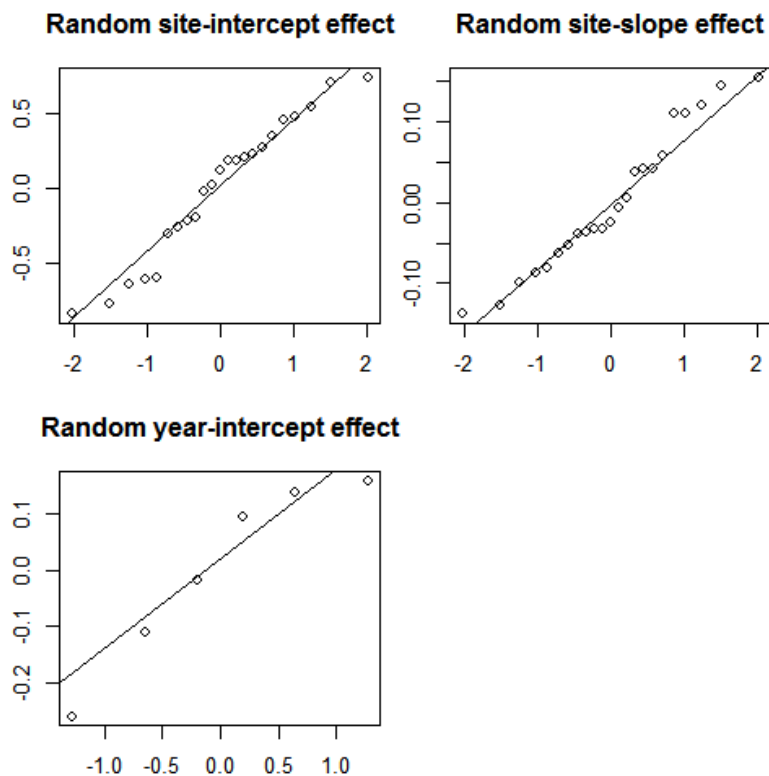


Figure SC25. Normal quantile-quantile plots of random effects by group.

Histograms of each of the random effects groups (Figure SC26) indicate that a mean of 0 is an acceptable assumption in each case.

```
par(mfrow=c(2,2))
hist(ranef(fit)$Site[,1],breaks=seq(-1,1,0.25),xlab="Site RE",
main="Random site-intercept effect")
hist(ranef(fit)$Site[,2],breaks=seq(-0.16,0.16,0.04),xlab="Site Slope
RE", main="Random site-intercept effect")
hist(ranef(fit)$Year[,1],breaks=seq(-0.3,0.3,0.1), xlab="Year
RE",main="Random year-intercept effect")
```

