Simulation Result For Two-Level Intercept Model With Low Prevalence

The mean prevalence for this simulation is 27 %

Shafayet Khan Shafee

23 August 2023

Histograms for $log(\widehat{MOR})$ When Number of Cluster is 10

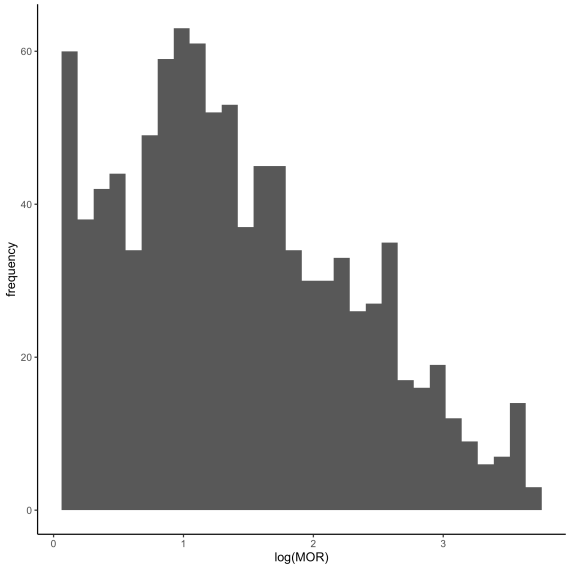

Figure 1: For cluster size 5

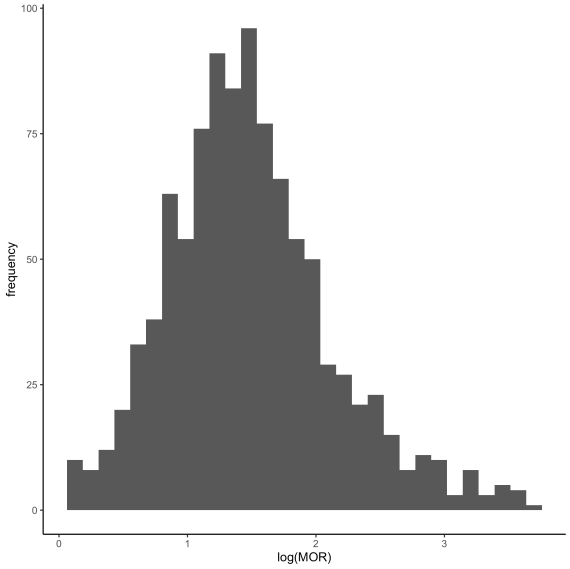

Figure 2: For cluster size 10

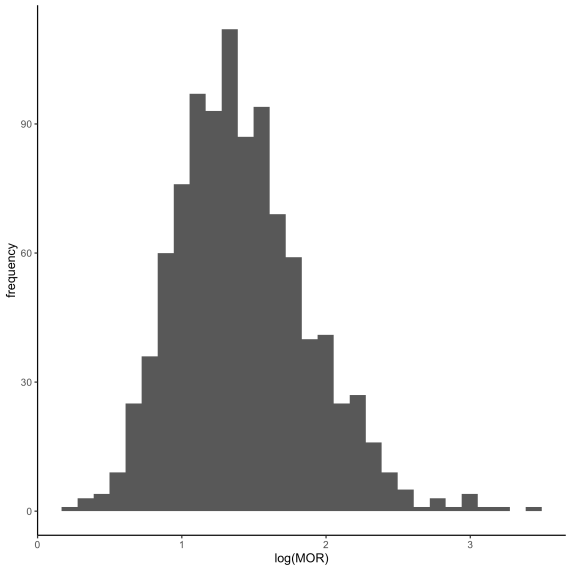

Figure 3: For cluster size 30

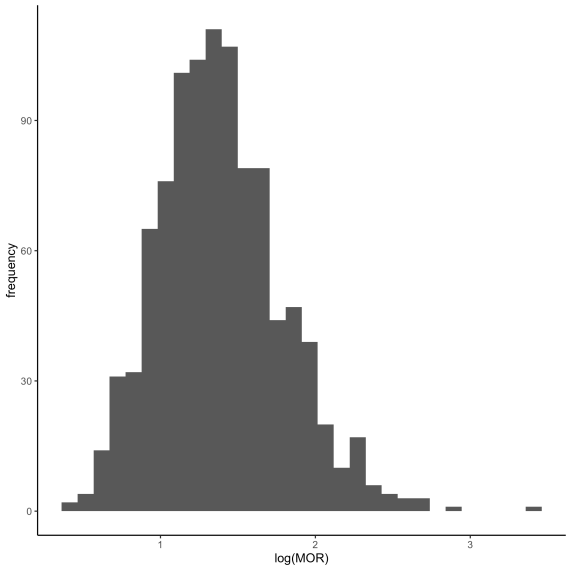

Figure 4: For cluster size 50

Histograms for $log(\widehat{MOR})$ When Number of Cluster is 30

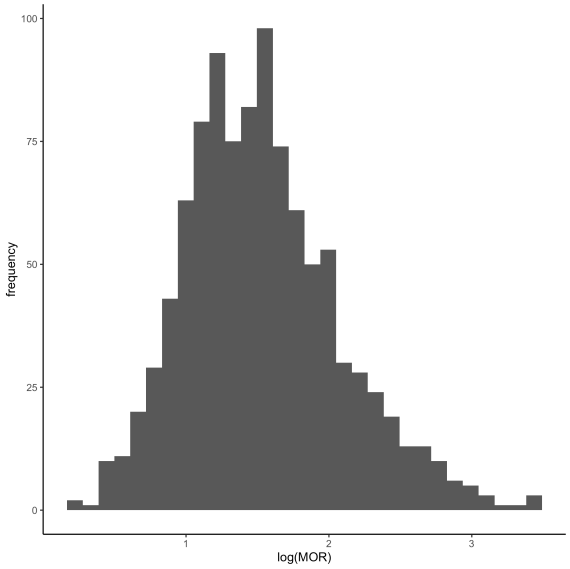

