Simulation Result For Three-Level Intercept Model With High Prevalence

The mean prevalence for this simulation is 31 %

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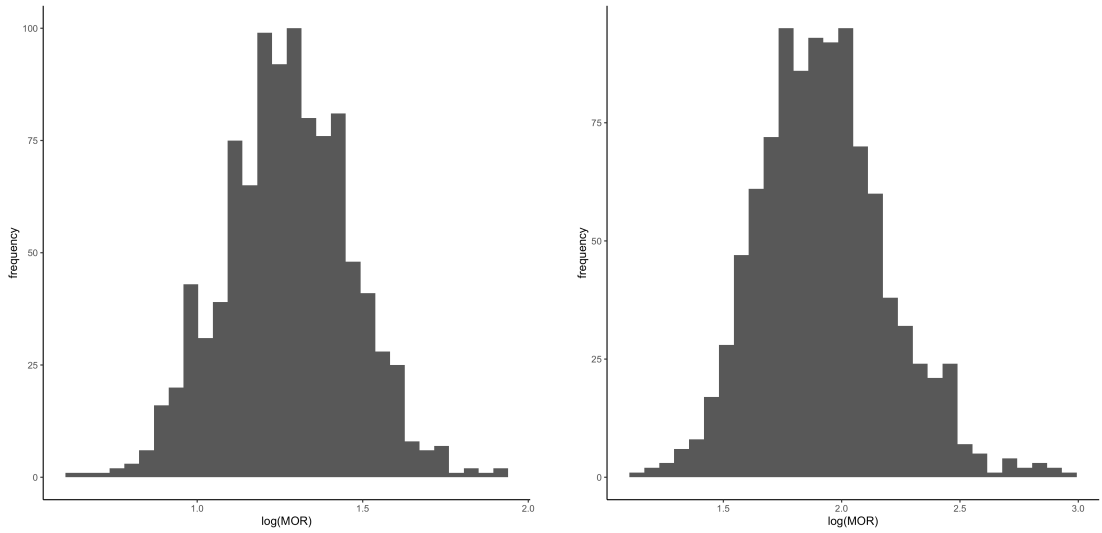
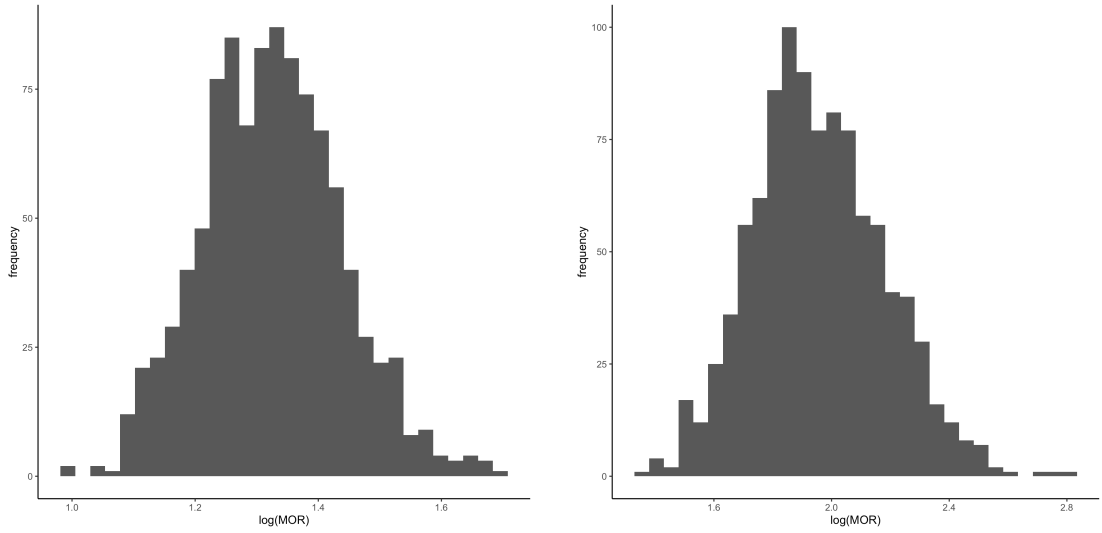
Histograms for $log(\widehat{MOR})$



