

Bias and Estimation under Misspecification of the Risk Period in Self-Controlled Case Series Studies

**Supplemental Materials: Patterns of Bias for Models with Two Age
Groups**

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Additional simulation results

We provide results from additional simulations for the characterization of the bias of the relative incidence, $R^* = \exp(\beta^*)$, under different exposure models with no age effects. We also provide the characterization of the bias of the age effect, $\exp(\alpha^*)$.

Figures 1-3, 4-6 and 8-9 show the theoretical characterization of the bias of the relative incidence for the single Uniformly distributed exposure model and true risk length $\tau = 15, 30$ and 45 respectively.

Figures 10-12, 13-15 and 16-18 show the theoretical characterization of the bias of the relative incidence for the multiple Uniformly distributed exposures model and true risk length $\tau = 15, 30$ and 45 respectively.

Figures 19-21, 22-24 and 25-27 show the theoretical characterization of the bias of the relative incidence for the single Normally distributed exposure model and true risk length $\tau = 15, 30$ and 45 respectively.

Figures 28-30, 31-33 and 34-36 show the theoretical characterization of the bias of the relative incidence for the multiple Normally distributed exposures model and true risk length $\tau = 15, 30$ and 45 respectively.

Figures 37-39, 40-42 and 43-45 show the theoretical characterization of the bias of the age effect, $\exp(\alpha^*)$, for the single Uniformly distributed exposure model and true risk length $\tau = 15, 30$ and 45 respectively.

Figures 46-48, 49-51 and 52-54 show the theoretical characterization of the bias of the age effect, $\exp(\alpha^*)$, for the multiple Uniformly distributed exposures model and true risk length $\tau = 15, 30$ and 45 respectively.

Figures 55-57, 58-60 and 61-63 show the theoretical characterization of the bias of the age effect, $\exp(\alpha^*)$, for the single Normally distributed exposure model and true risk length $\tau = 15, 30$ and 45 respectively.

Figures 64-66, 67-69 and 70-72 show the theoretical characterization of the bias of the age effect, $\exp(\alpha^*)$, for the multiple Normally distributed exposures model and true risk length $\tau = 15, 30$ and 45 respectively.

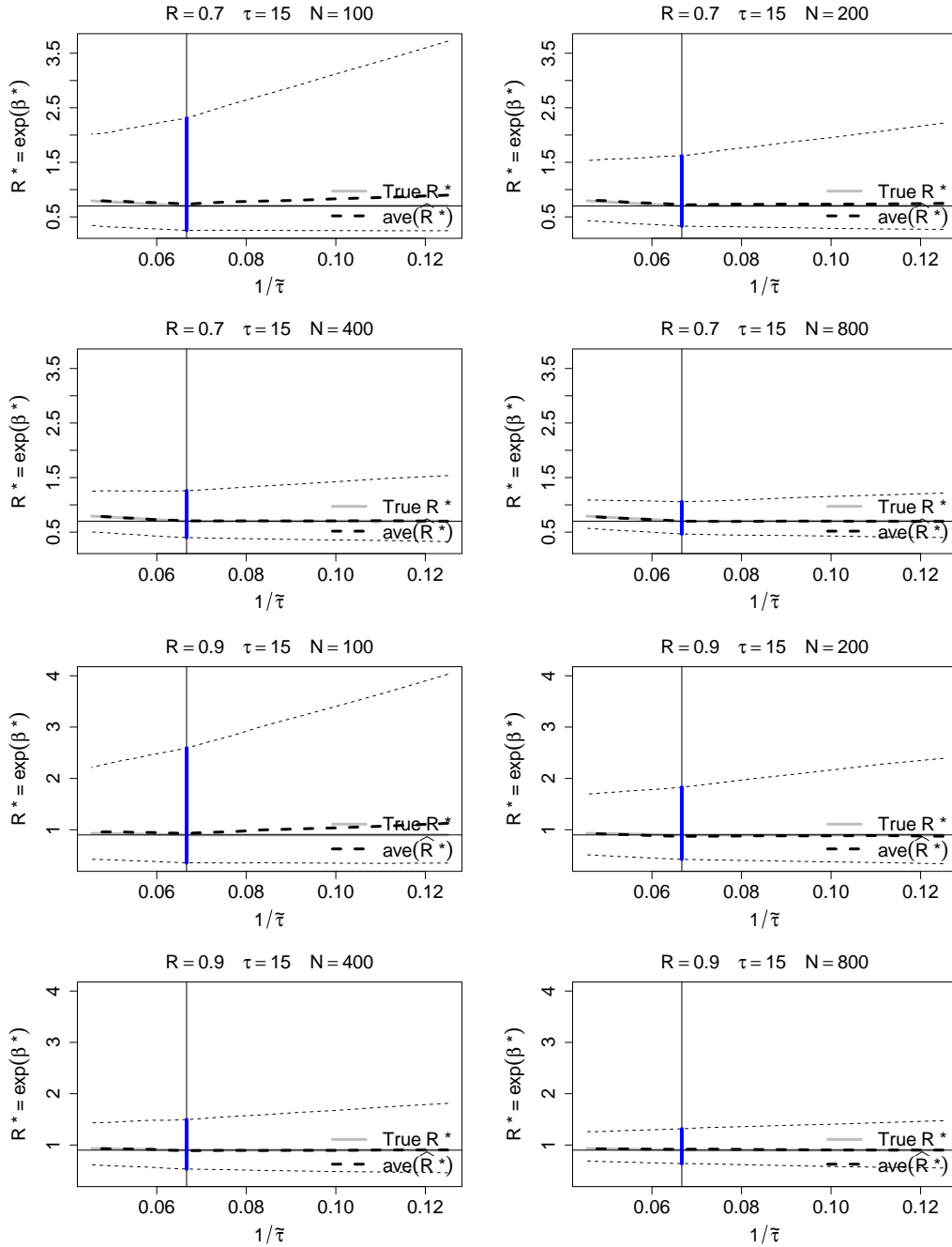


Figure 1: **Single Uniformly distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\hat{R}^*)$) over 200 simulated datasets. The true risk length is $\tau = 15$; $R = 0.7$ and 0.9 displayed in the top and bottom panels, respectively.

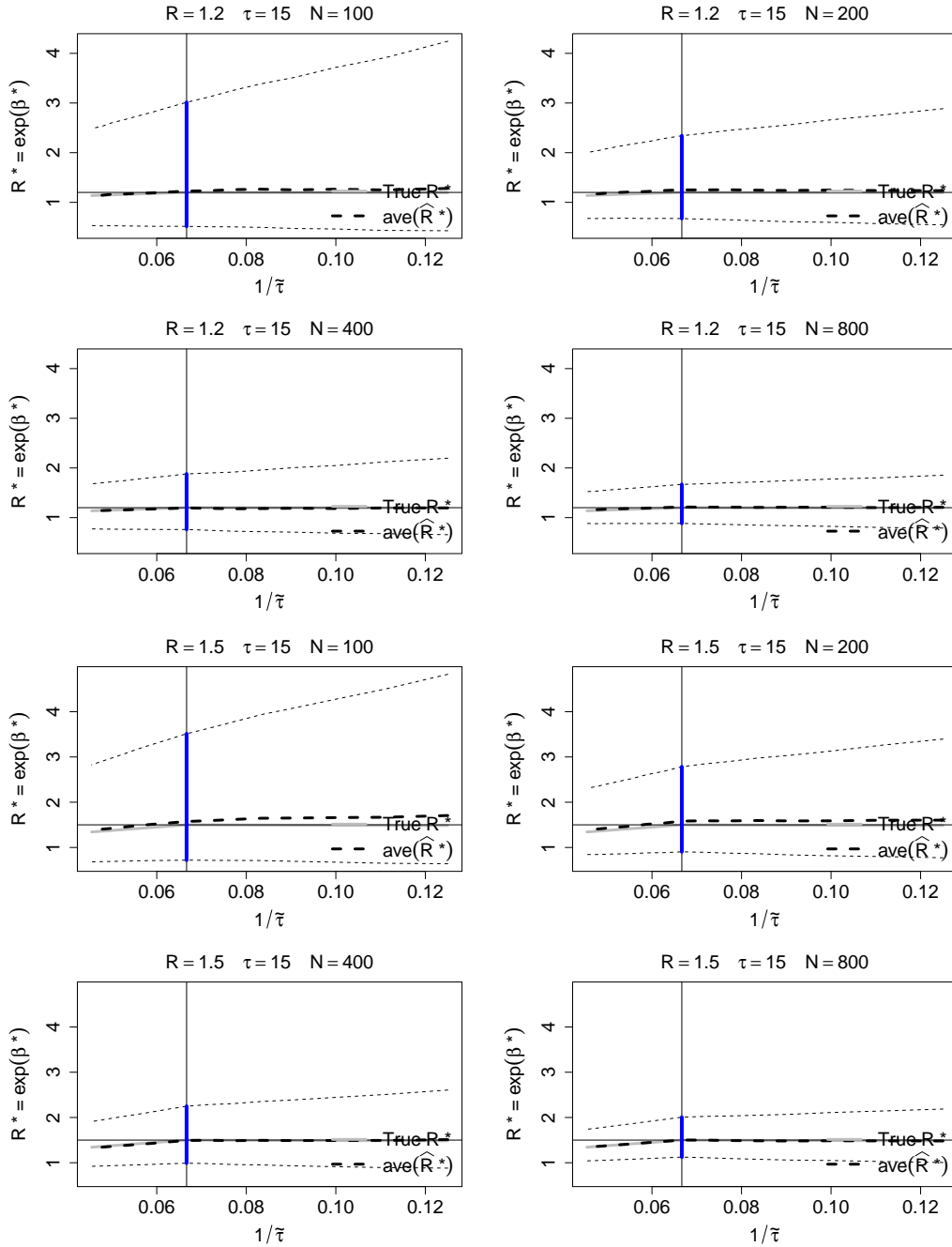


Figure 2: **Single Uniformly distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\hat{R}^*)$) over 200 simulated datasets. The true risk length is $\tau = 15$. $R = 1.2$ and 1.5 displayed in the top and bottom panels, respectively.

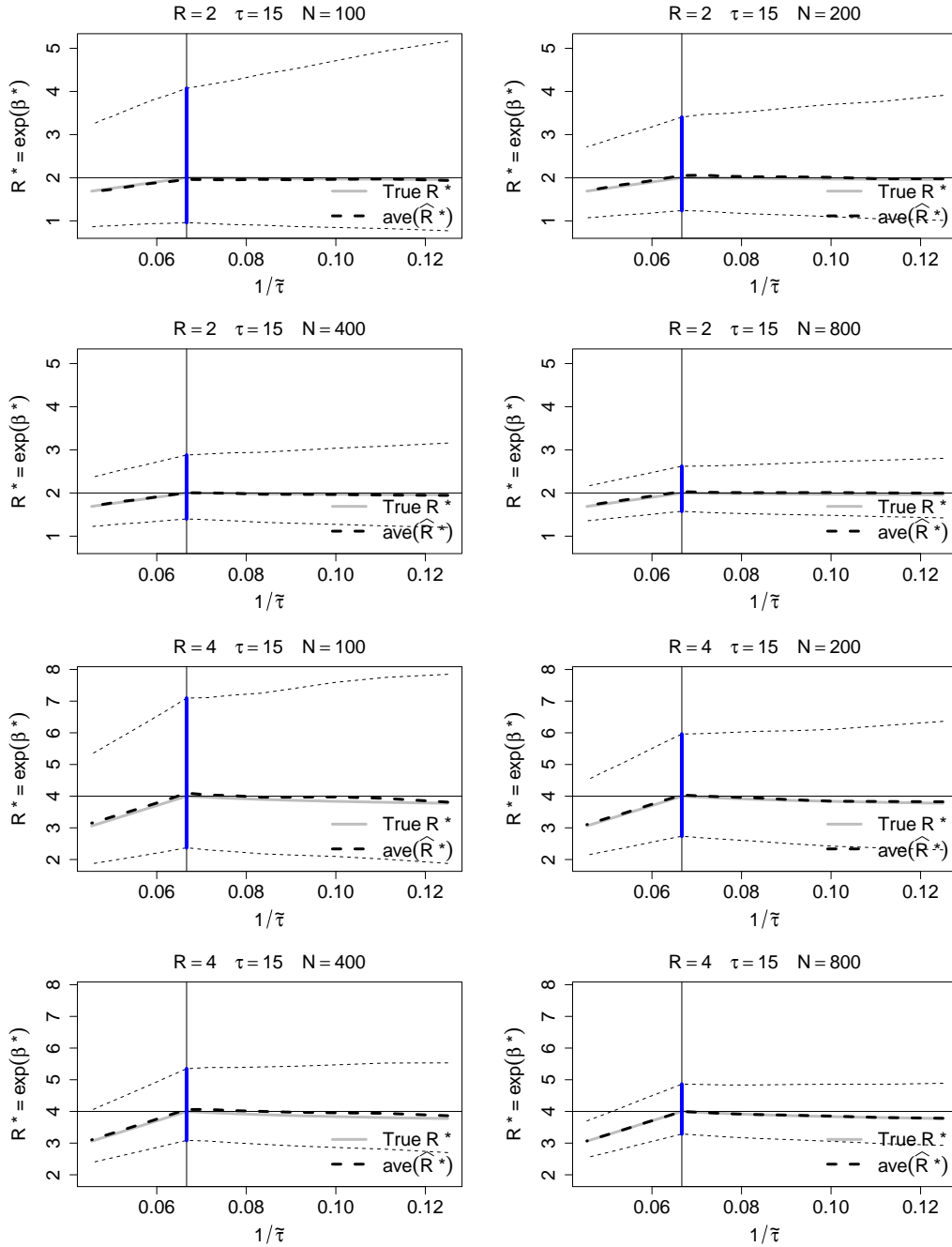


Figure 3: **Single Uniformly distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\hat{R}^*)$) over 200 simulated datasets. The true risk length is $\tau = 15$. $R = 2$ and 4 displayed in the top and bottom panels, respectively.

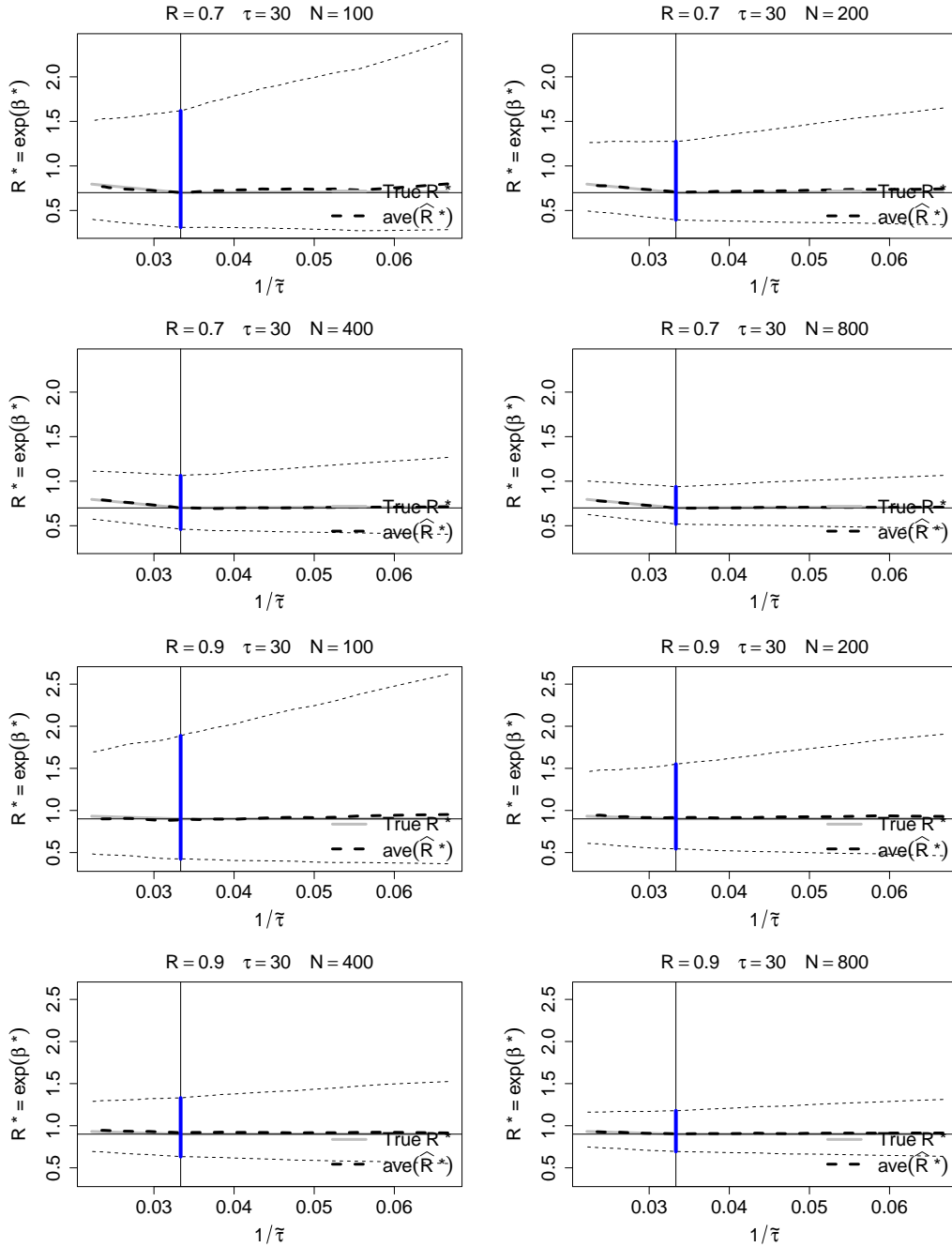


Figure 4: **Single Uniformly distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\hat{R}^*)$) over 200 simulated datasets. The true risk length is $\tau = 30$; $R = 0.7$ and 0.9 displayed in the top and bottom panels, respectively.

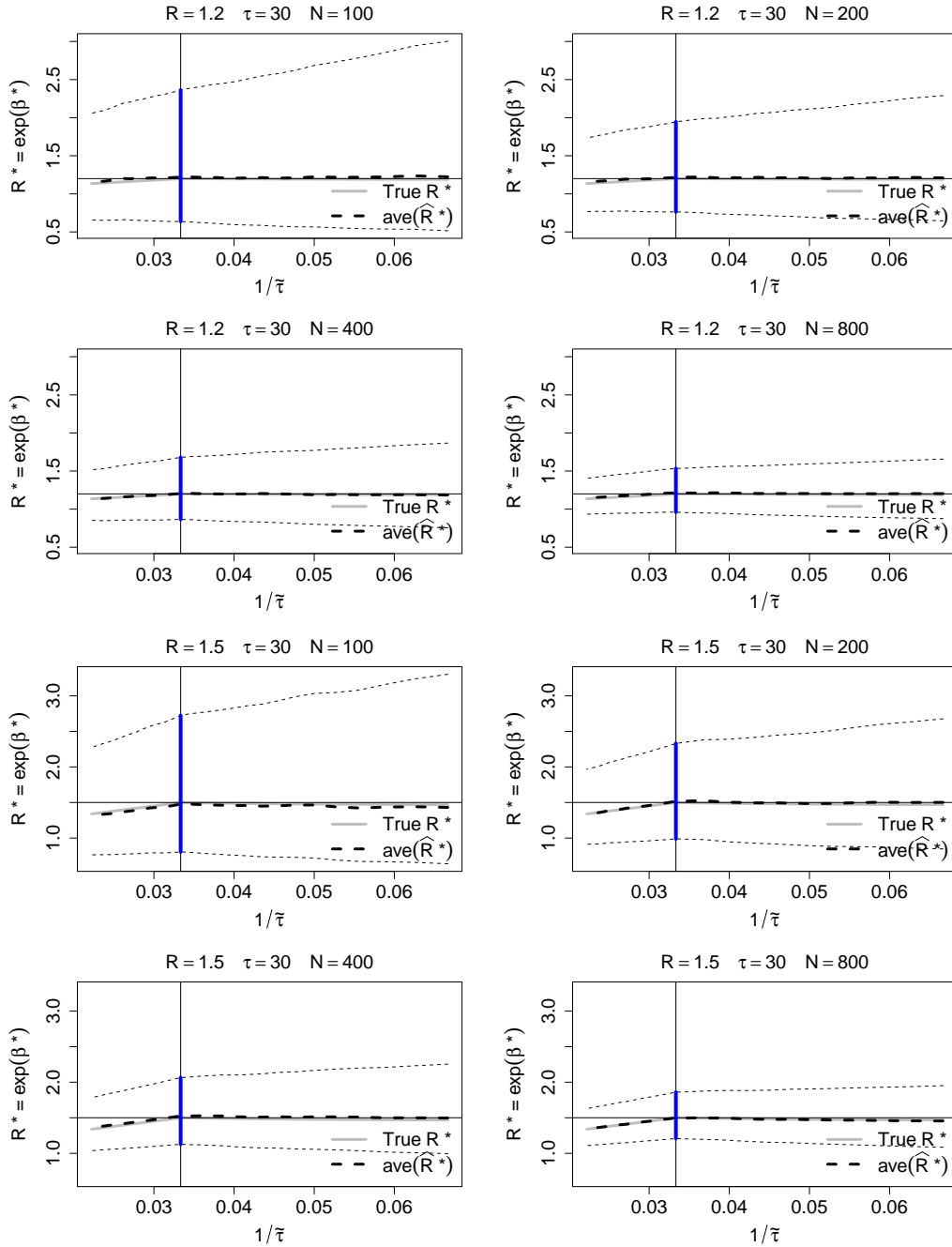


Figure 5: **Single Uniformly distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\hat{R}^*)$) over 200 simulated datasets. The true risk length is $\tau = 30$. $R = 1.2$ and 1.5 displayed in the top and bottom panels, respectively.

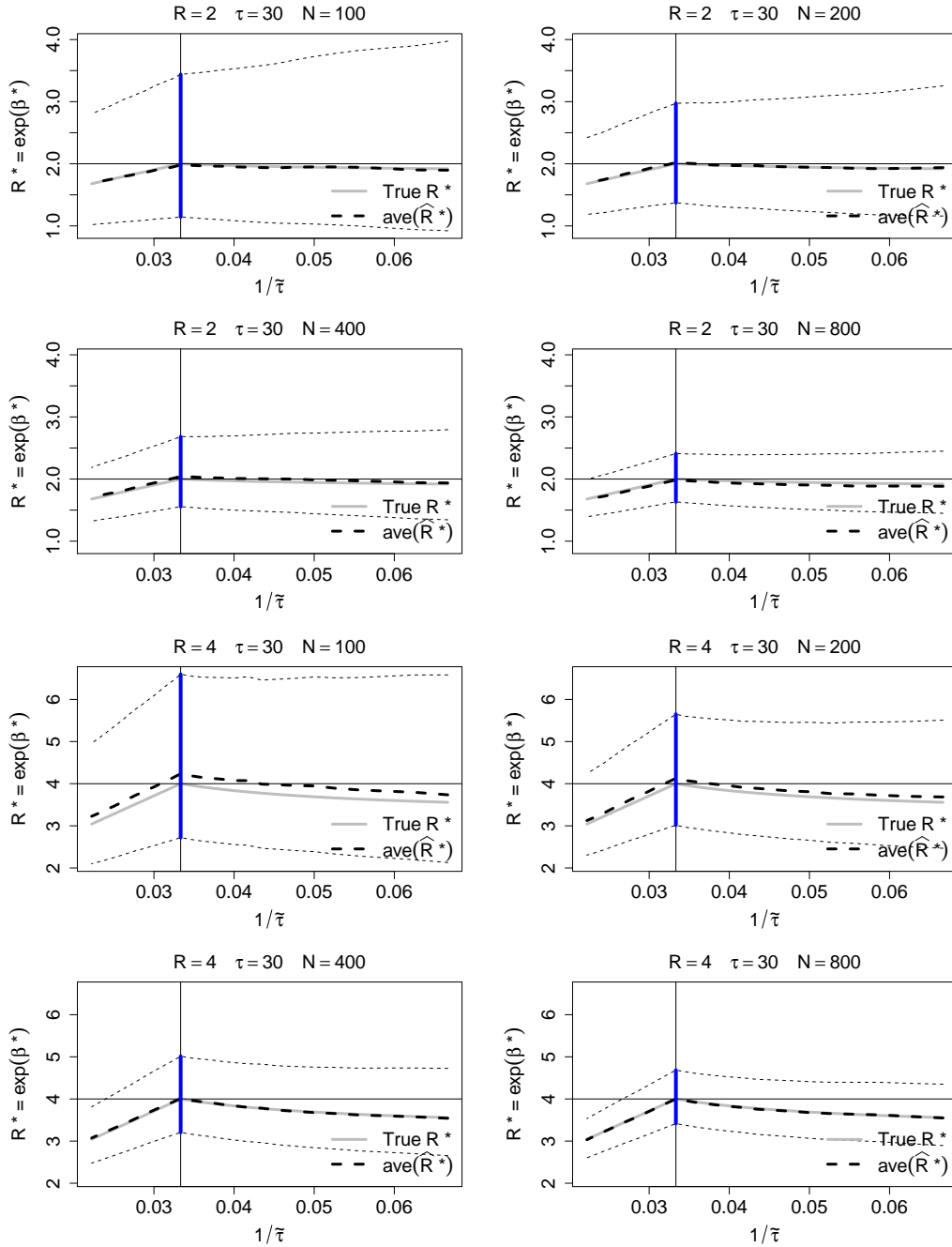


Figure 6: **Single Uniformly distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\hat{R}^*)$) over 200 simulated datasets. The true risk length is $\tau = 30$. $R = 2$ and 4 displayed in the top and bottom panels, respectively.

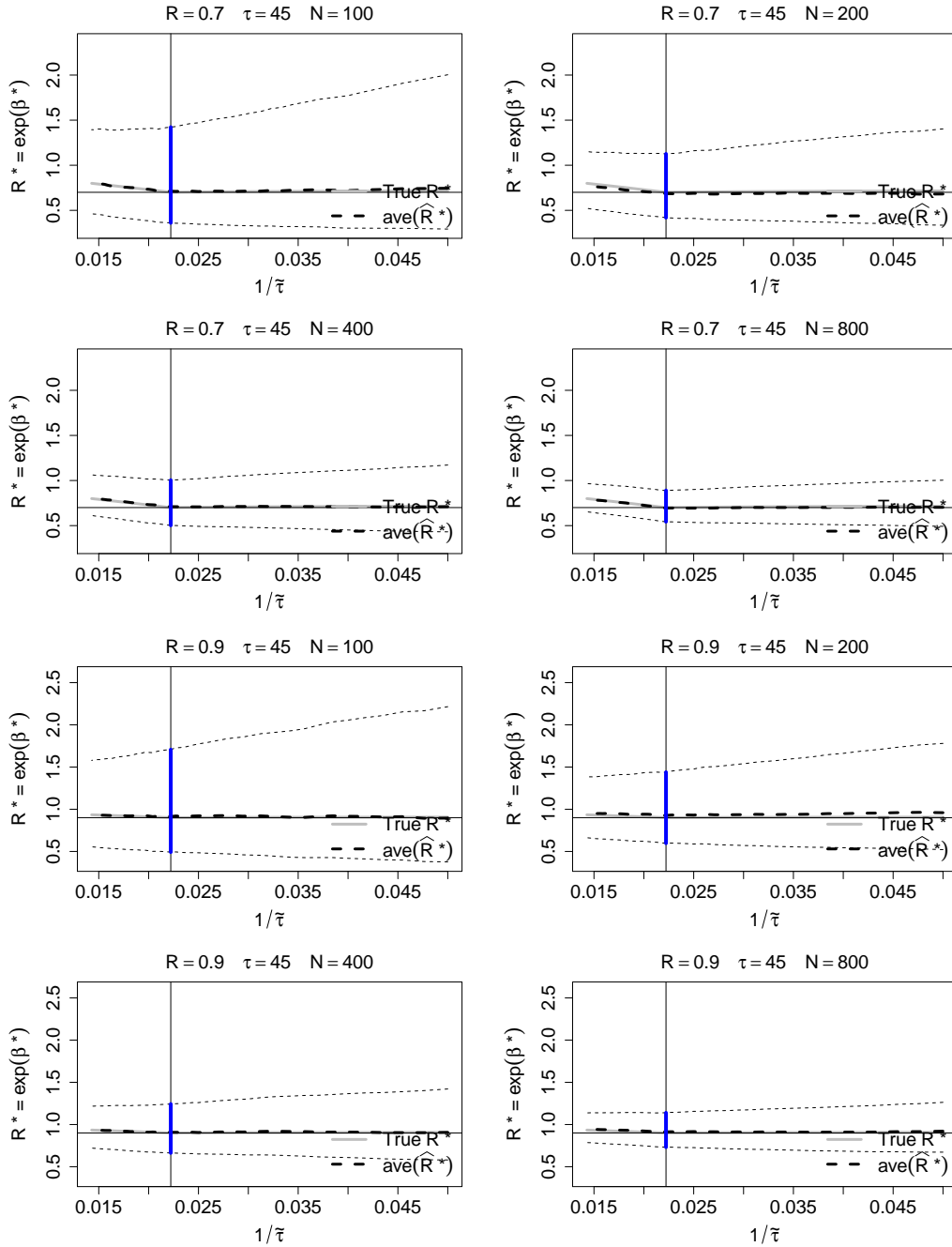


Figure 7: **Single Uniformly distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\hat{R}^*)$) over 200 simulated datasets. The true risk length is $\tau = 45$; $R = 0.7$ and 0.9 displayed in the top and bottom panels, respectively.

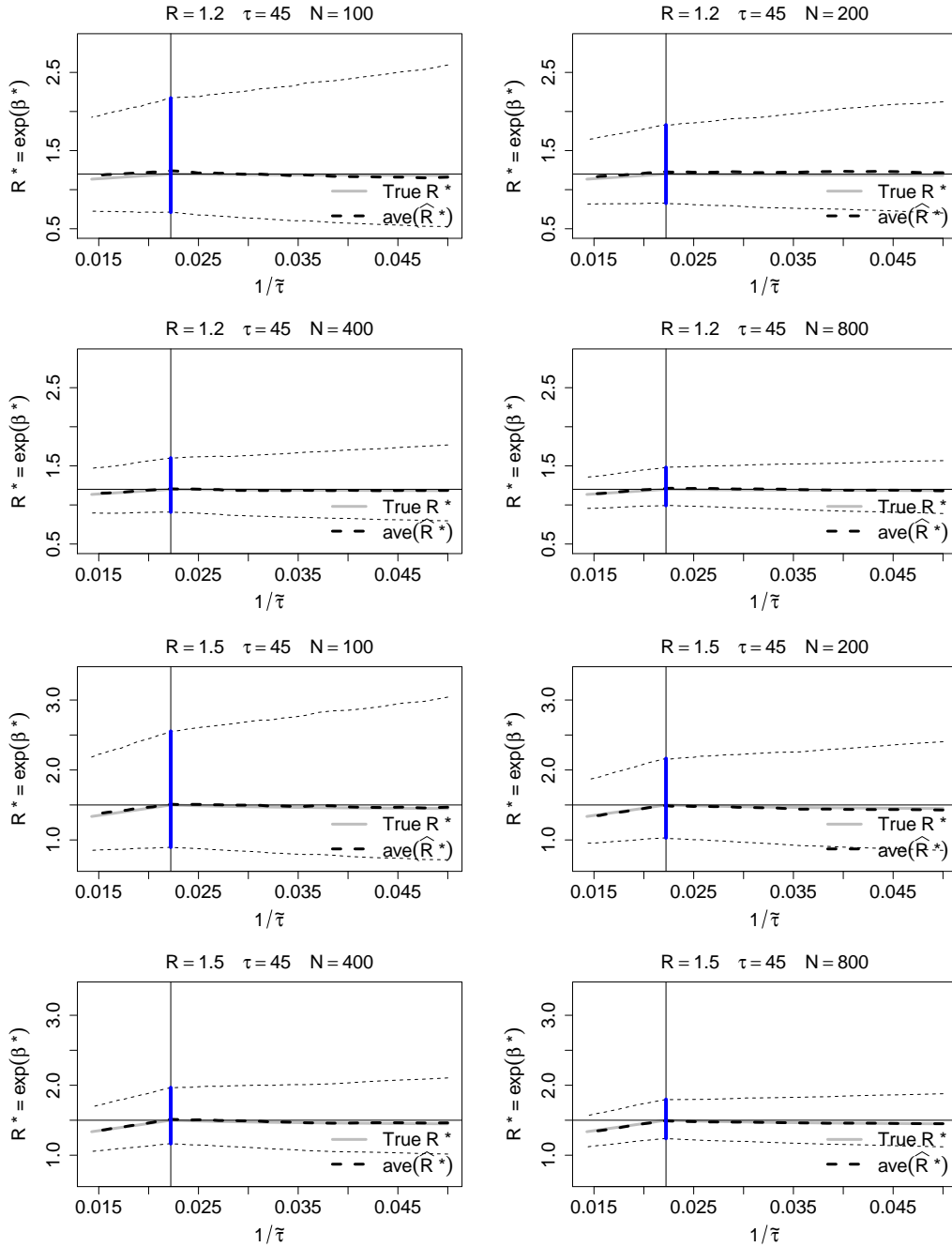


Figure 8: **Single Uniformly distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages (ave(\hat{R}^*)) over 200 simulated datasets. The true risk length is $\tau = 45$. $R = 1.2$ and 1.5 displayed in the top and bottom panels, respectively.

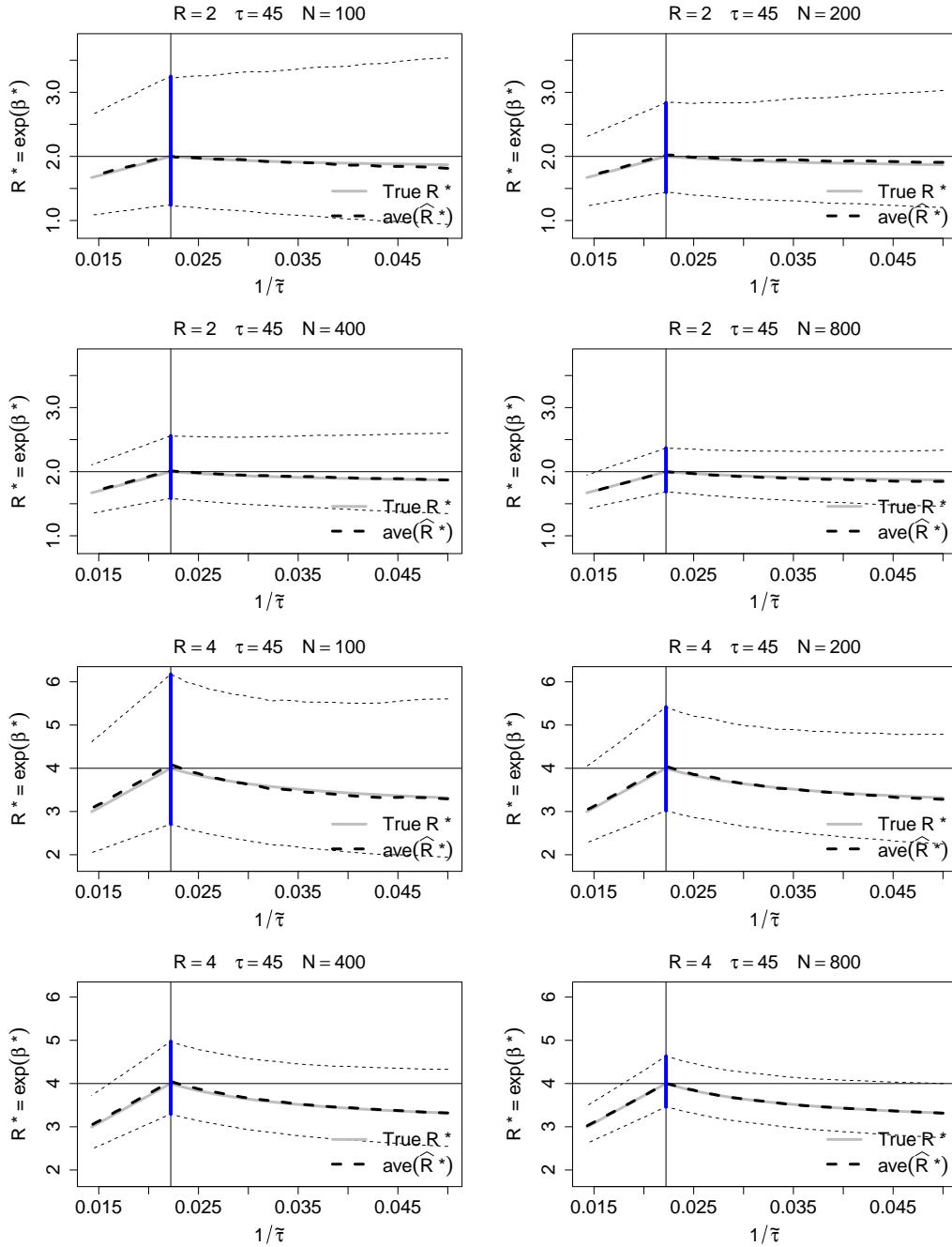


Figure 9: **Single Uniformly distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages (ave(\hat{R}^*)) over 200 simulated datasets. The true risk length is $\tau = 45$. $R = 2$ and 4 displayed in the top and bottom panels, respectively.

