## Methods Research Report

## Correcting for Publication Bias in the Presence of Covariates

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Prepared for:
Agency for Healthcare Research and Quality
U.S. Department of Health and Human Services

540 Gaither Road
Rockville, MD 20850
www.ahrq.gov
Contract No. 290-02-0009

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This report is based on research conducted by the Minnesota Evidence-based Practice Center (EPC) under contract to the Agency for Healthcare Research and Quality (AHRQ), Rockville, MD (Contract No. 290-02-0009, Task Order Number: 1, Work Assignment Number 1). The findings and conclusions in this document are those of the author(s), who are responsible for its content, and do not necessarily represent the views of AHRQ. No statement in this report should be construed as an official position of AHRQ or of the U.S. Department of Health and Human Services.

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Suggested Citation: Duval S, Weinhandl E. Correcting for Publication Bias in the Presence of Covariates. Methods Research Report. (Prepared by the Minnesota Evidence-based Practice Center under Contract No. 290-02-0009.) AHRQ Publication No. 11-EHC041-EF. Rockville, MD: Agency for Healthcare Research and Quality. September 2011. Available at: www.effectivehealthcare.ahrq.gov/reports/final.cfm.

## Preface

The Agency for Healthcare Research and Quality (AHRQ), through its Evidence-based Practice Centers (EPCs), sponsors the development of evidence reports and technology assessments to assist public- and private-sector organizations in their efforts to improve the quality of health care in the United States. The reports and assessments provide organizations with comprehensive, science-based information on common, costly medical conditions and new health care technologies and strategies. The EPCs systematically review the relevant scientific literature on topics assigned to them by AHRQ and conduct additional analyses when appropriate prior to developing their reports and assessments.

To improve the scientific rigor of these evidence reports, AHRQ supports empiric research by the EPCs to help understand or improve complex methodologic issues in systematic reviews. These methods research projects are intended to contribute to the research base in and be used to improve the science of systematic reviews. They are not intended to be guidance to the EPC program, although may be considered by EPCs along with other scientific research when determining EPC program methods guidance.

AHRQ expects that the EPC evidence reports and technology assessments will inform individual health plans, providers, and purchasers as well as the health care system as a whole by providing important information to help improve health care quality. The reports undergo peer review prior to their release as a final report.

We welcome comments on this Methods Research Project. They may be sent by mail to the Task Order Officer named below at: Agency for Healthcare Research and Quality, 540 Gaither Road, Rockville, MD 20850, or by e-mail to epc@ahrq.hhs.gov.

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## Acknowledgments

We would like to thank our reviewers, Dr. Michael Borenstein, Professor Larry Hedges, Dr. Alexander Sutton, and Dr. Norma Terrin, for reviewing and commenting on the draft. These reviewers and their affiliations are listed in Appendix A.

We also want to thank Marilyn Eells for her diligent editing and formatting of the report and Dr. Robert Kane for sharing his expertise in systematic reviews and his guidance throughout the project.

## Correcting for Publication Bias in the Presence of Covariates

## Structured Abstract

Objectives. To date, there are no established methods for assessing publication bias when study characteristics induce heterogeneity in the effects. The "trim and fill" method was developed to adjust for censored (i.e., missing) studies in a meta-analysis, assumed due to publication bias. We sought to modify this algorithm for use in the context where study characteristics induce heterogeneity in the effects.

Methods. An iterative algorithm based on the original trim and fill algorithm was developed. We performed Monte Carlo simulations with 5,000 iterations per instance of the adapted trim and fill algorithm. In each instance we set six parameters, both to alter the structure of the randomly generated data, and to manipulate the algorithm itself. We assessed the average performance (type 1 error, power, bias) of the algorithm, in the context of inference regarding the metaregression parameters. We also applied the method to data from 19 randomized studies examining the hypothesis that teachers’ expectations influence students’ IQ intelligence test scores, the covariate of interest being the dichotomized length of teacher-student contact prior to the study. We developed user-friendly software in R, for one covariate at this stage, with future versions to incorporate several covariates.

Results. Meaningful, albeit incomplete, reduction in the bias of estimated metaregression model parameters was achieved. Bias and coverage probability improved as the number of studies increased. The R estimator outperformed both $L$ and $Q$ from the original trim and fill method. Performance declined in the presence of large heterogeneity, but substantial bias reduction was still obtained. Two algorithm variants were developed, with the simpler one-dimensional version performing slightly better than the two-dimensional.

Conclusions. This new method provides a generalized trim and fill algorithm that is applicable to metaregression, that is, where covariates are available. The new algorithm should be seen as a sensitivity analysis to the influence of covariates on funnel plot asymmetry.

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## Executive Summary

We have adapted the trim and fill algorithm, ${ }^{1}$ originally created to adjust for publication bias in meta-analysis, to its application in metaregression. Under this scenario, studies report heterogeneous effect estimates, at least in part attributable to systematic variation induced by differences in measured covariate(s) that summarize salient features of the individual studies. In other words, whereas typical meta-analysis models pool a set of effect estimates into a single summary measure of, for example, efficacy or risk, metaregression pools effect estimates into a summary measure that is a function of (i.e., conditional upon) the value of some exogenous covariate.

An example of this situation might be seen in a series of studies evaluating the association of teachers' expectations and students’ IQ intelligence test scores. Raudenbush reported 19 studies, in which students were randomly allocated to either an experimental "expectancy induction group" or to a control group. ${ }^{2}$ Teachers of students in the experimental group were led to believe that their students were "likely to experience substantial intellectual growth." Raudenbush also hypothesized that the magnitude of teacher expectancy effects might be related to the length of time that the teacher and student were in contact prior to the expectancy induction. ${ }^{2}$ The amount of prior contact can be categorized into two groups: (1) contact for one week or less, and (2) contact for more than one week. This two-level categorization of prior contact serves a binary covariate that may systematically induce variability in study effect estimates.

Heuristically, our adaptation of trim and fill to the metaregression situation functions in much the same fashion as the original algorithm. We start by fitting a metaregression model to the observed data. From that fitted model, we estimate the residuals of each observation (i.e., study) in the model. Then, from the set of residuals, we estimate the number of missing studies, $k$, with the same analytic tools proposed by Duval. ${ }^{1}$ We then trim those $k$ studies with the largest residuals (in absolute terms), and re-estimate the metaregression model. Again, we estimate the residuals, and from there, the number of missing studies. This iterative loop proceeds until the estimate of $k$ converges, which is indicated by the lack of a difference in estimates of $k$ from one iterative step to the next. At this point, we fill the observed data set with $k$ missing studies in the following manner. We identify those $k$ studies with the largest absolute residuals (from the final fitted metaregression model to the trimmed data) and record the measured value of the exogenous covariate in those studies. For each of the k studies, we impute the "reflection," where the reflection is taken across the midrange of the covariate and the final fitted metaregression model.

We evaluated the performance of this modified trim and fill algorithm under a wide variety of scenarios, using Monte Carlo simulation. In particular, we estimated the bias and coverage probability of estimated model parameters (e.g., intercept, slope) across ranges of the number of observed studies, the number of missing studies, the magnitude of between-study variability as induced by stochastic error, the magnitude of between-study variability as induced by the slope associated with the exogenous covariate, the distribution of the covariate (either binary or uniform), and the nature of the metaregression model applied during the iterative portion of trim and fill.

We showed that certain methodological choices-the nature of the metaregression model, the estimator of $k$-resulted in superior performance, and we illustrated that the adaptation of trim and fill does result in meaningful, albeit incomplete, reduction in the bias of estimated model parameters.

We created user-friendly software in R (version 2.8.1), an open-source statistical software package that is freely available for download at http://www.r-project.org/, that can be applied to existing datasets that are amenable to metaregression and suffer from suspected publication bias. ${ }^{3}$ This software reports metaregression estimates from both fixed-effects and random-effects models, both before and after application of trim and fill to the set of observed studies. We have also developed documentation for the software, and code for an example dataset.

We recommend the use of the modified trim and fill algorithm as a form of sensitivity analysis in the case where both heterogeneity and publication bias may play a role.

## Introduction

## Context for This Research

Meta-analysis has become increasingly popular in the last decade and is now in the top position on most proposed hierarchies of evidence. Meta-analyses are also the most cited study design in the health sciences literature. The traditional role for meta-analysis has been to compile information from diverse studies on the same topic, thus increasing power. However, there is increasing recognition of the challenges that heterogeneity presents in data synthesis. It is important to quantify, assess, and potentially interpret heterogeneity and try to distinguish between genuine between-study heterogeneity and biases. Meta-analytic studies provide a very useful tool for sensitizing researchers, physicians, and public health practitioners to the almost ubiquitous presence of biases in research. The focus in the present report is on one such bias, publication bias, which has been suggested as the most important threat to the validity of metaanalyses.

The trim and fill method was developed by Duval and Tweedie ${ }^{1,4}$ to address the issue of publication bias in meta-analysis, and it is now widely used in practice in many areas of public health research. It relies on scrutinizing a funnel plot for asymmetry, assumed to be a manifestation of publication bias (see below). The goal of this research was to extend the trim and fill method to those situations where covariates are available as possible explanations for some of the funnel plot asymmetry.

## Publication Bias

Publication bias is the term used for the bias that may occur when the research on a particular topic does not include the whole population of studies that has been performed. The danger to interpretation under these conditions is that the wrong conclusions may be drawn if the available studies differ systematically from the results of all the research that has been done.

Publication bias is a phenomenon that runs counter to the way in which the scientific method has developed over the past century. One of the key historical contributions of statistical thinking has been a move away from a context where possible random observations were acceptable, to one where only those results that are statistically significant (i.e., not due to chance alone) are seen as being established and worth consideration.

It is commonly believed that studies are not uniformly likely to be published in scientific journals. ${ }^{5}$ Easterbrook et al. suggested that statistical significance is a major determining factor of publication. ${ }^{6}$ Some researchers may not submit a nonsignificant result for publication, and editors may fail to publish nonsignificant results even if they are submitted. ${ }^{7}$ Therefore, there may be a nonrepresentative proportion of significant studies in the scientific literature. This becomes problematic for a meta-analysis in which data come solely from the published literature, potentially leading to a nonrepresentative proportion of significant studies in the meta-analysis dataset. A standard meta-analysis will then result in a conclusion biased toward significance.

This is not just an academic problem: it can ultimately influence the clinical decisions of medical practitioners and public health officials. As Glass noted in 1976, journals that directly or indirectly influence medical practice cannot afford to ignore this problem. ${ }^{8}$ He claims, "The potential for publication bias concerns us because physicians now will search systematic reviews
to determine the best treatment for patients. If positive results get published more, then the risk of adopting ineffective and even harmful medical practices is greater."

## Publication Bias, Funnel Plot Asymmetry, and Small-Study Effects

Funnel plot asymmetry is often equated with publication bias; ${ }^{9,10}$ however, the funnel plot is simply a way of displaying small-study effects - a tendency for the effects seen in smaller studies to differ from those seen in larger studies. ${ }^{11}$ Small-study effects may be due to reasons other than publication bias. ${ }^{11,12}$ Funnel plot asymmetry may be due to publication bias, but it may also result from clinical or methodological heterogeneity between studies. Even if there is publication bias in a review, it may not result in an asymmetrical funnel plot. An important point is that heterogeneity among effects can cause funnel plot asymmetry without creating bias.

## Current Methods

There are several statistical methods available that purport to identify, quantify, or assess the potential impact of publication bias.

The methods developed to detect publication bias are based on either the funnel plot, or statistical hypothesis tests. Two well known tests for funnel plot asymmetry are those of Begg and Mazumdar, ${ }^{13}$ a rank correlation test, and the regression test of Egger et al. ${ }^{12}$

A set of techniques called "file-drawer" analyses provide sensitivity analyses to metaanalysis conclusions in the presence of publication bias. These have largely been replaced in the literature by more sophisticated methods, and are named here only for the sake of completeness.

Two main methods have been created to adjust meta-analytic estimates for the possible effects of publication bias. One group of methods use the selection model approach, and despite their utility in detecting and correcting for publication bias, are not often used in practice due to the level of computational complexity. These models, employing both parametric and nonparametric weight functions, have been generalized to include covariates. ${ }^{14,15}$ The other adjustment method, the trim and fill method, is rather less complex, and has been implemented in several software applications.

We will not discuss the aforementioned methods in any detail in this report. However, since our new method builds on the original trim and fill method, we will describe this method briefly. Full details may be found in the original articles by Duval and Tweedie. ${ }^{1,4}$

## Methods

We conducted a simulation study, using a factorial design for the simulation parameters, to assess the performance of the newly developed "modified" trim and the fill algorithm. We define the modified trim and fill algorithm as the original trim and fill algorithm adapted to a twodimensional metaregression.

For completeness, we present a brief description of the original trim and fill method, as described fully in Duval and Tweedie. ${ }^{1,4}$

## The "Original" Trim and Fill Method

The trim and fill method is a simple rank-based augmentation technique to formalize the use of a funnel plot. The method can be used to estimate the number of missing studies and, more importantly, to provide an estimate of the estimate of the "treatment" effect by adjusting for potential publication bias in a meta-analysis. The mechanics of the approach are displayed in Figure 1, using a meta-analysis of the effect of gangliosides on mortality from ischemic stroke. ${ }^{16}$ Figure 1 shows the observed studies as filled circles, with the open circles denoting the imputed missing studies. Note that the "funnel" is much more visually symmetric with the inclusion of the imputed data. The bottom panel of Figure 1 gives the odds ratios (ORs) and their 95 percent confidence intervals before and after allowing for publication bias, on the OR scale.

Figure 1. Trim and fill applied to a meta-analysis of the effect of gangliosides on mortality from ischemic stroke


The key assumption of the method is that it is the most extreme negative studies which have not been published. Three easily calculated estimators for the number of missing studies, $R, L$, and $Q$, have been derived based on method of moment considerations.

## The Modified Trim and Fill Algorithm

## Generation of Simulated Meta-Analytic Data

We simulated metaregression data under a variety of conditions. Simulated data were generated from a hierarchical model. For $i=1,2, \ldots, n$, where $n$ is the number of studies, both published and unpublished, we had:
$\mathrm{X}_{1, i} \sim f\left(\mathrm{X}_{1}\right)$,
$\theta_{i} \mid X_{1, i}, \beta \sim N\left(\beta_{0}+\beta_{1} * X_{1, i} \tau^{2}\right)$,
$\sigma_{i} \sim \operatorname{Gamma}(3,1 / 9)$,
$\mathrm{Y}_{i} \mid \theta_{i}, \sigma_{i} \sim \mathrm{~N}\left(\theta_{i}, \sigma_{i}{ }^{2}\right)$,
where the parameters $\beta_{0}, \beta_{1}$, and $\tau^{2}$ were pre-specified.
We varied the following parameters in our simulation:

1. Sample size. We set $n=25,35,45,55$, and 65.
2. Distribution of $\mathrm{X}_{1}$. We set $f(\mathrm{x})=(1 / 2)^{\mathrm{x}}(1 / 2)^{1-\mathrm{x}}$, for $\mathrm{x}=0,1$ (i.e., Bernoulli), and $f(\mathrm{x})=1$, for $0<x<1$.
3. Slope parameter. We set $\beta_{1}=4 / 81,2 / 27,4 / 27,8 / 27$, and $12 / 27$. (We set $\beta_{0}=0$ in all simulations.)
4. Between-study variability. We set $\tau^{2}=0,4 / 81,4 / 27$, and $4 / 9$.
5. Number of missing studies. We set $k=0,5$, and 10 .
6. Dimension of the metaregression model during the iterative portion of the algorithm. We set the dimension $d=1$ and 2 .

## Two Variants of the Algorithm

From a sample of $n$ studies, $k$ studies were censored. We defined $r_{i}$ as the rank of $Y_{i}$, and censored those studies with rank $\mathrm{r}_{1}, \mathrm{r}_{2}, \ldots, \mathrm{r}_{k}$. Therefore, censoring resulted in an "observed" sample of $m=n-k$ studies.

We fit both a fixed effect (FE) and random effects (RE), two-dimensional metaregression model to each observed sample. Then, we proceeded to apply the following adaptation of the trim and fill algorithm:

1. Fit an FE model to the observed sample: for $i=1,2, \ldots, m$,
$Y_{i}=\beta_{0}+\beta_{1} * X_{1, i}+e_{i}$,
where $\mathrm{e}_{i} \sim \mathrm{~N}\left(0, \sigma_{i}{ }^{2}\right)$.
Denote the estimates of $\left(\beta_{0}, \beta_{1}\right)$ by $[\beta]^{(1)}=\left(\left[\beta_{0}\right]^{(1)},\left[\beta_{1}\right]^{(1)}\right)$.
2. Calculate centered values from the fitted FE model: for $i=1,2, \ldots, m$,
$\mathrm{Y}_{i}{ }^{(1)}=\mathrm{Y}_{i}-\left(\left[\beta_{0}\right]+\left[\beta_{1}\right] * \mathrm{X}_{1, i}\right)$.
Estimate $k^{(1)}$, the number of missing studies, using one of the three usual estimators, applied to the set $\left\{\mathrm{Y}_{i}{ }^{(1)}\right\}, i=1,2, \ldots, m$ :
$R=\gamma^{*}-1$,
$L=\left[4 * \mathrm{~T}_{m}-m *(m+1)\right] /[2 * m-1]$,
$Q=m-1 / 2-\sqrt{ }\left[2 * m^{2}-4 * \mathrm{~T}_{m}+1 / 4\right]$,
where $\gamma^{*}$ and $\mathrm{T}_{m}$ are defined in the usual manner. ${ }^{4}$
3. Remove those studies with the $k^{(1)}$ largest values of $\left\{\mathrm{Y}_{i}{ }^{(1)}\right\}$ from the observed sample. Fit an FE model to the reduced sample of $m-k^{(1)}$ studies, and calculate centered values, based upon the updated estimate $[\beta]^{(2)}=\left(\left[\beta_{0}\right]^{(2)},\left[\beta_{1}\right]^{(2)}\right)$ :
$\mathrm{Y}_{i}^{(2)}=\mathrm{Y}_{i}-\left(\left[\beta_{0}\right]^{(2)}+\left[\beta_{1}\right]^{(2)} * \mathrm{X}_{1, i}\right)$.
Estimate ${ }^{(2)}$ from the set $\left\{\mathrm{Y}_{i}{ }^{(2)}\right\}, i=1,2, \ldots, m$.
4. Continue until an iteration $J$ where $k^{(J)}=k^{(J-1)} \equiv[k]$.

Set $[\beta]=\left(\left[\beta_{0}\right],\left[\beta_{1}\right]\right)=\left(\left[\beta_{0}\right]^{(J)},\left[\beta_{1}\right]^{(J)}\right)$, and for $j=1,2, \ldots,[k]$, define the triplet $Z_{j}$ :
$\mathrm{Z}_{j}=\left(\mathrm{Z}_{1, j}, \mathrm{Z}_{2, j}, \mathrm{Z}_{3, j}\right)=\left(\mathrm{Y}_{h}^{(J)}, \sigma_{h}, \mathrm{X}_{1, h}\right)$,
where $h$ is the index value such that the rank of $\mathrm{Y}_{h}{ }^{(J)}$ equals $m-j+1$.
5. As a final step, augment the observed sample with [ $k$ ] studies:
$\mathrm{X}_{1, j}=2$ * midrange $\left\{\mathrm{X}_{1}\right\}-\mathrm{Z}_{3, j}$,
$\sigma_{j}=\mathrm{Z}_{2, \mathrm{j}}$,
$\mathrm{Y}_{j}=\left[\beta_{0}\right]+\left[\beta_{1}\right] * \mathrm{X}_{1, j}-\mathrm{Z}_{1, j}$,
for $j=1,2, \ldots,[k]$, where midrange $\left\{\mathrm{X}_{1}\right\}$ is the mid-range of $\mathrm{X}_{1}$, which may be either estimated or specified by the analyst.

Figure 2 is a simple visual illustration of how Step 5 is implemented in the algorithm. Midrange estimates include the maximum likelihood estimate $(\mathrm{MLE})=\left[\min \left(\mathrm{X}_{1}\right)+\max \left(\mathrm{X}_{1}\right)\right] / 2$, or the method of moments estimate $(\mathrm{MOM})=$ sample mean of $\mathrm{X}_{1}$. The user may also specify a mid-range, typically taken as the mean of user-specified minimum and maximum values for the covariate (e.g., 0 and 1, for a dichotomous $\mathrm{X}_{1}$ ).

Figure 2. Augmentation using the modified trim and fill algorithm

6. In a metaregression model with covariate $X_{1}$, analyze the set of $m+[k]$ studies, with either an FE model or an RE model.

As a variant on the above algorithm, we also considered fitting only a one-dimensional metaregression model during the iterative portion of the algorithm:

1. Fit an FE model to the observed sample: for $i=1,2, \ldots, m$,
$\mathrm{Y}_{i}=\beta_{0}+\mathrm{e}_{i}$,
where $\mathrm{e}_{i} \sim \mathrm{~N}\left(0, \sigma_{i}^{2}\right)$.
Denote the estimate of $\left(\beta_{0}\right)$ by $[\beta]^{(1)}=\left(\left[\beta_{0}\right]^{(1)}\right)$.
2. Calculate centered values from the fitted FE model: for $i=1,2, \ldots, m$,
$\mathrm{Y}_{i}{ }^{(1)}=\mathrm{Y}_{i}-\left[\beta_{0}\right]$.
Estimate $k^{(1)}$, the number of missing studies, using one of the three usual estimators, applied to the set $\left\{\mathrm{Y}_{i}{ }^{(1)}\right\}, i=1,2, \ldots, m$ :
$R=\gamma^{*}-1$,
$L=\left[4 * \mathrm{~T}_{m}-m^{*}(m+1)\right] /[2 * m-1]$,
$Q=m-1 / 2-\sqrt{ }\left[2 * m^{2}-4 * \mathrm{~T}_{m}+1 / 4\right]$,
where $\gamma^{*}$ and $\mathrm{T}_{m}$ are defined in the usual manner. ${ }^{4}$
3. Remove those studies with the $k^{(1)}$ largest values of $\left\{\mathrm{Y}_{i}{ }^{(1)}\right\}$ from the observed sample. Fit an FE model to the reduced sample of $m-k^{(1)}$ studies, and calculate centered values, based upon the updated estimate $[\beta]^{(2)}=\left(\left[\beta_{0}\right]^{(2)}\right)$ :
$\mathrm{Y}_{i}^{(2)}=\mathrm{Y}_{i}-\left[\beta_{0}\right]^{(2)}$.
Estimate ${ }^{(2)}$ from the set $\left\{\mathrm{Y}_{i}{ }^{(2)}\right\}, i=1,2, \ldots, m$.
4. Continue until an iteration $J$ where $k^{(J)}=k^{(J-1)} \equiv[k]$.

Set $[\beta]=\left(\left[\beta_{0}\right]\right)=\left(\left[\beta_{0}\right]^{(J)}\right)$, and for $j=1,2, \ldots,[k]$, define the triplet $Z_{j}$ :
$\mathrm{Z}_{j}=\left(\mathrm{Z}_{1, j}, \mathrm{Z}_{2, j}, \mathrm{Z}_{3, j}\right)=\left(\mathrm{Y}_{h}{ }^{(J)}, \sigma_{h}, \mathrm{X}_{1, h}\right)$,
where $h$ is the index value such that the rank of $\mathrm{Y}_{h}{ }^{(J)}$ equals $m-j+1$.
5. As a final step, augment the observed sample with [ $k$ ] studies:
$\mathrm{X}_{1, j}=2$ * midrange $\left\{\mathrm{X}_{1}\right\}-\mathrm{Z}_{3, j}$,
$\sigma_{j}=\mathrm{Z}_{2, j}$,
$\mathrm{Y}_{j}=\left[\beta_{0}\right]+\left[\beta_{1}\right] * \mathrm{X}_{1, j}-\mathrm{Z}_{1, j}$,
for $j=1,2, \ldots,[k]$, where midrange $\left\{\mathrm{X}_{1}\right\}$ is the mid-range of $\mathrm{X}_{1}$, which may be either estimated or specified by the analyst.
6. In a metaregression model with covariate $X_{1}$, analyze the set of $m+[k]$ studies, with either an FE model or an RE model.

For each set of parameters, we ran 5,000 iterations. Within each iteration, we proceeded through the algorithm by estimating $k$ with each of the three estimators, $R, L$, and $Q$.

We reported absolute bias and coverage probability for the regression parameters $\beta_{0}$ and $\beta_{1}$, along with relative bias for the parameter $\beta_{1}$. We also report mean values for $R, L$, and $Q$, along with estimation failure rates for each of $R, L$, and $Q$. Estimation failure occurred when $Q$ was inestimable, the estimate of $k$ failed to converge within 100 steps, or if $d=2$, when the estimate of $k$ was equal to 1 at any point during the iterative portion of the algorithm.

All simulations were conducted in R, version 2.8.1.

## Results

Without correction for publication bias, the performance of the estimated parameters in the usual fixed effect (FE) and random effects (RE) metaregression models largely depends, rather unsurprisingly of course, on whether or not publication bias exists, although to a lesser extent, the relative performance of the FE and RE models also depends on the magnitude of betweenstudy variability $\left(\tau^{2}\right)$.

In the absence of publication bias (i.e., with zero missing studies), the absolute biases of the estimated intercept (Appendix Table E1) and slope (Appendix Table E7) were both negligible, independent of the true value of the slope parameter, the magnitude of between-study variability, sample size (from 25 to 65), and model assumptions concerning random variability (FE or RE). In contrast, still in the absence of publication bias, the coverage probabilities of the confidence intervals around the estimated intercept (Appendix Table E2) and slope (Appendix Table E8) were mixed. The coverage probabilities achieved the nominal level ( 95 percent) in the absence of between-study variability ( $\tau^{2}=0$ ), independent of both sample size and model assumptions (FE or RE). However, with between-study variability ( $\tau^{2}>0$ ), coverage probabilities of intervals around both the estimated slope and intercept rapidly decreased with increasing between-study variability in the FE model, but were stable, albeit modestly below nominal level, with increasing between-study variability in the RE model. In all instances, associations of coverage probabilities with simulation parameters were independent of the true value of the slope parameter. Finally, still in the absence of publication bias, the relative bias of the estimated slope parameter (Appendix Table E13) was mixed, although only as a function of the true value of the slope parameter. When the true value of the slope was 0.049 , the relative bias of the slope parameter was generally non-negligible, although without discernible patterns with respect to other simulation parameters. As the true value of the slope increased, the relative bias of the slope parameter typically decreased, such that when the true value of the slope was 0.444 , relative bias was, in fact, negligible. Much of this relative bias is symptomatic of the metric itself, since even a small absolute bias may be a quite large relative bias when the true value of the parameter in question is in the neighborhood of zero.

Without correction for publication bias in spite of the presence of such bias, the performance of the estimated intercept and slope parameters, along with associated confidence intervals, was much different. Absolute bias of the estimated intercept was positive (Appendix Table E1). Absolute bias increased as the number of missing studies increased (from 5 to 10), as betweenstudy variability increased, and as the true value of the slope parameter increased. Absolute bias decreased as the sample size increased. Bias was largely independent of model assumptions (FE or RE), with only a modest increase in the RE vs. FE model when $\tau^{2}=0$, and a modest decrease in the RE versus FE model when $\tau^{2}>0$. The absolute bias of the estimate slope parameter, in contrast, was negative (Appendix Table E7). Absolute bias of the estimated slope also increased in (absolute) magnitude as the number of missing studies increased, as between-study variability increased, and as the true value of the slope parameter increased, while bias decreased as sample size grew larger. The coverage probabilities of the confidence intervals around the estimated intercept (Appendix Table E2) and slope (Appendix Table E8) decreased, relative to probabilities in the absence of publication bias. Coverage probabilities decreased as the number of missing studies increased (particularly with 10 missing studies), as between-study variability increased, as the true value of the slope increased, and interestingly, even as the sample size increased. Decreases were equally apparent in the both the FE and RE models. Finally, the
relative bias of the estimate slope (Appendix Table E13) typically increased, compared to the relative bias in the absence of publication bias. Associations of relative bias with simulation parameters mirrored the above associations of absolute bias in the estimated slope with simulation parameters.

With correction for publication bias, via imputation of $\mathbf{k}=R$ or $\mathbf{k}=L$ studies, as estimated and identified from the modified trim and fill algorithm, the performance of the estimated intercept and slope parameters, along with associated confidence intervals, was mixed, as a function of whether or not publication bias was actually present. In the absence of publication bias, the imputation of $\mathbf{k}$ studies actually introduced negative absolute bias in the estimated intercept (Appendix Tables E2 and E3). This bias grew in (absolute) magnitude as the true value of the slope increased and as between-study variability increased. This bias was largely independent of sample size, but was clearly larger in the RE versus FE model, independent of the magnitude of $\tau^{2}$. Conversely, but still in the absence of publication bias, imputation of $\mathbf{k}$ studies introduced non-negative absolute bias in the estimated slope (Appendix Tables E8 and E9). In the FE model, bias was generally negligible, but in the RE model, bias was generally positive, relatively more so as the true value of the slope increased. As with the estimated intercept, the absolute bias in the estimated slope was larger in the RE versus FE model. The coverage probabilities of the confidence intervals around the estimated intercept (Appendix Tables E5 and E6) and slope (Appendix Tables E11 and E12) parameters were practically unchanged, with only very modest degradation, relative to a lack of correction for publication bias. Finally, patterns in the relative bias of the estimated slope parameter (Appendix Tables E14 and E15), with correction for publication bias despite the absence of such bias, generally mirrored corresponding patterns in the absolute bias of the estimated slope parameter. In particular, for larger true values of the slope parameter, relative bias in the estimated slope was negligible in the FE model, but almost always positive in the RE model, with increasing bias as between-study variability increased.

With correction for publication bias in the absence of such bias, the performance of estimated parameters, and associated confidence intervals, was generally superior with imputation of $\mathbf{k}=R$ $v s$. $\mathbf{k}=L$ studies. In particular, with imputation of $R$ versus $L$ studies, absolute and relative biases in the estimated intercept and slope parameters were generally smaller and corresponding coverage probabilities were generally larger.

When publication bias actually existed, the imputation of $\mathbf{k}$ studies resulted in meaningful, albeit incomplete correction of bias in estimated model parameters induced by publication bias. The absolute bias of the estimated intercept (Appendix Tables E2 and E3) and slope (Appendix Tables E8 and E9) parameters was reduced via application of modified trim. Absolute bias in the estimated intercept parameter was mostly eliminated, with five missing studies from any sample size given small $\tau^{2}$, from sample size $\geq 35$ given medium $\tau^{2}$, and from sample size $\geq 45$ with large $\tau^{2}$, all through fitting of an FE model. Bias was also mostly eliminated with 10 missing studies from sample size $\geq 45$ given small $\tau^{2}$ and from sample size 65 given medium $\tau^{2}$, but non-trivial bias remained with 10 missing studies and large $\tau^{2}$, again all through fitting of an FE model. Generally, the absolute bias in the estimated intercept was further reduced through fitting of an RE model, even independent of the magnitude of $\tau^{2}$, so much so that absolute bias was largely eliminated with 10 missing studies from sample size 65 in sets of studies with large betweenstudy variability. The absolute bias of the slope parameter exhibited similar improvement, with analogous associations with simulation parameters. In particular, with 5 missing studies, bias was largely eliminated only as sample size increased, given increasing levels of between-study
variability, while with 10 missing studies, bias was eliminated only with even larger sample size, given commensurate between-study variability. Again, bias was further reduced through fitting of an RE model, relative to fitting of an FE model. The relative bias of the estimated slope parameter (Appendix Tables E14 and E15) mirrored these trends. However, the relative bias metric better illuminates the fact that with a relatively large proportion of missing studies attributable to publication bias and substantial between-study variability (beyond that accounted by the metaregression model), nontrivial negative relative bias remains in the estimated slope. Coverage probabilities of the confidence intervals around the estimated intercept (Appendix Tables E5 and E6) and slope (Appendix Tables E11 and E12) were mixed, after correction for publication bias. In general, coverage probabilities of FE-model-derived intervals around the estimated intercept ranged from unchanged to slightly greater, relative to a lack of correction for publication bias. Improvements were seen, unsurprisingly, when $\tau^{2}=0$. However, all coverage probabilities of FE-model-derived intervals were below nominal level, particularly as betweenstudy variability increased. Corresponding probabilities were much closer to nominal level with intervals derived from RE models. Interestingly however, coverage probabilities were modestly smaller with correction for publication bias than without such correction when the proportion of missing studies was low, although coverage probabilities were larger, as may be expected, when that proportion was high.

Throughout all scenarios in which the modified trim and fill algorithm was applied to sets of studies in which publication bias, in fact, existed, the imputation of $\mathbf{k}=R$ studies was generally superior to the imputation of $\mathbf{k}=L$ studies. Absolute and relative biases in model parameters were generally smaller, although coverage probabilities were often comparable.

Some of this difference can likely be attributed to the mean values of $\mathbf{k}$. Mean values of $\mathbf{k}$ when $\mathbf{k}=R$ (Appendix Table E16) and $\mathbf{k}=L$ (Appendix Table E17) illustrate this. When $\mathbf{k}=R$, the estimated number, $\mathbf{k}$, of missing studies tends to exhibit good properties. It remains low in the absence of publication bias, typically exceeding one only with substantial between-study variability. It typically increases as the number of missing studies increases, but does not rapidly increase as sample size increases. However, when the proportion of missing studies is large (e.g., 10 studies from sample size 25), the estimated number of missing studies is badly biased downward. In contrast, when $\mathbf{k}=L$, the estimated number of missing studies tends to exhibit less desirable properties. In the absence of publication bias, $\mathbf{k}$ typically increases as sample size increases, and with large between-study variability, overestimates the number of missing studies. When publication bias does exist, the estimated number of missing studies appears to increase rapidly with sample size, even with a given number of missing studies, but nonetheless remains negatively biased when 10 studies are missing, largely independent of the proportion of missing studies.

In Appendix Tables E1 through E17, we display simulation results from the one-dimensional variant of the modified trim and fill algorithm. In Appendix Tables E18 through E34, we display analogous results from the two-dimensional variant of the algorithm. In this variant, unlike in the former, a random effects metaregression model, with both an intercept and a slope parameter, is fit to the data during the iterative phase of the algorithm, during which $\mathbf{k}$ is estimated; in the former, only an intercept is included in the model that is fit during the iterative phase. Patterns associated with the simulation parameters are entirely analogous in this variant. Notably, however, all measures of bias in the estimated slope parameter indicate relatively poorer performance, with much larger relative bias, given a high proportion of missing studies and medium to high between-study variability.

## Example

We consider here data from 19 randomized studies examining the hypothesis that teachers' expectations influence students’ IQ intelligence test scores. ${ }^{2}$ In each study, students were randomly assigned either to an experimental, "expectancy induction" group, or to a control group. Teachers of students in the experimental group were led to believe that their students were "likely to experience substantial intellectual growth." The effect analyzed here is the standardized mean difference between the study groups.

The authors hypothesized that the magnitude of the response variable might be related to the length of time that the teacher and student were in contact prior to the expectancy induction. For instance, teachers who had accumulated more contact with students prior to the start of the study were expected to be less vulnerable to induction. Thus, amount of prior contact was categorized into two groups: contact for one week or less (i.e., the low-contact group) and contact for more than one week (i.e., the high-contact group). This variable is the study-level covariate used in the modified trim and fill algorithm.

In a metaregression ignoring the possibility of publication bias, the predicted mean response from a fixed effect model was $Y=0.349-0.371 * I$ [high-contact group], where $I$ [high-contact group] is an indicator variable that equals 1 if a study is in the high-contact group, and equals zero if a study is in the low-contact group. In the model, the estimated intercept is significantly different from zero ( 95 percent confidence interval (CI): $0.19,0.51 ; p<0.01$ ), and so is the estimated slope ( 95 percent CI: $-0.55,-0.20 ; p<0.01$ ). A test of whether between-study variability was equal to zero versus greater than zero, given adjustment for heterogeneity induced by contact group, was nonsignificant ( $X^{2}=16.8, d f=17, p=0.47$ ), suggesting that a random effects model was unnecessary. Perhaps of greater interest are the predicted means of the response variable in each contact group. In the low-contact group, the predicted mean response was 0.35 ( 95 percent CI: $0.19,0.51 ; p<0.01$ ). In contrast, in the high-contact group, the predicted mean response was -0.021 ( 95 percent CI: $-0.102,0.059 ; p=0.60$ ). Thus, there was a significant, positive effect of expectancy induction in studies in the low-contact group, but a nonsignificant, modestly negative effect of induction in studies in the high-contact group.

With application of the one-dimensional variant of the modified trim and fill algorithm, and with $\mathbf{k}=R$ missing studies, there is evidence of funnel plot asymmetry, with estimated $R=2$. Both of the missing studies are estimated to be in the high-contact group. Interestingly, after imputation of this pair of studies, there is some evidence of between-study heterogeneity, even with adjustment for contact group ( $X^{2}=31.4, d f=17, p=0.04$ ). Thus, unlike above, a random effects model is likely appropriate here. In a metaregression with imputation of missing studies, the predicted mean response from a random effects model was $Y=0.368-0.450 * I$ [highcontract group]. In the model, both the estimated intercept (95 percent CI: $0.16,0.54 ; p<0.01$ ) and the estimated slope ( 95 percent CI: $-0.60,-0.15 ; p<0.01$ ) remained significantly different from 0 . In the low-contact group, the predicted mean response was 0.37 ( 95 percent CI: 0.16 , $0.54 ; p<0.01$ ), quite similar to the earlier analysis, unsurprisingly, since the trim and fill algorithm estimated no missing studies in this group. However, in the high-contact group, the predicted mean response was -0.082 ( 95 percent CI: $-0.20,0.034 ; p=0.16$ ). Therefore, while there was persistent evidence of a positive effect of expectancy induction in the studies in the low-contact group, there was also evidence, albeit nonsignificant, of an opposite, negative effect in the high-contact group. As an example, this finding is compatible with the hypothesis that expectancy induction in teachers with lengthy contact with students may encourage complacency, resulting in lower IQ intelligence test scores.

Figure 3 gives a funnel plot of the teacher expectancy studies, using different symbols for the low- and high-contact groups. The imputed studies are shown as open symbols. In Figure 4, the residuals after fitting the metaregression model to the data are shown. Evidently, publication bias may have resulted in censoring of two studies in the high-contact group, both with very negative findings.

Figure 3. Funnel plot of the teacher expectancy data, showing imputed studies


Figure 4. Funnel plot of the residuals of the standardized mean differences, showing imputed data


A scatter-plot with all relevant studies, along with the fitted regression lines both before and after correction for publication bias, is shown in Figure 5. Addition of these studies to the observed studies results in a more negative slope in the fitted regression line.

Figure 5. Application of the modified Trim and Fill algorithm to the teacher expectancy data


Finally of note, with $\mathbf{k}=L$, the modified trim and fill algorithm estimated $L=3$. This resulted in a slightly more negatively sloped line than $\mathbf{k}=R$, but the quantitative difference in conclusions regarding the high-contact group was trivial.

## Discussion

We have developed a new generalized trim and fill algorithm for analyzing heterogeneity and publication bias simultaneously in a meta-analysis. Since this report focuses on the development of a new method, we did not explicitly discuss investigation of the sources of heterogeneity per se. Naturally, elucidation of sources of heterogeneity may explain at least some of the funnel plot asymmetry, and may even obviate the need for adjustment for potential publication bias. The more typical situation arises where we do not have enough information to identify all of the sources for heterogeneity, or we are unable to remove all of the heterogeneity even when sources can be identified. Another issue is that metaregression methods require a minimal amount of studies—some say at least 10 per covariate—and this is not often the case in the medical literature.

In the simulation studies of Peters et al ${ }^{17}$ and Terrin et al, ${ }^{18}$ only unexplainable between-study heterogeneity was induced. Until now, there has been very little research into assessment of publication bias in the presence of explainable between-study heterogeneity. It may sometimes be the case that study-level covariates can explain some of the heterogeneity in a meta-analysis, which, although complicating the assessment of publication bias, is now addressable via the modified algorithm we have presented here.

We assessed the performance of the algorithm with simulation techniques and applied it to data from a set of 19 randomized studies examining the hypothesis that teachers' expectations influence students’ intelligence test scores. We found that bias and coverage probability improved as the number of studies increased, varying from 25 to 65 component studies in the meta-analysis. The $R$ estimator outperforms both $L$ and $Q$ from the original trim and fill method. Performance declined in the presence of large heterogeneity, with between-study variability varied from an intraclass coefficient (ICC) of 0 to 0.75 , but substantial bias reduction still obtained. Two algorithm variants were developed, with the simpler one-dimensional version performing slightly better than the two-dimensional. We caution, however, that the onedimensional variant may not be superior in all instances.

In general, the simulations show that estimation of the number of missing studies $k$ is better using the $R$ estimator, especially when between-study variability exceeds zero. The $Q$ estimator should not be used to estimate $k$. Performance of the one-dimensional variant of the algorithm is superior to the two-dimensional version.

## Further Work

In general, it appears that $R$ is a superior estimator of $k$, in contrast to previous recommendations in support of $L$. It is unclear why this is the case here, and requires further investigation. In the future, we will investigate properties of the adapted algorithm in the presence of multiple covariates. This will allow a broader adjustment to be made, given covariate information and sufficient studies in each covariate profile. We will also assess inferential properties of predicted values from the metaregression.

We have written "trim.fill.regression," a program (freely available) for the statistical software package, R. The program currently supports this adaptation of trim and fill for metaregression, but with just one covariate. Future versions will support multiple covariates. A beta version of the program can be requested from the authors. The software package Stata (StataCorp Inc, College Station, Tx) currently includes an implementation of the original trim and fill algorithm called metatrim. We intend for the modified algorithm to be incorporated into metatrim in collaboration with Stata developers, thus making the research much more widely accessible.

## Recommendation

We acknowledge that assessment for publication bias in the presence of heterogeneity requires considerable caution. Our recommendation when covariates are available is for the use of the modified trim and fill algorithm as a sensitivity analysis to the potential impact of publication bias.

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## Acronyms/Abbreviations

CI Confidence interval
FE Fixed effect
ICC Intraclass coefficient
RE Random effects

## Appendix A. Peer Reviewers

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## Appendix B. Software Program Code

```
trim.fill.regression <- function (theta.hat, s.e.theta, covariate,
                                    k.estimator, t.f.mod, t.f.dim,
                                    fill.range, level = 0.95) {
dim.beta <- 2
n.obs.1 <- length(theta.hat)
n.obs.2 <- length(s.e.theta)
n.obs. }3\mathrm{ <- length(covariate)
n.check <- 1 * (var(c(n.obs.1, n.obs.2, n.obs.3)) == 0)
if (n.check == 0) {
    return("ERROR. Argument lengths are not equal.")
}
if (n.check == 1) {
    n.obs <- n.obs.1
    estimate.obs <- matrix(
        cbind(theta.hat, s.e.theta),
        nrow = n.obs, ncol = 2
        )
    x.design.obs <- matrix(
                        cbind(rep(1, n.obs), covariate),
                        nrow = n.obs, ncol = 2
            )
    meta.fit <- data.frame(
        matrix(NA, 2 * (2 * dim.beta + 1) + 1, 11)
        )
    names(meta.fit)[1] <- "METHOD"
    names(meta.fit)[2] <- "MODEL"
    names(meta.fit)[3] <- "PARAM"
    names(meta.fit)[4] <- "Estimate"
    names(meta.fit)[5] <- "St Error"
    names(meta.fit)[6] <- "Stat"
    names(meta.fit)[7] <- "P"
    names(meta.fit)[8] <- "Lower CI"
    names(meta.fit)[9] <- "Upper CI"
```

```
names(meta.fit)[10] <- "CovBeta1"
names(meta.fit)[11] <- "CovBeta2"
for(i in 1:2) {
    if (i== 1) {
        inv.v <- solve(
                        diag(estimate.obs[, 2]^2, n.obs, n.obs)
                        )
    }
    if (i== 2) {
        inv.v.fix <- solve(
                                    diag(estimate.obs[, 2]^2, n.obs, n.obs)
                                    )
        m.1.fix <- solve(
                                    t(x.design.obs) %*% inv.v.fix %*% x.design.obs
                )
```

        q.hat <- t(estimate.obs[, 1]) \%*\%
        (inv.v.fix -
                inv.v.fix \%*\% x.design.obs \%*\% m.1.fix \%*\% t(x.design.obs)
    \%*\% inv.v.fix) \%*\%
estimate.obs[, 1]
d.f <- n.obs - dim.beta
if (dim.beta $==1$ ) \{
c.hat <- sum(diag(inv.v.fix)) -
sum(m.1.fix \%*\% t(x.design.obs) \%*\% inv.v.fix \%*\%
inv.v.fix \%*\% x.design.obs)
\}
if (dim.beta > 1) \{
c.hat <- sum(diag(inv.v.fix)) -
sum(diag(m.1.fix \%*\% t(x.design.obs) \%*\% inv.v.fix
\%*\% inv.v.fix \%*\% x.design.obs))
\}
tau.sq.hat <- max(0, (q.hat - d.f) / c.hat)
inv.v <- solve(
diag(estimate.obs[, 2]^2 + tau.sq.hat, n.obs, n.obs)
)
\}
m. 1 <- solve(
t(x.design.obs) \%*\% inv.v \%*\% x.design.obs

```
        )
    m.2 <- t(x.design.obs) %*% inv.v %*% estimate.obs[, 1]
    if (i == 1) {
        beta.hat. }1<-\textrm{m}.1%*% m. 
        beta.cov.1 <- m. }
        if (dim.beta == 1) beta.err. 1<- sqrt(m.1)
        if (dim.beta > 1) beta.err.1 <- sqrt(diag(m.1))
    }
    if (i == 2) {
        beta.hat.2 <- m. }1\mathrm{ %*% m. }
        beta.cov.2 <- m. }
        if (dim.beta == 1) beta.err. 2 <- sqrt(m.1)
        if (dim.beta > 1) beta.err.2 <- sqrt(diag(m.1))
    }
}
mark.1<-(1-1) * (2 * dim.beta + 1) + (1-1) * (dim.beta) + 1
mark.2<-(1-1)* (2 * dim.beta + 1) + (1-1) *(dim.beta) + dim.beta
mark. 3 <- (1-1) * (2 * dim.beta + 1) + (2-1) * (dim.beta) + 1
mark. 4<-(1-1) * (2 * dim.beta + 1) + (2-1) * (dim.beta) + dim.beta
mark.5 <- (1-1) * (2 * dim.beta + 1) + (2-1) * (dim.beta) + dim.beta + 1
meta.fit[mark. 1 : mark.5, 1] <- rep("OBSERVED", 2 * dim.beta + 1)
meta.fit[mark. 1 : mark.5, 2] <- c(rep("FIX", dim.beta), rep("RAN", dim.beta + 1))
meta.fit[mark. 1 : mark.5, 3] <- c(rep(c("Intercept", "Covariate"), 2), "Tau^2")
meta.fit[mark. 1 : mark.2, \(4: 5]\) <- cbind(beta.hat.1, beta.err.1)
meta.fit[mark. 3 : mark.4, 4 : 5] <- cbind(beta.hat.2, beta.err.2)
meta.fit[mark. 1 : mark.4, 6] <- meta.fit[mark.1 : mark.4, 4] / meta.fit[mark. 1 : mark.4, 5]
meta.fit[mark. 1 : mark.4, 7] <- 2 * (1-pnorm(abs(meta.fit[mark. 1 : mark.4, 6])))
meta.fit[mark. 1 : mark.4, 8] <- meta.fit[1:4, 4] + qnorm(0 + (1-level) / 2) *
meta.fit[mark. 1 : mark.4, 5]
meta.fit[mark. 1 : mark.4, 9] <- meta.fit[1:4, 4] + qnorm(1-(1-level) / 2) *
meta.fit[mark. 1 : mark.4, 5]
meta.fit[mark. 1 : mark.2, \(10: 11]<-\) beta.cov. 1
meta.fit[mark. 3 : mark. \(4,10: 11\) ] <- beta.cov. 2
meta.fit[mark.5, 4] <- tau.sq.hat
meta.fit[mark.5, 6] <- q.hat
```

meta.fit[mark.5, 7] <- 1 - pchisq(q.hat, df = d.f)
assign("meta.fit", meta.fit, env = .GlobalEnv)
if (t.f.mod == "FIX") \{ inv.v <- solve( diag(estimate.obs[, 2]^2, n.obs, n.obs) )
\}
if (t.f.mod == "RAN") \{ inv.v.fix <- solve( diag(estimate.obs[, 2]^2, n.obs, n.obs) )
m.1.fix <- solve( $\mathrm{t}(\mathrm{x} . \mathrm{design} . \mathrm{obs}[, 1$ : t.f.dim]) $\% * \%$ inv.v.fix $\% * \%$ x.design.obs[, 1 :
t.f.dim]
q.hat $<-\mathrm{t}(\mathrm{estimate} . \mathrm{obs}[, 1]) \% * \%$ (inv.v.fix -
inv.v.fix \%*\% x.design.obs[, 1 : t.f.dim] \%*\% m.1.fix \%*\%
t(x.design.obs[, 1 : t.f.dim]) $\% * \%$ inv.v.fix) $\% * \%$
estimate.obs[, 1]
d.f <- n.obs - t.f.dim
if $($ dim.beta $==1)\{$
c.hat $<-\operatorname{sum}(d i a g(i n v . v . f i x))-$
sum(m.1.fix \%*\% t(x.design.obs[, 1 : t.f.dim]) \%*\% inv.v.fix
\%*\% inv.v.fix $\% * \%$ x.design.obs[, 1 : t.f.dim])
\}
if (dim.beta > 1) \{
c.hat $<-\operatorname{sum}(\operatorname{diag}($ inv.v.fix $))$ -
sum(diag(m.1.fix $\% * \% \mathrm{t}(\mathrm{x} . \mathrm{design} . \mathrm{obs}[, 1$ : t.f.dim]) $\% * \%$
inv.v.fix \%*\% inv.v.fix \%*\% x.design.obs[, 1 : t.f.dim]))
\}
tau.sq.hat <- max(0, (q.hat - d.f) / c.hat)
inv.v <- solve(
diag(estimate.obs[, 2]^2 + tau.sq.hat, n.obs, n.obs)
)
\}
m. $1<-$ solve(
t(x.design.obs[, 1 : t.f.dim]) \%*\% inv.v \%*\% x.design.obs[, 1 : t.f.dim] )
m. $2<-\mathrm{t}(\mathrm{x}$. design.obs[, 1 : t.f.dim]) $\% * \%$ inv.v \%*\% estimate.obs[, 1]
iter.beta.hat <- m. 1 \%*\% m. 2
residual <- round( estimate.obs[, 1] - x.design.obs[, 1 : t.f.dim] $\% * \%$ iter.beta.hat, digits $=12$
)
sign.rank <- cbind( sign(residual), $\operatorname{rank}($ residual, ties.method = "random"), rank(abs(residual), ties.method = "random") )
if $(\min (\operatorname{sign} . \operatorname{rank}[, 1])==-1)$ gamma.star $<-$ n.obs $-\max (\operatorname{sign} \cdot r a n k[\operatorname{sign} . r a n k[, 1]==-1$,
3])

$$
\text { if }(\min (\operatorname{sign} \cdot \operatorname{rank}[, 1])==0) \text { gamma.star }<- \text { n.obs }-\operatorname{sum}(\operatorname{sign} \cdot \operatorname{rank}[, 1]==0)
$$

if $(\max (\operatorname{sign} \cdot \operatorname{rank}[, 1])==0)$ T.n $<-0$
if $(\max (\operatorname{sign} . \operatorname{rank}[, 1])==1)$ T.n $<-\operatorname{sum}(\operatorname{sign} \cdot \operatorname{rank}[\operatorname{sign} \cdot \operatorname{rank}[, 1]==1,3])$
if (k.estimator == "R") \{
n.miss.hat <- max (0, gamma.star - 1)
delta.n.miss.hat <- n.miss.hat - 0
if (n.miss.hat > (n.obs - t.f.dim)) \{
n.miss.hat <- NA
delta.n.miss.hat <-0
return("ERROR. Trimmed data is of insufficient rank.")
\}
\}
if (k.estimator == "L") \{
n.miss.hat <- max (0, floor((4 * T.n - n.obs * (n.obs + 1)) / (2 * n.obs - 1) + 1/2))
delta.n.miss.hat <- n.miss.hat - 0
if (n.miss.hat > (n.obs - t.f.dim)) \{
n.miss.hat <- NA
delta.n.miss.hat <-0
return("ERROR. Trimmed data is of insufficient rank.")
\}

```
}
if (k.estimator == "Q") {
    if ((2* n.obs^2 - 4* T.n + 1/4)< 0) {
            n.miss.hat <- NA
            delta.n.miss.hat <- 0
            return("ERROR. Q-hat cannot be calculated.")
    }
    if ((2 * n.obs^2 - 4* T.n + 1/4) >= 0) {
            n.miss.hat <- max(0, floor((n.obs - 1/2) - sqrt(2 * n.obs^2 - 4 * T.n + 1/4)
+ 1/2))
    delta.n.miss.hat <- n.miss.hat - 0
    if (n.miss.hat > (n.obs - t.f.dim)) {
            n.miss.hat <- NA
                delta.n.miss.hat <- 0
                    return("ERROR. Trimmed data is of insufficient rank.")
    }
    }
}
step <- 1
while ((delta.n.miss.hat != 0) & (step <= 100)) {
    lag.n.miss.hat <- n.miss.hat
    retain <- (1 : n.obs)[!(sign.rank[, 2] > (n.obs - lag.n.miss.hat))]
    x.design.sub <- matrix(
                        x.design.obs[retain, 1 : t.f.dim],
                        ncol = t.f.dim
            )
    estimate.sub <- matrix(
                        estimate.obs[retain, ],
                        ncol = 2
                        )
    n.sub <- nrow(estimate.sub)
    x.rank.check <- 1 * (qr(x.design.sub)$rank == t.f.dim)
    if (x.rank.check == 0) {
        n.miss.hat <- NA
        delta.n.miss.hat <- 0
    }
```

```
    if (x.rank.check == 1) {
    if (t.f.mod == "FIX") {
            inv.v <- solve(
                                    diag(estimate.sub[, 2]^2, n.sub, n.sub)
                                    )
    }
    if (t.f.mod == "RAN") {
            if (n.sub == 1) {
            tau.sq.hat <- 0
        }
        if (n.sub > 1) {
            inv.v.fix <- solve(
                                    diag(estimate.sub[, 2]^2, n.sub, n.sub)
                                    )
```

        m.1.fix <- solve(
                t(x.design.sub) \%*\% inv.v.fix \%*\%
    x.design.sub
)
q.hat <- t(estimate.sub[, 1]) \%*\%
(inv.v.fix -
inv.v.fix \%*\% x.design.sub \%*\% m.1.fix \%*\%
t (x.design.sub) \%*\% inv.v.fix) \%*\%
estimate.sub[, 1]
d.f <- n.sub - t.f.dim
if (t.f.dim $==1$ ) \{
c.hat <- sum(diag(inv.v.fix)) -
sum(m.1.fix \%*\% t(x.design.sub) \%*\%
inv.v.fix \%*\% inv.v.fix \%*\% x.design.sub)
\}
if (t.f.dim > 1) \{
c.hat <- sum(diag(inv.v.fix)) -
sum(diag(m.1.fix $\% * \% \mathrm{t}$ (x.design.sub)
\%*\% inv.v.fix $\% * \%$ inv.v.fix $\% * \%$ x.design.sub))
\}
tau.sq.hat <- max(0, (q.hat - d.f) / c.hat)
\}
inv.v <- solve(
diag(estimate.sub[, 2]^2 + tau.sq.hat, n.sub, n.sub)
)
\}

```
        m.1 <- solve(
        t(x.design.sub) %*% inv.v %*% x.design.sub
        )
        m.2 <- t(x.design.sub) %*% inv.v %*% estimate.sub[, 1]
        iter.beta.hat <- m. 1 %*% m. }
}
    residual <- round(
        estimate.obs[, 1] - x.design.obs[, 1 : t.f.dim] %*% iter.beta.hat,
        digits = 12
        )
    sign.rank <- cbind(
        sign(residual),
        rank(residual, ties.method = "random"),
        rank(abs(residual), ties.method = "random")
        )
if (min(sign.rank[, 1]) == -1) gamma.star <- n.obs - max(sign.rank[sign.rank[, 1]
== -1, 3])
    if (min(sign.rank[, 1]) == 0) gamma.star <- n.obs - sum(sign.rank[, 1] == 0)
    if (max(sign.rank[, 1]) == 0) T.n <- 0
    if (max(sign.rank[, 1]) == 1) T.n <- sum(sign.rank[sign.rank[, 1] == 1, 3])
    if (k.estimator == "R") {
        n.miss.hat <- max(0, gamma.star - 1)
        delta.n.miss.hat <- n.miss.hat - lag.n.miss.hat
        if (n.miss.hat > (n.obs - t.f.dim)) {
            n.miss.hat <- NA
            delta.n.miss.hat <- 0
            return("ERROR. Trimmed data is of insufficient rank.")
    }
}
if (k.estimator == "L") {
        n.miss.hat <- max(0, floor((4 * T.n - n.obs * (n.obs + 1)) / (2 * n.obs - 1) +
1/2))
        delta.n.miss.hat <- n.miss.hat - lag.n.miss.hat
        if (n.miss.hat > (n.obs - t.f.dim)) {
        n.miss.hat <- NA
        delta.n.miss.hat <- 0
```

```
                    return("ERROR. Trimmed data is of insufficient rank.")
    }
    }
    if (k.estimator == "Q") {
        if ((2* n.obs^2-4*T.n + 1/4)<0) {
            n.miss.hat <- NA
            delta.n.miss.hat <- 0
            return("ERROR. Q-hat cannot be calculated.")
    }
    if ((2 * n.obs^2-4 * T.n + 1/4) >= 0) {
            n.miss.hat <- max(0, floor((n.obs - 1/2) - sqrt(2 * n.obs^2 - 4 * T.n
+1/4)+1/2))
    delta.n.miss.hat <- n.miss.hat - lag.n.miss.hat
    if (n.miss.hat > (n.obs - t.f.dim)) {
                                    n.miss.hat <- NA
                                    delta.n.miss.hat <- 0
                                    return("ERROR. Trimmed data is of insufficient rank.")
    }
    }
    }
    step <- step + 1
    if (step == 100) {
        n.miss.hat <- NA
        delta.n.miss.hat <- 0
        if (k.estimator == "R") {
            return("ERROR. R-hat does not converge.")
        }
        if (k.estimator == "L") {
        return("ERROR. L-hat does not converge.")
        }
        if (k.estimator == "Q") {
        return("ERROR. Q-hat does not converge.")
    }
}
}
    n.miss.check <- 1 * (is.na(n.miss.hat) == 0)
    if (n.miss.check == 1) {
```

```
    if (n.miss.hat == 0) {
    x.design.t.f.1 <- x.design.obs
    estimate.t.f.1 <- estimate.obs
    x.design.t.f <- rbind(x.design.t.f.1)
    estimate.t.f <- rbind(estimate.t.f.1)
    n.t.f <- nrow(estimate.t.f)
    }
    if (n.miss.hat > 0) {
    range.check <- 1 * (is.numeric(fill.range))
    if (range.check == 0) {
                if (fill.range == "MLE") {
                        mid.range <- mean(c(min(x.design.obs[, 2]),
```