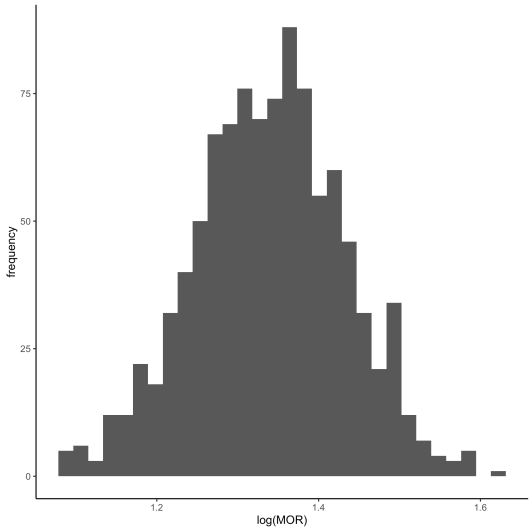
(a) MOR_1 (b) MOR_2

Figure 1: Hospitals = 20, Doctors = 10, Patients = 5

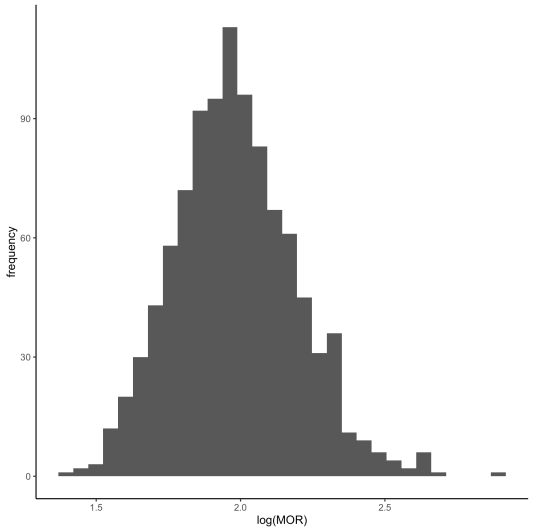


(a) MOR_1 (b) MOR_2

Figure 2: Hospitals = 20, Doctors = 10, Patients = 15

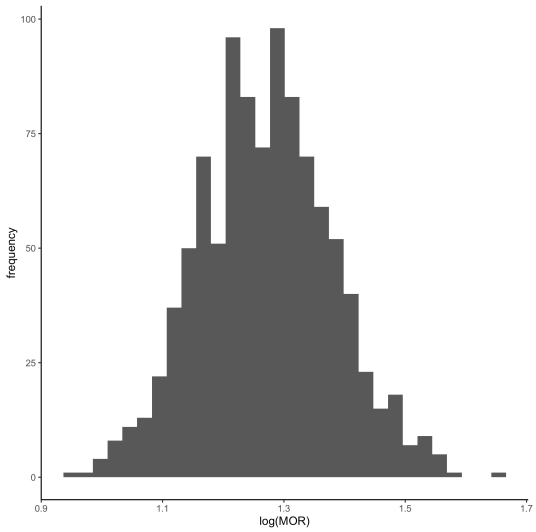


(a) MOR_1

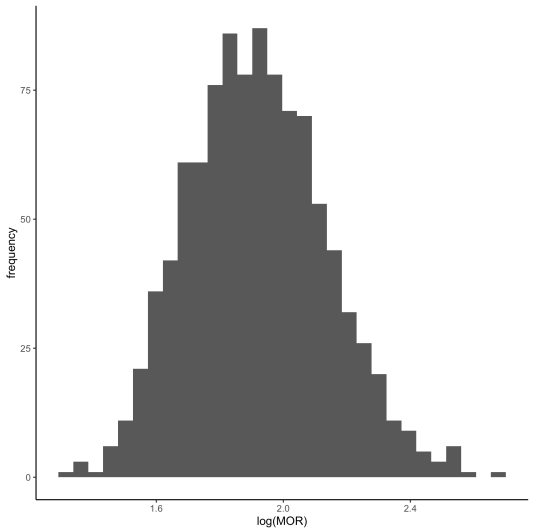


(b) MOR_2

Figure 3: Hospitals = 20, Doctors = 10, Patients = 30

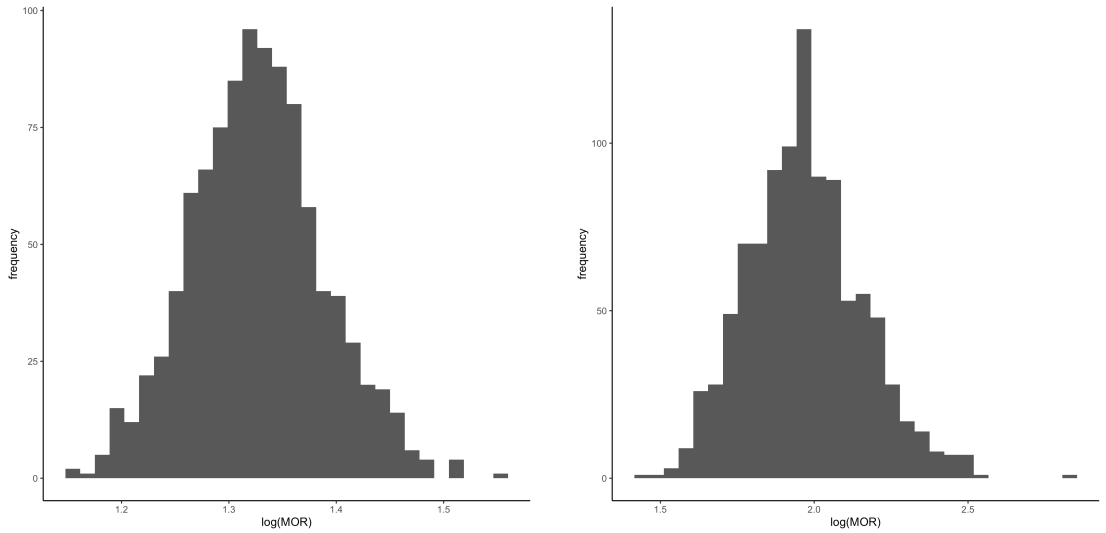


(a) MOR_1



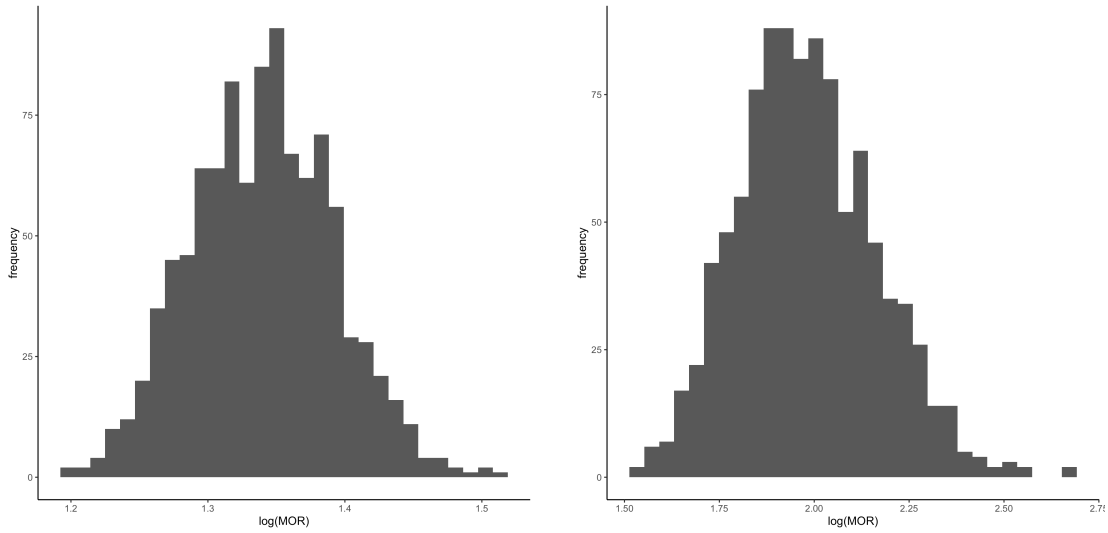
(b) MOR_2

Figure 4: Hospitals = 20, Doctors = 30, Patients = 5



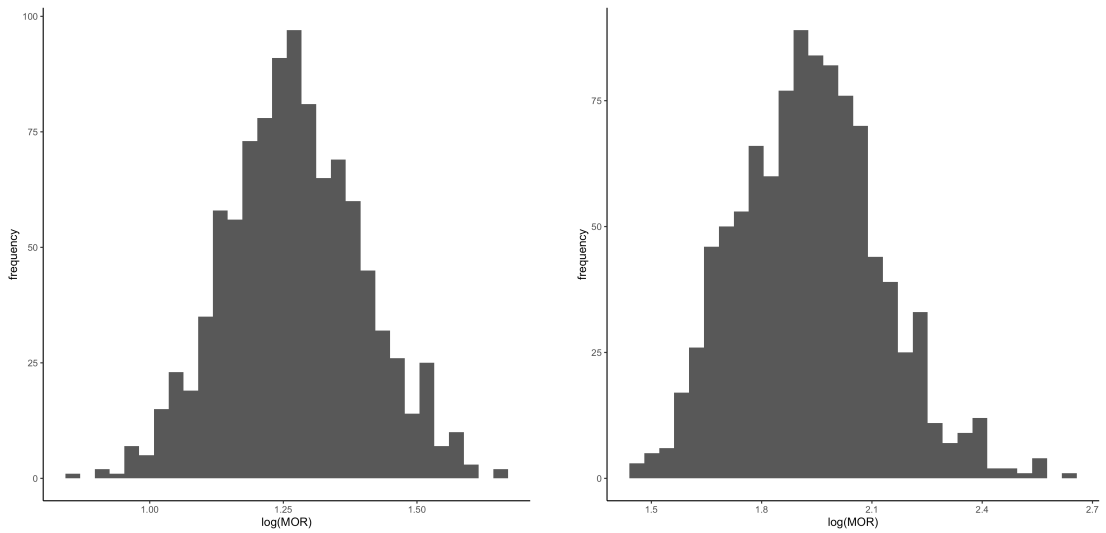
(a) MOR_1 (b) MOR_2

Figure 5: Hospitals = 20, Doctors = 30, Patients = 15



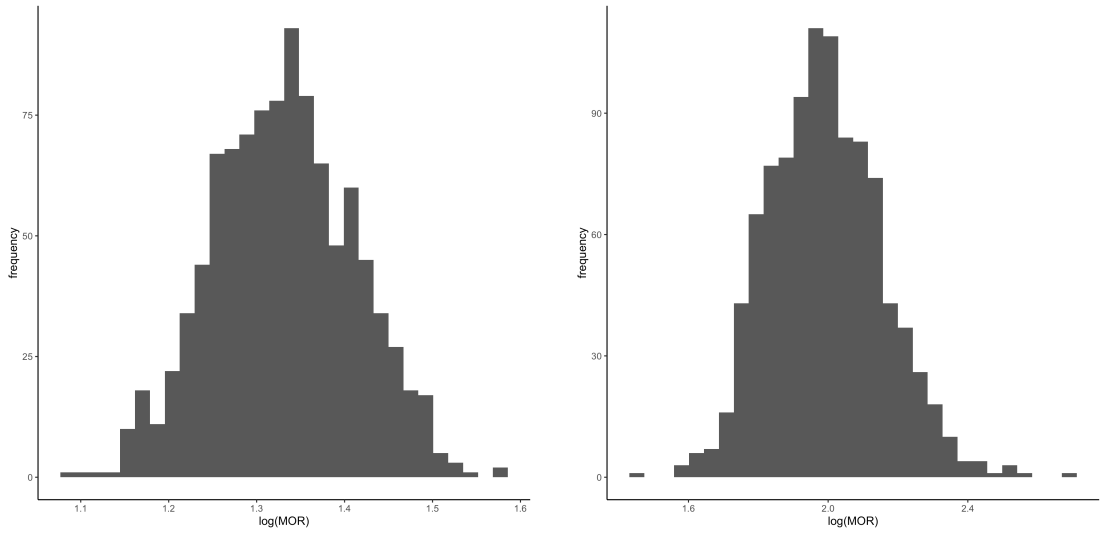