Figure 5: For cluster size 5

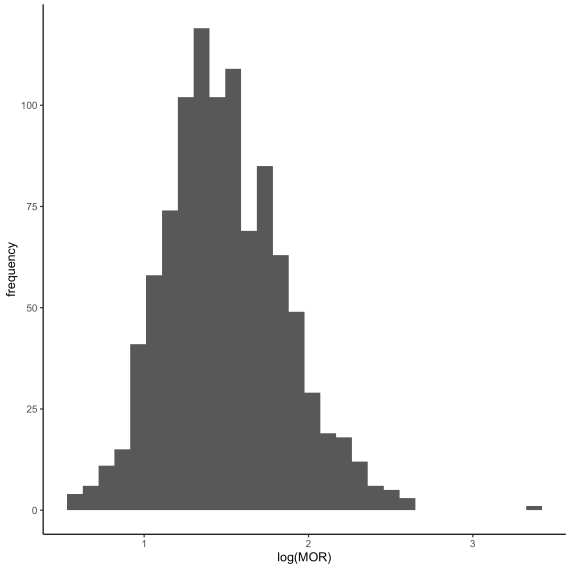

Figure 6: For cluster size 10

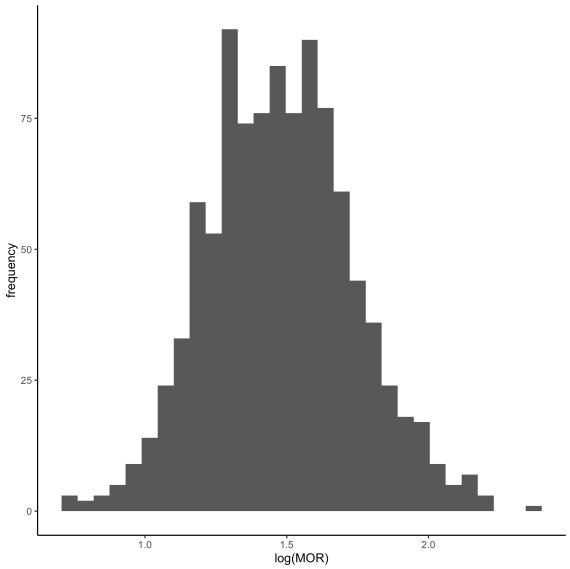

Figure 7: For cluster size 30

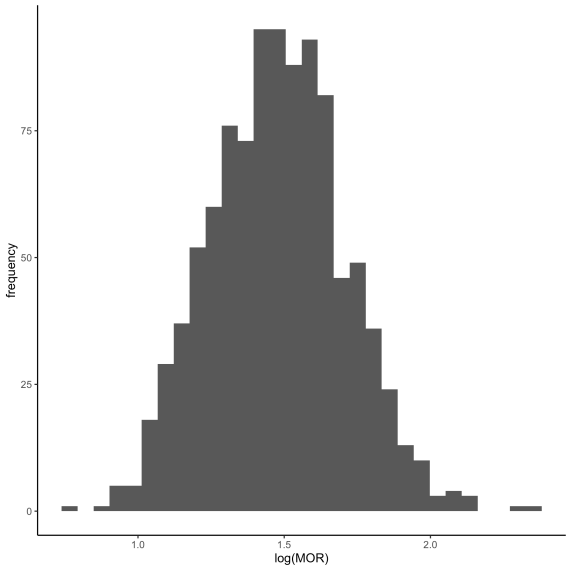

Figure 8: For cluster size 50

Histograms for $log(\widehat{MOR})$ When Number of Cluster is 50

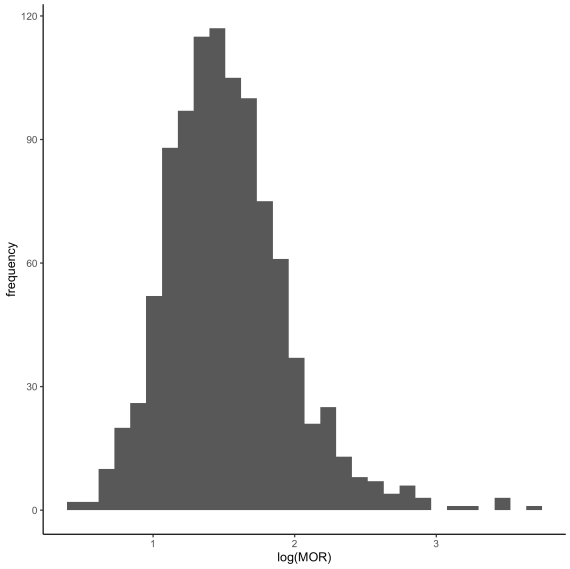

Figure 9: For cluster size 5

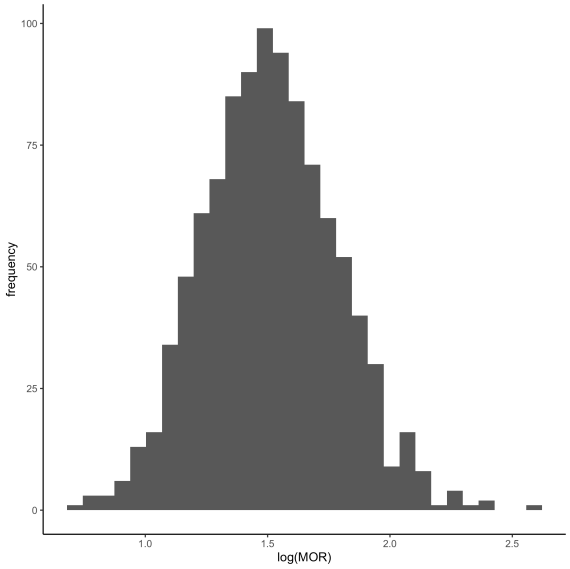

Figure 10: For cluster size 10

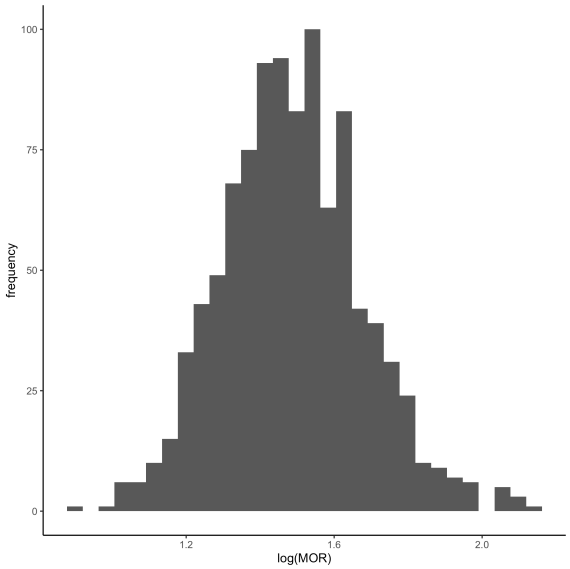

Figure 11: For cluster size 30

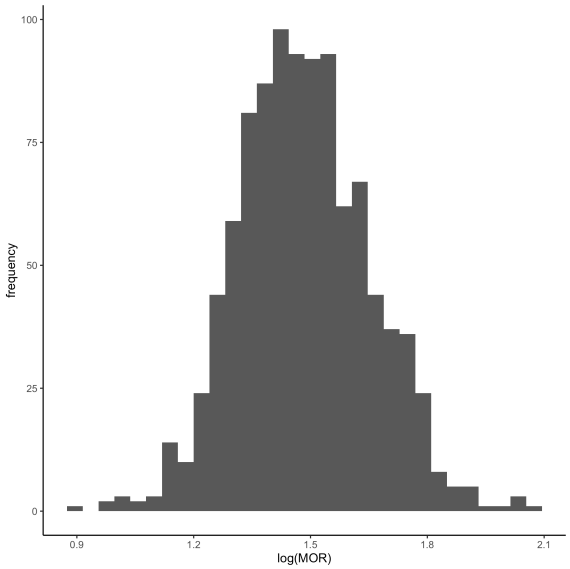

Figure 12: For cluster size 50