$\max (x . d e s i g n . o b s[, 2])))$
\}
if (fill.range == "MOM") \{
mid.range <- mean(x.design.obs[, 2])
\}
\}
if (range.check == 1) \{
mid.range $<-$ mean(c(fill.range[1], fill.range[2]))
\}
x.design.t.f. $1<-$ x.design.obs
x.design.t.f. $2<-$ matrix(
cbind(
rep(1, n.miss.hat),
2 * mid.range - x.design.obs[(sign.rank[, 2] >
(n.obs - n.miss.hat)), 2]
),
nrow $=$ n.miss.hat, ncol $=2$
)
estimate.t.f. $1<-$ estimate.obs
estimate.t.f. $2<-$ cbind(
x.design.t.f.2[, 1 : t.f.dim] $\% * \%$ iter.beta.hat -
residual[(sign.rank[, 2] > (n.obs - n.miss.hat)), ],
estimate.obs[(sign.rank[, 2] > (n.obs - n.miss.hat)),
2]
)
x.design.t.f <- rbind(x.design.t.f.1, x.design.t.f.2)
estimate.t.f <- rbind(estimate.t.f.1, estimate.t.f.2)

```
    n.t.f <- nrow(estimate.t.f)
```

    \}
    t.f.theta.hat <- estimate.t.f[, 1]
    t.f.s.e.theta <- estimate.t.f[, 2]
    t.f.covariate <- x.design.t.f[, 2]
    t.f.fill.flag <- c(rep(0, n.obs), rep(1, n.miss.hat))
    assign("t.f.theta.hat", t.f.theta.hat, env = .GlobalEnv)
    assign("t.f.s.e.theta", t.f.s.e.theta, env = .GlobalEnv)
    assign("t.f.covariate", t.f.covariate, env = .GlobalEnv)
    assign("t.f.fill.flag", t.f.fill.flag, env = .GlobalEnv)
    for (i in \(1: 2\) ) \{
        if (i==1) \{
            inv.v <- solve(
                        diag(estimate.t.f[, 2]^2, n.t.f, n.t.f)
                            )
    \}
    if \((i==2)\{\)
        if (n.t.f == 1) \{
        tau.sq.hat <- 0
            \}
            if (n.t.f > 1) \{
                inv.v.fix <- solve(
                                    diag(estimate.t.f[, 2]^2, n.t.f, n.t.f)
                                    )
        m.1.fix <- solve(
                t(x.design.t.f) \%*\% inv.v.fix \%*\%
    x.design.t.f
)
q.hat <- t(estimate.t.f[, 1]) \%*\%
(inv.v.fix - inv.v.fix \%*\% x.design.t.f \%*\%
m.1.fix $\% * \%$ t(x.design.t.f) $\% * \%$ inv.v.fix) $\% * \%$
estimate.t.f[, 1]
d.f <- n.t.f - dim.beta
if $($ dim.beta $==1)\{$
c.hat <- sum(diag(inv.v.fix)) -
sum(m.1.fix $\% * \% \mathrm{t}$ (x.design.t.f) $\% * \%$
inv.v.fix \%*\% inv.v.fix \%*\% x.design.t.f)

# if (dim.beta > 1) \{ 

 c.hat <- sum(diag(inv.v.fix)) sum(diag(m.1.fix $\% * \%$ t(x.design.t.f)\%*\% inv.v.fix $\% * \%$ inv.v.fix $\% * \%$ x.design.t.f))
$\}$
\}
tau.sq.hat <- max(0, (q.hat - d.f) / c.hat)
\}
inv.v <- solve(
diag(estimate.t.f[, 2]^2 + tau.sq.hat, n.t.f, n.t.f)
)
\}
m. $1<-$ solve(
t (x.design.t.f) $\% * \%$ inv.v $\% * \%$ x.design.t.f
)
m. $2<-\mathrm{t}(\mathrm{x} . \mathrm{design.t.f)} \% * \%$ inv.v $\% * \%$ estimate.t.f[, 1]
if $(i==1)\{$
beta.hat. $1<-\mathrm{m} .1$ \%*\% m. 2
beta.cov. $1<-\mathrm{m} .1$
if (dim.beta == 1) beta.err. $1<-$ sqrt(m.1)
if (dim.beta > 1) beta.err. $1<-$ sqrt(diag(m.1))
\}
if $(\mathrm{i}==2)\{$
beta.hat. $2<-\mathrm{m} .1$ \%*\% m. 2
beta.cov. 2 <- m. 1
if (dim.beta $==1$ ) beta.err. $2<-\operatorname{sqrt}(m .1)$
if (dim.beta > 1) beta.err. $2<-\operatorname{sqrt}(\operatorname{diag}(m .1)$ )
\}
\}
mark. $1<-(2-1) *(2 * \operatorname{dim}$. beta +1$)+(1-1) *($ dim.beta $)+1$
mark. $2<-(2-1) *(2 *$ dim.beta +1$)+(1-1) *($ dim.beta $)+$ dim.beta
mark. $3<-(2-1) *(2 *$ dim.beta +1$)+(2-1) *($ dim.beta $)+1$
mark. $4<-(2-1) *(2 *$ dim.beta +1$)+(2-1) *(d i m . b e t a)+$ dim.beta
mark. $5<-(2-1) *(2 * \operatorname{dim}$. beta +1$)+(2-1) *($ dim.beta $)+$ dim.beta +1
meta.fit[mark. 1 : mark.5, 1] <- rep("FILLED", 2 * dim.beta + 1)
meta.fit[mark. 1 : mark.5, 2] <- c(rep("FIX", dim.beta), rep("RAN", dim.beta + 1)) meta.fit[mark. 1 : mark.5, 3] <- c(rep(c("Intercept", "Covariate"), 2), "Tau^2")
meta.fit[mark. 1 : mark.2, 4 : 5] <- cbind(beta.hat.1, beta.err.1)
meta.fit[mark. 3 : mark.4, 4 : 5] <- cbind(beta.hat.2, beta.err.2)
meta.fit[mark. 1 : mark.4, 6] <- meta.fit[mark. 1 : mark.4, 4] / meta.fit[mark. 1 :
mark.4, 5]
meta.fit[mark. 1 : mark.4, 7] <- 2 * (1-pnorm(abs(meta.fit[mark. 1 : mark.4, 6]))) meta.fit[mark. 1 : mark.4, 8] <- meta.fit[1:4, 4] + qnorm(0 + (1-level) / 2) * meta.fit[mark. 1 : mark.4, 5] meta.fit[mark. 1 : mark.4, 9] <- meta.fit[1:4, 4] + qnorm(1-(1-level) / 2) * meta.fit[mark. 1 : mark.4, 5]
meta.fit[mark. 1 : mark.2, $10: 11]<-$ beta.cov. 1
meta.fit[mark. 3 : mark.4, $10: 11$ ] <- beta.cov. 2
meta.fit[mark.5, 4] <- tau.sq.hat
meta.fit[mark.5, 6] <- q.hat meta.fit[mark.5, 7] <-1 - pchisq(q.hat, df = d.f)
meta.fit[mark. $5+1,3]<-$ paste(k.estimator, "hat", sep = "-") meta.fit[mark. $5+1,4]<-$ n.miss.hat
assign("meta.fit", meta.fit, env = .GlobalEnv)
\}
\}
\}

## Appendix C. Program Documentation

## Trim and Fill for Meta-regression

## Description

trim.fill.regression is used to perform trim and fill in a metaregression, in which publication bias is assumed to have censored some study estimates.

Usage<br>trim.fill.regression(theta.hat, s.e.theta, covariate, k.estimator, t.f.mod, t.f.dim, fill.range, level = 0.95)

## Arguments

| theta. hat | A vector consisting of study effect estimates, on whichever scale <br> estimates are assumed to be normally distributed (typically, log). <br> A vector consisting of standard errors of study effect estimates. |
| :--- | :--- |
| s.e.theta | A vector consisting of measured values of a variable assumed to be <br> associated with effect estimate. |
| covariate | The formula used to estimate the number of missing studies; options <br> include "R," "L," or "Q." |
| t.f.mod | The model formulation for the iterative step of trim and fill; either <br> "FIX" (fixed effects model) or "RAN" (random effects model). |
| t.f.dim | The dimension of the model that is fit during the iterative step of trim and <br> fill; options include 1 or 2. |
| fill.range | The range over which covariate values are reflected during the fill phase <br> of trim and fill; options include "MLE" (maximum likelihood), "MOM" <br> (method of moments), or a user-supplied vector c (a, b), with a as the |
| level | minimum and b as the maximum of the fill interval. |
| Level of statistical significance (to determine confidence interval width). |  |

## Details

Currently, in its beta form, trim.fill. regression supports trim and fill in a metaregression with only one covariate. Use of multiple vectors in the covariate argument will result in an error.

The options for k .estimator include $R=\backslash$ gamma $\wedge$ star $-1, L=\left[4 * T \_n-n *(n-1)\right] /[2 *$ $n-1]$, and $Q=n-1 / 2-\operatorname{sqrt}\left[2 * n^{\wedge} 2-4 * T \_n+1 / 4\right]$, where $\backslash$ gamma $\wedge$ star and $T_{-} n$ are defined as in Duval (2000), and $n$ is the number of observed studies. Note that $Q$ may be undefined, in which case trim.fill.regression will return an error code dictating so. In simulation studies of the algorithm in meta.fit, $R$ generally performed superiorly.

Like for trim and fill in a standard (one-dimensional) meta-analysis, "FIX" is highly recommended as the t.f.mod argument.

Simulation studies have generally suggested that $t . f . d i m=1$ is recommended, although this suggestion may depend some upon the assumed censoring mechanism. Note that if t.f.dim $=$ 2, it is possible for the estimate of $k$ to be equal to 1 during the iterative phase of trim and fill, in which case trim.fill. regression will return an error code dictating so, although this occurs rarely.

For fill. range, use of "MLE" corresponds to a fill interval [ $a, b$ ], where $a$ is the minimum of covariate, and $b$ is the maximum, while use of "MOM" corresponds to a fill interval [ x bar $-\operatorname{sqrt}[3] * s, x$-bar $+\operatorname{sqrt}[3] * s$ ], where $x$-bar is the mean of covariate, and $s$ is its estimated standard deviation.

## Value

trim.fill. regression returns a matrix of analytical results, meta.fit, and four vectors of data, t.f.theta.hat, t.f.s.e.theta, t.f.covariate, t.f.fill.flag.
meta.fit consists an 11-by-11 matrix. The first set of five rows corresponds to a metaregression analysis of the observed data, under both a fixed-effects and a random-effects model. The fifth row includes an estimate of $\backslash t a u \wedge 2$ (between-study variability) from the random-effects model, along with a test of its significance. The second set of five rows corresponds to a metaregression analysis of observed and imputed data, after trim and fill has imputed missing studies, under both a fixed-effects and a random-effects model. The tenth row again includes an estimate of $\backslash t a u \wedge 2$ from the random-effects model, along with a test of its significance. The final row of meta.fit includes the estimate of $k$, with whichever estimator was requested by the user. Finally, the 10th and 11th columns of the matrix include the covariance matrix of the parameter estimates.

The vectorst.f.theta.hat, t.f.s.e.theta, and t.f.covariate are analogous to the user-supplied arguments theta.hat, s.e.theta, and covariate, but with imputed studies appended to the original vectors. The vectort.f.fill.flag is of identical length as $t . f . t h e t a . h a t . I t$ includes binary indicators of whether each value in $t . f . t h e t a$. hat represents an observed study (0) or an imputed study (1).

## References

Duval S, Tweedie R. A nonparametric "trim and fill" method of accounting for publication bias in meta-analysis. Journal of the American Statistical Association 2000;95:89-98.

## Examples

\#\#\#\#\# Example 1
example <- read.csv("C:<br>example.csv", header = F)
trim.fill.regression(example[, 1], example[, 2], example[, 3], "R", "FIX", 1, $c(0,1))$
\#\#\#\#\# Example 2
$\begin{array}{rrrrr}y<-c( & 0.54, & -0.32, & 0.12, & -0.06, \\ -0.18, & 0.07, & 0.18, & -0.07, & -0.06, \\ 0.23, & -0.14, & -0.02, & 0.27, & 0.80, \\ 1.18, & 0.26, & 0.30, & 0.03) & \end{array}$
sigma <- c(0.306957, 0.221297, 0.147462, 0.103098, 0.103264, 0.158934, 0.093603, 0.223096, 0.174151, 0.166704, 0.290517, 0.166871, 0.288682, 0.164595, 0.259808, $0.396813,0.370659,0.139452,0.126246)$
$x<-c(0,1,1,1,1$, 1, 1, 0, 1, 1, 1, 1, 0, 0, 0, 0, 0, 0, 1)
trim.fill.regression(y, sigma, $x$,
"L", "FIX", 2,
"MLE")

## Appendix D. Output From Example

|  | METHODL | MODEL | PARAM | Estimate | St Error | Stat | P | Lower CI | Upper CI | CovBeta1 | CovBeta2 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 1 | OBSERVED | FIX | Intercept | 0.3494971 | 0.07918507 | 4.413674 | 1.016311e-05 | 0.1942972 | 0.5046970 | 0.006270276 | -0.006270276 |
| 2 | OBSERVED | FIX | Covariate | -0.3708776 | 0.08928915 | -4.153669 | 3.271863e-05 | -0.5458811 | -0.1958741 | -0.006270276 | 0.007972552 |
| 3 | OBSERVED | RAN | Intercept | 0.3494971 | 0.07918507 | 4.413674 | 1.016311e-05 | 0.1942972 | 0.5046970 | 0.006270276 | -0.006270276 |
| 4 | OBSERVED | RAN | Covariate | -0.3708776 | 0.08928915 | -4.153669 | 3.271863e-05 | -0.5458811 | -0.1958741 | -0.006270276 | 0.007972552 |
| 5 | OBSERVED | RAN | Tau^2 | 0.0000000 | NA | 16.786276 | $4.689346 \mathrm{e}-01$ | NA | NA | NA | NA |
| 6 | FILLED | FIX | Intercept | 0.3494971 | 0.07918507 | 4.413674 | $1.016311 \mathrm{e}-05$ | 0.1942972 | 0.5046970 | 0.006270276 | -0.006270276 |
| 7 | FILLED | FIX | Covariate | -0.3708776 | 0.08928915 | -4.153669 | 3.271863e-05 | -0.5458811 | -0.1958741 | -0.006270276 | 0.007972552 |
| 8 | FILLED | RAN | Intercept | 0.3494971 | 0.07918507 | 4.413674 | $1.016311 \mathrm{e}-05$ | 0.1942972 | 0.5046970 | 0.006270276 | -0.006270276 |
| 9 | FILLED | RAN | Covariate | -0.3708776 | 0.08928915 | -4.153669 | 3.271863e-05 | -0.5458811 | -0.1958741 | -0.006270276 | 0.007972552 |
| 10 | FILLED | RAN | Tau^2 | 0.0000000 | NA | 16.786276 | $4.689346 \mathrm{e}-01$ | NA | NA | NA | NA |
| 11 | <NA> | <NA? | L-hat | 0.0000000 | NA | NA | NA | NA | NA | NA | NA |

## Appendix E. Tables

Table E1. Absolute bias in the estimated intercept, with no correction for publication bias (from 1-dimensional algorithmic variant)

| No Correction for Publication Bias |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.049 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | -0.001 | 0.001 | 0.001 | 0.000 | 0.001 | -0.001 | 0.001 | 0.001 | 0.000 | 0.001 |
|  |  |  | 5 | 0.041 | 0.025 | 0.019 | 0.012 | 0.011 | 0.044 | 0.027 | 0.020 | 0.013 | 0.012 |
|  |  |  | 10 | 0.113 | 0.061 | 0.041 | 0.032 | 0.022 | 0.117 | 0.063 | 0.042 | 0.033 | 0.023 |
|  |  |  | 0 | 0.000 | 0.000 | -0.001 | 0.001 | 0.002 | 0.002 | 0.002 | 0.001 | 0.000 | 0.001 |
|  |  |  | 5 | 0.081 | 0.049 | 0.032 | 0.027 | 0.019 | 0.099 | 0.068 | 0.054 | 0.044 | 0.036 |
|  |  |  | 10 | 0.193 | 0.120 | 0.087 | 0.064 | 0.049 | 0.203 | 0.137 | 0.107 | 0.084 | 0.072 |
|  |  |  | 0 | -0.010 | -0.007 | 0.001 | 0.001 | -0.001 | -0.003 | -0.002 | 0.003 | 0.000 | -0.001 |
|  | $0.148$ |  | 5 | 0.128 | 0.091 | 0.070 | 0.050 | 0.041 | 0.152 | 0.113 | 0.089 | 0.075 | 0.065 |
|  |  |  | 10 | 0.275 | 0.191 | 0.146 | 0.117 | 0.101 | 0.292 | 0.218 | 0.171 | 0.146 | 0.125 |
|  |  |  | 0 | 0.000 | -0.003 | 0.002 | 0.012 | 0.002 | 0.000 | -0.006 | 0.008 | 0.004 | 0.000 |
|  | $0.444$ |  | 5 | 0.228 | 0.161 | 0.131 | 0.104 | 0.078 | 0.247 | 0.190 | 0.157 | 0.127 | 0.109 |
|  |  |  | 10 | 0.436 | 0.311 | 0.252 | 0.199 | 0.172 | 0.464 | 0.339 | 0.282 | 0.234 | 0.202 |
| $\begin{gathered} \beta_{1}= \\ 0.074 \end{gathered}$ |  |  | 0 | 0.001 | -0.001 | 0.000 | 0.000 | 0.001 | 0.001 | -0.001 | 0.000 | 0.000 | 0.000 |
|  | $\mathrm{T}^{\mathbf{2}}=0$ |  | 5 | 0.046 | 0.027 | 0.018 | 0.014 | 0.011 | 0.050 | 0.029 | 0.020 | 0.015 | 0.012 |
|  |  |  | 10 | 0.122 | 0.065 | 0.043 | 0.033 | 0.026 | 0.125 | 0.067 | 0.045 | 0.034 | 0.027 |
|  |  |  | 0 | -0.001 | 0.002 | -0.001 | 0.001 | -0.001 | -0.001 | 0.002 | -0.001 | 0.000 | 0.002 |
|  |  |  | 5 | 0.079 | 0.055 | 0.041 | 0.029 | 0.019 | 0.097 | 0.071 | 0.058 | 0.045 | 0.036 |
|  |  |  | 10 | 0.202 | 0.128 | 0.090 | 0.069 | 0.053 | 0.215 | 0.144 | 0.111 | 0.093 | 0.076 |
|  |  |  | 0 | 0.001 | 0.001 | 0.003 | -0.002 | 0.001 | 0.000 | -0.002 | 0.003 | 0.000 | -0.003 |
|  | $0.148$ |  | 5 | 0.133 | 0.093 | 0.067 | 0.059 | 0.043 | 0.158 | 0.118 | 0.091 | 0.083 | 0.068 |
|  |  |  | 10 | 0.287 | 0.198 | 0.152 | 0.117 | 0.099 | 0.306 | 0.223 | 0.177 | 0.146 | 0.130 |
|  | $\begin{gathered} \mathbf{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | -0.006 | -0.007 | 0.007 | -0.003 | 0.006 | -0.006 | -0.005 | -0.002 | -0.005 | 0.001 |
|  |  |  | 5 | 0.226 | 0.164 | 0.133 | 0.109 | 0.087 | 0.248 | 0.189 | 0.154 | 0.132 | 0.113 |
|  |  |  | 10 | 0.450 | 0.326 | 0.261 | 0.210 | 0.173 | 0.468 | 0.350 | 0.283 | 0.242 | 0.205 |

Table E1. Absolute bias in the estimated intercept, with no correction for publication bias (from 1-dimensional algorithmic variant) (continued)

| No Correction for Publication Bias |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.148 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 0.001 | 0.000 | 0.001 | 0.000 | 0.000 | 0.001 | 0.000 | 0.001 | 0.000 | 0.000 |
|  |  |  | 5 | 0.051 | 0.031 | 0.021 | 0.015 | 0.013 | 0.054 | 0.033 | 0.022 | 0.017 | 0.014 |
|  |  |  | 10 | 0.143 | 0.076 | 0.052 | 0.038 | 0.030 | 0.147 | 0.079 | 0.053 | 0.039 | 0.031 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | -0.001 | -0.004 | 0.002 | 0.002 | 0.001 | 0.000 | -0.004 | 0.002 | 0.002 | -0.001 |
|  |  |  | 5 | 0.093 | 0.058 | 0.046 | 0.031 | 0.025 | 0.111 | 0.080 | 0.065 | 0.052 | 0.043 |
|  |  |  | 10 | 0.217 | 0.141 | 0.104 | 0.080 | 0.061 | 0.228 | 0.158 | 0.126 | 0.104 | 0.086 |
|  |  |  | 0 | -0.002 | 0.002 | 0.008 | 0.001 | 0.006 | 0.000 | -0.001 | 0.003 | 0.003 | 0.004 |
|  |  |  | 5 | 0.139 | 0.112 | 0.079 | 0.065 | 0.049 | 0.164 | 0.133 | 0.104 | 0.091 | 0.071 |
|  |  |  | 10 | 0.297 | 0.209 | 0.161 | 0.130 | 0.115 | 0.319 | 0.235 | 0.192 | 0.161 | 0.139 |
|  |  |  | 0 | 0.003 | -0.007 | -0.001 | 0.000 | 0.000 | 0.000 | -0.002 | 0.002 | 0.008 | 0.004 |
|  |  |  | 5 | 0.247 | 0.173 | 0.133 | 0.121 | 0.093 | 0.269 | 0.198 | 0.166 | 0.143 | 0.120 |
|  |  |  | 10 | 0.477 | 0.346 | 0.265 | 0.223 | 0.183 | 0.493 | 0.371 | 0.299 | 0.250 | 0.219 |
| $\begin{gathered} \beta_{1}= \\ 0.296 \end{gathered}$ | $\mathrm{T}^{2}=0$ | Number of Missing Studies | 0 | -0.001 | -0.002 | 0.000 | 0.001 | 0.000 | -0.001 | -0.002 | 0.000 | 0.001 | -0.001 |
|  |  |  | 5 | 0.066 | 0.037 | 0.027 | 0.020 | 0.016 | 0.069 | 0.040 | 0.029 | 0.021 | 0.017 |
|  |  |  | 10 | 0.190 | 0.100 | 0.065 | 0.047 | 0.036 | 0.195 | 0.103 | 0.068 | 0.049 | 0.038 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | 0.001 | 0.002 | 0.001 | 0.001 | -0.004 | 0.003 | 0.000 | 0.001 | -0.002 | -0.003 |
|  |  |  | 5 | 0.116 | 0.077 | 0.053 | 0.042 | 0.030 | 0.136 | 0.099 | 0.074 | 0.064 | 0.052 |
|  |  |  | 10 | 0.259 | 0.173 | 0.128 | 0.099 | 0.080 | 0.273 | 0.191 | 0.151 | 0.126 | 0.107 |
|  |  |  | 0 | 0.001 | -0.006 | -0.002 | 0.005 | 0.002 | 0.001 | -0.004 | 0.000 | 0.004 | 0.001 |
|  |  |  | 5 | 0.171 | 0.113 | 0.091 | 0.076 | 0.060 | 0.196 | 0.145 | 0.122 | 0.104 | 0.086 |
|  |  |  | 10 | 0.344 | 0.248 | 0.189 | 0.154 | 0.127 | 0.362 | 0.272 | 0.219 | 0.185 | 0.162 |
|  |  |  | 0 | -0.008 | 0.012 | 0.001 | 0.003 | 0.010 | -0.006 | 0.007 | 0.002 | -0.001 | 0.004 |
|  |  |  | 5 | 0.281 | 0.197 | 0.168 | 0.134 | 0.118 | 0.303 | 0.227 | 0.188 | 0.159 | 0.140 |
|  |  |  | 10 | 0.507 | 0.374 | 0.305 | 0.253 | 0.222 | 0.526 | 0.396 | 0.332 | 0.283 | 0.248 |
| $\begin{gathered} \beta_{1}= \\ 0.444 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 0.000 | -0.001 | 0.001 | -0.001 | 0.000 | 0.000 | -0.001 | 0.001 | -0.001 | 0.001 |
|  |  |  | 5 | 0.079 | 0.046 | 0.031 | 0.025 | 0.019 | 0.084 | 0.049 | 0.033 | 0.027 | 0.021 |
|  |  |  | 10 | 0.217 | 0.123 | 0.080 | 0.057 | 0.043 | 0.223 | 0.126 | 0.083 | 0.059 | 0.045 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | 0.001 | 0.000 | 0.002 | -0.003 | -0.001 | 0.001 | 0.001 | 0.000 | -0.001 | -0.001 |
|  |  |  | 5 | 0.141 | 0.091 | 0.064 | 0.049 | 0.040 | 0.159 | 0.116 | 0.090 | 0.073 | 0.063 |
|  |  |  | 10 | 0.298 | 0.201 | 0.150 | 0.118 | 0.093 | 0.311 | 0.222 | 0.176 | 0.146 | 0.122 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | 0.002 | 0.005 | -0.003 | -0.001 | -0.003 | -0.001 | 0.003 | -0.002 | 0.003 | 0.001 |
|  |  |  | 5 | 0.198 | 0.135 | 0.109 | 0.082 | 0.067 | 0.222 | 0.168 | 0.142 | 0.116 | 0.098 |
|  |  |  | 10 | 0.387 | 0.280 | 0.220 | 0.179 | 0.151 | 0.408 | 0.308 | 0.251 | 0.213 | 0.184 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 0.013 | -0.007 | -0.001 | 0.001 | 0.000 | 0.004 | -0.001 | 0.001 | -0.003 | 0.000 |
|  |  |  | 5 | 0.288 | 0.221 | 0.175 | 0.138 | 0.121 | 0.325 | 0.249 | 0.202 | 0.173 | 0.148 |
|  |  |  | 10 | 0.553 | 0.405 | 0.325 | 0.271 | 0.238 | 0.571 | 0.435 | 0.358 | 0.301 | 0.270 |

Table E2. Absolute bias in the estimated intercept, with $R$ studies imputed (from 1-dimensional algorithmic variant)

| R Missing Studies Imputed |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.049 \end{gathered}$ |  | Number of Missing Studies | 0 | -0.004 | -0.001 | -0.001 | -0.001 | 0.000 | -0.005 | -0.001 | -0.002 | -0.002 | -0.001 |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 0.012 | 0.003 | 0.002 | -0.001 | 0.001 | 0.012 | 0.003 | 0.002 | -0.001 | 0.001 |
|  |  |  | 10 | 0.058 | 0.020 | 0.009 | 0.006 | 0.001 | 0.058 | 0.020 | 0.010 | 0.006 | 0.001 |
|  |  |  | 0 | -0.008 | -0.005 | -0.004 | -0.002 | -0.001 | -0.014 | -0.009 | -0.007 | -0.007 | -0.005 |
|  |  |  | 5 | 0.034 | 0.010 | 0.000 | -0.001 | -0.006 | 0.030 | 0.005 | -0.003 | -0.008 | -0.010 |
|  |  |  | 10 | 0.138 | 0.063 | 0.033 | 0.014 | 0.004 | 0.136 | 0.061 | 0.029 | 0.008 | -0.002 |
|  | $\mathrm{T}^{2}=$ |  | 0 | -0.027 | -0.023 | -0.009 | -0.008 | -0.008 | -0.039 | -0.033 | -0.021 | -0.020 | -0.017 |
|  |  |  | 5 | 0.067 | 0.032 | 0.012 | -0.003 | -0.004 | 0.051 | 0.013 | -0.007 | -0.019 | -0.017 |
|  |  |  | 10 | 0.211 | 0.123 | 0.074 | 0.046 | 0.035 | 0.202 | 0.111 | 0.058 | 0.030 | 0.015 |
|  |  |  | 0 | -0.042 | -0.040 | -0.028 | -0.017 | -0.019 | -0.078 | -0.074 | -0.050 | -0.048 | -0.042 |
|  | $\begin{aligned} & \mathrm{T}^{\top}= \\ & 0.444 \end{aligned}$ |  | 5 | 0.127 | 0.069 | 0.037 | 0.019 | -0.005 | 0.092 | 0.035 | 0.003 | -0.019 | -0.030 |
|  |  |  | 10 | 0.352 | 0.208 | 0.142 | 0.090 | 0.062 | 0.331 | 0.176 | 0.109 | 0.059 | 0.026 |
| $\begin{gathered} \beta_{1}= \\ 0.074 \end{gathered}$ |  | Number of Missing Studies | 0 | -0.003 | -0.003 | -0.002 | -0.001 | 0.000 | -0.004 | -0.004 | -0.002 | -0.001 | -0.001 |
|  | $\mathrm{T}^{\mathbf{2}}=0$ |  | 5 | 0.015 | 0.004 | 0.002 | 0.000 | 0.000 | 0.016 | 0.004 | 0.002 | 0.001 | 0.000 |
|  |  |  | 10 | 0.064 | 0.023 | 0.010 | 0.007 | 0.004 | 0.064 | 0.023 | 0.011 | 0.007 | 0.005 |
|  |  |  | 0 | -0.009 | -0.004 | -0.005 | -0.001 | -0.003 | -0.017 | -0.010 | -0.011 | -0.007 | -0.004 |
|  | $\mathbf{T}^{2}=$ $0.049$ |  | 5 | 0.029 | 0.014 | 0.007 | 0.000 | -0.005 | 0.026 | 0.005 | -0.001 | -0.008 | -0.011 |
|  |  |  | 10 | 0.144 | 0.073 | 0.035 | 0.019 | 0.006 | 0.144 | 0.068 | 0.030 | 0.015 | 0.000 |
|  |  |  | 0 | -0.018 | -0.013 | -0.008 | -0.010 | -0.006 | -0.038 | -0.030 | -0.022 | -0.020 | -0.020 |
|  | $\begin{aligned} & \mathrm{T}^{2}= \\ & 0.148 \end{aligned}$ |  | 5 | 0.070 | 0.030 | 0.008 | 0.006 | -0.005 | 0.057 | 0.012 | -0.008 | -0.009 | -0.016 |
|  |  |  | 10 | 0.221 | 0.126 | 0.076 | 0.045 | 0.029 | 0.212 | 0.112 | 0.059 | 0.030 | 0.013 |
|  |  |  | 0 | -0.053 | -0.040 | -0.025 | -0.033 | -0.016 | -0.093 | -0.070 | -0.061 | -0.060 | -0.044 |
|  | $\begin{aligned} & \mathrm{T}^{\top}= \\ & 0.444 \end{aligned}$ |  | 5 | 0.134 | 0.066 | 0.043 | 0.019 | 0.005 | 0.097 | 0.030 | -0.001 | -0.013 | -0.024 |
|  |  |  | 10 | 0.361 | 0.220 | 0.155 | 0.093 | 0.062 | 0.330 | 0.187 | 0.111 | 0.062 | 0.026 |
| $\begin{gathered} \beta_{1}= \\ 0.148 \end{gathered}$ |  | Number of Missing Studies | 0 | -0.003 | -0.002 | -0.001 | -0.001 | -0.001 | -0.004 | -0.003 | -0.001 | -0.001 | -0.002 |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 0.018 | 0.006 | 0.003 | 0.001 | 0.002 | 0.016 | 0.006 | 0.002 | 0.001 | 0.001 |
|  |  |  | 10 | 0.077 | 0.028 | 0.015 | 0.009 | 0.005 | 0.077 | 0.028 | 0.015 | 0.008 | 0.005 |
|  |  |  | 0 | -0.008 | -0.010 | -0.002 | -0.001 | -0.002 | -0.018 | -0.017 | -0.008 | -0.006 | -0.007 |
|  | $\mathrm{T}^{\mathbf{2}}=$ |  | 5 | 0.041 | 0.015 | 0.009 | -0.001 | -0.002 | 0.035 | 0.010 | 0.002 | -0.008 | -0.009 |
|  |  |  | 10 | 0.156 | 0.080 | 0.046 | 0.029 | 0.015 | 0.152 | 0.074 | 0.039 | 0.022 | 0.006 |
|  |  |  | 0 | -0.020 | -0.013 | -0.003 | -0.009 | -0.002 | -0.040 | -0.032 | -0.023 | -0.019 | -0.015 |
|  | $\begin{aligned} & \mathrm{T}^{\top}= \\ & 0.148 \end{aligned}$ |  | 5 | 0.070 | 0.044 | 0.019 | 0.010 | -0.001 | 0.054 | 0.021 | 0.000 | -0.007 | -0.018 |
|  |  |  | 10 | 0.225 | 0.127 | 0.083 | 0.057 | 0.044 | 0.217 | 0.110 | 0.068 | 0.037 | 0.023 |
|  |  |  | 0 | -0.043 | -0.043 | -0.033 | -0.028 | -0.022 | -0.084 | -0.071 | -0.058 | -0.046 | -0.041 |
|  | $\begin{aligned} & \mathrm{T}^{2}= \\ & 0.444 \end{aligned}$ |  | 5 | 0.149 | 0.069 | 0.035 | 0.029 | 0.005 | 0.111 | 0.028 | 0.002 | -0.012 | -0.031 |
|  |  |  | 10 | 0.385 | 0.238 | 0.148 | 0.103 | 0.068 | 0.349 | 0.202 | 0.113 | 0.060 | 0.034 |

Table E2. Absolute bias in the estimated intercept, with R studies imputed (from 1-dimensional algorithmic variant) (continued) R Missing Studies Imputed Fixed Effects in the Final Model Random Effects in the Final Model

|  |  |  |  | Number of Studies |  |  |  |  | Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.296 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | -0.004 | -0.005 | -0.002 | -0.001 | -0.002 | -0.006 | -0.006 | -0.003 | -0.001 | -0.002 |
|  |  |  | 5 | 0.028 | 0.010 | 0.006 | 0.002 | 0.002 | 0.025 | 0.008 | 0.004 | 0.001 | 0.000 |
|  |  |  | 10 | 0.110 | 0.045 | 0.023 | 0.012 | 0.007 | 0.109 | 0.044 | 0.021 | 0.010 | 0.005 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | -0.008 | -0.005 | -0.004 | -0.002 | -0.007 | -0.017 | -0.015 | -0.010 | -0.011 | -0.011 |
|  |  |  | 5 | 0.062 | 0.029 | 0.013 | 0.006 | 0.000 | 0.053 | 0.019 | 0.000 | -0.002 | -0.008 |
|  |  |  | 10 | 0.183 | 0.099 | 0.062 | 0.039 | 0.025 | 0.177 | 0.088 | 0.051 | 0.030 | 0.014 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | -0.019 | -0.020 | -0.014 | -0.004 | -0.006 | -0.040 | -0.038 | -0.030 | -0.019 | -0.020 |
|  |  |  | 5 | 0.104 | 0.047 | 0.028 | 0.015 | 0.009 | 0.084 | 0.029 | 0.006 | -0.007 | -0.013 |
|  |  |  | 10 | 0.263 | 0.161 | 0.102 | 0.070 | 0.046 | 0.244 | 0.138 | 0.079 | 0.046 | 0.026 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | -0.049 | -0.022 | -0.029 | -0.024 | -0.014 | -0.088 | -0.063 | -0.060 | -0.055 | -0.042 |
|  |  |  | 5 | 0.176 | 0.092 | 0.069 | 0.034 | 0.029 | 0.128 | 0.055 | 0.017 | -0.008 | -0.017 |
|  |  |  | 10 | 0.405 | 0.253 | 0.181 | 0.123 | 0.098 | 0.367 | 0.207 | 0.138 | 0.081 | 0.053 |
| $\begin{gathered} \beta_{1}= \\ 0.444 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | -0.005 | -0.004 | -0.001 | -0.003 | -0.001 | -0.008 | -0.006 | -0.002 | -0.004 | -0.002 |
|  |  |  | 5 | 0.038 | 0.013 | 0.006 | 0.004 | 0.002 | 0.034 | 0.007 | 0.001 | 0.001 | -0.001 |
|  |  |  | 10 | 0.136 | 0.063 | 0.032 | 0.016 | 0.007 | 0.134 | 0.060 | 0.028 | 0.011 | 0.002 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | -0.009 | -0.007 | -0.002 | -0.007 | -0.005 | -0.023 | -0.017 | -0.014 | -0.013 | -0.011 |
|  |  |  | 5 | 0.081 | 0.039 | 0.018 | 0.009 | 0.006 | 0.066 | 0.026 | 0.006 | -0.002 | -0.007 |
|  |  |  | 10 | 0.214 | 0.122 | 0.075 | 0.052 | 0.033 | 0.204 | 0.109 | 0.062 | 0.039 | 0.019 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | -0.018 | -0.010 | -0.015 | -0.012 | -0.012 | -0.046 | -0.033 | -0.034 | -0.024 | -0.023 |
|  |  |  | 5 | 0.119 | 0.056 | 0.040 | 0.018 | 0.011 | 0.093 | 0.033 | 0.016 | -0.005 | -0.011 |
|  |  |  | 10 | 0.294 | 0.187 | 0.123 | 0.087 | 0.061 | 0.275 | 0.163 | 0.095 | 0.062 | 0.032 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | -0.032 | -0.046 | -0.031 | -0.025 | -0.022 | -0.087 | -0.081 | -0.067 | -0.060 | -0.052 |
|  |  |  | 5 | 0.176 | 0.110 | 0.070 | 0.039 | 0.027 | 0.136 | 0.063 | 0.021 | -0.005 | -0.020 |
|  |  |  | 10 | 0.444 | 0.276 | 0.187 | 0.136 | 0.106 | 0.397 | 0.232 | 0.142 | 0.087 | 0.060 |

Table E3. Absolute bias in the estimated intercept, with $L$ studies imputed (from 1-dimensional algorithmic variant)

| L Missing Studies Imputed |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.049 \end{gathered}$ | $\mathrm{T}^{2}=0$ | Number of Missing Studies | 0 | -0.007 | -0.004 | -0.004 | -0.004 | -0.003 | -0.009 | -0.006 | -0.005 | -0.005 | -0.004 |
|  |  |  | 5 | 0.017 | 0.006 | 0.004 | 0.000 | 0.001 | 0.019 | 0.007 | 0.004 | 0.000 | 0.002 |
|  |  |  | 10 | 0.070 | 0.030 | 0.016 | 0.011 | 0.005 | 0.072 | 0.031 | 0.018 | 0.012 | 0.005 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | -0.019 | -0.018 | -0.015 | -0.013 | -0.011 | -0.034 | -0.031 | -0.029 | -0.029 | -0.027 |
|  |  |  | 5 | 0.046 | 0.019 | 0.005 | 0.000 | -0.007 | 0.045 | 0.017 | 0.004 | -0.005 | -0.012 |
|  |  |  | 10 | 0.153 | 0.081 | 0.050 | 0.029 | 0.017 | 0.154 | 0.083 | 0.050 | 0.027 | 0.016 |
|  |  |  | 0 | -0.045 | -0.042 | -0.031 | -0.031 | -0.032 | -0.069 | -0.069 | -0.060 | -0.062 | -0.059 |
|  |  |  | 5 | 0.081 | 0.046 | 0.023 | 0.004 | -0.001 | 0.071 | 0.032 | 0.007 | -0.008 | -0.013 |
|  |  |  | 10 | 0.232 | 0.146 | 0.100 | 0.072 | 0.057 | 0.226 | 0.142 | 0.093 | 0.065 | 0.045 |
|  |  |  | 0 | -0.071 | -0.077 | -0.067 | -0.060 | -0.067 | -0.127 | -0.134 | -0.114 | -0.120 | -0.119 |
|  |  |  | 5 | 0.155 | 0.096 | 0.063 | 0.035 | 0.005 | 0.126 | 0.069 | 0.035 | 0.002 | -0.017 |
|  |  |  | 10 | 0.383 | 0.249 | 0.187 | 0.134 | 0.105 | 0.369 | 0.230 | 0.166 | 0.115 | 0.080 |
| $\begin{gathered} \beta_{1}= \\ 0.074 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | -0.006 | -0.006 | -0.005 | -0.004 | -0.003 | -0.008 | -0.008 | -0.006 | -0.005 | -0.004 |
|  |  |  | 5 | 0.021 | 0.008 | 0.004 | 0.001 | 0.001 | 0.022 | 0.009 | 0.005 | 0.002 | 0.001 |
|  |  |  | 10 | 0.077 | 0.033 | 0.018 | 0.012 | 0.008 | 0.077 | 0.034 | 0.020 | 0.013 | 0.009 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | -0.020 | -0.016 | -0.017 | -0.014 | -0.014 | -0.037 | -0.031 | -0.033 | -0.030 | -0.026 |
|  |  |  | 5 | 0.041 | 0.022 | 0.011 | 0.001 | -0.005 | 0.040 | 0.017 | 0.007 | -0.006 | -0.011 |
|  |  |  | 10 | 0.160 | 0.091 | 0.052 | 0.034 | 0.020 | 0.161 | 0.090 | 0.053 | 0.035 | 0.018 |
|  |  |  | 0 | -0.037 | -0.034 | -0.030 | -0.033 | -0.031 | -0.069 | -0.065 | -0.061 | -0.061 | -0.064 |
|  | ${ }^{\mathrm{T}} 0.148$ |  | 5 | 0.087 | 0.046 | 0.020 | 0.013 | -0.001 | 0.079 | 0.033 | 0.008 | 0.001 | -0.012 |
|  |  |  | 10 | 0.240 | 0.153 | 0.104 | 0.071 | 0.052 | 0.236 | 0.147 | 0.095 | 0.064 | 0.044 |
|  |  |  | 0 | -0.082 | -0.077 | -0.068 | -0.077 | -0.061 | -0.141 | -0.130 | -0.133 | -0.133 | -0.120 |
|  |  |  | 5 | 0.157 | 0.090 | 0.061 | 0.037 | 0.017 | 0.127 | 0.061 | 0.025 | 0.009 | -0.009 |
|  |  |  | 10 | 0.390 | 0.264 | 0.198 | 0.140 | 0.103 | 0.369 | 0.241 | 0.168 | 0.120 | 0.079 |
| $\begin{gathered} \beta_{1}= \\ 0.148 \end{gathered}$ | $\mathrm{T}^{\mathbf{2}}=0$ | Number of Missing Studies | 0 | -0.007 | -0.006 | -0.004 | -0.004 | -0.004 | -0.010 | -0.008 | -0.006 | -0.005 | -0.006 |
|  |  |  | 5 | 0.024 | 0.011 | 0.005 | 0.002 | 0.002 | 0.023 | 0.011 | 0.005 | 0.002 | 0.002 |
|  |  |  | 10 | 0.090 | 0.040 | 0.024 | 0.015 | 0.010 | 0.091 | 0.040 | 0.025 | 0.016 | 0.010 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | -0.018 | -0.021 | -0.014 | -0.012 | -0.013 | -0.035 | -0.039 | -0.031 | -0.030 |  |
|  |  |  | 5 | 0.053 | 0.023 | 0.014 | 0.001 | -0.003 | 0.050 | 0.022 | 0.009 | -0.004 | -0.009 |
|  |  |  | 10 | 0.173 | 0.099 | 0.064 | 0.044 | 0.027 | 0.171 | 0.097 | 0.062 | 0.042 | 0.024 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | -0.039 | -0.034 | -0.025 | -0.034 | -0.028 | -0.073 | -0.070 | -0.065 | -0.065 | -0.060 |
|  |  |  | 5 | 0.088 | 0.060 | 0.031 | 0.017 | 0.003 | 0.077 | 0.042 | 0.016 | 0.003 | -0.013 |
|  |  |  | 10 | 0.248 | 0.156 | 0.112 | 0.083 | 0.067 | 0.245 | 0.145 | 0.105 | 0.072 | 0.053 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | -0.069 | -0.079 | -0.076 | -0.075 | -0.069 | -0.132 | -0.136 | -0.128 | -0.124 | -0.122 |
|  |  |  | 5 | 0.175 | 0.097 | 0.055 | 0.048 | 0.018 | 0.143 | 0.063 | 0.030 | 0.011 | -0.014 |
|  |  |  | 10 | 0.415 | 0.284 | 0.194 | 0.152 | 0.111 | 0.389 | 0.259 | 0.173 | 0.121 | 0.090 |

Table E3. Absolute bias in the estimated intercept, with L studies imputed (from 1-dimensional algorithmic variant) (continued) L Missing Studies Imputed

Fixed Effects in the Final Model
Number of Studies
Random Effects in the Final Model

|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{gathered} \beta_{1}= \\ 0.296 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | -0.008 | -0.009 | -0.006 | -0.005 | -0.005 | -0.012 | -0.012 | -0.010 | -0.008 | -0.008 |
|  |  |  | 5 | 0.035 | 0.015 | 0.009 | 0.004 | 0.003 | 0.034 | 0.013 | 0.007 | 0.003 | 0.001 |
|  |  |  | 10 | 0.124 | 0.058 | 0.033 | 0.020 | 0.013 | 0.124 | 0.058 | 0.033 | 0.020 | 0.012 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | -0.019 | -0.016 | -0.016 | -0.016 | -0.020 | -0.038 | -0.039 | -0.037 | -0.041 | -0.040 |
|  |  |  | 5 | 0.072 | 0.038 | 0.018 | 0.008 | 0.000 | 0.067 | 0.033 | 0.009 | 0.001 | -0.008 |
|  |  |  | 10 | 0.201 | 0.122 | 0.082 | 0.057 | 0.040 | 0.198 | 0.115 | 0.078 | 0.054 | 0.035 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | -0.037 | -0.042 | -0.039 | -0.031 | -0.033 | -0.074 | -0.078 | -0.076 | -0.068 | -0.071 |
|  |  |  | 5 | 0.121 | 0.063 | 0.041 | 0.024 | 0.014 | 0.107 | 0.050 | 0.025 | 0.005 | -0.006 |
|  |  |  | 10 | 0.286 | 0.191 | 0.133 | 0.099 | 0.073 | 0.273 | 0.176 | 0.118 | 0.085 | 0.061 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | -0.084 | -0.059 | -0.071 | -0.069 | -0.063 | -0.143 | -0.126 | -0.133 | -0.130 | -0.124 |
|  |  |  | 5 | 0.209 | 0.121 | 0.092 | 0.053 | 0.041 | 0.168 | 0.091 | 0.048 | 0.018 | 0.000 |
|  |  |  | 10 | 0.438 | 0.298 | 0.233 | 0.173 | 0.143 | 0.410 | 0.264 | 0.201 | 0.142 | 0.109 |
| $\begin{gathered} \beta_{1}= \\ 0.444 \end{gathered}$ |  | Number of Missing Studies | 0 | -0.010 | -0.009 | -0.007 | -0.008 | -0.006 | -0.017 | -0.015 | -0.012 | -0.013 | -0.012 |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 0.046 | 0.019 | 0.009 | 0.006 | 0.002 | 0.043 | 0.015 | 0.005 | 0.002 | -0.002 |
|  |  |  | 10 | 0.150 | 0.076 | 0.044 | 0.026 | 0.015 | 0.149 | 0.074 | 0.041 | 0.023 | 0.012 |
|  |  |  | 0 | -0.022 | -0.020 | -0.017 | -0.023 | -0.020 | -0.047 | -0.045 | -0.044 | -0.045 | -0.044 |
|  | $\begin{aligned} & \mathrm{T}^{\mathbf{2}}= \\ & 0.049 \end{aligned}$ |  | 5 | 0.094 | 0.049 | 0.026 | 0.013 | 0.006 | 0.082 | 0.039 | 0.016 | 0.003 | -0.006 |
|  |  |  | 10 | 0.233 | 0.145 | 0.098 | 0.071 | 0.049 | 0.225 | 0.137 | 0.091 | 0.064 | 0.041 |
|  |  |  | 0 | -0.038 | -0.032 | -0.039 | -0.038 | -0.041 | -0.083 | -0.076 | -0.081 | -0.074 | -0.078 |
|  | $\begin{aligned} & \mathrm{T}^{2}= \\ & \mathbf{1}^{1182} \end{aligned}$ |  | 5 | 0.139 | 0.074 | 0.054 | 0.027 | 0.016 | 0.117 | 0.056 | 0.036 | 0.008 | -0.003 |
|  |  |  | 10 | 0.320 | 0.220 | 0.155 | 0.118 | 0.090 | 0.305 | 0.204 | 0.137 | 0.102 | 0.070 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | -0.059 | -0.086 | -0.075 | -0.076 | -0.073 | -0.141 | -0.150 | -0.140 | -0.142 | -0.137 |
|  |  |  | 5 | 0.206 | 0.139 | 0.094 | 0.060 | 0.040 | 0.174 | 0.098 | 0.052 | 0.022 | -0.003 |
|  |  |  | 10 | 0.482 | 0.328 | 0.243 | 0.187 | 0.157 | 0.442 | 0.294 | 0.210 | 0.150 | 0.124 |