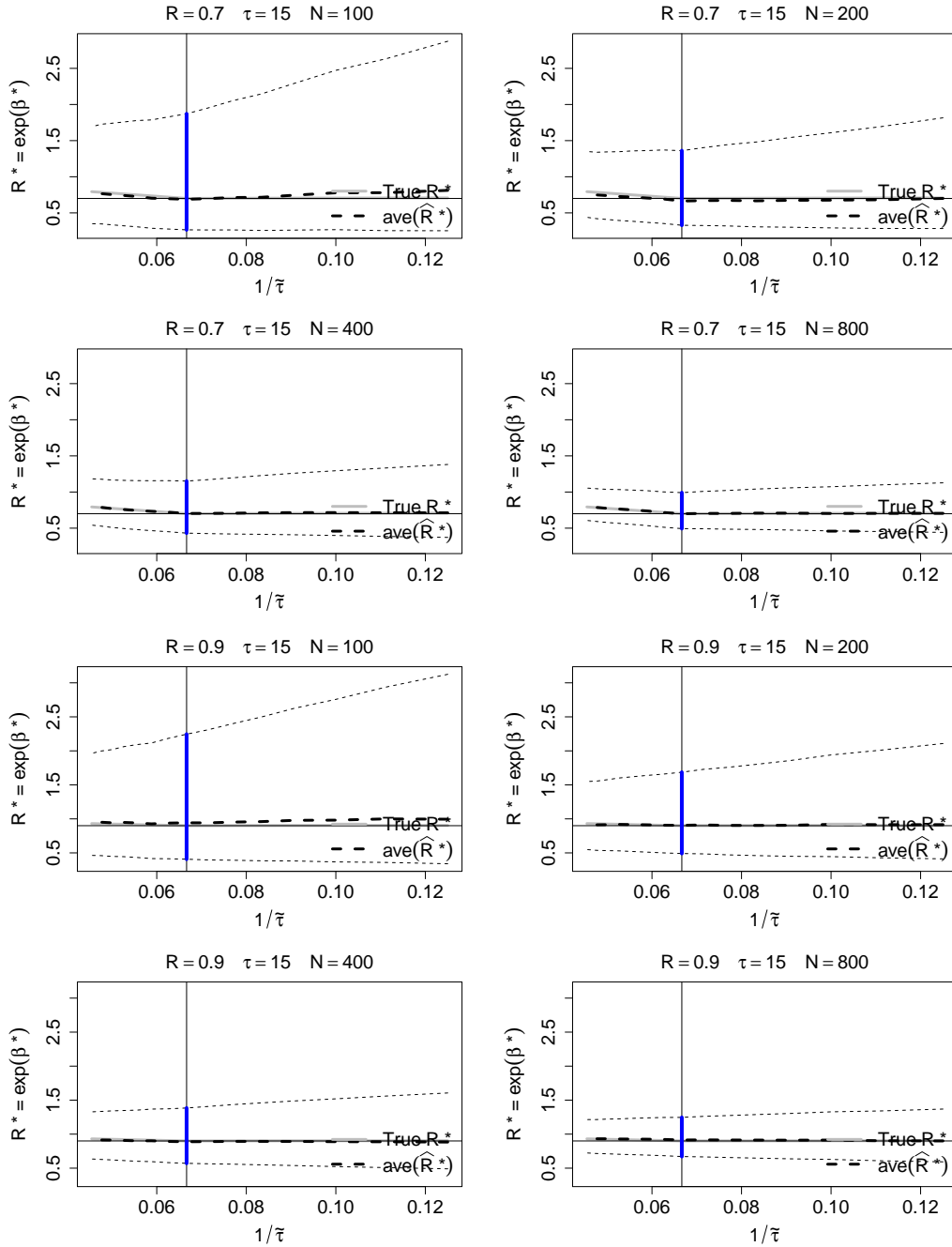


Figure 10: **Multiple Uniformly distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\hat{R}^*)$) over 200 simulated datasets. The true risk length is $\tau = 15$; $R = 0.7$ and 0.9 displayed in the top and bottom panels, respectively.

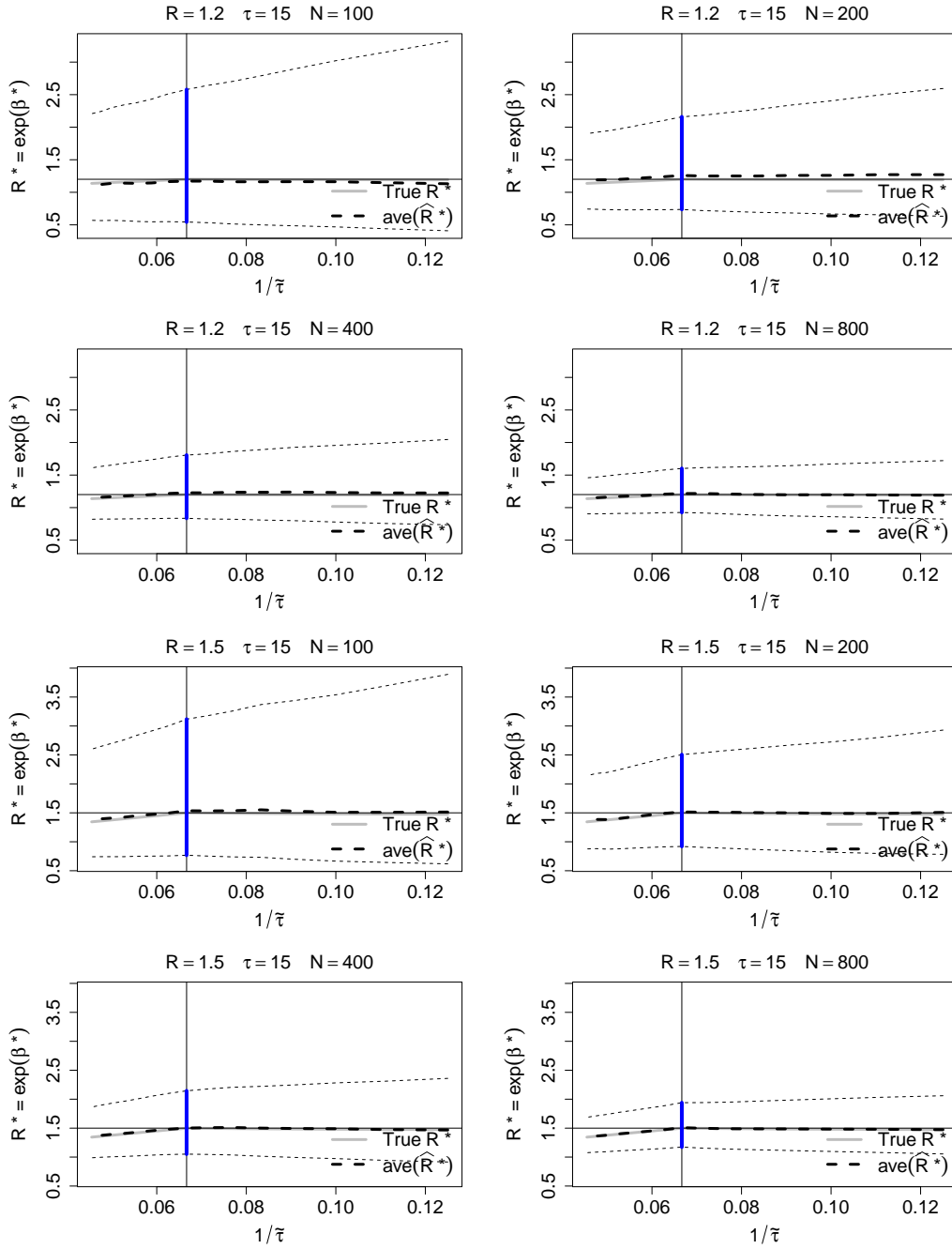


Figure 11: **Multiple Uniformly distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\hat{R}^*)$) over 200 simulated datasets. The true risk length is $\tau = 15$. $R = 1.2$ and 1.5 displayed in the top and bottom panels, respectively.

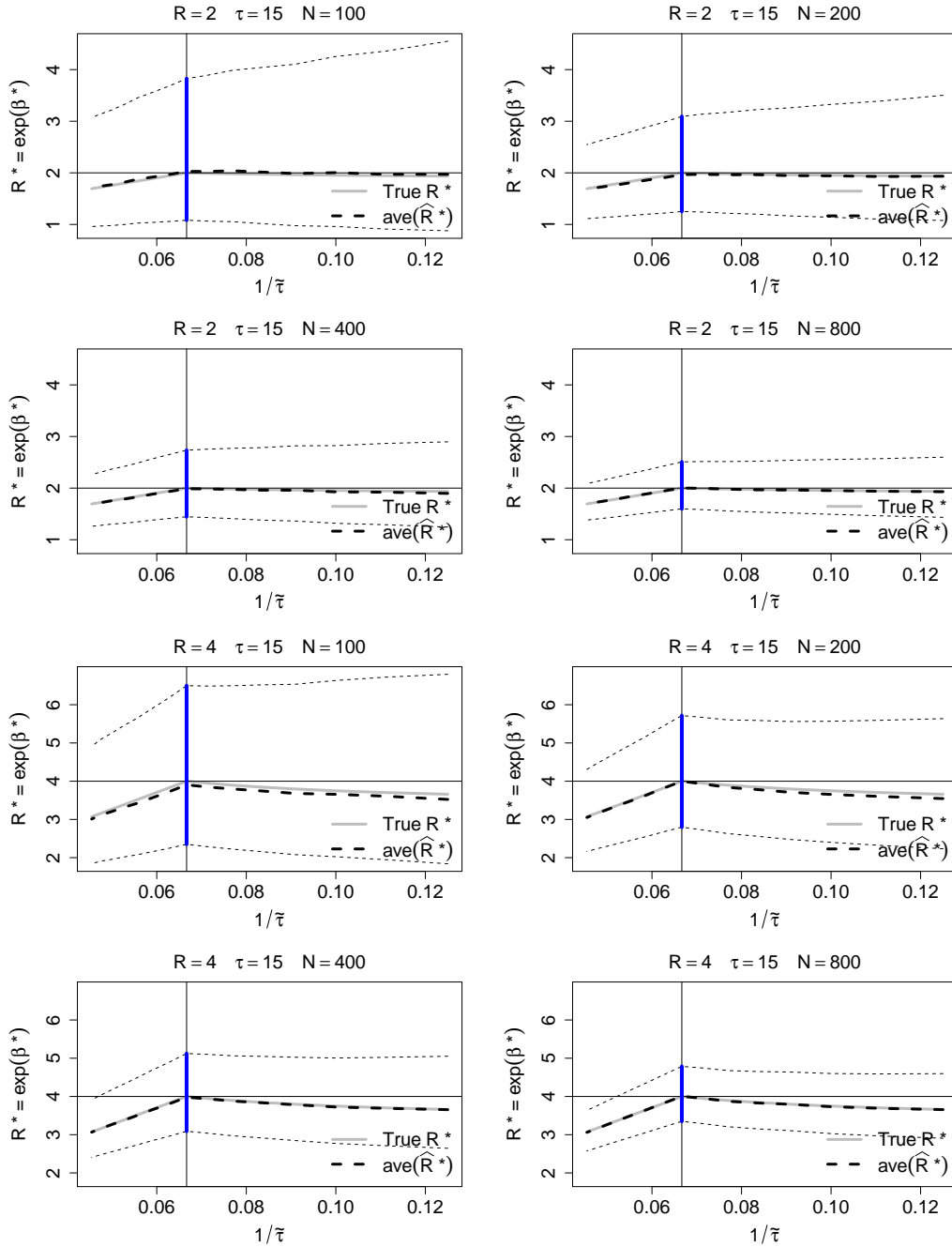


Figure 12: **Multiple Uniformly distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\hat{R}^*)$) over 200 simulated datasets. The true risk length is $\tau = 15$. $R = 2$ and 4 displayed in the top and bottom panels, respectively.

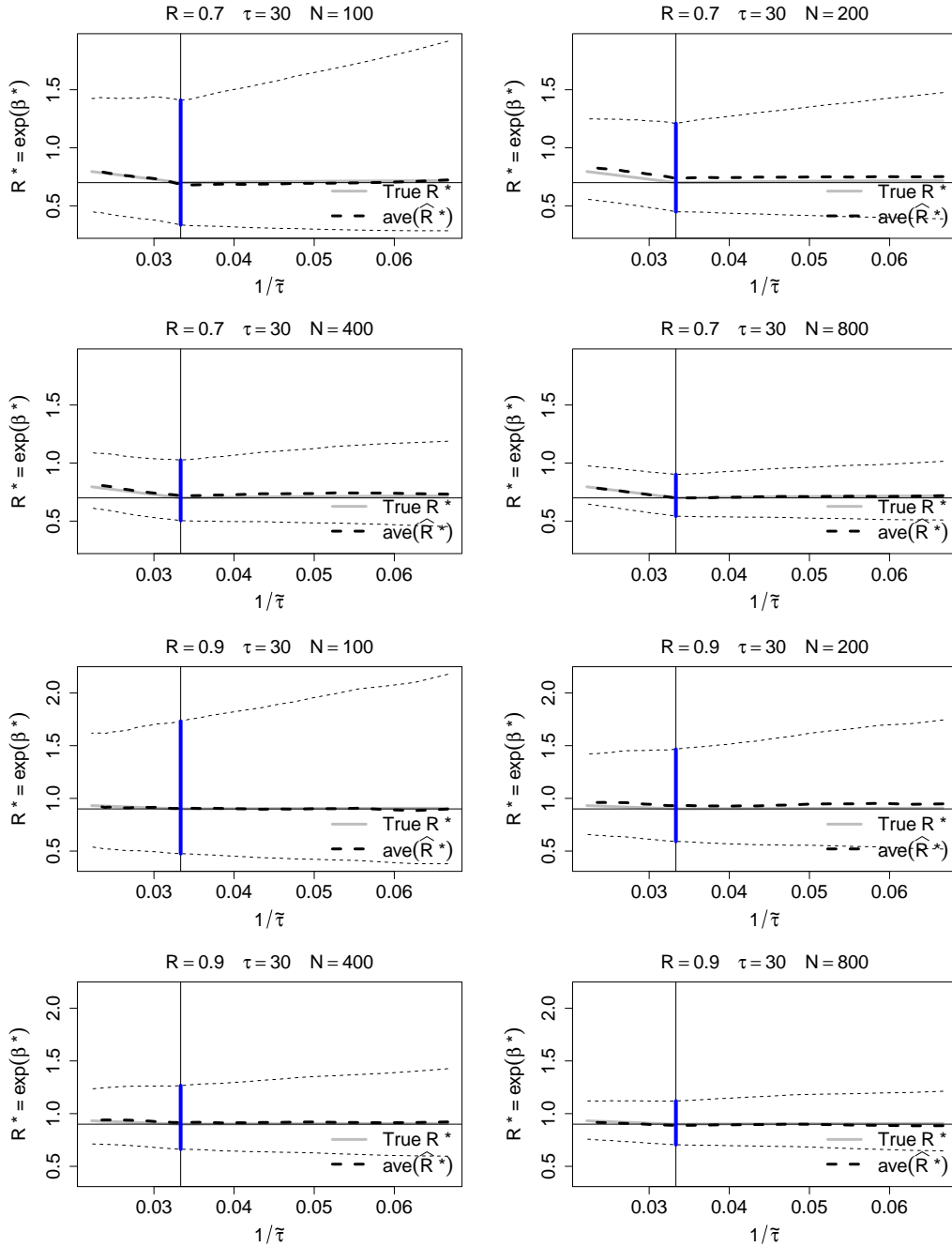


Figure 13: **Multiple Uniformly distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\hat{R}^*)$) over 200 simulated datasets. The true risk length is $\tau = 30$; $R = 0.7$ and 0.9 displayed in the top and bottom panels, respectively.

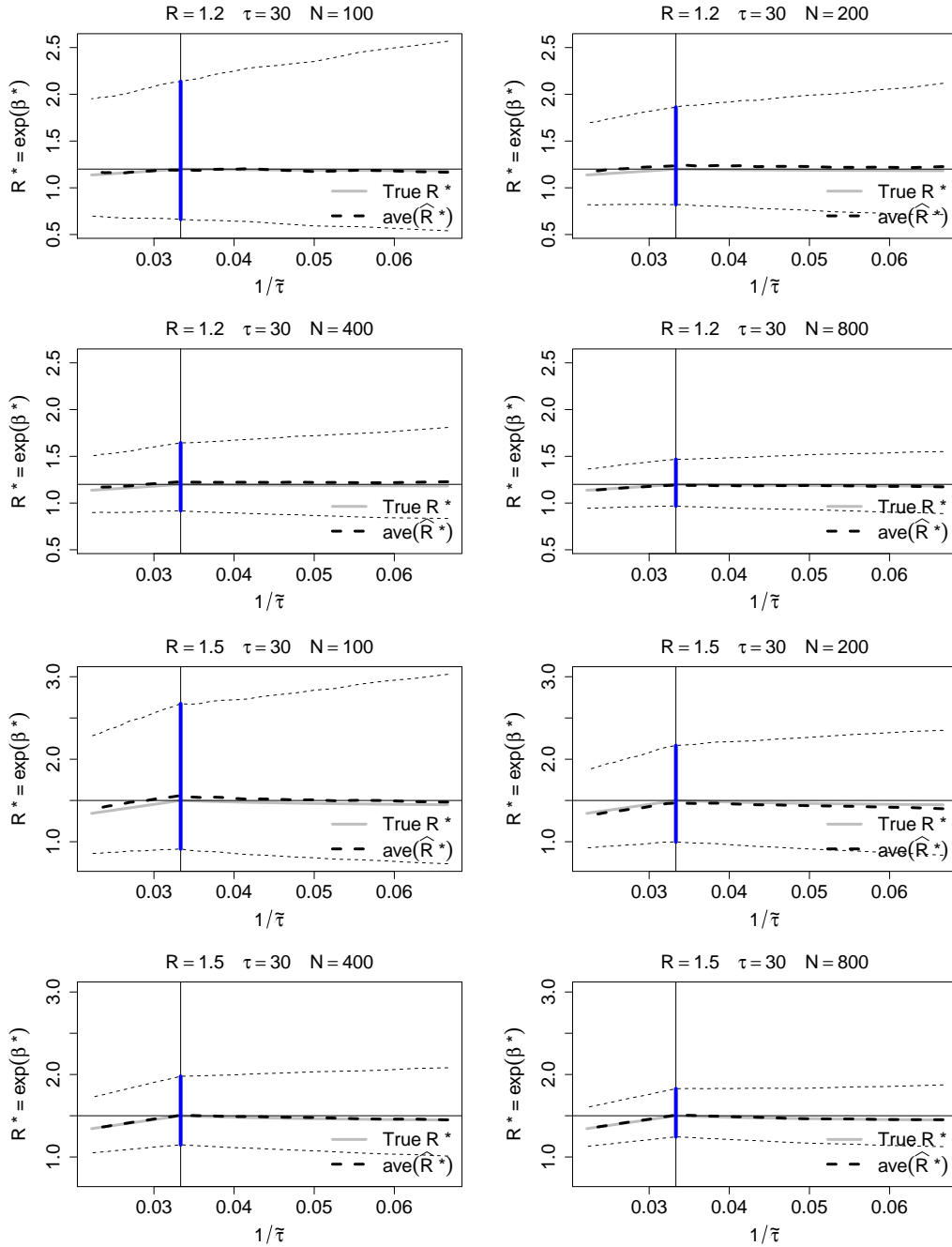


Figure 14: **Multiple Uniformly distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\hat{R}^*)$) over 200 simulated datasets. The true risk length is $\tau = 30$. $R = 1.2$ and 1.5 displayed in the top and bottom panels, respectively.

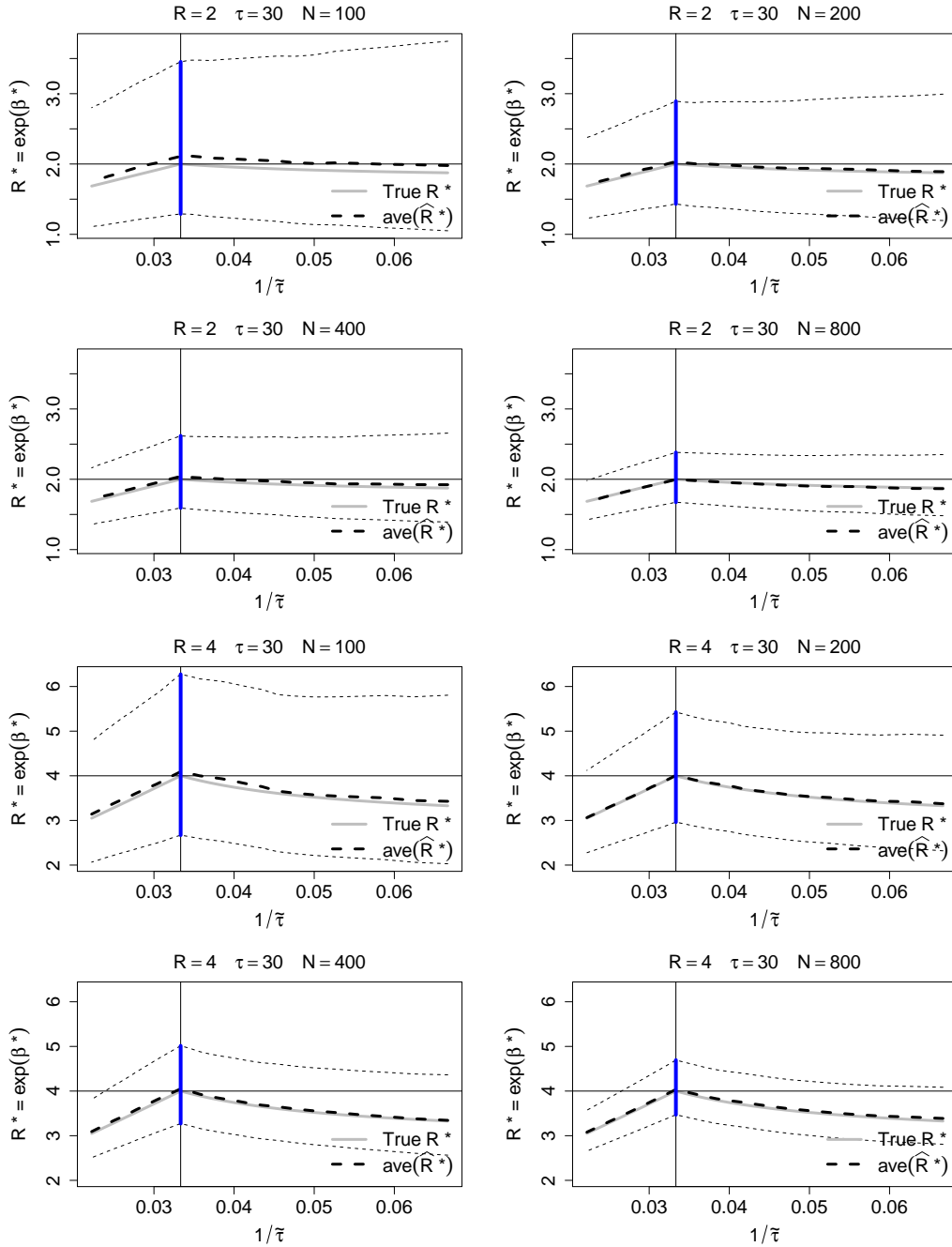


Figure 15: **Multiple Uniformly distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\hat{R}^*)$) over 200 simulated datasets. The true risk length is $\tau = 30$. $R = 2$ and 4 displayed in the top and bottom panels, respectively.

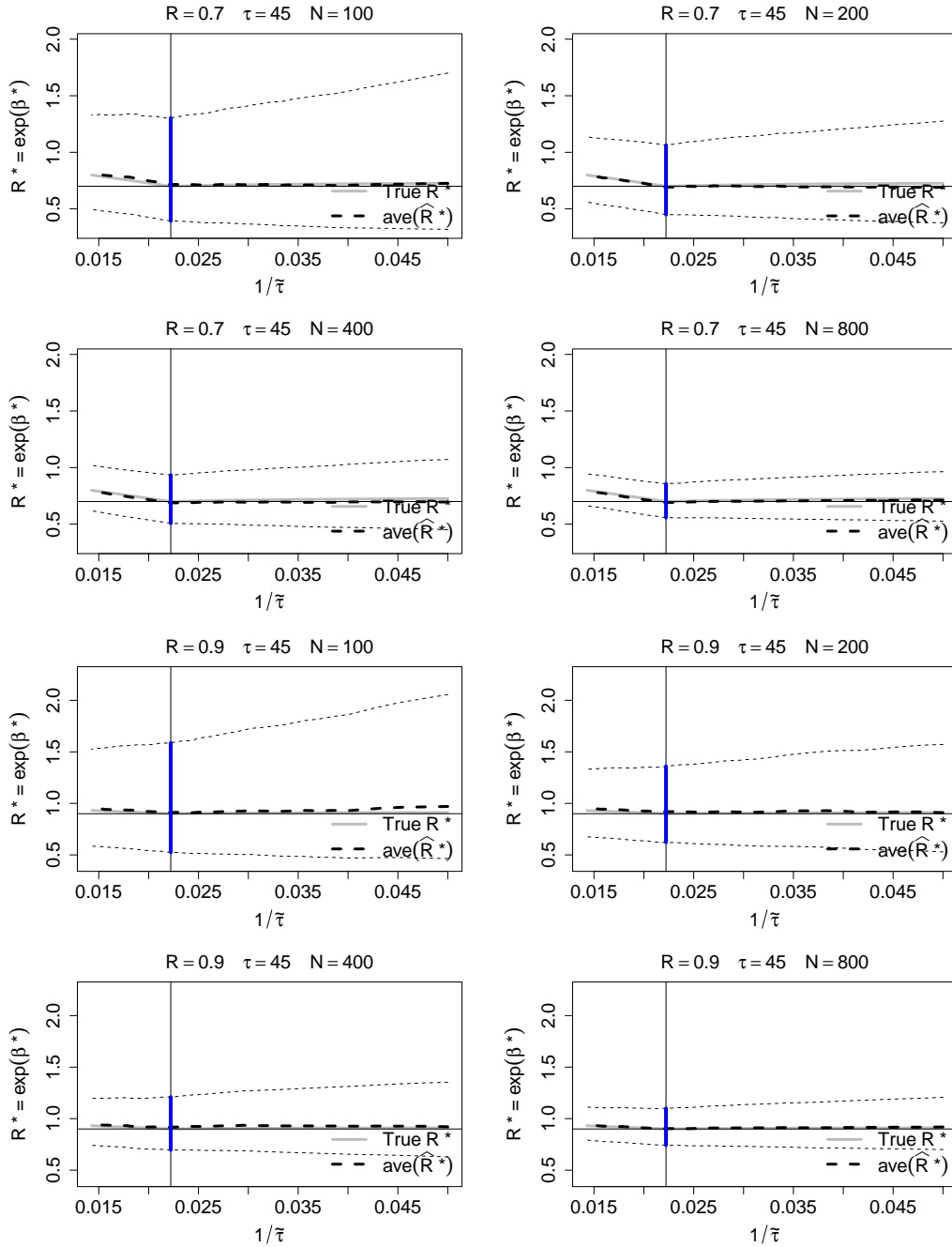


Figure 16: **Multiple Uniformly distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\hat{R}^*)$) over 200 simulated datasets. The true risk length is $\tau = 45$; $R = 0.7$ and 0.9 displayed in the top and bottom panels, respectively.

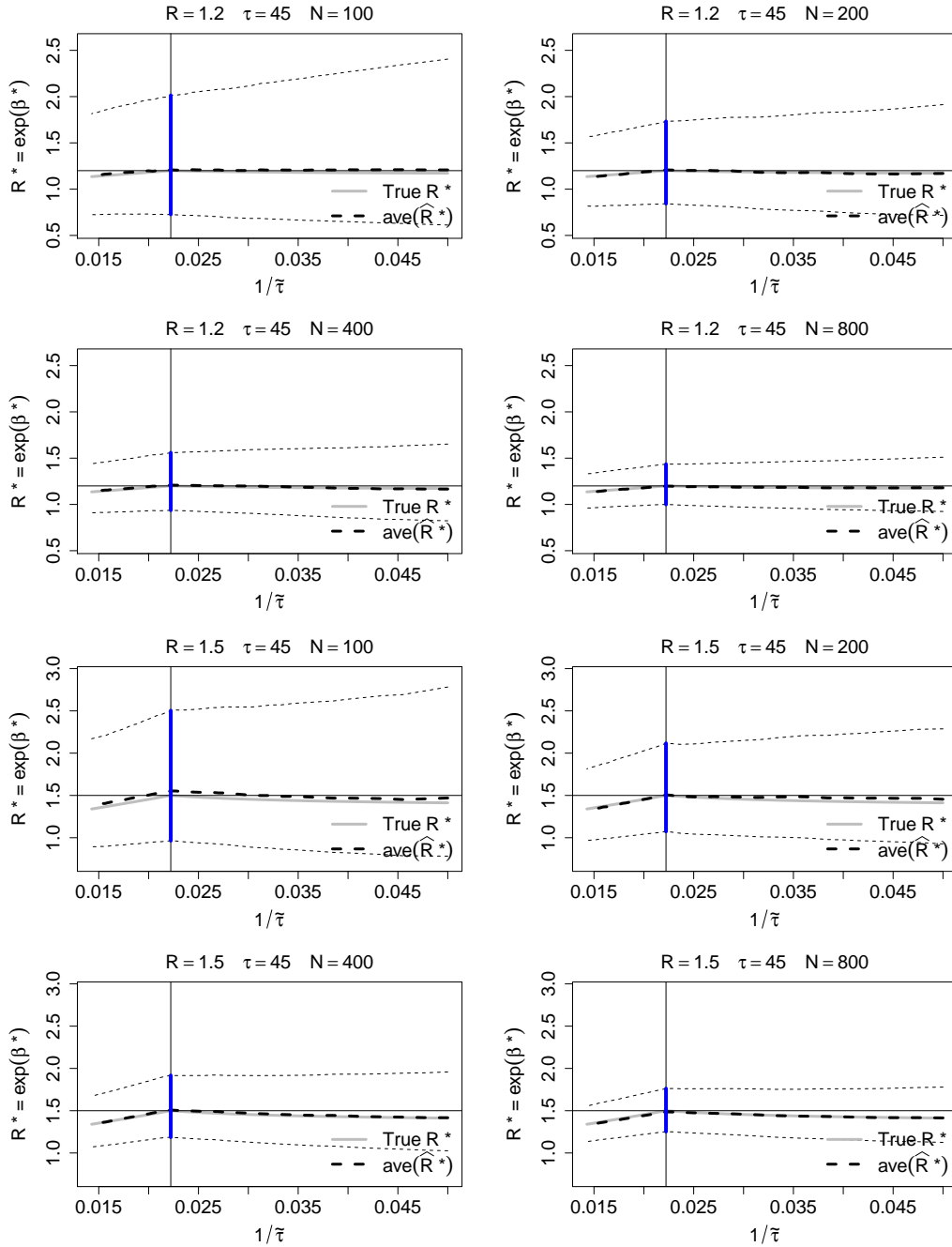


Figure 17: **Multiple Uniformly distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\hat{R}^*)$) over 200 simulated datasets. The true risk length is $\tau = 45$. $R = 1.2$ and 1.5 displayed in the top and bottom panels, respectively.

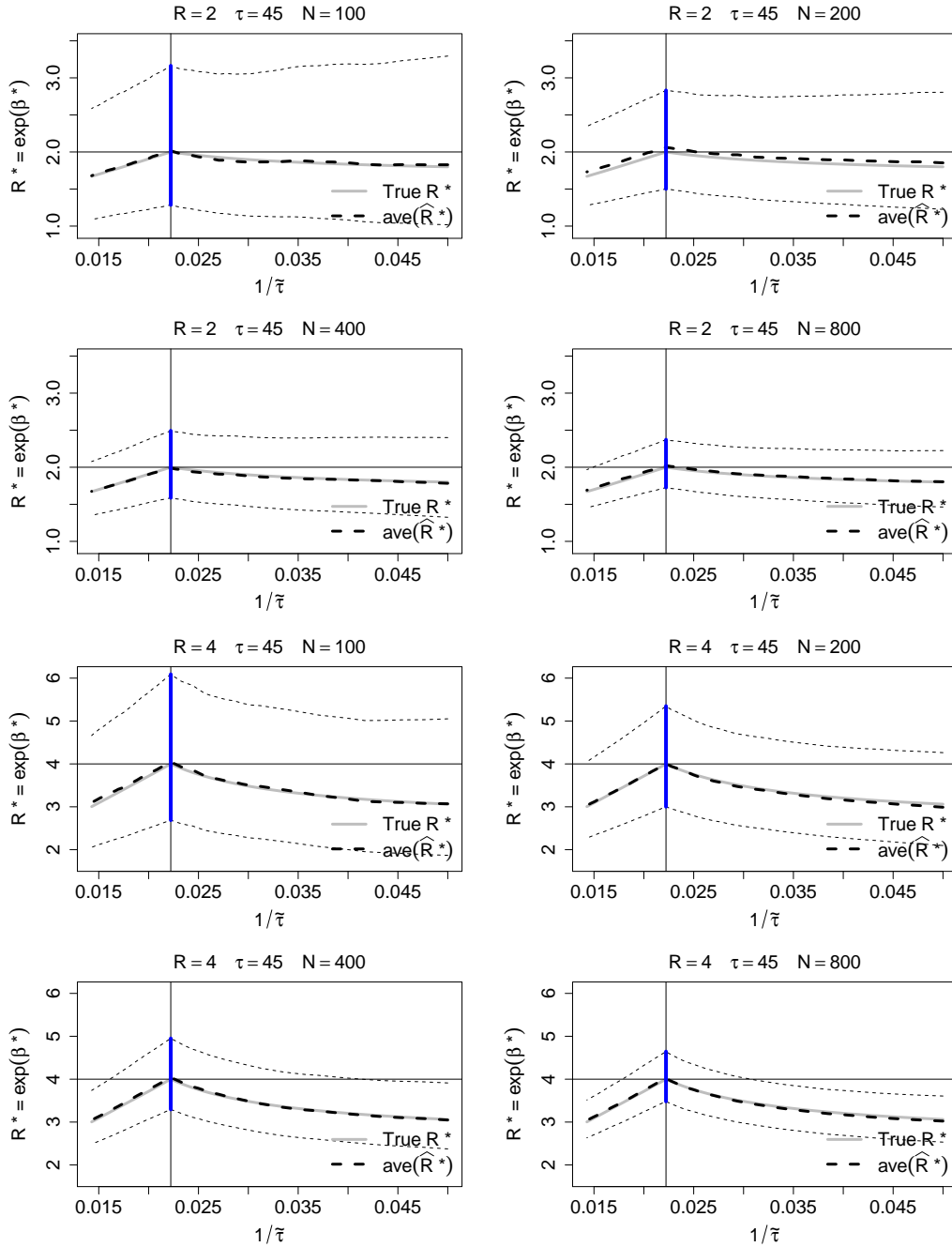


Figure 18: **Multiple Uniformly distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\hat{R}^*)$) over 200 simulated datasets. The true risk length is $\tau = 45$. $R = 2$ and 4 displayed in the top and bottom panels, respectively.