(a) MOR_1 (b) MOR_2

Figure 6: Hospitals = 20, Doctors = 30, Patients = 30



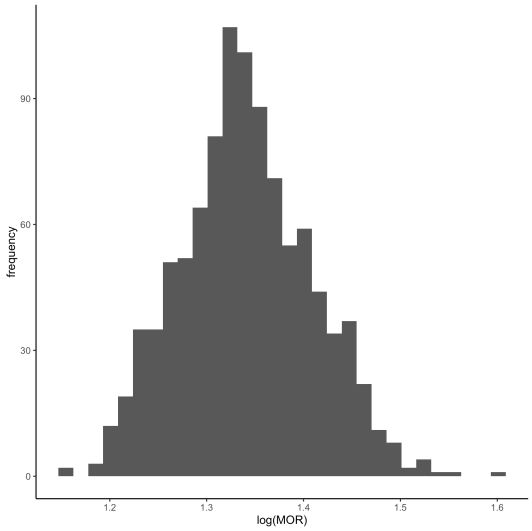
(a) MOR_1 (b) MOR_2

Figure 7: Hospitals = 40, Doctors = 10, Patients = 5

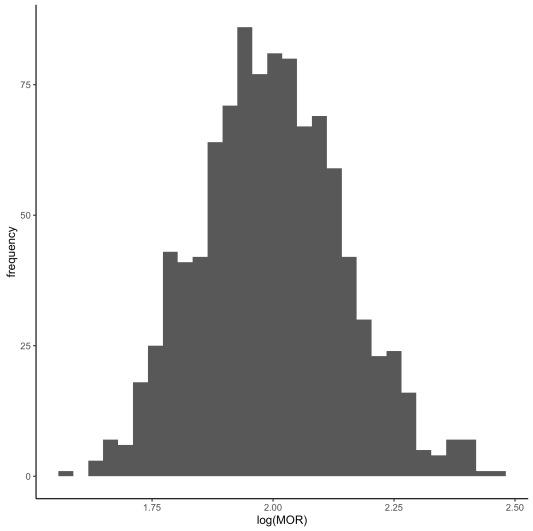


(a) MOR_1 (b) MOR_2

Figure 8: Hospitals = 40, Doctors = 10, Patients = 15

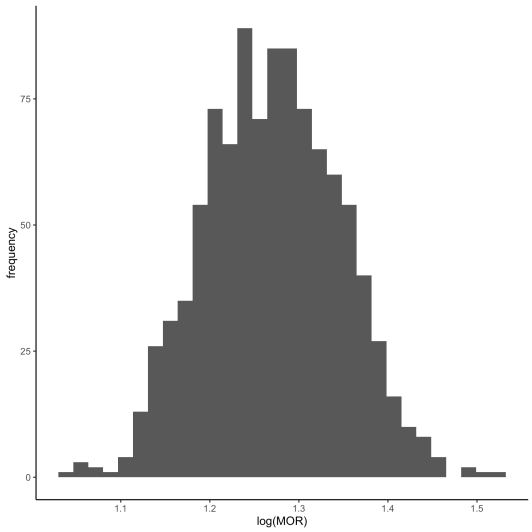


(a) MOR_1

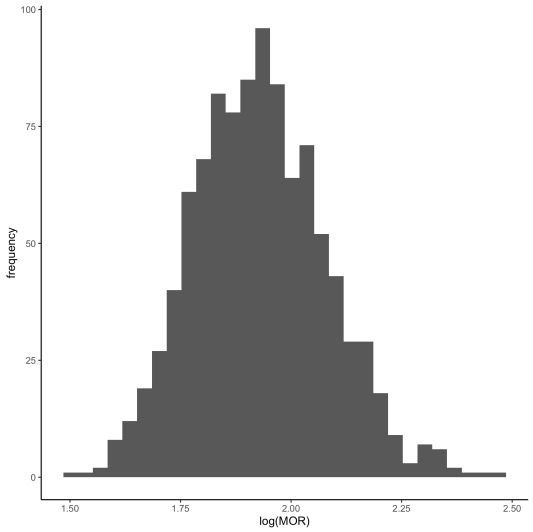


(b) MOR_2

Figure 9: Hospitals = 40, Doctors = 10, Patients = 30

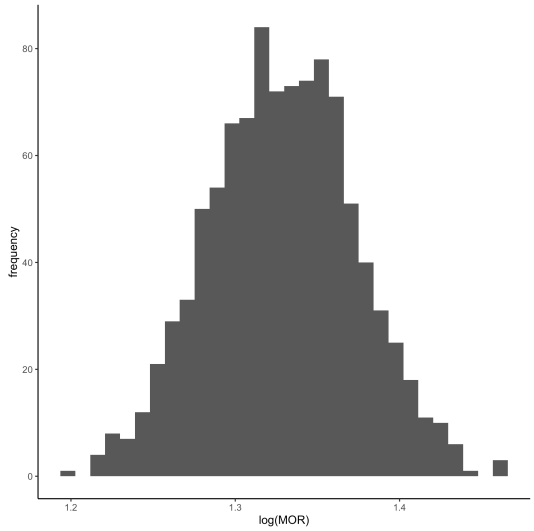


(a) MOR_1

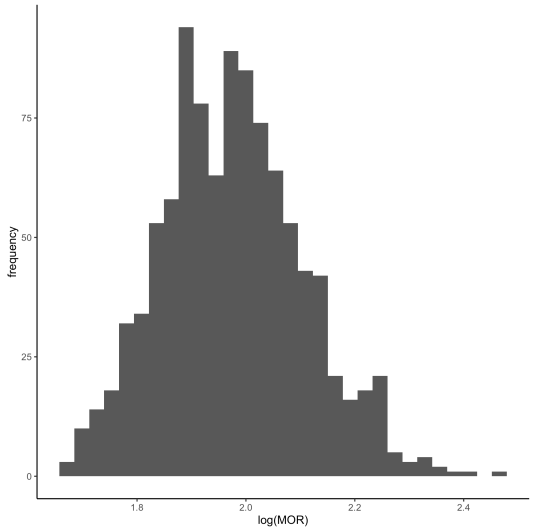


(b) MOR_2

Figure 10: Hospitals = 40, Doctors = 30, Patients = 5

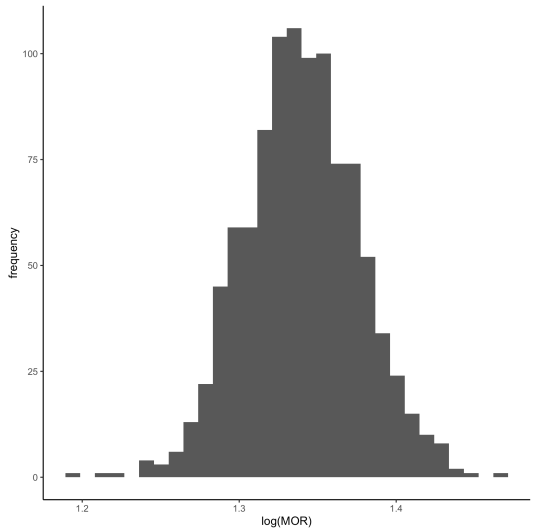


(a) MOR_1

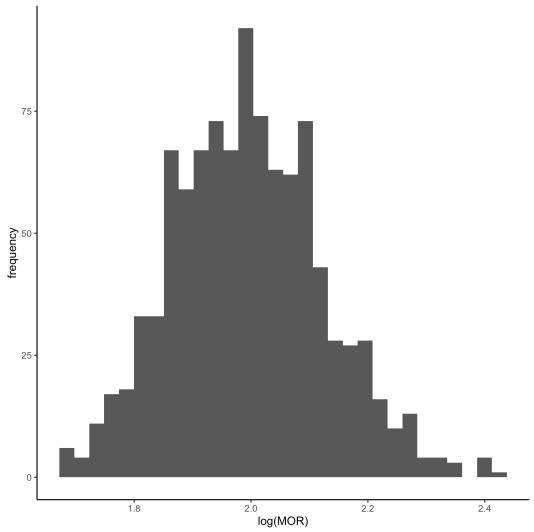