Table E4. Coverage probability of the estimated intercept, with no correction for publication bias (from 1-dimensional algorithmic variant)

| No Correction for Publication Bias |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.049 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 95.0\% | 94.9\% | 94.9\% | 95.4\% | 95.3\% | 96.2\% | 96.2\% | 95.9\% | 96.4\% | 96.1\% |
|  |  |  | 5 | 94.7\% | 94.4\% | 94.8\% | 94.8\% | 94.5\% | 94.9\% | 94.9\% | 95.2\% | 95.1\% | 94.7\% |
|  |  |  | 10 | 87.7\% | 90.2\% | 91.3\% | 91.9\% | 92.8\% | 87.9\% | 90.4\% | 91.6\% | 91.9\% | 93.1\% |
|  |  |  | 0 | 62.4\% | 60.0\% | 56.3\% | 55.5\% | 54.0\% | 92.2\% | 92.4\% | 93.2\% | 93.1\% | 94.2\% |
|  |  |  | 5 | 63.8\% | 61.8\% | 57.4\% | 55.6\% | 53.6\% | 82.5\% | 85.9\% | 88.9\% | 89.8\% | 90.4\% |
|  |  |  | 10 | 58.1\% | 56.2\% | 54.6\% | 54.1\% | 53.0\% | 65.3\% | 70.3\% | 74.4\% | 79.7\% | 82.5\% |
|  |  |  | 0 | 46.0\% | 41.4\% | 38.9\% | 37.7\% | 36.6\% | 93.1\% | 92.9\% | 93.4\% | 93.7\% | 93.6\% |
|  | $\begin{aligned} & \mathrm{T}^{\top}= \\ & 0.148 \end{aligned}$ |  | 5 | 48.8\% | 43.5\% | 40.2\% | 37.9\% | 37.1\% | 82.3\% | 86.6\% | 88.2\% | 89.2\% | 89.9\% |
|  |  |  | 10 | 41.1\% | 39.9\% | 38.8\% | 36.6\% | 34.9\% | 59.5\% | 66.6\% | 72.7\% | 75.7\% | 78.7\% |
|  |  |  | 0 | 27.9\% | 26.0\% | 23.7\% | 22.0\% | 21.3\% | 92.6\% | 93.1\% | 93.1\% | 93.9\% | 93.7\% |
|  | $\begin{aligned} & \mathrm{T}^{\top}= \\ & 0.444 \end{aligned}$ |  | 5 | 31.3\% | 27.8\% | 24.9\% | 23.5\% | 24.0\% | 81.1\% | 84.0\% | 85.9\% | 87.1\% | 89.1\% |
|  |  |  | 10 | 25.3\% | 25.0\% | 24.2\% | 23.7\% | 21.7\% | 55.7\% | 65.3\% | 69.1\% | 72.5\% | 75.6\% |
| $\begin{gathered} \beta_{1}= \\ 0.074 \end{gathered}$ |  | Number of Missing Studies | 0 | 95.0\% | 94.9\% | 94.8\% | 94.6\% | 94.8\% | 96.1\% | 96.0\% | 95.8\% | 95.8\% | 96.0\% |
|  | $\mathrm{T}^{\mathbf{2}}=0$ |  | 5 | 93.6\% | 94.2\% | 95.0\% | 94.5\% | 94.6\% | 93.9\% | 94.4\% | 95.3\% | 94.8\% | 95.1\% |
|  |  |  | 10 | 86.2\% | 89.1\% | 90.8\% | 91.9\% | 91.9\% | 86.4\% | 89.2\% | 90.9\% | 92.0\% | 92.1\% |
|  |  |  | 0 | 62.3\% | 58.3\% | 57.4\% | 56.0\% | 53.6\% | 92.4\% | 92.9\% | 93.4\% | 93.6\% | 93.5\% |
|  |  |  | 5 | 64.3\% | 59.7\% | 57.6\% | 54.7\% | 53.1\% | 82.6\% | 85.9\% | 87.9\% | 89.4\% | 90.7\% |
|  |  |  | 10 | 56.2\% | 55.0\% | 53.6\% | 53.0\% | 53.1\% | 63.5\% | 68.8\% | 73.5\% | 77.8\% | 81.9\% |
|  |  |  | 0 | 44.5\% | 41.2\% | 38.9\% | 37.9\% | 35.5\% | 92.7\% | 93.3\% | 94.1\% | 93.9\% | 94.2\% |
|  |  |  | 5 | 48.7\% | 41.7\% | 38.9\% | 37.2\% | 37.8\% | 81.5\% | 84.9\% | 87.8\% | 86.8\% | 90.1\% |
|  |  |  | 10 | 38.9\% | 37.7\% | 38.3\% | 36.6\% | 35.8\% | 57.0\% | 65.5\% | 71.9\% | 75.1\% | 77.0\% |
|  |  |  | 0 | 27.9\% | 25.9\% | 24.2\% | 23.0\% | 20.9\% | 93.2\% | 93.2\% | 93.8\% | 93.2\% | 93.8\% |
|  | $\begin{aligned} & \mathrm{T}^{2}= \\ & 0 \Delta \Delta \Delta 4 \end{aligned}$ |  | 5 | 30.7\% | 29.7\% | 26.0\% | 24.6\% | 23.7\% | 80.4\% | 84.8\% | 86.6\% | 86.9\% | 88.8\% |
|  |  |  | 10 | 26.3\% | 24.4\% | 24.5\% | 22.7\% | 22.5\% | 56.2\% | 63.5\% | 68.9\% | 71.6\% | 75.1\% |
| $\begin{gathered} \beta_{1}= \\ 0.148 \end{gathered}$ |  |  | 0 | 94.4\% | 95.4\% | 94.5\% | 94.9\% | 94.6\% | 95.6\% | 96.4\% | 95.8\% | 96.2\% | 95.7\% |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 92.6\% | 93.3\% | 94.0\% | 94.3\% | 94.4\% | 93.0\% | 93.6\% | 94.4\% | 94.6\% | 94.6\% |
|  |  |  | 10 | 82.9\% | 86.9\% | 89.3\% | 90.4\% | 91.6\% | 83.2\% | 87.0\% | 89.4\% | 90.5\% | 91.6\% |
|  |  |  | 0 | 62.7\% | 61.2\% | 56.3\% | 54.8\% | 53.2\% | 91.6\% | 93.5\% | 93.8\% | 93.8\% | 93.5\% |
|  | $\begin{aligned} & \mathrm{T}^{2}= \\ & 0 \times 40 \end{aligned}$ |  | 5 | 64.5\% | 59.6\% | 57.3\% | 55.3\% | 54.6\% | 81.1\% | 84.1\% | 86.2\% | 89.0\% | 89.7\% |
|  |  |  | 10 | 53.5\% | 53.2\% | 51.9\% | 52.0\% | 51.1\% | 61.5\% | 65.3\% | 70.4\% | 75.2\% | 78.7\% |
|  |  |  | 0 | 44.1\% | 41.3\% | 39.1\% | 36.8\% | 34.4\% | 93.3\% | 93.1\% | 93.6\% | 93.6\% | 92.8\% |
|  | $\begin{aligned} & \mathrm{T}^{\top}= \\ & 0.148 \end{aligned}$ |  | 5 | 46.8\% | 42.1\% | 41.0\% | 37.5\% | 35.8\% | 80.6\% | 84.2\% | 86.9\% | 87.7\% | 89.1\% |
|  |  |  | 10 | 38.9\% | 37.7\% | 35.8\% | 36.0\% | 34.8\% | 56.3\% | 64.2\% | 68.1\% | 72.3\% | 73.6\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 28.1\% | 26.5\% | 24.8\% | 22.4\% | 21.7\% | 92.3\% | 92.7\% | 92.7\% | 93.3\% | 93.7\% |
|  |  |  | 5 | 31.8\% | 28.3\% | 26.0\% | 22.9\% | 22.5\% | 80.2\% | 83.4\% | 85.6\% | 86.2\% | 87.6\% |
|  |  |  | 10 | 24.4\% | 23.3\% | 23.3\% | 22.4\% | 22.8\% | 53.6\% | 61.0\% | 66.1\% | 71.2\% | 72.8\% |

Table E4. Coverage probability of the estimated intercept, with no correction for publication bias (from 1-dimensional algorithmic variant) (continued)

| No Correction for Publication Bias |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.296 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 94.9\% | 95.2\% | 95.3\% | 95.0\% | 94.8\% | 95.9\% | 96.2\% | 96.4\% | 96.1\% | 95.8\% |
|  |  |  | 5 | 90.5\% | 93.4\% | 93.1\% | 93.8\% | 93.6\% | 91.0\% | 93.6\% | 93.5\% | 94.1\% | 94.0\% |
|  |  |  | 10 | 74.8\% | 81.0\% | 84.6\% | 87.4\% | 89.4\% | 75.2\% | 81.0\% | 84.6\% | 87.4\% | 89.3\% |
|  |  |  | 0 | 62.9\% | 59.8\% | 58.4\% | 55.2\% | 53.7\% | 92.2\% | 92.6\% | 93.8\% | 93.4\% | 94.0\% |
|  |  |  | 5 | 61.4\% | 57.7\% | 56.6\% | 53.8\% | 54.1\% | 77.7\% | 81.9\% | 86.1\% | 86.4\% | 88.5\% |
|  |  |  | 10 | 46.2\% | 46.4\% | 48.3\% | 46.6\% | 48.5\% | 53.5\% | 59.3\% | 64.2\% | 67.9\% | 72.7\% |
|  |  |  | 0 | 44.3\% | 41.9\% | 38.2\% | 36.7\% | 34.8\% | 92.7\% | 92.8\% | 93.1\% | 93.8\% | 93.0\% |
|  |  |  | 5 | 45.1\% | 41.7\% | 38.4\% | 37.4\% | 36.4\% | 77.9\% | 81.7\% | 84.1\% | 86.3\% | 87.3\% |
|  |  |  | 10 | 33.6\% | 32.5\% | 34.4\% | 32.5\% | 33.0\% | 50.5\% | 56.5\% | 62.5\% | 67.4\% | 69.5\% |
|  |  |  | 0 | 27.3\% | 26.7\% | 24.0\% | 22.4\% | 21.1\% | 91.8\% | 93.4\% | 93.2\% | 94.0\% | 93.6\% |
|  | $\begin{aligned} & \mathrm{T}^{\top}= \end{aligned}$ |  | 5 | 29.0\% | 27.9\% | 26.1\% | 23.5\% | 23.6\% | 78.0\% | 81.4\% | 83.4\% | 85.2\% | 86.8\% |
|  |  |  | 10 | 22.3\% | 22.0\% | 20.3\% | 21.6\% | 21.4\% | 51.0\% | 56.7\% | 61.2\% | 65.0\% | 68.2\% |
| $\begin{gathered} \beta_{1}= \\ 0.444 \end{gathered}$ |  | Number of Missing Studies | 0 | 95.1\% | 95.1\% | 95.2\% | 95.6\% | 95.3\% | 96.1\% | 95.9\% | 96.0\% | 96.4\% | 96.5\% |
|  | $\mathrm{r}^{2}=0$ |  | 5 | 89.1\% | 91.9\% | 92.5\% | 92.8\% | 93.3\% | 89.6\% | 92.2\% | 92.7\% | 93.1\% | 93.6\% |
|  |  |  | 10 | 71.6\% | 75.5\% | 79.6\% | 84.4\% | 87.1\% | 71.9\% | 75.6\% | 79.5\% | 84.4\% | 87.1\% |
|  |  |  | 0 | 63.4\% | 59.4\% | 57.2\% | 54.7\% | 54.4\% | 92.1\% | 92.0\% | 93.5\% | 93.0\% | 94.1\% |
|  | $\mathrm{r}^{2}=$ |  | 5 | 57.8\% | 55.9\% | 54.4\% | 52.7\% | 52.5\% | 74.0\% | 78.5\% | 82.5\% | 85.2\% | 86.7\% |
|  |  |  | 10 | 40.0\% | 40.7\% | 43.1\% | 43.0\% | 45.3\% | 47.8\% | 52.5\% | 57.9\% | 61.3\% | 66.5\% |
|  |  |  | 0 | 44.7\% | 40.7\% | 39.3\% | 37.0\% | 35.1\% | 92.8\% | 93.4\% | 93.9\% | 93.2\% | 94.0\% |
|  | $\mathrm{T}^{2}=$ |  | 5 | 43.1\% | 40.5\% | 39.0\% | 37.0\% | 35.7\% | 75.2\% | 79.1\% | 81.0\% | 84.7\% | 85.5\% |
|  |  |  | 10 | 28.3\% | 30.0\% | 30.2\% | 30.0\% | 31.0\% | 44.6\% | 51.0\% | 56.5\% | 60.3\% | 65.1\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 28.7\% | 26.5\% | 23.5\% | 22.8\% | 21.8\% | 92.5\% | 93.4\% | 93.7\% | 93.0\% | 94.3\% |
|  |  |  | 5 | 29.6\% | 27.2\% | 25.1\% | 24.5\% | 22.8\% | 75.3\% | 79.6\% | 81.8\% | 83.3\% | 85.1\% |
|  |  |  | 10 | 20.0\% | 20.8\% | 20.7\% | 20.4\% | 19.9\% | 47.1\% | 53.5\% | 57.9\% | 62.6\% | 63.6\% |

Table E5. Coverage probability of the estimated intercept, with $R$ studies imputed (from 1-dimensional algorithmic variant)

| R Missing Studies Imputed |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.049 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 94.6\% | 94.6\% | 94.5\% | 95.2\% | 95.1\% | 95.8\% | 96.1\% | 95.8\% | 96.3\% | 96.1\% |
|  |  |  | 5 | 93.1\% | 92.6\% | 93.6\% | 93.7\% | 93.3\% | 94.3\% | 93.9\% | 94.7\% | 94.7\% | 94.1\% |
|  |  |  | 10 | 90.6\% | 91.3\% | 91.9\% | 91.7\% | 91.9\% | 91.4\% | 92.5\% | 93.0\% | 92.6\% | 92.9\% |
|  |  |  | 0 | 61.3\% | 59.5\% | 56.2\% | 55.1\% | 53.7\% | 90.7\% | 91.4\% | 92.0\% | 92.4\% | 93.3\% |
|  |  |  | 5 | 60.9\% | 58.0\% | 53.6\% | 51.7\% | 50.7\% | 81.4\% | 82.8\% | 84.5\% | 85.5\% | 86.3\% |
|  |  |  | 10 | 61.0\% | 57.0\% | 53.5\% | 51.4\% | 49.0\% | 71.6\% | 76.2\% | 78.1\% | 80.0\% | 81.1\% |
|  |  |  | 0 | 44.5\% | 40.3\% | 38.1\% | 37.1\% | 36.2\% | 89.4\% | 89.1\% | 90.5\% | 90.9\% | 91.4\% |
|  |  |  | 5 | 45.5\% | 40.0\% | 36.2\% | 35.3\% | 33.9\% | 80.5\% | 82.3\% | 82.2\% | 82.0\% | 82.6\% |
|  |  |  | 10 | 44.0\% | 40.3\% | 37.7\% | 33.9\% | 31.1\% | 66.4\% | 73.9\% | 77.5\% | 77.9\% | 78.2\% |
|  |  |  | 0 | 26.4\% | 24.8\% | 23.1\% | 21.6\% | 20.7\% | 87.1\% | 87.4\% | 88.2\% | 89.1\% | 89.9\% |
|  |  |  | 5 | 28.8\% | 24.2\% | 22.3\% | 21.7\% | 20.8\% | 78.6\% | 79.4\% | 80.0\% | 79.9\% | 80.3\% |
|  |  |  | 10 | 27.4\% | 25.3\% | 23.2\% | 22.2\% | 20.9\% | 64.8\% | 72.6\% | 74.7\% | 75.1\% | 75.3\% |
| $\begin{gathered} \beta_{1}= \\ 0.074 \end{gathered}$ |  |  | 0 | 94.6\% | 94.6\% | 94.6\% | 94.2\% | 94.6\% | 95.9\% | 95.9\% | 95.8\% | 95.6\% | 95.9\% |
|  | $\mathrm{r}^{2}=0$ |  | 5 | 92.1\% | 92.4\% | 93.5\% | 93.0\% | 93.9\% | 93.1\% | 93.3\% | 94.4\% | 94.1\% | 94.9\% |
|  |  |  | 10 | 90.2\% | 91.1\% | 90.9\% | 92.1\% | 92.4\% | 90.9\% | 92.2\% | 92.0\% | 93.2\% | 93.6\% |
|  |  |  | 0 | 61.1\% | 57.7\% | 56.9\% | 55.8\% | 53.4\% | 90.6\% | 91.9\% | 92.3\% | 92.7\% | 92.7\% |
|  | $0.049$ |  | 5 | 61.3\% | 56.9\% | 54.1\% | 51.7\% | 51.1\% | 81.9\% | 83.0\% | 84.4\% | 84.9\% | 86.9\% |
|  |  |  | 10 | 60.6\% | 57.2\% | 53.1\% | 51.2\% | 50.3\% | 71.6\% | 76.0\% | 78.0\% | 80.2\% | 81.4\% |
|  |  |  | 0 | 43.5\% | 40.1\% | 38.2\% | 37.4\% | 35.2\% | 89.1\% | 90.0\% | 90.9\% | 91.4\% | 91.7\% |
|  |  |  | 5 | 45.9\% | 38.8\% | 35.6\% | 32.9\% | 34.0\% | 80.1\% | 80.6\% | 81.7\% | 81.2\% | 83.7\% |
|  |  |  | 10 | 42.0\% | 38.6\% | 37.8\% | 35.5\% | 32.5\% | 65.2\% | 73.4\% | 77.9\% | 77.9\% | 77.6\% |
|  |  |  | 0 | 27.1\% | 25.2\% | 23.3\% | 21.9\% | 20.4\% | 86.6\% | 88.0\% | 88.1\% | 88.1\% | 89.5\% |
|  |  |  | 5 | 28.9\% | 26.8\% | 22.9\% | 21.4\% | 20.5\% | 78.8\% | 80.2\% | 79.9\% | 80.5\% | 81.0\% |
|  |  |  | 10 | 28.8\% | 24.4\% | 23.3\% | 21.0\% | 21.0\% | 64.1\% | 71.1\% | 74.7\% | 74.5\% | 75.9\% |
| $\begin{gathered} \beta_{1}= \\ 0.148 \end{gathered}$ |  |  | 0 | 94.1\% | 94.8\% | 94.4\% | 94.7\% | 94.5\% | 95.5\% | 96.2\% | 95.8\% | 96.1\% | 95.7\% |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 91.7\% | 92.2\% | 92.9\% | 93.2\% | 93.7\% | 92.7\% | 93.4\% | 94.1\% | 94.6\% | 94.9\% |
|  |  |  | 10 | 88.6\% | 90.3\% | 91.3\% | 91.4\% | 92.2\% | 89.3\% | 91.2\% | 92.3\% | 92.2\% | 93.3\% |
|  |  |  | 0 | 61.5\% | 60.6\% | 55.8\% | 54.5\% | 52.9\% | 90.0\% | 91.7\% | 92.5\% | 92.9\% | 92.7\% |
|  | $\begin{aligned} & \mathrm{T}^{2}= \\ & 0.049 \end{aligned}$ |  | 5 | 62.5\% | 56.0\% | 54.5\% | 52.1\% | 52.0\% | 81.6\% | 81.7\% | 83.8\% | 84.7\% | 85.2\% |
|  |  |  | 10 | 59.5\% | 56.5\% | 51.9\% | 51.6\% | 48.8\% | 69.9\% | 74.5\% | 77.1\% | 79.6\% | 80.0\% |
|  |  |  | 0 | 42.9\% | 40.7\% | 38.3\% | 36.7\% | 33.5\% | 89.6\% | 89.9\% | 90.4\% | 91.4\% | 90.7\% |
|  | $\begin{aligned} & \mathrm{T}^{\top}= \\ & 0.148 \end{aligned}$ |  | 5 | 44.2\% | 37.8\% | 37.8\% | 34.7\% | 32.5\% | 79.4\% | 80.9\% | 81.8\% | 80.9\% | 81.8\% |
|  |  |  | 10 | 42.0\% | 40.5\% | 36.7\% | 34.9\% | 32.2\% | 65.0\% | 73.8\% | 75.1\% | 77.2\% | 76.5\% |
|  |  |  | 0 | 27.0\% | 25.0\% | 23.7\% | 21.8\% | 21.3\% | 86.0\% | 87.1\% | 87.4\% | 88.6\% | 89.1\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 5 | 30.5\% | 25.4\% | 23.2\% | 20.9\% | 20.4\% | 78.7\% | 78.7\% | 79.9\% | 79.3\% | 79.7\% |
|  |  |  | 10 | 26.5\% | 24.8\% | 21.8\% | 20.8\% | 20.0\% | 62.9\% | 70.6\% | 73.9\% | 76.3\% | 75.0\% |

Table E5. Coverage probability of the estimated intercept, with R studies imputed (from 1-dimensional algorithmic variant) (continued) R Missing Studies Imputed

|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | $45$ | 55 | 65 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{gathered} \beta_{1}= \\ 0.296 \end{gathered}$ | $\mathrm{T}^{2}=0$ | Number of Missing Studies | 0 | 94.4\% | 94.5\% | 94.9\% | 94.8\% | 94.7\% | 95.6\% | 95.8\% | 96.2\% | 96.0\% | 95.7\% |
|  |  |  | 5 | 89.3\% | 91.2\% | 91.9\% | 92.2\% | 92.8\% | 91.1\% | 92.5\% | 93.3\% | 93.2\% | 93.9\% |
|  |  |  | 10 | 83.8\% | 87.8\% | 88.4\% | 89.0\% | 90.1\% | 84.9\% | 88.6\% | 89.8\% | 90.4\% | 91.0\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | 61.7\% | 58.6\% | 57.6\% | 54.9\% | 53.5\% | 90.4\% | 90.9\% | 92.3\% | 92.2\% | 92.7\% |
|  |  |  | 5 | 60.3\% | 55.2\% | 54.3\% | 50.8\% | 50.7\% | 79.5\% | 81.5\% | 83.4\% | 83.5\% | 84.2\% |
|  |  |  | 10 | 55.1\% | 54.8\% | 52.6\% | 49.0\% | 47.0\% | 66.1\% | 73.4\% | 76.5\% | 76.7\% | 78.6\% |
|  | $\begin{gathered} T^{2}= \\ 0.148 \end{gathered}$ |  | 0 | 43.1\% | 40.9\% | 37.3\% | 36.3\% | 34.2\% | 88.5\% | 89.3\% | 89.6\% | 90.8\% | 90.5\% |
|  |  |  | 5 | 43.4\% | 38.1\% | 35.8\% | 34.4\% | 33.3\% | 79.1\% | 79.1\% | 80.0\% | 81.0\% | 80.7\% |
|  |  |  | 10 | 39.3\% | 36.9\% | 35.8\% | 33.4\% | 31.6\% | 63.1\% | 71.1\% | 74.6\% | 75.9\% | 76.4\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 25.8\% | 25.4\% | 23.3\% | 21.5\% | 20.6\% | 86.6\% | 87.7\% | 88.5\% | 89.3\% | 89.1\% |
|  |  |  | 5 | 28.0\% | 25.6\% | 23.2\% | 21.7\% | 20.5\% | 78.3\% | 78.9\% | 78.9\% | 78.7\% | 80.6\% |
|  |  |  | 10 | 25.4\% | 24.4\% | 22.0\% | 21.2\% | 20.8\% | 61.0\% | 69.3\% | 73.0\% | 73.9\% | 74.8\% |
| $\begin{gathered} \beta_{1}= \\ 0.444 \end{gathered}$ |  | $\text { sə!̣nłs 6u!ss!̣ } \ddagger 0 \text { љəquinN }$ | 0 | 94.2\% | 94.6\% | 94.7\% | 95.3\% | 95.0\% | 95.4\% | 95.5\% | 95.9\% | 96.2\% | 96.3\% |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 88.2\% | 89.1\% | 89.8\% | 90.9\% | 92.0\% | 89.7\% | 90.6\% | 90.7\% | 91.7\% | 92.9\% |
|  |  |  | 10 | 80.2\% | 83.4\% | 84.2\% | 86.1\% | 85.6\% | 81.7\% | 84.4\% | 85.3\% | 87.2\% | 86.4\% |
|  |  |  | 0 | 62.2\% | 58.6\% | 56.9\% | 54.0\% | 54.0\% | 90.0\% | 90.4\% | 91.8\% | 91.8\% | 92.8\% |
|  | $\begin{gathered} \mathbf{T}^{\prime}= \\ 0.049 \end{gathered}$ |  | 5 | 59.9\% | 54.4\% | 52.0\% | 50.3\% | 49.2\% | 78.3\% | 79.6\% | 80.7\% | 82.7\% | 83.3\% |
|  |  |  | 10 | 50.0\% | 51.0\% | 49.8\% | 48.3\% | 46.3\% | 62.8\% | 70.6\% | 74.1\% | 76.1\% | 76.3\% |
|  |  |  | 0 | 43.1\% | 40.0\% | 38.3\% | 36.3\% | 34.2\% | 88.5\% | 90.0\% | 90.2\% | 90.0\% | 90.7\% |
|  | $\begin{gathered} T^{\prime}= \\ 0.148 \end{gathered}$ |  | 5 | 42.9\% | 37.8\% | 35.9\% | 33.4\% | 32.3\% | 77.5\% | 79.3\% | 80.1\% | 79.6\% | 80.8\% |
|  |  |  | 10 | 36.4\% | 36.0\% | 33.7\% | 33.9\% | 31.2\% | 59.1\% | 67.7\% | 74.0\% | 74.4\% | 75.3\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 27.5\% | 25.0\% | 22.4\% | 22.3\% | 21.0\% | 86.9\% | 87.4\% | 87.9\% | 87.8\% | 89.0\% |
|  |  |  | 5 | 28.2\% | 25.5\% | 23.2\% | 21.7\% | 20.0\% | 76.6\% | 78.5\% | 78.3\% | 78.4\% | 78.1\% |
|  |  |  | 10 | 23.8\% | 23.2\% | 22.7\% | 20.5\% | 19.9\% | 60.2\% | 67.9\% | 71.2\% | 71.8\% | 72.2\% |

Table E6. Coverage probability of the estimated intercept, with L studies imputed (from 1-dimensional algorithmic variant)

| L Missing Studies Imputed |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.049 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 94.0\% | 94.2\% | 94.0\% | 94.4\% | 94.5\% | 95.5\% | 96.0\% | 95.4\% | 95.8\% | 95.9\% |
|  |  |  | 5 | 93.6\% | 93.1\% | 93.6\% | 93.6\% | 93.0\% | 94.7\% | 94.3\% | 94.5\% | 94.8\% | 94.1\% |
|  |  |  | 10 | 90.3\% | 92.2\% | 92.7\% | 92.5\% | 92.6\% | 90.9\% | 92.9\% | 93.5\% | 93.3\% | 93.6\% |
|  | $\mathrm{T}^{2}=0.049$ |  | 0 | 59.7\% | 57.7\% | 54.2\% | 53.1\% | 51.7\% | 88.2\% | 89.0\% | 88.2\% | 88.4\% | 89.2\% |
|  |  |  | 5 | 62.0\% | 59.1\% | 54.5\% | 51.7\% | 49.7\% | 82.2\% | 83.7\% | 85.4\% | 85.3\% | 85.4\% |
|  |  |  | 10 | 60.7\% | 57.9\% | 55.1\% | 53.2\% | 50.3\% | 70.7\% | 76.1\% | 78.5\% | 81.5\% | 82.2\% |
|  | $\begin{gathered} T^{2}= \\ 0.148 \end{gathered}$ |  | 0 | 43.3\% | 38.8\% | 36.2\% | 35.8\% | 33.9\% | 86.9\% | 84.7\% | 85.1\% | 84.3\% | 84.2\% |
|  |  |  | 5 | 46.2\% | 41.6\% | 37.4\% | 35.9\% | 33.5\% | 81.5\% | 84.2\% | 83.0\% | 83.2\% | 83.1\% |
|  |  |  | 10 | 43.2\% | 40.6\% | 38.1\% | 35.2\% | 31.8\% | 64.9\% | 72.6\% | 76.6\% | 78.7\% | 79.9\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 25.5\% | 23.2\% | 21.3\% | 20.1\% | 19.4\% | 84.3\% | 82.4\% | 82.6\% | 81.5\% | 80.1\% |
|  |  |  | 5 | 30.3\% | 25.6\% | 23.0\% | 20.9\% | 21.2\% | 80.1\% | 81.3\% | 82.2\% | 81.2\% | 81.5\% |
|  |  |  | 10 | 27.1\% | 25.2\% | 23.8\% | 22.6\% | 21.2\% | 62.4\% | 70.8\% | 73.7\% | 75.1\% | 76.3\% |
| $\begin{gathered} \beta_{1}= \\ 0.074 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 94.2\% | 94.2\% | 94.1\% | 94.1\% | 94.2\% | 95.5\% | 95.8\% | 95.6\% | 95.6\% | 95.7\% |
|  |  |  | 5 | 92.5\% | 92.8\% | 93.8\% | 93.5\% | 93.6\% | 93.8\% | 93.6\% | 94.9\% | 94.4\% | 94.8\% |
|  |  |  | 10 | 89.7\% | 91.1\% | 91.6\% | 92.8\% | 92.9\% | 90.4\% | 91.9\% | 92.6\% | 93.9\% | 93.9\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | 59.8\% | 56.7\% | 54.9\% | 54.2\% | 51.3\% | 88.3\% | 88.5\% | 88.9\% | 88.4\% | 88.1\% |
|  |  |  | 5 | 62.7\% | 57.4\% | 54.6\% | 51.8\% | 50.4\% | 82.8\% | 83.7\% | 84.7\% | 84.7\% | 85.6\% |
|  |  |  | 10 | 59.6\% | 57.4\% | 54.5\% | 53.0\% | 51.3\% | 70.0\% | 75.0\% | 78.4\% | 80.4\% | 82.4\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | 41.9\% | 38.4\% | 36.5\% | 35.4\% | 33.5\% | 86.7\% | 85.8\% | 85.7\% | 84.8\% | 83.4\% |
|  |  |  | 5 | 46.9\% | 40.0\% | 36.2\% | 33.5\% | 33.5\% | 81.1\% | 81.9\% | 83.5\% | 81.7\% | 84.1\% |
|  |  |  | 10 | 41.6\% | 39.3\% | 38.5\% | 36.2\% | 33.7\% | 63.8\% | 71.9\% | 77.0\% | 78.1\% | 78.8\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 25.8\% | 23.9\% | 22.1\% | 20.4\% | 19.4\% | 83.5\% | 83.0\% | 81.9\% | 80.1\% | 80.5\% |
|  |  |  | 5 | 29.8\% | 27.7\% | 23.6\% | 22.1\% | 21.5\% | 79.8\% | 81.6\% | 81.5\% | 81.8\% | 82.1\% |
|  |  |  | 10 | 27.7\% | 24.5\% | 23.4\% | 21.7\% | 21.2\% | 62.3\% | 69.5\% | 73.0\% | 73.4\% | 76.2\% |

Table E6. Coverage probability of the estimated intercept, with L studies imputed (from 1-dimensional algorithmic variant) (continued)

| L Missing Studies Imputed |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{aligned} & \beta_{1}= \\ & 0.148 \end{aligned}$ | $\mathrm{T}^{2}=0$ |  | 0 | 93.2\% | 94.5\% | 93.8\% | 93.9\% | 93.8\% | 95.1\% | 95.9\% | 95.2\% | 95.8\% | 95.3\% |
|  |  |  | 5 | 92.4\% | 92.5\% | 93.0\% | 93.0\% | 93.4\% | 93.2\% | 93.7\% | 94.2\% | 94.2\% | 94.7\% |
|  |  |  | 10 | 87.6\% | 90.8\% | 91.5\% | 92.0\% | 92.5\% | 88.5\% | 91.5\% | 92.3\% | 92.8\% | 93.4\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | 60.2\% | 58.6\% | 54.3\% | 52.8\% | 50.4\% | 87.8\% | 88.4\% | 88.6\% | 88.4\% | 87.7\% |
|  |  |  | 5 | 63.0\% | 57.3\% | 54.3\% | 51.9\% | 50.7\% | 82.5\% | 83.1\% | 84.1\% | 84.6\% | 84.4\% |
|  |  |  | 10 | 58.2\% | 56.3\% | 52.6\% | 51.4\% | 49.5\% | 68.2\% | 72.6\% | 76.7\% | 79.2\% | 80.3\% |
|  | $\begin{gathered} T^{2}= \\ 0.148 \end{gathered}$ |  | 0 | 41.8\% | 38.8\% | 35.7\% | 33.7\% | 31.5\% | 86.9\% | 85.1\% | 84.6\% | 83.7\% | 83.1\% |
|  |  |  | 5 | 45.6\% | 39.3\% | 38.1\% | 35.3\% | 32.0\% | 80.1\% | 82.2\% | 82.4\% | 81.9\% | 82.0\% |
|  |  |  | 10 | 42.0\% | 39.6\% | 36.0\% | 35.1\% | 33.0\% | 63.0\% | 71.5\% | 73.6\% | 76.7\% | 75.9\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 26.1\% | 23.0\% | 21.7\% | 19.8\% | 19.1\% | 83.3\% | 82.1\% | 81.1\% | 79.6\% | 79.6\% |
|  |  |  | 5 | 31.1\% | 25.8\% | 24.0\% | 21.3\% | 20.4\% | 79.8\% | 80.9\% | 81.4\% | 80.7\% | 80.3\% |
|  |  |  | 10 | 26.2\% | 24.4\% | 22.4\% | 21.7\% | 21.1\% | 60.5\% | 68.3\% | 72.0\% | 76.1\% | 75.2\% |
| $\begin{gathered} \beta_{1}= \\ 0.296 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 93.5\% | 93.4\% | 93.8\% | 93.5\% | 93.8\% | 94.7\% | 95.3\% | 95.2\% | 94.9\% | 94.7\% |
|  |  |  | 5 | 90.2\% | 91.9\% | 92.2\% | 91.9\% | 91.7\% | 91.5\% | 92.9\% | 93.6\% | 93.1\% | 93.0\% |
|  |  |  | 10 | 83.0\% | 87.5\% | 87.9\% | 89.5\% | 90.3\% | 84.3\% | 88.2\% | 89.3\% | 90.7\% | 91.1\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | 60.1\% | 56.8\% | 55.2\% | 51.6\% | 51.6\% | 87.9\% | 87.6\% | 87.6\% | 86.2\% | 85.8\% |
|  |  |  | 5 | 61.0\% | 55.6\% | 53.7\% | 50.0\% | 50.5\% | 79.8\% | 81.8\% | 84.0\% | 83.1\% | 83.1\% |
|  |  |  | 10 | 53.6\% | 53.0\% | 51.6\% | 49.2\% | 48.1\% | 64.2\% | 70.7\% | 74.5\% | 75.6\% | 77.9\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | 42.0\% | 39.4\% | 35.5\% | 33.8\% | 32.0\% | 85.6\% | 84.4\% | 82.5\% | 83.5\% | 81.8\% |
|  |  |  | 5 | 44.6\% | 39.4\% | 36.3\% | 34.2\% | 33.3\% | 79.4\% | 80.0\% | 81.2\% | 81.7\% | 80.6\% |
|  |  |  | 10 | 38.2\% | 36.1\% | 35.6\% | 33.2\% | 31.5\% | 60.4\% | 68.1\% | 71.2\% | 74.0\% | 73.9\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 24.9\% | 24.0\% | 21.7\% | 20.1\% | 18.5\% | 82.8\% | 82.6\% | 80.9\% | 81.0\% | 79.7\% |
|  |  |  | 5 | 28.8\% | 26.3\% | 24.7\% | 21.5\% | 20.7\% | 78.9\% | 79.9\% | 80.2\% | 79.8\% | 80.7\% |
|  |  |  | 10 | 24.7\% | 23.7\% | 21.1\% | 20.9\% | 20.1\% | 59.0\% | 66.5\% | 70.2\% | 71.8\% | 72.5\% |

Table E6. Coverage probability of the estimated intercept, with $L$ studies imputed (from 1-dimensional algorithmic variant) (continued)

| L Missing Studies Imputed |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.444 \end{gathered}$ | $\mathrm{r}^{\mathbf{2}}=0$ |  | 0 | 92.8\% | 93.2\% | 92.8\% | 93.8\% | 92.8\% | 94.0\% | 94.1\% | 94.0\% | 94.1\% | 94.1\% |
|  |  |  | 5 | 89.4\% | 89.5\% | 89.7\% | 90.2\% | 90.7\% | 90.4\% | 90.9\% | 90.5\% | 90.9\% | 91.3\% |
|  |  |  | 10 | 79.5\% | 82.3\% | 84.6\% | 86.7\% | 86.8\% | 80.7\% | 83.3\% | 85.3\% | 87.6\% | 87.3\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | 59.8\% | 56.7\% | 54.1\% | 50.8\% | 51.2\% | 86.6\% | 86.1\% | 86.0\% | 84.7\% | 84.8\% |
|  |  |  | 5 | 59.8\% | 53.8\% | 51.5\% | 50.5\% | 48.2\% | 77.5\% | 80.2\% | 80.5\% | 81.5\% | 81.6\% |
|  |  |  | 10 | 47.8\% | 48.2\% | 48.5\% | 46.7\% | 45.3\% | 60.6\% | 67.0\% | 71.0\% | 72.9\% | 74.5\% |
|  | $\begin{aligned} & \mathrm{T}^{2}= \\ & 0.148 \end{aligned}$ |  | 0 | 40.9\% | 38.1\% | 36.0\% | 34.0\% | 31.7\% | 85.1\% | 84.8\% | 83.2\% | 81.7\% | 79.8\% |
|  |  |  | 5 | 43.6\% | 38.9\% | 36.1\% | 33.9\% | 32.2\% | 77.5\% | 79.5\% | 80.6\% | 79.4\% | 79.8\% |
|  |  |  | 10 | 34.2\% | 34.0\% | 33.1\% | 32.3\% | 31.1\% | 56.3\% | 63.0\% | 69.5\% | 71.5\% | 73.3\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 26.3\% | 24.6\% | 21.1\% | 20.7\% | 19.2\% | 82.7\% | 82.5\% | 80.5\% | 78.1\% | 77.6\% |
|  |  |  | 5 | 29.2\% | 26.0\% | 22.7\% | 21.4\% | 20.0\% | 76.7\% | 79.8\% | 79.2\% | 79.2\% | 78.2\% |
|  |  |  | 10 | 22.5\% | 22.2\% | 22.1\% | 20.6\% | 20.2\% | 57.1\% | 64.0\% | 67.4\% | 69.8\% | 69.7\% |

Table E7. Absolute bias in the estimated slope, with no correction for publication bias (from 1-dimensional algorithmic variant)

| No Correction for Publication Bias |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{aligned} & \beta_{1}= \\ & 0.049 \end{aligned}$ | $\mathrm{T}^{2}=0$ | Number of Missing Studies | 0 | 0.001 | -0.002 | -0.002 | 0.000 | -0.001 | 0.001 | -0.002 | -0.002 | 0.000 | -0.001 |
|  |  |  | 5 | -0.008 | -0.005 | -0.004 | -0.001 | -0.003 | -0.009 | -0.005 | -0.004 | -0.001 | -0.003 |
|  |  |  | 10 | -0.030 | -0.015 | -0.009 | -0.009 | -0.003 | -0.030 | -0.015 | -0.010 | -0.009 | -0.003 |
|  | $\mathrm{T}^{2}=$ |  | 0 | 0.000 | -0.007 | 0.003 | 0.001 | -0.004 | 0.000 | -0.008 | -0.002 | 0.002 | -0.004 |
|  |  |  | 5 | -0.019 | -0.008 | -0.005 | -0.007 | -0.002 | -0.019 | -0.011 | -0.011 | -0.006 | -0.004 |
|  |  |  | 10 | -0.040 | -0.020 | -0.020 | -0.012 | -0.009 | -0.039 | -0.022 | -0.019 | -0.011 | -0.010 |
|  | $\mathrm{T}^{2}=$ |  | 0 | 0.019 | 0.008 | 0.001 | -0.003 | 0.007 | 0.010 | 0.002 | -0.003 | 0.001 | 0.002 |
|  |  |  | 5 | -0.018 | -0.016 | -0.017 | -0.008 | -0.003 | -0.017 | -0.014 | -0.012 | -0.010 | -0.010 |
|  |  |  | 10 | -0.033 | -0.022 | -0.021 | -0.020 | -0.022 | -0.027 | -0.027 | -0.019 | -0.020 | -0.018 |
|  | $\mathrm{T}^{2}=$ |  | 0 | -0.008 | 0.014 | 0.008 | -0.021 | -0.003 | -0.009 | 0.010 | -0.010 | -0.004 | 0.001 |
|  |  |  | 5 | -0.020 | -0.002 | -0.020 | -0.013 | 0.004 | -0.008 | -0.011 | -0.025 | -0.012 | -0.007 |
|  |  |  | 10 | -0.009 | -0.009 | -0.026 | -0.006 | -0.008 | -0.028 | -0.018 | -0.027 | -0.020 | -0.009 |
| $\begin{aligned} & \beta_{1}= \\ & 0.074 \end{aligned}$ |  |  | 0 | -0.002 | 0.001 | 0.001 | -0.001 | 0.000 | -0.001 | 0.000 | 0.001 | -0.001 | 0.000 |
|  | $\mathrm{T}^{2}=0$ |  | 5 | -0.018 | -0.007 | -0.004 | -0.004 | -0.002 | -0.019 | -0.008 | -0.005 | -0.004 | -0.003 |
|  |  |  | 10 | -0.047 | -0.023 | -0.014 | -0.011 | -0.008 | -0.047 | -0.024 | -0.014 | -0.011 | -0.009 |
|  |  |  | 0 | 0.001 | -0.006 | -0.001 | -0.001 | 0.001 | 0.001 | -0.003 | 0.001 | 0.000 | -0.004 |
|  | $\begin{gathered} \mathrm{T}^{-}= \\ 0.049 \end{gathered}$ |  | 5 | -0.018 | -0.017 | -0.015 | -0.013 | -0.004 | -0.019 | -0.016 | -0.016 | -0.012 | -0.007 |
|  |  |  | 10 | -0.047 | -0.036 | -0.025 | -0.021 | -0.017 | -0.049 | -0.036 | -0.026 | -0.025 | -0.018 |
|  |  |  | 0 | -0.006 | 0.001 | -0.003 | 0.003 | -0.005 | -0.006 | 0.003 | -0.004 | -0.001 | 0.003 |
|  | $\begin{gathered} \mathrm{T}^{-}= \\ 0.148 \end{gathered}$ |  | 5 | -0.021 | -0.018 | -0.013 | -0.021 | -0.010 | -0.024 | -0.021 | -0.013 | -0.022 | -0.015 |
|  |  |  | 10 | -0.046 | -0.039 | -0.033 | -0.017 | -0.021 | -0.047 | -0.039 | -0.030 | -0.022 | -0.025 |
|  |  |  | 0 | 0.018 | 0.023 | -0.021 | 0.002 | -0.006 | 0.020 | 0.009 | -0.001 | 0.012 | 0.000 |
|  | $0.444$ |  | 5 | -0.023 | -0.011 | -0.020 | -0.017 | -0.002 | -0.023 | -0.020 | -0.017 | -0.023 | -0.014 |
|  |  |  | 10 | -0.036 | -0.041 | -0.038 | -0.030 | -0.017 | -0.037 | -0.037 | -0.031 | -0.036 | -0.020 |
| $\begin{gathered} \beta_{1}= \\ 0.148 \end{gathered}$ |  | sə!pnłs 6u!ss!̣ to ıəqunN | 0 | -0.001 | -0.001 | -0.001 | -0.002 | 0.001 | -0.001 | -0.001 | -0.001 | -0.002 | 0.001 |
|  | $\mathrm{T}^{2}=0$ |  | 5 | -0.027 | -0.015 | -0.011 | -0.008 | -0.007 | -0.028 | -0.015 | -0.011 | -0.008 | -0.008 |
|  |  |  | 10 | -0.083 | -0.045 | -0.031 | -0.021 | -0.016 | -0.084 | -0.045 | -0.032 | -0.022 | -0.017 |
|  |  |  | 0 | 0.003 | 0.006 | -0.001 | -0.001 | 0.001 | 0.002 | 0.007 | -0.001 | -0.002 | 0.001 |
|  |  |  | 5 | -0.043 | -0.027 | -0.027 | -0.017 | -0.013 | -0.044 | -0.037 | -0.031 | -0.024 | -0.018 |
|  | 0.049 |  | 10 | -0.080 | -0.060 | -0.049 | -0.041 | -0.030 | -0.081 | -0.061 | -0.053 | -0.049 | -0.037 |
|  | $\mathrm{T}^{2}=$ |  | 0 | 0.006 | -0.005 | -0.012 | -0.002 | -0.008 | 0.000 | -0.001 | -0.005 | -0.004 | -0.005 |
|  |  |  | 5 | -0.044 | -0.052 | -0.035 | -0.037 | -0.024 | -0.046 | -0.046 | -0.040 | -0.039 | -0.026 |
|  | 0.140 |  | 10 | -0.073 | -0.062 | -0.054 | -0.043 | -0.049 | -0.081 | -0.062 | -0.062 | -0.052 | -0.048 |
|  | $\begin{gathered} \mathbf{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | -0.003 | 0.005 | -0.009 | -0.001 | 0.001 | 0.001 | 0.003 | -0.005 | -0.011 | -0.006 |
|  |  |  | 5 | -0.059 | -0.040 | -0.029 | -0.038 | -0.029 | -0.057 | -0.041 | -0.040 | -0.037 | -0.032 |
|  |  |  | 10 | -0.100 | -0.077 | -0.057 | -0.061 | -0.037 | -0.092 | -0.082 | -0.066 | -0.053 | -0.048 |

Table E7. Absolute bias in the estimated slope, with no correction for publication bias (from 1-dimensional algorithmic variant) (continued)

| No Correction for Publication Bias |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.296 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 0.001 | 0.002 | 0.001 | 0.000 | 0.001 | 0.000 | 0.002 | 0.001 | 0.000 | 0.001 |
|  |  |  | 5 | -0.053 | -0.030 | -0.023 | -0.016 | -0.012 | -0.055 | -0.031 | -0.024 | -0.017 | -0.013 |
|  |  |  | 10 | -0.168 | -0.088 | -0.056 | -0.039 | -0.029 | -0.169 | -0.089 | -0.057 | -0.040 | -0.030 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | -0.004 | -0.003 | -0.001 | -0.004 | 0.007 | -0.004 | -0.002 | -0.001 | 0.003 | 0.005 |
|  |  |  | 5 | -0.088 | -0.062 | -0.042 | -0.040 | -0.025 | -0.093 | -0.073 | -0.049 | -0.050 | -0.038 |
|  |  |  | 10 | -0.165 | -0.126 | -0.097 | -0.082 | -0.066 | -0.167 | -0.128 | -0.104 | -0.092 | -0.077 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | -0.001 | 0.012 | 0.002 | -0.007 | -0.009 | 0.000 | 0.007 | 0.003 | -0.006 | -0.002 |
|  |  |  | 5 | -0.099 | -0.064 | -0.064 | -0.060 | -0.044 | -0.105 | -0.081 | -0.075 | -0.065 | -0.055 |
|  |  |  | 10 | -0.165 | -0.140 | -0.114 | -0.094 | -0.080 | -0.165 | -0.140 | -0.117 | -0.101 | -0.093 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 0.015 | -0.016 | -0.006 | -0.002 | -0.010 | 0.009 | -0.013 | -0.002 | 0.000 | -0.006 |
|  |  |  | 5 | -0.128 | -0.081 | -0.087 | -0.076 | -0.061 | -0.127 | -0.094 | -0.084 | -0.079 | -0.066 |
|  |  |  | 10 | -0.164 | -0.130 | -0.123 | -0.109 | -0.101 | -0.160 | -0.125 | -0.128 | -0.114 | -0.100 |
| $\begin{gathered} \beta_{1}= \\ 0.444 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | -0.001 | 0.000 | -0.002 | 0.002 | 0.001 | 0.000 | 0.000 | -0.003 | 0.002 | 0.000 |
|  |  |  | 5 | -0.080 | -0.045 | -0.031 | -0.024 | -0.018 | -0.083 | -0.047 | -0.032 | -0.025 | -0.019 |
|  |  |  | 10 | -0.219 | -0.126 | -0.083 | -0.057 | -0.042 | -0.221 | -0.129 | -0.085 | -0.059 | -0.043 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | -0.005 | -0.004 | 0.001 | 0.002 | 0.000 | -0.003 | -0.003 | 0.003 | 0.001 | 0.000 |
|  |  |  | 5 | -0.130 | -0.090 | -0.064 | -0.049 | -0.043 | -0.134 | -0.104 | -0.080 | -0.066 | -0.058 |
|  |  |  | 10 | -0.242 | -0.178 | -0.141 | -0.114 | -0.090 | -0.243 | -0.186 | -0.152 | -0.130 | -0.107 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | -0.005 | -0.007 | 0.008 | 0.001 | 0.008 | 0.000 | -0.005 | 0.002 | -0.005 | -0.001 |
|  |  |  | 5 | -0.156 | -0.109 | -0.096 | -0.072 | -0.054 | -0.156 | -0.123 | -0.115 | -0.090 | -0.074 |
|  |  |  | 10 | -0.246 | -0.192 | -0.173 | -0.142 | -0.129 | -0.248 | -0.205 | -0.179 | -0.154 | -0.138 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | -0.018 | 0.007 | 0.002 | 0.004 | 0.009 | -0.008 | 0.006 | 0.004 | 0.002 | 0.002 |
|  |  |  | 5 | -0.161 | -0.130 | -0.110 | -0.083 | -0.076 | -0.180 | -0.139 | -0.117 | -0.104 | -0.087 |
|  |  |  | 10 | -0.246 | -0.197 | -0.179 | -0.155 | -0.140 | -0.246 | -0.210 | -0.185 | -0.154 | -0.150 |

Table E8. Absolute bias in the estimated slope, with $R$ studies imputed (from 1-dimensional algorithmic variant

| R Missing Studies Imputed |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.049 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 0.001 | -0.002 | -0.001 | 0.000 | 0.000 | 0.002 | -0.002 | -0.001 | 0.000 | 0.000 |
|  |  |  | 5 | -0.008 | -0.003 | -0.002 | 0.001 | -0.001 | -0.007 | -0.002 | -0.002 | 0.001 | -0.001 |
|  |  |  | 10 | -0.016 | -0.009 | -0.007 | -0.006 | 0.001 | -0.015 | -0.009 | -0.007 | -0.006 | 0.001 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | -0.001 | -0.006 | 0.003 | 0.002 | -0.004 | 0.000 | -0.006 | -0.001 | 0.003 | -0.003 |
|  |  |  | 5 | -0.014 | -0.006 | -0.003 | -0.004 | 0.002 | -0.011 | -0.005 | -0.006 | 0.000 | 0.003 |
|  |  |  | 10 | -0.028 | -0.011 | -0.012 | -0.006 | -0.005 | -0.026 | -0.010 | -0.009 | -0.002 | -0.001 |
|  |  |  | 0 | 0.014 | 0.009 | 0.001 | -0.001 | 0.008 | 0.008 | 0.005 | 0.000 | 0.005 | 0.004 |
|  |  |  | 5 | -0.018 | -0.013 | -0.011 | -0.004 | -0.002 | -0.009 | -0.006 | -0.003 | 0.002 | -0.003 |
|  |  |  | 10 | -0.024 | -0.017 | -0.017 | -0.014 | -0.018 | -0.018 | -0.017 | -0.012 | -0.010 | -0.010 |
|  |  |  | 0 | -0.007 | 0.018 | 0.007 | -0.020 | -0.003 | -0.010 | 0.014 | -0.007 | -0.004 | 0.003 |
|  | $0.444$ |  | 5 | -0.006 | -0.004 | -0.019 | -0.012 | 0.009 | 0.000 | -0.006 | -0.023 | -0.004 | 0.000 |
|  |  |  | 10 | -0.008 | -0.004 | -0.014 | -0.003 | -0.005 | -0.021 | -0.005 | -0.015 | -0.010 | 0.006 |
| $\begin{gathered} \beta_{1}= \\ 0.074 \end{gathered}$ | $\mathrm{T}^{2}=0$ | Number of Missing Studies | 0 | -0.001 | 0.002 | 0.002 | 0.000 | 0.000 | 0.000 | 0.002 | 0.002 | 0.000 | 0.000 |
|  |  |  | 5 | -0.014 | -0.003 | -0.001 | -0.001 | 0.000 | -0.014 | -0.003 | -0.001 | -0.002 | 0.000 |
|  |  |  | 10 | -0.027 | -0.015 | -0.009 | -0.007 | -0.004 | -0.025 | -0.014 | -0.009 | -0.007 | -0.004 |
|  |  |  | 0 | 0.001 | -0.006 | -0.001 | -0.001 | 0.001 | 0.003 | -0.002 | 0.003 | 0.001 | -0.002 |
|  | $0.049$ |  | 5 | -0.009 | -0.011 | -0.011 | -0.010 | -0.002 | -0.006 | -0.004 | -0.007 | -0.004 | -0.001 |
|  |  |  | 10 | -0.033 | -0.029 | -0.017 | -0.011 | -0.009 | -0.032 | -0.024 | -0.013 | -0.011 | -0.005 |
|  |  |  | 0 | -0.008 | 0.002 | -0.003 | 0.002 | -0.004 | -0.003 | 0.006 | 0.000 | 0.001 | 0.005 |
|  | $0.148$ |  | 5 | -0.013 | -0.013 | -0.004 | -0.016 | -0.004 | -0.012 | -0.008 | -0.002 | -0.012 | -0.004 |
|  |  |  | 10 | -0.034 | -0.031 | -0.021 | -0.008 | -0.012 | -0.032 | -0.028 | -0.014 | -0.008 | -0.009 |
|  |  |  | 0 | 0.024 | 0.021 | -0.018 | 0.007 | -0.007 | 0.034 | 0.015 | 0.003 | 0.017 | 0.004 |
|  | $0.444$ |  | 5 | -0.017 | 0.003 | -0.017 | -0.005 | 0.002 | -0.009 | 0.001 | -0.002 | -0.010 | -0.008 |
|  |  |  | 10 | -0.026 | -0.028 | -0.032 | -0.012 | -0.015 | -0.022 | -0.022 | -0.017 | -0.017 | -0.005 |
| $\begin{gathered} \beta_{1}= \\ 0.148 \end{gathered}$ |  |  | 0 | 0.000 | -0.001 | 0.000 | -0.001 | 0.001 | 0.002 | 0.000 | 0.000 | -0.001 | 0.001 |
|  | $\mathrm{T}^{2}=0$ |  | 5 | -0.021 | -0.008 | -0.005 | -0.004 | -0.004 | -0.017 | -0.007 | -0.004 | -0.003 | -0.003 |
|  |  |  | 10 | -0.047 | -0.027 | -0.019 | -0.012 | -0.008 | -0.045 | -0.025 | -0.018 | -0.012 | -0.007 |
|  |  |  | 0 | 0.002 | 0.007 | 0.000 | -0.001 | 0.002 | 0.004 | 0.011 | 0.002 | 0.001 | 0.004 |
|  | $\begin{aligned} & \mathrm{T} \boldsymbol{=} \\ & 0.049 \end{aligned}$ |  | 5 | -0.030 | -0.020 | -0.018 | -0.009 | -0.006 | -0.023 | -0.019 | -0.013 | -0.005 | -0.002 |
|  |  |  | 10 | -0.057 | -0.041 | -0.035 | -0.030 | -0.020 | -0.051 | -0.032 | -0.029 | -0.025 | -0.014 |
|  |  |  | 0 | 0.002 | -0.003 | -0.011 | 0.000 | -0.006 | 0.006 | 0.005 | 0.003 | 0.002 | -0.001 |
|  | $0.148$ |  | 5 | -0.029 | -0.035 | -0.024 | -0.029 | -0.013 | -0.021 | -0.019 | -0.016 | -0.020 | -0.007 |
|  |  |  | 10 | -0.051 | -0.036 | -0.034 | -0.030 | -0.034 | -0.049 | -0.023 | -0.031 | -0.022 | -0.021 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | -0.001 | 0.011 | -0.005 | 0.002 | 0.005 | 0.009 | 0.012 | 0.002 | -0.002 | 0.002 |
|  |  |  | 5 | -0.045 | -0.022 | -0.016 | -0.030 | -0.024 | -0.035 | -0.010 | -0.019 | -0.015 | -0.010 |
|  |  |  | 10 | -0.087 | -0.060 | -0.036 | -0.042 | -0.021 | -0.067 | -0.056 | -0.031 | -0.021 | -0.018 |