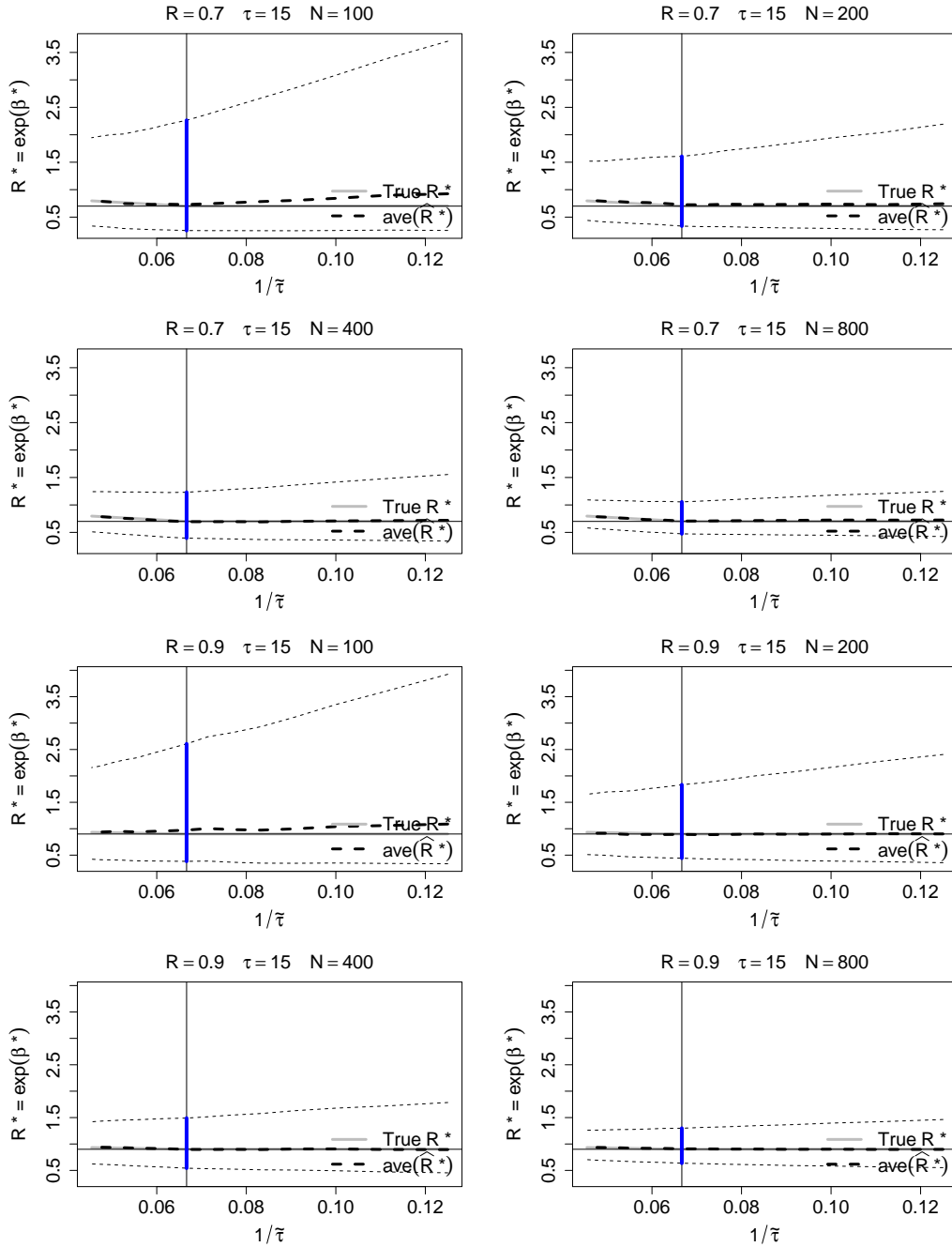


Figure 19: **Single Normally distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\hat{R}^*)$) over 200 simulated datasets. The true risk length is $\tau = 15$; $R = 0.7$ and 0.9 displayed in the top and bottom panels, respectively.

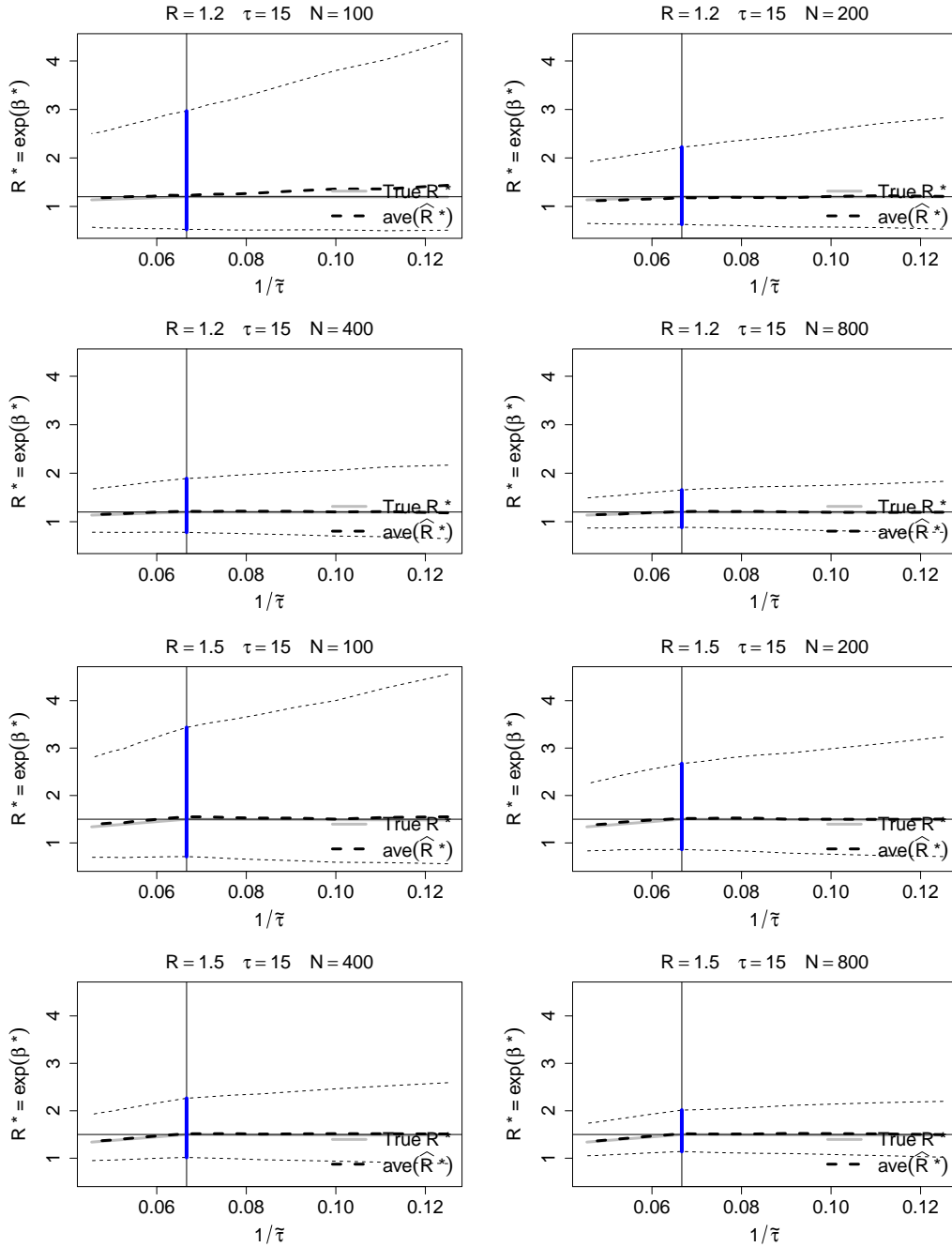


Figure 20: **Single Normally distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\hat{R}^*)$) over 200 simulated datasets. The true risk length is $\tau = 15$. $R = 1.2$ and 1.5 displayed in the top and bottom panels, respectively.

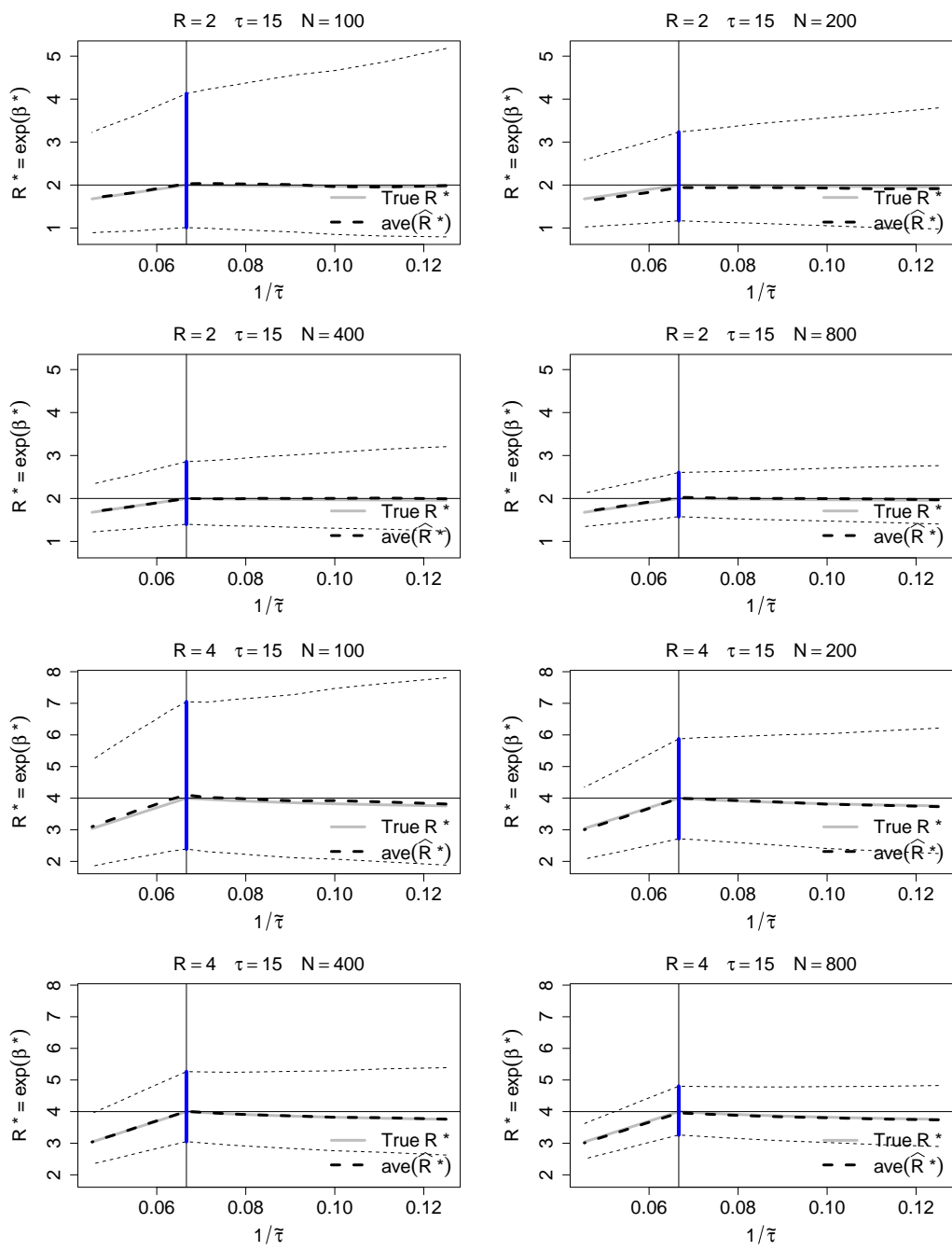


Figure 21: **Single Normally distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages (ave(\hat{R}^*)) over 200 simulated datasets. The true risk length is $\tau = 15$. $R = 2$ and 4 displayed in the top and bottom panels, respectively.

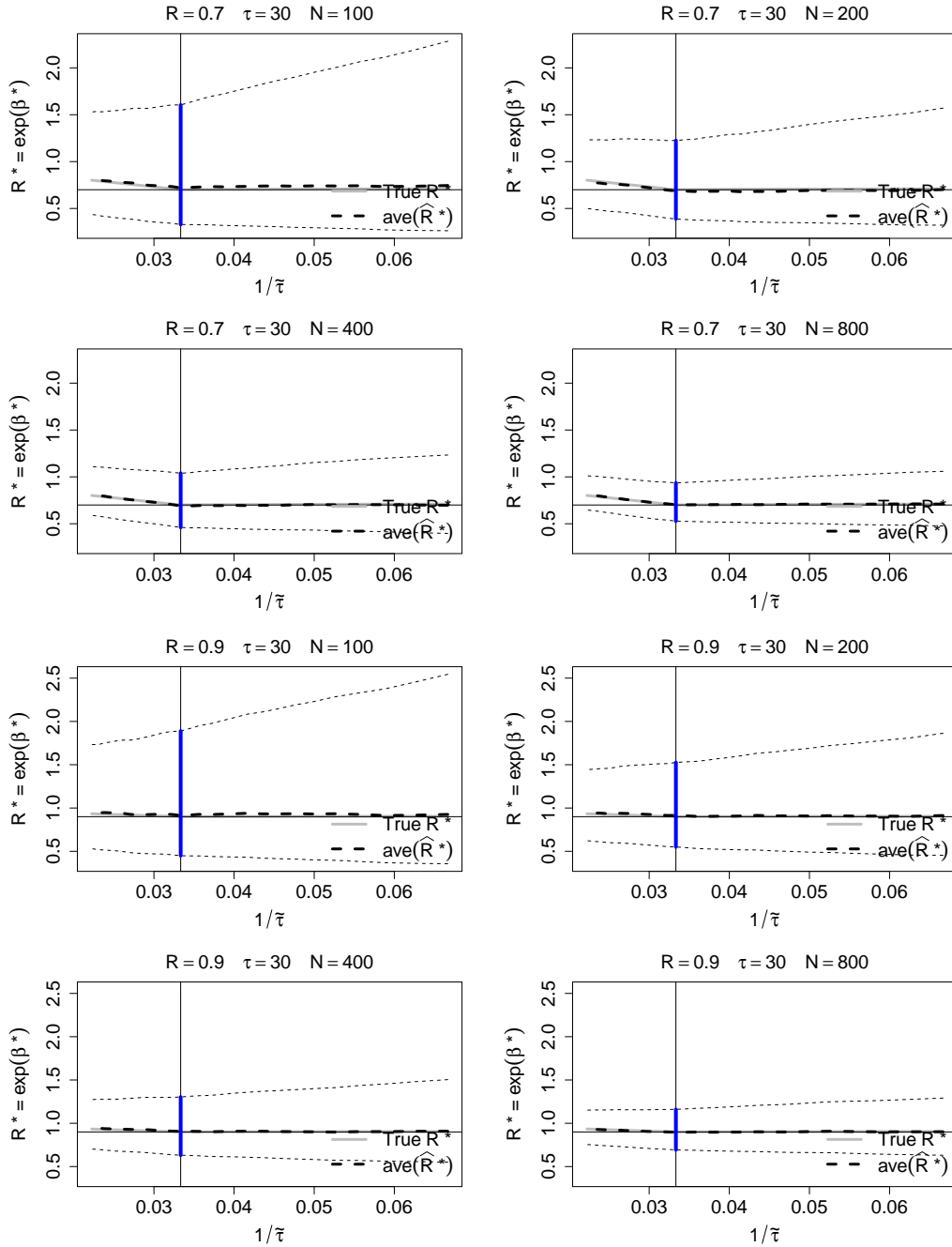


Figure 22: **Single Normally distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\hat{R}^*)$) over 200 simulated datasets. The true risk length is $\tau = 30$; $R = 0.7$ and 0.9 displayed in the top and bottom panels, respectively.

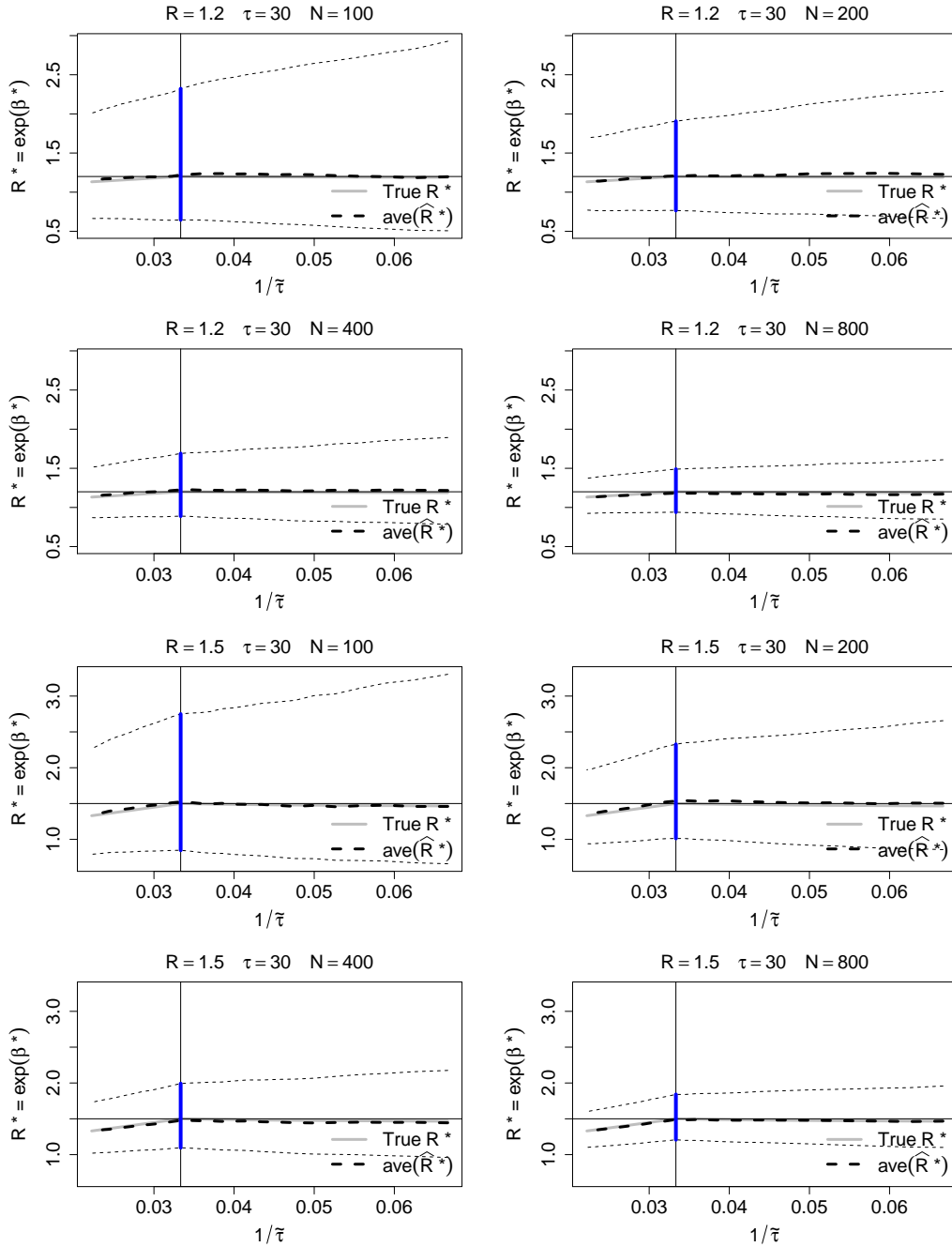


Figure 23: **Single Normally distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages (ave(\hat{R}^*)) over 200 simulated datasets. The true risk length is $\tau = 30$. $R = 1.2$ and 1.5 displayed in the top and bottom panels, respectively.

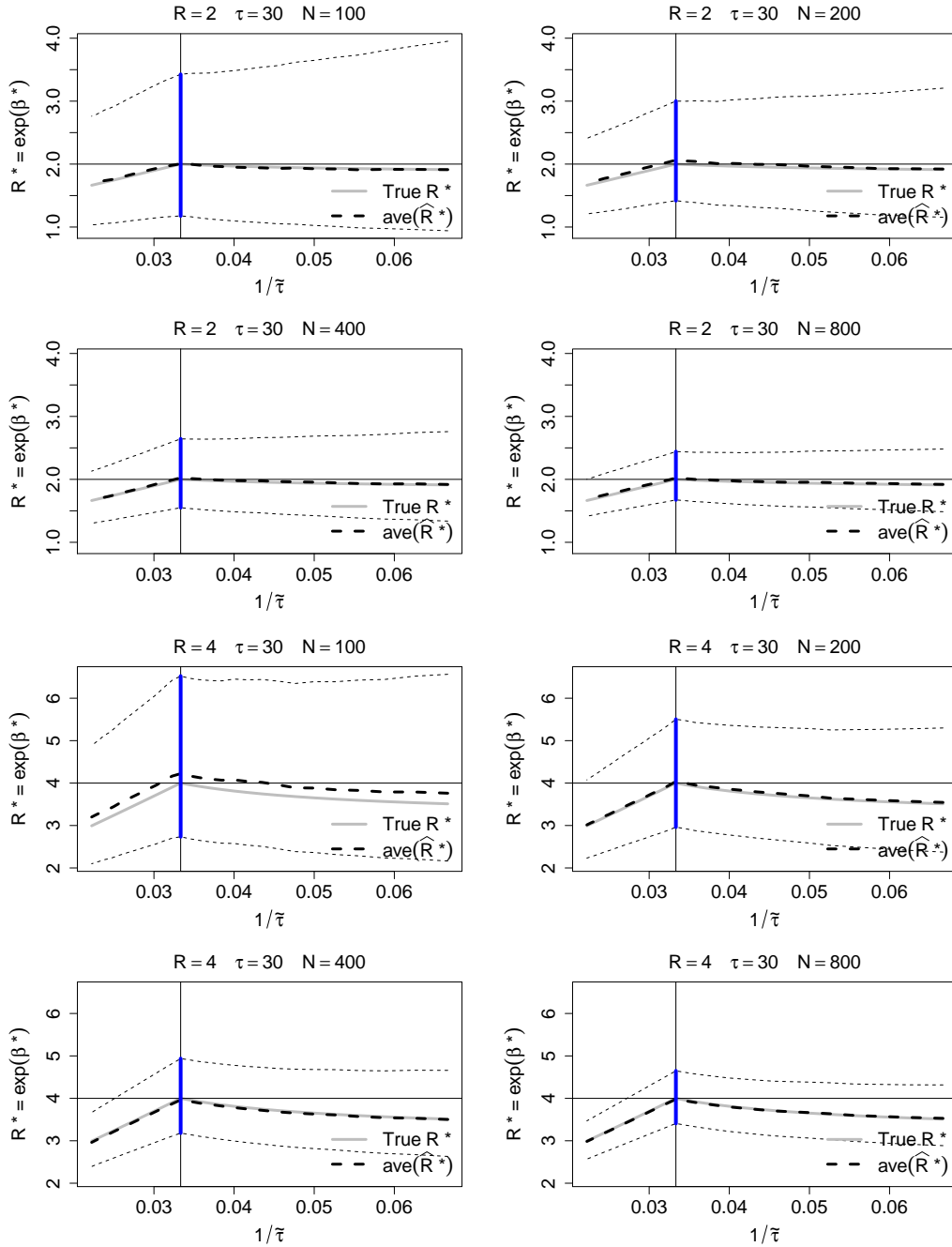


Figure 24: **Single Normally distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages (ave(\hat{R}^*)) over 200 simulated datasets. The true risk length is $\tau = 30$. $R = 2$ and 4 displayed in the top and bottom panels, respectively.

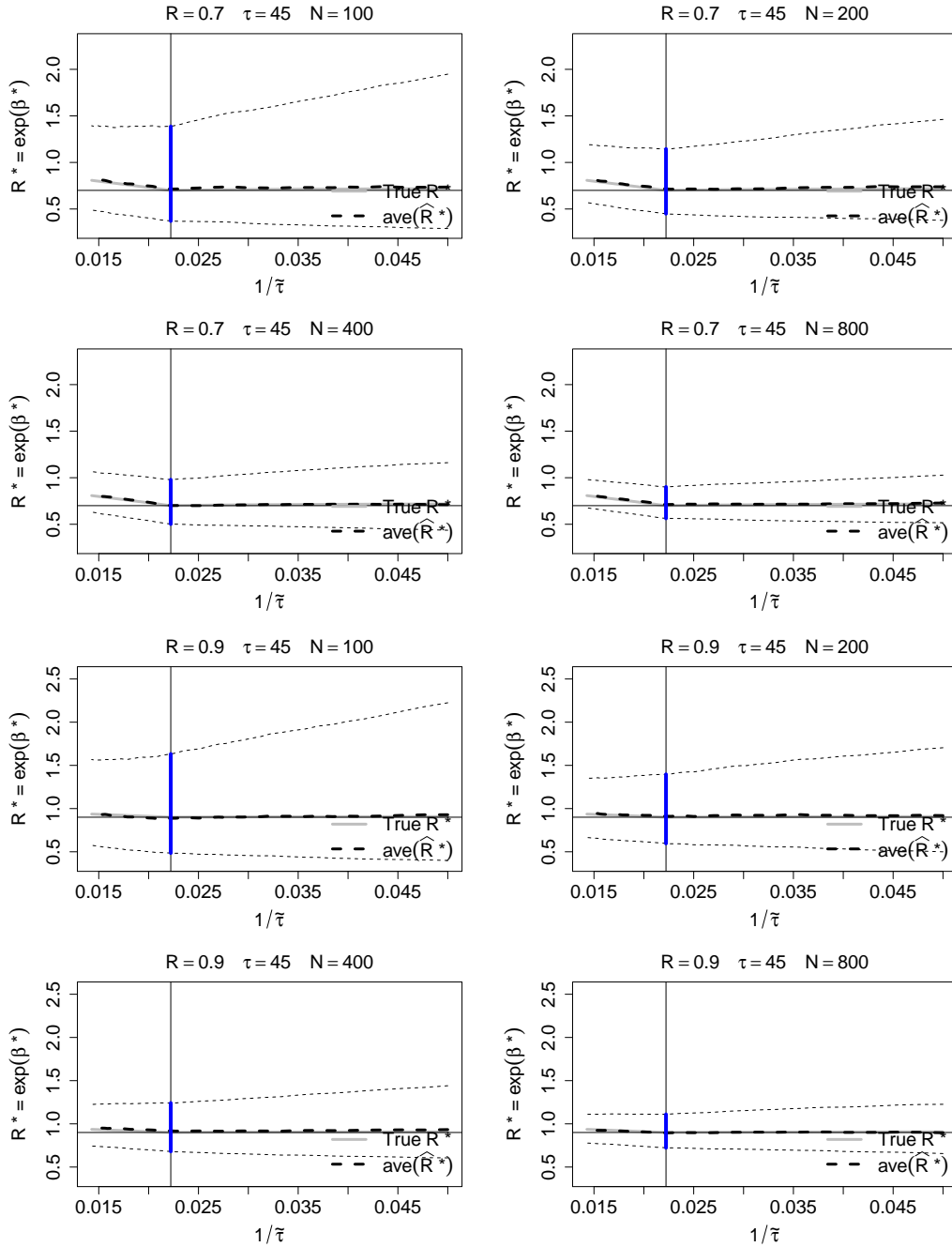


Figure 25: **Single Normally distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\hat{R}^*)$) over 200 simulated datasets. The true risk length is $\tau = 45$; $R = 0.7$ and 0.9 displayed in the top and bottom panels, respectively.

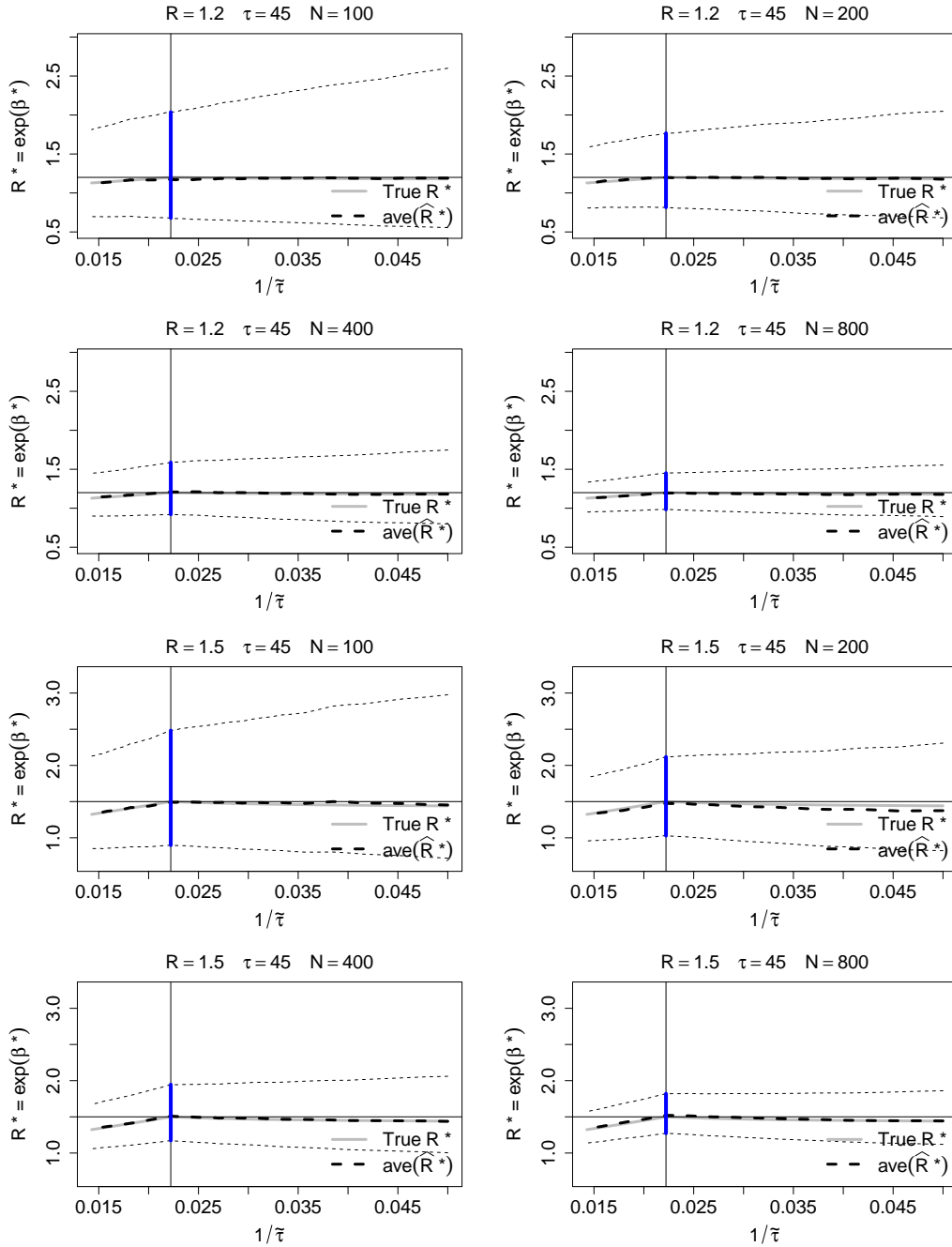


Figure 26: **Single Normally distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\hat{R}^*)$) over 200 simulated datasets. The true risk length is $\tau = 45$. $R = 1.2$ and 1.5 displayed in the top and bottom panels, respectively.

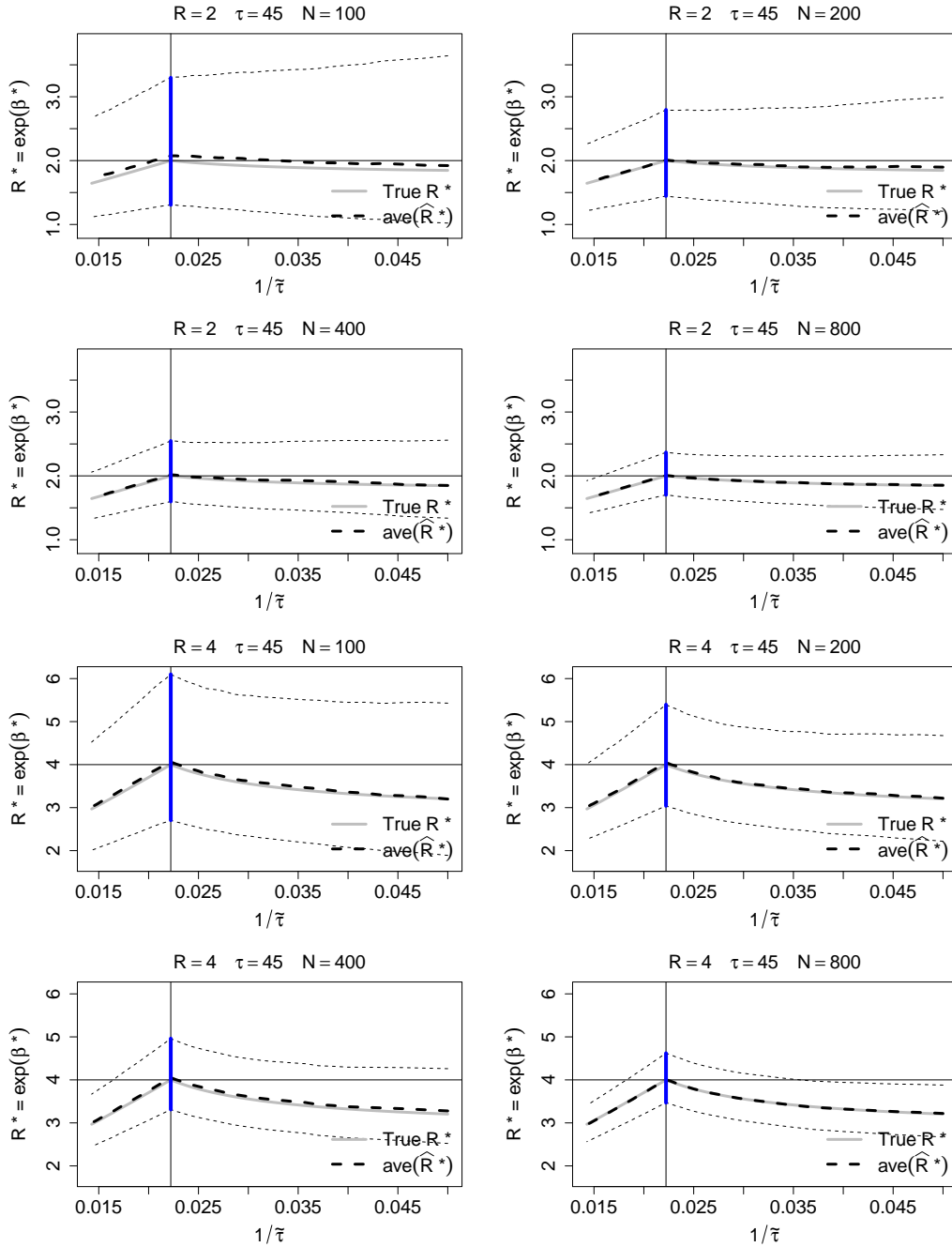


Figure 27: **Single Normally distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\hat{R}^*)$) over 200 simulated datasets. The true risk length is $\tau = 45$. $R = 2$ and 4 displayed in the top and bottom panels, respectively.