(b) MOR_2

Figure 11: Hospitals = 40, Doctors = 30, Patients = 15



(a) MOR_1



(b) MOR_2

Figure 12: Hospitals = 40, Doctors = 30, Patients = 30

Simulation Result Table for MOR of Second Level

L[1]	M[2]	N[3]	$\widehat{\beta_0}$	$\widehat{\beta_1}$	$\widehat{\beta_2}$	$\widehat{\sigma^2_{u_{jk}}}$	$\widehat{\sigma^2_{v_k}}$	$\widehat{MOR}_1$	Rel. Bias (%)	$\widehat{SE}_{MOR}$	Sim. $\widehat{SE}_{MOR}$	Ratio[4]	Coverage[5] (95%)	Model Conv[6]
20	10	5	-1.84	1.75	0.67	1.82	2.34	3.64	-5.65	1.21	1.21	1.00	0.90	1
20	10	15	-1.85	1.75	0.67	1.94	2.31	3.79	-1.77	1.12	1.12	1.00	0.93	1
20	10	30	-1.83	1.75	0.67	1.98	2.38	3.83	-0.56	1.10	1.10	1.00	0.93	1
20	30	5	-1.83	1.73	0.66	1.79	2.31	3.58	-7.02	1.11	1.12	0.99	0.85	1