Table E8. Absolute bias in the estimated slope, with R studies imputed (from 1-dimensional algorithmic variant (continued)


Table E9. Absolute bias in the estimated slope, with $L$ studies imputed (from 1-dimensional algorithmic variant)

| L Missing Studies Imputed |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 |  | 45 |  | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.049 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 0.000 | -0.002 | -0.002 | 0.000 | 0.000 | 0.001 | -0.001 | -0.001 | 0.000 | 0.000 |
|  |  |  | 5 | -0.008 | -0.004 | -0.003 | 0.000 | -0.002 | -0.008 | -0.003 | -0.003 | 0.000 | -0.002 |
|  |  |  | 10 | -0.018 | -0.010 | -0.007 | -0.007 | -0.001 | -0.017 | -0.010 | -0.007 | -0.007 | 0.000 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | 0.000 | -0.004 | 0.002 | 0.002 | -0.004 | 0.002 | -0.004 | -0.001 | 0.005 | -0.002 |
|  |  |  | 5 | -0.016 | -0.007 | -0.004 | -0.004 | 0.000 | -0.012 | -0.007 | -0.006 | -0.001 | 0.002 |
|  |  |  | 10 | -0.031 | -0.013 | -0.014 | -0.007 | -0.006 | -0.029 | -0.012 | -0.010 | -0.002 | -0.003 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | 0.014 | 0.006 | 0.002 | -0.001 | 0.009 | 0.008 | 0.006 | 0.003 | 0.007 | 0.006 |
|  |  |  | 5 | -0.017 | -0.014 | -0.012 | -0.006 | -0.004 | -0.010 | -0.007 | -0.003 | 0.000 | -0.005 |
|  |  |  | 10 | -0.029 | -0.018 | -0.017 | -0.017 | -0.019 | -0.021 | -0.018 | -0.013 | -0.014 | -0.012 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | -0.006 | 0.018 | 0.002 | -0.023 | 0.000 | -0.006 | 0.018 | -0.008 | -0.002 | 0.008 |
|  |  |  | 5 | -0.011 | -0.006 | -0.021 | -0.011 | 0.007 | -0.003 | -0.009 | -0.025 | -0.005 | -0.003 |
|  |  |  | 10 | -0.012 | -0.005 | -0.019 | -0.005 | -0.008 | -0.025 | -0.008 | -0.018 | -0.014 | 0.001 |
| $\begin{gathered} \beta_{1}= \\ 0.074 \end{gathered}$ | $\mathrm{T}^{\mathbf{2}}=0$ |  | 0 | -0.002 | 0.001 | 0.002 | 0.000 | -0.001 | -0.001 | 0.001 | 0.003 | 0.000 | 0.000 |
|  |  |  | 5 | -0.014 | -0.005 | -0.003 | -0.002 | -0.001 | -0.014 | -0.005 | -0.002 | -0.003 | -0.001 |
|  |  |  | 10 | -0.030 | -0.016 | -0.011 | -0.009 | -0.006 | -0.027 | -0.015 | -0.011 | -0.008 | -0.006 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | 0.001 | -0.004 | -0.002 | 0.002 | 0.002 | 0.005 | 0.000 | 0.003 | 0.005 | -0.001 |
|  |  |  | 5 | -0.011 | -0.012 | -0.011 | -0.010 | -0.003 | -0.008 | -0.005 | -0.007 | -0.004 | -0.001 |
|  |  |  | 10 | -0.036 | -0.031 | -0.018 | -0.014 | -0.011 | -0.034 | -0.026 | -0.014 | -0.013 | -0.007 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | -0.006 | 0.004 | -0.004 | 0.004 | -0.002 | 0.000 | 0.008 | 0.002 | 0.004 | 0.008 |
|  |  |  | 5 | -0.016 | -0.016 | -0.007 | -0.015 | -0.006 | -0.016 | -0.010 | -0.002 | -0.013 | -0.006 |
|  |  |  | 10 | -0.035 | -0.034 | -0.026 | -0.008 | -0.014 | -0.033 | -0.030 | -0.018 | -0.010 | -0.011 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 0.022 | 0.026 | -0.018 | 0.007 | -0.009 | 0.032 | 0.018 | 0.007 | 0.021 | 0.006 |
|  |  |  | 5 | -0.017 | 0.002 | -0.016 | -0.011 | -0.001 | -0.008 | -0.002 | -0.004 | -0.014 | -0.010 |
|  |  |  | 10 | -0.029 | -0.035 | -0.034 | -0.020 | -0.014 | -0.027 | -0.028 | -0.019 | -0.022 | -0.006 |
| $\begin{gathered} \beta_{1}= \\ 0.148 \end{gathered}$ | $\mathrm{T}^{\mathbf{2}}=0$ |  | 0 | 0.000 | -0.001 | -0.001 | -0.002 | 0.002 | 0.002 | 0.001 | 0.001 | -0.001 | 0.003 |
|  |  |  | 5 | -0.021 | -0.010 | -0.008 | -0.005 | -0.005 | -0.018 | -0.009 | -0.007 | -0.005 | -0.004 |
|  |  |  | 10 | -0.050 | -0.029 | -0.021 | -0.015 | -0.011 | -0.048 | -0.027 | -0.021 | -0.015 | -0.010 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | 0.002 | 0.008 | 0.001 | 0.001 | 0.004 | 0.005 | 0.016 | 0.008 | 0.007 | 0.009 |
|  |  |  | 5 | -0.032 | -0.021 | -0.019 | -0.010 | -0.006 | -0.024 | -0.020 | -0.015 | -0.007 | -0.003 |
|  |  |  | 10 | -0.061 | -0.044 | -0.037 | -0.031 | -0.022 | -0.055 | -0.035 | -0.030 | -0.027 | -0.016 |
|  | $\begin{gathered} \mathrm{r}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | 0.005 | -0.002 | -0.011 | 0.001 | -0.001 | 0.012 | 0.011 | 0.009 | 0.010 | 0.006 |
|  |  |  | 5 | -0.033 | -0.036 | -0.026 | -0.029 | -0.015 | -0.024 | -0.021 | -0.018 | -0.021 | -0.008 |
|  |  |  | 10 | -0.057 | -0.042 | -0.042 | -0.034 | -0.038 | -0.055 | -0.028 | -0.037 | -0.027 | -0.026 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | -0.003 | 0.009 | -0.003 | 0.005 | 0.002 | 0.015 | 0.020 | 0.005 | 0.006 | 0.011 |
|  |  |  | 5 | -0.048 | -0.026 | -0.015 | -0.033 | -0.024 | -0.037 | -0.013 | -0.019 | -0.019 | -0.014 |
|  |  |  | 10 | -0.090 | -0.068 | -0.041 | -0.053 | -0.026 | -0.073 | -0.063 | -0.038 | -0.031 | -0.026 |

Table E9. Absolute bias in the estimated slope, with L studies imputed (from 1-dimensional algorithmic variant) (continued)
L Missing Studies Imputed
Fixed Effects in the Final Model
Random Effects in the Final Model

|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{gathered} \beta_{1}= \\ 0.296 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 0.001 | 0.003 | 0.002 | 0.001 | 0.002 | 0.004 | 0.006 | 0.006 | 0.004 | 0.005 |
|  |  |  | 5 | -0.042 | -0.021 | -0.016 | -0.010 | -0.006 | -0.038 | -0.018 | -0.013 | -0.009 | -0.004 |
|  |  |  | 10 | -0.108 | -0.060 | -0.038 | -0.026 | -0.018 | -0.103 | -0.058 | -0.036 | -0.024 | -0.016 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | -0.002 | 0.000 | 0.002 | 0.001 | 0.011 | 0.009 | 0.014 | 0.013 | 0.021 | 0.023 |
|  |  |  | 5 | -0.067 | -0.046 | -0.031 | -0.027 | -0.012 | -0.056 | -0.039 | -0.019 | -0.020 | -0.008 |
|  |  |  | 10 | -0.121 | -0.093 | -0.071 | -0.061 | -0.047 | -0.109 | -0.075 | -0.058 | -0.052 | -0.038 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | 0.000 | 0.018 | 0.008 | 0.000 | -0.003 | 0.017 | 0.030 | 0.027 | 0.018 | 0.021 |
|  |  |  | 5 | -0.083 | -0.051 | -0.052 | -0.046 | -0.032 | -0.070 | -0.045 | -0.039 | -0.028 | -0.018 |
|  |  |  | 10 | -0.128 | -0.111 | -0.089 | -0.069 | -0.058 | -0.108 | -0.089 | -0.069 | -0.052 | -0.047 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 0.019 | -0.017 | -0.001 | 0.003 | 0.001 | 0.031 | 0.008 | 0.024 | 0.023 | 0.021 |
|  |  |  | 5 | -0.110 | -0.065 | -0.069 | -0.053 | -0.045 | -0.082 | -0.060 | -0.043 | -0.039 | -0.026 |
|  |  |  | 10 | -0.137 | -0.103 | -0.104 | -0.083 | -0.076 | -0.115 | -0.078 | -0.083 | -0.066 | -0.055 |
| $\begin{gathered} \beta_{1}= \\ 0.444 \end{gathered}$ | $\mathrm{T}^{\mathbf{2}}=0$ |  | 0 | 0.001 | 0.003 | 0.000 | 0.005 | 0.004 | 0.007 | 0.008 | 0.006 | 0.011 | 0.009 |
|  |  |  | 5 | -0.060 | -0.030 | -0.019 | -0.013 | -0.008 | -0.055 | -0.024 | -0.013 | -0.008 | -0.004 |
|  |  |  | 10 | -0.148 | -0.086 | -0.056 | -0.035 | -0.021 | -0.143 | -0.081 | -0.051 | -0.031 | -0.017 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | 0.000 | 0.001 | 0.008 | 0.011 | 0.008 | 0.019 | 0.022 | 0.030 | 0.029 | 0.026 |
|  |  |  | 5 | -0.101 | -0.069 | -0.044 | -0.029 | -0.025 | -0.078 | -0.054 | -0.031 | -0.021 | -0.013 |
|  |  |  | 10 | -0.184 | -0.132 | -0.100 | -0.080 | -0.062 | -0.164 | -0.113 | -0.083 | -0.066 | -0.049 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | -0.001 | -0.002 | 0.011 | 0.011 | 0.017 | 0.030 | 0.025 | 0.032 | 0.029 | 0.036 |
|  |  |  | 5 | -0.124 | -0.081 | -0.072 | -0.049 | -0.033 | -0.094 | -0.061 | -0.061 | -0.032 | -0.022 |
|  |  |  | 10 | -0.194 | -0.152 | -0.130 | -0.107 | -0.094 | -0.169 | -0.132 | -0.102 | -0.086 | -0.068 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | -0.016 | 0.016 | 0.011 | 0.015 | 0.019 | 0.030 | 0.043 | 0.042 | 0.044 | 0.046 |
|  |  |  | 5 | -0.131 | -0.100 | -0.083 | -0.066 | -0.055 | -0.113 | -0.074 | -0.057 | -0.046 | -0.029 |
|  |  |  | 10 | -0.211 | -0.160 | -0.140 | -0.118 | -0.104 | -0.173 | -0.137 | -0.112 | -0.084 | -0.083 |

Table E10. Coverage probability of the estimated slope, with no correction for publication

| No Correction for Publication Bias |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.049 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 95.1\% | 95.2\% | 94.9\% | 95.0\% | 95.4\% | 96.4\% | 96.3\% | 95.8\% | 96.2\% | 96.3\% |
|  |  |  | 5 | 95.9\% | 95.4\% | 95.6\% | 95.3\% | 95.0\% | 96.2\% | 95.9\% | 96.1\% | 95.8\% | 95.3\% |
|  |  |  | 10 | 95.9\% | 94.9\% | 95.1\% | 95.2\% | 94.8\% | 96.3\% | 95.3\% | 95.4\% | 95.3\% | 95.2\% |
|  |  |  | 0 | 64.0\% | 61.4\% | 58.2\% | 56.1\% | 54.9\% | 92.3\% | 92.4\% | 93.1\% | 93.5\% | 93.6\% |
|  | $0.049$ |  | 5 | 70.7\% | 64.6\% | 60.9\% | 58.0\% | 55.6\% | 90.1\% | 90.6\% | 92.0\% | 92.8\% | 93.3\% |
|  |  |  | 10 | 82.8\% | 71.4\% | 64.9\% | 61.4\% | 57.6\% | 90.4\% | 88.6\% | 89.6\% | 91.7\% | 92.2\% |
|  | $\mathrm{T}^{2}=$ |  | 0 | 45.8\% | 41.4\% | 39.0\% | 39.0\% | 35.9\% | 92.7\% | 93.0\% | 93.0\% | 93.6\% | 93.8\% |
|  |  |  | 5 | 54.9\% | 47.5\% | 42.6\% | 39.6\% | 38.3\% | 91.9\% | 93.3\% | 93.3\% | 94.0\% | 94.3\% |
|  |  |  | 10 | 68.0\% | 55.2\% | 48.2\% | 45.0\% | 41.6\% | 89.9\% | 92.0\% | 92.8\% | 93.2\% | 94.0\% |
|  |  |  | 0 | 28.8\% | 26.2\% | 24.5\% | 22.3\% | 22.2\% | 92.3\% | 92.9\% | 93.6\% | 93.3\% | 94.0\% |
|  | $0.444$ |  | 5 | 37.6\% | 31.9\% | 27.0\% | 25.4\% | 23.6\% | 92.9\% | 93.2\% | 93.4\% | 94.1\% | 94.1\% |
|  |  |  | 10 | 47.7\% | 38.4\% | 32.6\% | 29.3\% | 26.2\% | 90.9\% | 93.9\% | 93.8\% | 94.1\% | 93.6\% |
| $\begin{gathered} \beta_{1}= \\ 0.074 \end{gathered}$ |  |  | 0 | 95.2\% | 95.2\% | 95.1\% | 95.2\% | 95.5\% | 96.2\% | 96.6\% | 96.1\% | 96.2\% | 96.5\% |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 95.8\% | 95.5\% | 95.7\% | 95.5\% | 95.5\% | 96.1\% | 95.8\% | 96.0\% | 95.9\% | 95.8\% |
|  |  |  | 10 | 96.0\% | 95.2\% | 94.4\% | 95.1\% | 94.9\% | 96.4\% | 95.6\% | 94.7\% | 95.3\% | 95.1\% |
|  |  |  | 0 | 63.2\% | 60.0\% | 56.7\% | 56.9\% | 53.7\% | 92.4\% | 93.2\% | 92.9\% | 93.6\% | 93.4\% |
|  | $\begin{aligned} & \mathrm{T}^{\top}= \\ & 0.049 \end{aligned}$ |  | 5 | 71.3\% | 64.3\% | 59.8\% | 56.5\% | 54.3\% | 89.8\% | 90.0\% | 91.5\% | 92.2\% | 93.2\% |
|  |  |  | 10 | 82.6\% | 71.3\% | 63.7\% | 61.2\% | 57.9\% | 90.1\% | 88.1\% | 89.0\% | 91.6\% | 91.9\% |
|  |  |  | 0 | 45.6\% | 41.3\% | 39.7\% | 37.3\% | 35.9\% | 93.1\% | 93.2\% | 93.6\% | 94.0\% | 94.5\% |
|  | $0.148$ |  | 5 | 54.7\% | 46.8\% | 42.0\% | 39.9\% | 38.9\% | 91.3\% | 92.7\% | 93.5\% | 93.4\% | 94.1\% |
|  |  |  | 10 | 67.1\% | 54.4\% | 48.7\% | 45.9\% | 41.2\% | 90.0\% | 91.1\% | 92.6\% | 93.5\% | 93.6\% |
|  |  |  | 0 | 28.6\% | 25.4\% | 25.0\% | 22.8\% | 20.9\% | 93.1\% | 93.0\% | 93.2\% | 93.5\% | 93.7\% |
|  | $0.444$ |  | 5 | 37.1\% | 31.9\% | 29.0\% | 27.0\% | 24.7\% | 92.5\% | 93.6\% | 94.0\% | 93.6\% | 94.0\% |
|  |  |  | 10 | 47.7\% | 36.9\% | 32.4\% | 28.9\% | 26.5\% | 90.7\% | 92.6\% | 93.5\% | 93.0\% | 93.9\% |
| $\begin{gathered} \beta_{1}= \\ 0.148 \end{gathered}$ |  |  | 0 | 94.2\% | 95.0\% | 94.6\% | 95.0\% | 95.0\% | 95.4\% | 96.3\% | 95.7\% | 96.3\% | 95.8\% |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 95.5\% | 95.1\% | 95.3\% | 95.4\% | 95.3\% | 95.8\% | 95.5\% | 95.8\% | 95.9\% | 95.6\% |
|  |  |  | 10 | 94.7\% | 94.8\% | 95.1\% | 94.5\% | 95.1\% | 95.2\% | 95.0\% | 95.3\% | 94.9\% | 95.4\% |
|  |  |  | 0 | 64.0\% | 62.3\% | 58.0\% | 56.8\% | 53.2\% | 91.8\% | 93.7\% | 93.0\% | 94.2\% | 93.8\% |
|  | $\begin{aligned} & \mathrm{T}^{2}= \\ & 0 \times 40 \end{aligned}$ |  | 5 | 71.3\% | 64.9\% | 59.7\% | 57.5\% | 55.3\% | 89.4\% | 90.0\% | 91.5\% | 92.5\% | 92.5\% |
|  |  |  | 10 | 81.3\% | 71.8\% | 64.9\% | 61.0\% | 58.0\% | 89.7\% | 88.4\% | 89.1\% | 90.1\% | 91.5\% |
|  |  |  | 0 | 45.4\% | 41.9\% | 39.1\% | 36.3\% | 35.4\% | 92.5\% | 93.6\% | 93.3\% | 94.0\% | 93.3\% |
|  | $0.148$ |  | 5 | 55.0\% | 46.9\% | 43.5\% | 39.7\% | 38.0\% | 91.5\% | 92.6\% | 93.6\% | 93.6\% | 93.5\% |
|  |  |  | 10 | 67.2\% | 54.8\% | 46.6\% | 42.4\% | 40.5\% | 89.5\% | 90.4\% | 92.7\% | 93.1\% | 93.4\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 29.0\% | 26.1\% | 24.1\% | 21.9\% | 22.3\% | 92.4\% | 93.2\% | 92.6\% | 93.2\% | 93.6\% |
|  |  |  | 5 | 37.2\% | 31.5\% | 27.9\% | 26.0\% | 23.7\% | 92.5\% | 92.9\% | 93.6\% | 94.3\% | 93.0\% |
|  |  |  | 10 | 47.7\% | 37.9\% | 31.7\% | 29.9\% | 27.1\% | 90.6\% | 93.0\% | 93.4\% | 93.9\% | 93.0\% |

Table E10. Coverage probability of the estimated slope, with no correction for publication (continued)

| No Correction for Publication Bias |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.296 \end{gathered}$ | $\mathrm{T}^{2}=0$ | Number of Missing Studies | 0 | 95.0\% | 95.3\% | 95.1\% | 95.4\% | 94.7\% | 96.1\% | 96.1\% | 96.6\% | 96.4\% | 96.0\% |
|  |  |  | 5 | 93.9\% | 95.0\% | 95.0\% | 94.9\% | 95.0\% | 94.5\% | 95.3\% | 95.5\% | 95.2\% | 95.4\% |
|  |  |  | 10 | 89.5\% | 91.3\% | 92.8\% | 93.0\% | 94.4\% | 90.2\% | 91.7\% | 93.2\% | 93.3\% | 94.6\% |
|  |  |  | 0 | 63.7\% | 59.6\% | 59.1\% | 55.6\% | 53.5\% | 92.5\% | 93.1\% | 93.8\% | 93.7\% | 94.2\% |
|  |  |  | 5 | 69.2\% | 63.9\% | 59.9\% | 57.6\% | 54.1\% | 87.8\% | 89.9\% | 91.9\% | 92.0\% | 92.7\% |
|  |  |  | 10 | 76.2\% | 66.4\% | 61.6\% | 58.1\% | 55.7\% | 84.8\% | 83.9\% | 85.4\% | 86.8\% | 88.8\% |
|  |  |  | 0 | 45.1\% | 41.8\% | 39.0\% | 37.3\% | 35.6\% | 92.7\% | 92.9\% | 93.9\% | 93.4\% | 93.6\% |
|  |  |  | 5 | 53.6\% | 45.9\% | 42.3\% | 37.7\% | 37.1\% | 90.1\% | 91.8\% | 92.3\% | 93.0\% | 93.1\% |
|  |  |  | 10 | 63.3\% | 51.9\% | 46.4\% | 41.9\% | 39.2\% | 86.2\% | 88.3\% | 90.3\% | 90.7\% | 91.4\% |
|  |  |  | 0 | 28.1\% | 26.6\% | 23.8\% | 22.3\% | 22.6\% | 91.2\% | 93.4\% | 93.4\% | 93.6\% | 93.3\% |
|  |  |  | 5 | 37.7\% | 31.1\% | 27.7\% | 25.8\% | 24.2\% | 92.2\% | 92.9\% | 92.9\% | 93.1\% | 94.0\% |
|  |  |  | 10 | 45.0\% | 37.3\% | 32.3\% | 28.5\% | 27.4\% | 89.4\% | 91.5\% | 92.8\% | 92.4\% | 92.7\% |
| $\begin{gathered} \beta_{1}= \\ 0.444 \end{gathered}$ |  |  | 0 | 94.9\% | 95.2\% | 95.4\% | 95.0\% | 94.6\% | 96.2\% | 96.1\% | 96.2\% | 95.8\% | 95.9\% |
|  | $\mathrm{T}^{\mathbf{2}}=0$ |  | 5 | 93.1\% | 94.8\% | 94.2\% | 94.7\% | 94.9\% | 93.8\% | 94.9\% | 94.5\% | 95.0\% | 95.1\% |
|  |  |  | 10 | 85.7\% | 86.9\% | 89.1\% | 91.1\% | 92.5\% | 86.5\% | 87.3\% | 89.6\% | 91.2\% | 92.7\% |
|  |  |  | 0 | 64.6\% | 59.3\% | 58.4\% | 54.9\% | 54.9\% | 92.5\% | 92.3\% | 93.4\% | 93.3\% | 94.3\% |
|  | $\mathrm{T}^{2}=$ $0.049$ |  | 5 | 68.0\% | 61.3\% | 58.9\% | 56.1\% | 54.1\% | 85.5\% | 87.8\% | 89.6\% | 90.5\% | 91.3\% |
|  |  |  | 10 | 68.1\% | 61.3\% | 57.6\% | 55.7\% | 54.0\% | 79.1\% | 78.3\% | 80.6\% | 82.7\% | 84.9\% |
|  |  |  | 0 | 45.4\% | 42.4\% | 40.3\% | 36.2\% | 34.9\% | 93.0\% | 93.5\% | 93.8\% | 93.7\% | 93.3\% |
|  | $\begin{aligned} & \mathrm{T}^{\top}= \\ & 0.148 \end{aligned}$ |  | 5 | 52.7\% | 45.3\% | 40.3\% | 39.7\% | 37.6\% | 88.6\% | 89.9\% | 90.6\% | 92.3\% | 92.3\% |
|  |  |  | 10 | 59.8\% | 50.3\% | 44.9\% | 40.5\% | 37.7\% | 82.8\% | 83.9\% | 86.0\% | 87.8\% | 88.4\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 27.8\% | 26.5\% | 24.3\% | 23.1\% | 21.1\% | 92.5\% | 93.0\% | 93.9\% | 93.3\% | 94.1\% |
|  |  |  | 5 | 36.1\% | 31.0\% | 28.0\% | 25.8\% | 23.7\% | 90.5\% | 92.1\% | 92.2\% | 92.7\% | 92.8\% |
|  |  |  | 10 | 45.4\% | 35.7\% | 31.0\% | 28.3\% | 25.8\% | 87.8\% | 89.2\% | 90.1\% | 91.3\% | 90.7\% |

Table E11. Coverage probability of the estimated slope, with $R$ studies imputed (from 1-dimensional algorithmic variant)

| R Missing Studies Imputed |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.049 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 94.7\% | 94.9\% | 94.7\% | 94.8\% | 95.3\% | 96.0\% | 96.1\% | 95.6\% | 96.1\% | 96.2\% |
|  |  |  | 5 | 93.5\% | 92.9\% | 93.7\% | 93.5\% | 93.0\% | 94.3\% | 93.7\% | 94.4\% | 94.2\% | 94.1\% |
|  |  |  | 10 | 94.4\% | 93.0\% | 92.8\% | 92.3\% | 92.3\% | 94.7\% | 93.4\% | 93.5\% | 92.9\% | 93.1\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | 63.8\% | 61.4\% | 58.0\% | 55.9\% | 54.9\% | 91.2\% | 91.8\% | 92.5\% | 92.8\% | 92.9\% |
|  |  |  | 5 | 67.1\% | 62.5\% | 58.9\% | 55.8\% | 54.8\% | 85.8\% | 86.2\% | 87.6\% | 88.6\% | 89.1\% |
|  |  |  | 10 | 79.4\% | 67.2\% | 62.0\% | 57.7\% | 53.9\% | 87.1\% | 85.0\% | 84.7\% | 86.3\% | 86.4\% |
|  | $\mathrm{T}^{2}=$ |  | 0 | 45.7\% | 41.6\% | 38.4\% | 38.7\% | 35.8\% | 90.4\% | 91.1\% | 91.0\% | 92.3\% | 92.8\% |
|  |  |  | 5 | 52.0\% | 45.0\% | 41.3\% | 38.1\% | 36.5\% | 85.7\% | 87.7\% | 87.8\% | 87.7\% | 88.3\% |
|  | 0.148 |  | 10 | 63.9\% | 49.9\% | 44.3\% | 41.0\% | 37.6\% | 85.1\% | 84.6\% | 85.1\% | 86.5\% | 86.3\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 28.3\% | 26.0\% | 24.6\% | 22.5\% | 22.4\% | 89.0\% | 90.2\% | 91.1\% | 91.2\% | 91.8\% |
|  |  |  | 5 | 35.1\% | 29.2\% | 25.4\% | 24.6\% | 22.4\% | 85.2\% | 86.3\% | 87.0\% | 86.4\% | 86.8\% |
|  |  |  | 10 | 44.4\% | 34.4\% | 29.0\% | 26.0\% | 23.4\% | 84.7\% | 85.5\% | 85.5\% | 84.8\% | 85.0\% |
| $\begin{aligned} & \beta_{1}= \\ & 0.074 \end{aligned}$ | $\mathrm{T}^{2}=0$ | $\begin{aligned} & \text { ๗ } \\ & \text { 을 } \\ & \underset{\sim}{\omega} \end{aligned}$ | 0 | 95.0\% | 95.0\% | 94.9\% | 94.9\% | 95.4\% | 96.1\% | 96.4\% | 96.0\% | 96.0\% | 96.5\% |
|  |  |  | 5 | 93.3\% | 93.1\% | 93.8\% | 93.7\% | 94.2\% | 94.0\% | 93.7\% | 94.4\% | 94.4\% | 95.1\% |
|  |  |  | 10 | 94.7\% | 92.4\% | 90.9\% | 92.7\% | 92.6\% | 95.0\% | 93.2\% | 91.8\% | 93.4\% | 93.6\% |
|  |  |  | 0 | 63.1\% | 59.8\% | 56.4\% | 56.7\% | 53.8\% | 91.2\% | 92.5\% | 92.2\% | 93.0\% | 92.7\% |
|  |  |  | 5 | 67.6\% | 62.0\% | 57.7\% | 55.2\% | 53.2\% | 86.1\% | 86.4\% | 87.4\% | 88.6\% | 89.8\% |
|  |  |  | 10 | 79.3\% | 67.2\% | 61.1\% | 58.2\% | 56.1\% | 87.9\% | 84.2\% | 84.7\% | 86.6\% | 86.5\% |
|  |  |  | 0 | 45.6\% | 41.5\% | 39.5\% | 37.6\% | 35.6\% | 90.5\% | 91.2\% | 92.1\% | 92.4\% | 93.2\% |
|  | $\begin{aligned} & \mathbf{T}^{\top}= \\ & 0.148 \end{aligned}$ |  | 5 | 52.4\% | 44.3\% | 39.4\% | 38.1\% | 37.6\% | 85.6\% | 86.1\% | 86.6\% | 86.9\% | 88.4\% |
|  |  |  | 10 | 63.7\% | 50.2\% | 44.1\% | 42.3\% | 37.9\% | 84.7\% | 84.8\% | 85.3\% | 86.3\% | 86.2\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 28.4\% | 25.7\% | 24.8\% | 23.1\% | 21.0\% | 89.8\% | 90.1\% | 90.5\% | 90.9\% | 91.5\% |
|  |  |  | 5 | 33.8\% | 30.1\% | 27.2\% | 24.4\% | 23.2\% | 86.2\% | 86.3\% | 87.0\% | 87.3\% | 87.3\% |
|  |  |  | 10 | 44.0\% | 33.1\% | 29.9\% | 26.7\% | 23.3\% | 84.2\% | 84.6\% | 85.6\% | 85.5\% | 85.6\% |


| R Missing Studies Imputed |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.148 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 93．8\％ | 94．7\％ | 94．3\％ | 94．8\％ | 94．9\％ | 95．1\％ | 96．1\％ | 95．6\％ | 96．3\％ | 95．9\％ |
|  |  |  | 5 | 92．9\％ | 92．8\％ | 93．2\％ | 93．5\％ | 94．1\％ | 93．8\％ | 93．5\％ | 94．0\％ | 94．2\％ | 95．3\％ |
|  |  |  | 10 | 93．8\％ | 92．8\％ | 92．5\％ | 92．0\％ | 92．5\％ | 94．3\％ | 93．4\％ | 93．1\％ | 92．9\％ | 93．2\％ |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | 63．5\％ | 62．3\％ | 58．0\％ | 56．5\％ | 53．1\％ | 90．8\％ | 92．9\％ | 92．5\％ | 93．6\％ | 93．4\％ |
|  |  |  | 5 | 68．2\％ | 62．3\％ | 57．9\％ | 56．3\％ | 53．7\％ | 85．7\％ | 86．4\％ | 87．9\％ | 88．8\％ | 88．5\％ |
|  |  |  | 10 | 78．5\％ | 68．5\％ | 61．5\％ | 57．6\％ | 56．0\％ | 87．0\％ | 85．0\％ | 85．3\％ | 86．4\％ | 86．3\％ |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | 46．1\％ | 42．3\％ | 39．2\％ | 36．5\％ | 35．5\％ | 90．4\％ | 91．8\％ | 91．9\％ | 92．6\％ | 92．2\％ |
|  |  |  | $5$ | $51.5 \%$ | $44.1 \%$ | 41．7\％ | 38．4\％ | 36．2\％ | 85．2\％ | 86．4\％ | 86．4\％ | 88．2\％ | 87．6\％ |
|  |  |  | 10 | $62.3 \%$ | 50．8\％ | 43．2\％ | 39．3\％ | $38.2 \%$ | 84.6\% | 84.6\% | $85.5 \%$ | 85．9\％ | 85.8\% |
|  |  |  | 0 | 28．6\％ | 25．9\％ | 24．1\％ | 21．7\％ | 22．0\％ | 89．3\％ | 90．6\％ | 90．5\％ | 91．2\％ | 91．5\％ |
|  |  |  | $5$ | $34.7 \%$ | 29．2\％ | 26．2\％ | 24．1\％ | 23．0\％ | 86．0\％ | 85．7\％ | 86．7\％ | 87.3\% | $86.5 \%$ |
|  | $0.444$ |  | 10 | $43.9 \%$ | 33．8\％ | 29．2\％ | 27．4\％ | 24．3\％ | 83.9\% | $85.1 \%$ | $84.3 \%$ | $86.3 \%$ | 85.0\% |
| $\begin{gathered} \beta_{1}= \\ 0.296 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 94．5\％ | 94．8\％ | 94．7\％ | 94．9\％ | 94．7\％ | 95．8\％ | 95．9\％ | 96．3\％ | 96．2\％ | 96．1\％ |
|  |  |  | $5$ | 90.9\% | 92．2\％ | 92．6\％ | 93．4\％ | 93.5\% | 92．0\％ | 93．6\％ | 93．9\％ | 94.0\% | 94.3\% |
|  |  |  | $10$ | 90.6\% | 89.5\% | 89.8\% | 90.6\% | 92.2\% | 91.5\% | 90.7\% | 91.5\% | 92.1\% | 93.3\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ | $\ddot{\omega}$ | 0 | 63．4\％ | 59．6\％ | 59．2\％ | 55．4\％ | 53．2\％ | 91．0\％ | 92．6\％ | 93．2\％ | 92．8\％ | 93．5\％ |
|  |  | 올 | 5 | 66．8\％ | 61．4\％ | 57．9\％ | 56．3\％ | 53．1\％ | 84．4\％ | 86．8\％ | 88．5\％ | 88．3\％ | 89．5\％ |
|  |  | "⿹\zh26灬 | 10 | 75．1\％ | 65．3\％ | 59．3\％ | 56．3\％ | 53．8\％ | 84．2\％ | 83．4\％ | 84．0\％ | 84．7\％ | 86．8\％ |
|  | $\begin{gathered} T^{2}= \\ 0.148 \end{gathered}$ | $\sum_{4}^{20}$ | 0 | 44．6\％ | 41．7\％ | 39．1\％ | 37．1\％ | 35．6\％ | 90．7\％ | 91．0\％ | 91．7\％ | 91．9\％ | 92．2\％ |
|  |  |  | 5 | 50．1\％ | 42．8\％ | 40．0\％ | 37．3\％ | 35．9\％ | 85．0\％ | 86．3\％ | 87．0\％ | 87．7\％ | 88．1\％ |
|  |  | $\begin{aligned} & \frac{1}{む} \\ & \text { (1) } \\ & \frac{1}{5} \end{aligned}$ | 10 | 61．6\％ | 48．3\％ | 44．2\％ | 38．8\％ | 37．0\％ | 83．8\％ | 84．1\％ | 85．4\％ | 85．7\％ | 85．5\％ |
|  | $\mathrm{T}^{2}=$ |  | 0 | 27．8\％ | 26．5\％ | 23．5\％ | 22．1\％ | 22．1\％ | 88．7\％ | 90．3\％ | 90．8\％ | 91．6\％ | 91．3\％ |
|  |  |  | 5 | 35．0\％ | 29．3\％ | 26．1\％ | 24．9\％ | 23．2\％ | 86．7\％ | 86．1\％ | 86．5\％ | 86．9\％ | 88．3\％ |
|  | $0.444$ |  | 10 | 41．8\％ | 34．3\％ | 29．1\％ | 26．2\％ | 24．3\％ | 83．6\％ | 84．8\％ | 85．2\％ | 85．5\％ | 86．0\％ |
| $\begin{aligned} & \beta_{1}= \\ & 0.444 \end{aligned}$ | $\mathrm{T}^{2}=0$ |  | 0 | 94．1\％ | 94．9\％ | 95．1\％ | 94．8\％ | 94．5\％ | 95．4\％ | 95．8\％ | 95．8\％ | 95．7\％ | 95．7\％ |
|  |  |  | 5 | 89．4\％ | 91．4\％ | 91．1\％ | 92．3\％ | 93．4\％ | 91．7\％ | 93．3\％ | 93．0\％ | 93.3\% | 94.1\% |
|  |  |  | 10 | 88．2\％ | 86．5\％ | 87．6\％ | 88．4\％ | 89．7\％ | 89．2\％ | 88．6\％ | 89．9\％ | 91．4\％ | 91．5\％ |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | 64．3\％ | 59．3\％ | 58．4\％ | 54．9\％ | 54．6\％ | 91．3\％ | 91．6\％ | 92．4\％ | 92．8\％ | 94．0\％ |
|  |  | $\begin{aligned} & \stackrel{0}{0} \\ & \text { ס } \end{aligned}$ | 5 | 65．4\％ | 58．3\％ | 56．9\％ | 55．1\％ | 53．5\％ | 84．3\％ | 86．1\％ | 87．3\％ | 88．8\％ | 89.4\% |
|  |  | $\begin{aligned} & \text { 드N } \\ & \underset{\Sigma}{N} \end{aligned}$ | 10 | 69．1\％ | 62．0\％ | 57．0\％ | 55．2\％ | 53．0\％ | 81．5\％ | 81．3\％ | 82．8\％ | 84．6\％ | 86．1\％ |
|  | $\mathrm{T}^{2}=$ |  | 0 | 45．0\％ | 42．3\％ | 40．3\％ | 36．0\％ | 34．9\％ | 91．0\％ | 91．5\％ | 92．0\％ | 92．1\％ | 91．8\％ |
|  |  | $\stackrel{\square}{0}$ | 5 | 50．6\％ | 43．5\％ | 39．3\％ | 38．3\％ | $36.2 \%$ | 85．4\％ | 85.6\% | 86．1\％ | 88.0\% | 88.0\% |
|  | $0.148$ | $\begin{aligned} & \text { o } \\ & \text { む } \\ & \text { E } \\ & \frac{1}{2} \end{aligned}$ | 10 | 58．2\％ | 48．6\％ | 43．0\％ | 39．5\％ | 36．3\％ | 81．5\％ | 82．5\％ | 84．8\％ | 85．8\％ | 85．9\％ |
|  | $\begin{gathered} \mathbf{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 27．6\％ | 26．5\％ | 24．3\％ | 23．1\％ | 20．7\％ | 89．7\％ | 90．0\％ | 90．8\％ | 90．7\％ | 91．8\％ |
|  |  |  | 5 | 33．5\％ | 28．7\％ | 26．1\％ | 23．2\％ | 22．0\％ | 84．3\％ | 85．6\％ | 86．2\％ | 86．5\％ | 86．7\％ |
|  |  |  | 10 | 42．0\％ | 32．5\％ | 27．8\％ | 25．2\％ | 24．3\％ | 83．2\％ | 83．9\％ | 84．1\％ | 84．9\％ | 84．5\％ |

Table E12. Coverage probability of the estimated slope, with L studies imputed (from 1-dimensional algorithmic variant)

| L Missing Studies Imputed |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.049 \end{gathered}$ |  | Number of Missing Studies | 0 | 94.1\% | 94.6\% | 94.3\% | 94.4\% | 94.8\% | 95.3\% | 96.0\% | 95.5\% | 95.7\% | 96.2\% |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 94.6\% | 93.7\% | 93.8\% | 93.8\% | 93.3\% | 95.2\% | 94.3\% | 94.6\% | 94.4\% | 93.9\% |
|  |  |  | 10 | 94.7\% | 94.1\% | 93.7\% | 93.2\% | 93.4\% | 95.1\% | 94.4\% | 94.5\% | 93.6\% | 94.2\% |
|  |  |  | 0 | 63.3\% | 61.3\% | 57.8\% | 55.5\% | 55.2\% | 90.2\% | 90.2\% | 90.7\% | 91.3\% | 90.6\% |
|  |  |  | 5 | 68.2\% | 63.2\% | 59.5\% | 56.4\% | 55.0\% | 86.4\% | 87.1\% | 87.9\% | 88.4\% | 89.2\% |
|  |  |  | 10 | 80.5\% | 70.5\% | 63.9\% | 60.1\% | 55.9\% | 88.1\% | 86.0\% | 86.2\% | 87.6\% | 88.0\% |
|  |  |  | 0 | 45.4\% | 41.0\% | 38.3\% | 38.4\% | 35.8\% | 88.7\% | 88.2\% | 89.0\% | 89.8\% | 90.2\% |
|  |  |  | 5 | 53.3\% | 46.8\% | 41.6\% | 38.4\% | 37.7\% | 86.9\% | 89.0\% | 88.2\% | 88.4\% | 88.7\% |
|  |  |  | 10 | 66.4\% | 53.6\% | 46.8\% | 43.5\% | 39.8\% | 86.5\% | 86.8\% | 87.2\% | 88.1\% | 88.0\% |
|  |  |  | 0 | 28.3\% | 25.8\% | 24.0\% | 21.8\% | 21.7\% | 87.3\% | 88.0\% | 89.0\% | 88.9\% | 89.1\% |
|  |  |  | 5 | 36.6\% | 30.9\% | 25.9\% | 25.2\% | 22.9\% | 86.8\% | 87.7\% | 88.1\% | 88.1\% | 87.5\% |
|  |  |  | 10 | 46.4\% | 36.6\% | 31.4\% | 27.9\% | 25.3\% | 86.4\% | 88.0\% | 88.0\% | 87.0\% | 87.3\% |
| $\begin{gathered} \beta_{1}= \\ 0.074 \end{gathered}$ |  | Number of Missing Studies | 0 | 94.3\% | 94.7\% | 94.5\% | 94.7\% | 94.6\% | 95.7\% | 95.9\% | 95.7\% | 95.7\% | 96.2\% |
|  | $\mathrm{T}^{\mathbf{2}}=0$ |  | 5 | 94.1\% | 93.8\% | 94.2\% | 93.9\% | 94.2\% | 94.8\% | 94.3\% | 94.8\% | 94.6\% | 94.9\% |
|  |  |  | 10 | 95.2\% | 93.2\% | 92.7\% | 93.5\% | 93.1\% | 95.5\% | 94.0\% | 93.6\% | 94.2\% | 94.0\% |
|  |  |  | 0 | 63.2\% | 59.6\% | 56.5\% | 56.7\% | 53.8\% | 89.7\% | 90.4\% | 90.5\% | 91.4\% | 91.0\% |
|  | $0.049$ |  | 5 | 69.4\% | 62.9\% | 59.5\% | 56.5\% | 54.2\% | 87.1\% | 86.8\% | 87.8\% | 88.6\% | 89.5\% |
|  |  |  | 10 | 81.4\% | 70.1\% | 63.5\% | 60.3\% | 57.2\% | 88.9\% | 86.1\% | 86.2\% | 87.7\% | 87.4\% |
|  |  |  | 0 | 45.3\% | 40.9\% | 39.1\% | 37.0\% | 35.3\% | 89.3\% | 89.5\% | 89.1\% | 90.3\% | 90.2\% |
|  | $0.148$ |  | 5 | 53.2\% | 45.6\% | 41.0\% | 38.2\% | 38.1\% | 85.9\% | 87.2\% | 87.7\% | 88.0\% | 89.2\% |
|  |  |  | 10 | 65.8\% | 53.3\% | 46.3\% | 44.8\% | 39.9\% | 86.3\% | 86.4\% | 86.9\% | 87.8\% | 88.0\% |
|  |  |  | 0 | 27.6\% | 24.9\% | 24.5\% | 22.4\% | 21.1\% | 88.0\% | 88.1\% | 87.9\% | 87.9\% | 88.8\% |
|  |  |  | 5 | 35.6\% | 30.7\% | 28.7\% | 25.3\% | 23.6\% | 86.8\% | 87.5\% | 88.3\% | 88.1\% | 87.7\% |
|  |  |  | 10 | 46.8\% | 35.7\% | 31.3\% | 27.9\% | 25.6\% | 86.2\% | 86.6\% | 87.3\% | 86.9\% | 88.3\% |
| $\begin{gathered} \beta_{1}= \\ 0.148 \end{gathered}$ |  |  | 0 | 93.3\% | 94.1\% | 94.0\% | 94.4\% | 94.5\% | 94.8\% | 95.6\% | 95.4\% | 96.0\% | 95.8\% |
|  | $\mathrm{T}^{\mathbf{2}}=0$ |  | 5 | 93.5\% | 93.3\% | 93.5\% | 93.6\% | 93.9\% | 94.2\% | 94.1\% | 94.3\% | 94.4\% | 94.9\% |
|  |  |  | 10 | 94.2\% | 93.6\% | 93.5\% | 92.7\% | 93.5\% | 94.5\% | 93.9\% | 93.9\% | 93.3\% | 94.1\% |
|  |  |  | 0 | 63.3\% | 61.7\% | 57.8\% | 56.7\% | 53.6\% | 89.6\% | 90.9\% | 90.8\% | 91.7\% | 91.7\% |
|  | $0.049$ |  | 5 | 70.2\% | 63.5\% | 59.6\% | 56.8\% | 54.1\% | 86.8\% | 86.8\% | 88.6\% | 89.0\% | 88.9\% |
|  |  |  | 10 | 79.5\% | 70.3\% | 63.4\% | 59.7\% | 56.9\% | 87.8\% | 86.4\% | 86.4\% | 87.1\% | 87.1\% |
|  |  |  | 0 | 45.9\% | 42.1\% | 38.6\% | 36.0\% | 35.0\% | 88.2\% | 89.7\% | 89.7\% | 89.8\% | 89.5\% |
|  | $0.148$ |  | 5 | 52.9\% | 46.1\% | 42.6\% | 38.3\% | 37.0\% | 86.6\% | 87.5\% | 87.6\% | 88.4\% | 87.8\% |
|  |  |  | 10 | 65.0\% | 53.1\% | 45.5\% | 41.1\% | 39.6\% | 86.2\% | 86.1\% | 87.5\% | 87.2\% | 87.3\% |
|  |  |  | 0 | 28.3\% | 25.8\% | 23.6\% | 21.9\% | 21.4\% | 87.7\% | 87.9\% | 87.4\% | 88.5\% | 88.7\% |
|  | $\begin{aligned} & \mathrm{T}^{2}= \\ & 0.444 \end{aligned}$ |  | 5 | 35.4\% | 30.5\% | 26.8\% | 24.6\% | 23.4\% | 87.1\% | 86.9\% | 87.5\% | 88.0\% | 87.3\% |
|  |  |  | 10 | 46.4\% | 36.7\% | 30.9\% | 29.0\% | 26.1\% | 85.4\% | 87.5\% | 87.1\% | 87.8\% | 87.0\% |

Table E12. Coverage probability of the estimated slope, with L studies imputed (from 1-dimensional algorithmic variant) (continued) L Missing Studies Imputed

|  |  |  |  | 25 | 35 | $45$ | 55 | 65 | 25 | 35 | $45$ | 55 | 65 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{gathered} \beta_{1}= \\ 0.296 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 93.8\% | 94.1\% | 94.0\% | 94.1\% | 94.2\% | 95.2\% | 95.2\% | 95.7\% | 95.2\% | 95.5\% |
|  |  |  | 5 | 91.5\% | 92.6\% | 92.5\% | 93.4\% | 93.3\% | 92.4\% | 93.7\% | 93.7\% | 94.4\% | 93.8\% |
|  |  |  | 10 | 91.5\% | 91.1\% | 91.1\% | 91.6\% | 92.6\% | 92.1\% | 91.7\% | 92.3\% | 92.8\% | 93.3\% |
|  |  |  | 0 | 62.5\% | 58.7\% | 59.2\% | 55.5\% | 53.1\% | 89.9\% | 90.7\% | 91.6\% | 90.1\% | 91.1\% |
|  | $\begin{gathered} \mathbf{T}^{\prime}= \\ 0.049 \end{gathered}$ |  | 5 | 68.0\% | 62.5\% | 59.3\% | 56.6\% | 53.6\% | 85.5\% | 87.2\% | 88.9\% | 88.4\% | 89.0\% |
|  |  |  | 10 | 76.3\% | 67.1\% | 61.0\% | 57.9\% | 55.7\% | 84.7\% | 83.7\% | 84.9\% | 85.5\% | 87.3\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | 44.1\% | 41.1\% | 38.5\% | 36.6\% | 35.0\% | 88.5\% | 88.7\% | 89.3\% | 89.3\% | 89.1\% |
|  |  |  | 5 | 51.9\% | 44.5\% | 40.5\% | 37.9\% | 36.7\% | 85.9\% | 87.7\% | 87.6\% | 88.3\% | 88.2\% |
|  |  |  | 10 | 63.0\% | 50.7\% | 45.9\% | 41.4\% | 38.3\% | 84.9\% | 85.4\% | 87.0\% | 86.7\% | 87.0\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 27.8\% | 25.4\% | 23.1\% | 21.6\% | 21.8\% | 86.5\% | 88.7\% | 88.3\% | 88.5\% | 88.5\% |
|  |  |  | $5$ | 36.1\% | 30.3\% | 26.4\% | 25.8\% | 23.5\% | 87.6\% | 87.0\% | 87.6\% | 87.9\% | 88.6\% |
|  |  |  | 10 | 43.3\% | 36.4\% | 30.7\% | 27.4\% | 26.3\% | 85.4\% | 86.8\% | 87.5\% | 87.4\% | 87.5\% |
| $\begin{aligned} & \beta_{1}= \\ & 0.444 \end{aligned}$ | $\mathrm{T}^{\mathbf{2}}=0$ | $\boldsymbol{y}$$\stackrel{\rightharpoonup}{0}$$\pm$0 | 0 | 93.2\% | 93.7\% | 94.0\% | 94.1\% | 93.6\% | 94.7\% | 94.7\% | 95.0\% | 94.9\% | 94.9\% |
|  |  |  | 5 | 91.3\% | 92.2\% | 91.7\% | 91.9\% | 92.7\% | 92.8\% | 93.2\% | 93.0\% | 93.0\% | 93.5\% |
|  |  |  | 10 | 88.6\% | 87.8\% | 89.2\% | 89.8\% | 90.3\% | 89.4\% | 89.0\% | 90.0\% | 91.1\% | 91.1\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | 63.2\% | 58.6\% | 57.7\% | 54.1\% | 53.4\% | 89.9\% | 89.6\% | 90.4\% | 90.0\% | 91.3\% |
|  |  | Number of Missing S | 5 | 66.9\% | 59.1\% | 57.7\% | 55.7\% | 53.2\% | 85.0\% | 85.5\% | 87.0\% | 88.3\% | 88.3\% |
|  |  |  | 10 | 69.9\% | 62.3\% | 58.4\% | 55.9\% | 53.6\% | 81.7\% | 81.2\% | 82.5\% | 84.1\% | 84.9\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | 44.8\% | 40.9\% | 39.8\% | 35.6\% | 34.3\% | 88.9\% | 89.4\% | 89.7\% | 89.0\% | 88.8\% |
|  |  |  | 5 | 51.6\% | 44.3\% | 39.4\% | 38.2\% | 37.1\% | 85.9\% | 86.3\% | 86.9\% | 87.6\% | 88.2\% |
|  |  |  | 10 | 59.0\% | 50.0\% | 44.4\% | 40.1\% | 36.5\% | 81.6\% | 83.2\% | 85.2\% | 86.0\% | 86.0\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 27.0\% | 25.6\% | 24.0\% | 23.0\% | 20.9\% | 87.8\% | 87.7\% | 88.1\% | 87.8\% |  |
|  |  |  | 5 | 35.2\% | 29.9\% | 27.1\% | 23.9\% | 22.3\% | 85.5\% | 87.0\% | 86.9\% | 87.3\% | 87.9\% |
|  |  |  | 10 | 43.4\% | 34.1\% | 30.1\% | 27.4\% | 25.6\% | 84.0\% | 85.1\% | 85.8\% | 86.4\% | 86.1\% |