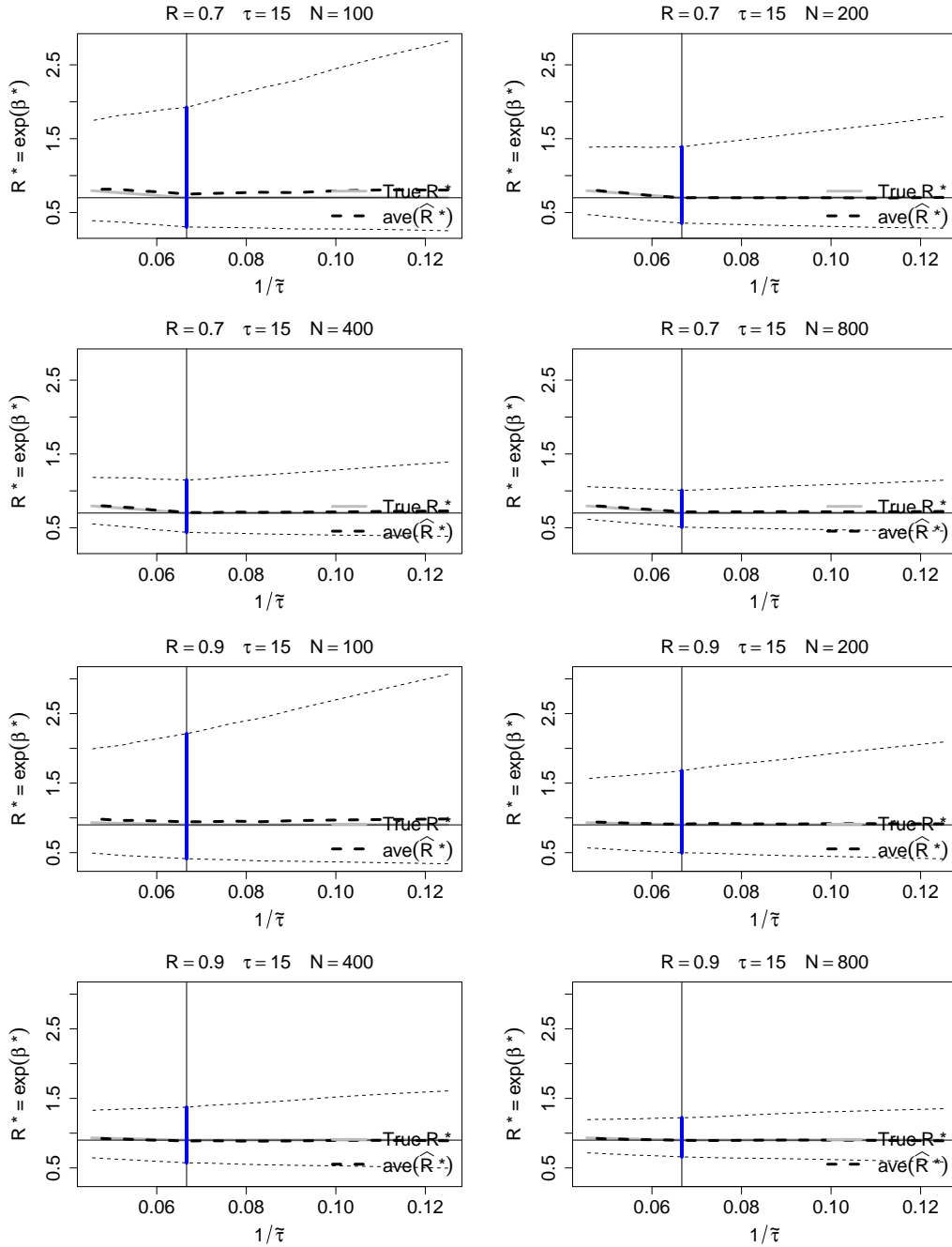


Figure 28: **Multiple Normally distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\hat{R}^*)$) over 200 simulated datasets. The true risk length is $\tau = 15$; $R = 0.7$ and 0.9 displayed in the top and bottom panels, respectively.

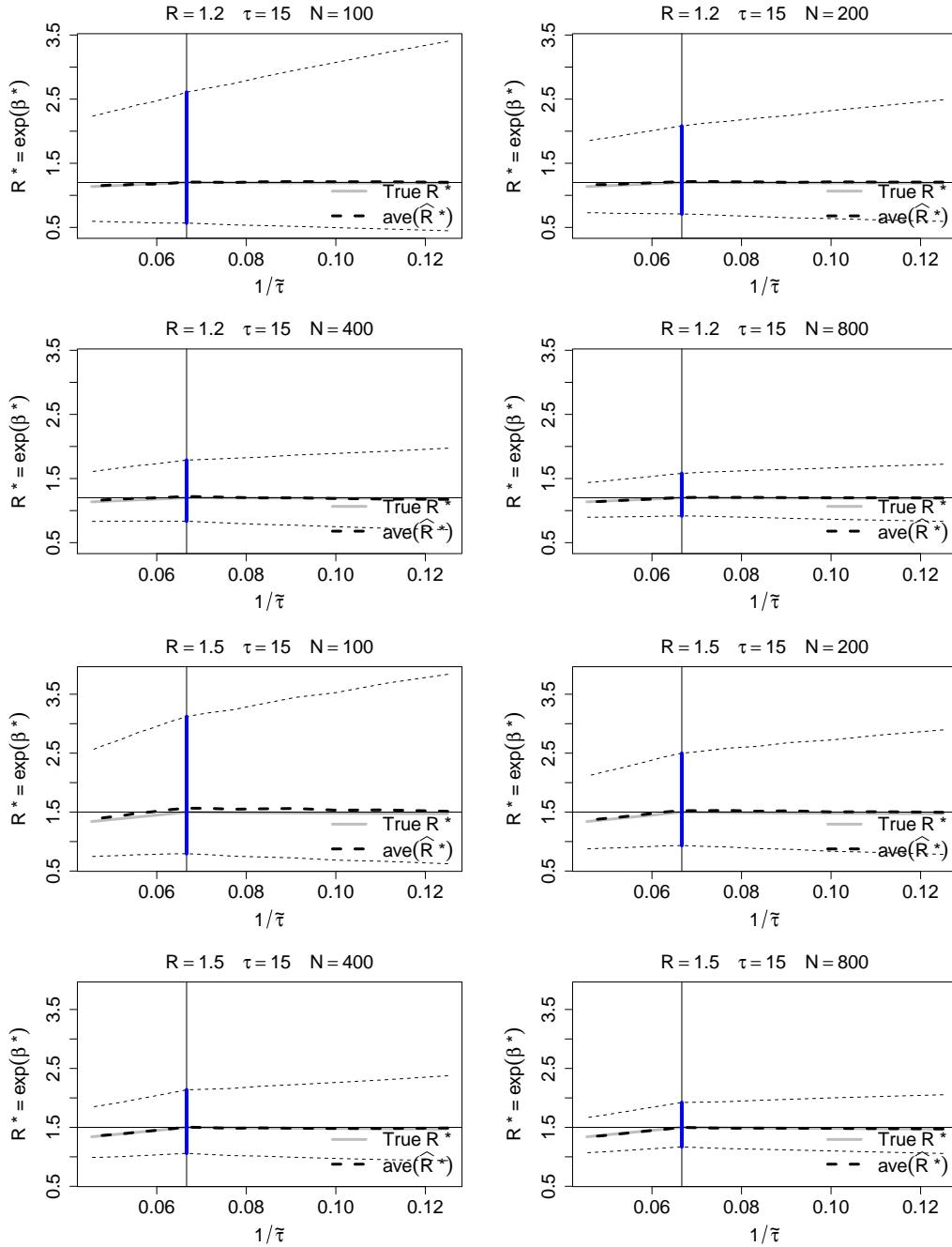


Figure 29: **Multiple Normally distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\hat{R}^*)$) over 200 simulated datasets. The true risk length is $\tau = 15$. $R = 1.2$ and 1.5 displayed in the top and bottom panels, respectively.

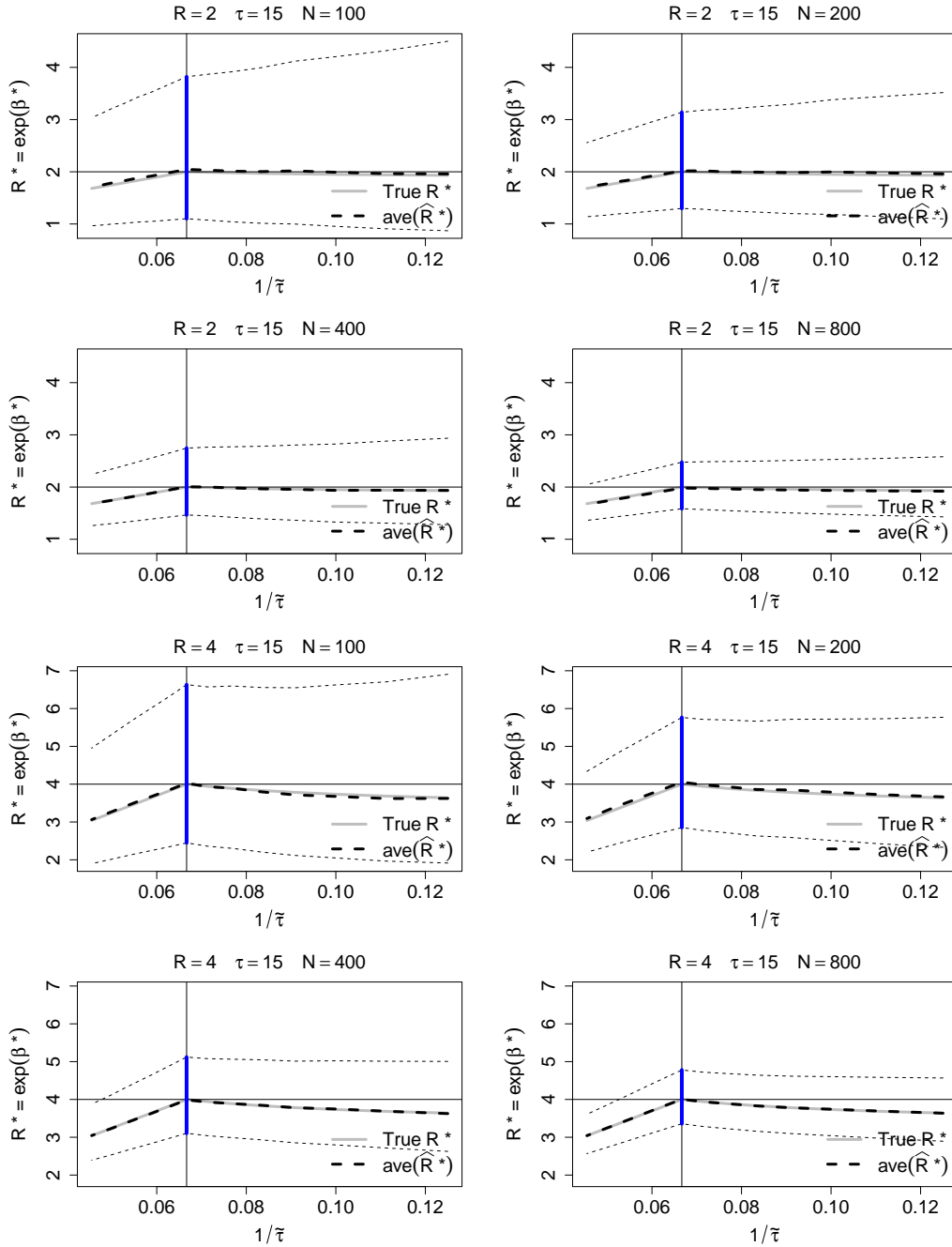


Figure 30: **Multiple Normally distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\hat{R}^*)$) over 200 simulated datasets. The true risk length is $\tau = 15$. $R = 2$ and 4 displayed in the top and bottom panels, respectively.

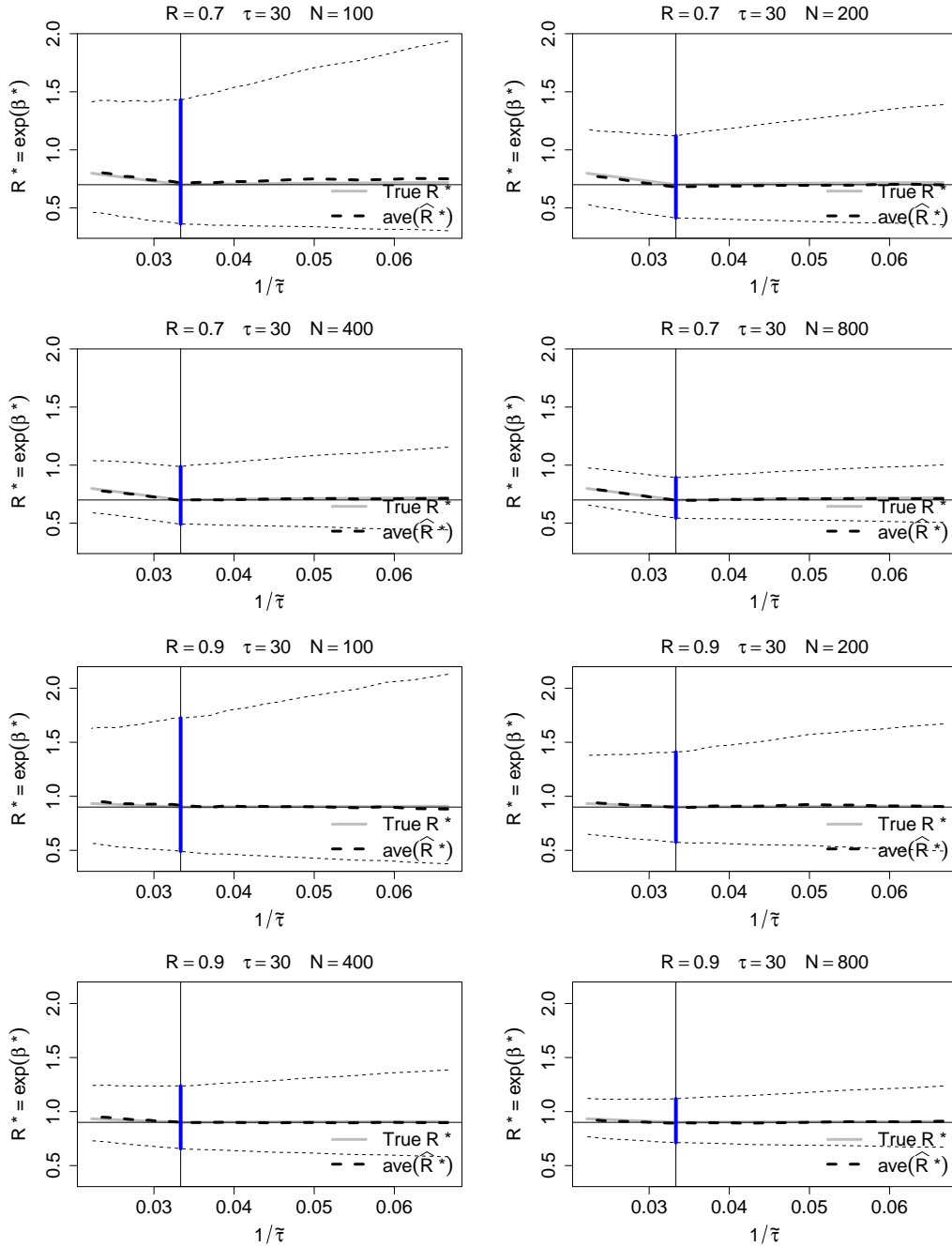


Figure 31: **Multiple Normally distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\hat{R}^*)$) over 200 simulated datasets. The true risk length is $\tau = 30$; $R = 0.7$ and 0.9 displayed in the top and bottom panels, respectively.

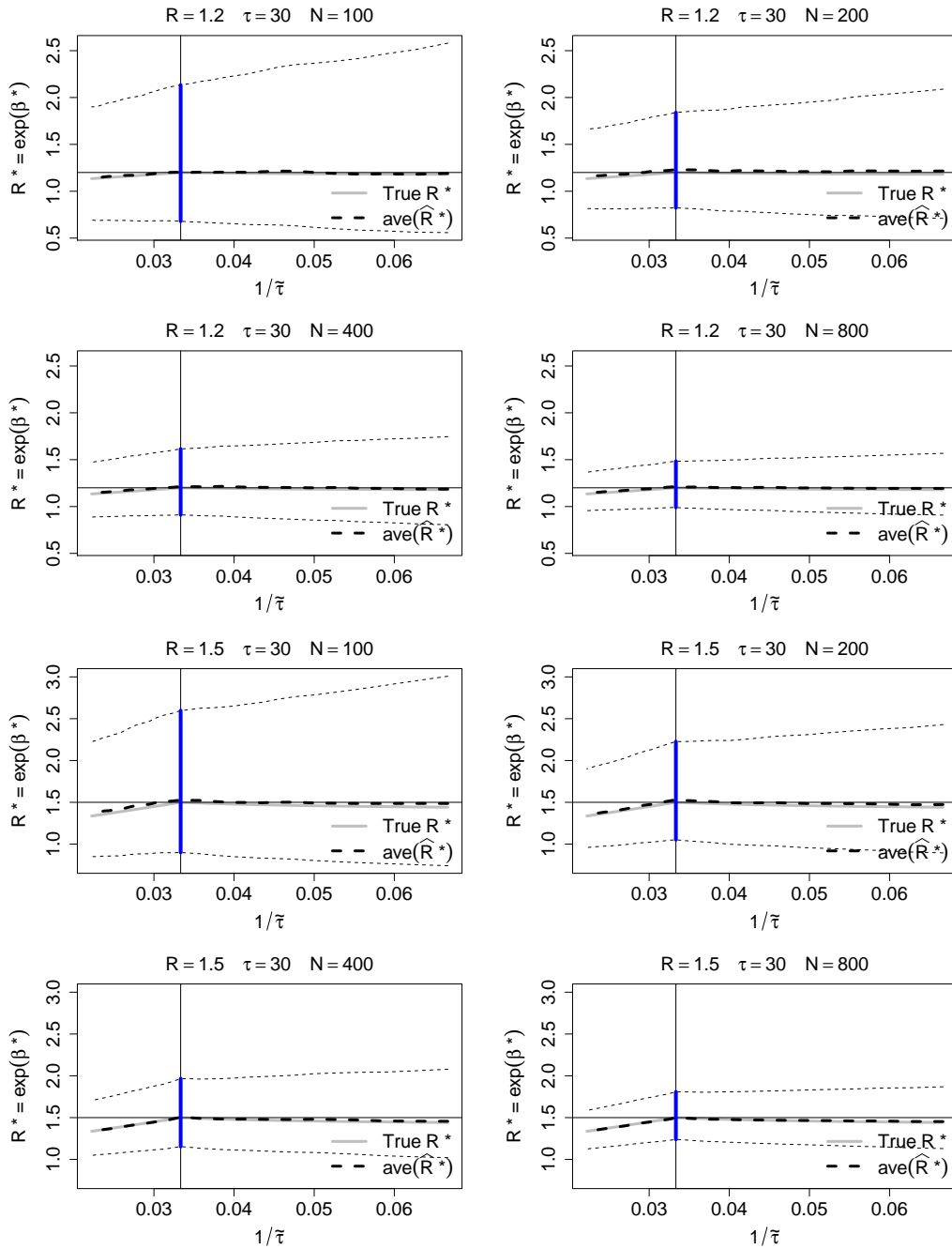


Figure 32: **Multiple Normally distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\hat{R}^*)$) over 200 simulated datasets. The true risk length is $\tau = 30$. $R = 1.2$ and 1.5 displayed in the top and bottom panels, respectively.

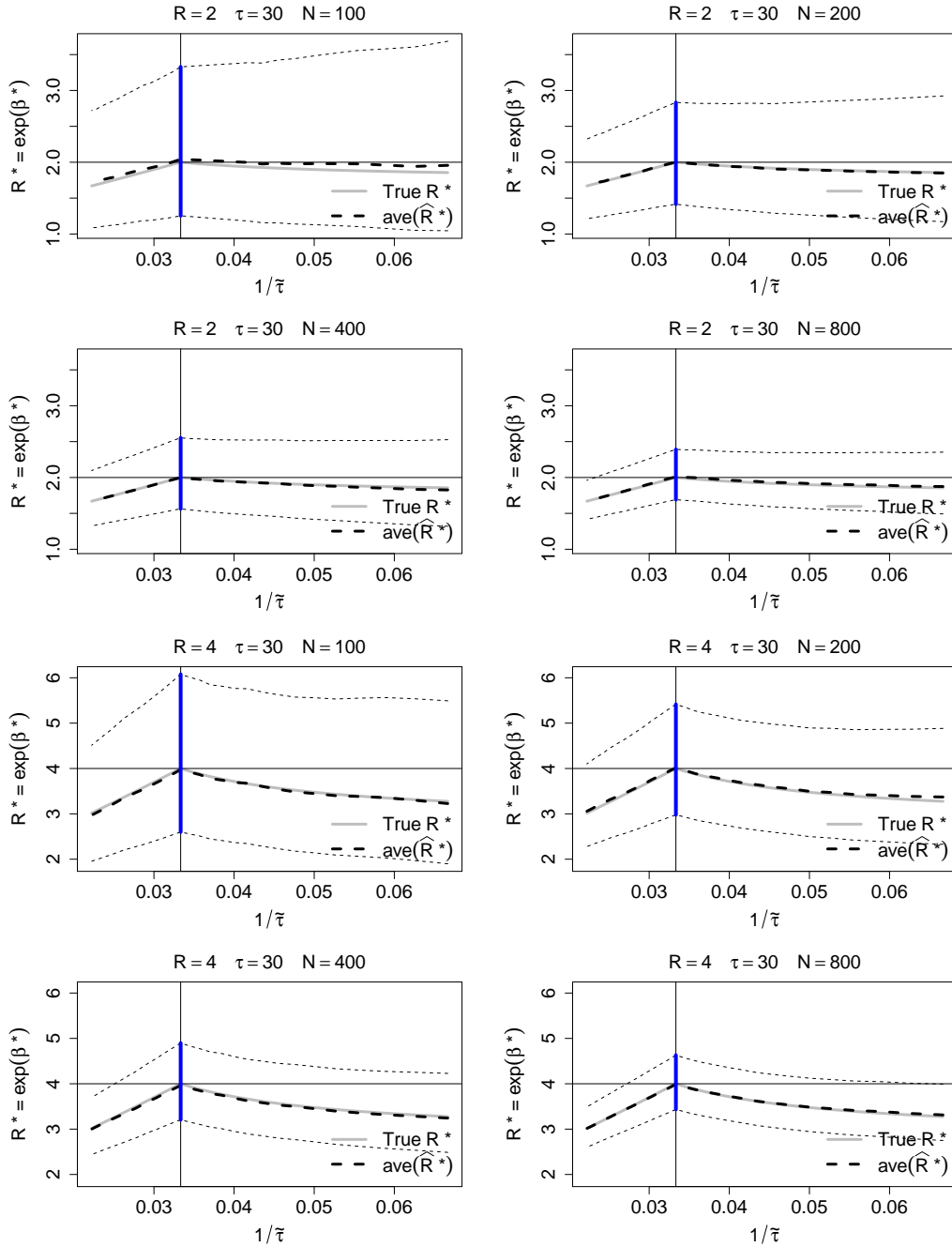


Figure 33: **Multiple Normally distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\hat{R}^*)$) over 200 simulated datasets. The true risk length is $\tau = 30$. $R = 2$ and 4 displayed in the top and bottom panels, respectively.

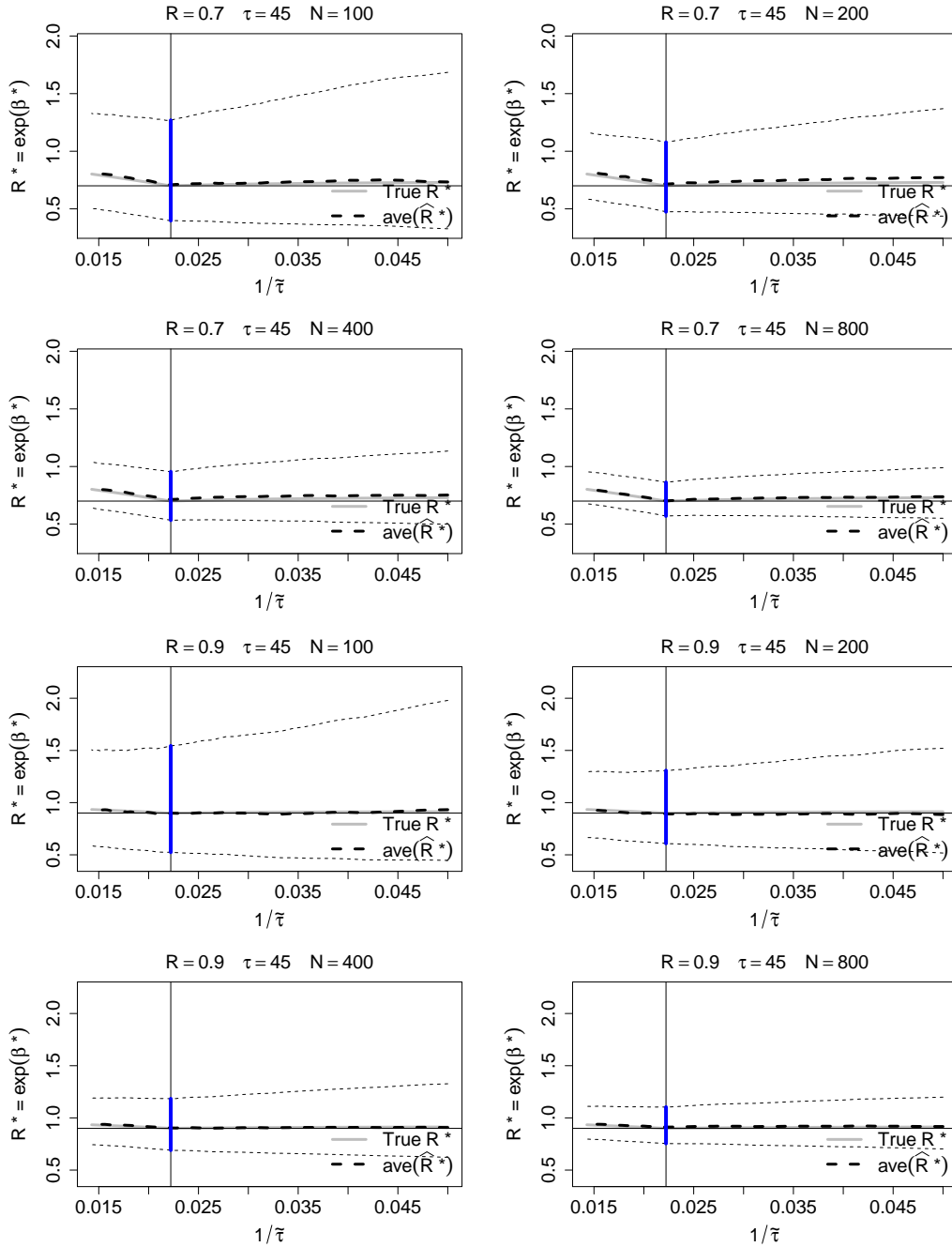


Figure 34: **Multiple Normally distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length, along with 95% confidence interval; given are averages (ave(\hat{R}^*)) over 200 simulated datasets. The true risk length is $\tau = 45$; $R = 0.7$ and 0.9 displayed in the top and bottom panels, respectively.

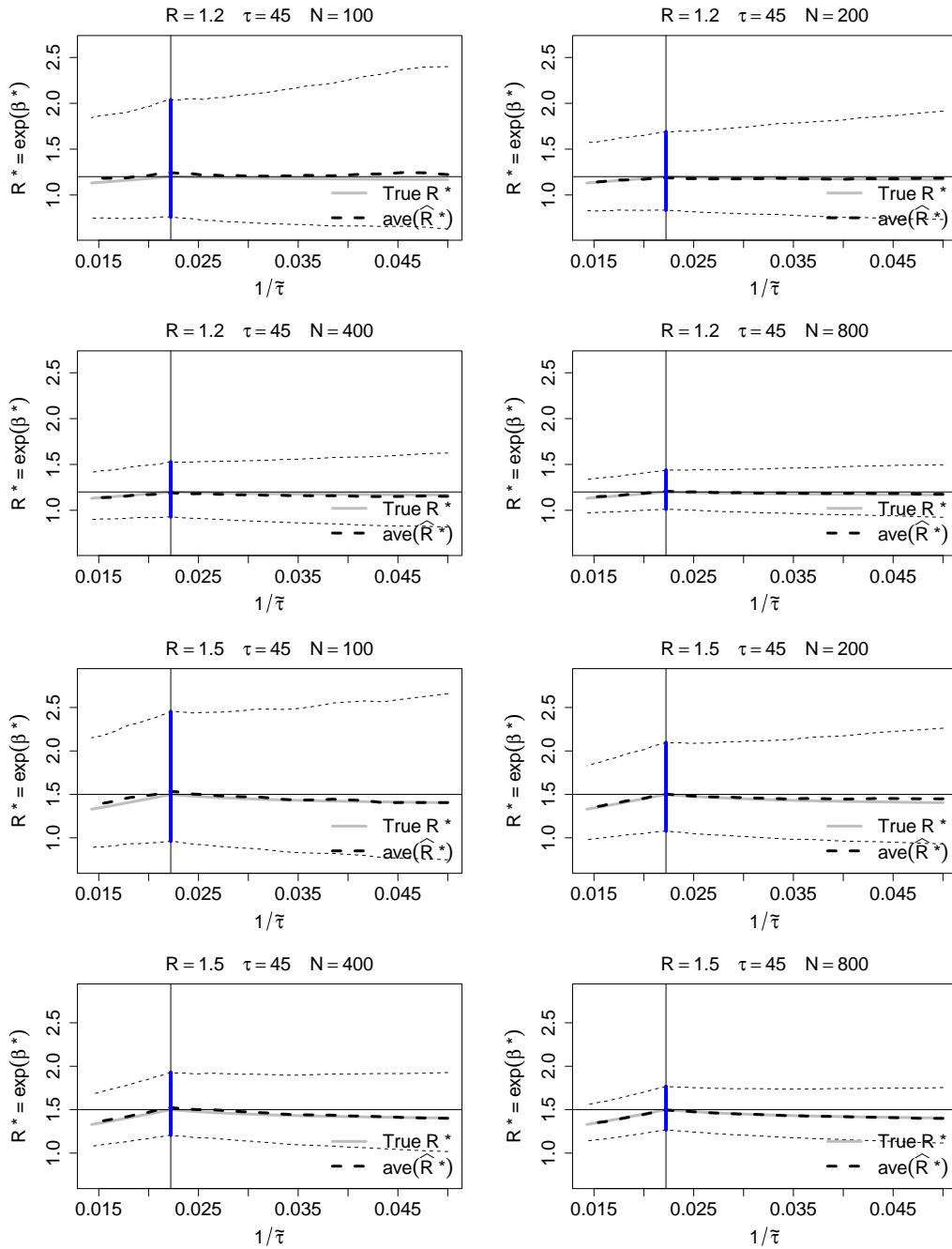


Figure 35: **Multiple Normally distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages (ave(\hat{R}^*)) over 200 simulated datasets. The true risk length is $\tau = 45$. $R = 1.2$ and 1.5 displayed in the top and bottom panels, respectively.

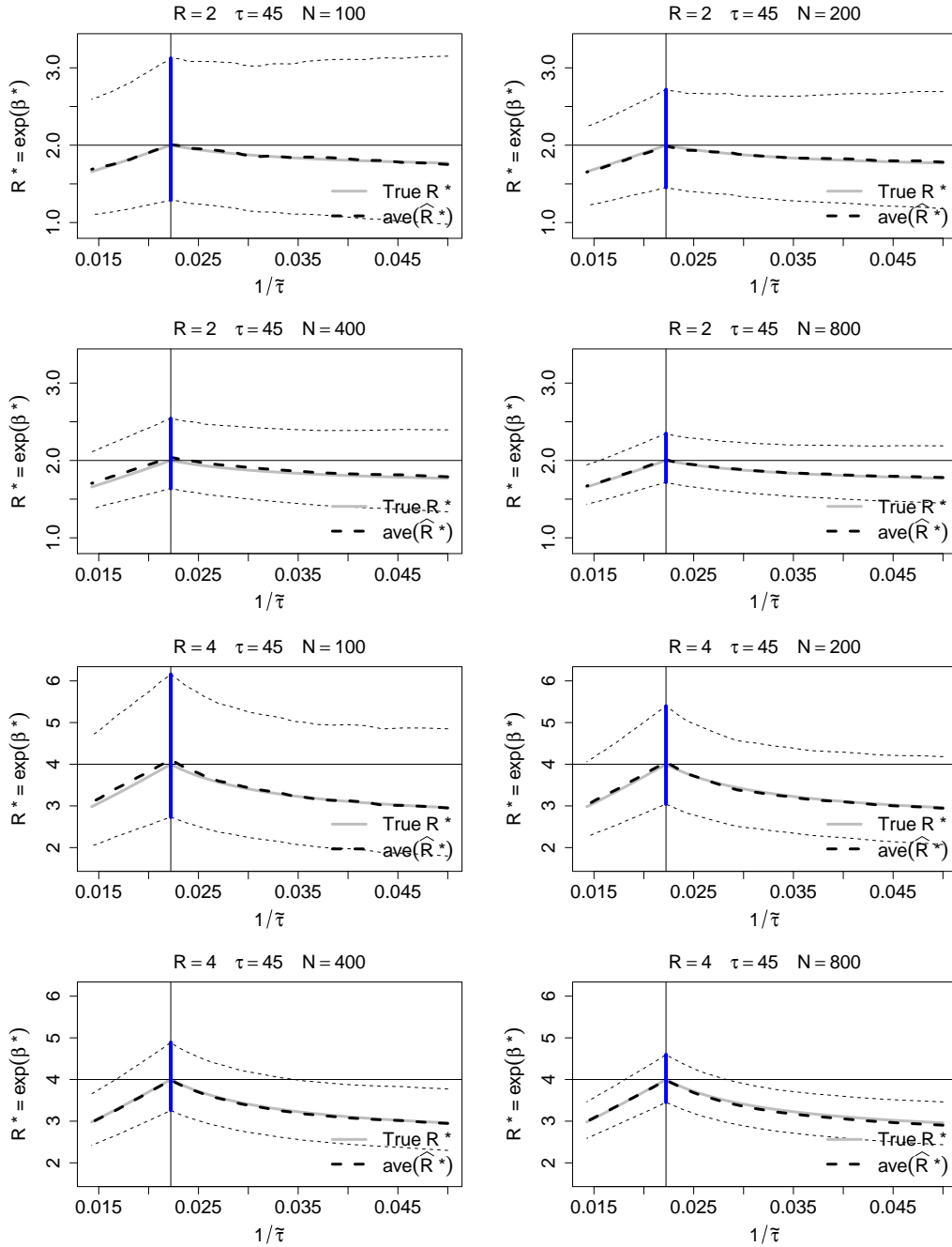


Figure 36: **Multiple Normally distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the relative incidence estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\hat{R}^*)$) over 200 simulated datasets. The true risk length is $\tau = 45$. $R = 2$ and 4 displayed in the top and bottom panels, respectively.

