Simulation Result For Two-Level Intercept Model With Low Prevalence

The mean prevalence for this simulation is 10 %

Shafayet Khan Shafee

03 September 2023

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

Cluster Number 10

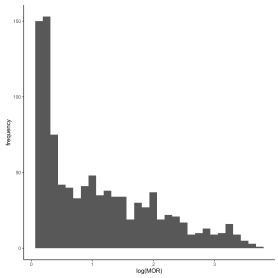

Figure 1: Cluster size 5

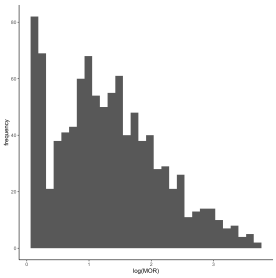

Figure 2: Cluster size 10

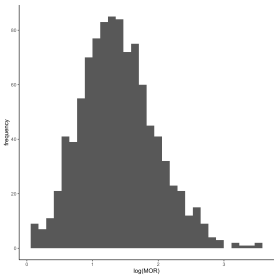

Figure 3: Cluster size 30

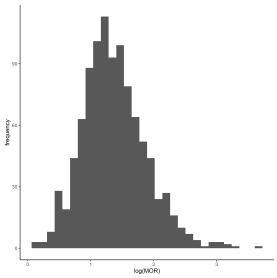

Figure 4: Cluster size 50

Cluster Number 30

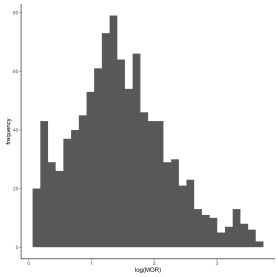

Figure 5: Cluster size 5

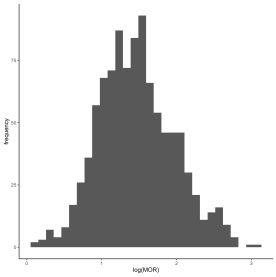

Figure 6: Cluster size 10

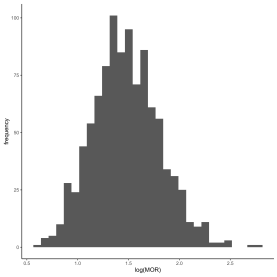

Figure 7: Cluster size 30

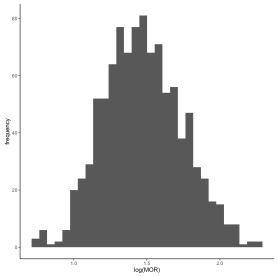

Figure 8: Cluster size 50

Cluster Number 50

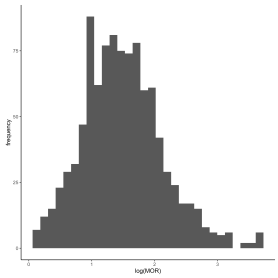

Figure 9: Cluster size 5

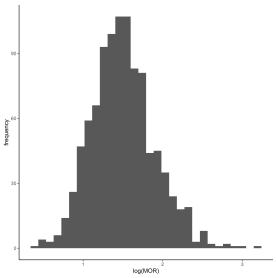

Figure 10: Cluster size 10

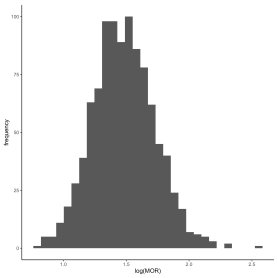

Figure 11: Cluster size 30

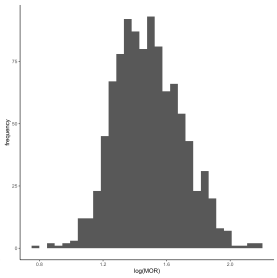

Figure 12: Cluster size 50

Cluster Number 100

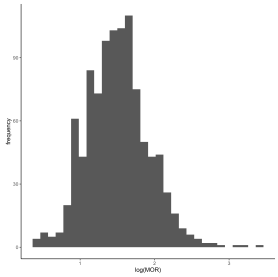

Figure 13: Cluster size 5

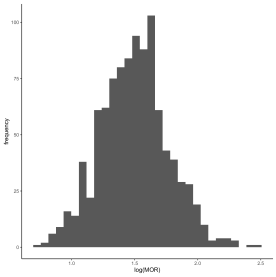

Figure 14: Cluster size 10

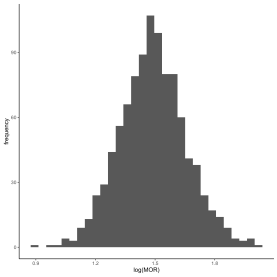

Figure 15: Cluster size 30

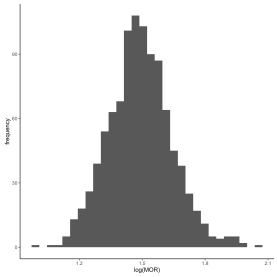

Figure 16: Cluster size 50

Simulation Result Table

Number of Cluster	Cluster Size	$\widehat{\beta_0}$	$\widehat{\beta_1}$	$\widehat{\beta_2}$	$\widehat{\sigma_u^2}$	$\widehat{MOR}$	Relative Bias (%)	$\widehat{SE}_{MOR}$	Simulation $\widehat{SE}_{MOR}$	Ratio[1]	CI coverage (95%)	Model Conver-gence
10	5	-4.09	1.94	0.77	2.19	4.84	7.08	4.69	2.50	1.87	0.91	0.55
10	10	-4.30	1.93	0.70	2.67	5.48	21.26	2.85	2.30	1.24	0.92	0.87
10	30	-4.24	1.82	0.67	2.50	4.82	6.59	1.80	1.77	1.02	0.89	0.99
10	50	-4.17	1.79	0.66	2.34	4.53	0.24	1.62	1.65	0.98	0.86	1.00
30	5	-4.37	1.92	0.64	3.02	6.01	32.91	2.61	2.15	1.21	0.97	0.93
30	10	-4.24	1.81	0.69	2.64	4.94	9.28	1.69	1.65	1.03	0.97	0.99
30	30	-4.14	1.77	0.65	2.52	4.63	2.54	1.37	1.39	0.99	0.91	1.00
30	50	-4.13	1.77	0.65	2.46	4.52	-0.04	1.32	1.30	1.01	0.94	1.00
50	5	-4.29	1.87	0.67	2.88	5.56	23.12	1.94	1.88	1.03	0.99	0.96
50	10	-4.19	1.79	0.69	2.65	4.88	7.92	1.48	1.48	0.99	0.96	1.00
50	30	-4.11	1.77	0.66	2.47	4.53	0.24	1.27	1.28	1.00	0.93	1.00
50	50	-4.12	1.76	0.67	2.47	4.51	-0.11	1.24	1.23	1.00	0.95	1.00
100	5	-4.19	1.80	0.69	2.67	4.92	8.87	1.52	1.51	1.01	0.98	1.00
100	10	-4.14	1.77	0.66	2.54	4.64	2.62	1.30	1.31	1.00	0.94	1.00
100	30	-4.11	1.76	0.67	2.47	4.49	-0.58	1.19	1.18	1.00	0.94	1.00
100	50	-4.12	1.75	0.67	2.47	4.49	-0.60	1.16	1.16	1.00	0.93	1.00

Note:

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

[*] The mean prevalence for this simulation is 10%

[†] True MOR is 4.52

[‡] True σ_u^2 is 2.5

[§] True Values of $\beta_0 = -4.1$, $\beta_1 = 1.75$, $\beta_2 = 0.67$