Table E13. Relative bias in the estimated slope, with no correction for publication bias (from 1-dimensional algorithmic variant)

| No Correction for Publication Bias |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.049 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 2.2\% | -4.4\% | -3.8\% | -0.8\% | -1.3\% | 3.0\% | -4.5\% | -3.8\% | -0.2\% | -1.3\% |
|  |  |  | 5 | -17.1\% | -10.1\% | -8.5\% | -1.9\% | -5.6\% | -17.7\% | -10.6\% | -8.7\% | -2.7\% | -6.3\% |
|  |  |  | 10 | -61.1\% | -29.6\% | -19.0\% | -17.9\% | -6.1\% | -60.9\% | -30.3\% | -19.6\% | -18.0\% | -6.1\% |
|  |  |  | 0 | 0.5\% | -14.2\% | 6.2\% | 2.9\% | -8.2\% | -0.7\% | -15.2\% | -3.6\% | 4.0\% | -8.1\% |
|  |  |  | 5 | -39.0\% | -15.4\% | -9.5\% | -13.2\% | -4.0\% | -39.3\% | -22.5\% | -21.3\% | -12.2\% | -7.6\% |
|  |  |  | 10 | -81.2\% | -40.7\% | -39.9\% | -24.4\% | -19.1\% | -79.3\% | -44.7\% | -39.3\% | -21.9\% | -20.1\% |
|  |  |  | 0 | 37.6\% | 16.0\% | 2.5\% | -6.3\% | 13.8\% | 20.3\% | 4.6\% | -5.4\% | 1.3\% | 4.0\% |
|  | $\begin{aligned} & \mathrm{T}^{\top}= \\ & 0.148 \end{aligned}$ |  | 5 | -37.0\% | -32.8\% | -34.3\% | -16.3\% | -5.1\% | -35.3\% | -28.7\% | -23.3\% | -19.5\% | -19.5\% |
|  |  |  | 10 | -66.9\% | -44.6\% | -43.4\% | -39.6\% | -44.8\% | -54.3\% | -54.7\% | -37.7\% | -40.8\% | -35.6\% |
|  |  |  | 0 | -17.0\% | 27.8\% | 16.8\% | -42.0\% | -6.5\% | -18.8\% | 20.3\% | -21.0\% | -8.9\% | 2.2\% |
|  | $\begin{aligned} & \mathrm{T}^{-}= \\ & 0.444 \end{aligned}$ |  | 5 | -39.6\% | -5.0\% | -40.8\% | -26.6\% | 7.6\% | -17.2\% | -23.2\% | -51.1\% | -23.5\% | -14.8\% |
|  |  |  | 10 | -18.3\% | -19.0\% | -52.8\% | -13.0\% | -16.1\% | -56.2\% | -36.8\% | -54.9\% | -40.9\% | -17.3\% |
| $\begin{gathered} \beta_{1}= \\ 0.074 \end{gathered}$ |  | Number of Missing Studies | 0 | -2.0\% | 1.4\% | 2.0\% | -0.7\% | -0.6\% | -1.5\% | 0.7\% | 2.0\% | -0.9\% | -0.4\% |
|  | $\mathrm{T}^{\mathbf{2}}=0$ |  | 5 | -24.1\% | -10.1\% | -5.7\% | -4.8\% | -3.0\% | -25.0\% | -10.8\% | -6.3\% | -5.7\% | -3.5\% |
|  |  |  | 10 | -63.1\% | -31.2\% | -18.5\% | -14.9\% | -11.1\% | -63.1\% | -31.8\% | -19.0\% | -15.3\% | -11.5\% |
|  |  |  | 0 | 1.0\% | -7.8\% | -1.9\% | -1.6\% | 1.4\% | 1.8\% | -3.8\% | 1.1\% | 0.2\% | -5.1\% |
|  |  |  | 5 | -24.3\% | -23.4\% | -19.9\% | -16.9\% | -5.6\% | -25.5\% | -21.8\% | -21.2\% | -16.5\% | -8.9\% |
|  |  |  | 10 | -63.0\% | -48.7\% | -33.6\% | -27.9\% | -23.3\% | -66.2\% | -48.2\% | -34.6\% | -33.3\% | -24.6\% |
|  |  |  | 0 | -8.4\% | 1.5\% | -3.7\% | 3.6\% | -6.4\% | -7.8\% | 4.5\% | -4.9\% | -0.9\% | 4.4\% |
|  | $\begin{aligned} & \mathrm{T}^{\mathrm{T}}= \\ & 0.148 \end{aligned}$ |  | 5 | -28.5\% | -24.7\% | -16.9\% | -27.8\% | -14.0\% | -33.0\% | -28.1\% | -18.2\% | -29.8\% | -20.4\% |
|  |  |  | 10 | -61.8\% | -52.4\% | -44.8\% | -22.8\% | -28.5\% | -63.0\% | -52.3\% | -40.1\% | -30.4\% | -33.5\% |
|  |  |  | 0 | 23.9\% | 30.6\% | -28.2\% | 3.0\% | -8.4\% | 26.6\% | 12.0\% | -1.4\% | 16.7\% | -0.5\% |
|  | $\begin{aligned} & \mathrm{T}= \\ & 0.444 \end{aligned}$ |  | 5 | -31.4\% | -14.2\% | -26.4\% | -23.1\% | -2.7\% | -31.5\% | -26.8\% | -22.7\% | -30.4\% | -18.9\% |
|  |  |  | 10 | -49.0\% | -56.0\% | -50.7\% | -40.3\% | -22.7\% | -50.5\% | -49.3\% | -41.3\% | -48.4\% | -27.2\% |
| $\begin{gathered} \beta_{1}= \\ 0.148 \end{gathered}$ |  | sə!pnłs 6u!ss!̣ ło ءəqunn | 0 | -1.0\% | -0.9\% | -0.5\% | -1.2\% | 0.9\% | -0.5\% | -0.8\% | -0.4\% | -1.2\% | 0.6\% |
|  | $\mathrm{T}^{\mathbf{2}}=0$ |  | 5 | -18.5\% | -9.8\% | -7.4\% | -5.2\% | -5.0\% | -18.7\% | -10.3\% | -7.6\% | -5.5\% | -5.3\% |
|  |  |  | 10 | -56.3\% | -30.4\% | -21.0\% | -14.2\% | -11.1\% | -56.9\% | -30.5\% | -21.5\% | -14.6\% | -11.3\% |
|  |  |  | 0 | 2.1\% | 3.9\% | -0.9\% | -0.6\% | 1.0\% | 1.2\% | 4.9\% | -1.0\% | -1.1\% | 0.9\% |
|  | $\begin{aligned} & \mathrm{T}^{2}= \\ & 0.049 \end{aligned}$ |  | 5 | -28.9\% | -18.4\% | -18.1\% | -11.4\% | -8.8\% | -29.8\% | -24.7\% | -20.9\% | -16.0\% | -12.4\% |
|  |  |  | 10 | -53.7\% | -40.6\% | -33.2\% | -27.7\% | -20.6\% | -54.6\% | -41.3\% | -36.1\% | -32.9\% | -24.8\% |
|  |  |  | 0 | 3.7\% | -3.5\% | -8.0\% | -1.4\% | -5.1\% | 0.0\% | -0.7\% | -3.1\% | -2.7\% | -3.7\% |
|  | $\begin{aligned} & \mathrm{T}^{2}= \\ & 0.148 \end{aligned}$ |  | 5 | -29.8\% | -35.0\% | -23.6\% | -24.7\% | -16.2\% | -31.2\% | -30.9\% | -26.7\% | -26.4\% | -17.4\% |
|  |  |  | 10 | -49.1\% | -42.0\% | -36.6\% | -29.2\% | -33.1\% | -54.4\% | -42.0\% | -42.1\% | -34.9\% | -32.2\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | -1.9\% | 3.1\% | -6.1\% | -0.8\% | 0.9\% | 0.7\% | 1.8\% | -3.3\% | -7.1\% | -4.0\% |
|  |  |  | 5 | -39.7\% | -26.7\% | -19.3\% | -25.7\% | -19.7\% | -38.5\% | -27.6\% | -27.0\% | -24.9\% | -21.5\% |
|  |  |  | 10 | -67.3\% | -52.1\% | -38.3\% | -41.2\% | -24.7\% | -62.0\% | -55.5\% | -44.5\% | -35.7\% | -32.4\% |

Table E13. Relative bias in the estimated slope, with no correction for publication bias (from 1-dimensional algorithmic variant) (continued)

| No Correction for Publication Bias |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.296 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 0.2\% | 0.7\% | 0.2\% | 0.0\% | 0.4\% | 0.1\% | 0.7\% | 0.2\% | 0.1\% | 0.4\% |
|  |  |  | 5 | -17.9\% | -10.1\% | -7.7\% | -5.4\% | -4.1\% | -18.5\% | -10.6\% | -8.0\% | -5.7\% | -4.2\% |
|  |  |  | 10 | -56.7\% | -29.7\% | -18.9\% | -13.1\% | -9.7\% | -57.1\% | -30.2\% | -19.3\% | -13.4\% | -10.0\% |
|  |  |  | 0 | -1.5\% | -1.0\% | -0.4\% | -1.3\% | 2.2\% | -1.5\% | -0.5\% | -0.3\% | 1.1\% | 1.7\% |
|  |  |  | 5 | -29.5\% | -21.0\% | -14.2\% | -13.4\% | -8.3\% | -31.5\% | -24.5\% | -16.6\% | -17.0\% | -12.9\% |
|  |  |  | 10 | -55.8\% | -42.5\% | -32.8\% | -27.7\% | -22.4\% | -56.5\% | -43.0\% | -35.0\% | -31.0\% | -26.1\% |
|  |  |  | 0 | -0.3\% | 4.1\% | 0.5\% | -2.4\% | -3.1\% | 0.1\% | 2.4\% | 0.9\% | -2.1\% | -0.5\% |
|  | $\begin{aligned} & \mathbf{T}^{2}= \\ & 0.148 \end{aligned}$ |  | 5 | -33.4\% | -21.7\% | -21.6\% | -20.2\% | -14.9\% | -35.5\% | -27.4\% | -25.2\% | -22.0\% | -18.5\% |
|  |  |  | 10 | -55.8\% | -47.3\% | -38.4\% | -31.7\% | -26.9\% | -55.6\% | -47.2\% | -39.6\% | -34.2\% | -31.4\% |
|  |  |  | 0 | 5.1\% | -5.5\% | -2.0\% | -0.6\% | -3.5\% | 3.1\% | -4.4\% | -0.8\% | 0.1\% | -1.9\% |
|  | $0.444$ |  | 5 | -43.2\% | -27.5\% | -29.4\% | -25.5\% | -20.7\% | -42.8\% | -31.7\% | -28.4\% | -26.7\% | -22.1\% |
|  |  |  | 10 | -55.4\% | -44.0\% | -41.6\% | -36.8\% | -34.1\% | -54.0\% | -42.1\% | -43.4\% | -38.6\% | -33.9\% |
| $\begin{gathered} \beta_{1}= \\ 0.444 \end{gathered}$ |  |  | 0 | -0.1\% | 0.1\% | -0.5\% | 0.5\% | 0.2\% | -0.1\% | 0.1\% | -0.6\% | 0.5\% | 0.0\% |
|  | $\mathrm{T}^{2}=0$ |  | 5 | -18.0\% | -10.1\% | -6.9\% | -5.3\% | -4.1\% | -18.7\% | -10.5\% | -7.3\% | -5.6\% | -4.4\% |
|  |  |  | 10 | -49.2\% | -28.5\% | -18.7\% | -12.9\% | -9.4\% | -49.8\% | -28.9\% | -19.1\% | -13.3\% | -9.6\% |
|  |  |  | 0 | -1.2\% | -0.9\% | 0.2\% | 0.5\% | 0.1\% | -0.7\% | -0.7\% | 0.8\% | 0.1\% | 0.0\% |
|  | $\mathbf{T}^{2}=$ <br> 0.049 |  | 5 | -29.3\% | -20.3\% | -14.3\% | -11.0\% | -9.8\% | -30.1\% | -23.4\% | -17.9\% | -14.8\% | -13.0\% |
|  |  |  | 10 | -54.5\% | -40.1\% | -31.6\% | -25.6\% | -20.3\% | -54.7\% | -41.8\% | -34.1\% | -29.1\% | -24.2\% |
|  |  |  | 0 | -1.2\% | -1.6\% | 1.7\% | 0.1\% | 1.9\% | 0.0\% | -1.0\% | 0.4\% | -1.2\% | -0.2\% |
|  | $\begin{aligned} & \mathrm{T}^{2}= \\ & 0.148 \end{aligned}$ |  | 5 | -35.0\% | -24.6\% | -21.5\% | -16.3\% | -12.1\% | -35.1\% | -27.6\% | -25.9\% | -20.3\% | -16.8\% |
|  |  |  | 10 | -55.3\% | -43.2\% | -38.9\% | -31.9\% | -28.9\% | -55.8\% | -46.1\% | -40.2\% | -34.7\% | -31.1\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | -4.1\% | 1.7\% | 0.4\% | 0.8\% | 2.0\% | -1.7\% | 1.2\% | 0.8\% | 0.4\% | 0.5\% |
|  |  |  | 5 | -36.1\% | -29.1\% | -24.7\% | -18.8\% | -17.2\% | -40.4\% | -31.2\% | -26.3\% | -23.4\% | -19.6\% |
|  |  |  | 10 | -55.3\% | -44.4\% | -40.2\% | -35.0\% | -31.4\% | -55.4\% | -47.3\% | -41.7\% | -34.6\% | -33.8\% |

Table E14. Relative bias in the estimated slope, with $R$ studies imputed (from 1-dimensional algorithmic variant)

| R Missing Studies Imputed |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 |  | 45 | 55 | 65 |
| $\begin{gathered} \boldsymbol{\beta}_{1}= \\ 0.049 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 2.8\% | -3.8\% | -2.5\% | -0.6\% | -1.0\% | 4.9\% | -3.8\% | -1.6\% | 0.0\% | -0.6\% |
|  |  |  | 5 | -15.6\% | -5.4\% | -4.5\% | 2.5\% | -2.1\% | -14.7\% | -4.7\% | -3.6\% | 2.6\% | -2.5\% |
|  |  |  | 10 | -31.8\% | -18.8\% | -15.0\% | -12.6\% | 1.3\% | -30.4\% | -18.1\% | -14.6\% | -12.0\% | 2.1\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | -1.0\% | -11.3\% | 5.6\% | 3.5\% | -7.9\% | -0.4\% | -12.3\% | -2.5\% | 6.9\% | -6.7\% |
|  |  |  | 5 | -27.7\% | -12.1\% | -6.7\% | -7.6\% | 3.1\% | -23.2\% | -10.7\% | -12.8\% | 0.3\% | 6.9\% |
|  |  |  | 10 | -56.4\% | -22.7\% | -23.4\% | -11.2\% | -10.5\% | -51.9\% | -21.0\% | -19.0\% | -3.4\% | -2.7\% |
|  | $\begin{gathered} \mathrm{r}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | 28.6\% | 18.5\% | 2.3\% | -1.5\% | 15.8\% | 16.7\% | 10.3\% | -0.4\% | 9.5\% | 8.7\% |
|  |  |  | 5 | -37.2\% | -26.8\% | -22.1\% | -7.9\% | -3.3\% | -18.6\% | -12.9\% | -6.6\% | 4.6\% | -6.7\% |
|  |  |  | 10 | -49.2\% | -35.2\% | -34.1\% | -27.8\% | -37.3\% | -37.5\% | -34.5\% | -23.9\% | -19.4\% | -21.1\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | -14.9\% | 35.8\% | 13.5\% | -40.0\% | -5.3\% | -19.2\% | 28.8\% | -15.1\% | -8.0\% | 6.5\% |
|  |  |  | 5 | -13.1\% | -7.9\% | -37.7\% | -23.6\% | 18.4\% | -0.1\% | -12.4\% | -46.7\% | -7.7\% | -0.9\% |
|  |  |  | 10 | -15.5\% | -8.6\% | -28.3\% | -6.0\% | -10.8\% | -42.2\% | -10.1\% | -30.1\% | -20.7\% | 11.3\% |
| $\begin{gathered} \beta_{1}= \\ 0.074 \end{gathered}$ | $\mathrm{T}^{\mathbf{2}}=0$ |  | 0 | -1.6\% | 2.4\% | 2.5\% | -0.1\% | -0.5\% | -0.4\% | 2.2\% | 2.8\% | -0.1\% | -0.2\% |
|  |  |  | 5 | -18.5\% | -4.5\% | -1.9\% | -1.3\% | -0.3\% | -18.5\% | -3.7\% | -1.3\% | -2.4\% | -0.3\% |
|  |  |  | 10 | -36.3\% | -20.6\% | -12.3\% | -9.8\% | -5.3\% | -33.4\% | -19.2\% | -12.4\% | -9.5\% | -5.8\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | 1.1\% | -7.7\% | -1.1\% | -1.1\% | 1.4\% | 4.6\% | -2.4\% | 4.2\% | 2.0\% | -3.4\% |
|  |  |  | 5 | -11.8\% | -15.4\% | -14.7\% | -14.1\% | -3.2\% | -8.6\% | -5.1\% | -9.2\% | -4.9\% | -1.0\% |
|  |  |  | 10 | -44.9\% | -39.1\% | -22.9\% | -15.5\% | -11.9\% | -43.2\% | -32.5\% | -17.7\% | -14.4\% | -6.2\% |
|  |  |  | 0 | -11.2\% | 2.6\% | -3.6\% | 2.6\% | -5.6\% | -4.6\% | 8.0\% | -0.2\% | 1.8\% | 7.0\% |
|  | $0.148$ |  | 5 | -17.0\% | -17.9\% | -6.0\% | -21.7\% | -5.2\% | -15.8\% | -10.9\% | -2.1\% | -16.5\% | -6.0\% |
|  |  |  | 10 | -45.2\% | -41.4\% | -27.8\% | -10.2\% | -16.4\% | -43.5\% | -37.3\% | -18.4\% | -10.5\% | -11.9\% |
|  |  |  | 0 | 32.0\% | 28.0\% | -23.9\% | 9.6\% | -8.9\% | 45.9\% | 20.0\% | 3.8\% | 23.4\% | 5.1\% |
|  | $\begin{aligned} & \mathrm{T}^{2}= \\ & 0.444 \end{aligned}$ |  | 5 | -23.0\% | 4.7\% | -23.1\% | -7.3\% | 2.5\% | -11.5\% | 1.9\% | -3.3\% | -13.7\% | -10.7\% |
|  |  |  | 10 | -35.5\% | -37.6\% | -43.3\% | -16.8\% | -19.6\% | -29.3\% | -29.3\% | -23.2\% | -23.4\% | -7.4\% |
| $\begin{gathered} \beta_{1}= \\ 0.148 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 0.0\% | -0.4\% | -0.3\% | -0.8\% | 1.0\% | 1.2\% | 0.1\% | 0.1\% | -0.6\% | 0.9\% |
|  |  |  | 5 | -14.1\% | -5.1\% | -3.3\% | -2.5\% | -2.5\% | -11.6\% | -4.8\% | -2.7\% | -2.2\% | -2.2\% |
|  |  |  | 10 | -31.6\% | -18.4\% | -12.6\% | -8.4\% | -5.4\% | -30.3\% | -16.9\% | -12.1\% | -7.9\% | -5.0\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | 1.1\% | 4.6\% | -0.2\% | -0.6\% | 1.4\% | 2.9\% | 7.5\% | 1.3\% | 0.4\% | 2.5\% |
|  |  |  | 5 | -20.1\% | -13.4\% | -12.3\% | -6.2\% | -3.8\% | -15.4\% | -12.5\% | -8.7\% | -3.4\% | -1.3\% |
|  |  |  | 10 | -38.2\% | -27.3\% | -23.8\% | -19.9\% | -13.4\% | -34.3\% | -21.8\% | -19.6\% | -16.6\% | -9.3\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | 1.4\% | -2.3\% | -7.6\% | -0.1\% | -4.2\% | 4.1\% | 3.3\% | 1.7\% | 1.0\% | -0.9\% |
|  |  |  | 5 | -19.7\% | -23.5\% | -16.1\% | -19.4\% | -8.8\% | -14.4\% | -12.6\% | -10.7\% | -13.4\% | -4.4\% |
|  |  |  | 10 | -34.2\% | -24.1\% | -22.7\% | -20.3\% | -22.7\% | -33.0\% | -15.3\% | -20.7\% | -15.1\% | -14.3\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | -0.8\% | 7.4\% | -3.1\% | 1.6\% | 3.2\% | 6.1\% | 8.1\% | 1.7\% | -1.3\% | 1.1\% |
|  |  |  | 5 | -30.1\% | -14.9\% | -10.7\% | -20.4\% | -16.3\% | -23.9\% | -6.4\% | -12.9\% | -9.9\% | -6.8\% |
|  |  |  | 10 | -58.7\% | -40.3\% | -24.6\% | -28.6\% | -14.0\% | -45.1\% | -37.9\% | -20.8\% | -13.9\% | -12.2\% |

Table E14. Relative bias in the estimated slope, with R studies imputed (from 1-dimensional algorithmic variant) (continued)
R Missing Studies Imputed Fixed Effects in the Final Model Random Effects in the Final Model


Table E15. Relative bias in the estimated slope, with $L$ studies imputed (from 1-dimensional algorithmic variant)

| L Missing Studies Imputed |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.049 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 0.6\% | -3.3\% | -3.4\% | -0.6\% | -0.8\% | 2.6\% | -2.9\% | -2.6\% | 0.6\% | 0.0\% |
|  |  |  | 5 | -16.3\% | -7.2\% | -6.5\% | 0.4\% | -4.0\% | -15.7\% | -6.3\% | -5.6\% | 0.0\% | -4.3\% |
|  |  |  | 10 | -36.0\% | -19.8\% | -15.2\% | -14.3\% | -1.8\% | -34.4\% | -19.7\% | -15.2\% | -13.8\% | -0.9\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | 0.4\% | -8.6\% | 3.2\% | 4.3\% | -9.0\% | 3.3\% | -8.2\% | -1.6\% | 9.7\% | -3.4\% |
|  |  |  | 5 | -31.7\% | -14.1\% | -8.2\% | -9.0\% | 0.8\% | -25.1\% | -14.8\% | -12.6\% | -1.8\% | 4.6\% |
|  |  |  | 10 | -63.3\% | -26.8\% | -27.7\% | -14.2\% | -13.0\% | -58.7\% | -24.0\% | -19.6\% | -5.0\% | -5.7\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | 29.0\% | 12.9\% | 3.6\% | -1.3\% | 18.2\% | 17.1\% | 11.8\% | 5.8\% | 13.2\% | 11.5\% |
|  |  |  | 5 | -35.1\% | -28.6\% | -23.7\% | -11.5\% | -7.6\% | -21.2\% | -14.0\% | -5.4\% | 0.2\% | -10.1\% |
|  |  |  | 10 | -58.3\% | -35.8\% | -33.4\% | -34.4\% | -38.7\% | -41.7\% | -36.2\% | -25.5\% | -28.6\% | -24.1\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | -13.1\% | 37.3\% | 3.6\% | -46.0\% | 0.7\% | -11.7\% | 35.9\% | -17.0\% | -3.6\% | 15.4\% |
|  |  |  | 5 | -22.9\% | -13.0\% | -42.4\% | -22.1\% | 13.5\% | -7.1\% | -17.6\% | -50.3\% | -9.5\% | -6.0\% |
|  |  |  | 10 | -23.6\% | -10.9\% | -38.9\% | -9.8\% | -16.6\% | -49.8\% | -16.0\% | -35.9\% | -27.5\% | 1.2\% |
| $\begin{gathered} \beta_{1}= \\ 0.074 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | -2.5\% | 1.4\% | 2.6\% | -0.1\% | -0.7\% | -1.0\% | 1.3\% | 3.9\% | 0.2\% | -0.3\% |
|  |  |  | 5 | -18.9\% | -6.7\% | -4.0\% | -3.0\% | -1.9\% | -19.4\% | -6.2\% | -3.3\% | -3.8\% | -1.7\% |
|  |  |  | 10 | -39.9\% | -21.1\% | -14.8\% | -11.7\% | -7.7\% | -36.1\% | -20.0\% | -14.9\% | -11.4\% | -8.3\% |
|  | $\begin{gathered} \mathrm{r}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | 0.8\% | -4.9\% | -2.4\% | 2.1\% | 2.4\% | 7.0\% | 0.6\% | 4.0\% | 6.1\% | -1.0\% |
|  |  |  | 5 | -15.2\% | -16.4\% | -14.7\% | -13.5\% | -4.0\% | -10.3\% | -6.9\% | -9.9\% | -5.2\% | -1.3\% |
|  |  |  | 10 | -48.9\% | -41.5\% | -24.3\% | -19.1\% | -15.4\% | -45.4\% | -34.8\% | -19.4\% | -17.5\% | -10.1\% |
|  |  |  | 0 | -7.7\% | 5.3\% | -4.8\% |  | -3.1\% | -0.3\% | 10.9\% |  |  |  |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ \mathbf{1}^{148} \end{gathered}$ |  | 5 | -22.0\% | -21.1\% | -9.2\% | -20.1\% | -7.6\% | -21.8\% | -13.4\% | -3.2\% | -17.0\% | -7.9\% |
|  |  |  | 10 | -47.5\% | -45.6\% | -34.7\% | -10.9\% | -19.0\% | -45.2\% | -40.6\% | -24.9\% | -13.2\% | -15.4\% |
|  |  |  | 0 | 29.7\% | 35.3\% | -24.4\% | 9.4\% | -12.3\% | 43.7\% | 24.2\% | 10.1\% | 29.0\% | 8.0\% |
|  |  |  | 5 | -23.5\% | 2.2\% | -21.9\% | -15.0\% | -1.6\% | -10.8\% | -2.8\% | -5.1\% | -18.5\% | -13.4\% |
|  |  |  | 10 | -38.7\% | -46.8\% | -45.2\% | -27.0\% | -19.2\% | -36.1\% | -38.3\% | -26.2\% | -29.3\% | -8.5\% |
| $\begin{gathered} \beta_{1}= \\ 0.148 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 0.0\% | -0.6\% | -0.4\% | -1.1\% | 1.1\% | 1.6\% | 0.8\% | 0.8\% | -0.4\% | 1.8\% |
|  |  |  | 5 | -14.5\% | -6.8\% | -5.2\% | -3.6\% | -3.6\% | -12.3\% | -6.4\% | -4.5\% | -3.2\% | -2.9\% |
|  |  |  | 10 | -34.0\% | -19.7\% | -14.5\% | -10.3\% | -7.3\% | -32.4\% | -18.3\% | -14.2\% | -10.1\% | -6.8\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 |  |  |  |  |  |  | 10.7\% |  | 4.8\% | 6.3\% |
|  |  |  | 5 | -21.4\% | -14.0\% | -13.1\% | -6.9\% | -4.3\% | -16.1\% | -13.3\% | -10.0\% | -4.4\% | -2.0\% |
|  |  |  | 10 | -40.8\% | -29.5\% | -24.7\% | -20.9\% | -14.7\% | -37.1\% | -23.9\% | -20.6\% | -18.5\% | -10.8\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | 3.2\% | -1.2\% | -7.5\% | 0.9\% | -1.0\% | 8.2\% | 7.7\% | 6.2\% | 6.5\% | 3.9\% |
|  |  |  | 5 | -22.0\% | -24.3\% | $-17.5 \%$ | $-19.8 \%$ | -9.8\% | -16.4\% | -14.1\% | $-12.2 \%$ | $-14.1 \%$ | $-5.3 \%$ |
|  |  |  | 10 | -38.3\% | -28.3\% | -28.2\% | -23.2\% | -25.4\% | -37.1\% | -19.0\% | -24.8\% | -18.1\% | -17.8\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | -1.8\% | 6.0\% | -2.2\% | 3.6\% | 1.4\% | 10.2\% | 13.3\% | 3.4\% | 4.1\% | 7.4\% |
|  |  |  | 5 | -32.7\% | -17.6\% | -9.9\% | -22.4\% | -16.3\% | -24.8\% | -8.8\% | -12.8\% | -12.7\% | -9.2\% |
|  |  |  | 10 | -60.9\% | -45.9\% | -27.9\% | -35.5\% | -17.7\% | -49.0\% | -42.4\% | -25.4\% | -20.8\% | -17.5\% |

Table E15. Relative bias in the estimated slope, with $L$ studies imputed (from 1-dimensional algorithmic variant) (continued)

| L Missing Studies Imputed |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.296 \end{gathered}$ | $\mathrm{T}^{2}=0$ | Number of Missing Studies | 0 | 0.3\% | 1.0\% | 0.7\% | 0.3\% | 0.8\% | 1.3\% | 2.0\% | 1.9\% | 1.4\% | 1.7\% |
|  |  |  | 5 | -14.1\% | -7.2\% | -5.5\% | -3.5\% | -2.1\% | -12.7\% | -6.2\% | -4.5\% | -2.9\% | -1.2\% |
|  |  |  | 10 | -36.3\% | -20.2\% | -12.7\% | -8.7\% | -6.2\% | -34.8\% | -19.5\% | -12.1\% | -8.0\% | -5.5\% |
|  |  |  | 0 | -0.8\% | 0.0\% | 0.6\% | 0.3\% | 3.5\% | 3.0\% | 4.8\% | 4.5\% | 7.2\% | 7.7\% |
|  | $\begin{aligned} & \mathrm{T}^{2}= \\ & 0.049 \end{aligned}$ |  | 5 | -22.5\% | -15.5\% | -10.5\% | -9.1\% | -4.2\% | -18.9\% | -13.3\% | -6.3\% | -6.7\% | -2.8\% |
|  |  |  | 10 | -41.0\% | -31.3\% | -24.0\% | -20.5\% | -15.9\% | -36.8\% | -25.2\% | -19.7\% | -17.7\% | -12.8\% |
|  |  |  | 0 | 0.1\% | 5.9\% | 2.6\% | 0.0\% | -1.1\% | 5.8\% | 10.2\% | 9.0\% | 5.9\% | 7.1\% |
|  |  |  | 5 | -27.9\% | -17.1\% | -17.7\% | -15.4\% | -10.7\% | -23.5\% | -15.2\% | -13.0\% | -9.6\% | -6.0\% |
|  |  |  | 10 | -43.3\% | -37.4\% | -30.1\% | -23.2\% | -19.5\% | -36.3\% | -30.0\% | -23.3\% | -17.6\% | -16.0\% |
|  |  |  | 0 | 6.5\% | -5.7\% | -0.2\% | 1.0\% | 0.5\% | 10.5\% | 2.7\% | 8.1\% | 7.9\% | 7.0\% |
|  | $\mathrm{T}^{2}=$ <br> 0.444 |  | 5 | -37.3\% | -22.1\% | -23.4\% | -17.7\% | -15.1\% | -27.6\% | -20.2\% | -14.4\% | -13.1\% | -8.8\% |
|  |  |  | 10 | -46.3\% | -34.9\% | -35.0\% | -28.0\% | -25.6\% | -38.8\% | -26.2\% | -28.2\% | -22.4\% | -18.6\% |
| $\begin{gathered} \beta_{1}= \\ 0.444 \end{gathered}$ |  | Number of Missing Studies | 0 | 0.1\% | 0.6\% | 0.1\% | 1.1\% | 0.8\% | 1.6\% | 1.9\% | 1.4\% | 2.4\% | 2.0\% |
|  | $\mathrm{T}^{\mathbf{2}}=0$ |  | 5 | -13.6\% | -6.8\% | -4.3\% | -2.9\% | -1.9\% | -12.3\% | -5.4\% | -2.9\% | -1.7\% | -0.8\% |
|  |  |  | 10 | -33.3\% | -19.2\% | -12.6\% | -7.9\% | -4.8\% | -32.1\% | -18.2\% | -11.5\% | -7.1\% | -3.8\% |
|  |  |  | 0 | 0.0\% | 0.3\% | 1.8\% | 2.5\% | 1.9\% | 4.3\% | 5.0\% | 6.8\% | 6.4\% | 5.9\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0 \times \Delta 9 \end{gathered}$ |  | 5 | -22.7\% | -15.4\% | -9.9\% | -6.5\% | -5.6\% | -17.6\% | -12.2\% | -7.0\% | -4.7\% | -2.9\% |
|  |  |  | 10 | -41.4\% | -29.7\% | -22.5\% | -18.1\% | -13.9\% | -36.8\% | -25.3\% | -18.6\% | -14.9\% | -10.9\% |
|  |  |  | 0 | -0.3\% | -0.5\% | 2.5\% | 2.5\% | 3.9\% | 6.7\% | 5.6\% | 7.3\% | 6.5\% | 8.0\% |
|  | $\begin{aligned} & \mathrm{T}^{2}= \\ & 0.148 \end{aligned}$ |  | 5 | -27.9\% | -18.1\% | -16.3\% | -11.0\% | -7.4\% | -21.1\% | -13.8\% | -13.6\% | -7.2\% | -5.0\% |
|  |  |  | 10 | -43.7\% | -34.2\% | -29.3\% | -24.1\% | -21.2\% | -38.0\% | -29.7\% | -22.9\% | -19.2\% | -15.3\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | -3.6\% | 3.5\% | 2.5\% | 3.4\% | 4.4\% | 6.7\% | 9.8\% | 9.5\% | 9.8\% | 10.3\% |
|  |  |  | 5 | -29.5\% | -22.5\% | -18.6\% | -14.9\% | -12.4\% | -25.4\% | -16.7\% | -12.8\% | -10.3\% | -6.6\% |
|  |  |  | 10 | -47.4\% | -35.9\% | -31.5\% | -26.5\% | -23.5\% | -38.8\% | -30.9\% | -25.3\% | -18.8\% | -18.6\% |

Table E16. Mean number of imputed studies, with $R$ studies imputed (from 1-dimensional algorithmic variant)

| R Missing Studies Imputed |  |  |  | Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  |  |  |  |  |  |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.049 \end{gathered}$ |  | sə!pnłs 6u!ss!w ło лəqunN | 0 | 0.519 | 0.482 | 0.495 | 0.507 | 0.495 |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 4.757 | 5.040 | 4.978 | 5.035 | 4.970 |
|  |  |  | 10 | 6.601 | 9.086 | 9.834 | 9.970 | 9.889 |
|  |  |  | 0 | 0.842 | 0.775 | 0.716 | 0.728 | 0.727 |
|  | $\begin{aligned} & \mathbf{T}^{2}= \\ & 0.049 \end{aligned}$ |  | 5 | 4.505 | 5.644 | 6.183 | 6.472 | 6.493 |
|  |  |  | 10 | 4.434 | 7.498 | 9.423 | 10.812 | 11.790 |
|  | $\mathrm{T}^{2}=$ |  | 0 | 1.255 | 1.354 | 1.304 | 1.186 | 1.103 |
|  |  |  | 5 | 4.254 | 5.515 | 6.594 | 7.365 | 7.497 |
|  |  |  | 10 | 3.833 | 6.373 | 8.618 | 10.313 | 11.433 |
|  | $\mathrm{T}^{2}=$ |  | 0 | 1.673 | 1.868 | 1.968 | 2.151 | 1.904 |
|  |  |  | 5 | 3.959 | 5.484 | 6.872 | 7.507 | 8.167 |
|  |  |  | 10 | 3.259 | 5.792 | 7.908 | 9.676 | 11.325 |
| $\begin{gathered} \beta_{1}= \\ 0.074 \end{gathered}$ |  |  | 0 | 0.535 | 0.526 | 0.509 | 0.483 | 0.492 |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 4.767 | 4.967 | 4.914 | 5.091 | 5.054 |
|  |  |  | 10 | 6.523 | 8.990 | 9.808 | 9.936 | 9.981 |
|  |  |  | 0 | 0.854 | 0.816 | 0.819 | 0.726 | 0.752 |
|  |  |  | 5 | 4.605 | 5.648 | 6.172 | 6.525 | 6.703 |
|  |  |  | 10 | 4.519 | 7.411 | 9.662 | 10.660 | 11.961 |
|  |  |  | 0 | 1.244 | 1.239 | 1.327 | 1.220 | 1.184 |
|  | $\begin{aligned} & \mathbf{T}^{-}= \end{aligned}$ |  | 5 | 4.132 | 5.774 | 6.778 | 7.384 | 7.562 |
|  |  |  | 10 | 3.806 | 6.543 | 8.605 | 10.105 | 11.595 |
|  |  |  | 0 | 1.706 | 1.741 | 1.984 | 2.121 | 1.996 |
|  | $0.444$ |  | 5 | 3.742 | 5.395 | 6.547 | 7.287 | 8.205 |
|  |  |  | 10 | 3.251 | 5.764 | 7.795 | 9.723 | 11.476 |
| $\begin{gathered} \beta_{1}= \\ 0.148 \end{gathered}$ |  |  | 0 | 0.502 | 0.515 | 0.499 | 0.513 | 0.470 |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 4.784 | 4.980 | 5.050 | 5.052 | 5.128 |
|  |  |  | 10 | 6.348 | 9.138 | 9.890 | 10.115 | 10.087 |
|  |  |  | 0 | 0.867 | 0.799 | 0.767 | 0.768 | 0.706 |
|  | $0.049$ |  | 5 | 4.602 | 5.729 | 6.125 | 6.701 | 6.782 |
|  |  |  | 10 | 4.449 | 7.292 | 9.474 | 10.669 | 11.622 |
|  | $\mathrm{T}^{2}=$ |  | 0 | 1.241 | 1.284 | 1.283 | 1.222 | 1.251 |
|  | 0.148 |  | 5 | 4.293 | 5.704 | 6.549 | 7.462 | 7.657 |
|  |  |  | 10 | 3.768 | 6.600 | 8.515 | 10.168 | 11.104 |
|  |  |  | 0 | 1.754 | 1.813 | 1.972 | 2.054 | 1.932 |
|  | 0.444 |  | 5 | 3.831 | 5.629 | 6.800 | 7.636 | 8.604 |
|  |  |  | 10 | 3.279 | 5.735 | 7.977 | 10.009 | 11.235 |
| $\begin{gathered} \beta_{1}= \\ 0.296 \end{gathered}$ |  | Number of Missing Studies | 0 | 0.533 | 0.518 | 0.544 | 0.536 | 0.490 |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 4.910 | 5.285 | 5.325 | 5.273 | 5.263 |
|  |  |  | 10 | 5.739 | 8.776 | 9.994 | 10.488 | 10.821 |
|  |  |  | 0 | 0.888 | 0.882 | 0.798 | 0.732 | 0.815 |
|  | $0.0 \overline{49}$ |  | 5 | 4.459 | 5.773 | 6.473 | 6.788 | 6.711 |
|  |  |  | 10 | 4.413 | 7.377 | 9.255 | 10.805 | 11.819 |
|  |  |  | 0 | 1.299 | 1.287 | 1.364 | 1.267 | 1.270 |
|  | $\begin{aligned} & \mathbf{T}^{-1}= \\ & 0.148 \end{aligned}$ |  | 5 | 3.953 | 5.580 | 6.728 | 7.727 | 7.630 |
|  |  |  | 10 | 3.677 | 6.473 | 8.636 | 10.102 | 11.443 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 1.572 | 1.839 | 1.915 | 2.012 | 1.843 |
|  |  |  | 5 | 3.844 | 5.444 | 6.418 | 7.567 | 8.045 |
|  |  |  | 10 | 3.255 | 5.792 | 7.779 | 9.780 | 10.936 |

Table E16. Mean number of imputed studies, with $R$ studies imputed (from 1-dimensional algorithmic variant) (continued)

| R Missing Studies Imputed |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Number of Studies |  |  |  |  |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.444 \end{gathered}$ | $\mathrm{T}^{2}=0$ | sə!pmıs 反u!ss!w fo дəquin | 0 | 0.645 | 0.584 | 0.569 | 0.558 | 0.564 |
|  |  |  | 5 | 4.901 | 5.786 | 5.781 | 5.718 | 5.526 |
|  |  |  | 10 | 5.195 | 8.306 | 10.135 | 11.031 | 11.451 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | 0.951 | 0.898 | 0.812 | 0.843 | 0.793 |
|  |  |  | 5 | 4.406 | 5.872 | 6.624 | 6.747 | 6.987 |
|  |  |  | 10 | 4.291 | 7.216 | 9.159 | 10.447 | 11.744 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | 1.289 | 1.319 | 1.366 | 1.315 | 1.307 |
|  |  |  | 5 | 4.147 | 5.866 | 6.828 | 7.378 | 7.669 |
|  |  |  | 10 | 3.771 | 6.185 | 8.549 | 10.194 | 11.627 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 1.664 | 1.917 | 1.981 | 1.897 | 1.907 |
|  |  |  | 5 | 3.902 | 5.459 | 6.454 | 7.599 | 8.270 |
|  |  |  | 10 | 3.195 | 5.697 | 8.039 | 9.745 | 11.002 |

Table E17. Mean number of imputed studies, with L studies imputed (from 1-dimensional algorithmic variant)

| L Missing Studies Imputed |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Number of Studies |  |  |  |  |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.049 \end{gathered}$ |  | Number of Missing Studies | 0 | 1.211 | 1.342 | 1.616 | 1.774 | 1.884 |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 3.887 | 4.485 | 4.701 | 5.061 | 5.135 |
|  |  |  | 10 | 4.668 | 6.606 | 7.602 | 8.197 | 8.501 |
|  |  |  | 0 | 1.900 | 2.385 | 2.771 | 3.178 | 3.641 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0 \cap 10 \end{gathered}$ |  | 5 | 3.319 | 4.376 | 5.194 | 5.941 | 6.637 |
|  |  |  | 10 | 3.080 | 4.762 | 6.100 | 7.283 | 8.287 |
|  |  |  | 0 | 2.325 | 3.075 | 3.653 | 4.308 | 4.803 |
|  | $\begin{aligned} & \mathrm{T}^{2}= \end{aligned}$ |  | 5 | 3.025 | 4.025 | 5.050 | 6.141 | 6.883 |
|  |  |  | 10 | 2.531 | 3.915 | 5.115 | 6.319 | 7.278 |
|  |  |  | 0 | 2.692 | 3.610 | 4.531 | 5.635 | 6.247 |
|  | $\mathbf{N}^{\mathbf{T}=}$ |  | 5 | 2.705 | 3.744 | 4.822 | 5.881 | 7.020 |
|  |  |  | 10 | 2.086 | 3.259 | 4.429 | 5.556 | 6.692 |
| $\begin{gathered} \beta_{1}= \\ 0.074 \end{gathered}$ |  | sə!pnłs 6u!ss!w ło лəqunN | 0 | 1.222 | 1.436 | 1.573 | 1.774 | 1.917 |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 3.894 | 4.421 | 4.652 | 5.016 | 5.237 |
|  |  |  | 10 | 4.574 | 6.507 | 7.535 | 8.194 | 8.635 |
|  |  |  | 0 | 1.902 | 2.361 | 2.890 | 3.164 | 3.634 |
|  |  |  | 5 | 3.394 | 4.336 | 5.101 | 6.002 | 6.607 |
|  |  |  | 10 | 3.107 | 4.743 | 6.238 | 7.238 | 8.368 |
|  |  |  | 0 | 2.304 | 2.929 | 3.694 | 4.279 | 5.013 |
|  | $\begin{aligned} & \mathrm{T}^{2}= \\ & 0.148 \end{aligned}$ |  | 5 | 2.942 | 4.116 | 5.113 | 6.062 | 6.929 |
|  |  |  | 10 | 2.497 | 3.882 | 5.188 | 6.113 | 7.454 |
|  |  |  | 0 | 2.765 | 3.547 | 4.810 | 5.594 | 6.303 |
|  |  |  | 5 | 2.609 | 3.779 | 4.877 | 5.768 | 6.831 |
|  |  |  | 10 | 2.058 | 3.252 | 4.335 | 5.576 | 6.794 |
| $\begin{gathered} \beta_{1}= \\ 0.148 \end{gathered}$ |  |  | 0 | 1.240 | 1.453 | 1.685 | 1.829 | 1.971 |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 3.905 | 4.350 | 4.791 | 5.023 | 5.237 |
|  |  |  | 10 | 4.503 | 6.508 | 7.453 | 8.177 | 8.579 |
|  |  |  | 0 | 1.791 | 2.296 | 2.772 | 3.168 | 3.586 |
|  | $\begin{aligned} & \mathrm{T}^{2}= \\ & 0.049 \end{aligned}$ |  | 5 | 3.364 | 4.398 | 5.155 | 6.069 | 6.674 |
|  |  |  | 10 | 3.042 | 4.661 | 6.104 | 7.187 | 8.215 |
|  |  |  | 0 | 2.296 | 3.028 | 3.696 | 4.470 | 4.957 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 5 | 3.005 | 4.066 | 5.024 | 6.214 | 6.872 |
|  |  |  | 10 | 2.455 | 3.921 | 5.052 | 6.242 | 7.189 |
|  |  |  | 0 | 2.696 | 3.682 | 4.738 | 5.638 | 6.349 |
|  | $\begin{aligned} & \mathbf{T}^{\mathbf{2}}= \end{aligned}$ |  | $5$ | 2.631 | 3.822 | 4.966 | 5.951 | 7.098 |
|  |  |  | 10 | 2.063 | 3.169 | 4.459 | 5.744 | 6.687 |
| $\begin{gathered} \beta_{1}= \\ 0.296 \end{gathered}$ |  |  | 0 | 1.331 | 1.573 | 1.890 | 2.151 | 2.266 |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 3.821 | 4.548 | 4.983 | 5.272 | 5.505 |
|  |  |  | 10 | 4.043 | 6.053 | 7.289 | 8.112 | 8.757 |
|  |  |  | 0 | 1.933 | 2.353 | 2.867 | 3.470 | 3.829 |
|  | $\begin{aligned} & \mathrm{T}^{\top}= \\ & 0.049 \end{aligned}$ |  | 5 | 3.289 | 4.409 | 5.377 | 6.143 | 6.604 |
|  |  |  | 10 | 3.009 | 4.691 | 5.935 | 7.179 | 8.116 |
|  |  |  | 0 | 2.337 | 2.971 | 3.853 | 4.406 |  |
|  | $0.148$ |  | 5 | 2.796 | 4.053 | 5.081 | 6.207 | 6.760 |
|  |  |  | 10 | 2.442 | 3.865 | 5.143 | 6.128 | 7.343 |
|  |  |  | 0 | 2.694 | 3.645 | 4.594 | 5.369 | 6.221 |
|  | $0.444$ |  | 5 | 2.589 | 3.717 | 4.741 | 5.809 | 6.826 |
|  |  |  | 10 | 2.050 | 3.325 | 4.337 | 5.648 | 6.576 |

Table E17. Mean number of imputed studies, with $L$ studies imputed (from 1-dimensional algorithmic variant) (continued)

| L Missing Studies Imputed |  |  |  |  |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | Number of Studies |  |  |  |  |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.444 \end{gathered}$ | $\mathrm{T}^{2}=0$ | sə!pmıs 反u!ss!w fo дəquin | 0 | 1.526 | 1.769 | 2.109 | 2.400 | 2.750 |
|  |  |  | 5 | 3.740 | 4.669 | 5.193 | 5.670 | 5.955 |
|  |  |  | 10 | 3.652 | 5.575 | 7.001 | 7.970 | 8.786 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | 2.000 | 2.541 | 2.905 | 3.509 | 3.948 |
|  |  |  | 5 | 3.235 | 4.474 | 5.294 | 5.959 | 6.831 |
|  |  |  | 10 | 2.950 | 4.491 | 5.733 | 6.929 | 8.089 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | 2.367 | 3.063 | 3.826 | 4.429 | 5.244 |
|  |  |  | 5 | 2.877 | 4.214 | 5.122 | 6.150 | 6.873 |
|  |  |  | 10 | 2.491 | 3.646 | 5.107 | 6.210 | 7.348 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 2.688 | 3.824 | 4.613 | 5.460 | 6.304 |
|  |  |  | 5 | 2.651 | 3.755 | 4.788 | 5.912 | 6.986 |
|  |  |  | 10 | 2.030 | 3.201 | 4.416 | 5.655 | 6.477 |


| No Correction for Publication Bias |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 |  | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.049 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 0.000 | 0.001 | 0.000 | 0.001 | 0.000 | 0.000 | 0.001 | 0.000 | 0.001 | 0.000 |
|  |  |  | 5 | 0.041 | 0.026 | 0.019 | 0.014 | 0.010 | 0.043 | 0.027 | 0.020 | 0.015 | 0.011 |
|  |  |  | 10 | 0.111 | 0.062 | 0.040 | 0.030 | 0.024 | 0.115 | 0.064 | 0.042 | 0.031 | 0.025 |
|  |  |  | 0 | 0.002 | 0.003 | -0.001 | 0.001 | 0.000 | 0.003 | 0.001 | -0.002 | 0.002 | -0.001 |
|  |  |  | 5 | 0.081 | 0.050 | 0.037 | 0.027 | 0.018 | 0.099 | 0.067 | 0.054 | 0.045 | 0.035 |
|  |  |  | 10 | 0.188 | 0.119 | 0.084 | 0.069 | 0.052 | 0.198 | 0.136 | 0.104 | 0.089 | 0.073 |
|  |  |  | 0 | 0.001 | -0.007 | -0.004 | 0.001 | 0.002 | 0.002 | 0.000 | -0.001 | -0.002 | 0.000 |
|  |  |  | 5 | 0.135 | 0.082 | 0.066 | 0.047 | 0.042 | 0.154 | 0.112 | 0.091 | 0.074 | 0.066 |
|  |  |  | 10 | 0.271 | 0.180 | 0.143 | 0.118 | 0.089 | 0.292 | 0.209 | 0.171 | 0.146 | 0.123 |
|  |  |  | 0 | -0.001 | -0.018 | -0.005 | 0.001 | 0.007 | 0.002 | -0.006 | -0.001 | -0.001 | -0.001 |
|  | $\begin{aligned} & \mathrm{T}^{\top}= \\ & 0.444 \end{aligned}$ |  | 5 | 0.213 | 0.167 | 0.130 | 0.107 | 0.092 | 0.244 | 0.190 | 0.154 | 0.132 | 0.111 |
|  |  |  | 10 | 0.450 | 0.319 | 0.251 | 0.209 | 0.174 | 0.467 | 0.352 | 0.277 | 0.235 | 0.201 |
| $\begin{gathered} \beta_{1}= \\ 0.074 \end{gathered}$ |  | Number of Missing Studies | 0 | 0.001 | -0.002 | -0.001 | 0.001 | 0.001 | 0.001 | -0.003 | -0.001 | 0.001 | 0.001 |
|  | $\mathrm{T}^{\mathbf{2}}=0$ |  | 5 | 0.043 | 0.026 | 0.019 | 0.014 | 0.012 | 0.046 | 0.028 | 0.020 | 0.015 | 0.013 |
|  |  |  | 10 | 0.123 | 0.065 | 0.043 | 0.032 | 0.025 | 0.127 | 0.068 | 0.045 | 0.033 | 0.026 |
|  |  |  | 0 | 0.005 | 0.003 | -0.001 | 0.000 | 0.001 | 0.003 | 0.003 | -0.002 | 0.002 | 0.000 |
|  |  |  | 5 | 0.080 | 0.057 | 0.037 | 0.028 | 0.023 | 0.099 | 0.076 | 0.057 | 0.046 | 0.039 |
|  |  |  | 10 | 0.196 | 0.127 | 0.088 | 0.070 | 0.054 | 0.207 | 0.142 | 0.109 | 0.091 | 0.079 |
|  |  |  | 0 | -0.002 | -0.001 | -0.006 | 0.002 | 0.000 | 0.001 | 0.002 | -0.002 | -0.001 | 0.000 |
|  | $0.148$ |  | 5 | 0.129 | 0.091 | 0.071 | 0.058 | 0.039 | 0.156 | 0.113 | 0.098 | 0.080 | 0.065 |
|  |  |  | 10 | 0.287 | 0.197 | 0.145 | 0.127 | 0.103 | 0.304 | 0.218 | 0.177 | 0.150 | 0.127 |
|  |  |  | 0 | -0.008 | -0.010 | 0.007 | 0.003 | 0.003 | -0.001 | -0.004 | 0.008 | 0.005 | 0.001 |
|  | $\begin{aligned} & \mathbf{T}^{\mathbf{2}=} \end{aligned}$ |  | 5 | 0.223 | 0.165 | 0.128 | 0.116 | 0.099 | 0.250 | 0.195 | 0.155 | 0.133 | 0.115 |
|  |  |  | 10 | 0.450 | 0.320 | 0.261 | 0.206 | 0.181 | 0.475 | 0.347 | 0.287 | 0.238 | 0.207 |
| $\begin{gathered} \beta_{1}= \\ 0.148 \end{gathered}$ |  |  | 0 | 0.001 | 0.001 | 0.001 | -0.001 | -0.001 | 0.001 | 0.001 | 0.001 | -0.001 | -0.001 |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 0.050 | 0.030 | 0.022 | 0.016 | 0.013 | 0.054 | 0.032 | 0.023 | 0.017 | 0.014 |
|  |  |  | 10 | 0.144 | 0.076 | 0.051 | 0.036 | 0.028 | 0.148 | 0.079 | 0.052 | 0.038 | 0.029 |
|  |  |  | 0 | -0.004 | -0.002 | -0.001 | 0.002 | 0.001 | -0.001 | 0.001 | 0.003 | 0.000 | 0.002 |
|  |  |  | 5 | 0.090 | 0.064 | 0.040 | 0.032 | 0.025 | 0.110 | 0.082 | 0.061 | 0.051 | 0.044 |
|  |  |  | 10 | 0.217 | 0.140 | 0.101 | 0.077 | 0.066 | 0.229 | 0.158 | 0.122 | 0.102 | 0.090 |
|  |  |  | 0 | -0.002 | 0.002 | 0.000 | 0.001 | -0.001 | -0.007 | 0.001 | -0.001 | 0.001 | 0.000 |
|  | $0.148$ |  | 5 | 0.150 | 0.100 | 0.077 | 0.062 | 0.054 | 0.173 | 0.129 | 0.102 | 0.088 | 0.076 |
|  |  |  | 10 | 0.304 | 0.217 | 0.163 | 0.134 | 0.108 | 0.324 | 0.238 | 0.190 | 0.161 | 0.139 |
|  |  |  | 0 | -0.011 | -0.005 | -0.006 | 0.004 | 0.004 | -0.003 | 0.001 | 0.000 | -0.002 | 0.002 |
|  | $\begin{aligned} & \mathrm{T}^{2}= \\ & 0.444 \end{aligned}$ |  | 5 | 0.255 | 0.182 | 0.145 | 0.111 | 0.096 | 0.274 | 0.203 | 0.170 | 0.144 | 0.120 |
|  |  |  | 10 | 0.476 | 0.338 | 0.264 | 0.224 | 0.196 | 0.495 | 0.364 | 0.298 | 0.252 | 0.224 |

Table E18. Absolute bias in the estimated intercept, with no correction for publication bias (from 2-dimensional algorithmic variant) (continued)

| No Correction for Publication Bias |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.296 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 0.000 | 0.001 | -0.001 | -0.001 | 0.001 | 0.000 | 0.001 | -0.002 | -0.001 | 0.001 |
|  |  |  | 5 | 0.067 | 0.040 | 0.027 | 0.020 | 0.016 | 0.071 | 0.042 | 0.029 | 0.021 | 0.017 |
|  |  |  | 10 | 0.187 | 0.099 | 0.066 | 0.047 | 0.037 | 0.191 | 0.102 | 0.068 | 0.049 | 0.038 |
|  |  |  | 0 | -0.001 | -0.001 | 0.000 | -0.002 | -0.001 | -0.001 | 0.002 | 0.000 | -0.001 | 0.000 |
|  |  |  | 5 | 0.114 | 0.078 | 0.054 | 0.038 | 0.032 | 0.137 | 0.098 | 0.076 | 0.063 | 0.055 |
|  |  |  | 10 | 0.261 | 0.175 | 0.128 | 0.102 | 0.080 | 0.273 | 0.192 | 0.150 | 0.126 | 0.107 |
|  |  |  | 0 | -0.006 | 0.004 | 0.002 | 0.001 | -0.002 | -0.002 | 0.001 | 0.002 | -0.001 | -0.001 |
|  |  |  | 5 | 0.177 | 0.122 | 0.087 | 0.072 | 0.061 | 0.199 | 0.151 | 0.115 | 0.105 | 0.087 |
|  |  |  | 10 | 0.337 | 0.243 | 0.192 | 0.152 | 0.129 | 0.359 | 0.270 | 0.220 | 0.185 | 0.162 |
|  |  |  | 0 | 0.008 | -0.012 | 0.003 | -0.006 | -0.007 | 0.002 | -0.003 | 0.001 | 0.000 | -0.003 |
|  |  |  | 5 | 0.276 | 0.206 | 0.163 | 0.139 | 0.115 | 0.300 | 0.230 | 0.187 | 0.158 | 0.142 |
|  |  |  | 10 | 0.512 | 0.377 | 0.299 | 0.252 | 0.212 | 0.534 | 0.405 | 0.327 | 0.283 | 0.241 |
| $\begin{gathered} \beta_{1}= \\ 0.444 \end{gathered}$ |  |  | 0 | 0.001 | 0.000 | 0.001 | 0.000 | 0.000 | 0.001 | 0.000 | 0.001 | 0.000 | -0.001 |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 0.078 | 0.046 | 0.031 | 0.025 | 0.019 | 0.083 | 0.049 | 0.033 | 0.027 | 0.020 |
|  |  |  | 10 | 0.221 | 0.120 | 0.078 | 0.059 | 0.044 | 0.226 | 0.124 | 0.081 | 0.060 | 0.046 |
|  |  |  | 0 | -0.002 | 0.001 | 0.001 | 0.001 | -0.001 | 0.000 | 0.002 | 0.002 | 0.001 | -0.002 |
|  |  |  | 5 | 0.138 | 0.092 | 0.061 | 0.050 | 0.036 | 0.159 | 0.114 | 0.088 | 0.074 | 0.060 |
|  |  |  | 10 | 0.299 | 0.202 | 0.148 | 0.114 | 0.094 | 0.313 | 0.223 | 0.175 | 0.143 | 0.123 |
|  |  |  | 0 | -0.006 | -0.006 | -0.003 | -0.001 | -0.001 | -0.004 | -0.003 | 0.001 | 0.002 | 0.004 |
|  | $\begin{aligned} & \mathrm{T}^{2}= \\ & 0.148 \end{aligned}$ |  | 5 | 0.191 | 0.147 | 0.110 | 0.089 | 0.068 | 0.221 | 0.173 | 0.140 | 0.119 | 0.100 |
|  |  |  | 10 | 0.388 | 0.283 | 0.219 | 0.171 | 0.156 | 0.410 | 0.307 | 0.250 | 0.208 | 0.186 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 0.003 | -0.002 | -0.008 | -0.009 | -0.004 | 0.004 | 0.002 | 0.000 | 0.002 | -0.002 |
|  |  |  | 5 | 0.295 | 0.234 | 0.176 | 0.152 | 0.125 | 0.321 | 0.258 | 0.206 | 0.173 | 0.152 |
|  |  |  | 10 | 0.559 | 0.404 | 0.336 | 0.282 | 0.244 | 0.583 | 0.439 | 0.361 | 0.308 | 0.272 |