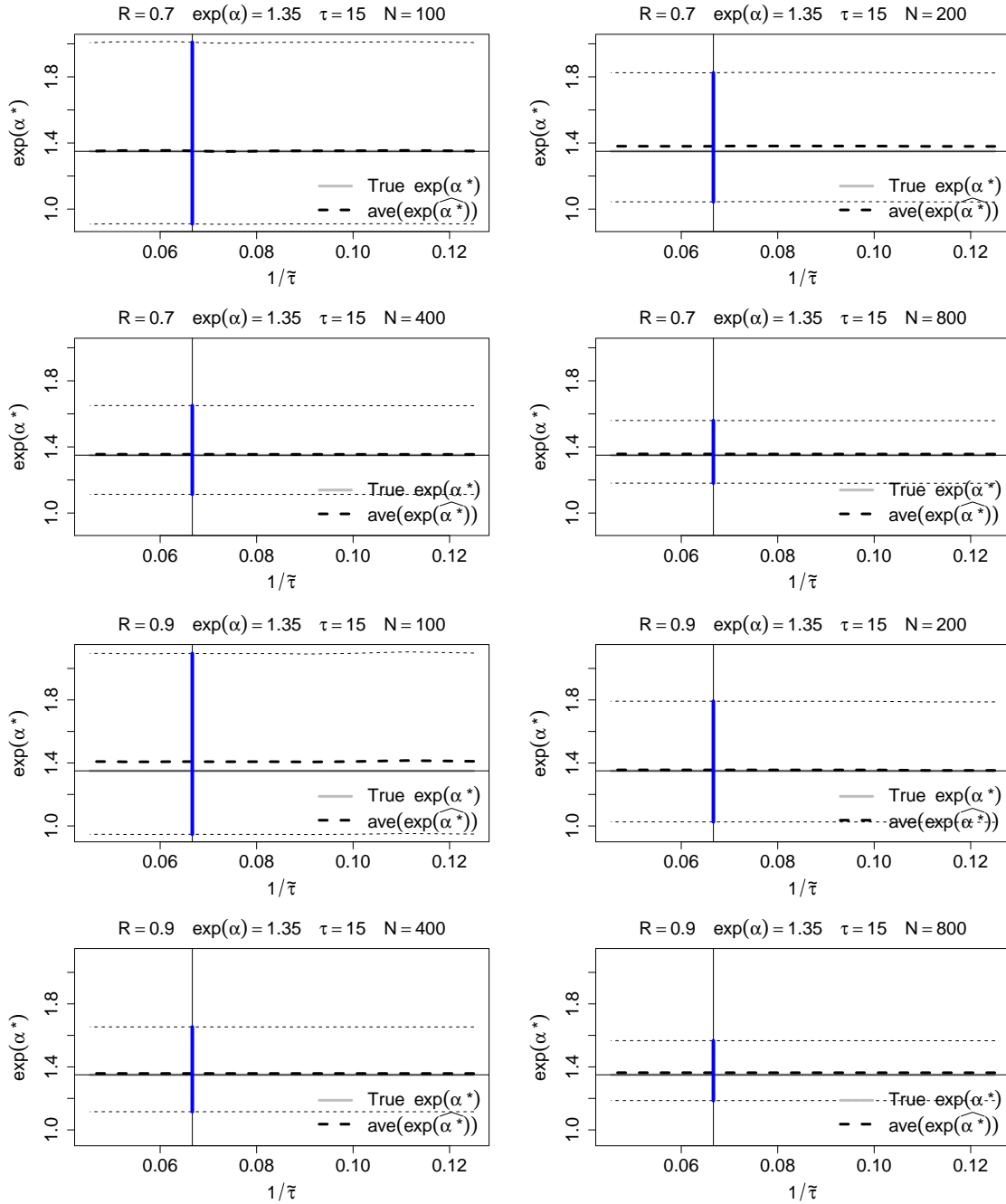


Figure 37: **Single Uniformly distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 15$; $R = 0.7$ and 0.9 displayed in the top and bottom panels, respectively.

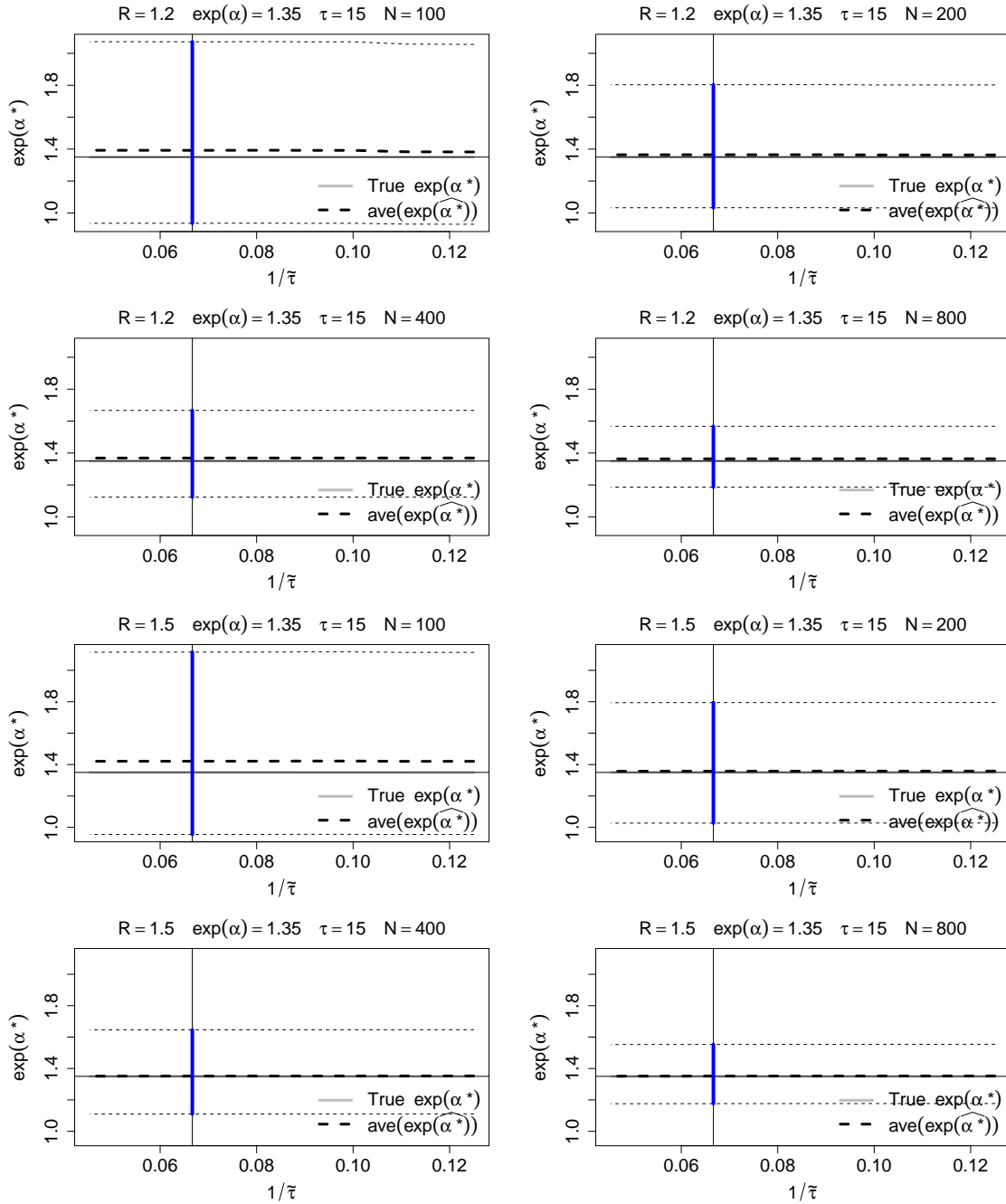


Figure 38: **Single Uniformly distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 15$. $R = 1.2$ and 1.5 displayed in the top and bottom panels, respectively.

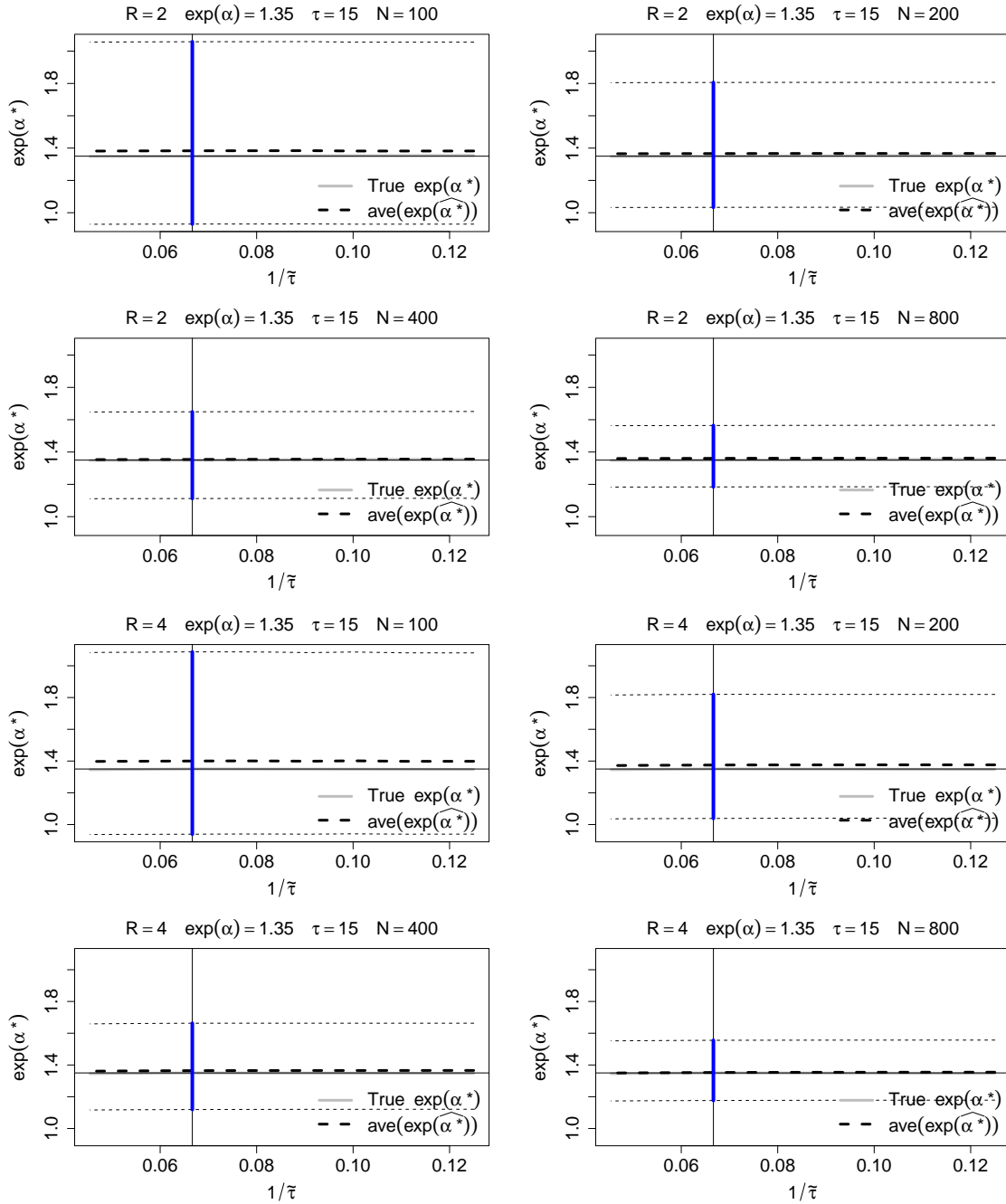


Figure 39: **Single Uniformly distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 15$. $R = 2$ and 4 displayed in the top and bottom panels, respectively.

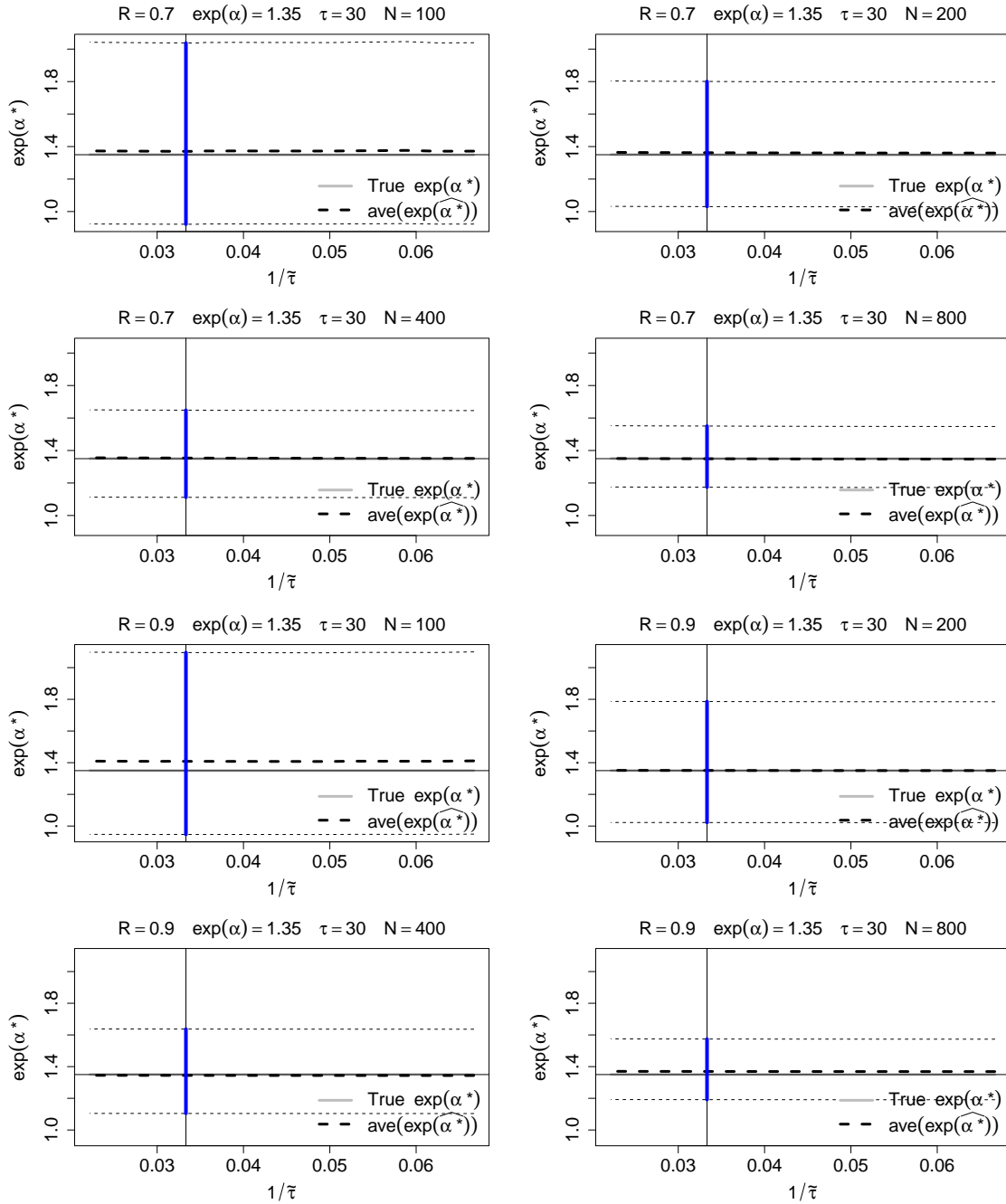


Figure 40: **Single Uniformly distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 30$; $R = 0.7$ and 0.9 displayed in the top and bottom panels, respectively.

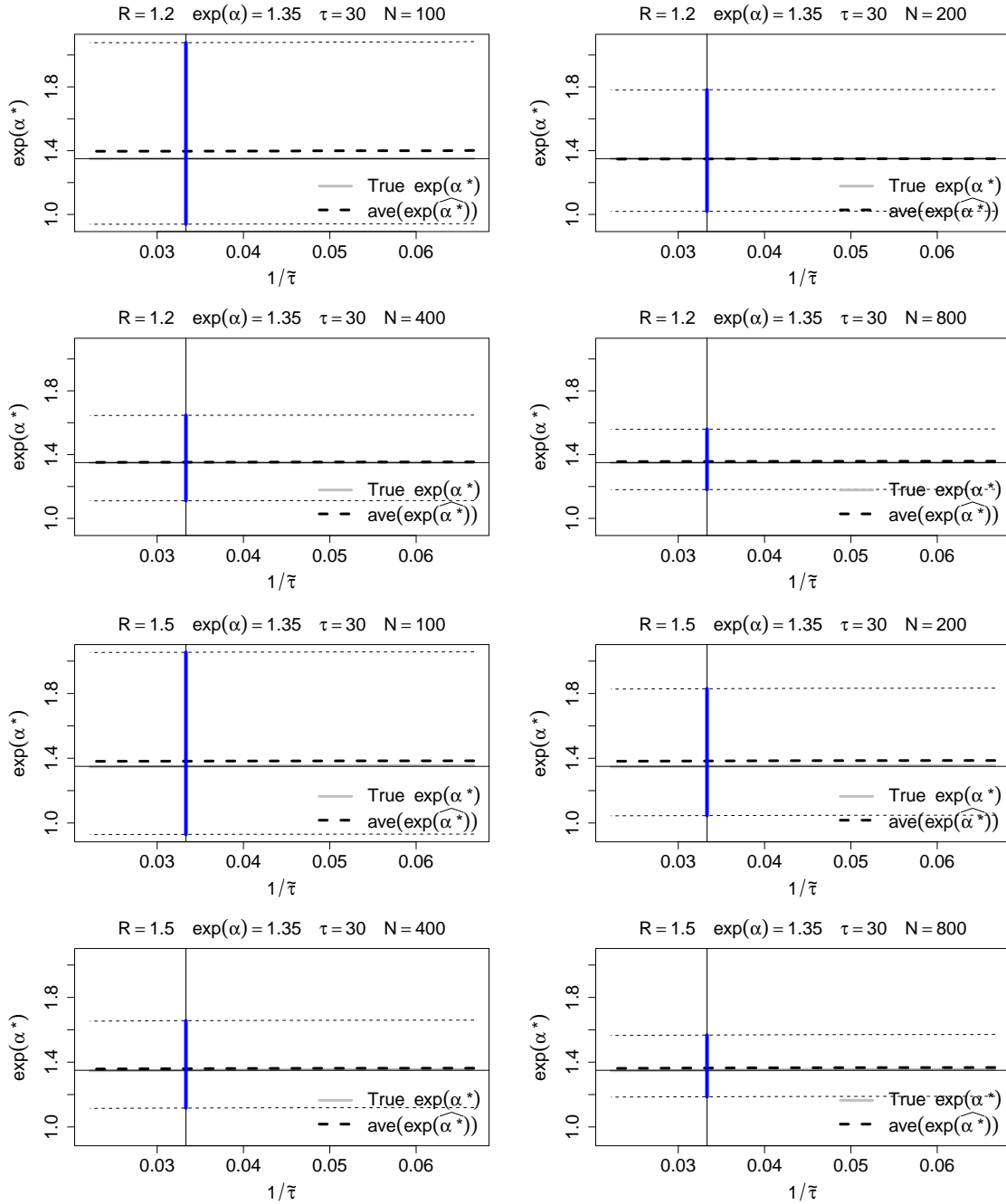


Figure 41: **Single Uniformly distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 30$. $R = 1.2$ and 1.5 displayed in the top and bottom panels, respectively.

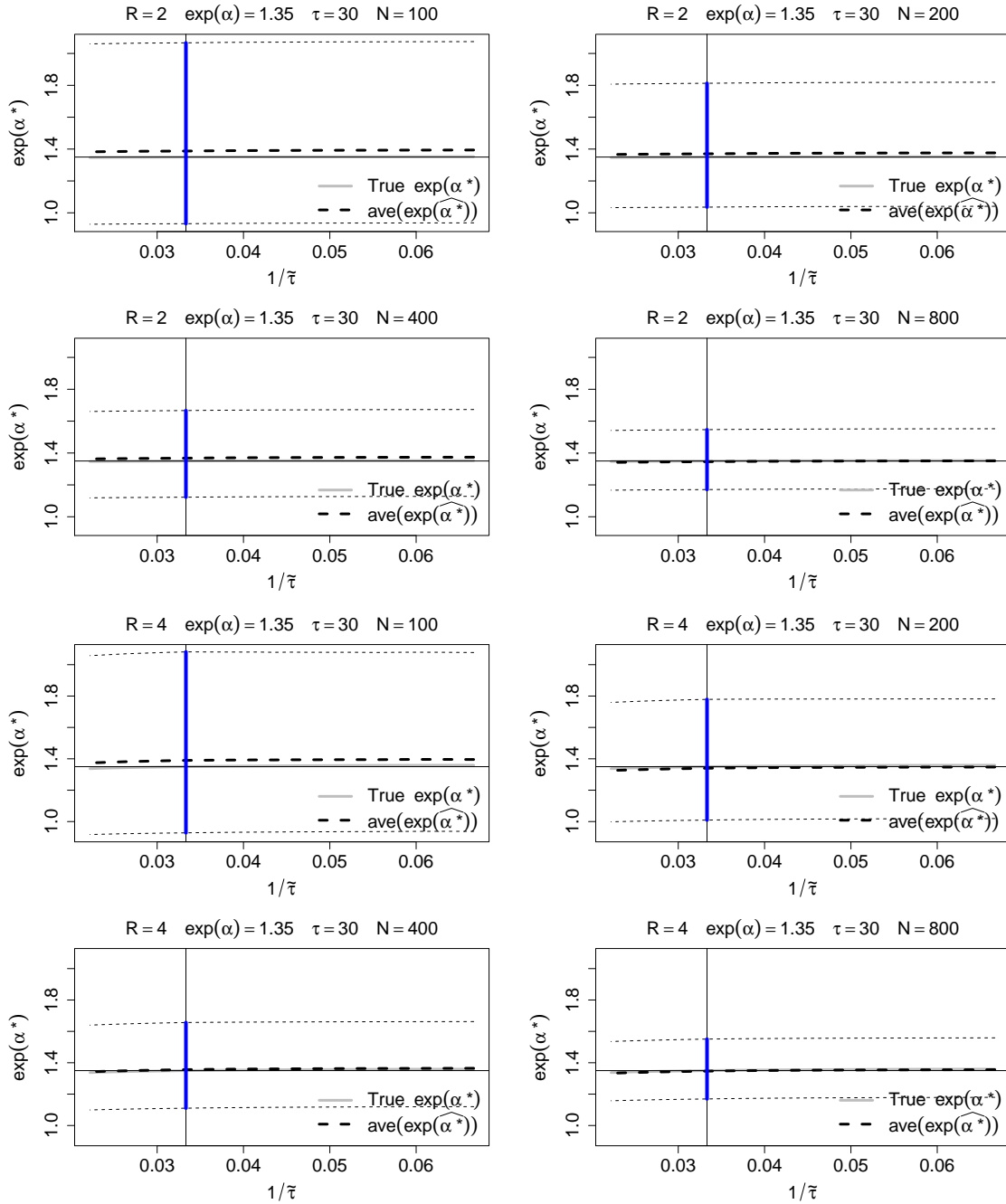


Figure 42: **Single Uniformly distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 30$. $R = 2$ and 4 displayed in the top and bottom panels, respectively.

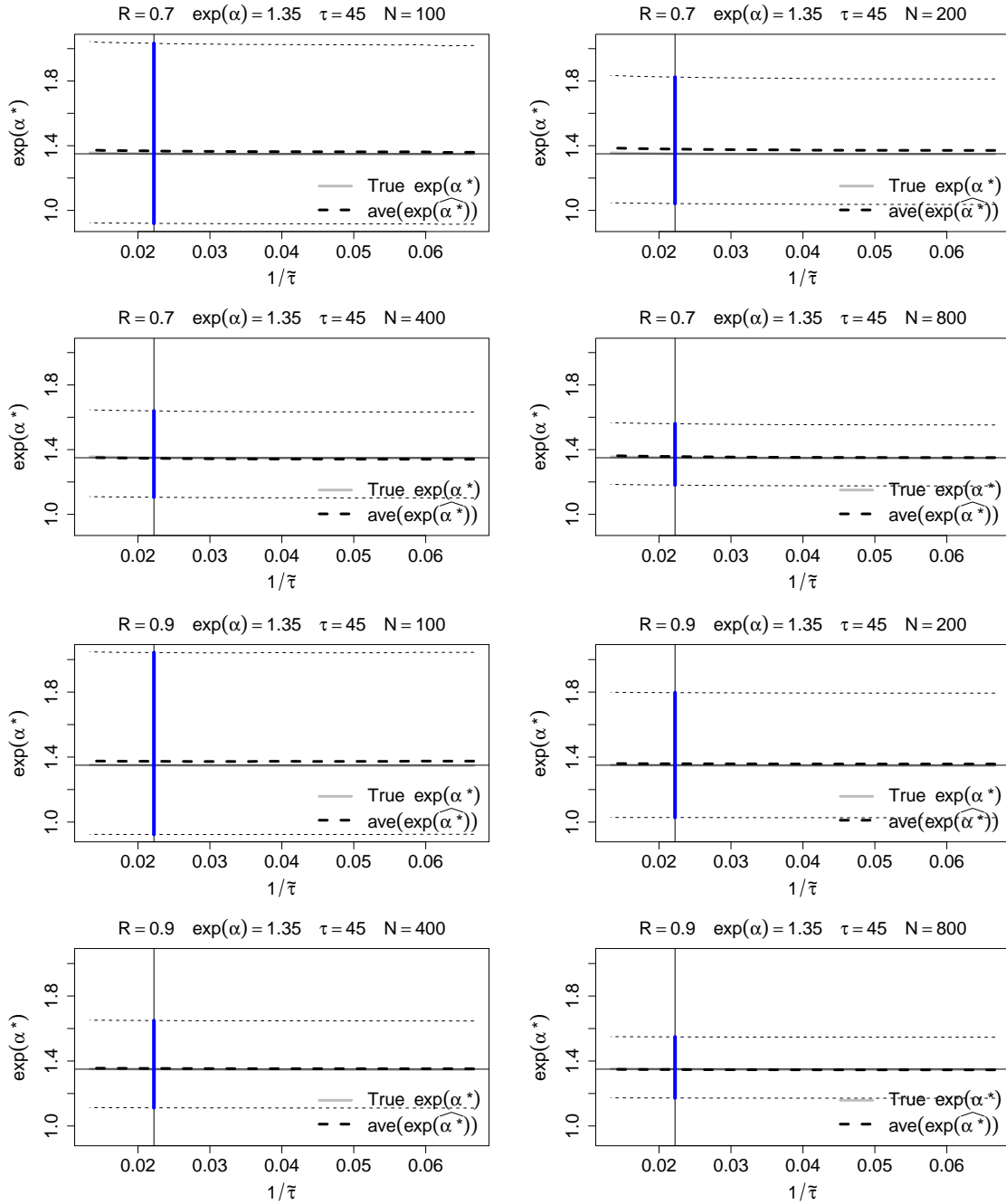


Figure 43: **Single Uniformly distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 45$; $R = 0.7$ and 0.9 displayed in the top and bottom panels, respectively.

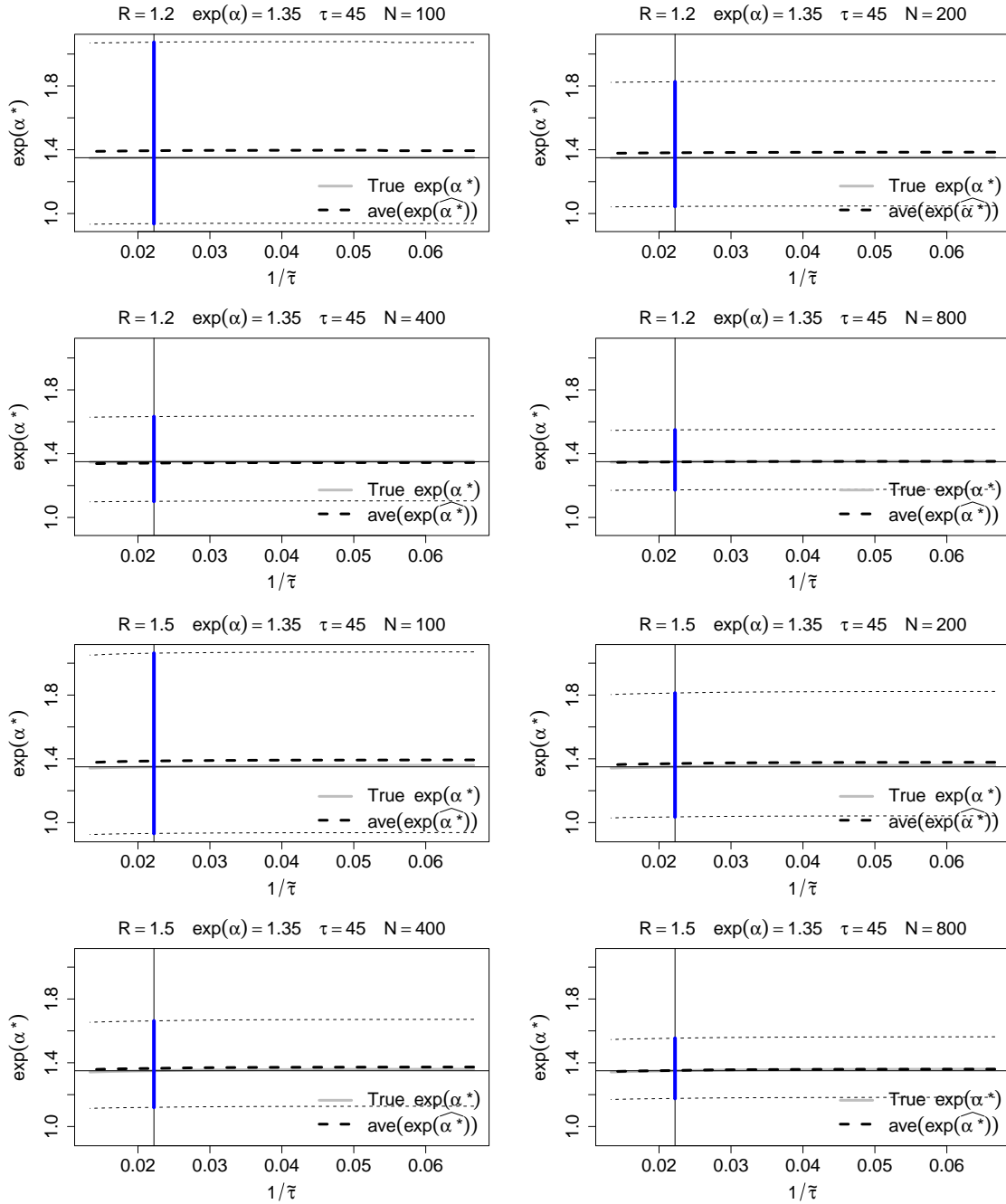


Figure 44: **Single Uniformly distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 45$. $R = 1.2$ and 1.5 displayed in the top and bottom panels, respectively.

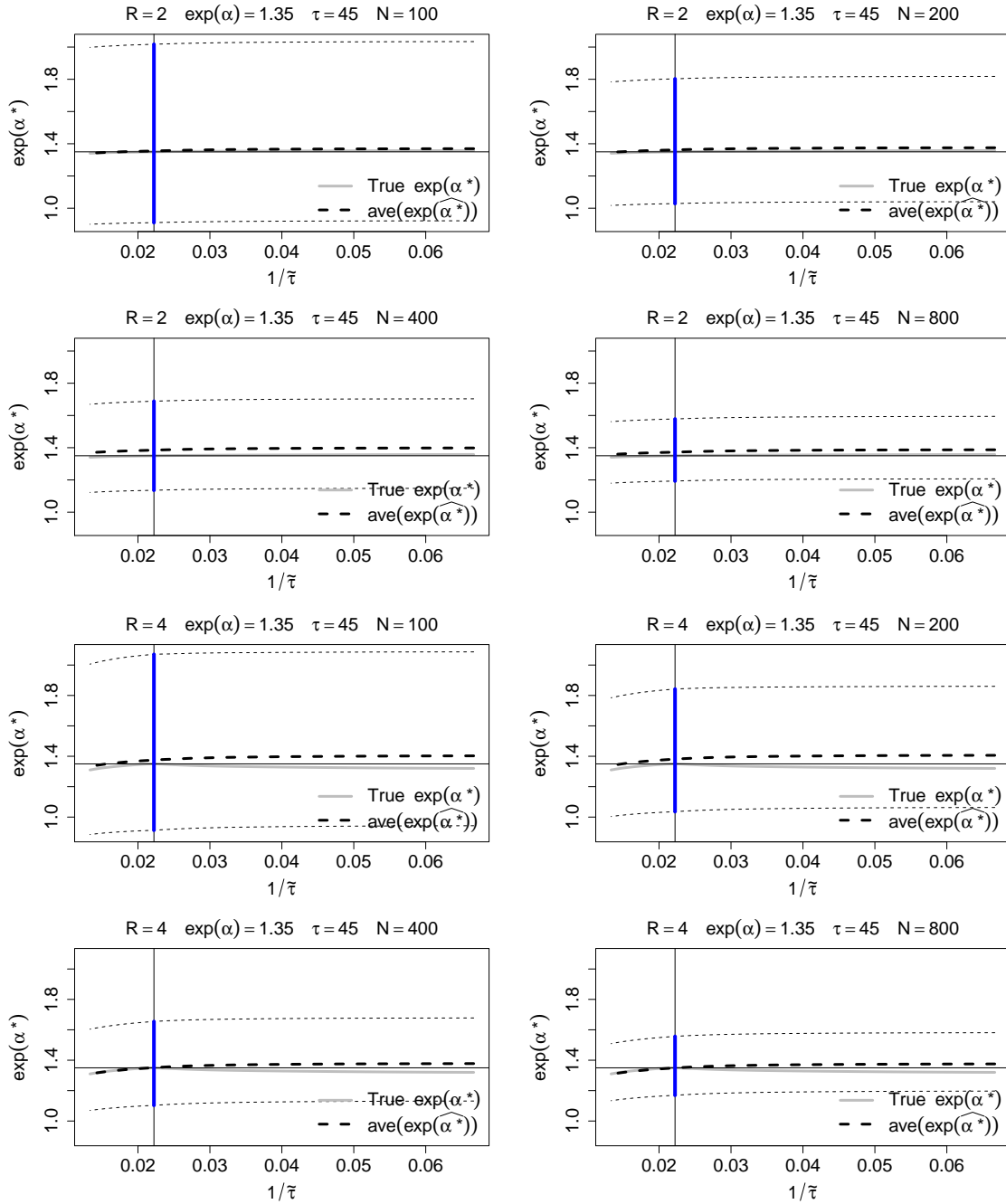


Figure 45: **Single Uniformly distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 45$. $R = 2$ and 4 displayed in the top and bottom panels, respectively.