20	30	15	-1.85	1.75	0.67	1.94	2.36	3.78	-2.01	1.06	1.06	1.00	0.93	1
20	30	30	-1.84	1.75	0.67	1.98	2.37	3.83	-0.74	1.05	1.05	1.00	0.95	1
40	10	5	-1.84	1.73	0.67	1.79	2.35	3.59	-6.76	1.14	1.14	1.00	0.91	1
40	10	15	-1.83	1.75	0.67	1.95	2.44	3.80	-1.51	1.08	1.08	1.00	0.94	1
40	10	30	-1.84	1.75	0.67	1.98	2.43	3.83	-0.58	1.07	1.07	1.00	0.95	1
40	30	5	-1.83	1.73	0.67	1.78	2.33	3.57	-7.23	1.08	1.08	1.00	0.78	1
40	30	15	-1.85	1.75	0.67	1.94	2.37	3.78	-1.92	1.05	1.05	1.00	0.92	1
40	30	30	-1.84	1.75	0.67	1.97	2.42	3.82	-0.86	1.04	1.04	1.00	0.95	1

Note:

[1] Number of Hospital

[2] Number of Doctors

[3] Number of patients

[4] Ratio = $\dfrac{\widehat{SE}_{MOR}}{Simulation\ \widehat{SE}_{MOR}}$