Table E19. Absolute bias in the estimated intercept, with $R$ studies imputed (from 2-dimensional algorithmic variant)

| R Missing Studies Imputed |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.049 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | -0.003 | -0.001 | -0.002 | 0.000 | -0.001 | -0.004 | -0.002 | -0.002 | 0.000 | -0.001 |
|  |  |  | 5 | 0.015 | 0.006 | 0.004 | 0.003 | 0.000 | 0.016 | 0.007 | 0.004 | 0.003 | 0.001 |
|  |  |  | 10 | 0.069 | 0.026 | 0.012 | 0.006 | 0.005 | 0.071 | 0.027 | 0.013 | 0.007 | 0.005 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | -0.005 | -0.001 | -0.005 | -0.001 | -0.002 | -0.010 | -0.008 | -0.009 | -0.004 | -0.006 |
|  |  |  | 5 | 0.046 | 0.018 | 0.013 | 0.005 | 0.000 | 0.047 | 0.015 | 0.010 | 0.004 | 0.000 |
|  |  |  | 10 | 0.149 | 0.078 | 0.046 | 0.033 | 0.019 | 0.148 | 0.078 | 0.045 | 0.031 | 0.016 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | -0.013 | -0.017 | -0.011 | -0.005 | -0.003 | -0.025 | -0.023 | -0.018 | -0.016 | -0.011 |
|  |  |  | 5 | 0.093 | 0.038 | 0.029 | 0.013 | 0.012 | 0.082 | 0.034 | 0.020 | 0.007 | 0.005 |
|  |  |  | 10 | 0.228 | 0.128 | 0.092 | 0.069 | 0.042 | 0.228 | 0.124 | 0.086 | 0.061 | 0.039 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | -0.031 | -0.039 | -0.023 | -0.014 | -0.006 | -0.058 | -0.053 | -0.040 | -0.034 | -0.029 |
|  |  |  | 5 | 0.154 | 0.102 | 0.068 | 0.048 | 0.036 | 0.136 | 0.075 | 0.043 | 0.023 | 0.009 |
|  |  |  | 10 | 0.391 | 0.249 | 0.179 | 0.134 | 0.101 | 0.364 | 0.228 | 0.152 | 0.109 | 0.073 |
| $\begin{gathered} \beta_{1}= \\ 0.074 \end{gathered}$ | $\mathrm{T}^{2}=0$ | Number of Missing Studies | 0 | -0.002 | -0.004 | -0.002 | -0.001 | 0.000 | -0.003 | -0.005 | -0.003 | -0.001 | 0.000 |
|  |  |  | 5 | 0.015 | 0.007 | 0.004 | 0.002 | 0.003 | 0.016 | 0.008 | 0.004 | 0.002 | 0.003 |
|  |  |  | 10 | 0.077 | 0.028 | 0.015 | 0.008 | 0.005 | 0.078 | 0.029 | 0.016 | 0.009 | 0.006 |
|  |  |  | 0 | -0.001 | -0.002 | -0.004 | -0.002 | -0.001 | -0.009 | -0.006 | -0.009 | -0.004 | -0.004 |
|  | $0.049$ |  | 5 | 0.045 | 0.026 | 0.012 | 0.006 | 0.004 | 0.047 | 0.025 | 0.011 | 0.004 | 0.003 |
|  |  |  | 10 | 0.152 | 0.085 | 0.047 | 0.033 | 0.021 | 0.153 | 0.085 | 0.047 | 0.031 | 0.021 |
|  |  |  | 0 | -0.017 | -0.012 | -0.013 | -0.004 | -0.004 | -0.030 | -0.021 | -0.018 | -0.014 | -0.011 |
|  | $0.148$ |  | 5 | 0.088 | 0.045 | 0.031 | 0.023 | 0.006 | 0.084 | 0.035 | 0.026 | 0.014 | 0.002 |
|  |  |  | 10 | 0.240 | 0.144 | 0.092 | 0.073 | 0.053 | 0.235 | 0.133 | 0.089 | 0.059 | 0.042 |
|  |  |  | 0 | -0.032 | -0.032 | -0.012 | -0.012 | -0.010 | -0.057 | -0.051 | -0.031 | -0.028 | -0.026 |
|  |  |  | 5 | 0.159 | 0.100 | 0.066 | 0.062 | 0.044 | 0.132 | 0.078 | 0.044 | 0.029 | 0.015 |
|  |  |  | 10 | 0.396 | 0.249 | 0.187 | 0.130 | 0.109 | 0.382 | 0.222 | 0.156 | 0.109 | 0.084 |
| $\begin{gathered} \beta_{1}= \\ 0.148 \end{gathered}$ |  |  | 0 | -0.002 | -0.001 | -0.001 | -0.002 | -0.001 | -0.003 | -0.002 | -0.001 | -0.002 | -0.002 |
|  | $\mathrm{T}^{\mathbf{2}}=0$ |  | 5 | 0.023 | 0.010 | 0.007 | 0.004 | 0.004 | 0.025 | 0.011 | 0.007 | 0.005 | 0.004 |
|  |  |  | 10 | 0.091 | 0.037 | 0.020 | 0.013 | 0.009 | 0.092 | 0.038 | 0.021 | 0.014 | 0.010 |
|  |  |  | 0 | -0.010 | -0.006 | -0.004 | 0.000 | 0.000 | -0.014 | -0.008 | -0.004 | -0.005 | -0.002 |
|  | $0.049$ |  | 5 | 0.052 | 0.030 | 0.013 | 0.010 | 0.006 | 0.052 | 0.027 | 0.015 | 0.009 | 0.007 |
|  |  |  | 10 | 0.168 | 0.091 | 0.057 | 0.037 | 0.031 | 0.170 | 0.089 | 0.055 | 0.037 | 0.030 |
|  |  |  | 0 | -0.016 | -0.007 | -0.007 | -0.004 | -0.005 | -0.035 | -0.020 | -0.019 | -0.012 | -0.012 |
|  | $0.148$ |  | 5 | 0.103 | 0.055 | 0.038 | 0.026 | 0.021 | 0.095 | 0.048 | 0.030 | 0.017 | 0.014 |
|  |  |  | 10 | 0.256 | 0.162 | 0.105 | 0.080 | 0.056 | 0.251 | 0.147 | 0.094 | 0.069 | 0.048 |
|  |  |  | 0 | -0.039 | -0.026 | -0.025 | -0.012 | -0.009 | -0.062 | -0.046 | -0.038 | -0.035 | -0.026 |
|  | $0.444$ |  | 5 | 0.193 | 0.115 | 0.082 | 0.048 | 0.040 | 0.161 | 0.082 | 0.056 | 0.032 | 0.016 |
|  |  |  | 10 | 0.413 | 0.263 | 0.186 | 0.145 | 0.119 | 0.387 | 0.237 | 0.162 | 0.120 | 0.090 |

Table E19. Absolute bias in the estimated intercept, with R studies imputed (from 2-dimensional algorithmic variant) (continued) R Missing Studies Imputed

Fixed Effects in the Final Model
Random Effects in the Final Model

|  |  |  |  | Of |  |  |  |  | Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.296 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | -0.003 | -0.001 | -0.003 | -0.002 | 0.000 | -0.003 | -0.001 | -0.003 | -0.003 | 0.000 |
|  |  |  | 5 | 0.035 | 0.019 | 0.014 | 0.010 | 0.008 | 0.036 | 0.021 | 0.016 | 0.011 | 0.009 |
|  |  |  | 10 | 0.116 | 0.052 | 0.034 | 0.024 | 0.019 | 0.116 | 0.053 | 0.036 | 0.026 | 0.021 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | -0.007 | -0.006 | -0.003 | -0.004 | -0.003 | -0.012 | -0.008 | -0.007 | -0.007 | -0.005 |
|  |  |  | 5 | 0.073 | 0.043 | 0.027 | 0.017 | 0.014 | 0.074 | 0.042 | 0.028 | 0.024 | 0.019 |
|  |  |  | 10 | 0.199 | 0.117 | 0.077 | 0.059 | 0.044 | 0.196 | 0.113 | 0.074 | 0.057 | 0.045 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | -0.021 | -0.007 | -0.006 | -0.004 | -0.007 | -0.032 | -0.022 | -0.016 | -0.015 | -0.012 |
|  |  |  | 5 | 0.124 | 0.073 | 0.042 | 0.036 | 0.028 | 0.111 | 0.066 | 0.037 | 0.036 | 0.024 |
|  |  |  | 10 | 0.274 | 0.174 | 0.128 | 0.091 | 0.072 | 0.267 | 0.164 | 0.114 | 0.082 | 0.065 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | -0.021 | -0.035 | -0.015 | -0.022 | -0.020 | -0.052 | -0.053 | -0.037 | -0.031 | -0.032 |
|  |  |  | 5 | 0.198 | 0.135 | 0.093 | 0.070 | 0.056 | 0.171 | 0.103 | 0.066 | 0.039 | 0.037 |
|  |  |  | 10 | 0.440 | 0.291 | 0.209 | 0.161 | 0.129 | 0.413 | 0.263 | 0.180 | 0.133 | 0.098 |
| $\begin{gathered} \beta_{1}= \\ 0.444 \end{gathered}$ |  |  | 0 | -0.003 | -0.002 | -0.001 | -0.002 | -0.001 | -0.003 | -0.003 | -0.001 | -0.002 | -0.002 |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 0.046 | 0.027 | 0.018 | 0.015 | 0.011 | 0.049 | 0.029 | 0.020 | 0.017 | 0.013 |
|  |  |  | 10 | 0.135 | 0.071 | 0.048 | 0.038 | 0.028 | 0.135 | 0.073 | 0.051 | 0.040 | 0.031 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | -0.008 | -0.003 | -0.002 | -0.001 | -0.002 | -0.013 | -0.006 | -0.005 | -0.005 | -0.007 |
|  |  | $\begin{aligned} & \text { む } \\ & \text { ס } \\ & \text { N } \\ & \text { Non } \end{aligned}$ | 5 | 0.090 | 0.056 | 0.034 | 0.029 | 0.019 | 0.090 | 0.056 | 0.039 | 0.034 | 0.026 |
|  |  |  | 10 | 0.225 | 0.137 | 0.096 | 0.069 | 0.057 | 0.221 | 0.134 | 0.097 | 0.071 | 0.061 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ | $\sum_{0}^{2}$ | 0 | -0.019 | -0.015 | -0.010 | -0.006 | -0.005 | -0.032 | -0.024 | -0.017 | -0.012 | -0.008 |
|  |  | $\stackrel{\square}{0}$ | 5 | 0.132 | 0.095 | 0.063 | 0.050 | 0.034 | 0.126 | 0.084 | 0.057 | 0.043 | 0.033 |
|  |  | $\begin{aligned} & \frac{\vdots}{む} \\ & \frac{0}{E} \\ & \frac{1}{\Sigma} \end{aligned}$ | 10 | 0.316 | 0.206 | 0.148 | 0.107 | 0.097 | 0.306 | 0.189 | 0.133 | 0.101 | 0.087 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | -0.023 | -0.027 | -0.029 | -0.025 | -0.015 | -0.051 | -0.047 | -0.042 | -0.032 | -0.029 |
|  |  |  | 5 | 0.220 | 0.157 | 0.106 | 0.088 | 0.062 | 0.190 | 0.126 | 0.080 | 0.059 | 0.040 |
|  |  |  | 10 | 0.475 | 0.308 | 0.241 | 0.191 | 0.152 | 0.447 | 0.282 | 0.202 | 0.153 | 0.122 |

Table E20. Absolute bias in the estimated intercept, with L studies imputed (from 2-dimensional algorithmic variant)

| L Missing Studies Imputed |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.049 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | -0.007 | -0.004 | -0.005 | -0.003 | -0.004 | -0.008 | -0.005 | -0.006 | -0.003 | -0.004 |
|  |  |  | 5 | 0.019 | 0.008 | 0.005 | 0.002 | 0.000 | 0.021 | 0.010 | 0.006 | 0.003 | 0.001 |
|  |  |  | 10 | 0.076 | 0.033 | 0.016 | 0.010 | 0.007 | 0.078 | 0.035 | 0.018 | 0.011 | 0.008 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | -0.013 | -0.011 | -0.014 | -0.011 | -0.011 | -0.026 | -0.024 | -0.028 | -0.022 | -0.024 |
|  |  |  | 5 | 0.051 | 0.020 | 0.013 | 0.003 | -0.003 | 0.054 | 0.019 | 0.011 | 0.002 | -0.004 |
|  |  |  | 10 | 0.156 | 0.087 | 0.054 | 0.038 | 0.024 | 0.157 | 0.090 | 0.056 | 0.040 | 0.024 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | -0.029 | -0.035 | -0.034 | -0.024 | -0.025 | -0.055 | -0.056 | -0.058 | -0.050 | -0.053 |
|  |  |  | 5 | 0.096 | 0.043 | 0.030 | 0.009 | 0.006 | 0.088 | 0.040 | 0.022 | 0.003 | -0.003 |
|  |  |  | 10 | 0.236 | 0.140 | 0.103 | 0.080 | 0.051 | 0.238 | 0.142 | 0.102 | 0.076 | 0.052 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | -0.054 | -0.074 | -0.063 | -0.056 | -0.047 | -0.101 | -0.111 | -0.107 | -0.104 | -0.098 |
|  |  |  | 5 | 0.160 | 0.110 | 0.072 | 0.047 | 0.030 | 0.146 | 0.085 | 0.047 | 0.023 | -0.001 |
|  |  |  | 10 | 0.402 | 0.269 | 0.199 | 0.155 | 0.118 | 0.381 | 0.255 | 0.179 | 0.136 | 0.095 |
| $\begin{gathered} \beta_{1}= \\ 0.074 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | -0.006 | -0.008 | -0.006 | -0.003 | -0.003 | -0.007 | -0.009 | -0.006 | -0.004 | -0.003 |
|  |  |  | 5 | 0.018 | 0.009 | 0.004 | 0.002 | 0.003 | 0.020 | 0.010 | 0.005 | 0.003 | 0.003 |
|  |  |  | 10 | 0.083 | 0.035 | 0.020 | 0.012 | 0.008 | 0.085 | 0.036 | 0.022 | 0.013 | 0.009 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | -0.010 | -0.010 | -0.013 | -0.011 | -0.011 | -0.024 | -0.022 | -0.026 | -0.022 | -0.023 |
|  |  |  | 5 | 0.049 | 0.027 | 0.012 | 0.004 | 0.000 | 0.054 | 0.028 | 0.011 | 0.003 | -0.002 |
|  |  |  | 10 | 0.161 | 0.094 | 0.056 | 0.039 | 0.025 | 0.164 | 0.097 | 0.060 | 0.041 | 0.027 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | -0.032 | -0.030 | -0.032 | -0.023 | -0.026 | -0.057 | -0.054 | -0.054 | -0.051 | -0.050 |
|  |  |  | 5 | 0.090 | 0.050 | 0.031 | 0.020 | 0.000 | 0.089 | 0.042 | 0.025 | 0.011 | -0.006 |
|  |  |  | 10 | 0.248 | 0.157 | 0.104 | 0.085 | 0.062 | 0.246 | 0.151 | 0.106 | 0.074 | 0.054 |
|  | $\begin{gathered} \mathrm{r}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | -0.061 | -0.067 | -0.048 | -0.051 | -0.052 | -0.105 | -0.109 | -0.092 | -0.095 | -0.093 |
|  |  |  | 5 | 0.165 | 0.107 | 0.072 | 0.060 | 0.040 | 0.141 | 0.086 | 0.051 | 0.027 | 0.008 |
|  |  |  | 10 | 0.407 | 0.269 | 0.205 | 0.150 | 0.125 | 0.398 | 0.252 | 0.182 | 0.134 | 0.107 |
| $\begin{gathered} \beta_{1}= \\ 0.148 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | -0.006 | -0.005 | -0.004 | -0.005 | -0.004 | -0.007 | -0.006 | -0.004 | -0.006 | -0.005 |
|  |  |  | 5 | 0.026 | 0.011 | 0.007 | 0.004 | 0.003 | 0.029 | 0.013 | 0.008 | 0.005 | 0.004 |
|  |  |  | 10 | 0.097 | 0.043 | 0.024 | 0.016 | 0.011 | 0.099 | 0.045 | 0.026 | 0.017 | 0.012 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | -0.020 | -0.015 | -0.013 | -0.009 | -0.010 | -0.030 | -0.025 | -0.022 | -0.024 | -0.022 |
|  |  |  | 5 | 0.055 | 0.033 | 0.013 | 0.008 | 0.003 | 0.058 | 0.032 | 0.015 | 0.007 | 0.001 |
|  |  |  | 10 | 0.175 | 0.101 | 0.065 | 0.043 | 0.034 | 0.178 | 0.102 | 0.067 | 0.046 | 0.036 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | -0.031 | -0.026 | -0.026 | -0.024 | -0.026 | -0.061 | -0.052 | -0.054 | -0.048 | -0.049 |
|  |  |  | 5 | 0.107 | 0.060 | 0.037 | 0.025 | 0.016 | 0.100 | 0.056 | 0.030 | 0.016 | 0.006 |
|  |  |  | 10 | 0.265 | 0.175 | 0.118 | 0.090 | 0.064 | 0.264 | 0.166 | 0.112 | 0.084 | 0.060 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | -0.070 | -0.060 | -0.062 | -0.053 | -0.050 | -0.112 | -0.103 | -0.102 | -0.104 | -0.095 |
|  |  |  | 5 | 0.200 | 0.123 | 0.088 | 0.046 | 0.034 | 0.171 | 0.090 | 0.061 | 0.028 | 0.009 |
|  |  |  | 10 | 0.427 | 0.281 | 0.206 | 0.162 | 0.136 | 0.406 | 0.260 | 0.190 | 0.141 | 0.113 |

Table E20. Absolute bias in the estimated intercept, with L studies imputed (from 2-dimensional algorithmic variant) (continued)

| L Missing Studies Imputed |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.296 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | -0.007 | -0.004 | -0.006 | -0.005 | -0.003 | -0.008 | -0.005 | -0.007 | -0.006 | -0.003 |
|  |  |  | 5 | 0.038 | 0.020 | 0.013 | 0.008 | 0.006 | 0.040 | 0.023 | 0.015 | 0.009 | 0.007 |
|  |  |  | 10 | 0.124 | 0.058 | 0.037 | 0.024 | 0.018 | 0.124 | 0.060 | 0.039 | 0.027 | 0.021 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | -0.017 | -0.015 | -0.013 | -0.014 | -0.013 | -0.030 | -0.024 | -0.026 | -0.026 | -0.024 |
|  |  |  | 5 | 0.077 | 0.045 | 0.025 | 0.014 | 0.009 | 0.080 | 0.044 | 0.025 | 0.018 | 0.011 |
|  |  |  | 10 | 0.209 | 0.127 | 0.085 | 0.064 | 0.047 | 0.207 | 0.125 | 0.085 | 0.064 | 0.050 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | -0.037 | -0.026 | -0.026 | -0.027 | -0.028 | -0.061 | -0.056 | -0.051 | -0.053 | -0.050 |
|  |  |  | 5 | 0.130 | 0.076 | 0.043 | 0.032 | 0.021 | 0.120 | 0.071 | 0.037 | 0.030 | 0.014 |
|  |  |  | 10 | 0.285 | 0.191 | 0.141 | 0.103 | 0.081 | 0.282 | 0.185 | 0.132 | 0.099 | 0.077 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | -0.054 | -0.070 | -0.057 | -0.067 | -0.063 | -0.109 | -0.106 | -0.101 | -0.103 | -0.104 |
|  |  |  | 5 | 0.209 | 0.142 | 0.094 | 0.074 | 0.051 | 0.184 | 0.112 | 0.068 | 0.042 | 0.028 |
|  |  |  | 10 | 0.455 | 0.312 | 0.233 | 0.182 | 0.146 | 0.432 | 0.291 | 0.210 | 0.160 | 0.121 |
| $\begin{gathered} \beta_{1}= \\ 0.444 \end{gathered}$ | $\mathrm{T}^{\mathbf{2}}=0$ |  | 0 | -0.007 | -0.006 | -0.004 | -0.004 | -0.004 | -0.009 | -0.007 | -0.005 | -0.005 | -0.005 |
|  |  |  | 5 | 0.046 | 0.025 | 0.016 | 0.013 | 0.009 | 0.049 | 0.027 | 0.017 | 0.014 | 0.011 |
|  |  |  | 10 | 0.141 | 0.074 | 0.047 | 0.035 | 0.024 | 0.142 | 0.076 | 0.050 | 0.037 | 0.027 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | -0.017 | -0.014 | -0.012 | -0.010 | -0.012 | -0.028 | -0.025 | -0.024 | -0.023 | -0.025 |
|  |  |  | 5 | 0.094 | 0.056 | 0.030 | 0.024 | 0.013 | 0.094 | 0.056 | 0.034 | 0.027 | 0.015 |
|  |  |  | 10 | 0.234 | 0.146 | 0.102 | 0.072 | 0.058 | 0.231 | 0.145 | 0.104 | 0.075 | 0.061 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | -0.036 | -0.033 | -0.030 | -0.027 | -0.028 | -0.062 | -0.057 | -0.052 | -0.048 | -0.048 |
|  |  |  | 5 | 0.136 | 0.097 | 0.062 | 0.044 | 0.025 | 0.131 | 0.087 | 0.054 | 0.035 | 0.020 |
|  |  |  | 10 | 0.327 | 0.223 | 0.161 | 0.118 | 0.105 | 0.320 | 0.209 | 0.151 | 0.115 | 0.097 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | -0.051 | -0.062 | -0.068 | -0.070 | -0.057 | -0.097 | -0.104 | -0.108 | -0.104 | -0.100 |
|  |  |  | 5 | 0.226 | 0.162 | 0.108 | 0.085 | 0.054 | 0.197 | 0.131 | 0.082 | 0.056 | 0.028 |
|  |  |  | 10 | 0.492 | 0.331 | 0.264 | 0.210 | 0.167 | 0.469 | 0.311 | 0.232 | 0.179 | 0.142 |

Table E21. Coverage probability of the estimated intercept, with no correction for publication bias (from 2-dimensional algorithmic variant)


Table E21. Coverage probability of the estimated intercept, with no correction for publication bias (from 2-dimensional algorithmic variant) (continued)

| No Correction for Publication Bias |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.296 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 95.5\% | 95.5\% | 95.1\% | 94.8\% | 95.2\% | 96.7\% | 96.6\% | 96.1\% | 95.7\% | 96.1\% |
|  |  |  | 5 | 90.4\% | 91.9\% | 92.8\% | 94.0\% | 93.6\% | 90.7\% | 92.1\% | 93.2\% | 94.2\% | 94.0\% |
|  |  |  | 10 | 75.2\% | 81.2\% | 84.1\% | 87.5\% | 89.0\% | 75.7\% | 81.4\% | 84.1\% | 87.6\% | 89.0\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | 63.4\% | 60.0\% | 56.3\% | 54.7\% | 53.6\% | 92.3\% | 93.0\% | 93.8\% | 94.2\% | 93.7\% |
|  |  |  | 5 | 60.4\% | 59.0\% | 55.4\% | 55.1\% | 52.9\% | 78.1\% | 82.5\% | 85.3\% | 86.8\% | 88.3\% |
|  |  |  | 10 | 46.0\% | 46.8\% | 48.5\% | 47.8\% | 47.4\% | 53.0\% | 58.7\% | 64.3\% | 68.8\% | 71.9\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | 45.1\% | 40.0\% | 39.4\% | 37.0\% | 36.3\% | 92.6\% | 92.9\% | 94.3\% | 93.6\% | 94.0\% |
|  |  |  | 5 | 42.0\% | 41.8\% | 40.0\% | 37.4\% | 36.8\% | 76.9\% | 81.7\% | 84.9\% | 85.7\% | 87.0\% |
|  |  |  | 10 | 33.7\% | 33.1\% | 33.4\% | 32.7\% | 33.6\% | 50.2\% | 57.9\% | 63.6\% | 67.6\% | 69.4\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 28.5\% | 26.3\% | 23.3\% | 23.2\% | 21.6\% | 93.2\% | 93.4\% | 92.8\% | 93.6\% | 94.1\% |
|  |  |  | 5 | 30.3\% | 27.2\% | 25.7\% | 23.1\% | 22.1\% | 78.1\% | 80.9\% | 83.9\% | 85.6\% | 85.5\% |
|  |  |  | 10 | 22.6\% | 22.6\% | 22.6\% | 21.1\% | 21.2\% | 49.9\% | 56.7\% | 62.4\% | 65.0\% | 68.9\% |
| $\begin{gathered} \beta_{1}= \\ 0.444 \end{gathered}$ | $\mathrm{T}^{2}=0$ | Number of Missing Studies | 0 | 94.5\% | 94.9\% | 95.2\% | 94.8\% | 94.8\% | 95.9\% | 96.0\% | 96.4\% | 95.6\% | 95.9\% |
|  |  |  | 5 | 88.7\% | 91.2\% | 92.3\% | 93.3\% | 93.2\% | 89.2\% | 91.5\% | 92.7\% | 93.4\% | 93.5\% |
|  |  |  | 10 | 71.3\% | 76.6\% | 81.2\% | 83.9\% | 87.1\% | 71.9\% | 76.5\% | 81.1\% | 83.9\% | 86.8\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | 63.0\% | 60.3\% | 56.5\% | 55.4\% | 53.3\% | 92.4\% | 93.3\% | 93.4\% | 93.5\% | 93.8\% |
|  |  |  | 5 | 58.8\% | 56.4\% | 55.5\% | 54.2\% | 52.0\% | 75.5\% | 79.5\% | 82.4\% | 85.0\% | 86.9\% |
|  |  |  | 10 | 40.7\% | 40.5\% | 43.3\% | 46.1\% | 44.5\% | 48.1\% | 51.9\% | 58.0\% | 63.7\% | 66.4\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | 43.5\% | 41.3\% | 39.2\% | 36.5\% | 36.1\% | 92.5\% | 93.6\% | 93.1\% | 93.8\% | 94.2\% |
|  |  |  | 5 | 43.3\% | 40.3\% | 38.4\% | 36.9\% | 36.5\% | 74.3\% | 78.2\% | 81.3\% | 83.6\% | 85.5\% |
|  |  |  | 10 | 28.8\% | 29.3\% | 29.6\% | 30.6\% | 30.0\% | 43.8\% | 50.0\% | 56.5\% | 61.9\% | 63.7\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 28.4\% | 26.4\% | 24.8\% | 23.4\% | 22.2\% | 92.7\% | 93.1\% | 93.3\% | 93.7\% | 93.1\% |
|  |  |  | 5 | 30.1\% | 26.1\% | 24.6\% | 23.9\% | 23.2\% | 76.1\% | 77.5\% | 81.2\% | 83.6\% | 84.6\% |
|  |  |  | 10 | 19.1\% | 21.1\% | 20.2\% | 19.6\% | 19.9\% | 45.6\% | 52.1\% | 57.3\% | 60.8\% | 64.6\% |

Table E22. Coverage probability of the estimated intercept, with R studies imputed (from 2-dimensional algorithmic variant)

| R Missing Studies Imputed |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.049 \end{gathered}$ |  | Number of Missing Studies | 0 | 94.3\% | 94.9\% | 94.9\% | 94.9\% | 94.8\% | 95.8\% | 96.3\% | 96.1\% | 96.2\% | 96.1\% |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 92.9\% | 93.2\% | 94.0\% | 93.9\% | 94.2\% | 93.6\% | 94.2\% | 95.0\% | 94.9\% | 95.0\% |
|  |  |  | 10 | 88.8\% | 91.3\% | 92.9\% | 93.0\% | 93.2\% | 89.7\% | 91.9\% | 93.6\% | 93.7\% | 94.0\% |
|  |  |  | 0 | 62.3\% | 61.3\% | 56.0\% | 54.1\% | 51.7\% | 90.6\% | 92.6\% | 92.4\% | 93.0\% | 93.5\% |
|  |  |  | 5 | 62.7\% | 58.4\% | 55.5\% | 53.3\% | 53.8\% | 82.1\% | 85.0\% | 87.2\% | 88.2\% | 89.7\% |
|  |  |  | 10 | 60.5\% | 57.3\% | 55.9\% | 53.2\% | 52.8\% | 70.1\% | 75.9\% | 80.4\% | 82.7\% | 84.5\% |
|  |  |  | 0 | 43.8\% | 39.4\% | 39.2\% | 36.8\% | 34.8\% | 91.2\% | 90.8\% | 91.9\% | 92.7\% | 93.5\% |
|  |  |  | 5 | 45.7\% | 40.8\% | 37.5\% | 36.9\% | 34.4\% | 81.7\% | 84.9\% | 85.7\% | 86.6\% | 86.9\% |
|  |  |  | 10 | 43.2\% | 40.4\% | 38.6\% | 36.8\% | 35.4\% | 65.3\% | 73.9\% | 78.1\% | 78.6\% | 82.2\% |
|  |  |  | 0 | 27.5\% | 24.7\% | 23.5\% | 20.8\% | 20.8\% | 88.8\% | 89.5\% | 89.5\% | 91.3\% | 91.2\% |
|  |  |  | 5 | 30.7\% | 25.2\% | 24.6\% | 22.0\% | 22.1\% | 80.7\% | 82.8\% | 83.8\% | 84.3\% | 84.1\% |
|  |  |  | 10 | 26.8\% | 26.1\% | 25.0\% | 22.8\% | 21.3\% | 61.7\% | 71.5\% | 75.9\% | 77.9\% | 78.5\% |
| $\begin{gathered} \beta_{1}= \\ 0.074 \end{gathered}$ |  |  | 0 | 94.3\% | 95.0\% | 95.1\% | 94.1\% | 94.9\% | 95.8\% | 96.0\% | 96.5\% | 95.5\% | 96.2\% |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 92.7\% | 93.7\% | 93.8\% | 93.7\% | 94.4\% | 93.9\% | 94.4\% | 94.7\% | 95.2\% | 95.3\% |
|  |  |  | 10 | 87.1\% | 91.3\% | 92.0\% | 92.7\% | 93.7\% | 87.9\% | 92.0\% | 92.5\% | 93.5\% | 94.8\% |
|  |  |  | 0 | 61.2\% | 59.0\% | 55.9\% | 54.0\% | 54.2\% | 91.4\% | 92.6\% | 92.7\% | 93.9\% | 93.7\% |
|  | $0.049$ |  | 5 | 63.1\% | 58.1\% | 56.3\% | 53.8\% | 52.2\% | 82.9\% | 84.5\% | 86.1\% | 87.8\% | 89.4\% |
|  |  |  | 10 | 59.7\% | 57.3\% | 56.4\% | 54.0\% | 51.5\% | 69.5\% | 75.0\% | 80.6\% | 82.3\% | 84.1\% |
|  |  |  | 0 | 42.2\% | 39.8\% | 37.7\% | 36.3\% | 36.3\% | 90.1\% | 91.1\% | 92.3\% | 92.8\% | 92.7\% |
|  | $0.148$ |  | 5 | 46.7\% | 41.4\% | 37.8\% | 36.6\% | 35.2\% | 81.8\% | 83.2\% | 85.6\% | 86.2\% | 87.3\% |
|  |  |  | 10 | 41.8\% | 40.3\% | 39.5\% | 35.0\% | 34.6\% | 64.4\% | 72.8\% | 76.9\% | 78.9\% | 81.6\% |
|  |  |  | 0 | 28.2\% | 23.5\% | 22.8\% | 22.7\% | 21.2\% | 89.7\% | 89.2\% | 90.4\% | 91.3\% | 91.5\% |
|  |  |  | 5 | 29.9\% | 26.8\% | 24.1\% | 21.0\% | 21.0\% | 80.2\% | 82.4\% | 83.8\% | 84.5\% | 85.2\% |
|  |  |  | 10 | 27.0\% | 25.7\% | 25.0\% | 23.4\% | 22.4\% | 61.9\% | 70.5\% | 75.0\% | 77.3\% | 78.6\% |
| $\begin{gathered} \beta_{1}= \\ 0.148 \end{gathered}$ |  | Number of Missing Studies | 0 | 94.2\% | 95.3\% | 94.9\% | 94.8\% | 94.7\% | 95.8\% | 96.4\% | 96.1\% | 96.2\% | 95.8\% |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 92.3\% | 93.2\% | 94.1\% | 94.7\% | 94.5\% | 93.4\% | 94.3\% | 95.0\% | 95.6\% | 95.5\% |
|  |  |  | 10 | 86.1\% | 89.5\% | 91.5\% | 92.6\% | 93.6\% | 86.9\% | 90.4\% | 92.3\% | 93.5\% | 94.3\% |
|  |  |  | 0 | 62.5\% | 58.6\% | 57.0\% | 55.0\% | 52.2\% | 91.0\% | 91.9\% | 92.5\% | 93.4\% | 94.0\% |
|  | $0.049$ |  | 5 | 62.2\% | 58.7\% | 56.5\% | 53.5\% | 52.4\% | 81.8\% | 84.8\% | 86.1\% | 88.4\% | 89.3\% |
|  |  |  | 10 | 57.0\% | 56.8\% | 55.1\% | 53.7\% | 52.0\% | 67.3\% | 74.4\% | 79.1\% | 82.1\% | 83.2\% |
|  |  |  | 0 | 44.4\% | 41.0\% | 39.2\% | 37.1\% | 35.2\% | 90.3\% | 91.4\% | 91.9\% | 92.9\% | 92.1\% |
|  |  |  | 5 | 45.5\% | 40.9\% | 38.0\% | 36.2\% | 35.7\% | 80.5\% | 83.7\% | 84.5\% | 85.5\% | 86.9\% |
|  |  |  | 10 | 40.1\% | 39.5\% | 37.1\% | 36.1\% | 34.6\% | 60.3\% | 72.3\% | 76.2\% | 79.3\% | 81.0\% |
|  |  |  | 0 | 26.9\% | 25.8\% | 22.6\% | 23.2\% | 22.3\% | 89.4\% | 90.0\% | 90.6\% | 91.1\% | 91.5\% |
|  | $0.444$ |  | 5 | 28.0\% | 26.8\% | 24.3\% | 22.7\% | 20.5\% | 79.7\% | 82.1\% | 82.4\% | 83.5\% | 84.6\% |
|  |  |  | 10 | 26.4\% | 24.9\% | 25.5\% | 23.5\% | 21.5\% | 59.7\% | 69.4\% | 75.2\% | 76.7\% | 78.0\% |

Table E22. Coverage probability of the estimated intercept, with R studies imputed (from 2-dimensional algorithmic variant) (continued) R Missing Studies Imputed

Fixed Effects in the Final Model Number of Studies

Random Effects in the Final Model

|  |  |  |  | Of |  |  |  |  | Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.296 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 95.3\% | 95.3\% | 94.9\% | 94.7\% | 95.2\% | 96.6\% | 96.7\% | 96.1\% | 95.8\% | 96.3\% |
|  |  |  | 5 | 91.1\% | 93.1\% | 93.3\% | 94.5\% | 94.4\% | 92.0\% | 93.8\% | 94.4\% | 95.1\% | 95.5\% |
|  |  |  | 10 | 82.0\% | 87.6\% | 90.5\% | 91.3\% | 92.4\% | 82.9\% | 88.4\% | 91.0\% | 91.8\% | 92.8\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | 62.6\% | 59.5\% | 56.0\% | 54.6\% | 53.5\% | 91.5\% | 92.2\% | 93.2\% | 93.7\% | 93.4\% |
|  |  |  | 5 | 60.3\% | 59.1\% | 55.6\% | 54.8\% | 53.1\% | 80.9\% | 84.6\% | 86.8\% | 87.8\% | 88.4\% |
|  |  |  | 10 | 52.3\% | 53.1\% | 52.9\% | 52.3\% | 50.4\% | 63.0\% | 70.7\% | 75.6\% | 79.4\% | 81.5\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | 43.9\% | 38.9\% | 39.1\% | 36.9\% | 36.1\% | 90.7\% | 91.2\% | 92.5\% | 92.5\% | 92.9\% |
|  |  |  | 5 | 42.8\% | 41.5\% | 38.4\% | 36.1\% | 36.2\% | 78.8\% | 83.4\% | 84.7\% | 85.3\% | 86.1\% |
|  |  |  | 10 | 37.9\% | 39.0\% | 37.1\% | 35.2\% | 35.2\% | 60.2\% | 70.7\% | 74.6\% | 76.8\% | 78.1\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 27.9\% | 25.6\% | 22.7\% | 22.5\% | 21.4\% | 90.1\% | 90.7\% | 90.2\% | 91.0\% | 91.7\% |
|  |  |  | 5 | 29.3\% | 25.8\% | 24.9\% | 22.0\% | 20.5\% | 79.2\% | 81.1\% | 83.0\% | 82.9\% | 83.7\% |
|  |  |  | 10 | 25.0\% | 25.1\% | 23.8\% | 22.2\% | 21.0\% | 58.9\% | 65.9\% | 72.1\% | 73.7\% | 75.7\% |
| $\begin{aligned} & \beta_{1}= \\ & 0.444 \end{aligned}$ | $\mathrm{T}^{2}=0$ |  | 0 | 94.2\% | 94.7\% | 95.1\% | 94.6\% | 94.7\% | 95.7\% | 95.9\% | 96.4\% | 95.8\% | 95.8\% |
|  |  |  | 5 | 90.5\% | 92.5\% | 93.6\% | 94.7\% | 93.9\% | 91.3\% | 93.3\% | 94.3\% | 95.2\% | 94.5\% |
|  |  |  | 10 | 79.4\% | 85.1\% | 87.8\% | 89.6\% | 91.6\% | 80.6\% | 86.0\% | 88.6\% | 90.1\% | 92.1\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | 62.0\% | 59.9\% | 56.2\% | 55.3\% | 53.2\% | 91.7\% | 92.9\% | 92.9\% | 93.1\% | 93.2\% |
|  |  |  | 5 | 61.0\% | 57.8\% | 56.2\% | 54.8\% | 53.0\% | 79.8\% | 83.4\% | 85.2\% | 87.0\% | 88.2\% |
|  |  |  | 10 | 49.2\% | 49.6\% | 50.2\% | 52.2\% | 49.8\% | 59.9\% | 68.5\% | 72.5\% | 78.1\% | 78.2\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | 43.2\% | 41.0\% | 39.4\% | 35.9\% | 35.6\% | 90.2\% | 92.0\% | 91.4\% | 92.2\% | 93.1\% |
|  |  |  | 5 | 43.8\% | 41.3\% | 39.7\% | 38.0\% | 36.2\% | 77.3\% | 81.4\% | 83.7\% | 84.9\% | 85.2\% |
|  |  |  | 10 | 34.7\% | 35.1\% | 35.8\% | 34.9\% | 33.6\% | 55.7\% | 65.6\% | 71.3\% | 74.4\% | 76.4\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 27.4\% | 25.3\% | 24.0\% | 23.0\% | 22.1\% | 89.7\% | 89.8\% | 90.7\% | 91.2\% | 90.9\% |
|  |  |  | 5 | 30.1\% | 25.1\% | 24.5\% | 23.1\% | 22.4\% | 77.9\% | 79.0\% | 81.8\% | 83.4\% | 83.4\% |
|  |  |  | 10 | 22.3\% | 23.9\% | 22.8\% | 21.4\% | 21.4\% | 55.5\% | 64.9\% | 69.4\% | 71.1\% | 74.6\% |

Table E23. Coverage probability of the estimated intercept, with L studies imputed (from 2-dimensional algorithmic variant)

| L Missing Studies Imputed |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.049 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 93.9\% | 94.4\% | 94.2\% | 94.2\% | 94.3\% | 95.4\% | 96.0\% | 95.7\% | 96.0\% | 95.9\% |
|  |  |  | 5 | 93.3\% | 93.2\% | 93.7\% | 93.8\% | 93.7\% | 94.1\% | 94.1\% | 94.6\% | 94.8\% | 94.7\% |
|  |  |  | 10 | 88.8\% | 91.6\% | 93.5\% | 93.2\% | 92.8\% | 89.5\% | 92.4\% | 94.2\% | 93.9\% | 93.7\% |
|  |  |  | 0 | 60.6\% | 59.7\% | 54.3\% | 51.8\% | 49.7\% | 89.1\% | 90.7\% | 89.3\% | 90.0\% | 89.7\% |
|  |  |  | 5 | 63.3\% | 58.5\% | 55.3\% | 52.9\% | 52.3\% | 82.5\% | 84.8\% | 86.9\% | 87.1\% | 87.9\% |
|  |  |  | 10 | 60.3\% | 57.6\% | 56.2\% | 53.4\% | 52.3\% | 69.9\% | 74.9\% | 79.4\% | 81.5\% | 83.2\% |
|  |  |  | 0 | 41.7\% | 37.3\% | 36.8\% | 34.9\% | 32.3\% | 88.1\% | 87.6\% | 86.7\% | 87.2\% | 87.2\% |
|  |  |  | 5 | 45.8\% | 42.2\% | 36.5\% | 35.5\% | 32.9\% | 81.5\% | 84.6\% | 84.2\% | 85.3\% | 85.5\% |
|  |  |  | 10 | 42.3\% | 39.7\% | 38.2\% | 35.7\% | 34.5\% | 63.5\% | 72.3\% | 77.1\% | 78.2\% | 80.4\% |
|  |  |  | 0 | 26.3\% | 23.3\% | 21.8\% | 19.2\% | 19.5\% | 85.5\% | 84.8\% | 84.2\% | 83.5\% | 83.3\% |
|  | $\begin{aligned} & \mathbf{T}^{\top}= \\ & 0.444 \end{aligned}$ |  | 5 | 30.2\% | 25.5\% | 24.5\% | 22.0\% | 21.4\% | 80.8\% | 82.4\% | 83.3\% | 83.0\% | 82.2\% |
|  |  |  | 10 | 26.0\% | 25.0\% | 24.4\% | 22.7\% | 21.0\% | 60.8\% | 69.7\% | 74.2\% | 76.8\% | 77.3\% |
| $\begin{gathered} \beta_{1}= \\ 0.074 \end{gathered}$ |  |  | 0 | 94.1\% | 94.5\% | 94.6\% | 93.7\% | 94.6\% | 95.7\% | 95.7\% | 96.2\% | 95.4\% | 96.0\% |
|  | $\mathrm{r}^{2}=0$ |  | 5 | 93.2\% | 93.8\% | 93.4\% | 93.7\% | 94.0\% | 94.1\% | 94.8\% | 94.6\% | 94.7\% | 94.8\% |
|  |  |  | 10 | 87.4\% | 91.4\% | 92.1\% | 93.0\% | 93.6\% | 88.0\% | 92.1\% | 92.6\% | 93.6\% | 94.7\% |
|  |  |  | 0 | 60.0\% | 57.4\% | 54.6\% | 52.1\% | 52.9\% | 90.0\% | 90.9\% | 90.1\% | 90.6\% | 90.6\% |
|  | $0.049$ |  | 5 | 63.3\% | 57.7\% | 55.8\% | 52.1\% | 50.8\% | 82.0\% | 84.2\% | 85.1\% | 86.4\% | 87.5\% |
|  |  |  | 10 | 58.9\% | 56.9\% | 55.5\% | 53.7\% | 50.9\% | 69.0\% | 73.6\% | 79.4\% | 81.3\% | 82.6\% |
|  |  |  | 0 | 41.2\% | 37.6\% | 35.6\% | 33.7\% | 34.3\% | 88.0\% | 88.1\% | 87.6\% | 87.5\% | 86.6\% |
|  | $0.148$ |  | 5 | 46.7\% | 41.0\% | 37.0\% | 35.7\% | 34.1\% | 81.5\% | 83.3\% | 85.1\% | 84.9\% | 85.2\% |
|  |  |  | 10 | 41.0\% | 40.0\% | 39.2\% | 35.1\% | 33.8\% | 63.3\% | 71.5\% | 76.0\% | 77.9\% | 80.1\% |
|  |  |  | 0 | 27.1\% | 22.8\% | 21.2\% | 21.2\% | 19.8\% | 86.5\% | 84.7\% | 85.3\% | 84.5\% | 84.1\% |
|  |  |  | 5 | 29.7\% | 26.7\% | 24.3\% | 21.2\% | 20.0\% | 80.9\% | 82.2\% | 83.2\% | 83.1\% | 83.4\% |
|  |  |  | 10 | 26.3\% | 25.0\% | 23.8\% | 23.5\% | 21.5\% | 60.4\% | 69.4\% | 73.1\% | 76.3\% | 77.9\% |
| $\begin{gathered} \beta_{1}= \\ 0.148 \end{gathered}$ |  |  | 0 | 93.7\% | 95.0\% | 94.2\% | 94.1\% | 94.1\% | 95.4\% | 96.2\% | 95.7\% | 96.0\% | 95.9\% |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 92.5\% | 93.2\% | 93.6\% | 94.5\% | 93.8\% | 93.5\% | 94.2\% | 94.7\% | 95.2\% | 95.0\% |
|  |  |  | 10 | 86.3\% | 89.5\% | 90.9\% | 92.1\% | 93.2\% | 86.9\% | 90.2\% | 91.7\% | 92.8\% | 93.9\% |
|  |  |  | 0 | 60.9\% | 57.2\% | 55.1\% | 53.5\% | 50.6\% | 89.3\% | 89.6\% | 90.2\% | 90.6\% | 91.0\% |
|  | $0.049$ |  | 5 | 62.2\% | 58.5\% | 55.8\% | 52.9\% | 51.2\% | 81.8\% | 84.3\% | 85.0\% | 87.1\% | 87.0\% |
|  |  |  | 10 | 56.3\% | 55.7\% | 53.8\% | 52.9\% | 51.0\% | 66.6\% | 72.5\% | 77.3\% | 80.6\% | 82.2\% |
|  |  |  | 0 | 42.7\% | 39.0\% | 36.9\% | 35.2\% | 33.0\% | 87.7\% | 87.4\% | 87.2\% | 86.6\% | 86.6\% |
|  | $0.148$ |  | 5 | 45.3\% | 40.3\% | 37.3\% | 35.9\% | 34.1\% | 80.1\% | 82.9\% | 83.4\% | 84.0\% | 85.2\% |
|  |  |  | 10 | 39.5\% | 38.5\% | 36.1\% | 35.3\% | 34.2\% | 59.4\% | 70.2\% | 74.4\% | 77.5\% | 79.0\% |
|  |  |  | 0 | 26.2\% | 24.5\% | 21.2\% | 21.1\% | 20.1\% | 85.2\% | 85.9\% | 84.1\% | 83.4\% | 83.6\% |
|  | $0.444$ |  | 5 | 27.8\% | 26.7\% | 23.4\% | 22.0\% | 19.9\% | 79.7\% | 81.4\% | 82.2\% | 81.8\% | 82.0\% |
|  |  |  | 10 | 25.0\% | 24.6\% | 24.1\% | 22.2\% | 21.5\% | 58.9\% | 67.4\% | 72.6\% | 74.4\% | 75.9\% |

Table E23. Coverage probability of the estimated intercept, with L studies imputed (from 2-dimensional algorithmic variant) (continued) L Missing Studies Imputed

|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| $\begin{gathered} \beta_{1}= \\ 0.296 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 94.9\% | 94.7\% | 94.4\% | 94.2\% | 94.4\% | 96.4\% | 96.2\% | 95.7\% | 95.5\% | 95.9\% |
|  |  |  | 5 | 91.4\% | 92.3\% | 92.8\% | 94.0\% | 93.8\% | 92.2\% | 92.9\% | 93.9\% | 94.7\% | 94.8\% |
|  |  |  | 10 | 81.9\% | 86.7\% | 89.6\% | 90.7\% | 91.6\% | 82.6\% | 87.8\% | 90.4\% | 91.3\% | 92.3\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | 61.1\% | 57.6\% | 54.3\% | 52.4\% | 51.2\% | 89.8\% | 89.8\% | 90.6\% | 90.7\% | 89.6\% |
|  |  |  | 5 | 60.5\% | 57.6\% | 54.0\% | 53.4\% | 51.6\% | 80.8\% | 83.3\% | 85.1\% | 85.6\% | 86.5\% |
|  |  |  | 10 | 51.1\% | 51.3\% | 51.1\% | 49.9\% | 48.2\% | 61.7\% | 68.3\% | 72.9\% | 77.1\% | 79.3\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | 42.5\% | 36.9\% | 36.8\% | 34.5\% | 34.2\% | 87.9\% | 87.8\% | 88.1\% | 87.0\% | 87.3\% |
|  |  |  | 5 | 41.7\% | 40.7\% | 37.6\% | 35.2\% | 34.0\% | 78.2\% | 82.4\% | 83.4\% | 83.3\% | 83.3\% |
|  |  |  | 10 | 36.9\% | 37.4\% | 35.4\% | 33.7\% | 32.3\% | 58.0\% | 67.3\% | 71.1\% | 74.0\% | 74.8\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 26.5\% | 23.9\% | 21.1\% | 20.6\% | 19.6\% | 86.3\% | 86.5\% | 83.9\% | 83.8\% | 83.2\% |
|  |  |  | 5 | 28.7\% | 25.5\% | 23.6\% | 21.1\% | 20.1\% | 78.8\% | 80.5\% | 81.8\% | 81.7\% | 81.8\% |
|  |  |  | 10 | 23.9\% | 23.7\% | 22.9\% | 21.2\% | 20.3\% | 56.5\% | 63.5\% | 69.3\% | 71.1\% | 73.4\% |
| $\begin{aligned} & \beta_{1}= \\ & 0.444 \end{aligned}$ | $\mathrm{T}^{2}=0$ |  | 0 | 93.7\% | 94.3\% | 94.6\% | 94.2\% | 94.3\% | 95.4\% | 95.7\% | 96.1\% | 95.7\% | 95.7\% |
|  |  |  | 5 | 89.7\% | 91.8\% | 92.8\% | 94.1\% | 93.3\% | 90.5\% | 92.8\% | 93.9\% | 94.5\% | 94.2\% |
|  |  |  | 10 | 78.8\% | 84.3\% | 87.6\% | 89.6\% | 90.9\% | 79.9\% | 85.0\% | 88.2\% | 90.1\% | 91.6\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | 60.7\% | 58.4\% | 54.5\% | 53.8\% | 51.6\% | 90.0\% | 90.5\% | 90.7\% | 90.2\% | 90.3\% |
|  |  |  | 5 | 59.9\% | 56.4\% | 54.8\% | 53.2\% | 50.6\% | 78.7\% | 81.7\% | 83.7\% | 84.9\% | 86.0\% |
|  |  |  | 10 | 47.9\% | 48.3\% | 48.0\% | 50.6\% | 47.9\% | 58.7\% | 65.3\% | 69.8\% | 76.0\% | 75.7\% |
|  | $\begin{gathered} T^{2}= \\ 0.148 \end{gathered}$ |  | 0 | 41.6\% | 39.2\% | 37.3\% | 33.9\% | 33.0\% | 87.9\% | 88.3\% | 87.5\% | 87.6\% | 86.8\% |
|  |  |  | 5 | 43.1\% | 40.1\% | 37.5\% | 35.7\% | 34.2\% | 76.5\% | 80.8\% | 81.9\% | 83.3\% | 82.0\% |
|  |  |  | 10 | 32.6\% | 32.5\% | 33.9\% | 33.2\% | 31.9\% | 53.3\% | 62.4\% | 67.7\% | 71.4\% | 72.5\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 26.6\% | 23.5\% | 22.5\% | 20.9\% | 19.9\% | 86.6\% | 85.2\% | 84.2\% | 84.1\% | 82.3\% |
|  |  |  | 5 | 29.7\% | 24.8\% | 23.2\% | 22.7\% | 21.6\% | 77.4\% | 78.5\% | 80.6\% | 81.3\% | 81.0\% |
|  |  |  | 10 | 21.0\% | 22.2\% | 21.6\% | 20.2\% | 19.7\% | 54.2\% | 61.3\% | 66.1\% | 68.7\% | 71.7\% |