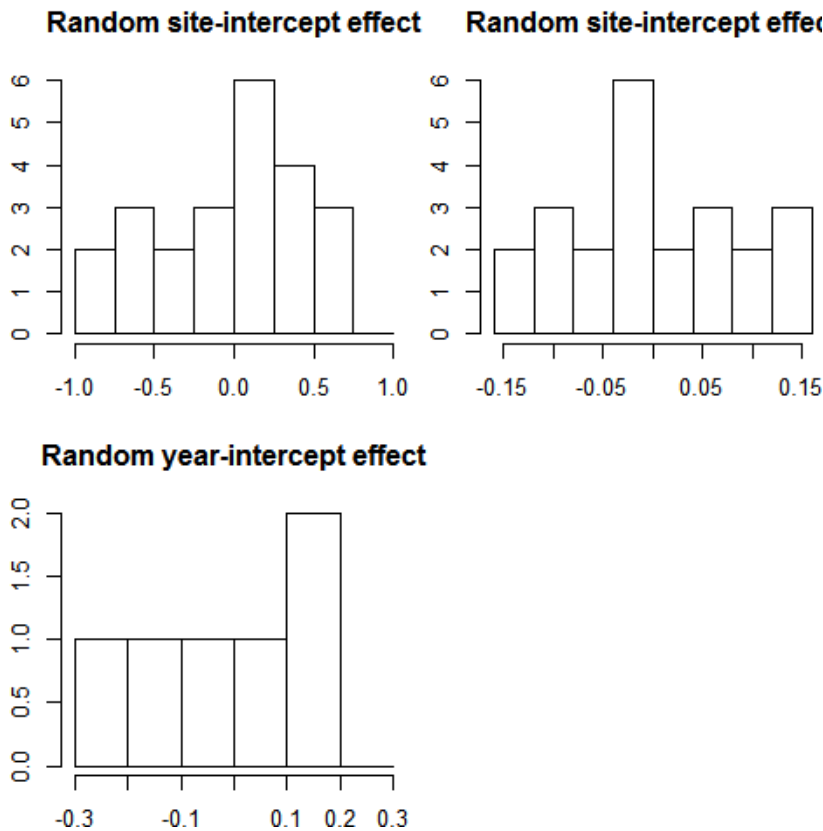


Figure SC26. Histograms of random effects by Site, Slope, and Year.

As with the first case study, the assumption that random effects are independent for each group is left unchecked. The sample size of years is small. A further complication is that the variance structure used in this case study involves crossed random effects which cannot be calculated with the tools in the nlme package. Refer to Pinheiro and Bates (2000) for more information on assessing the assumption of linear mixed models, including evaluating crossed random effects.

Determine and Run Appropriate Trend Method

We refer back to the flowchart (Figure 8) for guidance on how to proceed with the trend analysis. Note that the flowchart represents a simplification of the simulation exercise but only provides general recommendations. Given that a complex survey design is used and evidence of a subpopulation trend was observed with the separate-slopes model of trends by park, we know that the design weights should be incorporated into the trend analysis. However, more information is required to determine which trend approach is recommended.

The monitoring period consists of six years of data, which is considered short relative to the 12- and 24-year monitoring periods examined in the simulations. Assuming a “short” monitoring period, the flowchart then requires the analyst to indicate whether a stratified or unequal probability sampling design was used. In this case, unequal probability sampling was used within each stratum. If the unequal probability route is taken, the revisit design of [1-0, 1-3] indicates that the WLRDB approach should be used for trend. If the stratified sampling route is taken, the analyst needs to know if the year-to-year variance component is considered “large.” Referring back to the PO model results from the beginning of the case study, we see that the

proportion of the total variation represented by the year to year variation is $0.0408/(0.2847 + 0.0097 + 0.0408 + 0.0813) = 0.0980$ or 9.8%, which is larger than the 4.9% assumed in the simulation for large year-to-year variation. Therefore, choosing the “large σ_b^2 ” option in the flowchart indicates that the WLRDB trend approach is appropriate in this case as well. In the case that the flowchart results in two different approaches, the analyst would examine both options, compare results, and consider the impacts of each analysis.

The `TrendNPS_Cont` function in the `TrendNPS` R package (Starcevich and Mitchell 2017) is used to obtain the results of the trend analysis with the WLRDB approach. Note that the x- and y-coordinate data are required for this method so that the neighborhood variance estimator (Stevens and Olsen 2003) can be calculated. Because stratification is used, the proportion of the population represented by the first stratum is needed to appropriately weight the separate slopes for a network-level trend estimate. Note that only a two-level stratification variable can be accommodated.

```
# WLRDB
str1prop=808.6936/(808.6936+362.8214)
Ests_CL_WLRDB = TrendNPS_Cont(alpha=0.1,dat=LakeDataRep, method="WLRDB",
  type=NA,slope=TRUE,stratum="Park",Y="Cl",lat="xcoord",long="ycoord",
  stage1wt="AdjWgt",stage2wt="PanelWt",str1prop=str1prop)
Ests_CL_WLRDB

$ModelEstimates
      mu   trend SEtrend sig2a sig2t sigat sig2b sig2e eta
1 0.4218735 0.06037018 0.07802896   0   0   0   0 3.402272  4

$TrendTest
      trend SEtrend t-stat eta pvalue
1 0.06037018 0.07802896 0.7736894  4 0.4822974

$TrendCI
      trend trend.1 trend.2
1 0.06222969 -0.1005534 0.2544735

$DBests
      Year Est.Mean      SE WYear      Resid
1 2008 4.505724 0.55610529 0 1.083475074
2 2009 2.162006 0.20158290 1 0.288793000
3 2010 1.712219 0.03578556 2 -0.004823561
4 2011 1.592197 0.07584161 3 -0.137869385
5 2012 2.611047 0.14932238 4 0.296397135
6 2013 2.348186 0.18412120 5 0.129918636
```

The network level trend is found to be 6.22% annually with a 90%-confidence interval of (-10.06%, 25.45%), and the trend is not significantly different from 0 at the $\alpha = 0.10$ level (p-value = 0.4823). When the SLRDB or WLRDB trend approaches are used, the `TrendNPS_Cont` function also returns the design-based mean estimates (DBests) by year and the residuals from the trend model.