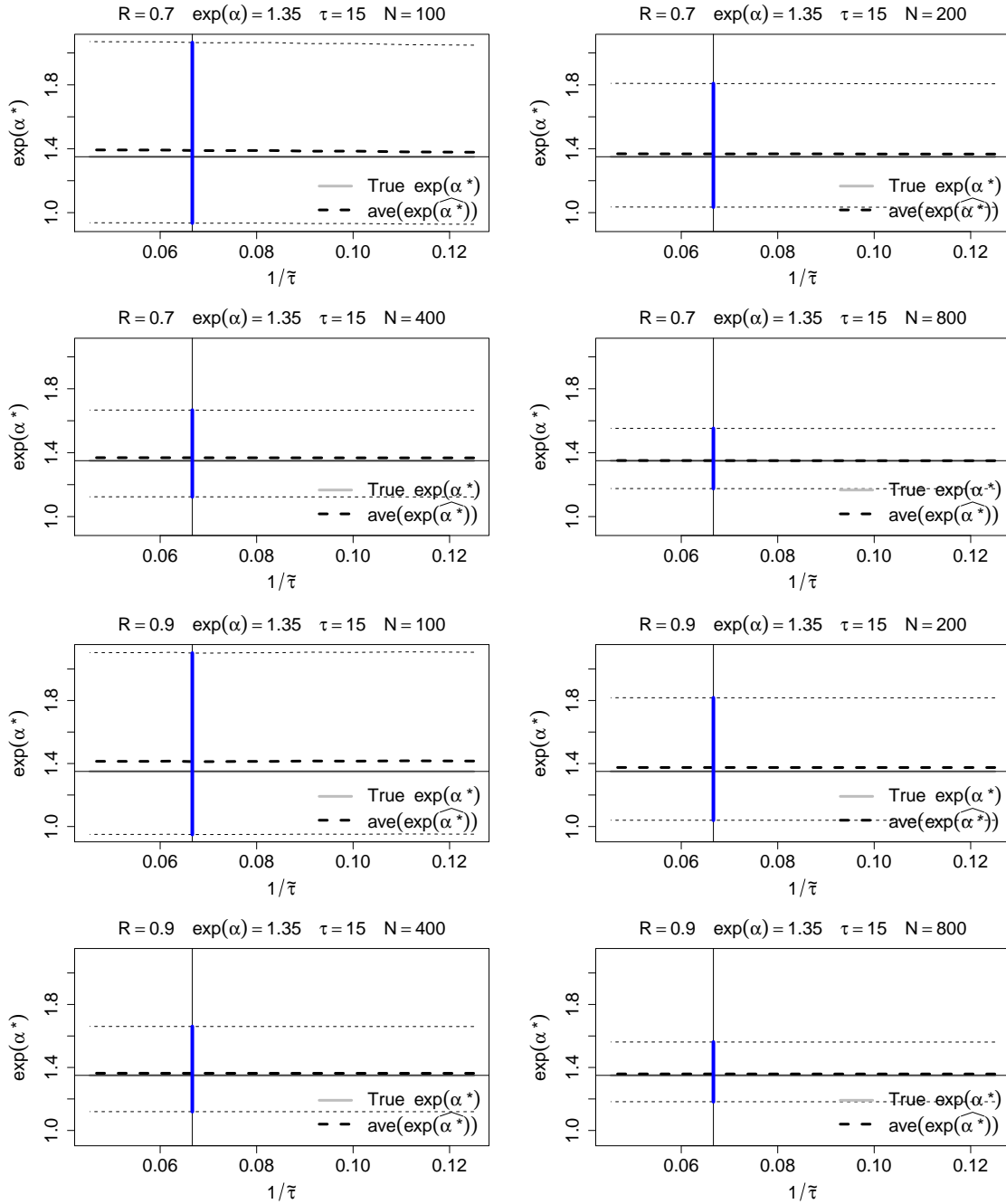


Figure 46: **Multiple Uniformly distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 15$; $R = 0.7$ and 0.9 displayed in the top and bottom panels, respectively.

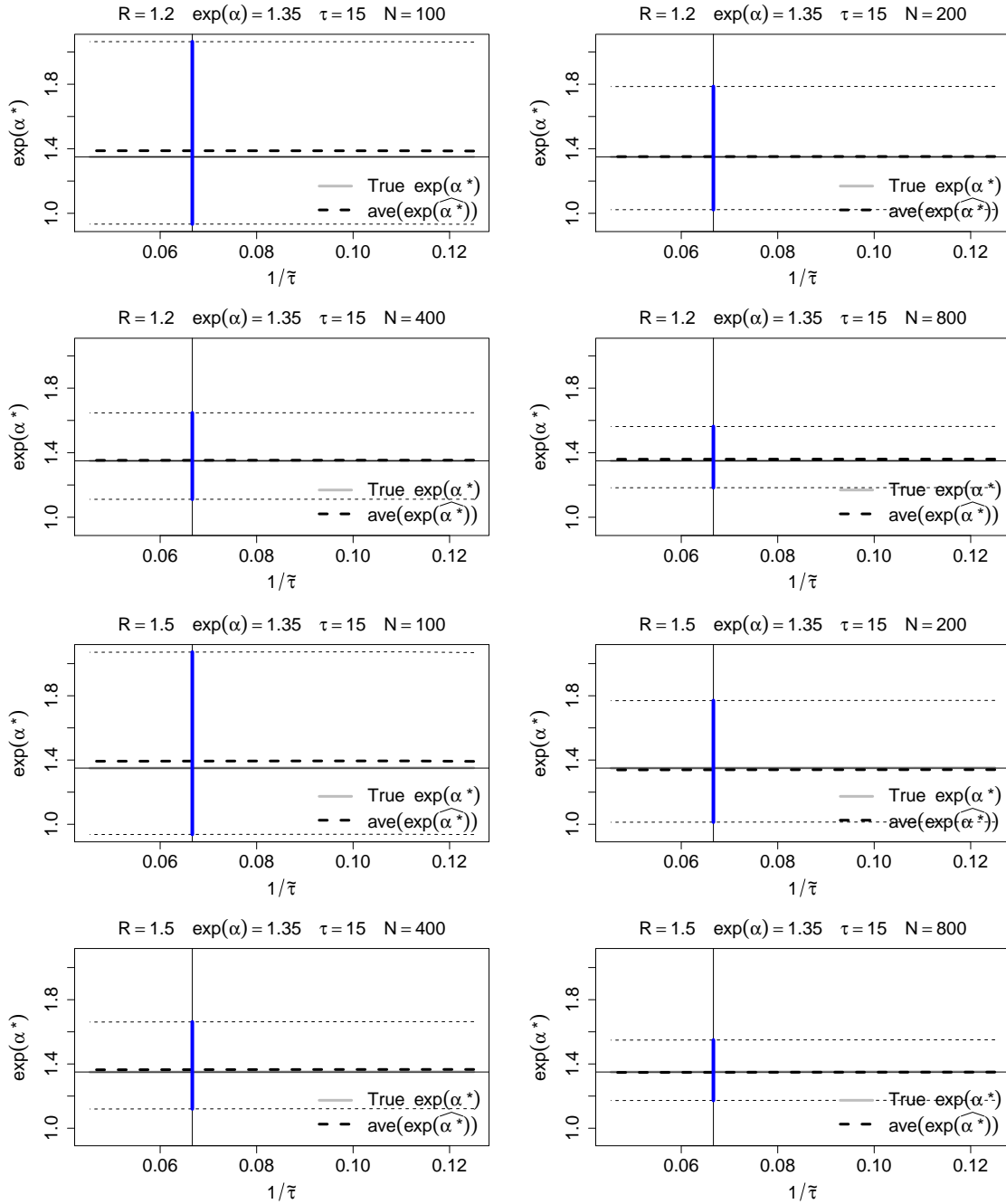


Figure 47: **Multiple Uniformly distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 15$. $R = 1.2$ and 1.5 displayed in the top and bottom panels, respectively.

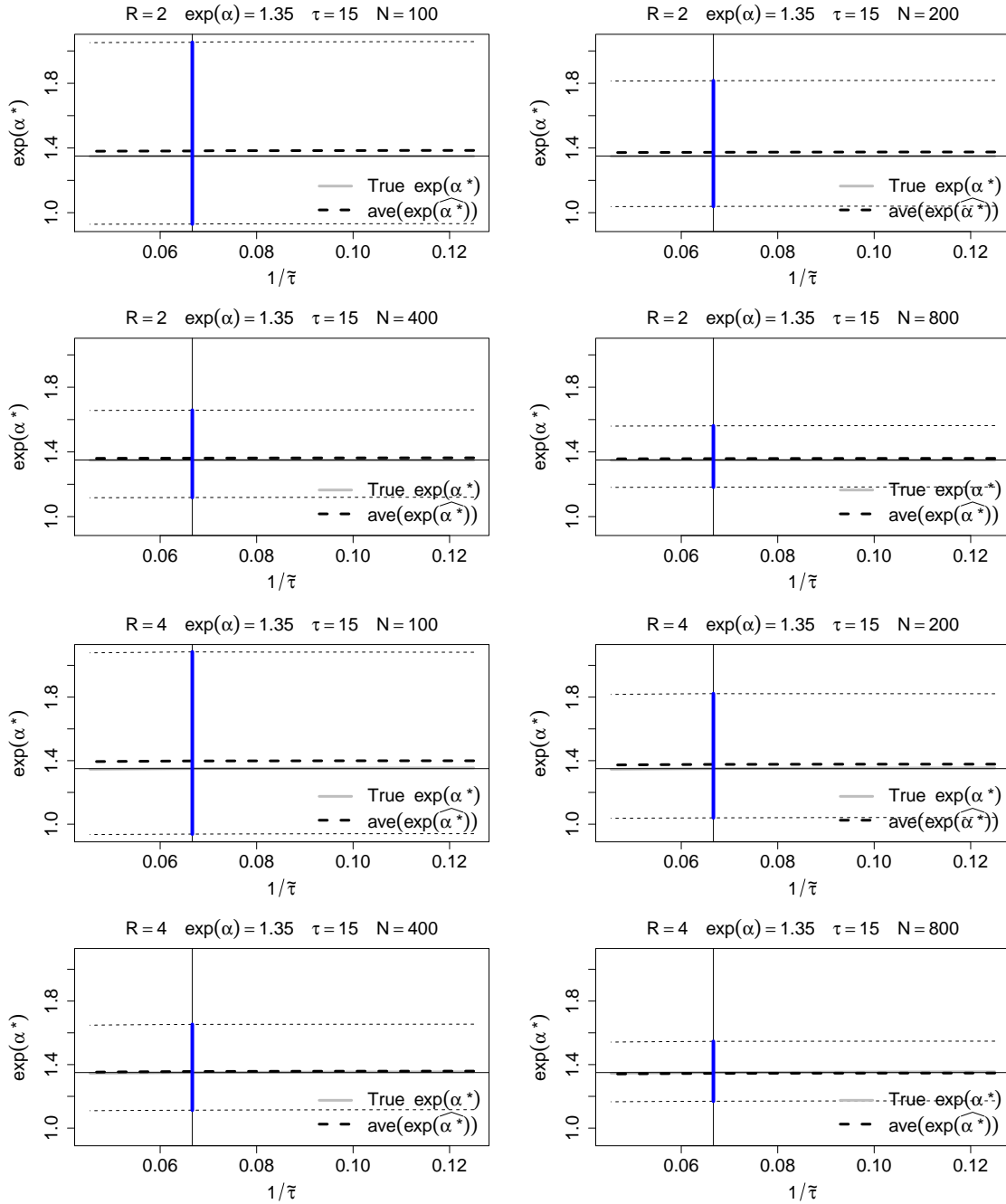


Figure 48: **Multiple Uniformly distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 15$. $R = 2$ and 4 displayed in the top and bottom panels, respectively.

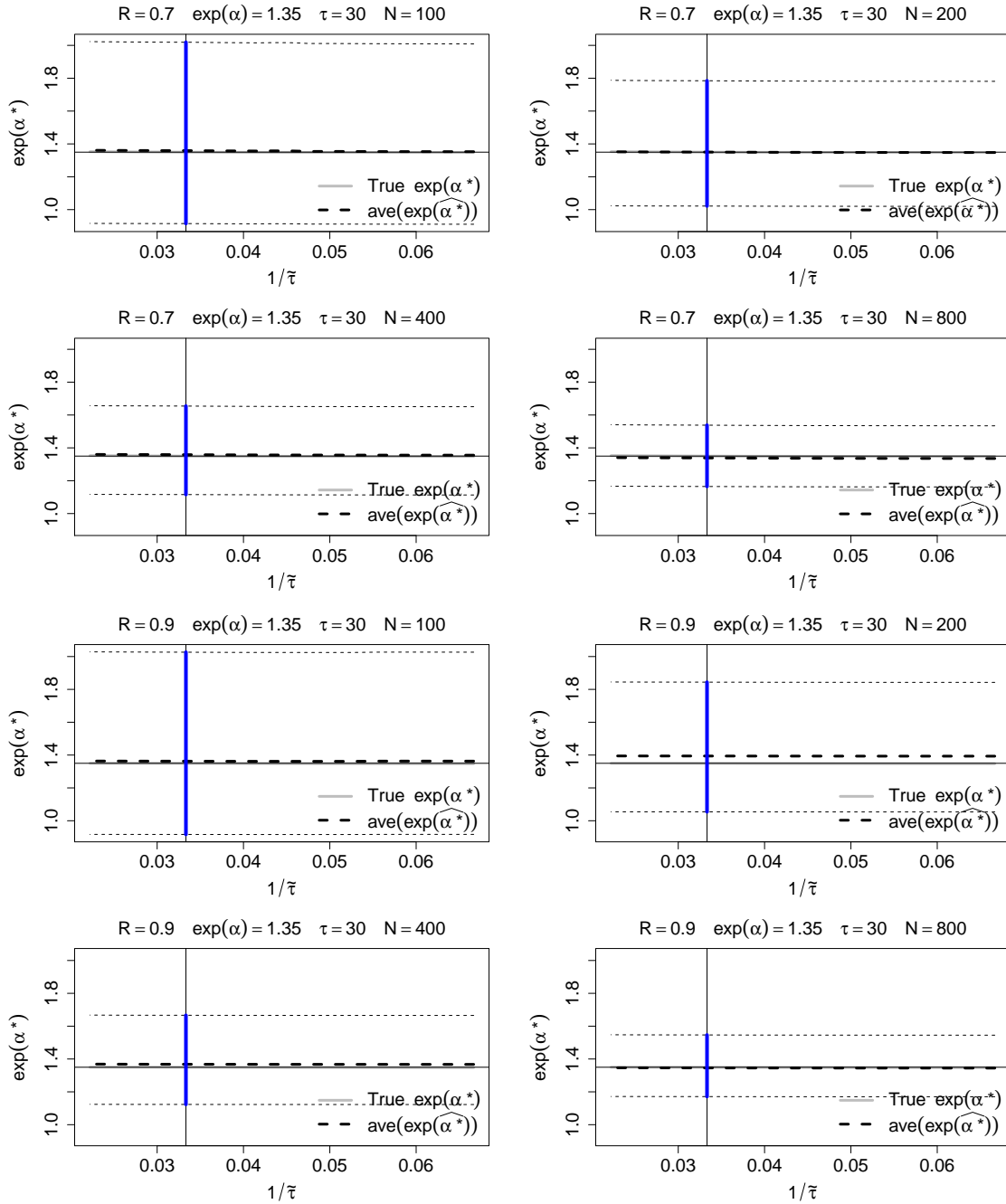


Figure 49: **Multiple Uniformly distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 30$; $R = 0.7$ and 0.9 displayed in the top and bottom panels, respectively.

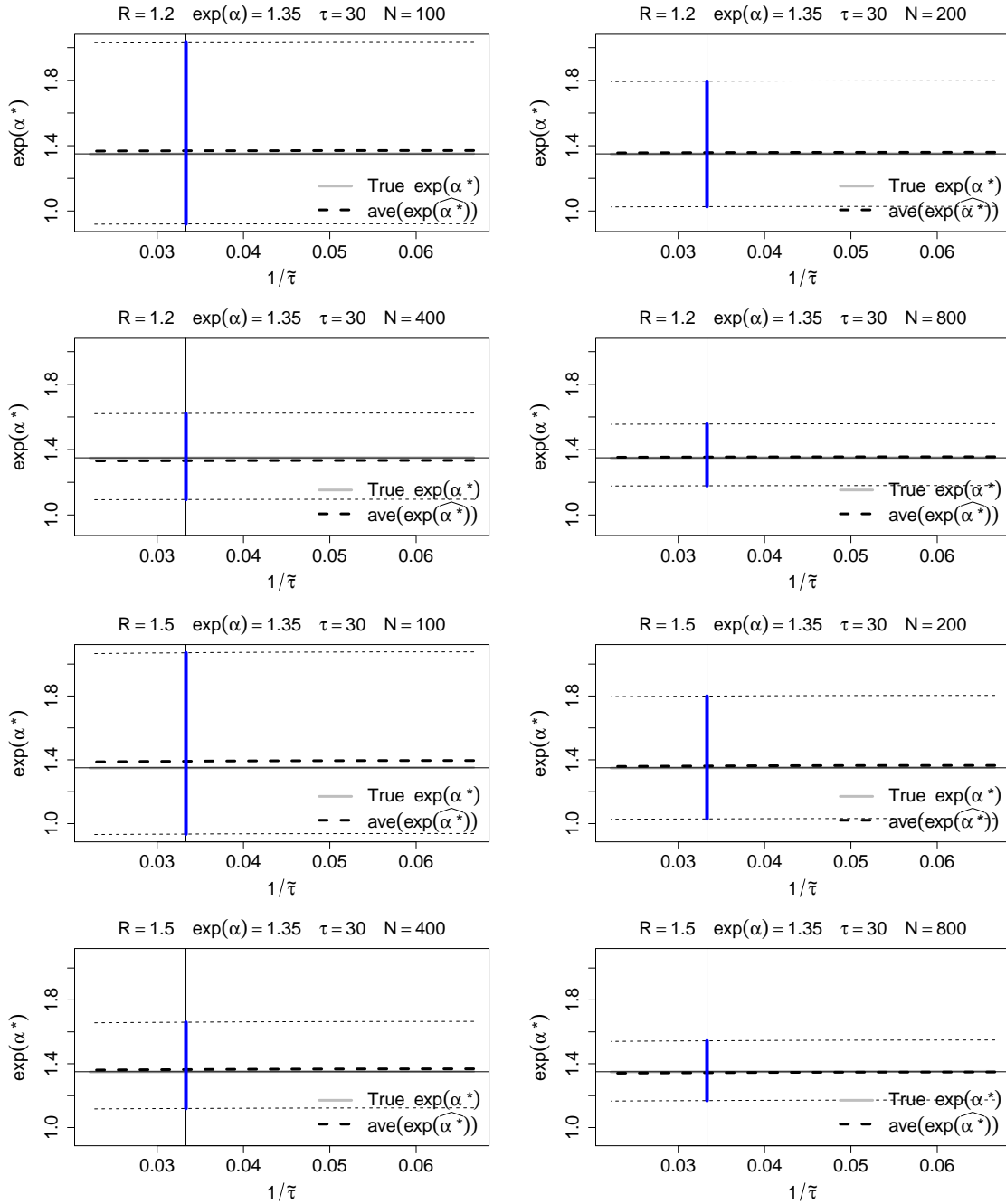


Figure 50: **Multiple Uniformly distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 30$. $R = 1.2$ and 1.5 displayed in the top and bottom panels, respectively.

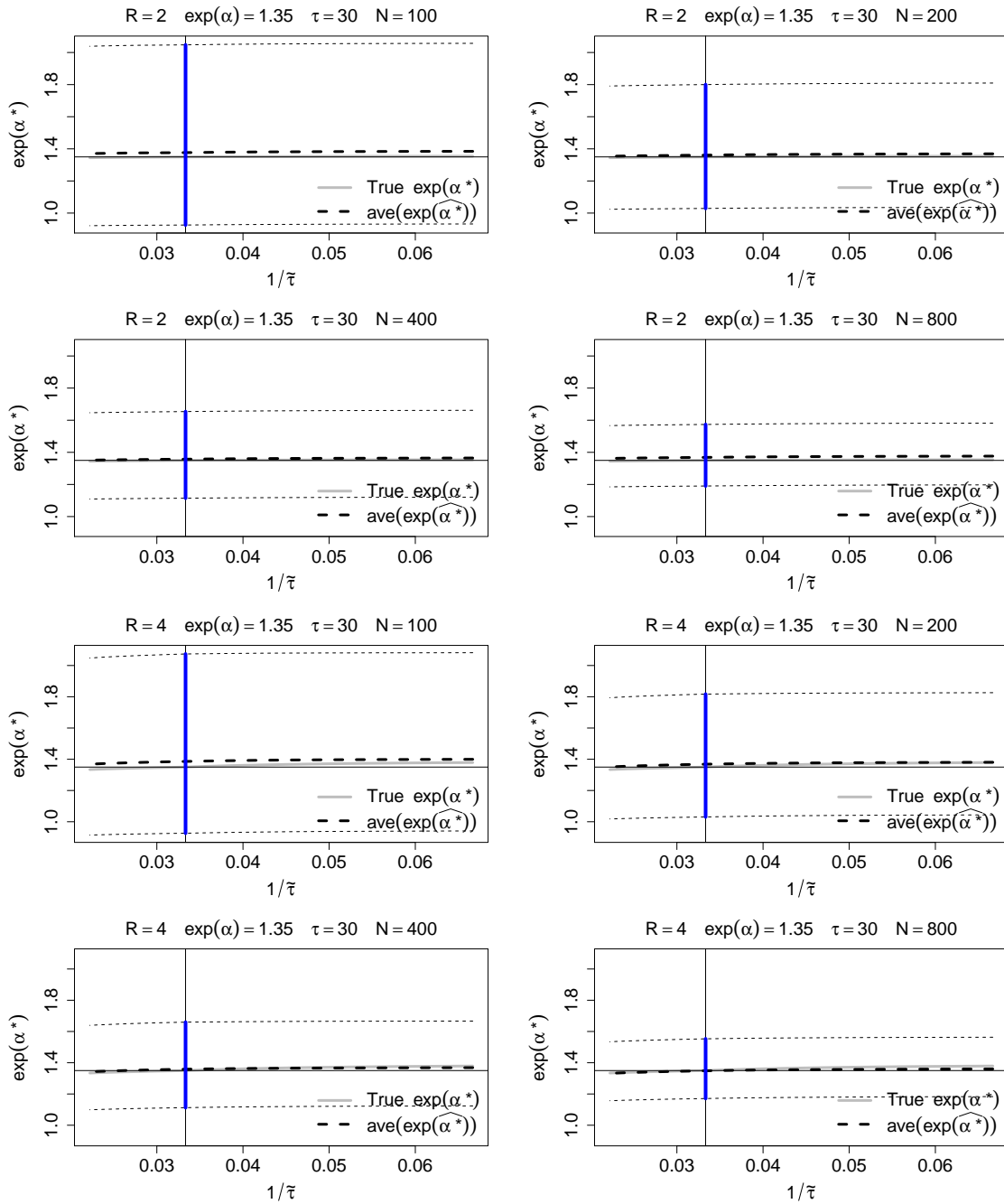


Figure 51: **Multiple Uniformly distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 30$. $R = 2$ and 4 displayed in the top and bottom panels, respectively.

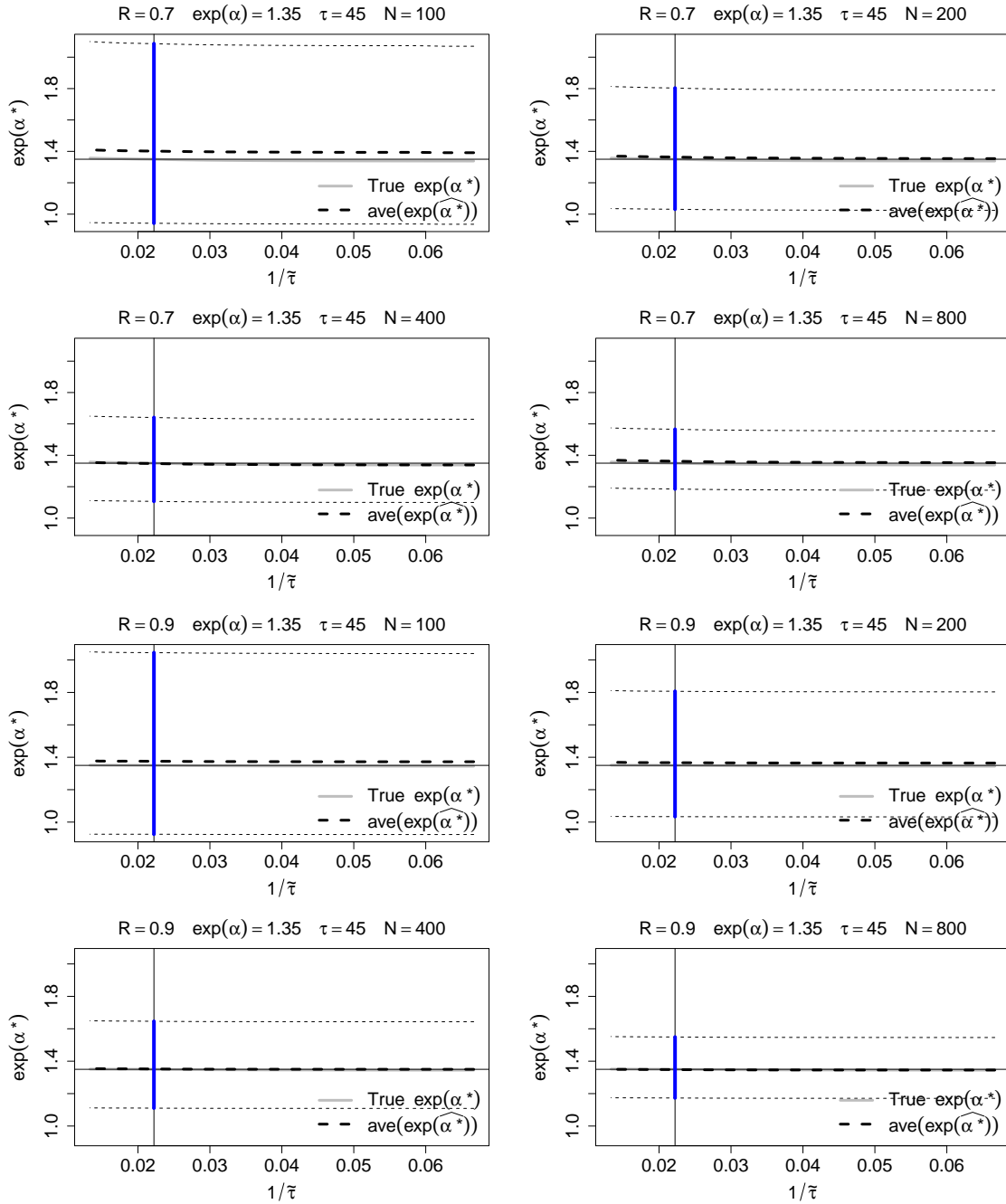


Figure 52: **Multiple Uniformly distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 45$; $R = 0.7$ and 0.9 displayed in the top and bottom panels, respectively.

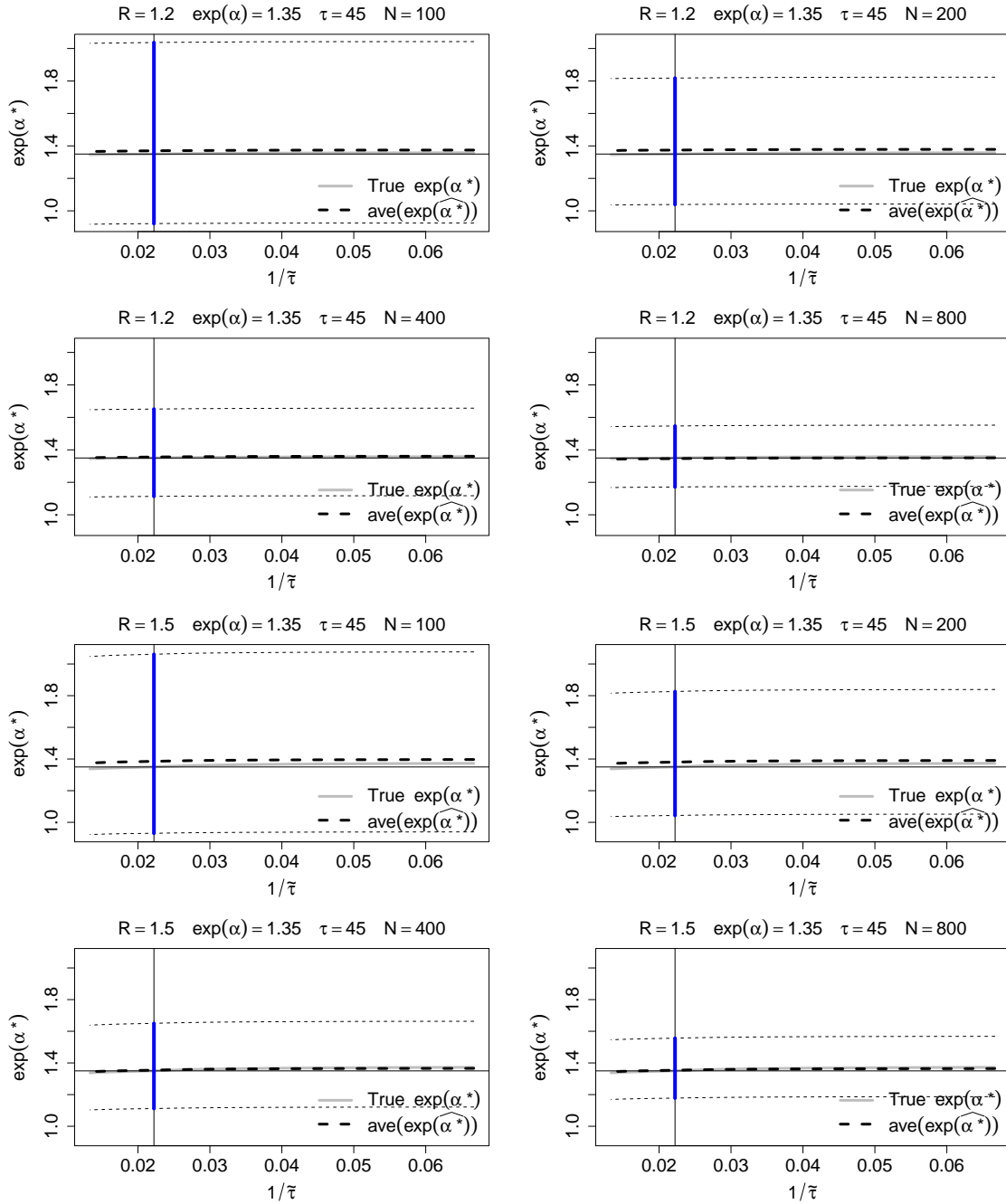


Figure 53: **Multiple Uniformly distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 45$. $R = 1.2$ and 1.5 displayed in the top and bottom panels, respectively.

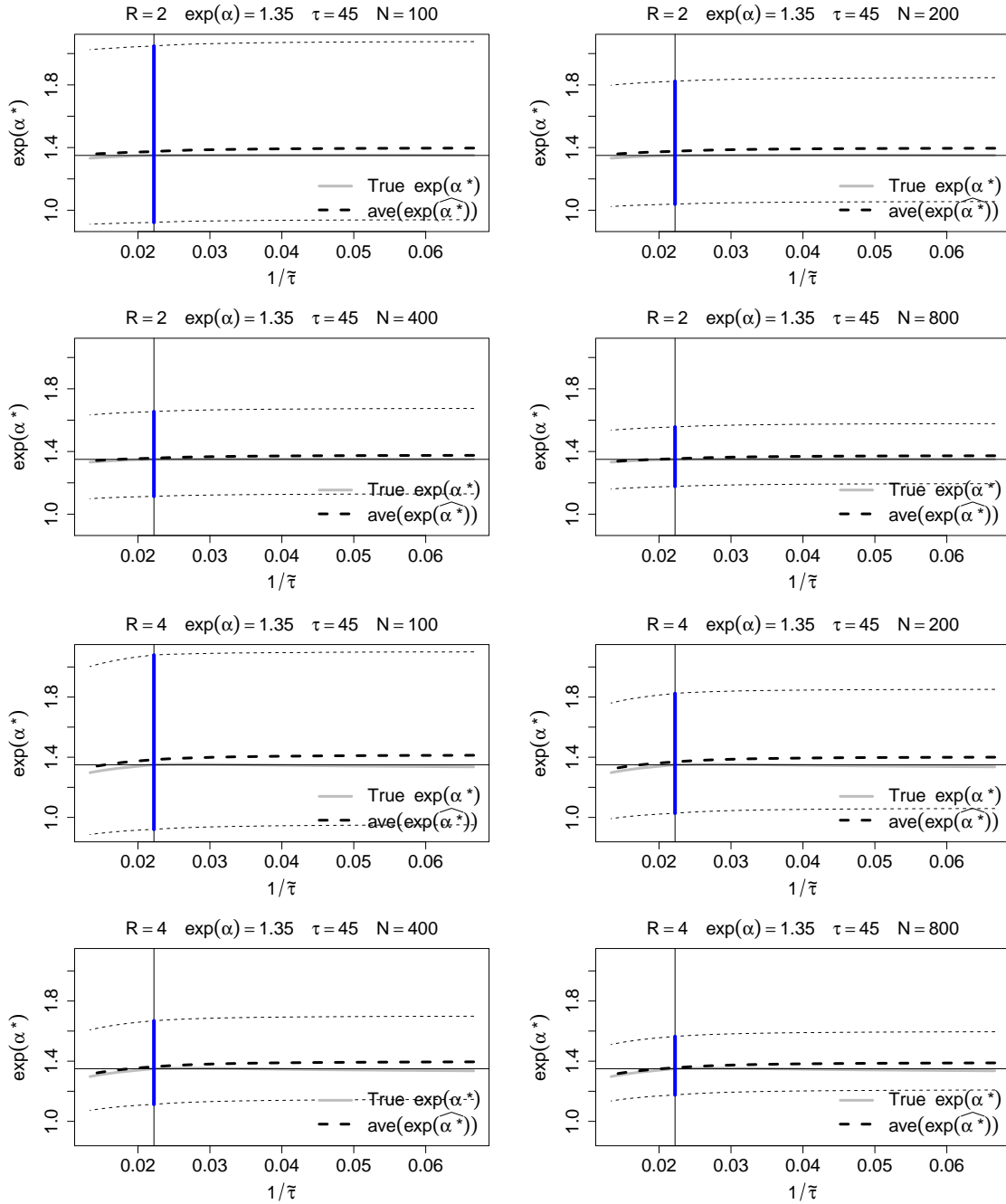


Figure 54: **Multiple Uniformly distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 45$. $R = 2$ and 4 displayed in the top and bottom panels, respectively.

