**Table 3.** Simulations’ results for the association between all-cause mortality and PM2.5. The true effects considered were 0.0100 for short –term exposure and 0.0686 for long-term per 10 μg/m3 increase in PM2.5.

|  |  |  |  |
| --- | --- | --- | --- |
|  | Model | Effect estimate for 10 μg/m3 increase in short-term exposure | Effect estimate for 10 μg/m3 increase in long-term exposure |
| $$\hat{β\_{1}}×10$$$$(se(\hat{β\_{1}}) ×10)$$ | Bias(%) | Coverage probability(%) | Power(%) | $$\hat{β\_{2}}×10$$$$(se(\hat{β\_{2}}) ×10)$$ | Bias(%) | Coverage Probability(%) | Power(%) |
| **Urban / Suburban** | Land Use Regression | 0.01166 (0.00642) | **16.6** | 94.8 | 43.7 | 0.02360 (0.14455) | -65.6 | 89.9 | 8.9 |
| Dispersion | 0.00799 (0.00356) | -20.1 | 90.8 | 60.2 | 0.02927 (0.15825) | -57.3 | 90.4 | 8.6 |
| Machine learning methods | 0.00909 (0.00404) | -9.1 | 94.2 | 62.1 | 0.04061 (0.20439) | -40.8 | 86.0 | 15.3 |
| Hybrid 1 | 0.01035 (0.00459) | **3.5** | 95.3 | 60.0 | 0.02170 (0.14578) | -68.4 | 91.9 | 8.0 |
| Hybrid 2 | 0.01007 (0.00447) | **0.7** | 95.3 | 61.8 | 0.03658 (0.19084) | -46.7 | 86.9 | 13.2 |
| Hybrid 3 | 0.00984 (0.00430) | -1.6 | 95.2 | 62.8 | 0.05574 (0.21437) | -18.7 | 84.3 | 16.8 |
| **Roadside Kerbside** | Land Use Regression | 0.01064 (0.00403) | **6.4** | 95.0 | 74.7 | 0.05372 (0.05982) | -21.7 | 59.2 | 45.6 |
| Dispersion | 0.00845 (0.00266) | -15.5 | 91.4 | 89.5 | 0.07749 (0.05142) | **13.0** | 70.4 | 44.5 |
| Machine learning methods | 0.00968 (0.00301) | -3.2 | 95.1 | 88.5 | 0.11602 (0.06145) | **69.1** | 51.9 | 58.8 |
| Hybrid 1 | 0.00967 (0.00306) | -3.3 | 95.5 | 89.7 | 0.07317 (0.05335) | **6.7** | 62.7 | 48.3 |
| Hybrid 2 | 0.01049 (0.00331) | **4.9** | 95.1 | 89.0 | 0.09793 (0.05338) | **42.8** | 61.2 | 51.1 |
| Hybrid 3 | 0.01037 (0.00319) | **3.7** | 94.7 | 89.5 | 0.11716 (0.06015) | **70.8** | 52.8 | 57.0 |

a Percent bias is highlighted in bold when positive (i.e. away from the null) rather than negative (i.e. towards the null).

Note: All reported biases are not statistically significant at the 5% level based on a one sample t-test.