Histograms for $log(\widehat{MOR})$ When Number of Cluster is 100

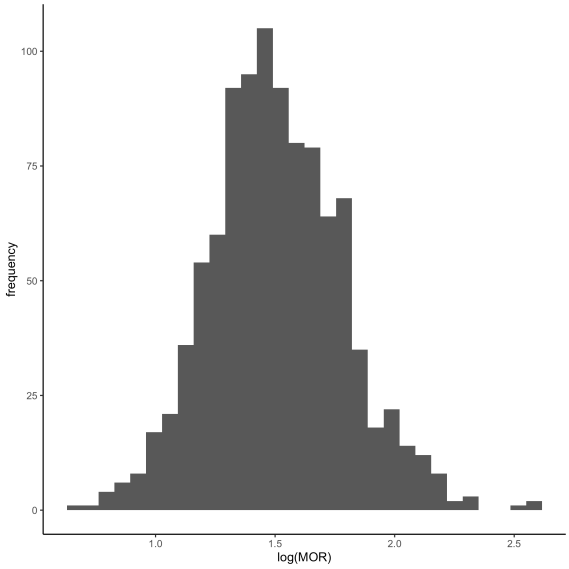

Figure 13: For cluster size 5

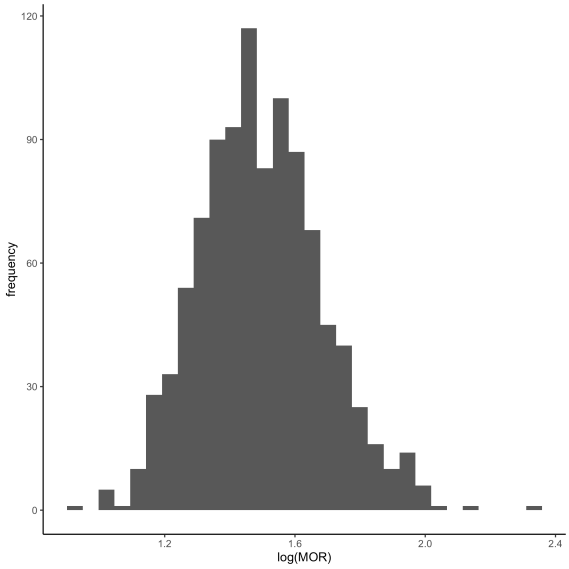

Figure 14: For cluster size 10

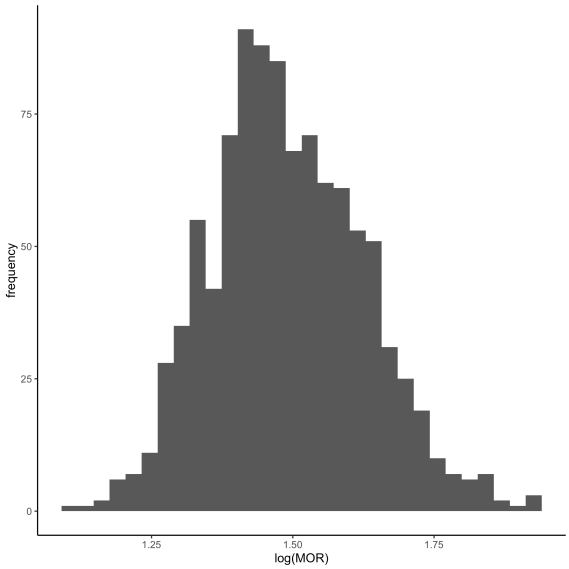

Figure 15: For cluster size 30

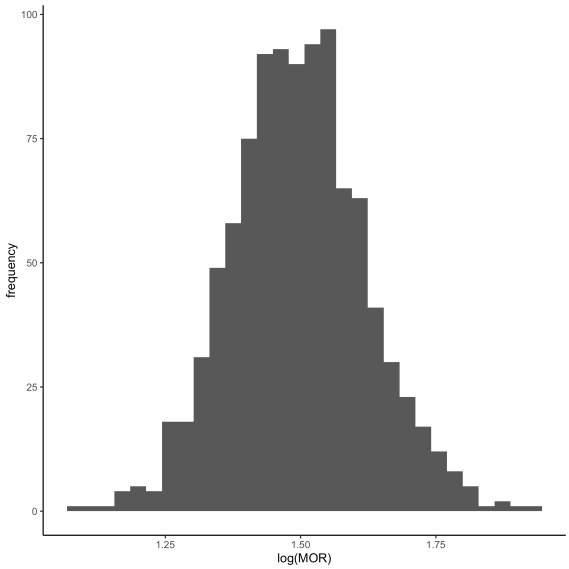

Figure 16: For cluster size 50

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%)	Runs used	Runs Required
10	5	-2.21	2.06	0.69	3.09	6.34	40.29	3.18	2.41	1.32	0.94	1000	1157
10	10	-2.08	1.89	0.70	2.90	5.62	24.42	1.96	1.89	1.03	0.94	1000	1036
10	30	-2.05	1.80	0.69	2.45	4.65	2.89	1.54	1.58	0.97	0.87	1000	1001