[5] Confidence Interval Coverage Probability

[6] Model Convergence (Ratio of 1000 runs to the runs required to get 1000 converged cases)

[*] The mean prevalence for this simulation is 31%

[†] True MOR_1 is 3.85

[‡] True $\sigma^2_{u_{jk}}$ is 2

[§] True $\sigma^2_{v_k}$ is 2.5

[¶] True Values of $\beta_0 = -1.85$, $\beta_1 = 1.75$, $\beta_2 = 0.67$

Simulation Result Table for MOR of Third Level

L[1]	M[2]	N[3]	$\widehat{\beta_0}$	$\widehat{\beta_1}$	$\widehat{\beta_2}$	$\widehat{\sigma^2_{u_{jk}}}$	$\widehat{\sigma^2_{v_k}}$	$\widehat{MOR_2}$	Rel. Bias (%)	$\widehat{SE}_{MOR}$	Sim. $\widehat{SE}_{MOR}$	Ratio[4]	Coverage[5] (95%)	Model Conv[6]
20	10	5	-1.84	1.75	0.67	1.82	2.34	7.13	-5.72	1.29	1.32	0.98	0.88	1
20	10	15	-1.85	1.75	0.67	1.94	2.31	7.25	-4.21	1.23	1.25	0.99	0.88	1
20	10	30	-1.83	1.75	0.67	1.98	2.38	7.42	-1.90	1.22	1.23	0.99	0.89	1
20	30	5	-1.83	1.73	0.66	1.79	2.31	6.98	-7.74	1.22	1.24	0.98	0.83	1
20	30	15	-1.85	1.75	0.67	1.94	2.36	7.29	-3.61	1.20	1.20	1.00	0.88	1
20	30	30	-1.84	1.75	0.67	1.98	2.37	7.37	-2.52	1.20	1.20	1.00	0.89	1
40	10	5	-1.84	1.73	0.67	1.79	2.35	7.03	-7.00	1.20	1.21	0.99	0.85	1
40	10	15	-1.83	1.75	0.67	1.95	2.44	7.44	-1.70	1.16	1.18	0.99	0.91	1
40	10	30	-1.84	1.75	0.67	1.98	2.43	7.45	-1.45	1.16	1.16	1.00	0.91	1
40	30	5	-1.83	1.73	0.67	1.78	2.33	6.97	-7.92	1.15	1.16	0.99	0.84	1
40	30	15	-1.85	1.75	0.67	1.94	2.37	7.28	-3.76	1.14	1.14	1.00	0.90	1
40	30	30	-1.84	1.75	0.67	1.97	2.42	7.41	-2.01	1.14	1.14	1.00	0.92	1