Table E24. Absolute bias in the estimated slope, with no correction for publication bias (from 2-dimensional algorithmic variant)

| No Correction for Publication Bias |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{aligned} & \beta_{1}= \\ & 0.049 \end{aligned}$ |  |  | 0 | 0.000 | -0.001 | 0.002 | -0.002 | -0.001 | 0.000 | -0.001 | 0.001 | -0.003 | -0.001 |
|  | $\mathrm{T}^{2}=0$ |  | 5 | -0.009 | -0.006 | -0.006 | -0.002 | -0.001 | -0.009 | -0.007 | -0.006 | -0.003 | -0.001 |
|  |  |  | 10 | -0.025 | -0.016 | -0.008 | -0.006 | -0.005 | -0.026 | -0.016 | -0.008 | -0.006 | -0.005 |
|  | $\mathrm{T}^{2}=$ |  | 0 | -0.003 | -0.002 | 0.000 | -0.003 | -0.001 | -0.003 | 0.002 | 0.001 | -0.004 | 0.002 |
|  |  |  | 5 | -0.018 | -0.009 | -0.010 | -0.010 | 0.000 | -0.020 | -0.007 | -0.009 | -0.011 | -0.005 |
|  |  |  | 10 | -0.024 | -0.020 | -0.013 | -0.019 | -0.011 | -0.022 | -0.020 | -0.014 | -0.018 | -0.012 |
|  | $\mathrm{T}^{2}$ |  | 0 | -0.005 | 0.016 | -0.002 | 0.004 | 0.001 | -0.003 | 0.001 | -0.001 | 0.003 | 0.003 |
|  |  |  | 5 | -0.023 | -0.009 | -0.008 | -0.006 | -0.006 | -0.020 | -0.012 | -0.012 | -0.010 | -0.010 |
|  | 0.148 |  | 10 | $-0.021$ | -0.014 | -0.016 | -0.019 | -0.004 | -0.025 | -0.020 | -0.018 | -0.022 | -0.015 |
|  | $\mathrm{T}^{2}$ |  | 0 | 0.000 | 0.024 | 0.007 | -0.003 | -0.001 | -0.007 | 0.011 | 0.000 | 0.000 | 0.003 |
|  |  |  | 5 | -0.002 | -0.018 | -0.017 | -0.022 | -0.013 | -0.012 | -0.022 | -0.018 | -0.018 | -0.008 |
|  |  |  | 10 | -0.041 | -0.023 | -0.024 | -0.017 | -0.009 | -0.028 | -0.033 | -0.023 | -0.019 | -0.008 |
| $\begin{aligned} & \beta_{1}= \\ & 0.074 \end{aligned}$ |  |  | 0 | -0.001 | 0.003 | 0.002 | -0.001 | -0.001 | 0.000 | 0.003 | 0.002 | -0.001 | -0.001 |
|  | $\mathrm{T}^{2}=0$ |  | 5 | -0.011 | -0.007 | -0.004 | -0.003 | -0.005 | -0.011 | -0.008 | -0.004 | -0.003 | -0.004 |
|  |  |  | 10 | -0.047 | -0.024 | -0.015 | -0.010 | -0.008 | -0.047 | -0.024 | -0.015 | -0.011 | -0.008 |
|  |  |  | 0 | -0.007 | -0.005 | 0.001 | 0.002 | -0.001 | -0.005 | -0.007 | 0.002 | -0.001 | -0.001 |
|  | $\begin{gathered} T^{2}= \\ 0.049 \end{gathered}$ |  | 5 | -0.016 | -0.020 | -0.014 | -0.011 | -0.008 | -0.021 | -0.022 | -0.017 | -0.014 | -0.009 |
|  |  |  | 10 | -0.040 | -0.030 | -0.025 | -0.023 | -0.015 | -0.041 | -0.032 | -0.027 | -0.022 | -0.020 |
|  | $\mathrm{T}^{2}=$ |  | 0 | 0.000 | 0.004 | 0.010 | 0.001 | -0.002 | -0.001 | -0.003 | 0.002 | 0.000 | -0.002 |
|  | $\begin{gathered} T^{2}= \\ 0.148 \end{gathered}$ |  | 5 | -0.020 | -0.020 | -0.018 | -0.015 | -0.001 | -0.025 | -0.014 | -0.025 | -0.017 | -0.008 |
|  | 0.148 |  | 10 | -0.047 | -0.038 | -0.021 | -0.045 | -0.027 | -0.043 | -0.033 | -0.029 | -0.032 | -0.022 |
|  |  |  | 0 | 0.008 | 0.005 | -0.003 | -0.005 | 0.006 | -0.004 | 0.001 | -0.011 | -0.006 | -0.002 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 5 | -0.020 | -0.023 | -0.010 | -0.027 | -0.024 | -0.022 | -0.026 | -0.022 | -0.022 | -0.015 |
|  | 0.444 |  | 10 | -0.034 | -0.031 | -0.041 | -0.023 | -0.019 | -0.048 | -0.032 | -0.039 | -0.030 | -0.021 |
| $\begin{gathered} \beta_{1}= \\ 0.148 \end{gathered}$ |  |  | 0 | -0.003 | 0.000 | -0.001 | 0.001 | 0.001 | -0.002 | -0.001 | -0.001 | 0.001 | 0.001 |
|  | $\mathrm{T}^{2}=0$ |  | $5$ | $-0.027$ | $-0.014$ | $-0.012$ | -0.007 | $-0.007$ | $-0.028$ | $-0.014$ | $-0.012$ | -0.007 | -0.006 |
|  |  |  | 10 | -0.087 | -0.044 | -0.030 | -0.018 | -0.014 | -0.087 | -0.045 | -0.030 | -0.019 | -0.014 |
|  |  |  | 0 | 0.007 | 0.003 | 0.003 | -0.007 | -0.002 | 0.003 | -0.004 | -0.002 | -0.003 | -0.003 |
|  | $\begin{gathered} \mathrm{T}^{\prime}= \\ 0.049 \end{gathered}$ |  | $5$ | $-0.041$ | $-0.039$ | $-0.017$ | $-0.015$ | $-0.015$ | $-0.046$ | $-0.040$ | $-0.024$ | $-0.021$ | $-0.020$ |
|  |  |  | 10 | -0.083 | -0.061 | -0.049 | -0.037 | -0.039 | -0.085 | -0.061 | -0.051 | -0.043 | -0.044 |
|  |  |  | 0 | 0.005 | -0.005 | -0.004 | 0.002 | 0.002 | 0.012 | -0.003 | -0.001 | 0.000 | $0.000$ |
|  | $\begin{gathered} \mathrm{T}^{\top}= \\ 0.148 \end{gathered}$ |  | 5 | $-0.058$ | $-0.032$ | $-0.029$ | $-0.026$ | $-0.024$ | $-0.060$ | $-0.043$ | $-0.033$ | $-0.033$ | $-0.028$ |
|  |  |  | 10 | -0.083 | -0.071 | -0.058 | -0.054 | -0.047 | -0.086 | -0.065 | -0.058 | -0.054 | -0.047 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 0.018 | 0.010 | 0.009 | -0.002 | -0.006 | 0.005 | -0.001 | -0.002 | 0.006 | -0.003 |
|  |  |  | $5$ | $-0.071$ | -0.053 | -0.039 | $-0.031$ | $-0.032$ | $-0.065$ | $-0.046$ | $-0.049$ | $-0.043$ | $-0.029$ |
|  |  |  | 10 | -0.092 | -0.067 | -0.054 | -0.053 | -0.059 | -0.087 | -0.066 | -0.067 | -0.054 | -0.058 |

Table E24. Absolute bias in the estimated slope, with no correction for publication bias (from 2-dimensional algorithmic variant) (continued)

| No Correction for Publication Bias |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.296 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 0.001 | -0.002 | 0.002 | 0.001 | -0.002 | 0.001 | -0.003 | 0.003 | 0.001 | -0.002 |
|  |  |  | 5 | -0.059 | -0.032 | -0.022 | -0.016 | -0.013 | -0.060 | -0.034 | -0.023 | -0.017 | -0.014 |
|  |  |  | 10 | -0.163 | -0.085 | -0.057 | -0.038 | -0.031 | -0.164 | -0.086 | -0.058 | -0.039 | -0.032 |
|  |  |  | 0 | -0.001 | 0.005 | 0.003 | 0.001 | 0.005 | 0.000 | -0.001 | 0.004 | 0.000 | 0.002 |
|  |  |  | 5 | -0.082 | -0.066 | -0.049 | -0.030 | -0.028 | -0.091 | -0.070 | -0.057 | -0.046 | -0.042 |
|  |  |  | 10 | -0.174 | -0.127 | -0.098 | -0.084 | -0.066 | -0.173 | -0.127 | -0.102 | -0.090 | -0.077 |
|  |  |  | 0 | 0.009 | -0.007 | -0.001 | -0.003 | 0.004 | 0.003 | -0.002 | -0.003 | 0.002 | 0.001 |
|  | $0.148$ |  | 5 | -0.108 | -0.076 | -0.054 | -0.046 | -0.046 | -0.108 | -0.086 | -0.060 | -0.067 | -0.055 |
|  |  |  | 10 | -0.150 | -0.128 | -0.111 | -0.087 | -0.084 | -0.156 | -0.131 | -0.116 | -0.099 | -0.093 |
|  |  |  | 0 | -0.009 | 0.021 | 0.000 | 0.010 | 0.011 | -0.001 | 0.010 | 0.000 | -0.003 | 0.004 |
|  | $0.444$ |  | 5 | -0.109 | -0.105 | -0.085 | -0.075 | -0.060 | -0.111 | -0.102 | -0.086 | -0.071 | -0.070 |
|  |  |  | 10 | -0.159 | -0.139 | -0.121 | -0.112 | -0.091 | -0.162 | -0.145 | -0.122 | -0.114 | -0.095 |
| $\begin{gathered} \beta_{1}= \\ 0.444 \end{gathered}$ |  | Number of Missing Studies | 0 | 0.003 | 0.001 | -0.002 | 0.001 | 0.000 | 0.003 | 0.001 | -0.002 | 0.001 | 0.000 |
|  | $\mathrm{T}^{2}=0$ |  | 5 | -0.077 | -0.046 | -0.030 | -0.023 | -0.019 | -0.079 | -0.048 | -0.031 | -0.024 | -0.020 |
|  |  |  | 10 | -0.222 | -0.126 | -0.081 | -0.059 | -0.043 | -0.223 | -0.129 | -0.083 | -0.060 | -0.044 |
|  |  |  | 0 | 0.001 | -0.002 | -0.003 | 0.001 | 0.004 | 0.000 | -0.004 | -0.003 | -0.001 | 0.006 |
|  |  |  | 5 | -0.132 | -0.091 | -0.063 | -0.048 | -0.037 | -0.140 | -0.101 | -0.080 | -0.066 | -0.055 |
|  |  |  | 10 | -0.241 | -0.181 | -0.136 | -0.109 | -0.093 | -0.242 | -0.186 | -0.149 | -0.125 | -0.111 |
|  |  |  | 0 | 0.012 | 0.010 | 0.003 | 0.001 | 0.004 | 0.008 | 0.003 | -0.004 | -0.004 | -0.004 |
|  | $\begin{aligned} & \mathrm{T}^{2}= \\ & 0.148 \end{aligned}$ |  | 5 | -0.143 | -0.125 | -0.095 | -0.084 | -0.061 | -0.152 | -0.130 | -0.108 | -0.097 | -0.078 |
|  |  |  | 10 | -0.254 | -0.205 | -0.168 | -0.131 | -0.129 | -0.256 | -0.204 | -0.175 | -0.148 | -0.139 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 0.003 | 0.010 | 0.000 | 0.008 | 0.007 | -0.007 | 0.000 | -0.002 | -0.006 | 0.005 |
|  |  |  | 5 | -0.163 | -0.153 | -0.110 | -0.098 | -0.092 | -0.167 | -0.154 | -0.118 | -0.102 | -0.099 |
|  |  |  | 10 | -0.254 | -0.206 | -0.198 | -0.171 | -0.154 | -0.258 | -0.212 | -0.189 | -0.168 | -0.153 |

Table E25. Absolute bias in the estimated slope, with $R$ studies imputed (from 2-dimensional algorithmic variant)

| R Missing Studies Imputed |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.049 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 0.000 | -0.001 | 0.001 | -0.002 | -0.001 | 0.000 | -0.001 | 0.001 | -0.003 | -0.001 |
|  |  |  | 5 | -0.008 | -0.006 | -0.006 | -0.002 | 0.000 | -0.008 | -0.006 | -0.005 | -0.003 | -0.001 |
|  |  |  | 10 | -0.015 | -0.010 | -0.006 | -0.004 | -0.004 | -0.014 | -0.010 | -0.007 | -0.004 | -0.004 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | -0.002 | -0.002 | 0.001 | -0.004 | -0.001 | -0.003 | 0.002 | 0.002 | -0.005 | 0.001 |
|  |  |  | 5 | -0.012 | -0.003 | -0.009 | -0.008 | 0.000 | -0.013 | 0.000 | -0.006 | -0.008 | -0.005 |
|  |  |  | 10 | -0.016 | -0.015 | -0.008 | -0.017 | -0.007 | -0.012 | -0.012 | -0.006 | -0.014 | -0.005 |
|  |  |  | 0 | -0.004 | 0.016 | -0.002 | 0.004 | 0.001 | -0.004 | 0.003 | -0.001 | 0.003 | 0.003 |
|  |  |  | 5 | -0.019 | -0.004 | -0.009 | -0.005 | -0.005 | -0.013 | -0.010 | -0.010 | -0.006 | -0.007 |
|  |  |  | 10 | -0.015 | -0.007 | -0.007 | -0.017 | -0.002 | -0.018 | -0.009 | -0.011 | -0.018 | -0.011 |
|  |  |  | 0 | -0.001 | 0.016 | 0.005 | -0.003 | 0.000 | -0.008 | 0.000 | -0.003 | -0.002 | 0.004 |
|  | $\begin{aligned} & \mathrm{T}^{\top}= \\ & 0^{-\Delta \Delta \Delta \Delta} \end{aligned}$ |  | 5 | -0.001 | -0.010 | -0.013 | -0.019 | -0.006 | -0.012 | -0.012 | -0.013 | -0.013 | 0.003 |
|  |  |  | 10 | -0.029 | -0.016 | -0.017 | -0.011 | -0.004 | -0.010 | -0.021 | -0.017 | -0.011 | 0.002 |
| $\begin{gathered} \beta_{1}= \\ 0.074 \end{gathered}$ | $\mathrm{T}^{2}=0$ | Number of Missing Studies | 0 | -0.002 | 0.003 | 0.001 | -0.001 | -0.001 | -0.002 | 0.003 | 0.002 | -0.001 | -0.001 |
|  |  |  | 5 | -0.006 | -0.005 | -0.004 | -0.002 | -0.004 | -0.006 | -0.006 | -0.004 | -0.003 | -0.005 |
|  |  |  | 10 | -0.029 | -0.016 | -0.013 | -0.008 | -0.006 | -0.028 | -0.015 | -0.014 | -0.008 | -0.006 |
|  |  |  | 0 | -0.007 | -0.005 | 0.001 | 0.001 | -0.001 | -0.005 | -0.007 | 0.001 | -0.001 | -0.001 |
|  | $0.049$ |  | 5 | -0.012 | -0.017 | -0.011 | -0.008 | -0.005 | -0.015 | -0.018 | -0.011 | -0.008 | -0.006 |
|  |  |  | 10 | -0.025 | -0.022 | -0.018 | -0.016 | -0.011 | -0.024 | -0.022 | -0.017 | -0.014 | -0.011 |
|  |  |  | 0 | 0.001 | 0.007 | 0.009 | 0.000 | -0.003 | 0.001 | -0.001 | 0.000 | 0.000 | -0.002 |
|  | $0.148$ |  | 5 | -0.020 | -0.012 | -0.011 | -0.011 | 0.006 | -0.024 | -0.007 | -0.018 | -0.011 | 0.000 |
|  |  |  | 10 | -0.033 | -0.026 | -0.013 | -0.033 | -0.017 | -0.028 | -0.016 | -0.022 | -0.019 | -0.010 |
|  |  |  | 0 | 0.002 | 0.002 | -0.002 | -0.006 | 0.005 | -0.006 | -0.001 | -0.014 | -0.011 | -0.004 |
|  |  |  | 5 | -0.012 | -0.017 | -0.006 | -0.027 | -0.021 | -0.005 | -0.019 | -0.018 | -0.017 | -0.008 |
|  |  |  | 10 | -0.026 | -0.023 | -0.032 | -0.014 | -0.017 | -0.041 | -0.016 | -0.020 | -0.018 | -0.018 |
| $\begin{gathered} \beta_{1}= \\ 0.148 \end{gathered}$ |  | Number of Missing Studies | 0 | -0.003 | -0.001 | -0.001 | 0.001 | 0.001 | -0.002 | -0.001 | -0.001 | 0.001 | 0.001 |
|  | $\mathrm{T}^{2}=0$ |  | 5 | -0.022 | -0.010 | -0.009 | -0.005 | -0.006 | -0.023 | -0.010 | -0.010 | -0.006 | -0.006 |
|  |  |  | 10 | -0.053 | -0.028 | -0.021 | -0.014 | -0.010 | -0.052 | -0.028 | -0.022 | -0.015 | -0.012 |
|  |  |  | 0 | 0.007 | 0.002 | 0.002 | -0.007 | -0.002 | 0.004 | -0.005 | -0.002 | -0.003 | -0.004 |
|  | $0.049$ |  | 5 | -0.029 | -0.028 | -0.012 | -0.011 | -0.013 | -0.029 | -0.024 | -0.016 | -0.013 | -0.015 |
|  |  |  | 10 | -0.061 | -0.039 | -0.035 | -0.024 | -0.030 | -0.059 | -0.033 | -0.030 | -0.025 | -0.031 |
|  |  |  | 0 | 0.006 | -0.006 | -0.005 | 0.001 | 0.001 | 0.013 | -0.005 | 0.000 | -0.002 | 0.000 |
|  | $0.148$ |  | 5 | -0.045 | -0.024 | -0.021 | -0.020 | -0.017 | -0.042 | -0.028 | -0.024 | -0.021 | -0.019 |
|  |  |  | 10 | -0.067 | -0.054 | -0.040 | -0.038 | -0.035 | -0.064 | -0.038 | -0.035 | -0.034 | -0.030 |
|  |  |  | 0 | 0.018 | 0.007 | 0.010 | 0.000 | -0.004 | 0.006 | -0.003 | -0.006 | 0.008 | -0.003 |
|  | $0.444$ |  | 5 | -0.061 | -0.039 | -0.030 | -0.020 | -0.025 | -0.051 | -0.025 | -0.034 | -0.029 | -0.017 |
|  |  |  | 10 | -0.072 | -0.049 | -0.037 | -0.036 | -0.048 | -0.056 | -0.041 | -0.039 | -0.031 | -0.038 |

Table E25. Absolute bias in the estimated slope, with R studies imputed (from 2-dimensional algorithmic variant) (continued)

| R Missing Studies Imputed |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.296 \end{gathered}$ | $\mathrm{T}^{2}=0$ | Number of Missing Studies | 0 | 0.001 | -0.002 | 0.002 | 0.001 | -0.002 | 0.001 | -0.002 | 0.003 | 0.001 | -0.002 |
|  |  |  | 5 | -0.043 | -0.026 | -0.019 | -0.015 | -0.012 | -0.043 | -0.028 | -0.022 | -0.017 | -0.014 |
|  |  |  | 10 | -0.099 | -0.054 | -0.042 | -0.030 | -0.026 | -0.096 | -0.053 | -0.043 | -0.033 | -0.028 |
|  |  |  | 0 | -0.002 | 0.006 | 0.003 | 0.001 | 0.005 | -0.002 | 0.001 | 0.003 | 0.000 | 0.002 |
|  |  |  | 5 | -0.059 | -0.049 | -0.037 | -0.025 | -0.023 | -0.061 | -0.049 | -0.041 | -0.039 | -0.033 |
|  |  |  | 10 | -0.124 | -0.090 | -0.067 | -0.061 | -0.048 | -0.113 | -0.078 | -0.060 | -0.057 | -0.051 |
|  |  |  | 0 | 0.010 | -0.005 | 0.000 | -0.004 | 0.005 | 0.003 | 0.001 | -0.001 | 0.000 | 0.001 |
|  |  |  | 5 | -0.079 | -0.056 | -0.037 | -0.037 | -0.039 | -0.070 | -0.058 | -0.040 | -0.052 | -0.042 |
|  |  |  | 10 | -0.109 | -0.086 | -0.078 | -0.057 | -0.059 | -0.101 | -0.074 | -0.067 | -0.055 | -0.059 |
|  |  |  | 0 | -0.005 | 0.021 | 0.002 | 0.011 | 0.011 | -0.003 | 0.010 | 0.000 | -0.005 | 0.004 |
|  |  |  | 5 | -0.074 | -0.084 | -0.061 | -0.054 | -0.048 | -0.067 | -0.071 | -0.054 | -0.039 | -0.050 |
|  |  |  | 10 | -0.121 | -0.100 | -0.084 | -0.076 | -0.064 | -0.109 | -0.091 | -0.073 | -0.067 | -0.051 |
| $\begin{gathered} \beta_{1}= \\ 0.444 \end{gathered}$ |  |  | 0 | 0.003 | 0.001 | -0.002 | 0.001 | 0.000 | 0.003 | 0.002 | -0.002 | 0.001 | 0.000 |
|  | $\mathrm{T}^{\mathbf{2}}=0$ |  | 5 | -0.056 | -0.038 | -0.026 | -0.021 | -0.017 | -0.058 | -0.041 | -0.028 | -0.023 | -0.019 |
|  |  |  | 10 | -0.132 | -0.086 | -0.061 | -0.049 | -0.037 | -0.128 | -0.087 | -0.064 | -0.052 | -0.040 |
|  |  |  | 0 | 0.001 | -0.002 | -0.003 | 0.001 | 0.003 | 0.000 | -0.004 | -0.003 | -0.001 | 0.005 |
|  |  |  | 5 | -0.100 | -0.070 | -0.052 | -0.037 | -0.032 | -0.096 | -0.072 | -0.060 | -0.051 | -0.045 |
|  |  |  | 10 | -0.169 | -0.126 | -0.098 | -0.078 | -0.071 | -0.157 | -0.116 | -0.097 | -0.081 | -0.077 |
|  |  |  | 0 | 0.010 | 0.009 | 0.003 | 0.000 | 0.003 | 0.006 | 0.003 | -0.004 | -0.005 | -0.005 |
|  |  |  | 5 | -0.106 | -0.098 | -0.072 | -0.065 | -0.045 | -0.102 | -0.092 | -0.073 | -0.067 | -0.052 |
|  |  |  | 10 | -0.195 | -0.146 | -0.121 | -0.093 | -0.093 | -0.178 | -0.124 | -0.105 | -0.093 | -0.089 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | -0.002 | 0.013 | 0.002 | 0.008 | 0.006 | -0.012 | 0.000 | -0.003 | -0.009 | 0.002 |
|  |  |  | 5 | -0.126 | -0.120 | -0.084 | -0.073 | -0.067 | -0.112 | -0.110 | -0.077 | -0.066 | -0.064 |
|  |  |  | 10 | -0.196 | -0.148 | -0.149 | -0.130 | -0.112 | -0.181 | -0.135 | -0.118 | -0.105 | -0.094 |

Table E26. Absolute bias in the estimated slope, with $L$ studies imputed (from 2-dimensional algorithmic variant)


Table E26. Absolute bias in the estimated slope, with L studies imputed (from 2-dimensional algorithmic variant) (continued)

| L Missing Studies Imputed |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.296 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 0.001 | -0.002 | 0.003 | 0.002 | -0.002 | 0.001 | -0.003 | 0.003 | 0.002 | -0.002 |
|  |  |  | 5 | -0.045 | -0.027 | -0.019 | -0.015 | -0.012 | -0.045 | -0.029 | -0.022 | -0.017 | -0.014 |
|  |  |  | 10 | -0.105 | -0.058 | -0.044 | -0.031 | -0.026 | -0.100 | -0.058 | -0.045 | -0.033 | -0.029 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | -0.001 | 0.006 | 0.003 | 0.001 | 0.005 | 0.000 | -0.001 | 0.003 | 0.000 | 0.002 |
|  |  |  | 5 | -0.063 | -0.052 | -0.038 | -0.027 | -0.023 | -0.065 | -0.051 | -0.041 | -0.039 | -0.034 |
|  |  |  | 10 | -0.131 | -0.095 | -0.073 | -0.065 | -0.051 | -0.120 | -0.083 | -0.065 | -0.060 | -0.054 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | 0.011 | -0.007 | 0.002 | -0.003 | 0.004 | 0.006 | 0.001 | -0.001 | 0.001 | 0.000 |
|  |  |  | 5 | -0.085 | -0.058 | -0.039 | -0.039 | -0.038 | -0.076 | -0.061 | -0.041 | -0.053 | -0.042 |
|  |  |  | 10 | -0.116 | -0.097 | -0.084 | -0.064 | -0.064 | -0.110 | -0.086 | -0.073 | -0.063 | -0.065 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 0.000 | 0.020 | 0.006 | 0.017 | 0.009 | 0.007 | 0.004 | 0.001 | 0.002 | 0.003 |
|  |  |  | 5 | -0.081 | -0.088 | -0.061 | -0.062 | -0.049 | -0.074 | -0.076 | -0.057 | -0.048 | -0.052 |
|  |  |  | 10 | -0.130 | -0.109 | -0.093 | -0.083 | -0.069 | -0.116 | -0.102 | -0.080 | -0.075 | -0.060 |
| $\begin{gathered} \beta_{1}= \\ 0.444 \end{gathered}$ |  |  | 0 | 0.004 | 0.001 | -0.002 | 0.001 | 0.000 | 0.004 | 0.002 | -0.002 | 0.002 | 0.000 |
|  | $\mathrm{T}^{2}=0$ |  | 5 | -0.057 | -0.038 | -0.025 | -0.021 | -0.018 | -0.059 | -0.040 | -0.027 | -0.023 | -0.020 |
|  |  |  | 10 | -0.138 | -0.087 | -0.062 | -0.048 | -0.035 | -0.133 | -0.088 | -0.064 | -0.051 | -0.038 |
|  |  |  | 0 | 0.000 | -0.001 | -0.004 | 0.001 | 0.004 | -0.002 | -0.004 | -0.003 | 0.000 | 0.004 |
|  |  |  | 5 | -0.102 | -0.071 | -0.051 | -0.039 | -0.033 | -0.097 | -0.073 | -0.060 | -0.051 | -0.044 |
|  |  |  | 10 | -0.178 | -0.132 | -0.102 | -0.082 | -0.073 | -0.164 | -0.122 | -0.101 | -0.084 | -0.078 |
|  |  |  | 0 | 0.012 | 0.007 | 0.004 | -0.001 | 0.006 | 0.008 | 0.003 | -0.004 | -0.007 | -0.003 |
|  | $0.148$ |  | 5 | -0.110 | -0.101 | -0.074 | -0.065 | -0.045 | -0.105 | -0.095 | -0.075 | -0.067 | -0.053 |
|  |  |  | 10 | -0.204 | -0.158 | -0.128 | -0.102 | -0.100 | -0.188 | -0.136 | -0.115 | -0.102 | -0.096 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | -0.005 | 0.017 | -0.001 | 0.007 | 0.001 | -0.014 | 0.006 | -0.004 | -0.011 | 0.002 |
|  |  |  | 5 | -0.128 | -0.122 | -0.086 | -0.075 | -0.067 | -0.113 | -0.109 | -0.080 | -0.070 | -0.064 |
|  |  |  | 10 | -0.211 | -0.162 | -0.160 | -0.137 | -0.115 | -0.195 | -0.147 | -0.132 | -0.115 | -0.101 |


| No Correction for Publication Bias |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.049 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 95.3\% | 94.7\% | 94.9\% | 95.1\% | 94.7\% | 96.2\% | 96.0\% | 96.1\% | 96.0\% | 96.0\% |
|  |  |  | 5 | 95.4\% | 95.4\% | 95.0\% | 94.9\% | 95.7\% | 95.7\% | 95.8\% | 95.5\% | 95.3\% | 96.0\% |
|  |  |  | 10 | 96.2\% | 95.5\% | 95.2\% | 94.9\% | 95.0\% | 96.6\% | 95.8\% | 95.4\% | 95.2\% | 95.2\% |
|  | $\mathrm{T}^{2}=$ |  | 0 | 63.8\% | 62.4\% | 57.5\% | 55.7\% | 53.3\% | 91.6\% | 93.6\% | 93.5\% | 93.4\% | 94.3\% |
|  |  |  | 5 | 71.6\% | 64.9\% | 59.5\% | 57.4\% | 55.1\% | 89.7\% | 90.9\% | 92.2\% | 92.7\% | 94.0\% |
|  |  |  | 10 | 83.3\% | 71.3\% | 65.8\% | 60.3\% | 57.0\% | 90.1\% | 87.9\% | 89.9\% | 90.6\% | 91.9\% |
|  |  |  | 0 | 45.2\% | 41.8\% | 40.3\% | 36.5\% | 35.7\% | 92.5\% | 93.2\% | 93.7\% | 94.3\% | 94.4\% |
|  | $0.148$ |  | 5 | 55.5\% | 47.1\% | 43.9\% | 40.2\% | 37.7\% | 91.2\% | 93.3\% | 93.8\% | 94.5\% | 94.4\% |
|  |  |  | 10 | 67.4\% | 55.4\% | 48.5\% | 44.3\% | 42.2\% | 88.8\% | 91.1\% | 93.1\% | 92.6\% | 94.1\% |
|  | $\mathrm{T}^{2}=$ |  | 0 | 28.9\% | 26.5\% | 24.3\% | 23.4\% | 21.6\% | 92.5\% | 93.2\% | 93.3\% | 93.7\% | 93.8\% |
|  | $\begin{aligned} & \mathrm{T}^{\top}= \\ & 0.444 \end{aligned}$ |  | 5 | 37.6\% | 30.8\% | 27.5\% | 24.7\% | 24.7\% | 92.4\% | 93.3\% | 93.8\% | 94.1\% | 94.6\% |
|  |  |  | 10 | 48.3\% | 37.8\% | 32.7\% | 29.2\% | 27.5\% | 91.6\% | 93.2\% | 93.8\% | 94.5\% | 94.5\% |
| $\begin{gathered} \beta_{1}= \\ 0.074 \end{gathered}$ |  | Number of Missing Studies | 0 | 94.9\% | 94.5\% | 95.3\% | 94.8\% | 95.0\% | 96.2\% | 95.9\% | 96.1\% | 95.8\% | 95.7\% |
|  | $\mathrm{r}^{\mathbf{2}}=0$ |  | 5 | 95.7\% | 95.8\% | 95.5\% | 94.6\% | 95.2\% | 96.2\% | 96.2\% | 95.8\% | 95.1\% | 95.6\% |
|  |  |  | 10 | 95.3\% | 94.9\% | 94.6\% | 95.0\% | 95.4\% | 95.8\% | 95.4\% | 95.0\% | 95.2\% | 95.6\% |
|  |  |  | 0 | 63.7\% | 61.9\% | 57.9\% | 54.4\% | 53.5\% | 92.4\% | 93.1\% | 93.5\% | 94.1\% | 94.2\% |
|  | $\begin{aligned} & \mathrm{T}^{2}= \\ & 0 \times 40 \end{aligned}$ |  | 5 | 70.9\% | 64.0\% | 60.5\% | 56.0\% | 55.0\% | 89.9\% | 90.2\% | 91.4\% | 92.2\% | 93.0\% |
|  |  |  | 10 | 82.5\% | 70.6\% | 65.6\% | 61.2\% | 57.6\% | 90.2\% | 87.2\% | 90.1\% | 90.9\% | 92.3\% |
|  |  |  | 0 | 44.5\% | 40.4\% | 39.1\% | 37.1\% | 36.1\% | 92.6\% | 93.1\% | 93.7\% | 94.2\% | 93.8\% |
|  | $0.148$ |  | 5 | 54.0\% | 47.8\% | 42.9\% | 39.2\% | 37.5\% | 91.3\% | 92.6\% | 93.7\% | 94.1\% | 94.4\% |
|  |  |  | 10 | 65.0\% | 55.5\% | 49.6\% | 44.7\% | 40.7\% | 89.4\% | 91.6\% | 92.7\% | 93.6\% | 93.8\% |
|  |  |  | 0 | 29.6\% | 26.5\% | 23.0\% | 23.1\% | 21.8\% | 92.7\% | 92.9\% | 92.7\% | 93.2\% | 93.8\% |
|  | $\begin{aligned} & \mathrm{T}^{2}= \\ & 0.444 \end{aligned}$ |  | 5 | 36.7\% | 30.5\% | 27.0\% | 24.7\% | 23.1\% | 92.5\% | 93.4\% | 93.6\% | 94.0\% | 93.8\% |
|  |  |  | 10 | 48.4\% | 37.3\% | 31.5\% | 28.4\% | 26.4\% | 91.2\% | 92.8\% | 94.2\% | 93.4\% | 93.7\% |
| $\begin{gathered} \beta_{1}= \\ 0.148 \end{gathered}$ |  |  | 0 | 95.0\% | 95.7\% | 94.8\% | 95.0\% | 95.0\% | 96.4\% | 96.6\% | 96.1\% | 96.0\% | 96.1\% |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 95.4\% | 95.4\% | 95.0\% | 95.3\% | 94.9\% | 95.8\% | 95.7\% | 95.4\% | 95.6\% | 95.3\% |
|  |  |  | 10 | 94.2\% | 93.4\% | 94.1\% | 94.6\% | 94.8\% | 94.8\% | 93.8\% | 94.3\% | 94.9\% | 95.0\% |
|  |  |  | 0 | 62.7\% | 60.5\% | 58.3\% | 55.9\% | 54.1\% | 91.9\% | 92.7\% | 92.7\% | 94.2\% | 94.0\% |
|  |  |  | 5 | 71.7\% | 63.8\% | 60.4\% | 56.8\% | 56.4\% | 89.4\% | 90.4\% | 91.7\% | 92.7\% | 93.5\% |
|  |  |  | 10 | 80.8\% | 72.0\% | 64.8\% | 60.4\% | 57.3\% | 89.4\% | 88.2\% | 88.9\% | 90.6\% | 91.0\% |
|  |  |  | 0 | 44.9\% | 41.4\% | 39.2\% | 37.2\% | 36.8\% | 92.6\% | 93.9\% | 93.5\% | 94.0\% | 93.7\% |
|  | $\begin{aligned} & \mathrm{T}^{2}= \\ & 0.148 \end{aligned}$ |  | 5 | 55.1\% | 46.3\% | 43.1\% | 39.3\% | 38.9\% | 90.4\% | 91.7\% | 93.0\% | 93.7\% | 94.1\% |
|  |  |  | 10 | 67.3\% | 54.4\% | 47.9\% | 44.4\% | 40.3\% | 88.7\% | 90.6\% | 92.3\% | 92.4\% | 93.9\% |
|  |  |  | 0 | 28.4\% | 26.1\% | 24.4\% | 22.1\% | 22.3\% | 92.4\% | 93.3\% | 93.1\% | 93.5\% | 94.1\% |
|  | $\begin{aligned} & \mathrm{T}^{\mathbf{2}}= \\ & 0.444 \end{aligned}$ |  | 5 | 36.9\% | 31.4\% | 28.4\% | 25.8\% | 23.9\% | 92.2\% | 93.5\% | 93.4\% | 93.7\% | 93.7\% |
|  |  |  | 10 | 47.3\% | 37.9\% | 32.3\% | 29.3\% | 27.7\% | 90.9\% | 92.5\% | 93.0\% | 93.5\% | 93.5\% |

Table E27. Coverage probability of the estimated slope, with no correction for publication bias (from 2-dimensional algorithmic variant) (continued)

| No Correction for Publication Bias |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{aligned} & \beta_{1}= \\ & 0.296 \end{aligned}$ | $\mathrm{T}^{2}=0$ |  | 0 | 95.4\% | 95.2\% | 94.9\% | 95.0\% | 95.3\% | 96.5\% | 96.3\% | 95.8\% | 95.7\% | 96.2\% |
|  |  |  | 5 | 94.4\% | 94.1\% | 94.6\% | 95.2\% | 94.6\% | 95.0\% | 94.6\% | 95.0\% | 95.6\% | 95.1\% |
|  |  |  | 10 | 90.3\% | 91.2\% | 92.2\% | 93.2\% | 93.4\% | 90.7\% | 91.6\% | 92.6\% | 93.3\% | 93.6\% |
|  |  |  | 0 | 64.9\% | 61.8\% | 58.3\% | 55.8\% | 53.7\% | 92.8\% | 93.6\% | 93.5\% | 93.8\% | 94.2\% |
|  |  |  | 5 | 70.0\% | 62.8\% | 59.2\% | 57.2\% | 56.0\% | 88.0\% | 89.4\% | 90.8\% | 91.3\% | 92.5\% |
|  |  |  | 10 | 76.0\% | 66.8\% | 61.7\% | 57.9\% | 55.7\% | 84.9\% | 83.9\% | 86.0\% | 87.1\% | 89.1\% |
|  |  |  | 0 | 45.9\% | 41.6\% | 39.4\% | 37.7\% | 36.7\% | 92.5\% | 93.0\% | 94.2\% | 93.9\% | 94.0\% |
|  | $\begin{aligned} & \mathrm{T}^{\mathrm{T}^{\top}=} \end{aligned}$ |  | 5 | 52.1\% | 47.1\% | 42.5\% | 40.1\% | 38.8\% | 89.5\% | 92.3\% | 92.3\% | 93.0\% | 93.3\% |
|  |  |  | 10 | 63.9\% | 53.0\% | 45.1\% | 42.8\% | 39.5\% | 86.2\% | 88.5\% | 90.3\% | 90.6\% | 91.1\% |
|  |  |  | 0 | 28.5\% | 25.3\% | 24.3\% | 23.7\% | 21.0\% | 92.5\% | 93.3\% | 92.7\% | 93.5\% | 93.6\% |
|  |  |  | 5 | 36.6\% | 30.3\% | 28.1\% | 25.5\% | 23.4\% | 92.4\% | 92.9\% | 92.8\% | 93.9\% | 93.8\% |
|  |  |  | 10 | 45.8\% | 36.3\% | 32.6\% | 29.0\% | 26.5\% | 89.2\% | 91.0\% | 92.2\% | 92.1\% | 92.9\% |
| $\begin{gathered} \beta_{1}= \\ 0.444 \end{gathered}$ |  |  | 0 | 94.5\% | 95.0\% | 95.1\% | 94.7\% | 95.0\% | 95.9\% | 96.1\% | 96.0\% | 95.9\% | 96.2\% |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 92.4\% | 94.1\% | 94.6\% | 94.5\% | 94.8\% | 93.2\% | 94.4\% | 95.0\% | 94.7\% | 95.1\% |
|  |  |  | 10 | 85.6\% | 88.1\% | 89.9\% | 90.8\% | 92.8\% | 86.4\% | 88.3\% | 90.1\% | 90.9\% | 93.0\% |
|  |  |  | 0 | 64.5\% | 61.0\% | 56.5\% | 57.0\% | 54.3\% | 92.2\% | 93.9\% | 93.4\% | 94.1\% | 94.1\% |
|  | $\begin{aligned} & \mathrm{T}^{\mathbf{2}}= \\ & 0.049 \end{aligned}$ |  | 5 | 67.5\% | 62.6\% | 59.3\% | 58.7\% | 53.8\% | 86.1\% | 87.4\% | 89.1\% | 90.0\% | 91.4\% |
|  |  |  | 10 | 69.9\% | 62.0\% | 57.6\% | 56.2\% | 53.5\% | 79.7\% | 79.6\% | 80.4\% | 84.1\% | 85.2\% |
|  |  |  | 0 | 44.5\% | 40.4\% | 38.9\% | 36.9\% | 36.8\% | 92.3\% | 93.3\% | 93.7\% | 93.6\% | 94.4\% |
|  |  |  | 5 | 51.4\% | 44.6\% | 41.2\% | 39.5\% | 37.9\% | 88.7\% | 90.3\% | 91.1\% | 92.1\% | 92.3\% |
|  |  |  | 10 | 58.0\% | 47.3\% | 43.4\% | 40.6\% | 38.0\% | 81.6\% | 84.6\% | 87.0\% | 87.8\% | 88.5\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 27.9\% | 26.7\% | 24.7\% | 23.4\% | 22.3\% | 92.1\% | 93.5\% | 93.2\% | 93.4\% | 93.5\% |
|  |  |  | 5 | 35.8\% | 30.5\% | 27.5\% | 25.3\% | 24.2\% | 90.8\% | 90.9\% | 91.7\% | 92.9\% | 93.4\% |
|  |  |  | 10 | 42.8\% | 34.9\% | 29.1\% | 26.4\% | 26.5\% | 87.0\% | 89.7\% | 89.7\% | 90.8\% | 90.8\% |



Table E28. Coverage probability of the estimated slope, with R studies imputed (from 2-dimensional algorithmic variant) (continued)

| R Missing Studies Imputed |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{aligned} & \beta_{1}= \\ & 0.296 \end{aligned}$ | $\mathrm{T}^{2}=0$ |  | 0 | 95.5\% | 95.2\% | 94.6\% | 95.0\% | 95.1\% | 96.5\% | 96.4\% | 95.8\% | 95.8\% | 96.3\% |
|  |  |  | 5 | 92.4\% | 92.8\% | 93.3\% | 94.5\% | 94.2\% | 93.0\% | 93.5\% | 94.1\% | 94.9\% | 95.1\% |
|  |  |  | 10 | 89.1\% | 90.6\% | 91.8\% | 92.1\% | 92.8\% | 89.8\% | 91.2\% | 92.6\% | 92.4\% | 93.1\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | 64.7\% | 61.5\% | 58.6\% | 55.9\% | 53.8\% | 92.2\% | 92.9\% | 93.3\% | 93.7\% | 94.0\% |
|  |  |  | 5 | 67.8\% | 62.1\% | 58.8\% | 57.4\% | 56.4\% | 86.8\% | 87.3\% | 89.7\% | 89.7\% | 90.1\% |
|  |  |  | 10 | 75.2\% | 65.4\% | 61.3\% | 58.1\% | 57.2\% | 83.7\% | 83.6\% | 84.9\% | 86.3\% | 87.9\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | 45.9\% | 41.5\% | 39.3\% | 37.8\% | 36.9\% | 91.3\% | 91.7\% | 93.0\% | 93.0\% | 93.3\% |
|  |  |  | 5 | 50.2\% | 45.2\% | 41.4\% | 39.4\% | 38.3\% | 85.6\% | 88.3\% | 88.6\% | 89.2\% | 90.1\% |
|  |  |  | 10 | 60.6\% | 51.4\% | 43.7\% | 42.1\% | 39.4\% | 83.3\% | 85.4\% | 86.3\% | 86.5\% | 86.0\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 28.7\% | 25.5\% | 24.5\% | 23.7\% | 21.2\% | 90.6\% | 91.5\% | 90.9\% | 92.2\% | 92.2\% |
|  |  |  | 5 | 33.8\% | 28.6\% | 26.2\% | 24.4\% | 22.8\% | 87.2\% | 88.0\% | 87.7\% | 88.7\% | 88.6\% |
|  |  |  | 10 | 42.2\% | 33.8\% | 30.6\% | 27.0\% | 23.8\% | 84.9\% | 85.2\% | 86.5\% | 86.3\% | 86.4\% |
| $\begin{gathered} \beta_{1}= \\ 0.444 \end{gathered}$ |  |  | 0 | 94.2\% | 94.9\% | 95.1\% | 94.5\% | 94.9\% | 95.7\% | 96.0\% | 95.9\% | 95.9\% | 96.1\% |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 91.7\% | 93.2\% | 93.7\% | 94.2\% | 94.5\% | 92.6\% | 94.1\% | 94.2\% | 94.7\% | 95.0\% |
|  |  |  | 10 | 87.7\% | 89.1\% | 90.2\% | 91.2\% | 93.0\% | 88.3\% | 89.8\% | 90.6\% | 91.6\% | 93.4\% |
|  |  |  | 0 | 64.2\% | 61.4\% | 56.9\% | 57.1\% | 54.3\% | 91.6\% | 93.4\% | 93.2\% | 94.1\% | 93.8\% |
|  |  |  | 5 | 67.0\% | 62.1\% | 59.2\% | 59.2\% | 54.5\% | 85.5\% | 86.8\% | 87.7\% | 89.5\% | 90.5\% |
|  |  |  | 10 | 70.6\% | 63.6\% | 59.8\% | 59.4\% | 55.8\% | 80.7\% | 82.0\% | 82.5\% | 85.7\% | 85.4\% |
|  |  |  | 0 | 44.9\% | 40.1\% | 39.2\% | 37.1\% | 37.0\% | 90.9\% | 92.3\% | 92.3\% | 92.8\% | 93.8\% |
|  | $0.148$ |  | 5 | 50.3\% | 44.1\% | 41.6\% | 39.1\% | 38.3\% | 85.4\% | 87.3\% | 88.2\% | 89.2\% | 89.5\% |
|  |  |  | 10 | 56.8\% | 47.3\% | 44.0\% | 41.8\% | 38.9\% | 80.7\% | 83.1\% | 84.9\% | 85.6\% | 85.9\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 27.8\% | 26.9\% | 24.6\% | 23.8\% | 22.3\% | 90.2\% | 91.2\% | 91.4\% | 92.0\% | 92.2\% |
|  |  |  | 5 | 34.2\% | 28.3\% | 26.6\% | 24.6\% | 23.6\% | 86.4\% | 86.0\% | 87.0\% | 88.7\% | 88.8\% |
|  |  |  | 10 | 41.3\% | 33.2\% | 28.2\% | 25.6\% | 25.4\% | 83.1\% | 84.8\% | 85.3\% | 84.8\% | 85.7\% |

Table E29. Coverage probability of the estimated slope, with $L$ studies imputed (from 2-dimensional algorithmic variant)

| L Missing Studies Imputed |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.049 \end{gathered}$ | $\mathrm{T}^{\mathbf{2}}=0$ |  | 0 | 94.5\% | 94.0\% | 94.3\% | 94.6\% | 94.5\% | 95.4\% | 95.4\% | 95.5\% | 95.9\% | 95.9\% |
|  |  |  | 5 | 93.1\% | 93.5\% | 94.1\% | 94.4\% | 94.2\% | 93.6\% | 94.2\% | 94.6\% | 94.9\% | 94.9\% |
|  |  |  | 10 | 94.0\% | 94.3\% | 94.1\% | 93.8\% | 93.7\% | 94.3\% | 94.6\% | 94.7\% | 94.2\% | 94.3\% |
|  |  |  | 0 | 64.0\% | 63.1\% | 57.7\% | 56.2\% | 53.4\% | 90.3\% | 91.8\% | 91.4\% | 91.8\% | 92.5\% |
|  | $0.049$ |  | 5 | 69.3\% | 63.4\% | 60.1\% | 57.4\% | 55.0\% | 86.9\% | 88.2\% | 89.0\% | 89.6\% | 90.2\% |
|  |  |  | 10 | 79.8\% | 69.5\% | 64.6\% | 60.1\% | 57.6\% | 87.4\% | 85.5\% | 87.2\% | 87.3\% | 88.3\% |
|  | $\mathrm{T}^{2}=$ |  | 0 | 44.8\% | 41.6\% | 40.2\% | 37.3\% | 36.7\% | 89.2\% | 89.9\% | 89.7\% | 90.7\% | 91.0\% |
|  |  |  | 5 | 52.9\% | 46.3\% | 42.5\% | 40.1\% | 37.8\% | 86.8\% | 88.5\% | 89.3\% | 89.3\% | 89.9\% |
|  |  |  | 10 | 63.5\% | 52.7\% | 46.6\% | 43.7\% | 41.1\% | 85.2\% | 86.8\% | 88.1\% | 88.0\% | 88.7\% |
|  |  |  | 0 | 28.0\% | 26.6\% | 23.3\% | 23.2\% | 21.0\% | 87.8\% | 87.7\% | 87.7\% | 88.6\% | 88.2\% |
|  | $0.444$ |  | 5 | 35.6\% | 30.0\% | 27.0\% | 24.4\% | 24.2\% | 87.0\% | 87.3\% | 88.0\% | 88.1\% | 88.0\% |
|  |  |  | 10 | 45.7\% | 36.1\% | 31.3\% | 28.2\% | 26.5\% | 86.9\% | 87.1\% | 87.7\% | 88.8\% | 88.1\% |
| $\begin{gathered} \beta_{1}= \\ 0.074 \end{gathered}$ |  |  | 0 | 94.0\% | 93.8\% | 94.8\% | 94.3\% | 94.3\% | 95.4\% | 95.4\% | 96.0\% | 95.6\% | 95.3\% |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 94.3\% | 94.1\% | 94.1\% | 93.9\% | 93.8\% | 94.9\% | 94.7\% | 94.5\% | 95.0\% | 94.5\% |
|  |  |  | 10 | 93.9\% | 93.7\% | 93.5\% | 93.6\% | 94.0\% | 94.0\% | 94.2\% | 93.6\% | 94.3\% | 94.5\% |
|  |  |  | 0 | 63.3\% | 61.8\% | 58.2\% | 54.9\% | 54.5\% | 90.7\% | 91.5\% | 91.6\% | 91.7\% | 92.7\% |
|  | $\begin{aligned} & \mathbf{T}^{2}= \\ & 0.049 \end{aligned}$ |  | 5 | 69.3\% | 62.5\% | 60.2\% | 56.7\% | 55.3\% | 87.0\% | 87.3\% | 88.5\% | 89.1\% | 89.8\% |
|  |  |  | 10 | 79.2\% | 68.8\% | 65.3\% | 60.4\% | 56.2\% | 87.6\% | 85.0\% | 87.2\% | 87.7\% | 89.0\% |
|  |  |  | 0 | 43.9\% | 40.4\% | 39.3\% | 37.7\% | 36.2\% | 90.1\% | 89.3\% | 89.9\% | 91.0\% | 90.4\% |
|  | $0.148$ |  | 5 | 51.9\% | 45.7\% | 41.0\% | 38.9\% | 37.3\% | 87.1\% | 87.1\% | 88.9\% | 89.2\% | 89.5\% |
|  |  |  | 10 | 62.7\% | 53.2\% | 48.1\% | 43.5\% | 40.7\% | 86.0\% | 86.3\% | 87.6\% | 88.1\% | 88.7\% |
|  |  |  | 0 | 28.7\% | 25.4\% | 23.0\% | 22.9\% | 22.2\% | 88.6\% | 87.9\% | 88.2\% | 88.2\% | 89.6\% |
|  | $0.444$ |  | 5 | 34.9\% | 29.0\% | 25.6\% | 23.1\% | 22.3\% | 87.0\% | 87.6\% | 87.3\% | 88.1\% | 88.0\% |
|  |  |  | 10 | 45.2\% | 35.7\% | 29.6\% | 27.8\% | 25.5\% | 86.1\% | 87.3\% | 88.5\% | 87.8\% | 88.1\% |
| $\begin{gathered} \beta_{1}= \\ 0.148 \end{gathered}$ |  |  | 0 | 94.0\% | 94.9\% | 94.2\% | 94.5\% | 94.8\% | 95.3\% | 95.9\% | 95.8\% | 95.9\% | 96.0\% |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 93.5\% | 93.8\% | 93.9\% | 94.5\% | 93.5\% | 94.0\% | 94.2\% | 94.7\% | 95.1\% | 94.5\% |
|  |  |  | 10 | 92.8\% | 92.7\% | 92.6\% | 93.7\% | 93.6\% | 92.9\% | 93.2\% | 92.7\% | 94.1\% | 94.3\% |
|  |  |  | 0 | 62.4\% | 60.4\% | 58.1\% | 56.2\% | 54.9\% | 90.2\% | 90.8\% | 91.3\% | 92.3\% | 92.2\% |
|  | $\begin{aligned} & \mathrm{T}^{\mathrm{T}}= \\ & \mathrm{O}_{\mathrm{O}} \end{aligned}$ |  | 5 | 69.2\% | 62.7\% | 60.0\% | 56.3\% | 57.4\% | 86.3\% | 88.3\% | 88.7\% | 90.5\% | 90.4\% |
|  |  |  | 10 | 78.8\% | 69.8\% | 63.5\% | 60.6\% | 57.6\% | 87.6\% | 86.0\% | 86.1\% | 88.4\% | 88.0\% |
|  |  |  | 0 | 44.5\% | 40.8\% | 40.0\% | 37.5\% | 36.9\% | 89.7\% | 90.4\% | 89.6\% | 90.3\% | 90.0\% |
|  | $0.148$ |  | 5 | 51.7\% | 44.8\% | 41.9\% | 39.7\% | 38.1\% | 86.0\% | 87.8\% | 88.2\% | 88.8\% | 89.3\% |
|  |  |  | 10 | 63.5\% | 51.8\% | 46.5\% | 43.3\% | 39.7\% | 84.7\% | 86.6\% | 87.5\% | 88.0\% | 88.8\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 28.4\% | 25.7\% | 24.0\% | 22.0\% | 22.7\% | 88.7\% | 88.7\% | 88.3\% | 88.1\% | 88.7\% |
|  |  |  | 5 | 35.1\% | 30.5\% | 26.6\% | 25.3\% | 23.2\% | 87.2\% | 87.6\% | 88.3\% | 87.8\% | 87.4\% |
|  |  |  | 10 | 44.6\% | 35.1\% | 30.4\% | 28.5\% | 27.1\% | 85.7\% | 86.9\% | 86.7\% | 88.0\% | 87.6\% |