Testing Assumptions of the WLRDB Approach

Next we need to test the assumptions for the WLRDB approach. The independence assumption for the trend regression model can be assessed with a partial autocorrelation function plot of these values. The plots indicate no serial correlation in either the design-based annual mean estimates or the residuals from the weighted linear regression model (Figure SC27).

```
# Examine serial correlation of annual status estimates
par(mfrow=c(2,2))
Cl_SIEN_WLRDB_ts = ts(Ests_Cl_WLRDB$DBests[,2])
pacf(Cl_SIEN_WLRDB_ts, main="DB estimates")
Cl_SIEN_WLRDB_resid_ts = ts(Ests_Cl_WLRDB$DBests[,5])
pacf(Cl_SIEN_WLRDB_resid_ts, main="Residuals")
```

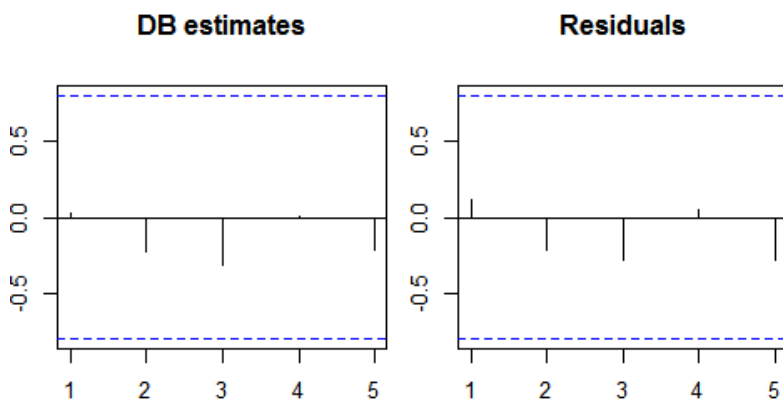


Figure SC27. Partial autocorrelation function plots of annual design-based (DB) estimates and trend model residuals.

To assess the impact of the weighting in the trend analysis, we examine the results of the unweighted PO trend analysis and compare them to the weighted trend analysis results. This comparison will determine how much incorporating the weights has changed inference compared to the case in which design weights are ignored. Again, the `TrendNPS_Cont` function is used, but the PO method is specified. The proportion of the population represented by the first stratum is needed to obtain a network-level trend estimate; the proportion is indicated in the code as `str1prop` (below). Note that spatial coordinates are not needed for this test. The results show that the unweighted trend test is not significant at the $\alpha = 0.10$ level (p-value = 0.2125). The weighted trend test was also not significant; therefore, trend testing inference is the same for the weighted and unweighted approaches. The unweighted annual trend estimate of -6.94% is lower than the weighted estimate (6.22% annually), but neither trend estimate is significantly different from 0. The unweighted approach yields a 90%-confidence interval of (-15.47%, 2.44%) is narrower than the trend estimate for the weighted approach (-10.06%, 25.45%).

```
# PO
Ests_Cl_PO = TrendNPS_Cont(alpha=0.1, dat=LakeDataRep,
method="PO", type=NA, slope=TRUE, stratum="Park", Y="Cl",
stage1wt="AdjWgt", stage2wt="PanelWt", str1prop=str1prop)
```

```

Ests_CL_P0
$ModelEstimates
      mu      trend SEtrend  sig2a   sig2t
1 1.269532 -0.07196304 0.05624014 0.2846501 0.009663692
      sigat  sig2b  sig2e   eta
1 -0.05208829 0.04079863 0.08133577 24.94572
$TrendTest
      trend SEtrend t-stat   eta pvalue
1 -0.07196304 0.05624014 -1.279567 24.94572 0.2124709
$TrendCI
      trend trend.1 trend.2
1 -0.06943471 -0.1546776 0.0244041

```


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