Note:

[1] Number of Hospital

[2] Number of Doctors

[3] Number of patients

[4] Ratio = $\dfrac{\widehat{SE}_{MOR}}{Simulation\ \widehat{SE}_{MOR}}$

[5] Confidence Interval Coverage Probability

[6] Model Convergence (Ratio of 1000 runs to the runs required to get 1000 converged cases)

[*] The mean prevalence for this simulation is 31%

[†] True MOR_2 is 7.56

[‡] True $\sigma^2_{u_{jk}}$ is 2

[§] True $\sigma^2_{v_k}$ is 2.5

[¶] True Values of $\beta_0 = -1.85$, $\beta_1 = 1.75$, $\beta_2 = 0.67$

Simulation Result Table All Together

								MOR_1						MOR_2						
L[1]	M[2]	N[3]	$\widehat{\beta_0}$	$\widehat{\beta_1}$	$\widehat{\beta_2}$	$\widehat{\sigma^2_{u_{jk}}}$	$\widehat{\sigma^2_{v_k}}$	$\widehat{MOR}$	Rel. Bias (%)	$\widehat{SE}_{MOR}$	Sim. $\widehat{SE}_{MOR}$	Ratio[4]	Coverage[5] (95%)	$\widehat{MOR}$	Rel. Bias (%)	$\widehat{SE}_{MOR}$	Sim. $\widehat{SE}_{MOR}$	Ratio[4]	Coverage[5] (95%)	Model Conv[6]
20	10	5	-1.84	1.75	0.67	1.82	2.34	3.64	-5.65	1.21	1.21	1.00	0.90	7.13	-5.72	1.29	1.32	0.98	0.88	1
20	10	15	-1.85	1.75	0.67	1.94	2.31	3.79	-1.77	1.12	1.12	1.00	0.93	7.25	-4.21	1.23	1.25	0.99	0.88	1
20	10	30	-1.83	1.75	0.67	1.98	2.38	3.83	-0.56	1.10	1.10	1.00	0.93	7.42	-1.90	1.22	1.23	0.99	0.89	1
20	30	5	-1.83	1.73	0.66	1.79	2.31	3.58	-7.02	1.11	1.12	0.99	0.85	6.98	-7.74	1.22	1.24	0.98	0.83	1
20	30	15	-1.85	1.75	0.67	1.94	2.36	3.78	-2.01	1.06	1.06	1.00	0.93	7.29	-3.61	1.20	1.20	1.00	0.88	1
20	30	30	-1.84	1.75	0.67	1.98	2.37	3.83	-0.74	1.05	1.05	1.00	0.95	7.37	-2.52	1.20	1.20	1.00	0.89	1
40	10	5	-1.84	1.73	0.67	1.79	2.35	3.59	-6.76	1.14	1.14	1.00	0.91	7.03	-7.00	1.20	1.21	0.99	0.85	1
40	10	15	-1.83	1.75	0.67	1.95	2.44	3.80	-1.51	1.08	1.08	1.00	0.94	7.44	-1.70	1.16	1.18	0.99	0.91	1
40	10	30	-1.84	1.75	0.67	1.98	2.43	3.83	-0.58	1.07	1.07	1.00	0.95	7.45	-1.45	1.16	1.16	1.00	0.91	1
40	30	5	-1.83	1.73	0.67	1.78	2.33	3.57	-7.23	1.08	1.08	1.00	0.78	6.97	-7.92	1.15	1.16	0.99	0.84	1
40	30	15	-1.85	1.75	0.67	1.94	2.37	3.78	-1.92	1.05	1.05	1.00	0.92	7.28	-3.76	1.14	1.14	1.00	0.90	1
40	30	30	-1.84	1.75	0.67	1.97	2.42	3.82	-0.86	1.04	1.04	1.00	0.95	7.41	-2.01	1.14	1.14	1.00	0.92	1

Note:

[1] Number of Hospital

[2] Number of Doctors

[3] Number of patients

[4] Ratio = $\dfrac{\widehat{SE}_{MOR}}{Simulation\ \widehat{SE}_{MOR}}$

[5] Confidence Interval Coverage Probability

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