Table E29. Coverage probability of the estimated slope, with L studies imputed (from 2-dimensional algorithmic variant) (continued)

| L Missing Studies Imputed |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.296 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 94.9\% | 94.8\% | 94.1\% | 94.4\% | 94.9\% | 96.1\% | 96.0\% | 95.3\% | 95.3\% | 95.9\% |
|  |  |  | 5 | 92.6\% | 92.8\% | 93.3\% | 94.3\% | 93.8\% | 93.1\% | 93.2\% | 93.9\% | 94.9\% | 94.7\% |
|  |  |  | 10 | 89.9\% | 90.8\% | 91.9\% | 92.2\% | 92.4\% | 90.2\% | 91.5\% | 92.6\% | 92.6\% | 92.8\% |
|  | $\mathrm{T}^{2}=$ |  | 0 | 64.0\% | 61.2\% | 58.3\% | 56.0\% | 54.2\% | 91.0\% | 91.5\% | 91.1\% | 92.1\% | 92.2\% |
|  |  | $\begin{aligned} & \text { O } \\ & \text { 드N } \\ & \text { in } \end{aligned}$ | 5 | 69.1\% | 62.2\% | 58.5\% | 56.9\% | 55.8\% | 86.4\% | 86.9\% | 88.7\% | 88.5\% | 89.2\% |
|  |  |  | 10 | 75.4\% | 65.4\% | 60.5\% | 57.8\% | 56.9\% | 84.2\% | 83.0\% | 83.9\% | 85.7\% | 87.2\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | 45.2\% | 41.0\% | 39.2\% | 37.5\% | 36.9\% | 89.6\% | 89.9\% | 91.2\% | 90.9\% | 90.5\% |
|  |  | $\sum_{0}^{2}$ | 5 | 50.7\% | 45.9\% | 42.1\% | 39.2\% | 37.9\% | 85.7\% | 88.1\% | 87.8\% | 88.1\% | 88.4\% |
|  |  | $\begin{aligned} & 0 \\ & \frac{1}{む} \\ & \frac{0}{E} \\ & \frac{1}{Z} \end{aligned}$ | 10 | $62.0 \%$ | 51.9\% | 43.9\% | 42.6\% | 39.0\% | 83.6\% | 85.5\% | 86.4\% | 86.5\% | 86.0\% |
|  |  |  | 0 | 27.2\% | 25.3\% | 23.7\% | 22.8\% | 20.5\% | 88.8\% | 88.9\% | 88.4\% | 88.4\% | 87.8\% |
|  |  |  | 5 | 34.4\% | 29.2\% | 26.8\% | 24.7\% | 22.5\% | 87.5\% | 87.6\% | 87.8\% | 88.3\% | 87.8\% |
|  | $0.444$ |  | 10 | 43.7\% | 34.9\% | 31.2\% | 27.8\% | 25.1\% | 85.1\% | 85.9\% | 87.0\% | 86.2\% | 87.3\% |
| $\begin{gathered} \beta_{1}= \\ 0.444 \end{gathered}$ | $\mathrm{T}^{2}=0$ | $\begin{aligned} & \text { © } \\ & \text { 응 } \\ & \text { N } \\ & 0 \end{aligned}$ | 0 | 93.7\% | 94.5\% | 94.6\% | 94.3\% | 94.5\% | 95.4\% | 95.5\% | 95.6\% | 95.9\% | 95.8\% |
|  |  |  | 5 | 91.4\% | 92.8\% | 93.6\% | 93.5\% | 94.0\% | 92.3\% | 93.5\% | 94.3\% | 93.9\% | 94.7\% |
|  |  |  | 10 | 87.6\% | 89.2\% | 90.2\% | 91.1\% | 92.2\% | 88.1\% | 89.6\% | 90.4\% | 91.4\% | 92.6\% |
|  | $\mathrm{T}^{2}=$ | $\bar{\omega}$ | 0 | 63.2\% | 61.2\% | 56.4\% | 57.2\% | 54.6\% | 90.3\% | 91.8\% | 91.6\% | 92.3\% | 92.1\% |
|  |  |  | 5 | 66.9\% | 61.8\% | 59.0\% | 58.9\% | 54.0\% | 85.1\% | 86.1\% | 87.1\% | 88.4\% | 89.4\% |
|  | 0.049 |  | 10 | 70.6\% | 62.9\% | 59.1\% | 57.6\% | 54.8\% | 80.8\% | 81.4\% | 81.9\% | 84.3\% | 83.9\% |
|  | $\mathrm{T}^{2}=$ |  | 0 | 43.2\% | 39.9\% | 38.7\% | 37.2\% | 37.0\% | 89.5\% | 89.8\% | 89.9\% | 90.5\% | 90.2\% |
|  |  | $\stackrel{0}{0}$ | 5 | 49.8\% | 43.5\% | 41.4\% | 38.4\% | 37.5\% | 85.0\% | 87.2\% | 87.1\% | 87.8\% | 87.8\% |
|  | 0.148 | $\begin{aligned} & \frac{\vdots}{d} \\ & \frac{0}{E} \\ & \frac{1}{5} \end{aligned}$ | 10 | 56.4\% | 46.5\% | 44.0\% | 40.8\% | 38.3\% | 80.2\% | 82.9\% | 84.7\% | 85.1\% | 85.1\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 27.5\% | 26.7\% | 24.4\% | 23.1\% | 22.3\% | 88.0\% | 89.3\% | 87.9\% | 88.6\% | 87.9\% |
|  |  |  | $5$ | $34.4 \%$ | $27.9 \%$ | $26.4 \%$ | $24.7 \%$ | $23.6 \%$ | $86.4 \%$ | 86.2\% | $87.1 \%$ | $88.2 \%$ | $87.6 \%$ |
|  |  |  | 10 | 41.9\% | 33.5\% | 28.0\% | 25.8\% | 25.9\% | 83.3\% | 84.8\% | 85.2\% | 85.9\% | 86.2\% |


| No Correction for Publication Bias |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.049 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 0.8\% | -1.4\% | 3.3\% | -5.1\% | -2.2\% | 0.2\% | -1.9\% | 2.5\% | -5.5\% | -2.6\% |
|  |  |  | 5 | -18.4\% | -13.0\% | -12.4\% | -4.5\% | -1.1\% | -19.1\% | -13.4\% | -12.3\% | -5.1\% | -1.6\% |
|  |  |  | 10 | -51.1\% | -31.5\% | -15.9\% | -11.7\% | -10.6\% | -51.8\% | -31.6\% | -16.9\% | -11.9\% | -10.7\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | -5.5\% | -3.4\% | 0.5\% | -6.2\% | -2.1\% | -6.7\% | 3.1\% | 2.1\% | -8.2\% | 3.3\% |
|  |  |  | 5 | -35.7\% | -18.3\% | -19.5\% | -19.9\% | -0.7\% | -40.3\% | -14.2\% | -18.2\% | -22.7\% | -10.4\% |
|  |  |  | 10 | -48.3\% | -39.6\% | -25.4\% | -39.1\% | -22.2\% | -44.9\% | -39.8\% | -27.7\% | -36.1\% | -25.2\% |
|  |  |  | 0 | -10.3\% | 31.5\% | -4.2\% | 9.1\% | 1.3\% | -6.6\% | 2.9\% | -2.5\% | 6.8\% | 6.5\% |
|  | $0.148$ |  | 5 | -47.4\% | -17.6\% | -16.5\% | -11.3\% | -12.0\% | -41.3\% | -24.8\% | -24.9\% | -20.4\% | -20.0\% |
|  |  |  | 10 | -42.0\% | -29.1\% | -31.5\% | -38.6\% | -7.2\% | -49.7\% | -40.2\% | -35.8\% | -44.4\% | -29.6\% |
|  |  |  | 0 | 1.0\% | 48.2\% | 14.7\% | -5.3\% | -1.8\% | -13.5\% | 21.8\% | 0.5\% | -1.0\% | 6.9\% |
|  | $\begin{aligned} & \mathrm{T}^{\top}= \\ & 0.444 \end{aligned}$ |  | 5 | -3.9\% | -35.9\% | -33.7\% | -44.0\% | -27.1\% | -24.0\% | -44.0\% | -36.1\% | -36.9\% | -16.0\% |
|  |  |  | 10 | -83.4\% | -46.6\% | -49.2\% | -34.4\% | -18.9\% | -56.3\% | -66.2\% | -46.9\% | -38.2\% | -16.6\% |
| $\begin{gathered} \beta_{1}= \\ 0.074 \end{gathered}$ | $\mathrm{T}^{2}=0$ | Number of Missing Studies | 0 | -1.1\% | 3.9\% | 2.1\% | -1.0\% | -2.0\% | -0.7\% | 4.3\% | 2.3\% | -1.3\% | -1.7\% |
|  |  |  | 5 | -14.6\% | -9.7\% | -5.5\% | -3.8\% | -6.1\% | -15.1\% | -10.4\% | -5.8\% | -4.2\% | -6.1\% |
|  |  |  | 10 | -63.9\% | -32.5\% | -19.7\% | -14.0\% | -10.1\% | -64.0\% | -33.1\% | -20.6\% | -14.3\% | -10.3\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | -9.8\% | -7.0\% | 1.7\% | 2.5\% | -1.5\% | -6.9\% | -9.1\% | 2.1\% | -1.5\% | -0.8\% |
|  |  |  | 5 | -21.8\% | -27.2\% | -18.5\% | -15.3\% | -10.7\% | -28.6\% | -29.6\% | -22.4\% | -18.3\% | -12.8\% |
|  |  |  | 10 | -54.6\% | -41.0\% | -34.1\% | -30.8\% | -20.6\% | -55.4\% | -42.6\% | -36.8\% | -29.9\% | -26.4\% |
|  |  |  | 0 | 0.2\% | 6.0\% | 13.2\% | 1.1\% | -3.3\% | -0.9\% | -3.5\% | 2.7\% | -0.3\% | -2.6\% |
|  | $0.148$ |  | 5 | -27.7\% | -26.5\% | -24.3\% | -20.2\% | -1.7\% | -34.1\% | -19.3\% | -33.7\% | -23.0\% | -11.2\% |
|  |  |  | 10 | -63.4\% | -51.7\% | -27.7\% | -60.5\% | -36.6\% | -58.6\% | -44.1\% | -38.6\% | -43.5\% | -29.2\% |
|  |  |  | 0 | 11.2\% | 6.8\% | -4.5\% | -6.9\% | 8.3\% | -4.8\% | 2.0\% | -15.5\% | -8.7\% | -2.6\% |
|  | $\begin{aligned} & \mathrm{T}^{2}= \\ & 0.444 \end{aligned}$ |  | 5 | -26.4\% | -30.7\% | -13.2\% | -36.0\% | -33.1\% | -30.3\% | -35.0\% | -29.2\% | -29.9\% | -19.8\% |
|  |  |  | 10 | -45.3\% | -41.2\% | -55.5\% | -30.5\% | -25.3\% | -64.1\% | -43.8\% | -52.8\% | -40.2\% | -29.0\% |
| $\begin{gathered} \beta_{1}= \\ 0.148 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | -1.7\% | -0.3\% | -0.6\% | 0.5\% | 0.7\% | -1.4\% | -0.4\% | -0.7\% | 0.4\% | 1.0\% |
|  |  |  | 5 | -18.1\% | -9.2\% | -8.1\% | -4.4\% | -4.5\% | -18.7\% | -9.4\% | -8.3\% | -4.6\% | -4.4\% |
|  |  |  | 10 | -58.9\% | -29.8\% | -19.9\% | -12.2\% | -9.5\% | -58.9\% | -30.4\% | -20.4\% | -12.6\% | -9.7\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | 4.4\% | 1.8\% | 1.7\% | -4.9\% | -1.3\% | 2.3\% | -2.4\% | -1.0\% | -1.8\% | -2.0\% |
|  |  |  | 5 | -27.6\% | -26.3\% | -11.6\% | -10.3\% | -10.2\% | -31.3\% | -27.2\% | -16.3\% | -14.2\% | -13.4\% |
|  |  |  | 10 | -56.1\% | -41.0\% | -33.1\% | -24.8\% | -26.6\% | -57.4\% | -41.3\% | -34.4\% | -29.3\% | -30.0\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | 3.2\% | -3.4\% | -2.9\% | 1.3\% | 1.1\% | 8.2\% | -2.1\% | -0.4\% | -0.1\% | 0.2\% |
|  |  |  | 5 | -39.0\% | -21.6\% | -19.8\% | -17.6\% | -16.0\% | -40.6\% | -29.1\% | -22.5\% | -22.3\% | -18.9\% |
|  |  |  | 10 | -55.9\% | -48.1\% | -38.9\% | -36.1\% | -31.6\% | -58.1\% | -44.0\% | -39.1\% | -36.6\% | -32.0\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 12.3\% | 6.9\% | 6.4\% | -1.5\% | -4.2\% | 3.4\% | -0.6\% | -1.1\% | 4.0\% | -1.8\% |
|  |  |  | 5 | -48.0\% | -35.7\% | -26.6\% | -21.2\% | -21.9\% | -44.1\% | -30.8\% | -33.0\% | -28.8\% | -19.7\% |
|  |  |  | 10 | -62.0\% | -45.0\% | -36.2\% | -35.7\% | -40.1\% | -58.5\% | -44.7\% | -44.9\% | -36.3\% | -39.2\% |

Table E30. Relative bias in the estimated slope, with no correction for publication bias (from 2-dimensional algorithmic variant) (continued)

| No Correction for Publication Bias |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.296 \end{gathered}$ | $\mathrm{T}^{2}=0$ | Number of Missing Studies | 0 | 0.3\% | -0.8\% | 0.8\% | 0.4\% | -0.5\% | 0.4\% | -0.9\% | 0.9\% | 0.5\% | -0.6\% |
|  |  |  | 5 | -19.8\% | -10.8\% | -7.3\% | -5.4\% | -4.5\% | -20.3\% | -11.3\% | -7.7\% | -5.7\% | -4.8\% |
|  |  |  | 10 | -55.0\% | -28.6\% | -19.3\% | -13.0\% | -10.4\% | -55.2\% | -29.2\% | -19.6\% | -13.3\% | -10.6\% |
|  |  |  | 0 | -0.5\% | 1.8\% | 1.0\% | 0.3\% | 1.7\% | 0.1\% | -0.4\% | 1.2\% | 0.0\% | 0.6\% |
|  |  |  | 5 | -27.6\% | -22.1\% | -16.4\% | -10.2\% | -9.5\% | -30.7\% | -23.7\% | -19.4\% | -15.7\% | -14.0\% |
|  |  |  | 10 | -58.6\% | -42.8\% | -33.0\% | -28.5\% | -22.2\% | -58.4\% | -42.8\% | -34.5\% | -30.3\% | -26.1\% |
|  |  |  | 0 | 3.0\% | -2.5\% | -0.5\% | -1.1\% | 1.3\% | 0.9\% | -0.7\% | -0.9\% | 0.6\% | 0.2\% |
|  | $\begin{aligned} & \mathrm{T}^{2}= \\ & 0.148 \end{aligned}$ |  | 5 | -36.4\% | -25.6\% | -18.4\% | -15.7\% | -15.6\% | -36.6\% | -29.0\% | -20.2\% | -22.6\% | -18.6\% |
|  |  |  | 10 | -50.8\% | -43.3\% | -37.6\% | -29.5\% | -28.4\% | -52.8\% | -44.3\% | -39.0\% | -33.3\% | -31.5\% |
|  |  |  | 0 | -2.9\% | 7.0\% | 0.1\% | 3.4\% | 3.7\% | -0.3\% | 3.5\% | -0.1\% | -0.9\% | 1.4\% |
|  | $0.444$ |  | 5 | -36.8\% | -35.3\% | -28.5\% | -25.4\% | -20.4\% | -37.5\% | -34.6\% | -29.1\% | -23.9\% | -23.6\% |
|  |  |  | 10 | -53.6\% | -47.0\% | -40.9\% | -37.9\% | -30.7\% | -54.6\% | -48.9\% | -41.0\% | -38.5\% | -31.9\% |
| $\begin{gathered} \beta_{1}= \\ 0.444 \end{gathered}$ |  |  | 0 | 0.6\% | 0.2\% | -0.4\% | 0.2\% | 0.0\% | 0.7\% | 0.3\% | -0.4\% | 0.2\% | 0.1\% |
|  | $\mathrm{T}^{\mathbf{2}}=0$ |  | 5 | -17.2\% | -10.4\% | -6.7\% | -5.3\% | -4.2\% | -17.9\% | -10.9\% | -6.9\% | -5.5\% | -4.4\% |
|  |  |  | 10 | -49.9\% | -28.4\% | -18.3\% | -13.3\% | -9.6\% | -50.3\% | -29.0\% | -18.7\% | -13.6\% | -9.9\% |
|  |  |  | 0 | 0.3\% | -0.5\% | -0.8\% | 0.1\% | 0.9\% | 0.0\% | -0.9\% | -0.7\% | -0.2\% | 1.3\% |
|  |  |  | 5 | -29.8\% | -20.5\% | -14.3\% | -10.7\% | -8.4\% | -31.4\% | -22.8\% | -18.0\% | -14.9\% | -12.3\% |
|  |  |  | 10 | -54.3\% | -40.6\% | -30.5\% | -24.6\% | -21.0\% | -54.5\% | -41.8\% | -33.5\% | -28.2\% | -24.9\% |
|  |  |  | 0 | 2.7\% | 2.2\% | 0.8\% | 0.1\% | 0.9\% | 1.8\% | 0.7\% | -0.9\% | -0.8\% | -0.9\% |
|  | $\begin{aligned} & \mathrm{T}^{2}= \\ & 0.148 \end{aligned}$ |  | 5 | -32.1\% | -28.2\% | -21.5\% | -18.9\% | -13.6\% | -34.3\% | -29.3\% | -24.2\% | -21.7\% | -17.6\% |
|  |  |  | 10 | -57.2\% | -46.1\% | -37.8\% | -29.5\% | -29.1\% | -57.6\% | -45.9\% | -39.4\% | -33.2\% | -31.3\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 0.6\% | 2.3\% | 0.0\% | 1.9\% | 1.6\% | -1.5\% | 0.0\% | -0.4\% | -1.4\% | 1.1\% |
|  |  |  | 5 | -36.8\% | -34.3\% | -24.7\% | -22.0\% | -20.6\% | -37.5\% | -34.6\% | -26.5\% | -23.0\% | -22.2\% |
|  |  |  | 10 | -57.1\% | -46.4\% | -44.6\% | -38.4\% | -34.6\% | -58.1\% | -47.7\% | -42.6\% | -37.7\% | -34.4\% |

Table E31. Relative bias in the estimated slope, with $R$ studies imputed (from 2-dimensional algorithmic variant)

| R Missing Studies Imputed |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.049 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 0.8\% | -1.6\% | 2.8\% | -4.9\% | -2.4\% | 0.6\% | -1.9\% | 2.0\% | -5.3\% | -2.8\% |
|  |  |  | 5 | -15.6\% | -11.7\% | -11.4\% | -4.3\% | -0.9\% | -16.1\% | -12.8\% | -10.9\% | -5.9\% | -2.6\% |
|  |  |  | 10 | -30.2\% | -19.9\% | -11.3\% | -7.3\% | -9.0\% | -29.3\% | -19.8\% | -13.3\% | -7.8\% | -8.5\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | -4.0\% | -4.1\% | 2.4\% | -7.3\% | -2.2\% | -5.9\% | 3.3\% | 4.6\% | -9.5\% | 3.0\% |
|  |  |  | 5 | -23.5\% | -6.4\% | -18.6\% | -15.7\% | -0.3\% | -25.8\% | -1.0\% | -13.1\% | -16.3\% | -9.7\% |
|  |  |  | 10 | -32.2\% | -30.1\% | -16.2\% | -33.8\% | -13.5\% | -25.2\% | -24.5\% | -13.0\% | -27.9\% | -11.0\% |
|  |  |  | 0 | -8.7\% | 32.3\% | -4.1\% | 8.9\% | 1.8\% | -8.0\% | 6.0\% | -1.4\% | 6.7\% | 5.9\% |
|  |  |  | 5 | -38.9\% | -8.0\% | -18.7\% | -9.4\% | -9.6\% | -25.8\% | -19.4\% | -20.4\% | -12.7\% | -13.8\% |
|  |  |  | 10 | -29.9\% | -13.6\% | -14.7\% | -34.4\% | -4.4\% | -37.3\% | -18.7\% | -22.4\% | -36.2\% | -22.5\% |
|  |  |  | 0 | -2.6\% | 33.0\% | 10.5\% | -6.3\% | -0.6\% | -17.2\% | 0.3\% | -5.6\% | -3.4\% | 8.0\% |
|  |  |  | 5 | -2.5\% | -19.3\% | -27.2\% | -37.5\% | -11.4\% | -24.0\% | -24.1\% | -26.0\% | -27.3\% | 6.0\% |
|  |  |  | 10 | -59.7\% | -33.3\% | -34.4\% | -22.0\% | -8.7\% | -20.1\% | -43.4\% | -34.0\% | -23.1\% | 4.0\% |
| $\begin{gathered} \beta_{1}= \\ 0.074 \end{gathered}$ | $\mathrm{T}^{2}=0$ | Number of Missing Studies | 0 | -2.0\% | 3.9\% | 2.0\% | -1.0\% | -1.9\% | -2.1\% | 3.8\% | 2.0\% | -1.2\% | -1.8\% |
|  |  |  | 5 | -7.7\% | -7.4\% | -4.9\% | -3.1\% | -6.0\% | -8.7\% | -8.7\% | -5.7\% | -3.6\% | -6.2\% |
|  |  |  | 10 | -39.1\% | -21.0\% | -17.1\% | -10.3\% | -7.5\% | -38.1\% | -20.1\% | -18.7\% | -10.3\% | -8.1\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | -9.1\% | -6.1\% | 0.8\% | 2.0\% | -1.6\% | -6.3\% | -9.0\% | 1.6\% | -1.4\% | -1.1\% |
|  |  |  | 5 | -16.1\% | -22.8\% | -15.1\% | -11.1\% | -6.7\% | -20.2\% | -23.9\% | -14.9\% | -10.3\% | -8.7\% |
|  |  |  | 10 | -34.1\% | -29.4\% | -23.7\% | -22.0\% | -14.2\% | -32.5\% | -29.6\% | -22.7\% | -18.5\% | -15.5\% |
|  |  |  | 0 | 1.2\% | 9.7\% | 12.3\% | 0.6\% | -3.9\% | 1.6\% | -1.2\% | 0.0\% | -0.2\% | -2.8\% |
|  | $0.148$ |  | 5 | -27.3\% | -15.6\% | -14.6\% | -15.2\% | 8.3\% | -32.8\% | -9.7\% | -23.8\% | -15.3\% | 0.6\% |
|  |  |  | 10 | -44.5\% | -34.9\% | -17.1\% | -44.8\% | -22.8\% | -37.9\% | -21.7\% | -29.8\% | -26.3\% | -13.8\% |
|  |  |  | 0 | 2.4\% | 2.4\% | -2.9\% | -8.7\% | 7.0\% | -7.7\% | -1.5\% | -19.4\% | -14.4\% | -5.2\% |
|  |  |  | 5 | -16.3\% | -23.3\% | -8.1\% | -36.7\% | -28.7\% | -6.3\% | -26.0\% | -24.1\% | -22.8\% | -11.0\% |
|  |  |  | 10 | -35.0\% | -30.6\% | -43.1\% | -19.2\% | -22.9\% | -54.8\% | -21.1\% | -26.9\% | -24.9\% | -23.7\% |
| $\begin{gathered} \beta_{1}= \\ 0.148 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | -1.8\% | -0.4\% | -0.5\% | 0.6\% | 0.7\% | -1.4\% | -0.5\% | -0.7\% | 0.5\% | 0.9\% |
|  |  |  | 5 | -14.6\% | -7.1\% | -6.2\% | -3.5\% | -4.0\% | -15.5\% | -7.1\% | -6.7\% | -3.9\% | -4.0\% |
|  |  |  | 10 | -36.1\% | -18.8\% | -14.3\% | -9.4\% | -7.0\% | -35.1\% | -18.7\% | -14.7\% | -10.3\% | -7.8\% |
|  |  |  | 0 | 4.6\% | 1.6\% | 1.5\% | -4.8\% | -1.2\% | 2.6\% | -3.1\% | -1.6\% | -1.9\% | -2.5\% |
|  | $\mathrm{T}^{2}=$ |  | 5 | -19.3\% | -18.9\% | -8.1\% | -7.7\% | -8.6\% | -19.3\% | -16.3\% | -10.9\% | -9.1\% | -9.8\% |
|  |  |  | 10 | -40.9\% | -26.3\% | -23.6\% | -16.2\% | -20.2\% | -40.2\% | -22.1\% | -20.1\% | -16.7\% | -20.7\% |
|  |  |  | 0 | 4.1\% | -4.1\% | -3.3\% | 0.6\% | 0.6\% | 8.8\% | -3.6\% | -0.1\% | -1.3\% | 0.0\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 5 | -30.2\% | -16.1\% | -14.4\% | -13.6\% | -11.4\% | -28.1\% | -18.9\% | -16.0\% | -14.3\% | -12.8\% |
|  |  |  | 10 | -45.0\% | -36.4\% | -27.3\% | -25.9\% | -23.5\% | -43.0\% | -25.6\% | -23.6\% | -22.8\% | -20.2\% |
|  |  |  | 0 | 12.3\% | 4.8\% | 6.9\% | -0.3\% | -2.9\% | 3.9\% | -2.2\% | -4.1\% | 5.7\% | -2.4\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 5 | -41.5\% | -26.4\% | -20.3\% | -13.6\% | -16.9\% | -34.5\% | -17.1\% | -22.9\% | -19.8\% | -11.6\% |
|  |  |  | 10 | -48.9\% | -33.1\% | -25.3\% | -24.4\% | -32.6\% | -37.9\% | -27.7\% | -26.3\% | -20.9\% | -25.5\% |

Table E31. Relative bias in the estimated slope, with R studies imputed (from 2-dimensional algorithmic variant) (continued)

| R Missing Studies Imputed |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.296 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 0.3\% | -0.7\% | 0.7\% | 0.5\% | -0.5\% | 0.3\% | -0.8\% | 0.9\% | 0.5\% | -0.6\% |
|  |  |  | 5 | -14.4\% | -8.8\% | -6.5\% | -5.1\% | -4.1\% | -14.5\% | -9.4\% | -7.4\% | -5.7\% | -4.6\% |
|  |  |  | 10 | -33.3\% | -18.1\% | -14.0\% | -10.2\% | -8.8\% | -32.3\% | -18.0\% | -14.5\% | -11.1\% | -9.6\% |
|  | $\begin{gathered} \mathrm{r}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | -0.6\% | 2.0\% | 0.9\% | 0.3\% | 1.7\% | -0.8\% | 0.2\% | 1.1\% | 0.0\% | 0.6\% |
|  |  |  | 5 | -20.0\% | -16.7\% | -12.6\% | -8.5\% | -7.6\% | -20.6\% | -16.4\% | -13.9\% | -13.0\% | -11.1\% |
|  |  |  | 10 | -41.9\% | -30.5\% | -22.6\% | -20.6\% | -16.3\% | -38.1\% | -26.3\% | -20.3\% | -19.2\% | -17.3\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | 3.5\% | -1.8\% | -0.1\% | -1.5\% | 1.6\% | 1.1\% | 0.3\% | -0.4\% | 0.0\% | 0.4\% |
|  |  |  | 5 | -26.8\% | -18.8\% | -12.6\% | -12.5\% | -13.0\% | -23.6\% | -19.6\% | -13.7\% | -17.6\% | -14.3\% |
|  |  |  | 10 | -36.6\% | -29.0\% | -26.3\% | -19.2\% | -19.8\% | -33.9\% | -25.0\% | -22.5\% | -18.7\% | -19.8\% |
|  | $\begin{gathered} \mathrm{r}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | -1.6\% | 7.1\% | 0.6\% | 3.9\% | 3.7\% | -1.0\% | 3.3\% | 0.0\% | -1.6\% | 1.3\% |
|  |  |  | 5 | -24.9\% | -28.4\% | -20.6\% | -18.2\% | -16.3\% | -22.6\% | -24.1\% | -18.2\% | -13.2\% | -16.8\% |
|  |  |  | 10 | -40.7\% | -33.8\% | -28.3\% | -25.5\% | -21.5\% | -36.7\% | -30.7\% | -24.8\% | -22.5\% | -17.2\% |
| $\begin{gathered} \beta_{1}= \\ 0.444 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 0.6\% | 0.3\% | -0.4\% | 0.3\% | 0.0\% | 0.7\% | 0.5\% | -0.4\% | 0.3\% | 0.1\% |
|  |  |  | 5 | -12.6\% | -8.6\% | -5.8\% | -4.7\% | -3.9\% | -13.1\% | -9.2\% | -6.2\% | -5.2\% | -4.4\% |
|  |  |  | 10 | -29.7\% | -19.4\% | -13.8\% | -11.0\% | -8.3\% | -28.8\% | -19.5\% | -14.4\% | -11.6\% | -9.0\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | 0.3\% | -0.5\% | -0.8\% | 0.1\% | 0.7\% | 0.0\% | -0.9\% | -0.6\% | -0.1\% | 1.2\% |
|  |  |  | 5 | -22.4\% | -15.8\% | -11.6\% | -8.4\% | -7.3\% | -21.7\% | -16.1\% | -13.5\% | -11.4\% | -10.1\% |
|  |  |  | 10 | -38.1\% | -28.3\% | -22.1\% | -17.6\% | -15.9\% | -35.3\% | -26.0\% | -21.8\% | -18.2\% | -17.2\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | 2.4\% | 2.0\% | 0.6\% | 0.0\% | 0.7\% | 1.4\% | 0.6\% | -0.8\% | -1.1\% | -1.0\% |
|  |  |  | 5 | -23.9\% | -22.1\% | -16.1\% | -14.7\% | -10.1\% | -23.0\% | -20.7\% | -16.5\% | -15.0\% | -11.7\% |
|  |  |  | 10 | -43.9\% | -32.9\% | -27.3\% | -21.0\% | -20.9\% | -40.1\% | -27.8\% | -23.6\% | -21.0\% | -20.0\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | -0.4\% | 2.9\% | 0.4\% | 1.8\% | 1.3\% | -2.6\% | 0.0\% | -0.6\% | -2.0\% | 0.6\% |
|  |  |  | 5 | -28.4\% | -26.9\% | -19.0\% | -16.4\% | -15.1\% | -25.3\% | -24.6\% | -17.2\% | -14.8\% | -14.5\% |
|  |  |  | 10 | -44.2\% | -33.3\% | -33.6\% | -29.2\% | -25.3\% | -40.6\% | -30.3\% | -26.6\% | -23.6\% | -21.2\% |

Table E32. Relative bias of imputed studies, with L studies imputed (from 2-dimensional algorithmic variant)

| L Missing Studies Imputed |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.049 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | -0.5\% | -3.2\% | 3.3\% | -4.7\% | -1.9\% | -1.7\% | -3.4\% | 2.6\% | -5.4\% | -2.1\% |
|  |  |  | 5 | -18.1\% | -10.7\% | -11.3\% | -3.3\% | -1.3\% | -19.2\% | -12.3\% | -10.9\% | -4.7\% | -2.7\% |
|  |  |  | 10 | -33.2\% | -22.4\% | -11.8\% | -8.7\% | -9.2\% | -32.5\% | -21.8\% | -13.7\% | -9.3\% | -9.0\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | -8.4\% | -1.5\% | 1.9\% | -8.6\% | -2.8\% | -8.8\% | 3.2\% | 6.7\% | -10.7\% | 1.5\% |
|  |  |  | 5 | -27.3\% | -7.6\% | -20.4\% | -17.5\% | -0.9\% | -29.7\% | -1.6\% | -15.5\% | -18.1\% | -9.8\% |
|  |  |  | 10 | -37.7\% | -30.7\% | -17.7\% | -28.9\% | -17.9\% | -29.1\% | -24.9\% | -14.4\% | -26.0\% | -16.9\% |
|  |  |  | 0 | -11.3\% | 29.4\% | 3.5\% | 4.6\% | 6.0\% | -8.5\% | 7.2\% | 5.7\% | 3.9\% | 13.6\% |
|  |  |  | 5 | -34.4\% | -14.2\% | -17.8\% | -8.1\% | -10.4\% | -23.4\% | -19.4\% | -19.0\% | -14.0\% | -13.2\% |
|  |  |  | 10 | -35.5\% | -15.9\% | -17.4\% | -34.8\% | -6.9\% | -40.0\% | -22.0\% | -24.2\% | -35.3\% | -23.8\% |
|  |  |  | 0 | -20.5\% | 37.9\% | 16.4\% | -4.9\% | -4.0\% | -32.9\% | 2.5\% | 3.6\% | 2.5\% | 8.2\% |
|  | $\begin{aligned} & \mathrm{T}^{\mathbf{2}}= \\ & 0.4444 \end{aligned}$ |  | 5 | 0.3\% | -26.7\% | -32.7\% | -36.5\% | -10.1\% | -27.2\% | -32.7\% | -29.2\% | -32.9\% | 4.8\% |
|  |  |  | 10 | -66.1\% | -44.3\% | -41.4\% | -30.4\% | -12.9\% | -27.2\% | -54.7\% | -40.0\% | -32.7\% | 1.6\% |
| $\begin{gathered} \beta_{1}= \\ 0.074 \end{gathered}$ | $\mathrm{T}^{\mathbf{2}}=0$ | Number of Missing Studies | 0 | -0.7\% | 3.8\% | 1.7\% | -0.9\% | -2.1\% | -0.8\% | 4.0\% | 1.7\% | -1.0\% | -1.5\% |
|  |  |  | 5 | -8.6\% | -8.0\% | -4.4\% | -3.4\% | -6.3\% | -8.8\% | -9.3\% | -5.0\% | -3.9\% | -6.6\% |
|  |  |  | 10 | -40.6\% | -22.2\% | -17.8\% | -11.4\% | -8.3\% | -39.6\% | -21.3\% | -19.8\% | -11.5\% | -9.0\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | -9.2\% | -7.9\% | 0.7\% | 0.4\% | 1.2\% | -8.7\% | -10.4\% | 1.8\% | -4.1\% | 0.8\% |
|  |  |  | 5 | -17.9\% | -22.6\% | -14.6\% | -13.0\% | -7.0\% | -23.2\% | -22.7\% | -14.6\% | -13.6\% | -10.0\% |
|  |  |  | 10 | -40.8\% | -30.8\% | -27.2\% | -24.5\% | -14.3\% | -38.5\% | -32.5\% | -26.8\% | -21.3\% | -15.7\% |
|  |  |  | 0 | -0.5\% | 8.8\% | 9.2\% | -0.4\% | -4.2\% | 1.8\% | -1.3\% | -0.4\% | 0.6\% | -4.0\% |
|  | $0.148$ |  | 5 | -22.8\% | -17.0\% | -14.6\% | -14.3\% | 7.8\% | -30.5\% | -12.6\% | -22.2\% | -14.2\% | -0.5\% |
|  |  |  | 10 | -48.8\% | -41.5\% | -19.0\% | -48.6\% | -25.9\% | -41.1\% | -28.8\% | -30.4\% | -28.8\% | -16.4\% |
|  |  |  | 0 | 2.5\% | 2.1\% | -5.2\% | -10.7\% | 4.0\% | -6.3\% | -5.1\% | -21.1\% | -14.5\% | -11.8\% |
|  |  |  | 5 | -17.2\% | -28.7\% | -13.2\% | -37.4\% | -31.4\% | -7.3\% | -27.7\% | -31.4\% | -25.0\% | -12.8\% |
|  |  |  | 10 | -41.4\% | -31.2\% | -42.6\% | -27.1\% | -22.5\% | -59.8\% | -26.8\% | -28.1\% | -31.2\% | -22.8\% |
| $\begin{gathered} \beta_{1}= \\ 0.148 \end{gathered}$ | $\mathrm{T}^{\mathbf{2}}=0$ |  | 0 | -1.8\% | -0.5\% | -0.8\% | 0.5\% | 0.6\% | -1.3\% | -0.3\% | -1.1\% | 0.4\% | 1.0\% |
|  |  |  | 5 | -14.8\% | -7.3\% | -6.6\% | -3.8\% | -4.0\% | -15.7\% | -7.4\% | -7.3\% | -4.3\% | -4.0\% |
|  |  |  | 10 | -38.5\% | -20.8\% | -14.8\% | -10.0\% | -7.6\% | -37.2\% | -20.7\% | -15.3\% | -10.9\% | -8.4\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | 4.3\% | 1.8\% | 1.3\% | -4.8\% | -1.4\% | 2.1\% | -3.8\% | -2.2\% | -1.9\% | -2.3\% |
|  |  |  | 5 | -21.3\% | -20.2\% | -8.8\% | -8.9\% | -8.9\% | -21.8\% | -18.1\% | -11.9\% | -10.2\% | -10.4\% |
|  |  |  | 10 | -41.4\% | -28.9\% | -25.0\% | -17.2\% | -20.4\% | -40.4\% | -25.4\% | -22.1\% | -17.4\% | -20.9\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | 2.8\% | -5.2\% | -3.8\% | 1.5\% | 0.6\% | 5.7\% | -4.3\% | -0.5\% | -0.5\% | -0.5\% |
|  |  |  | 5 | -32.0\% | -16.5\% | -14.3\% | -15.9\% | -11.9\% | -29.1\% | -21.0\% | -16.0\% | -16.7\% | -13.0\% |
|  |  |  | 10 | -47.2\% | -38.4\% | -30.4\% | -26.9\% | -24.9\% | -45.8\% | -29.4\% | -26.7\% | -24.5\% | -22.5\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 13.2\% | 4.1\% | 5.7\% | 0.0\% | -5.5\% | 4.2\% | -2.8\% |  | 5.6\% | -4.3\% |
|  |  |  | 5 | -43.5\% | -30.5\% | -23.5\% | -14.2\% | -17.6\% | -35.6\% | -18.8\% | -24.2\% | -20.3\% | -13.6\% |
|  |  |  | 10 | -53.0\% | -34.0\% | -28.4\% | -27.5\% | -35.3\% | -43.1\% | -26.0\% | -30.6\% | -23.6\% | -29.0\% |

Table E32. Relative bias of imputed studies, with L studies imputed (from 2-dimensional algorithmic variant) (continued)

| L Missing Studies Imputed |  |  |  | Fixed Effects in the Final Model Number of Studies |  |  |  |  | Random Effects in the Final Model Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.296 \end{gathered}$ | $\mathrm{T}^{2}=0$ |  | 0 | 0.3\% | -0.8\% | 0.9\% | 0.5\% | -0.6\% | 0.4\% | -0.9\% | 1.1\% | 0.5\% | -0.8\% |
|  |  |  | 5 | -15.1\% | -9.3\% | -6.5\% | -5.0\% | -4.1\% | -15.1\% | -9.9\% | -7.4\% | -5.6\% | -4.7\% |
|  |  |  | 10 | -35.3\% | -19.7\% | -14.8\% | -10.3\% | -8.8\% | -33.9\% | -19.5\% | -15.3\% | -11.1\% | -9.6\% |
|  |  |  | 0 | -0.3\% | 1.9\% | 0.9\% | 0.4\% | 1.8\% | 0.0\% | -0.5\% | 1.2\% | 0.1\% | 0.8\% |
|  |  |  | 5 | -21.4\% | -17.6\% | -12.9\% | -9.0\% | -7.7\% | -21.9\% | -17.2\% | -13.9\% | -13.3\% | -11.3\% |
|  |  |  | 10 | -44.2\% | -32.2\% | -24.5\% | -21.9\% | -17.4\% | -40.6\% | -28.2\% | -22.1\% | -20.4\% | -18.3\% |
|  |  |  | 0 | 3.8\% | -2.3\% | 0.5\% | -0.9\% | 1.4\% | 1.9\% | 0.2\% | -0.4\% | 0.3\% | 0.1\% |
|  |  |  | 5 | -28.8\% | -19.4\% | -13.2\% | -13.2\% | -12.9\% | -25.8\% | -20.8\% | -13.7\% | -17.8\% | -14.1\% |
|  |  |  | 10 | -39.0\% | -32.8\% | -28.4\% | -21.5\% | -21.7\% | -37.0\% | -29.0\% | -24.8\% | -21.3\% | -21.8\% |
|  |  |  | 0 | 0.0\% | 6.9\% | 2.0\% | 5.7\% | 2.9\% | 2.3\% | 1.4\% | 0.3\% | 0.6\% | 0.9\% |
|  |  |  | 5 | -27.2\% | -29.7\% | -20.6\% | -20.8\% | -16.4\% | -25.0\% | -25.5\% | -19.1\% | -16.2\% | -17.6\% |
|  |  |  | 10 | -43.7\% | -36.7\% | -31.2\% | -28.1\% | -23.4\% | -39.1\% | -34.4\% | -26.9\% | -25.2\% | -20.2\% |
| $\begin{gathered} \beta_{1}= \\ 0.444 \end{gathered}$ |  |  | 0 | 0.8\% | 0.3\% | -0.4\% | 0.3\% | 0.1\% | 0.9\% | 0.5\% | -0.4\% | 0.3\% | 0.1\% |
|  | $\mathrm{T}^{2}=0$ |  | 5 | -12.8\% | -8.5\% | -5.7\% | -4.6\% | -4.0\% | -13.2\% | -9.0\% | -6.1\% | -5.1\% | -4.5\% |
|  |  |  | 10 | -31.0\% | -19.7\% | -13.8\% | -10.8\% | -8.0\% | -29.9\% | -19.7\% | -14.3\% | -11.4\% | -8.7\% |
|  |  |  | 0 | 0.0\% | -0.3\% | -0.8\% | 0.3\% | 0.8\% | -0.5\% | -0.9\% | -0.8\% | 0.0\% | 1.0\% |
|  | $\begin{gathered} \mathrm{T}^{\top}= \\ 0.049 \end{gathered}$ |  | 5 | -22.9\% | -16.1\% | -11.5\% | -8.7\% | -7.4\% | -21.8\% | -16.5\% | -13.4\% | -11.5\% | -9.9\% |
|  |  |  | 10 | -40.0\% | -29.7\% | -22.9\% | -18.5\% | -16.5\% | -36.9\% | -27.3\% | -22.6\% | -18.9\% | -17.6\% |
|  |  |  | 0 | 2.8\% | 1.6\% | 1.0\% | -0.2\% | 1.4\% | 1.8\% | 0.8\% | -1.0\% | -1.5\% | -0.7\% |
|  |  |  | 5 | -24.7\% | -22.7\% | -16.6\% | -14.7\% | -10.1\% | -23.7\% | -21.3\% | -16.8\% | -15.0\% | -11.9\% |
|  |  |  | 10 | -45.9\% | -35.6\% | -28.7\% | -23.0\% | -22.6\% | -42.3\% | -30.6\% | -25.9\% | -22.9\% | -21.6\% |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | -1.0\% | 3.9\% | -0.3\% | 1.5\% | 0.3\% | -3.2\% | 1.3\% | -0.8\% | -2.4\% | 0.6\% |
|  |  |  | 5 | -28.8\% | -27.4\% | -19.3\% | -16.9\% | -15.1\% | -25.4\% | -24.5\% | -18.0\% | -15.7\% | -14.5\% |
|  |  |  | 10 | -47.4\% | -36.4\% | -36.0\% | -30.9\% | -26.0\% | -43.8\% | -33.1\% | -29.7\% | -26.0\% | -22.8\% |

Table E33. Mean number of imputed studies, with $R$ studies imputed (from 2-dimensional algorithmic variant)

| R Missing Studies Imputed |  |  |  | Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.049 \end{gathered}$ |  |  | 0 | 0.507 | 0.518 | 0.527 | 0.491 | 0.476 |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 4.066 | 4.573 | 4.846 | 4.810 | 4.904 |
|  |  |  | 10 | 5.158 | 7.959 | 8.865 | 9.354 | 9.481 |
|  |  |  | 0 | 0.730 | 0.696 | 0.700 | 0.654 | 0.661 |
|  |  |  | 5 | 3.444 | 4.451 | 4.805 | 5.186 | 5.349 |
|  |  |  | 10 | 3.377 | 5.647 | 7.010 | 8.310 | 8.844 |
|  |  |  | 0 | 0.941 | 1.000 | 0.967 | 0.941 | 0.885 |
|  |  |  | 5 | 2.884 | 4.155 | 4.722 | 5.116 | 5.310 |
|  |  |  | 10 | 2.628 | 4.692 | 5.922 | 7.086 | 8.054 |
|  |  |  | 0 | 1.233 | 1.415 | 1.284 | 1.308 | 1.233 |
|  |  |  | 5 | 2.571 | 3.544 | 4.334 | 5.028 | 5.170 |
|  |  |  | 10 | 2.140 | 3.865 | 5.086 | 6.110 | 7.187 |
| $\begin{gathered} \beta_{1}= \\ 0.074 \end{gathered}$ |  |  | 0 | 0.494 | 0.507 | 0.497 | 0.508 | 0.485 |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 4.200 | 4.597 | 4.808 | 4.879 | 4.820 |
|  |  |  | 10 | 5.192 | 7.932 | 8.857 | 9.184 | 9.371 |
|  |  |  | 0 | 0.709 | 0.678 | 0.693 | 0.653 | 0.631 |
|  |  |  | 5 | 3.466 | 4.475 | 4.895 | 5.257 | 5.180 |
|  |  |  | 10 | 3.401 | 5.472 | 7.215 | 8.291 | 8.880 |
|  |  |  | 0 | 1.012 | 0.940 | 0.973 | 0.913 | 0.873 |
|  | $\begin{aligned} & \mathrm{T}^{\top}= \\ & 0.148 \end{aligned}$ |  | 5 | 2.959 | 4.110 | 4.545 | 4.935 | 5.247 |
|  |  |  | 10 | 2.617 | 4.473 | 6.085 | 7.254 | 7.841 |
|  |  |  | 0 | 1.154 | 1.305 | 1.291 | 1.319 | 1.236 |
|  | $0.444$ |  | 5 | 2.592 | 3.654 | 4.381 | 4.775 | 5.206 |
|  |  |  | 10 | 2.076 | 3.819 | 5.132 | 6.164 | 7.062 |
| $\begin{gathered} \beta_{1}= \\ 0.148 \end{gathered}$ |  |  | 0 | 0.522 | 0.499 | 0.487 | 0.476 | 0.496 |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 4.059 | 4.513 | 4.567 | 4.618 | 4.661 |
|  |  |  | 10 | 5.008 | 7.503 | 8.497 | 8.887 | 8.911 |
|  |  |  | 0 | 0.731 | 0.695 | 0.672 | 0.661 | 0.621 |
|  | $0.049$ |  | 5 | 3.446 | 4.334 | 4.763 | 5.059 | 5.263 |
|  |  |  | 10 | 3.357 | 5.488 | 7.095 | 8.061 | 8.667 |
|  |  |  | 0 | 0.935 | 0.970 | 0.967 | 0.925 | 0.929 |
|  | $\begin{aligned} & \mathrm{T}^{\top}= \\ & 0.148 \end{aligned}$ |  | 5 | 2.874 | 3.978 | 4.456 | 5.040 | 5.185 |
|  |  |  | 10 | 2.652 | 4.445 | 6.031 | 7.010 | 8.062 |
|  |  |  | 0 | 1.202 | 1.307 | 1.310 | 1.193 | 1.231 |
|  | ${ }_{0}^{\top}=$ |  | 5 | 2.467 | 3.572 | 4.228 | 4.965 | 5.209 |
|  |  |  | 10 | 2.166 | 3.786 | 5.134 | 6.089 | 7.148 |
| $\begin{gathered} \beta_{1}= \\ 0.296 \end{gathered}$ |  |  | 0 | 0.533 | 0.490 | 0.528 | 0.514 | 0.481 |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 3.692 | 4.071 | 4.094 | 4.046 | 4.172 |
|  |  |  | 10 | 4.628 | 6.768 | 7.464 | 7.679 | 7.707 |
|  |  |  | 0 | 0.736 | 0.722 | 0.649 | 0.690 | 0.639 |
|  | $\begin{aligned} & \mathrm{T}^{\mathbf{2}}= \\ & 0.049 \end{aligned}$ |  | 5 | 3.228 | 4.102 | 4.474 | 4.685 | 4.760 |
|  |  |  | 10 | 3.267 | 5.440 | 6.661 | 7.611 | 8.087 |
|  |  |  | 0 | 0.999 | 0.966 | 0.952 | 0.899 | 0.811 |
|  |  |  | 5 | 2.813 | 3.840 | 4.478 | 4.734 | 5.066 |
|  |  |  | 10 | 2.659 | 4.420 | 5.779 | 6.866 | 7.741 |
|  |  |  | 0 | 1.109 | 1.347 | 1.217 | 1.220 | 1.299 |
|  |  |  | 5 | 2.537 | 3.585 | 4.166 | 4.833 | 5.099 |
|  |  |  | 10 | 2.138 | 3.765 | 5.101 | 6.283 | 7.069 |

Table E33. Mean number of imputed studies, with R studies imputed (from 2-dimensional algorithmic variant) (continued)

| R Missing Studies Imputed |  |  |  | Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.444 \end{gathered}$ | $\mathrm{T}^{2}=0$ | sə!pnłs 6u!ss!̣ ło ıəquinN | 0 | 0.524 | 0.533 | 0.506 | 0.524 | 0.506 |
|  |  |  | 5 | 3.232 | 3.596 | 3.631 | 3.636 | 3.676 |
|  |  |  | 10 | 4.166 | 5.745 | 6.060 | 6.157 | 6.361 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | 0.733 | 0.685 | 0.669 | 0.673 | 0.645 |
|  |  |  | 5 | 3.137 | 3.823 | 4.307 | 4.168 | 4.454 |
|  |  |  | 10 | 3.105 | 5.066 | 6.150 | 6.777 | 7.250 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | 0.984 | 0.979 | 1.004 | 0.924 | 0.912 |
|  |  |  | 5 | 2.767 | 3.736 | 4.318 | 4.619 | 4.771 |
|  |  |  | 10 | 2.620 | 4.383 | 5.659 | 6.622 | 7.100 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 1.156 | 1.297 | 1.391 | 1.339 | 1.209 |
|  |  |  | 5 | 2.454 | 3.515 | 4.207 | 4.480 | 5.092 |
|  |  |  | 10 | 2.181 | 3.820 | 5.134 | 6.196 | 6.982 |

Table E34. Mean number of imputed studies, with L studies imputed (from 2-dimensional algorithmic variant)

| L Missing Studies Imputed |  |  |  | Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.049 \end{gathered}$ |  |  | 0 | 1.216 | 1.382 | 1.614 | 1.760 | 1.907 |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 3.618 | 4.233 | 4.700 | 4.867 | 5.137 |
|  |  |  | 10 | 4.137 | 6.227 | 7.300 | 8.087 | 8.422 |
|  |  |  | 0 | 1.715 | 2.064 | 2.522 | 2.938 | 3.333 |
|  | $\mathrm{T}^{2}=$ |  | 5 | 3.003 | 4.028 | 4.742 | 5.529 | 6.038 |
|  |  |  | 10 | 2.781 | 4.364 | 5.581 | 6.793 | 7.700 |
|  |  |  | 0 | 2.065 | 2.647 | 3.418 | 3.723 | 4.473 |
|  |  |  | 5 | 2.558 | 3.766 | 4.574 | 5.558 | 6.281 |
|  |  |  | 10 | 2.186 | 3.559 | 4.580 | 5.656 | 6.729 |
|  |  |  | 0 | 2.354 | 3.281 | 3.982 | 4.722 | 5.315 |
|  |  |  | 5 | 2.297 | 3.221 | 4.226 | 5.188 | 6.042 |
|  |  |  | 10 | 1.783 | 2.921 | 3.829 | 4.731 | 5.760 |
| $\begin{gathered} \beta_{1}= \\ 0.074 \end{gathered}$ |  |  | 0 | 1.171 | 1.377 | 1.616 | 1.699 | 1.831 |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 3.693 | 4.288 | 4.744 | 4.894 | 4.995 |
|  |  |  | 10 | 4.203 | 6.268 | 7.392 | 8.053 | 8.426 |
|  |  |  | 0 | 1.642 | 2.055 | 2.443 | 2.914 | 3.218 |
|  |  |  | 5 | 3.072 | 4.157 | 4.838 | 5.581 | 6.062 |
|  |  |  | 10 | 2.740 | 4.263 | 5.714 | 6.827 | 7.800 |
|  |  |  | 0 | 2.049 | 2.655 | 3.323 | 3.712 | 4.493 |
|  | $\begin{gathered} \mathrm{T}^{\top}= \\ 0.148 \end{gathered}$ |  | 5 | 2.653 | 3.735 | 4.539 | 5.301 | 6.242 |
|  |  |  | 10 | 2.199 | 3.443 | 4.715 | 5.774 | 6.600 |
|  |  |  | 0 | 2.286 | 3.247 | 3.871 | 4.698 | 5.411 |
|  |  |  | 5 | 2.310 | 3.362 | 4.204 | 5.046 | 5.945 |
|  |  |  | 10 | 1.725 | 2.784 | 3.878 | 4.917 | 5.639 |
| $\begin{gathered} \beta_{1}= \\ 0.148 \end{gathered}$ |  |  | 0 | 1.192 | 1.427 | 1.562 | 1.758 | 1.851 |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 3.623 | 4.331 | 4.634 | 4.784 | 5.099 |
|  |  |  | 10 | 4.107 | 6.148 | 7.276 | 7.999 | 8.386 |
|  |  |  | 0 | 1.702 | 2.095 | 2.549 | 2.902 | 3.291 |
|  | $\begin{aligned} & \mathrm{\top}-\overline{7} \\ & 0.049 \end{aligned}$ |  | 5 | 3.100 | 3.996 | 4.877 | 5.539 | 6.182 |
|  |  |  | 10 | 2.742 | 4.364 | 5.732 | 6.772 | 7.680 |
|  |  |  | 0 | 1.996 | 2.690 | 3.257 | 3.708 | 4.335 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 5 | 2.622 | 3.614 | 4.455 | 5.424 | 6.130 |
|  |  |  | 10 | 2.182 | 3.429 | 4.740 | 5.594 | 6.907 |
|  |  |  | 0 | 2.395 | 3.160 | 3.940 | 4.731 | 5.447 |
|  | $0.444$ |  | 5 | 2.228 | 3.315 | 4.103 | 5.303 | 6.027 |
|  |  |  | 10 | 1.759 | 2.857 | 3.943 | 4.958 | 5.892 |
| $\begin{gathered} \beta_{1}= \\ 0.296 \end{gathered}$ |  | sə!̣pıs 6u!ss!w to ıəqunn | 0 | 1.207 | 1.353 | 1.604 | 1.836 | 1.941 |
|  | $\mathrm{T}^{2}=0$ |  | 5 | 3.518 | 4.188 | 4.448 | 4.786 | 4.948 |
|  |  |  | 10 | 3.883 | 5.907 | 7.115 | 7.760 | 8.250 |
|  |  |  | 0 | 1.713 | 2.115 | 2.560 | 2.940 | 3.310 |
|  | 0.049 |  | 5 | 2.970 | 3.986 | 4.741 | 5.452 | 5.968 |
|  |  |  | 10 | 2.723 | 4.382 | 5.586 | 6.659 | 7.487 |
|  |  |  | 0 | 2.070 | 2.723 | 3.197 | 3.839 | 4.289 |
|  |  |  | 5 | 2.547 | 3.619 | 4.535 | 5.369 | 6.203 |
|  |  |  | 10 | 2.206 | 3.429 | 4.531 | 5.621 | 6.761 |
|  |  |  | 0 | 2.340 | 3.214 | 3.889 | 4.685 | 5.571 |
|  | $0.444$ |  | 5 | 2.280 | 3.307 | 4.204 | 5.083 | 5.959 |
|  |  |  | 10 | 1.767 | 2.876 | 3.823 | 4.972 | 5.864 |

Table E34. Mean number of imputed studies, with L studies imputed (from 2-dimensional algorithmic variant) (continued)

| L Missing Studies Imputed |  |  |  | Number of Studies |  |  |  |  |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  |  |  | 25 | 35 | 45 | 55 | 65 |
| $\begin{gathered} \beta_{1}= \\ 0.444 \end{gathered}$ | $\mathrm{T}^{\mathbf{2}}=0$ |  | 0 | 1.227 | 1.449 | 1.593 | 1.757 | 1.863 |
|  |  |  | 5 | 3.425 | 4.109 | 4.464 | 4.742 | 4.916 |
|  |  |  | 10 | 3.661 | 5.514 | 6.534 | 7.303 | 7.950 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.049 \end{gathered}$ |  | 0 | 1.687 | 2.167 | 2.563 | 2.829 | 3.231 |
|  |  |  | 5 | 2.952 | 3.849 | 4.847 | 5.223 | 6.039 |
|  |  |  | 10 | 2.665 | 4.238 | 5.398 | 6.477 | 7.352 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.148 \end{gathered}$ |  | 0 | 2.070 | 2.660 | 3.291 | 3.806 | 4.419 |
|  |  |  | 5 | 2.598 | 3.597 | 4.575 | 5.426 | 6.251 |
|  |  |  | 10 | 2.215 | 3.446 | 4.570 | 5.664 | 6.377 |
|  | $\begin{gathered} \mathrm{T}^{2}= \\ 0.444 \end{gathered}$ |  | 0 | 2.279 | 3.090 | 4.170 | 5.047 | 5.466 |
|  |  |  | 5 | 2.233 | 3.302 | 4.225 | 4.889 | 6.069 |
|  |  |  | 10 | 1.813 | 2.957 | 3.957 | 4.919 | 5.947 |