10	50	-2.03	1.78	0.69	2.30	4.38	-3.05	1.46	1.49	0.98	0.86	1000	1000
30	5	-2.10	1.86	0.67	2.90	5.43	20.19	1.72	1.71	1.01	0.98	1000	1020
30	10	-2.03	1.80	0.67	2.59	4.77	5.58	1.42	1.44	0.99	0.94	1000	1000
30	30	-2.01	1.76	0.66	2.48	4.54	0.43	1.28	1.29	0.99	0.93	1000	1000
30	50	-2.02	1.76	0.67	2.46	4.50	-0.34	1.25	1.26	1.00	0.92	1000	1000
50	5	-2.05	1.82	0.68	2.76	5.12	13.40	1.50	1.54	0.97	0.96	1000	1002
50	10	-2.03	1.78	0.67	2.59	4.71	4.17	1.31	1.31	1.00	0.94	1000	1000
50	30	-2.01	1.75	0.67	2.47	4.50	-0.32	1.21	1.21	1.00	0.94	1000	1000
50	50	-2.02	1.75	0.67	2.45	4.47	-1.07	1.19	1.18	1.01	0.94	1000	1000
100	5	-2.02	1.76	0.67	2.58	4.70	3.96	1.31	1.32	0.99	0.95	1000	1000
100	10	-2.02	1.76	0.68	2.50	4.54	0.54	1.21	1.21	1.00	0.95	1000	1000
100	30	-2.01	1.75	0.67	2.46	4.48	-0.78	1.14	1.14	1.00	0.95	1000	1000
100	50	-2.01	1.75	0.67	2.48	4.50	-0.38	1.13	1.13	1.00	0.95	1000	1000

Note:

The mean prevalence for this simulation is 27%

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

Here,

- True MOR is 4.52
- True σ_u^2 is 2.5
- True Values of $\beta_0 = -2$, $\beta_1 = 1.75$, $\beta_2 = 0.67$
- "Runs used" column represent how many simulation runs were used to calculate the numbers in the corresponding row.