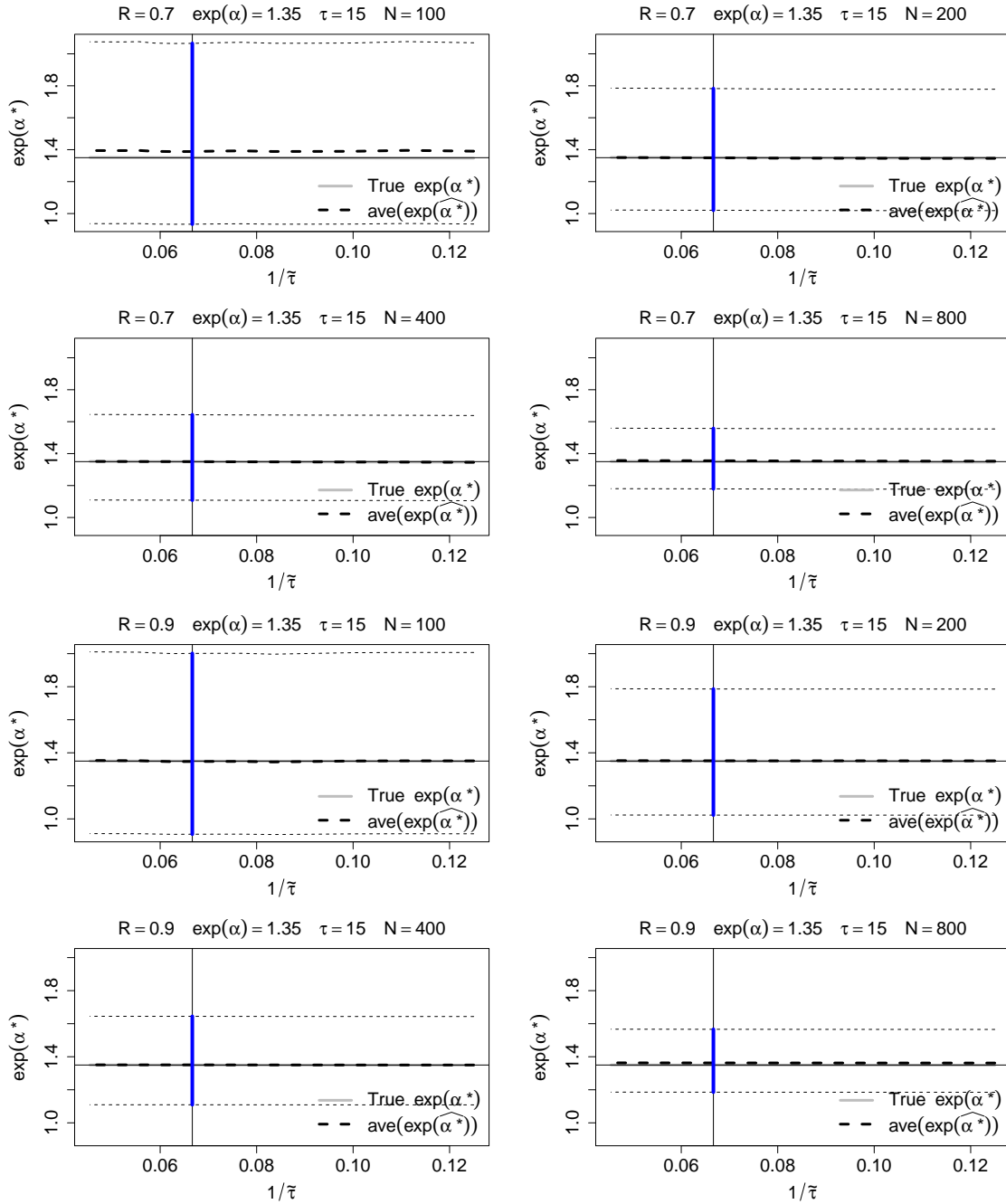


Figure 55: **Single Normally distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 15$; $R = 0.7$ and 0.9 displayed in the top and bottom panels, respectively.

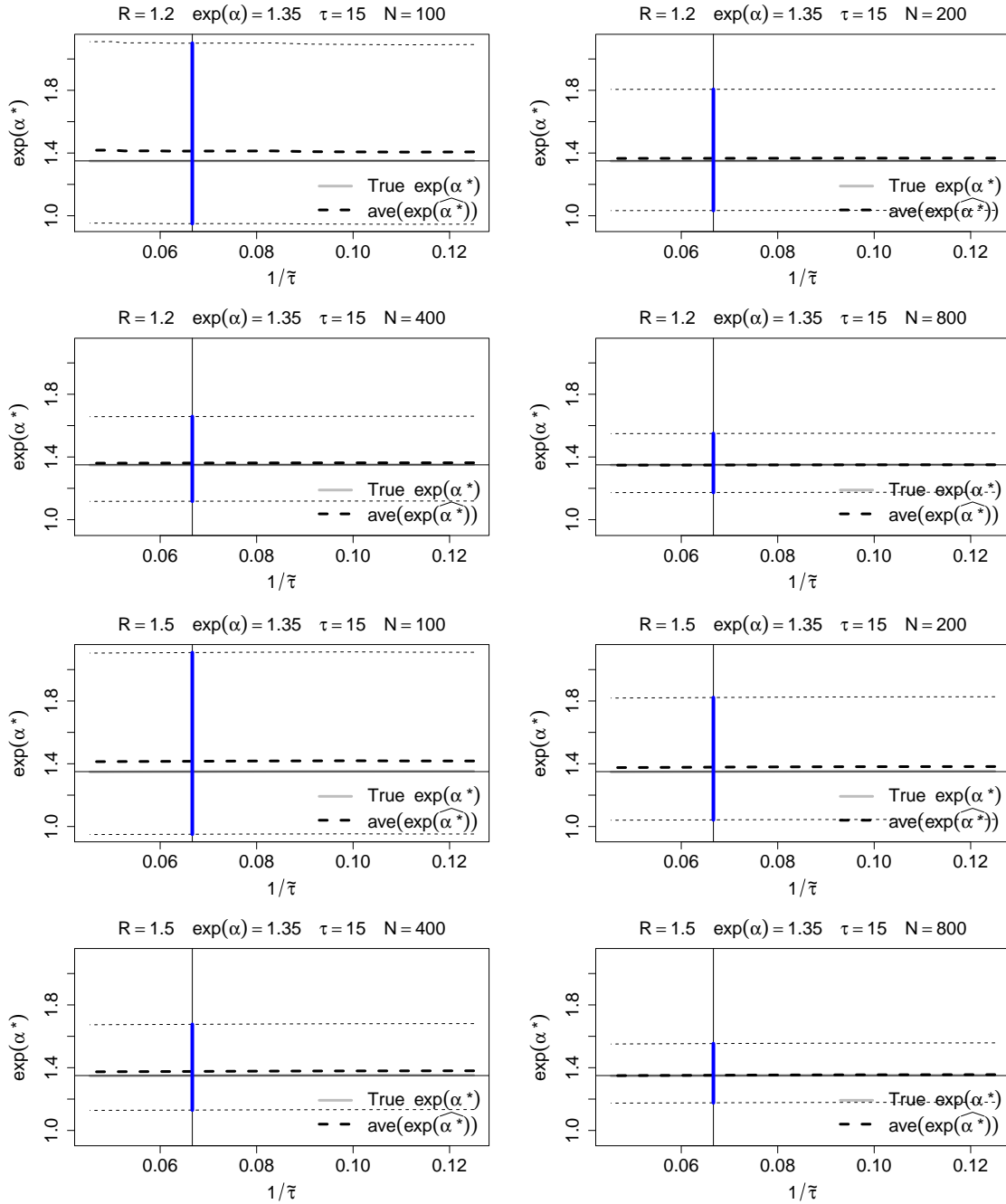


Figure 56: **Single Normally distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 15$. $R = 1.2$ and 1.5 displayed in the top and bottom panels, respectively.

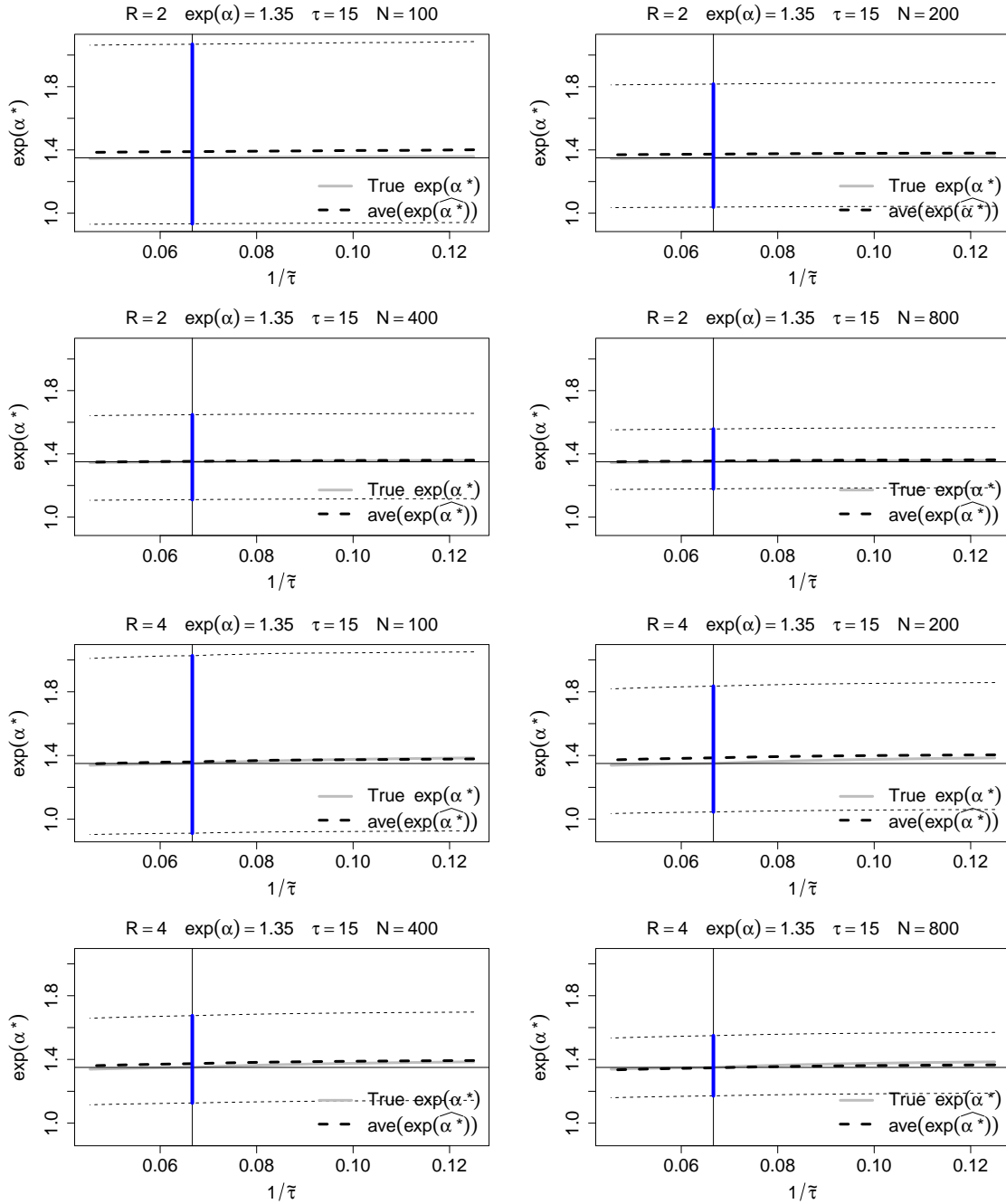


Figure 57: **Single Normally distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 15$. $R = 2$ and 4 displayed in the top and bottom panels, respectively.

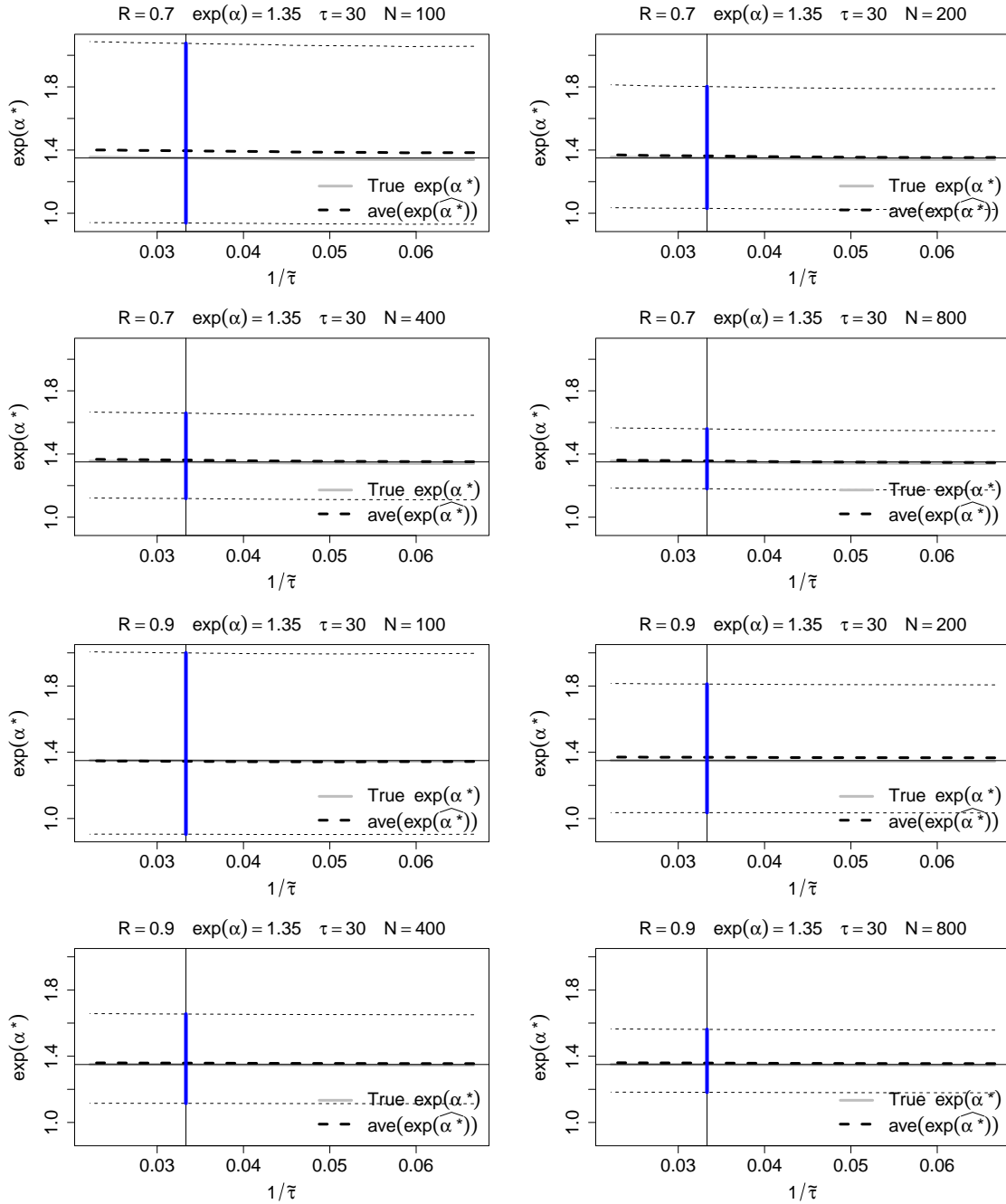


Figure 58: **Single Normally distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 30$; $R = 0.7$ and 0.9 displayed in the top and bottom panels, respectively.

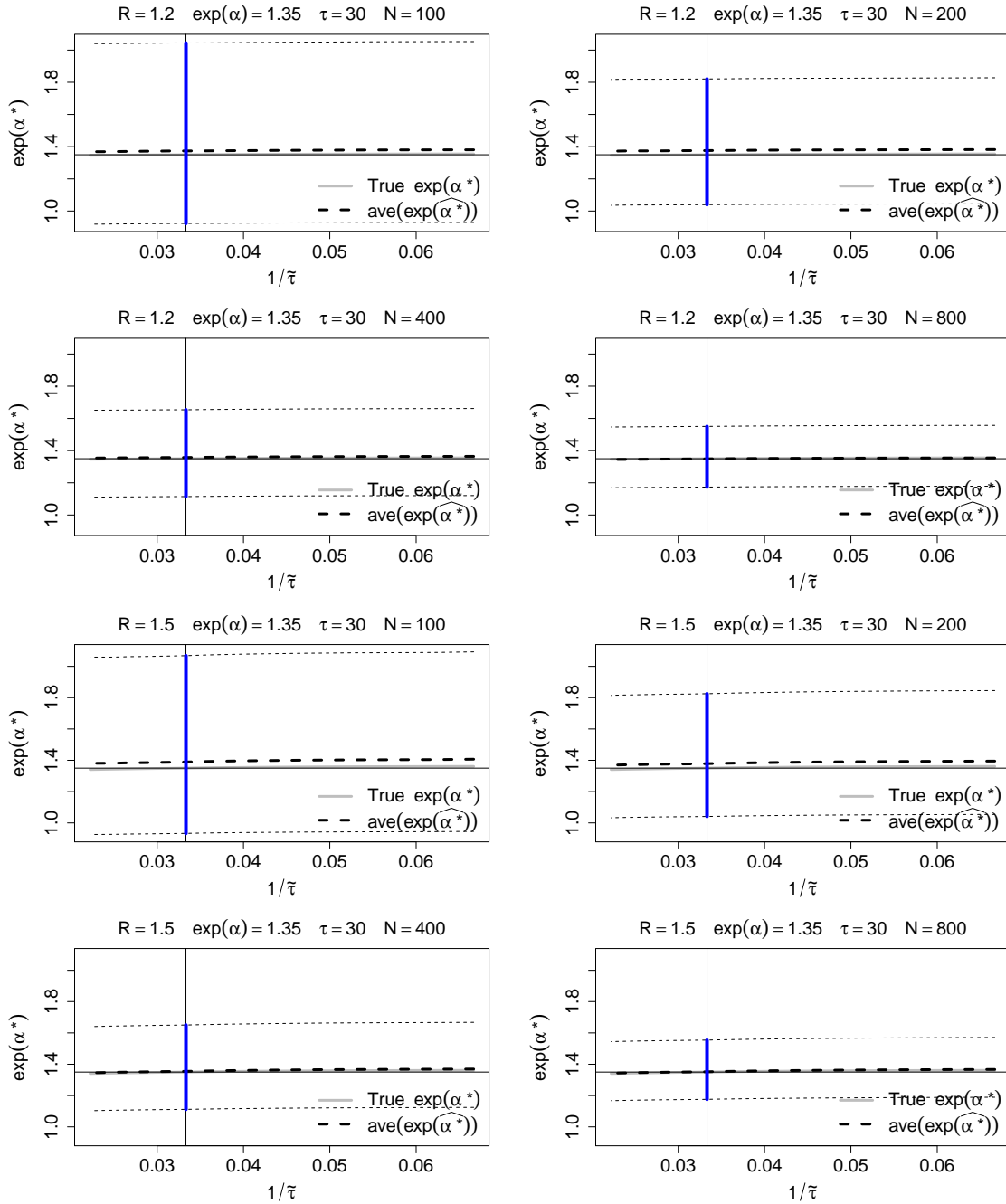


Figure 59: **Single Normally distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 30$. $R = 1.2$ and 1.5 displayed in the top and bottom panels, respectively.

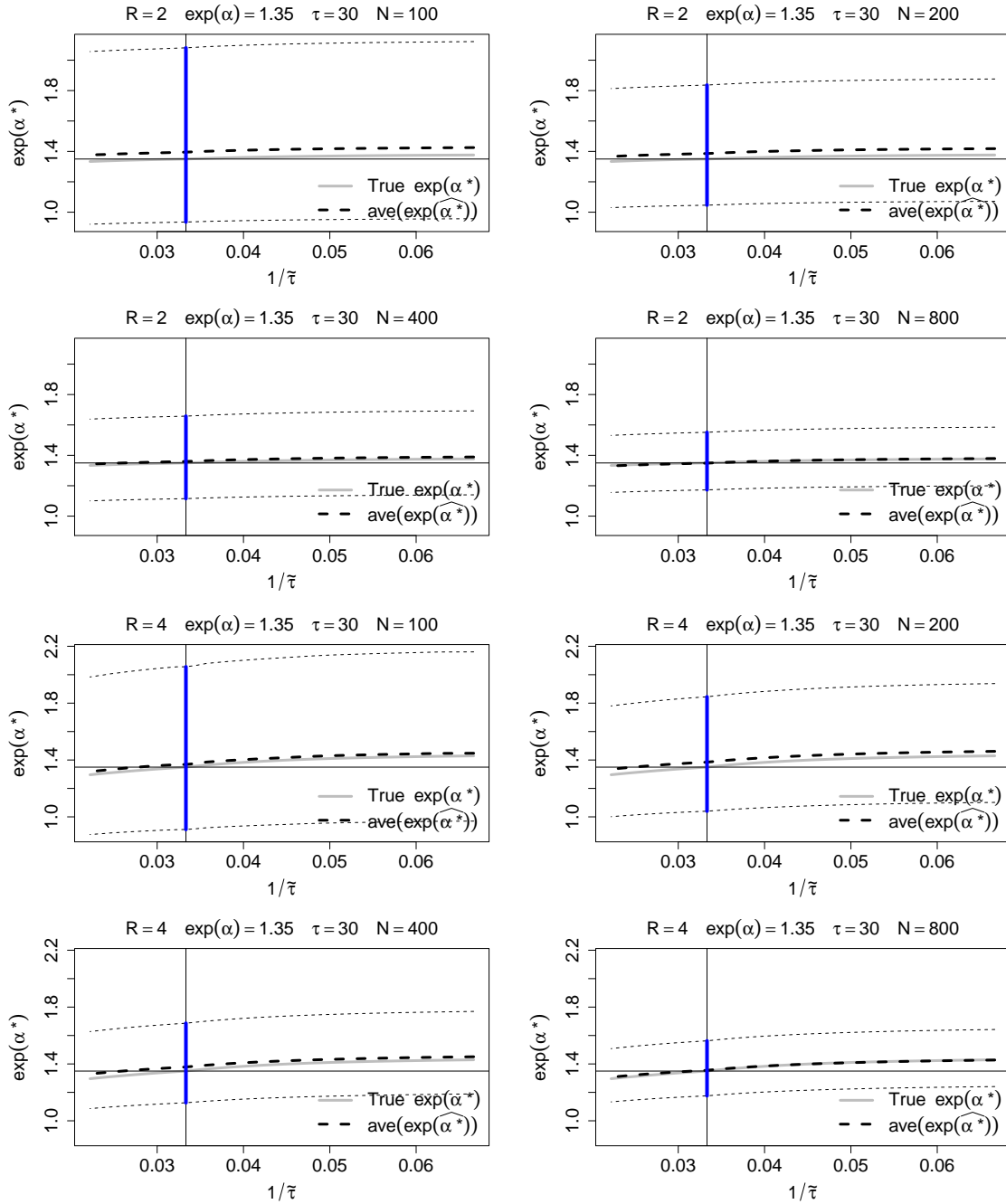


Figure 60: **Single Normally distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 30$. $R = 2$ and 4 displayed in the top and bottom panels, respectively.

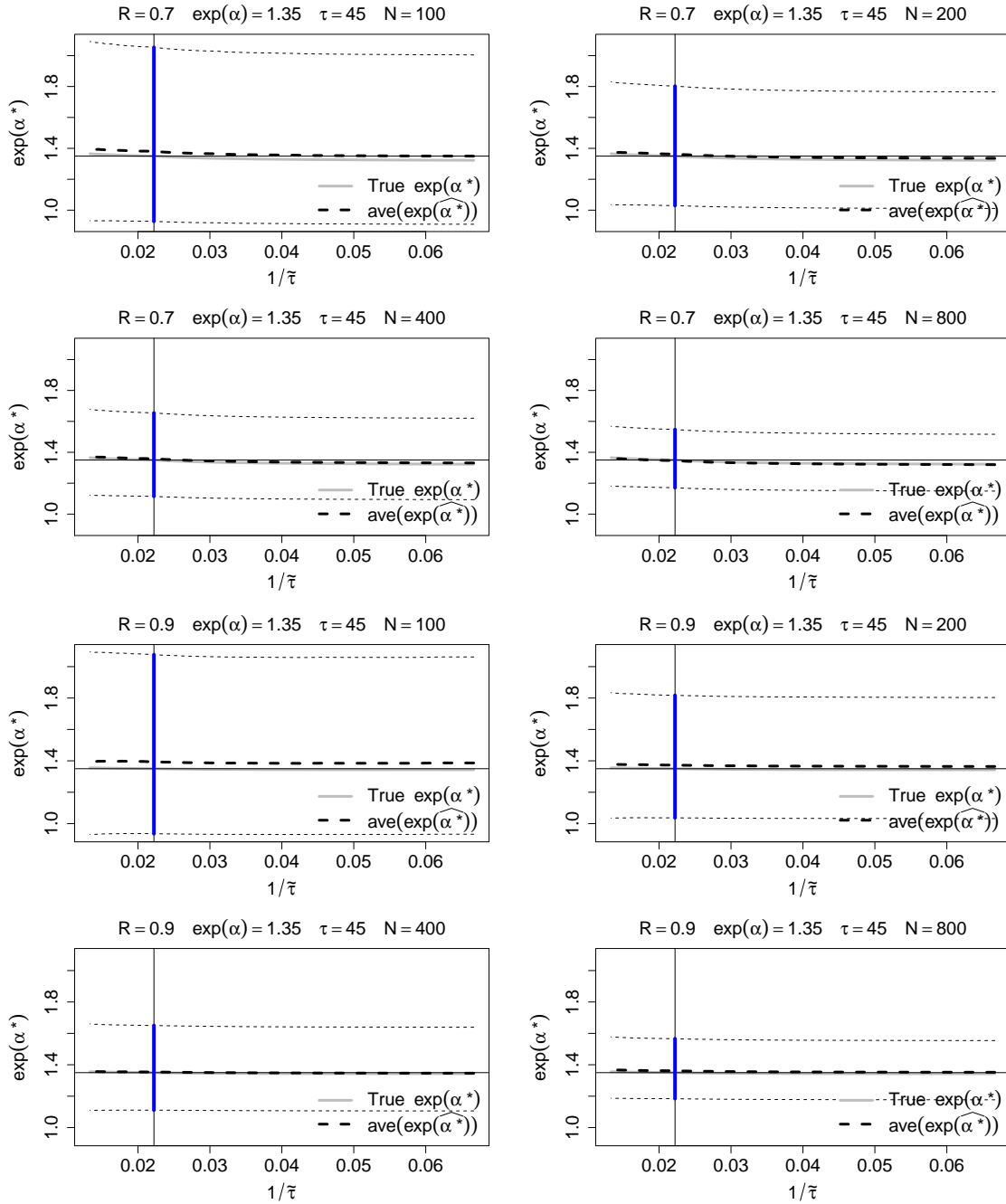


Figure 61: **Single Normally distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 45$; $R = 0.7$ and 0.9 displayed in the top and bottom panels, respectively.

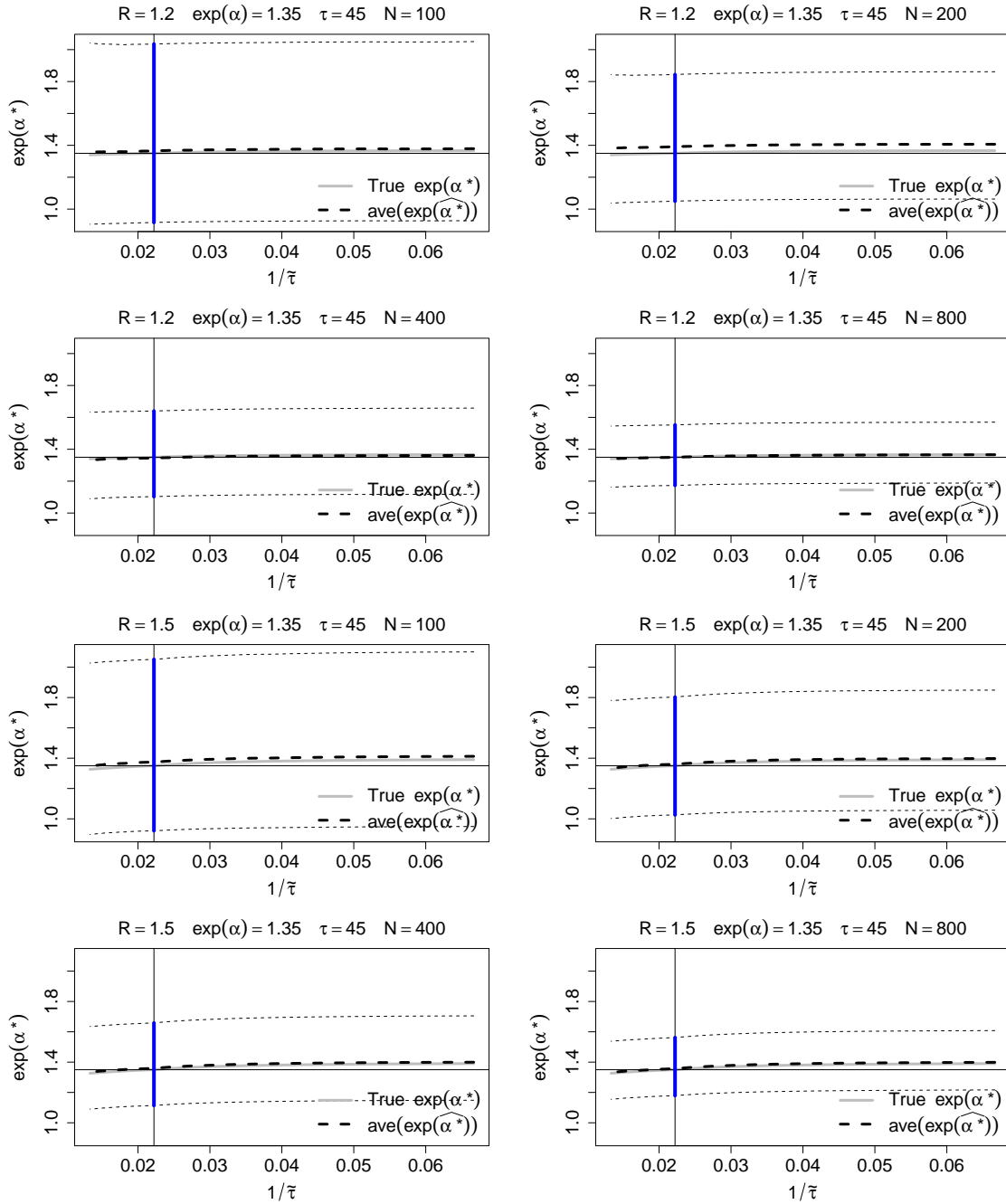


Figure 62: **Single Normally distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 45$. $R = 1.2$ and 1.5 displayed in the top and bottom panels, respectively.

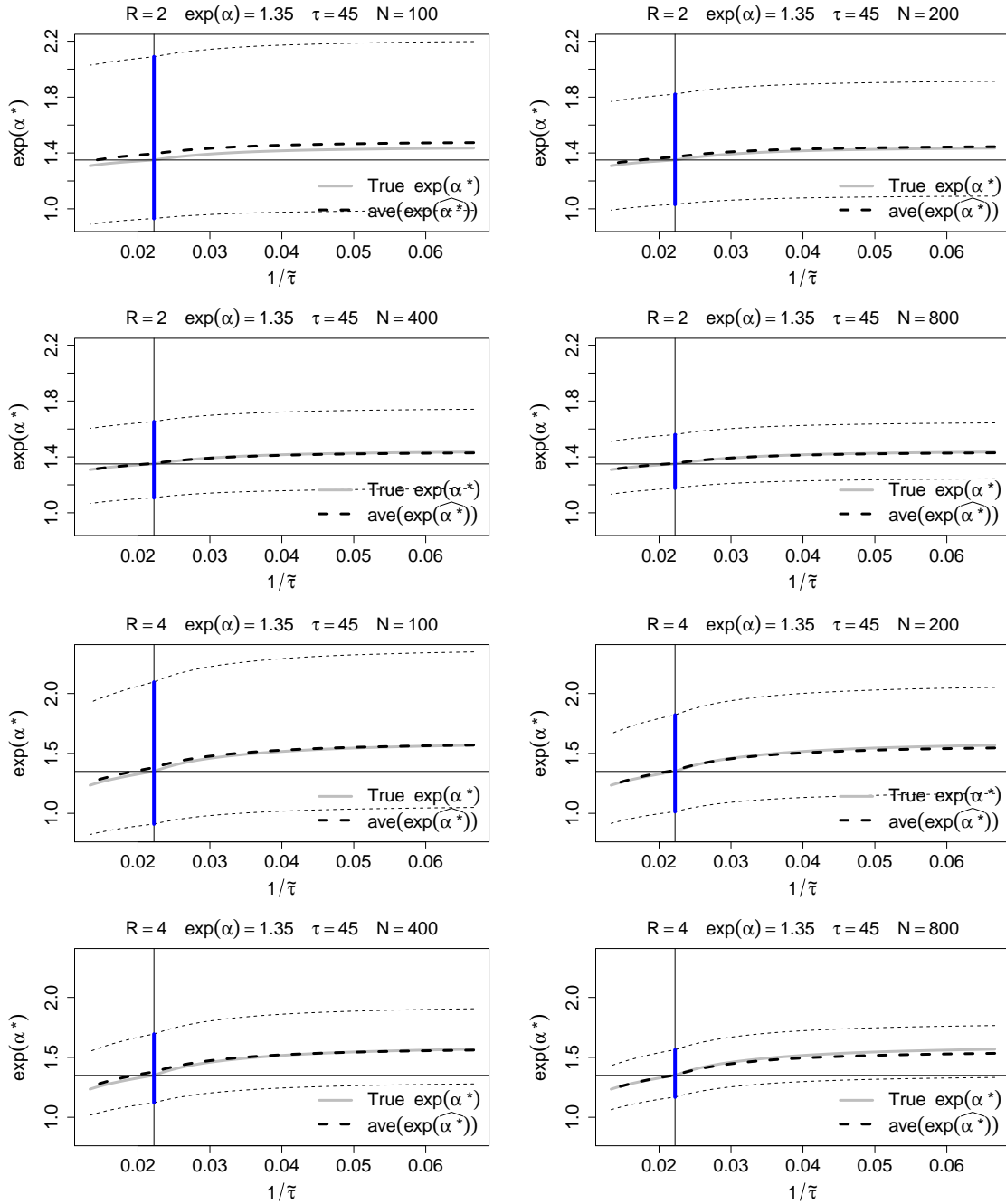


Figure 63: **Single Normally distributed exposure with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 45$. $R = 2$ and 4 displayed in the top and bottom panels, respectively.

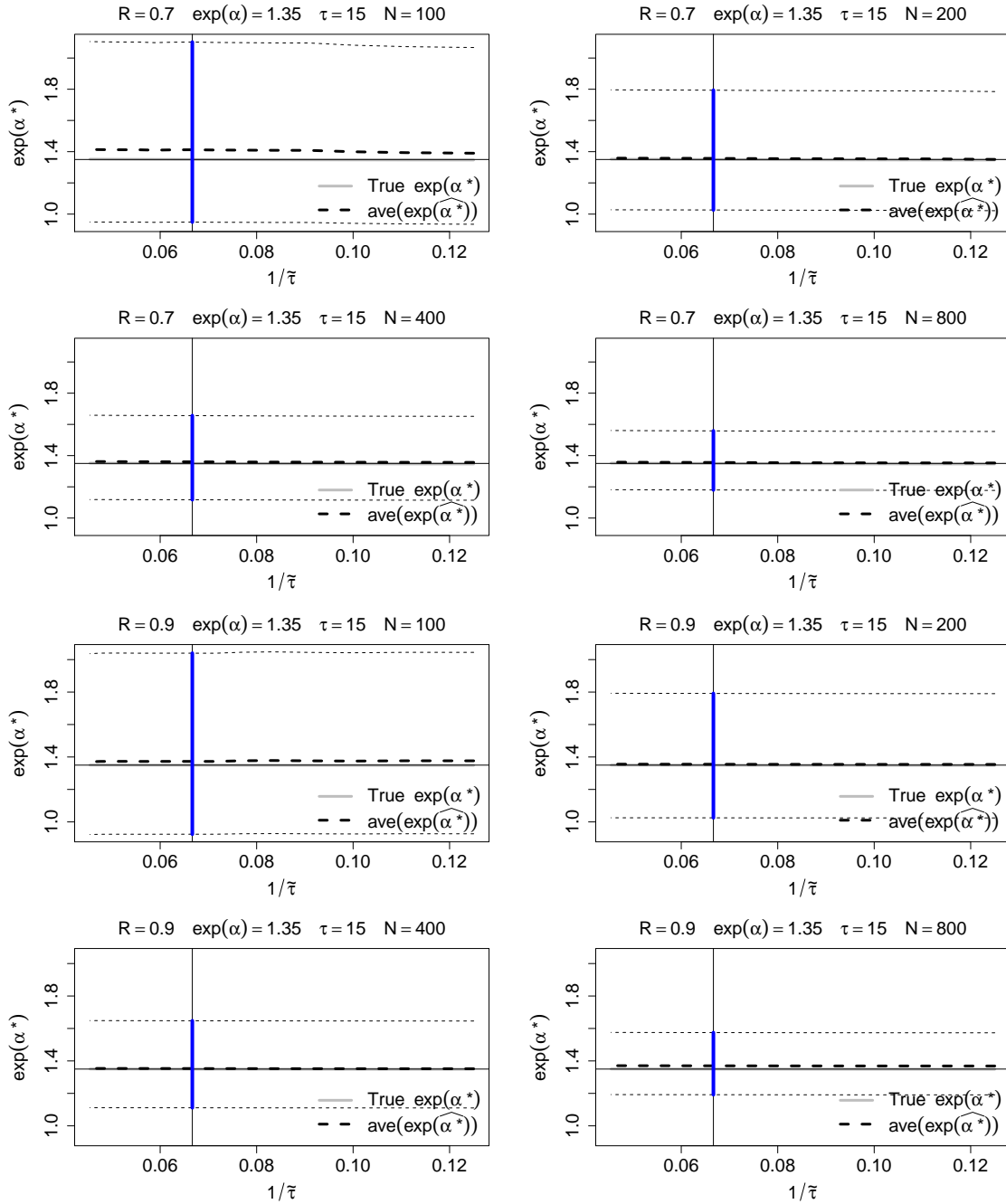


Figure 64: **Multiple Normally distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 15$; $R = 0.7$ and 0.9 displayed in the top and bottom panels, respectively.

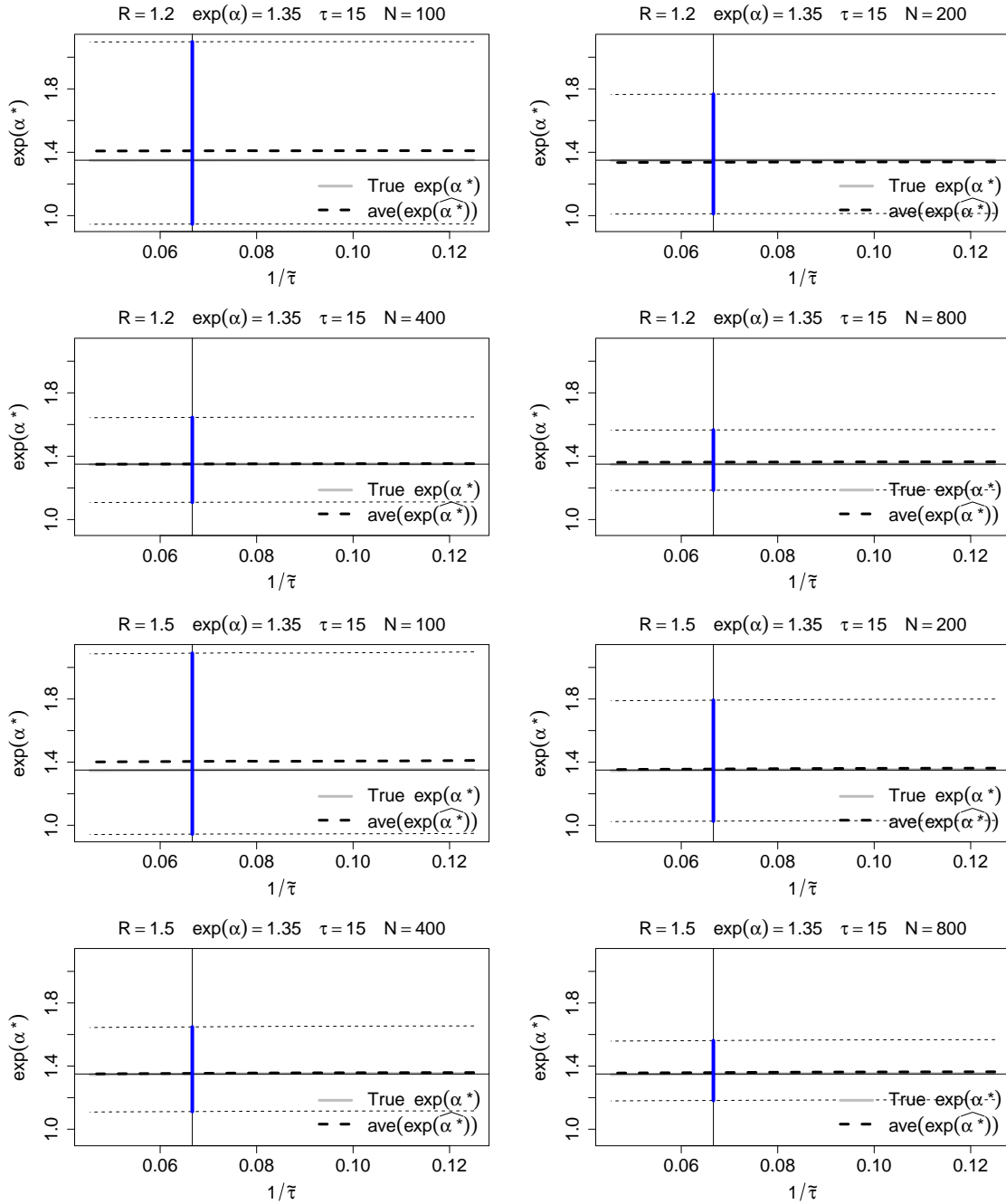


Figure 65: **Multiple Normally distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 15$. $R = 1.2$ and 1.5 displayed in the top and bottom panels, respectively.

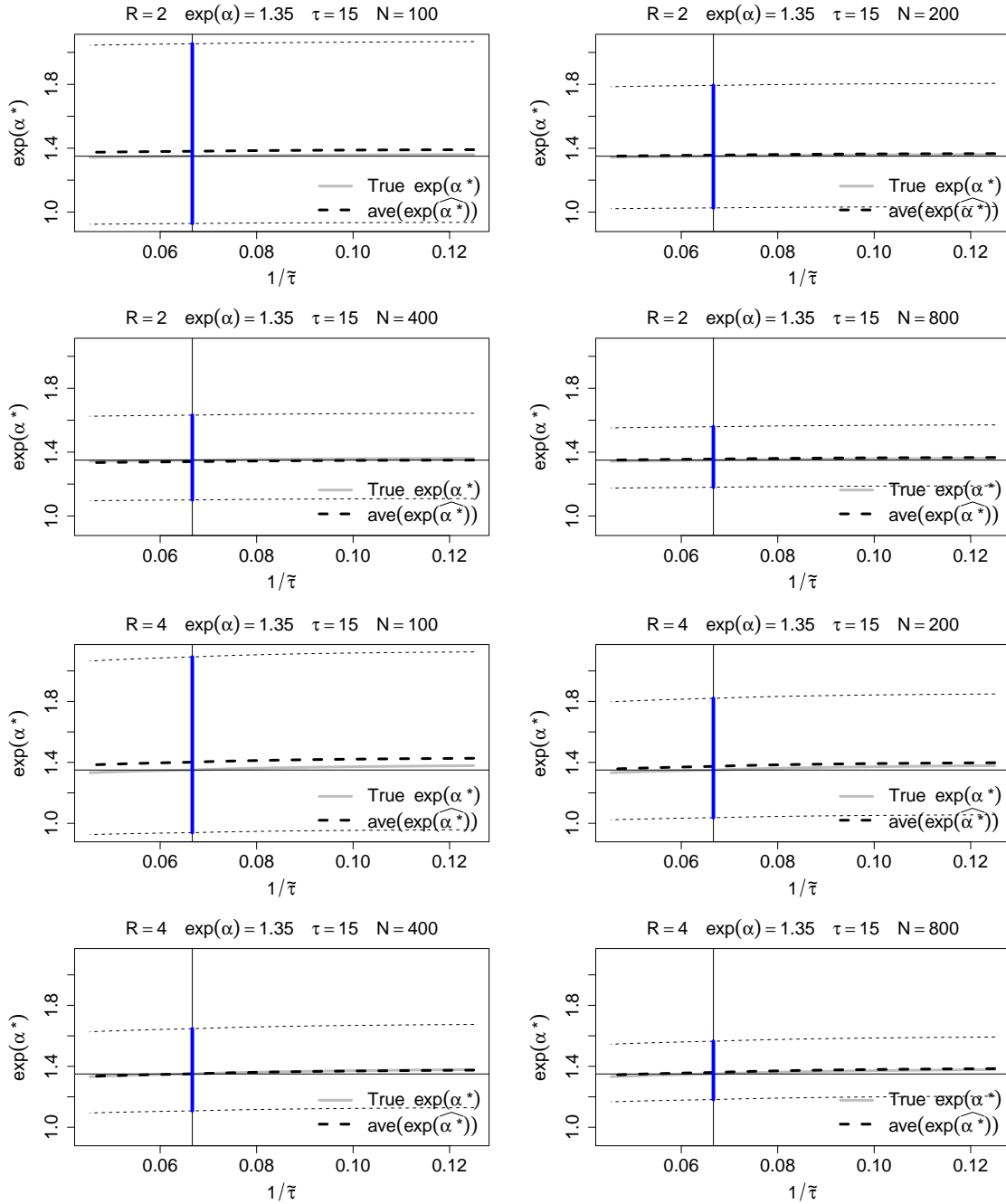


Figure 66: **Multiple Normally distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 15$. $R = 2$ and 4 displayed in the top and bottom panels, respectively.

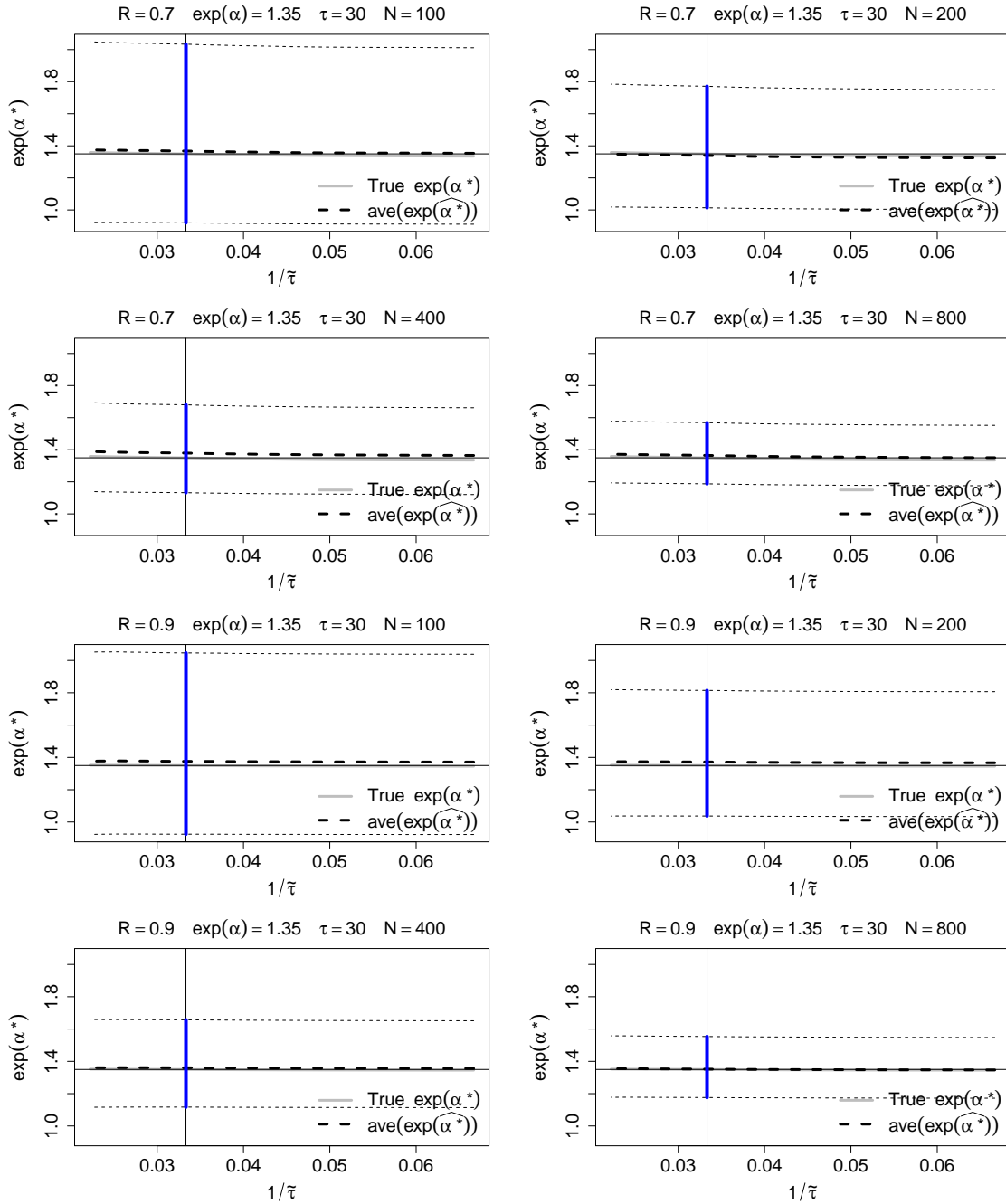


Figure 67: **Multiple Normally distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 30$; $R = 0.7$ and 0.9 displayed in the top and bottom panels, respectively.

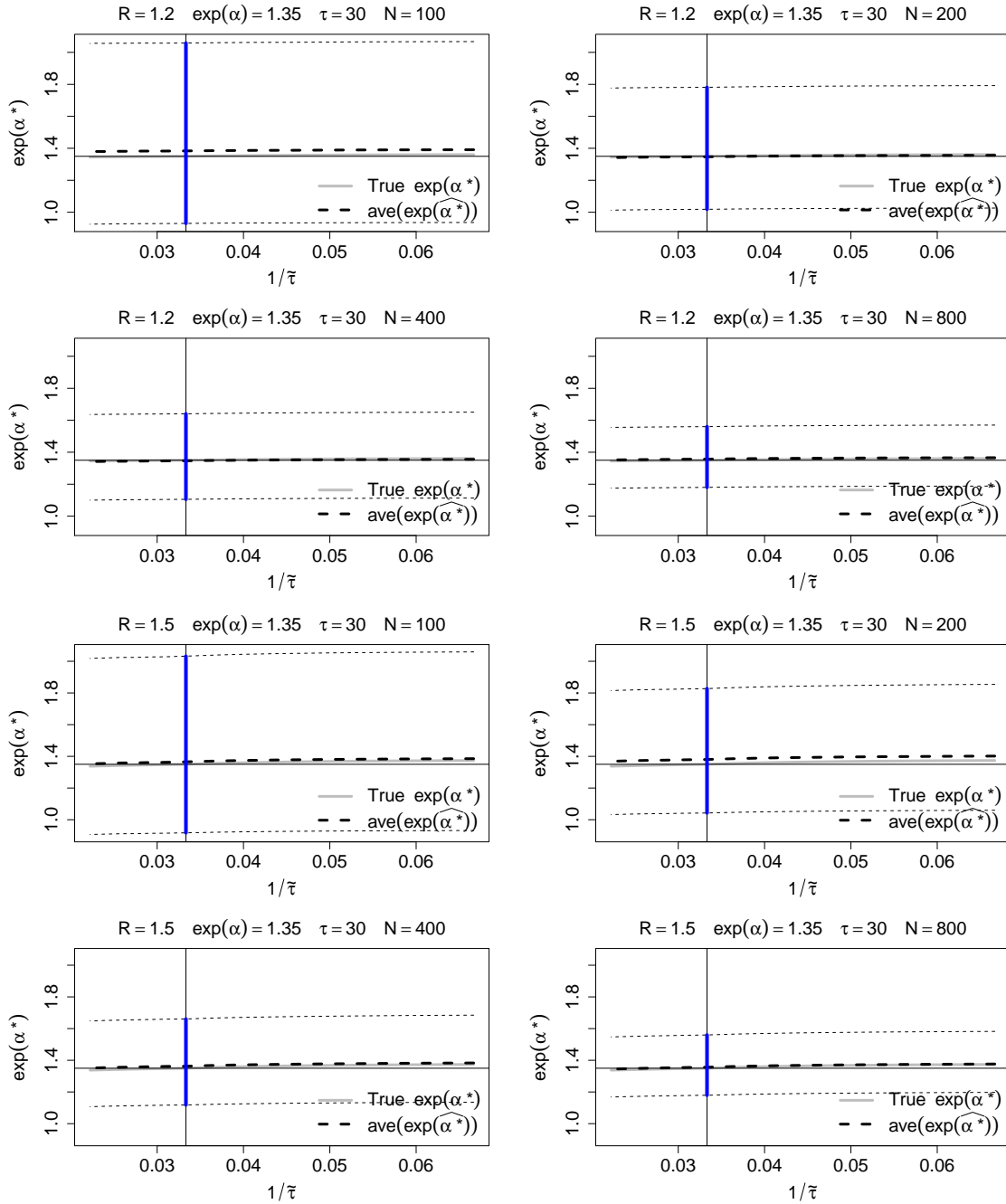


Figure 68: **Multiple Normally distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 30$. $R = 1.2$ and 1.5 displayed in the top and bottom panels, respectively.

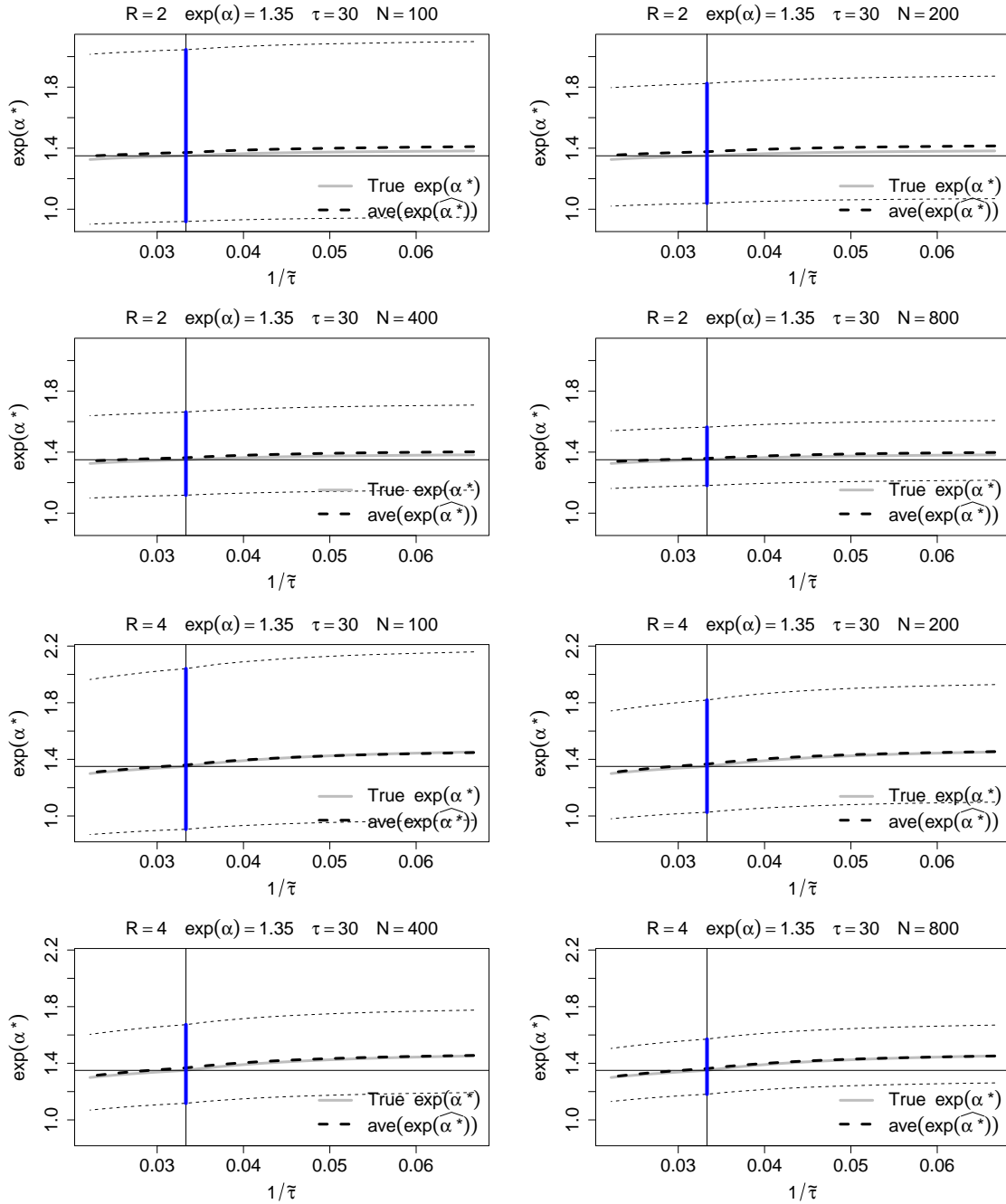


Figure 69: **Multiple Normally distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 30$. $R = 2$ and 4 displayed in the top and bottom panels, respectively.

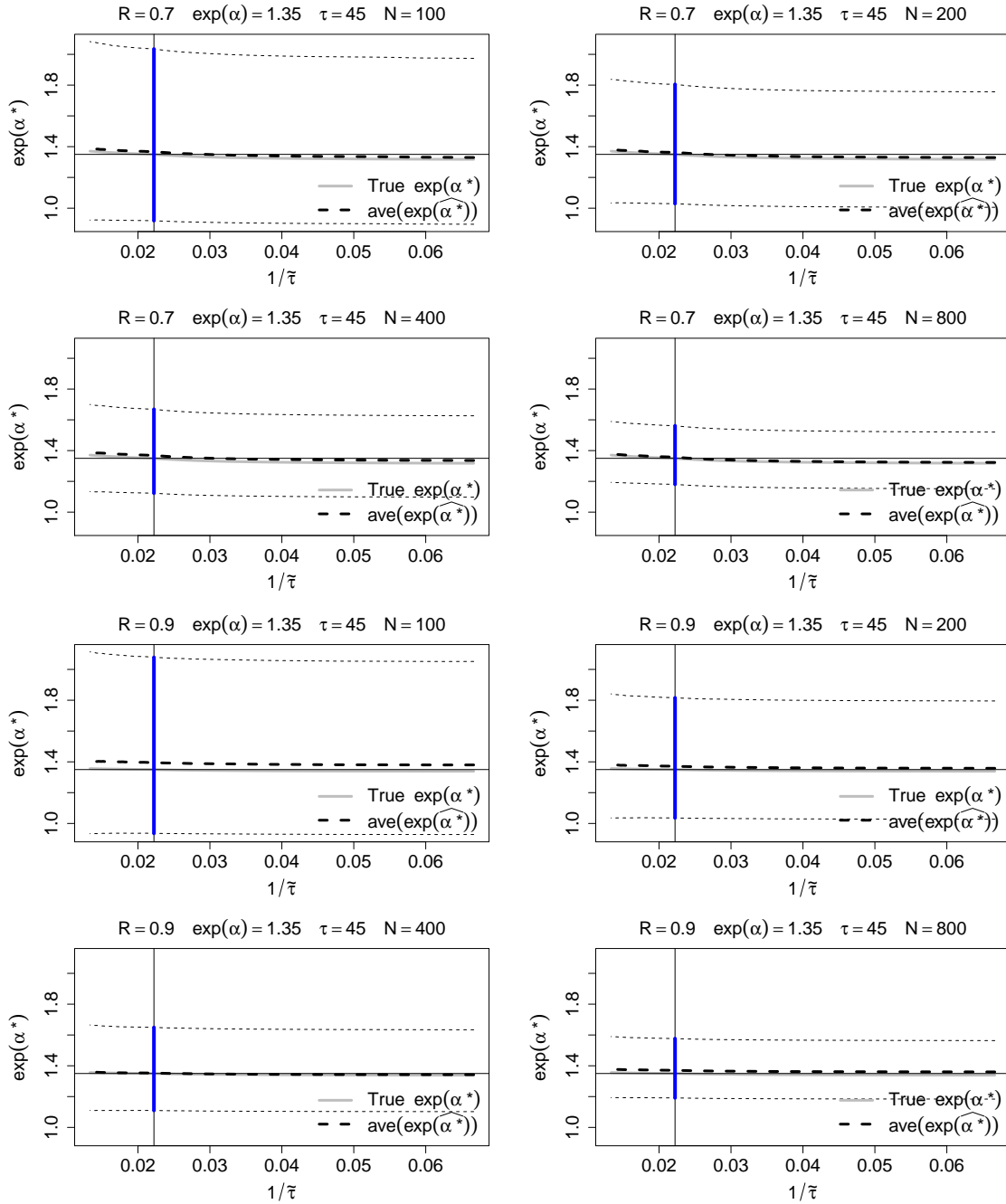


Figure 70: **Multiple Normally distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 45$; $R = 0.7$ and 0.9 displayed in the top and bottom panels, respectively.

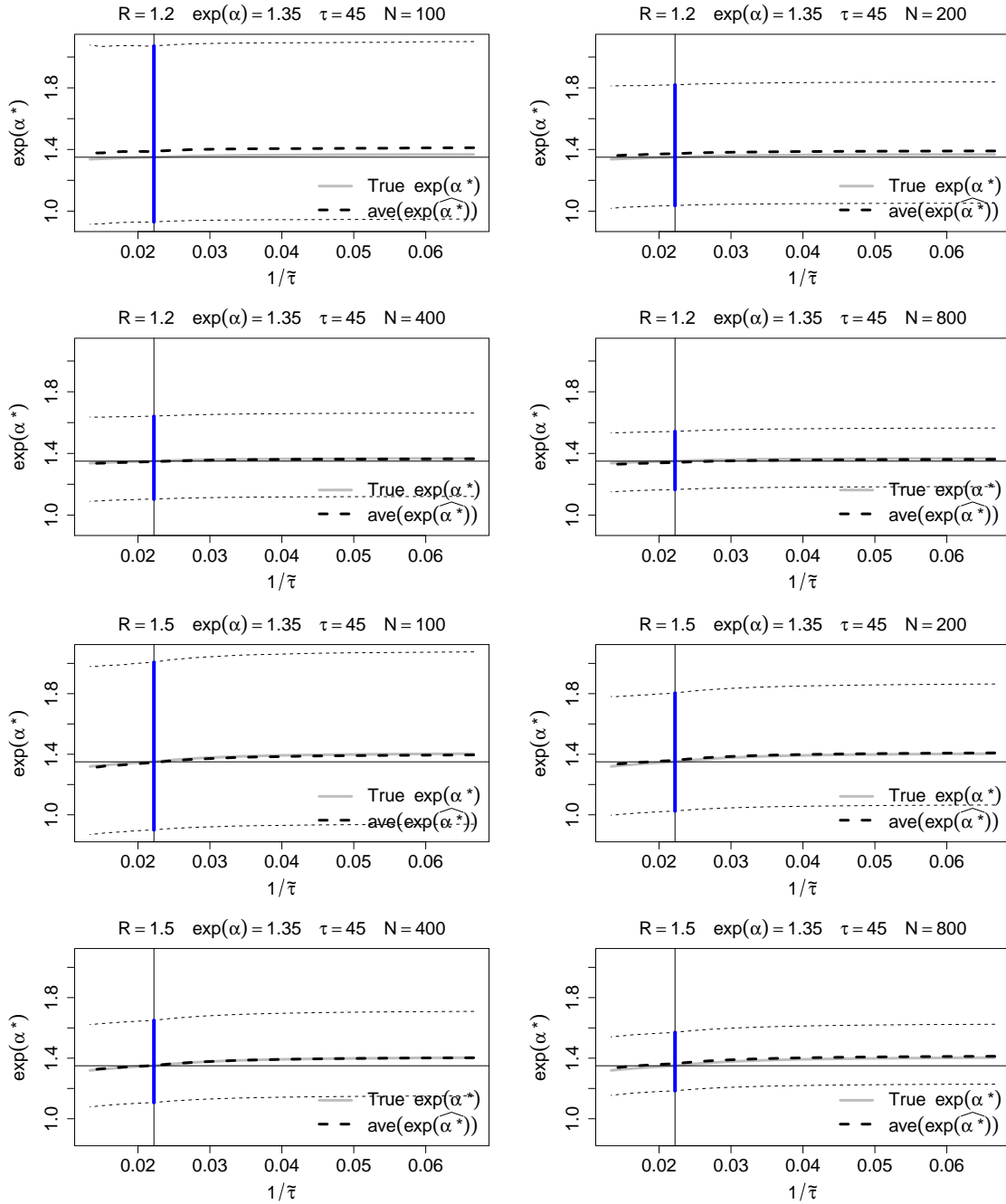


Figure 71: **Multiple Normally distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 45$. $R = 1.2$ and 1.5 displayed in the top and bottom panels, respectively.

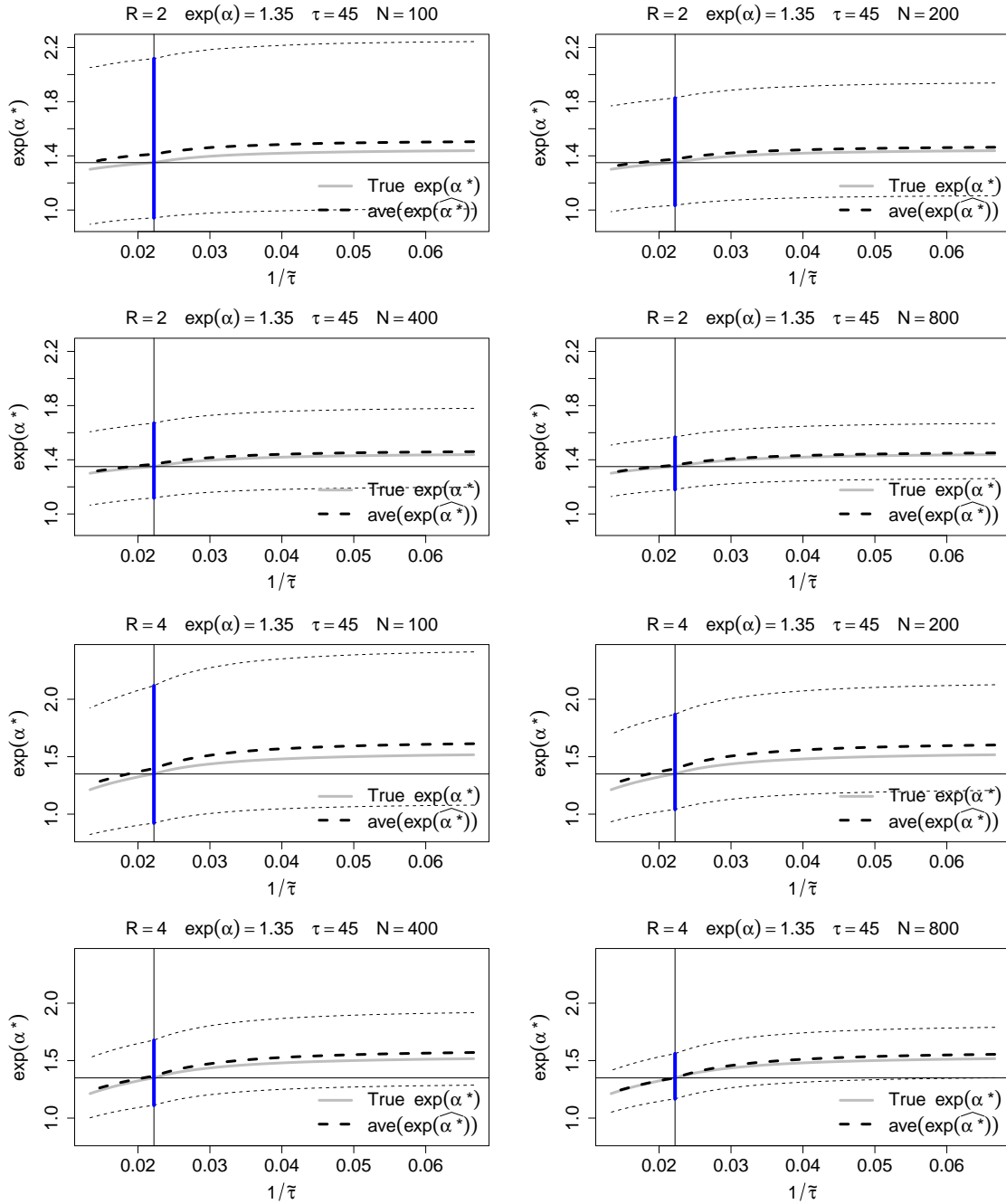


Figure 72: **Multiple Normally distributed exposures with one age effect.** Theoretical characterization of bias (solid gray) in the age effect estimate for varying (mis)specified risk period length, $\tilde{\tau}$. Dashed black curve denotes the naive SCCS estimate for a given risk period length along with 95% confidence interval; given are averages ($\text{ave}(\exp(\hat{\alpha}^*))$) over 200 simulated datasets. The true risk length is $\tau = 45$. $R = 2$ and 4 displayed in the top and bottom panels, respectively.